Elsewhere, the project is stated to shift treated effluent application from Tonini to Broaderson during the rains. Why are these values not presented and what are they?

P 5.3-3 SITE FLOODING. It should be noted that due to global weather changes the 100 year flood plains described at Warden Creek are likely to experience 100 year floods (as defined in 20 year old plans) at a more likely frequency of every 50 years. This likelihood is increased as the project lifetime may be 30 years. (members of the public should understand that 100 years is the measure of time expected to pass on average in which the next very high flood would occur, that does not exclude the possibility of such a flood from occurring say, tomorrow)

P 5.3-4 **5.3.3 - Thresholds of Significance**

"d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? "
Can the Hydrology and Water Quality Environmental Issues quoted above be maintained as "Less than Significant" given that the county is constructing a storm water system (Pallisades Signal Project) letting out at the midtown site almost directly downhill and within the subsurface flow patterns expected to have contribution from the Broaderson Leach field?

P40-4
CONT

Tonini ranch contains two tributaries to Warden Creek. With disposal through sprayfields of up to 500 AFY (Evaporation would reduce the larger numbers applied, and Sprayfields would not be used during rain events, but the drainage area could be assumed to be close to saturated from prior application). Would the excess water at Tonini not contribute to the likelihood of more serious flooding than if not applied at all? Is this not a significant impact?

5.4 – GEOLOGY

Time constraints do not allow full review of the references, It is intended to submit additional questions after the DEIR submission process.

Only the potential for liquefaction at the Disposal site during rains will be addressed here in detail (Broderson, all projects) At this point of review, this reviewer does not believe that (if of high level of treatment, and depending on location of salt water intrusion advance, discussed elsewhere) a controlled portion of waste waters applied to Broderson during the dry season would necessarily be a problem.
The following questions are submitted with reference to the discussion presented herein. The section in the DEIR Page 5.4-9 is considered incomplete and is quoted below. Please respond to all the discussion elements, and consider a revised paragraph in the final EIR.

P40-5

Elsewhere there is consideration that the project intends to build a head of pressure of 17 feet in order to combat sea water intrusion. During rains the spray fields will not be in use and the waste origin water will be shunted to Broderson.
Under normal conditions Groundwater is stated to be 100 feet below the leach field. It should be noted also that the first few feet of loose sands are described as a part of the project to be removed and replaced with rocks etc… The description quoted below does not describe the PROJECT soil conditions, since the near surface loose dune sands will no longer be present (the sands will however be present nearby, downslope from the application site and above the dwellings beneath it).

"The proposed effluent system at Broderson would be located on a relatively gently sloping hillside approximately 1,200 feet south of Highland Avenue. Based on previous investigations, the depth to groundwater is greater than 100 feet below the existing ground surface and except for the near-surface loose dune sand deposits, the deeper soils encountered beneath the site are generally dense and not susceptible to liquefaction or seismic settlement. The near-surface loose dune sand would not be considered potentially liquefiable." (Reviewer underlined) Page 5.4-9

Time does not allow this reviewer to confirm that the "generally dense soils beneath the site" are consistent with the description of the site as suitable for quickly transporting water to the aquifer below" and also brings a concern that soil contact post disposal would be adequate for further processing of the wastes.

It is also incorrect not to mention that immediately above (South) are present significantly steep hills and the rainfall on them is expected to arrive at the leach fields and the ground beneath them by surface or subsurface transport (This soil science non-expert is of the impression that water flows downhill).

P40-5
CONT

Since the ground will be potentially saturated (Broderson is sloped and at the bottom of a hill) from the treated water applied previously to achieve the head, from prior rains and from simultaneous application of the additional shunted treated water and the rains that caused the shunting; can a no impact be justified?
(Tonini and Broderson may not always experience the same rainfall but it can be expected that, especially with changing weather patterns, simultaneous heavy rains at both can be expected a significant portion of the time during rainy season)

Since the head is raised by additional inputs and the functional depth to groundwater is decreased, can it be determined that there will be no escapements (flows) away from the site and to the vicinity of nearby dwellings in the area, all below the site?
Can it be determined that in the case of heavy rains and the simultaneous application of Tonini sprayfield shunted flows, that the ground around the residences who may experience higher than normal stormwaters (rain that can no longer percolate) or combined rain wastewater flows?

Given all elements of the discussion above please justify the following EIR Determination of:
The disposal site is identified in as having no potential for liquefaction or off site landslide ?

Separate but related issue
Table 5.4-1 (Cont.): Geology Significance Determination,

Disposal Section
Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? **PS= Potentially significant.**

P40-6

Why is the Disposal section identified in this table as PS=potentially significant for off site disturbance but appears to be contradicting the previous determination and is there is no discussion at all in the DEIR near Page 5.4-15 or in appendix F where it should had been explained?

Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: **NI=No Impact**

P40-7

Seismic-Related Ground Failure Impact 5.4-C:
It is noted that the Collection system is identified in this section to be under 5-10 feet of ground surface, the projects are not coequal in this regard as to depth of piping. Why are projects 2, 3, 4 compared as "same" as Project 1 with shallower pipes?
Why are the conveyance system elements including returns lumped within the heading"collection system" in this section?

P40-7
CONT

"Project-Specific Analysis
Proposed Project 1
Collection System
Loose sand blankets are located within the upper 5 to 10 feet of ground surface area over most of the collection system area. Portions of the collection system network traverse areas having a relatively high potential for liquefaction. The potential for liquefaction and seismic settlement to impact pipelines may be governed by the depth of the pipeline relative to the depth of liquefiable soils. The proposed collection system for Proposed Project 1 may experience significant liquefaction impacts. Furthermore, this potential significant impact could result in pipeline breaks and release of untreated and/or treated effluent along the proposed collection/conveyance system, including within Los Osos Creek and Warden Creek."

P40-8

Table 5.4-1: Collection system Would the project result in substantial soil erosion or the loss of topsoil? **PS=potentially significant.** There appears to be no discussion at all in section **5.4-E**. Project 1 would be likely to cause easily detected erosion in a case of pipe failure, Project 2, 3, 4 being deeper could have undetectable and more substantial over time subsurface erosions leading to later surface erosion. Where is the discussion?

Disclosure: This reviewer had prior access to another person's review report on this subject, and while that long review was only given a cursory glance, it is felt appropriate to make this disclosure, as plagiarism plagues the Los Osos sewer experience.

5.5 - BIOLOGICAL RESOURCES

This reviewer cannot tackle this serious subject within this modest review and hopes to expand the issues after the deadline with a post DEIR deadline report. Personal observations (I found my first extended live Sholder banded and duly reported it to the monitor present in the work party, some weeks after the release of this DEIR) are that work has been halted on the Audubon Societies' work at Sweet Springs nature preserve and the Small Wilderness Area Preservation (Weed Worriors) work at Elfin Forrest. This is due to a lack of monitors. Restrictions are much tighter than when the data were collected for documentation that is referenced and, and elements of these projects conceived or designed (prior EIR).

P40-9

Mitigation for "***Morro Shoulderband Snail 1, 2, 3, and 4***
5.5-A4 *Prior to project approval, a biologist authorized by the USWFS shall conduct intensive surveys to identify and relocate all snail specimens within the proposed impact area on the Broderson and Mid-town properties, and all suitable habitat areas within the proposed collection system.* ***Only USFWS authorized biologists*** *shall survey for, monitor, handle, or relocate Morro shoulderband snails*."
Reviewer underlined

How is the project going to be able to get sufficient coverage of biologists? How much time before work resumes?

The sholderbanded snails thrive in the non-native Iceplant and do well in the moisture pockets created by the association of chain-link fence poles at the midtown site with the sandbags that anchor them. The ever invasive Veldgrass that the work groups remove, is not considered supportive habitat. The migratory Monarch butterflies have similarly adapted to the presence of historic (non-native) Eucalyptus groves.

P40-9
CONT

5.6 - CULTURAL RESOURCES

This section has been anticipated due to prior project design and its mitigated effects are known. Projects are recognized to have effects, Laws affecting non disclosure to prevent disturbance is in affect. And the county is in contact with the sovereign nation of the Chumash and other knowledgeable people. Full review his section is skipped by this reviewer.

On a observational note, A room full of archeologists came to a concurrence that ”pretty much all of Los Osos dunes and the valley is of archeological significance”, while under the project this will be recognized. County and state treatment of private property may differ.

P40-10

Edit note

Archaeological Resources

There appears to be missing part of a sentence at the end of the table

Table 2-9 on page 2-41 Mitigations (all)

5.6-B6 Preconstruction monitoring shall occur in areas ranked as high in sensitivity for buried deposits. Two such areas have been identified within the proposed project area: (1) along Los Osos Valley Road from Los Osos Creek east to the Cemetery Parcel; and (2) in the western portion of the Tonini Parcel. Mechanical backhoe trenching shall be conducted within **the**” --There is nothing after “**the**”

The missing part is in “*Cultural Resources 5.6-22* Table 5.6-3 (Cont.): Proposed Mitigation Measures

5.7 - PUBLIC HEALTH AND SAFETY

While this Section was intended to be fully reviewed. time does not permit adequate review and additional material will be submitted separately and may not be included in the EIR directly but as supplemental material.

General discussion

There has been a lot of talk about “emerging contaminants”, the emerging contaminants that have the potential to affect this project the most are not necessarily the ones in the magazines or the peer reviewed scientific journals or even in a research laboratory. They are not known yet, but they are in the waste stream already, and possibly in some amounts in our bodies. P40-11

There is a difference in infectious loading within the conveyance systems of Project 1 STEP/STEG and the other 3 projects (Gravity) but this reviewer cannot detail the evidence due to time constraints.

The following discussion and questions are also appropriate to be included in the **Air quality** section.

The word AEROSOL does not appear in this health section, Aerosol is the mist created along with droplets of secondarily treated waste water sprayed at the sprayfield), and is carried in the air. nor other droplet transport to human contact is mentioned, **Why?** Secondarily treated water when inhaled or in contact with skin is toxic when in quantity or in longer exposure. Eye contact is also a concern. P40-12

Turry road is a bicycle path within a county planning sphere and reference should be made to the fact that the spray fields, as drawn on the EIR maps, appear to be immediately adjacent to about 3,000 feet worth of bike path. Are affects on local plans not recognized as an impact? And/or an impact category?

Ag mitigations are better

Provide fencing of areas currently grazed on the Tonini parcel, and a buffer between the boundary of the disposal area and areas currently grazed. The width of the buffer shall be determined in consultation with the San Luis Obispo County Agricultural Commissioner’s office. The Cows are protected P40-13

Disposal at Tonini spray fields
It is noted that spray fields, though discussed at the TAC, were a relatively new addition to the project description section 3. There appears to be understandably but inexcusably little information or analysis in other sections of this DEIR. Please discuss fully the overspray of water containing increasing Concentration of secondary pollutants?

Discussion

"The proposed Tonini sptrayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design" and

Appendix B: Project Description Data ***7.1.1 Sprayfields***

"Sprayfield disposal is the practice of spraying effluent on land to dispose of the water through evapotranspiration and percolation. Soils on the sprayfield surface area of the Tonini Site as shown on Figure 7-1 represent reasonable material for spray applications. Sprayfield disposal would require secondary treatment. Sprayfields would be operated to maximize evaporation and minimize runoff. This would entail spraying only during the daytime and collecting any tailwater (run-off) and returning it to the sprayfields for reapplication. Disposal would occur through evapotranspiration, or through both evapotranspiration and percolation."

As the spray leaves the sprinkler heads under pressure, vary small droplets form. Some are light enough to form a mist. Under mist conditions these will stay (along with naturally condensing moisture in the air) as a fog and may travel far. On hot days they would evaporate completely. If the water was pure, that would be the end of the cycle.

The middle of the cycle in waste water disposal is more complex. Since there are; biological particles, pharmaceuticals and their breakdown products, coffee, and thousands of different chemicals and minerals, some dissolved, some in small particles, (Turbidity is not zero) some gasses in the water being sprayed, these will be found in the droplets. As the large and small droplets move in the air they loose moisture and become smaller. At some point some gasses and chemicals causing odor (mercaptans for example; as in skunk odor) will also leave. Some droplets will become very concentrated. Some chemicals other than water will remain. Most of these droplets will hit the ground more concentrated then permitted by regulations to leave the sprinkler head (per gallon if you were to collect them). P40-14

If almost all, or all of the water evaporates, and the droplet decreases, so it is as small as a speck, light enough to stay in the air and travel (size range of particle of combusted diesel residue-see cross reference to Air quality Expanded Sec05-09) If the particle is light enough to stay suspended in the air for a good while, it can be stated to be in aerosol form, and can be carried in the winds for days or for miles. Since a portion of what went into the sewer from the houses will still be in secondary waste water (though at lesser amounts), a small but significant amount of the wastewater chemicals will end up well off the project site.

Affect of the cumulative transport of wastewater constituents off the property , as aerosols, in this DEIR, appears to be ignored for **health** and (understated for agriculture) **please comment?**

Waste is also rich in the proteins and fragments of proteins of bacteria. The bacteria (at least those that made it this far, after many generations of being eaten by other bacteria)

aren't as much an issue if tests confirm they are destroyed in the final stages of the secondary treatment. But those biological fragments are very stimulating to the Human immune system. Call them potent Allergens. Those can be carried for miles.

"The proposed Tonini sptrayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design" Tonini Site Outlined in Light Blue. The Crops in foreground are not on the site

P40-14
CONT

Will the County public health department be noting and following potential increases in reports of Asthma and Hay fever in the area? Is there a management plan? Mitigations?
While this Section was intended to be fully reviewed time does not permit adequate review and additional material will be submitted separately and may not be included in the EIR.

Cross reference Health to Air Quality

*"The smaller suspended particles in $PM_{2.5}$ typically have a combustion origin, or result from the oxidation, chemical reaction, recombination, adsorption, and/or coagulation of diverse **aerosols** and gaseous air pollutants. "These smaller particles, which can be as tiny as larger molecules, remain suspended in the air far longer than coarse particles, for periods of days or weeks. Therefore, regional meteorology plays a main role in the movement of these finer particles, and in the atmospheric chemistry that affects their transformation. In fact, transport of particulate air pollutants from distant major urban areas does sometimes play a role in local levels observed in the County "*

Cross reference health to agriculture
Agriculture *Page* 5.11-7

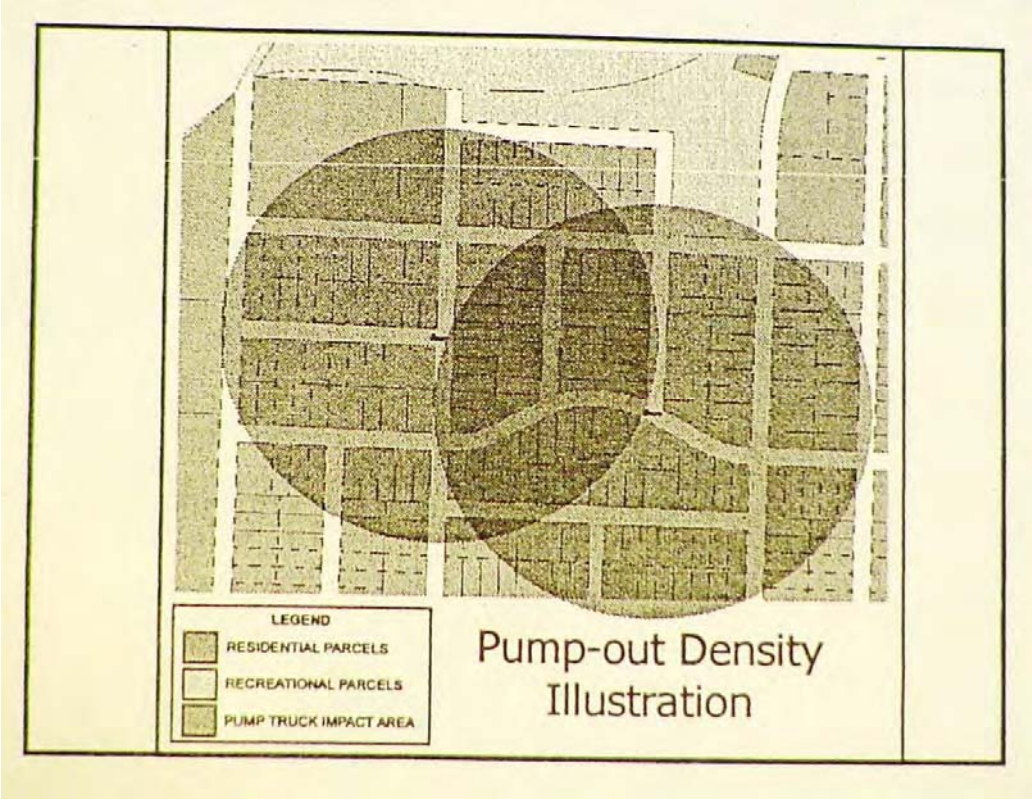
*"There would be indirect impacts within the Tonini parcel due to **accidental** spray dispersing beyond the direct affected areas (refer to Mitigation Measure 5.11-B1below) into grazing or stream buffer areas.*

Impact 5.11-B: The project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.
1,2,3, 4 and
Cumulative
5.11-B1: Provide fencing of areas currently grazed on the Tonini parcel, and a buffer between the boundary of the disposal area and areas currently grazed. The width of the buffer shall be determined in consultation with the San Luis Obispo County Agricultural Commissioner's office.
Impact Significant and Unavoidable.
Source Table 5.11-2: Agricultural Resources Proposed Mitigation Measures"

P40-14
CONT

"The proposed Tonini sptrayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design"

Agriculture *Page* *5.11-7*
*There would be indirect impacts within the Tonini parcel due to **accidental spray dispersing beyond the direct affected areas** (refer to Mitigation Measure 5.11-B1 below) into grazing or stream buffer areas.* Expanded Sec05-09 Air Quality.doc



"Air Quality Implications
Los Osos Septic Tank Pump-out
Project
April 29, 2006
Presentation to RWQCB"
(SLO Co APCD)

The slide title shows that prior assessments were made for potential Los Osos projects by the Air Pollution Control District

- **(The bi-monthly pumping order, raw data, 27 truck trips for 82 pumpouts)**
- **Diesel Exhaust Particulate matter is #1 airborne carcinogen in California**

Mitigation

"5.9-C2 Prior to initiating grading activities, the proponent's contractor or engineer shall:

a. Include the following specifications on all project plans: **One** catalyzed **diesel particulate** ***filter (CDPF) shall be used on the piece of equipment estimated to generate the greatest emissions.*** If a CDPF is unsuitable for the potential equipment to be controlled, five diesel oxidation catalysts (DOC) shall be use"

This reviewer interprets this mitigation to mean that there is a ranking of importance in this mitigation although this is a good compromise for some other density it is doubtful the APCD would allow anything but the highest level of filtration in an area that is likely comprised and assessed to be all sensitive receptors and not only schools and nurseries. Please confirm this mitigation is valid so that contractors can bid appropriately?

P40-15

Greenhouse Gas Emissions

5.9-F: The project would not result in an increase in greenhouse gas emissions that would significantly hinder or delay the State's ability to meet the reduction targets contained in AB 32.

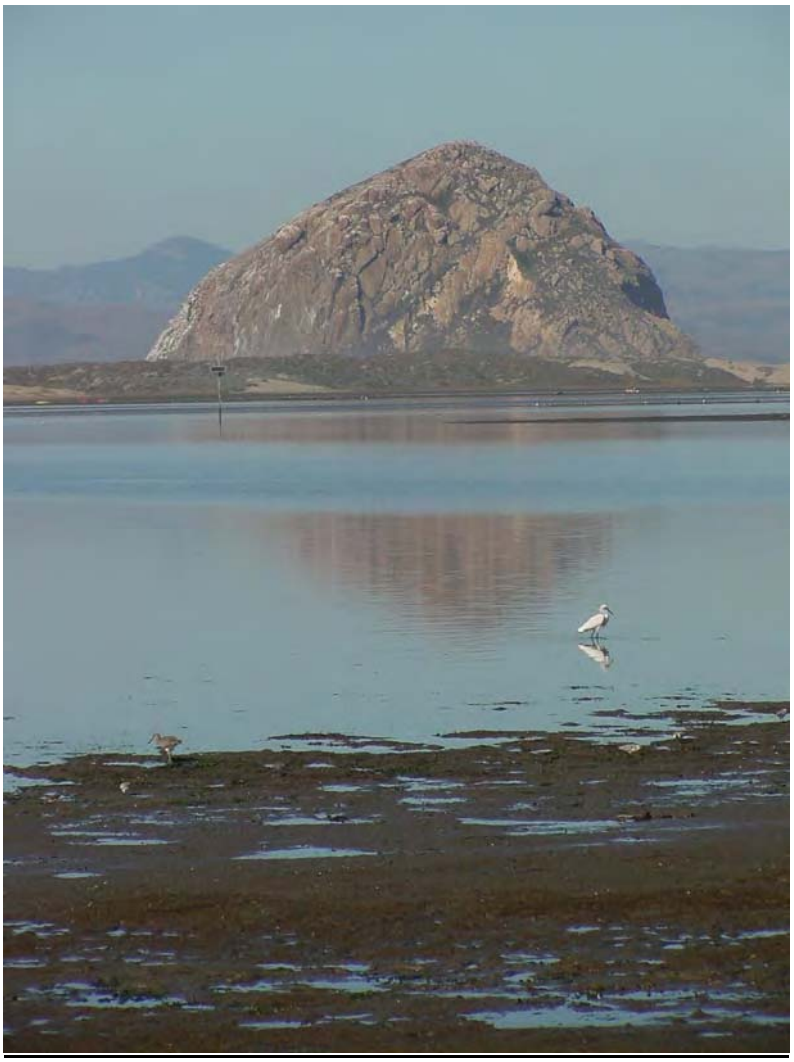
Project-Specific Impact Analysis

Effectively a wash in the opinion of this reviewer. Due to operating under the structure of "Meeting Thresholds", all projects are considered the same. This makes it harder to review "co-equal analysis" in order to identify or quantify the best project. But that is not the regulatory primary concern. The regulatory body is interested in mitigating and protecting for maximum health and environmental protection.

P40-16

This discussion is specific to the carbon cycle as it applies to the grasses grown on Tonini Sprayfields.

In order to grow as a grass the plant sequesters carbon dioxide (which is good, trapping a green house gas). After transportation to the landfill, the grass decomposes re releasing some of the carbon dioxide (which is ok) and methane (which can be collected as fuel which is good, or allowed to escape into the atmosphere which is bad) unrecovered methane and other released decomposition gasses can be worse green house gasses. Is potential recombination, release of methane an affect? Is it recognized in the DEIR? Mitigated?



5.10 - NOISE

Professor and TAC member Dave Dubbink has submitted on this section. There have been many conversations and details
This is meant as an addendum for the detail oriented review responder.
And to reinforce a reluctance to have Pile driving even considered in this quiet bird loving town, especially in low distance to and almost surfacing ground water area for reasons of conduction of sound and compression waves in wet sand
At this time an this (AP) reviewer of impact on nesting snoey plovers has not been confirmed or negated

P40-17

TABLE
5.10.4 Thresholds of Significance- CEQA Guidelines G.

a.) Exposure of persons to **or** gen. of noise >Standards established in **local** general plan or other agencies…resulting Permanent increase. No non-person non-structure environmental impact listed ? this a natural environment

P40-18

f.) Other Policies- Conflict with policies in the general plan. (what about tourism?)

P40-19

Table 5.10-1 Collection-Treatment-Disposal subdivided by "Impact" sound effect category by 4 project comparison.(typo? Subheading f. missing)

P40-20

There are other issues regarding organization. Why is the Back up generator discussed in the Permanent section a. and not c.

Page 9

Project 1 CBG ponds; Observation 1 -Aeration noise of 46 dBA exceeds 45 night limit at **200 ft to residence** (Permanent). Back up generator *(temporary)* 65.6 dBA . 20 dBA is stated as a **minimum** attenuation by structure "therefore, stationary noise impacts… could create a significant noise impact".This section (page 5.10-10) is flawed in presentation in that it failed to calculate **65.6** dBA **minus** attenuation of **20** is **45.6 dBA**, barely above threshold. An obvious test that could show additional mitigation opportunities. The appropriate mitigation **is** presented at **250 ft**

P40-21

additional suggestions; ground cover surrounding ponds and constructing buildings so that entrances and ventilation ports face away from nearby dwellings (?)

Combined Project Effects- pages 5.10-10,11,12 and tables 5.10-3,4

The dedication of several pages to "Combined project effects" in project 1 (traffic Noise contours) Yet the subject does not come up in any of the 3 other projects.

How many trips per day does a gravity sewer that is this spread out require? pump and back up generator inspections how often?

P40-22

If step stag tanks require pumping every 10 years then 450 truck entries per year expected (would be similar to existing septic tank pumping impact)

Additional-reworking Broaderson every few years-regrading the leachfield- no impact stated

P40-23

STEP/STEG effluent is described as "Raw wastewater"

P40-24

Page 16-15 CY excavated export material would not require **3** truckloads per residence and if it did, the 7200 trips total is wrong (10 cubic yards per load assumption)No real effects or mitigations described

P40-25

Table 510-5 Collection is ~4500 residences- conveyance is a much smaller number but not addressed- held to be equal though affects less people

P40-26

"Several Individuals had communicated these concerns within the TAC. Anne Normant is actually quoted in DEIR regarding noise. Dr. Dubbink had raised concerns within TAC.

REGULATORY ENVIRONMENT
Due to time limitations, this section cannot be developed
the following comments are pasted from a communication to the Central Coast Board regarding : "RS-2009-0012 amending the Basin Plan to adopt a conditional waiver as an onsite wastewater system implementation program…"

Comments relating to Los Osos were part of a larger letter relating to policies as a whole

"Waiver comments continue after this section.
Technical note- the section below is not amended as part of the waiver but the following comments are relevant to a functioning basin plan.
Page 9

VIII.D.2.e. ONSITE SYSTEM MAINTENANCE

"RECOMMENDATIONS
1. Septic tanks should be inspected every two to five years to determine the need for pumping.
2. Septic tanks should be pumped whenever: (1)the scum layer is within three inches of the outlet device, (2) the sludge level is within eight inches of the bottom of the outlet device, ***or (3) every 5 years; whichever is sooner. EPA***
3. Drainfields should be alternated when drainfield inspection pipes reveal a high water level or every six months, whichever is sooner."
Discussion:
1. A reasonable recommendation that could be a "should" if managed properly, and have reporting requirements. New alternate systems could require inspections after 2 years of first installation and five years thereafter. Older tanks could be inspected every 2 years and scheduled to five thereafter if 2 successive 2 year inspections show stable capacity. First 2 years following a functional failing etc…
2. The section causes the most problems. **The point of an inspection is to ascertain if pumping is necessary. There is no reason to assume that with adequate inspection, a modern Septic tank that is properly maintained and sized (leach pit included) can go unpumped for 20 years or so**. Older tanks, provided they are intact (and that can be tested) may require more frequent testing. **Currently a system considered for installation in Los Osos is assumed to require 5 year pumping intervals for brand new high capacity modern tanks. Elsewhere in the counties, this is mostly un-enforced.** P40-27
3. Unlikely that this is happening much, the level of implementation should be evaluated by the waterboard for increased implementation or an implementable schedule should be adopted. It is unlikely that a regulation that alters pumping schedules could be found to not have an impact in the 2009 Air quality, Carbon and Global warming gasses, regulatory environment, or the physical environments in which the waters of California flow.

Edit suggestion: page 3 column 2 paragraph 2 *"failing systems to be brought into compliance with (* the*) Basin Plan… or (*with*) repair criteria consistent with locally implemented"* suggest inserting "The" and "With". Additionally "failing systems" has been used in a regulatory meaning (as in failing systems in the Los Osos prohibition zone, indicating that they are all failing, irrespective of individual condition) page 2 of RS-2009-0012 includes a definition of "failing" that is functional. It should be made clear that it is failure of function that is to be addressed.

"General Discussion
The housing bubble burst and financial crisis are affecting the abilities of the governing jurisdictions to comply with a large number of new regulations. Local governments are feeling the loss of tax revenue and are responding by reducing staff. The very people that partnered with the water board staff in producing the current Memoranda of understanding may not be available for this round of changes. Other regulatory government agencies P40-28

(coastal commission for example) are reporting losses of planning positions and other essential staff. Global warming and weather change will ensure that 100 year flood events will take place every 50 years. This is a new era unanticipated in the plans that are now just being implemented. There have been encouraging signs in the Central Coast Waterboard in recognizing that the Governing Jurisdictions are partners in compliance rather than polluters to be enforced on. The economic burden of regulation must continue to be recognized. Actual conditions, recognized by local authorities, by valid scientific means must be prioritized. I hope these streamlining trends continue.
Alon Perlman"

P40-28
CONT

DEIR FINAL DISCUSSION AND SUMMATION

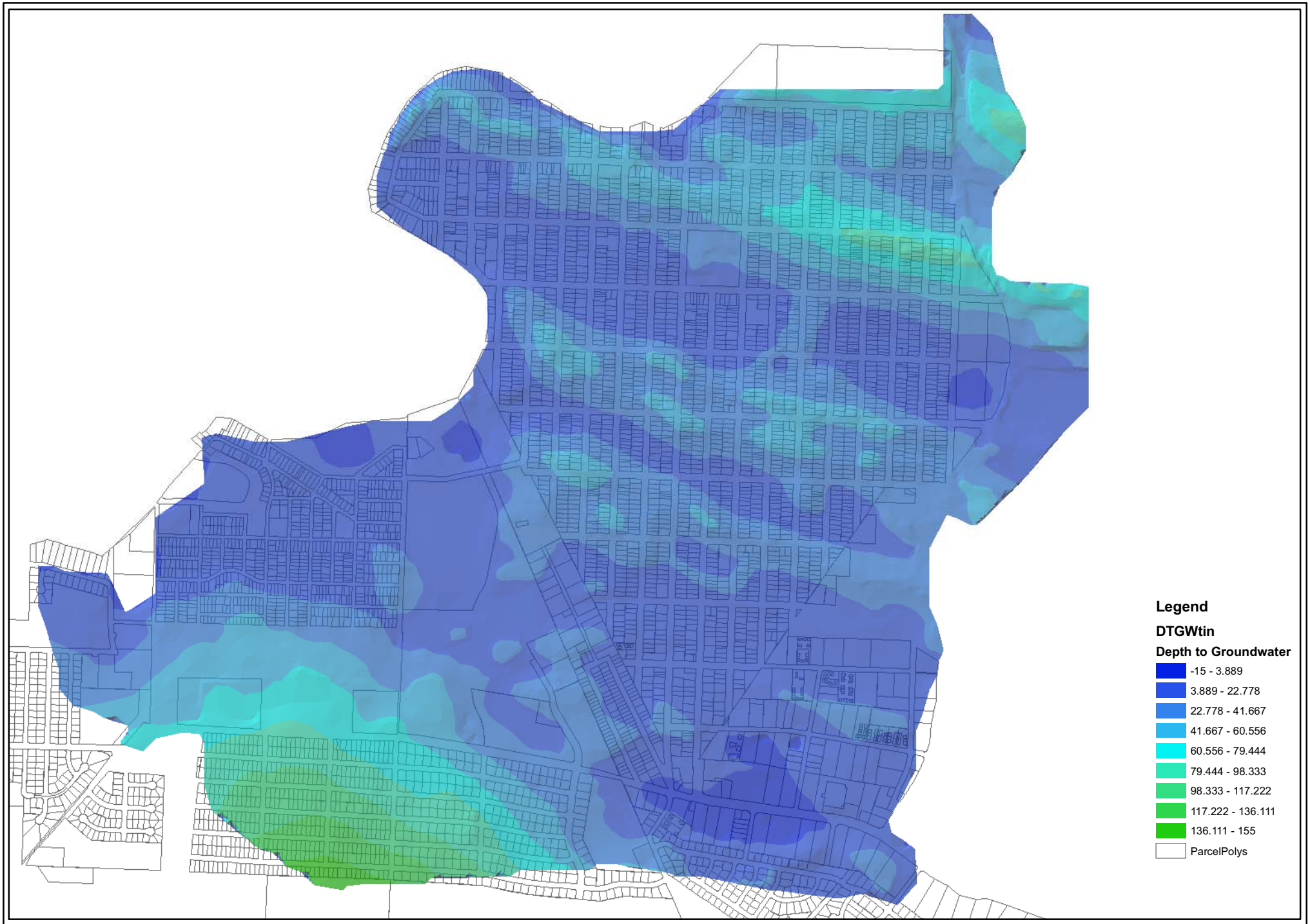
The _Fatal Flaw

Though it is appropriate to use questions, this reviewer is not able to avoid stating that (and as presented to the SLO counties supervisors) applying secondary treated wastes (liquid or solid) to agricultural lands or, to replenish a reliable thousands of year old aquifer and a still mostly intact sand filter that created the aquifer, will not work.

P40-29

The county needs to obtain guidance from it's own EIR Document. This need is hampered, by this disparity between what the EIR is stating (secondary treatment), and what will more than likely happen, after more delays (Tritiary treatment).

T. A R.



WALLACE GROUP

3-652

N
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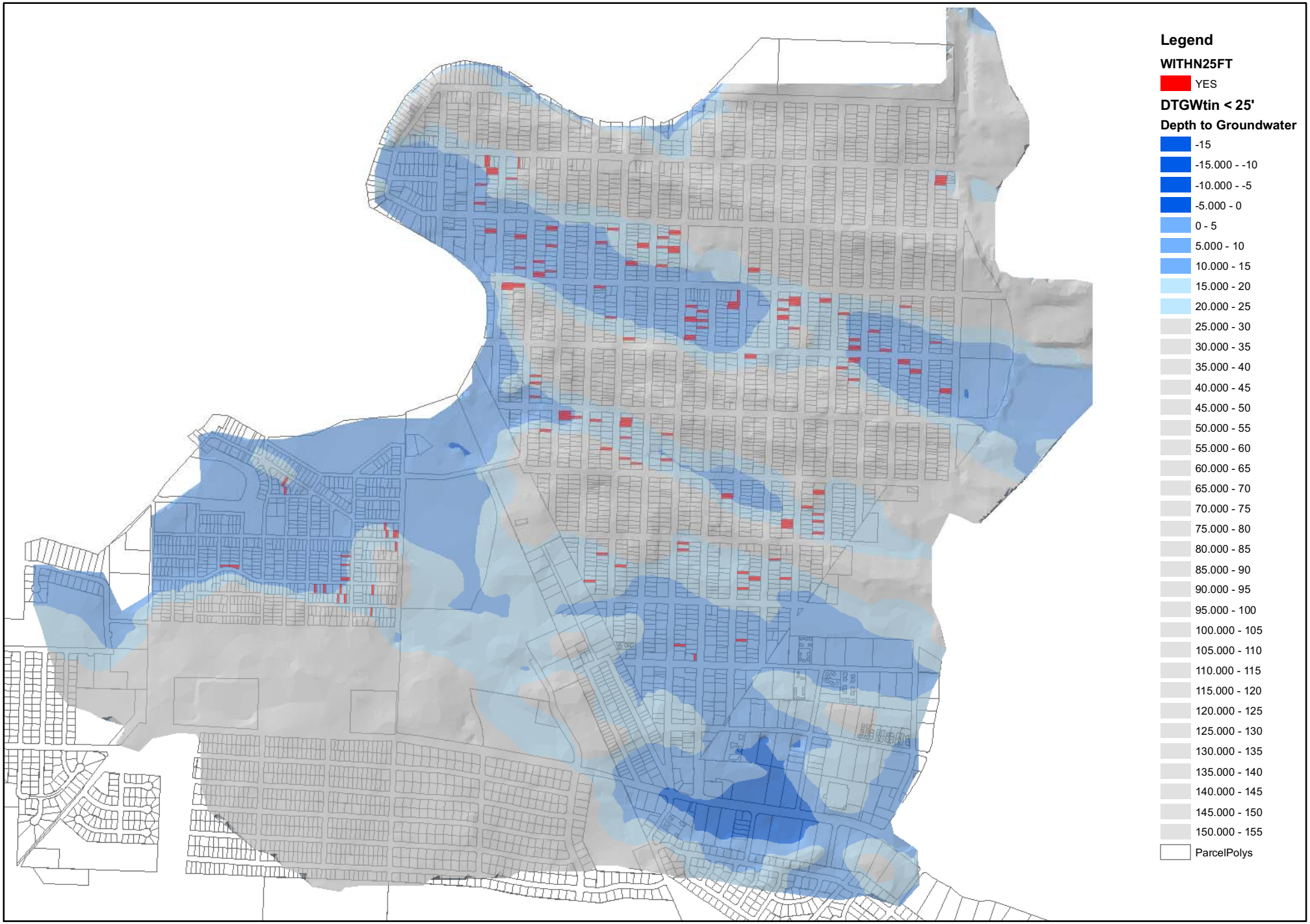
Depth to Groundwater Surface Model



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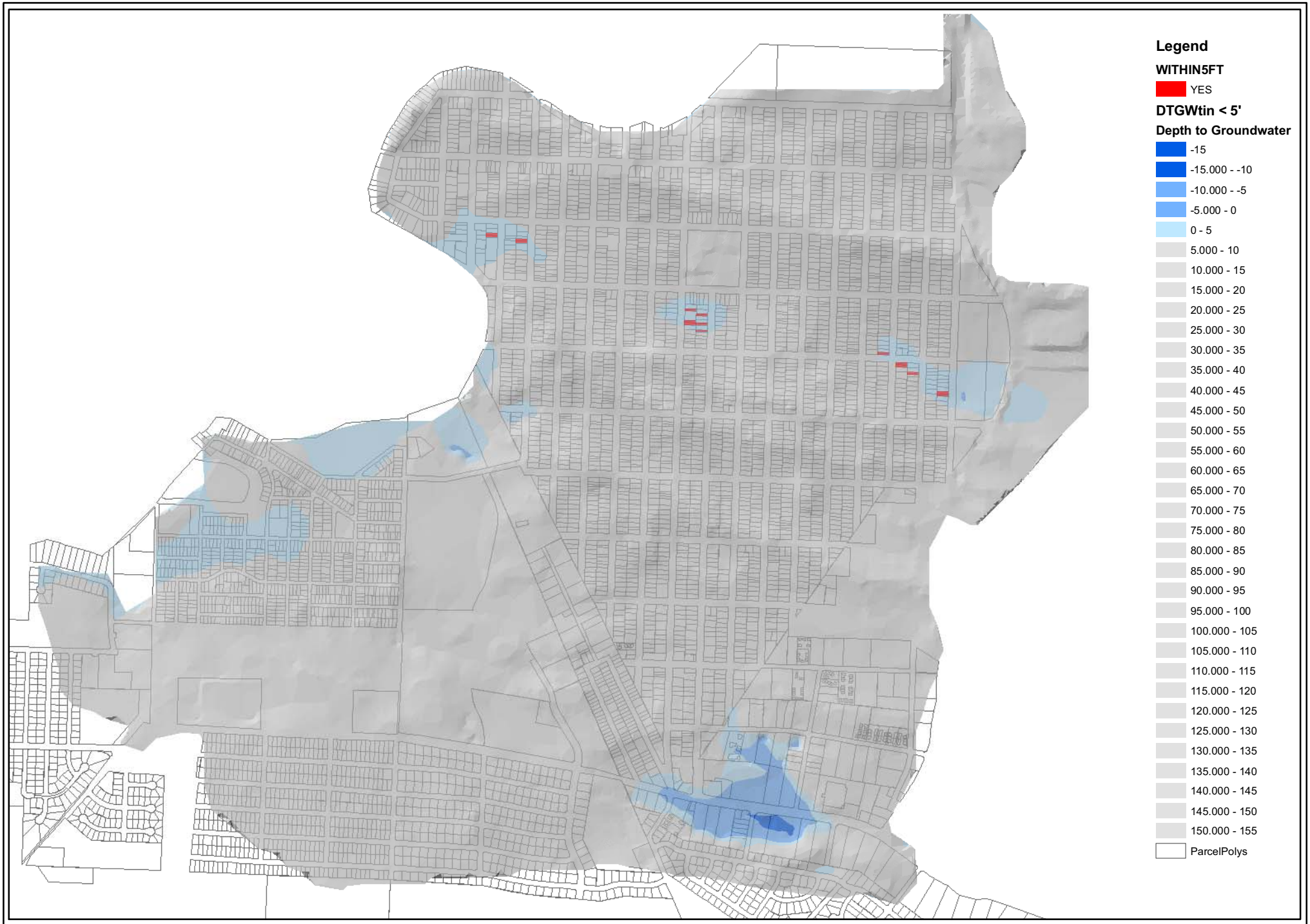
Parcels < 3150 Sq. Ft. and < 25 Ft to Ground Water

3-653

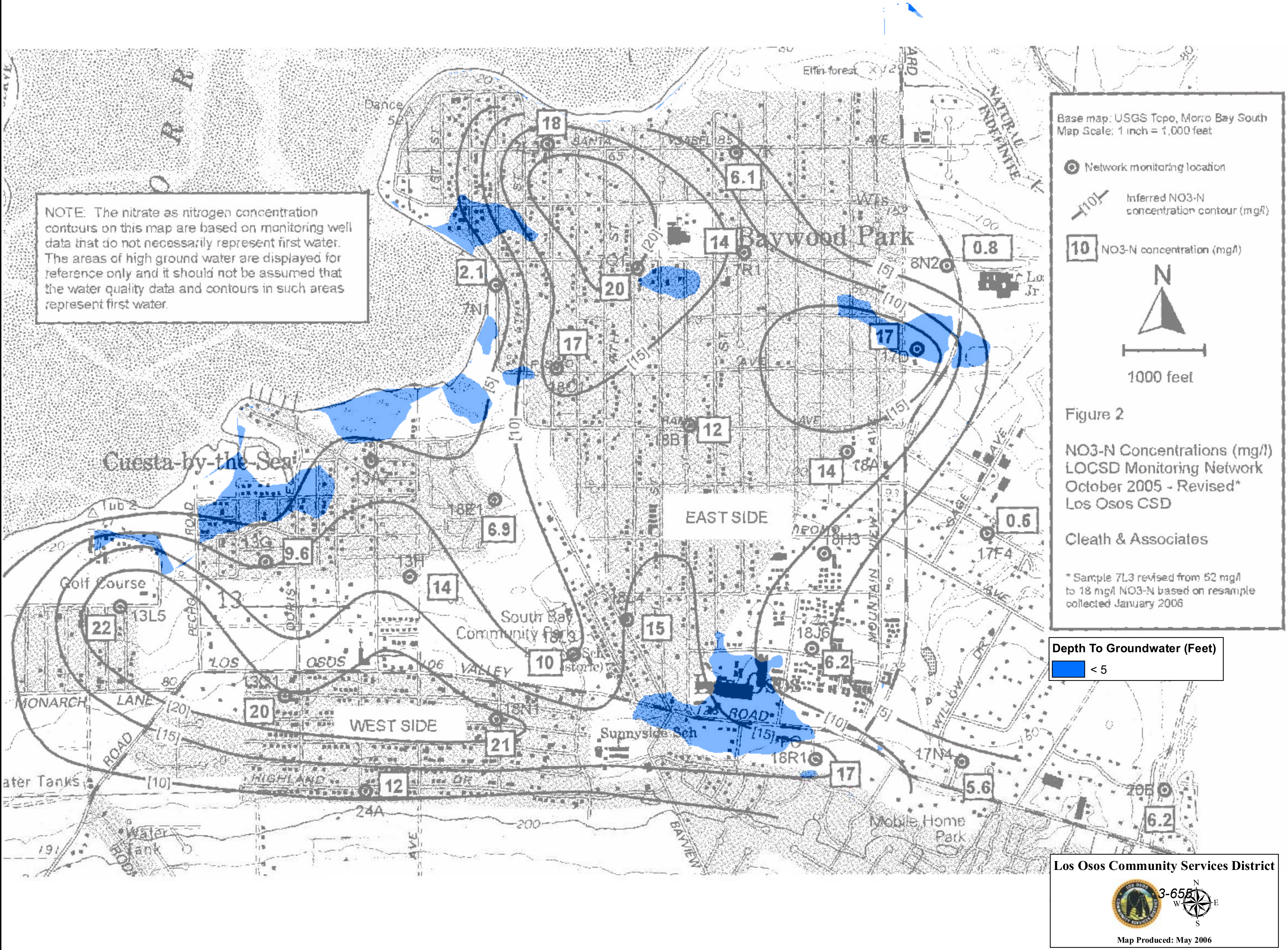


WALLACE GROUP

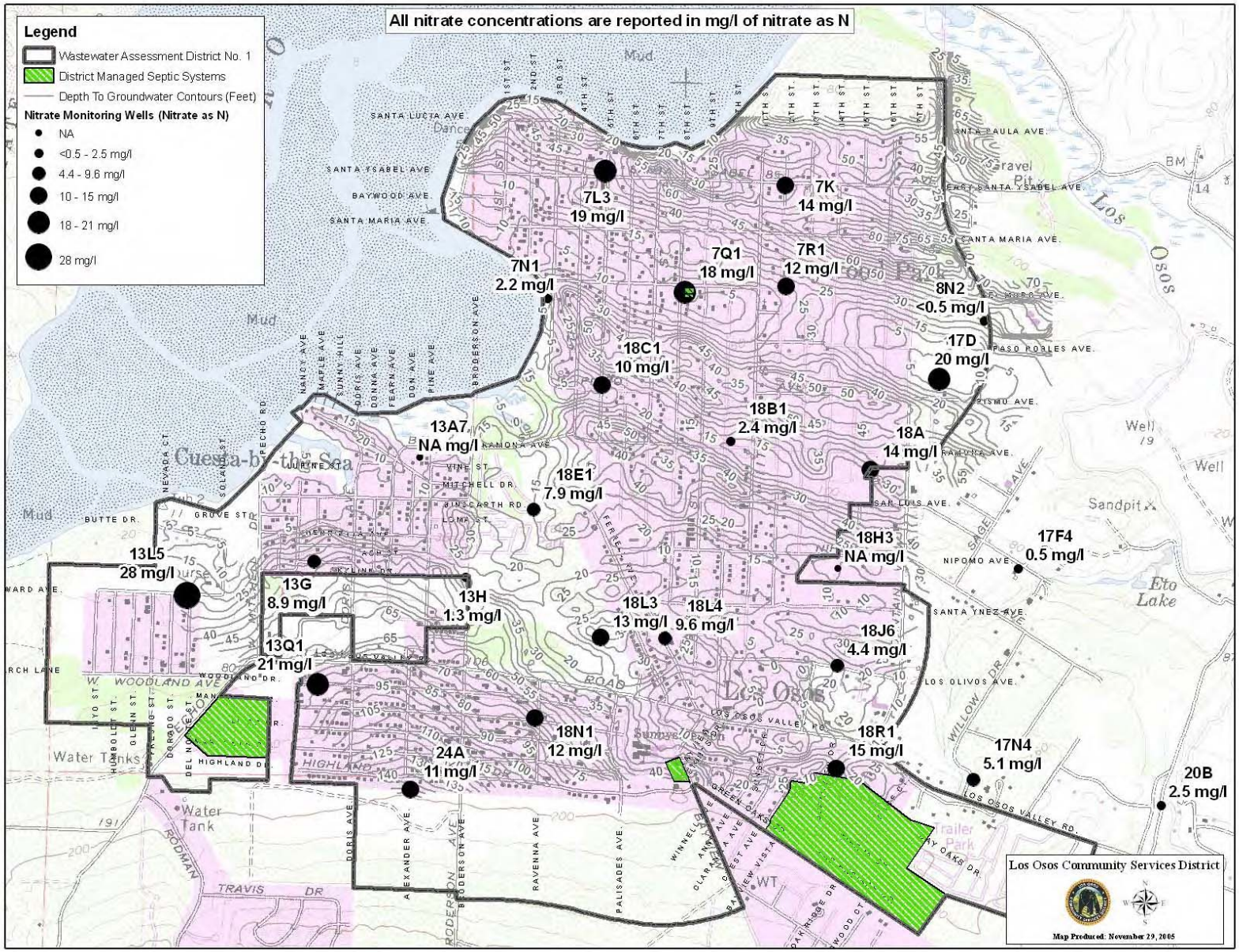
3-654

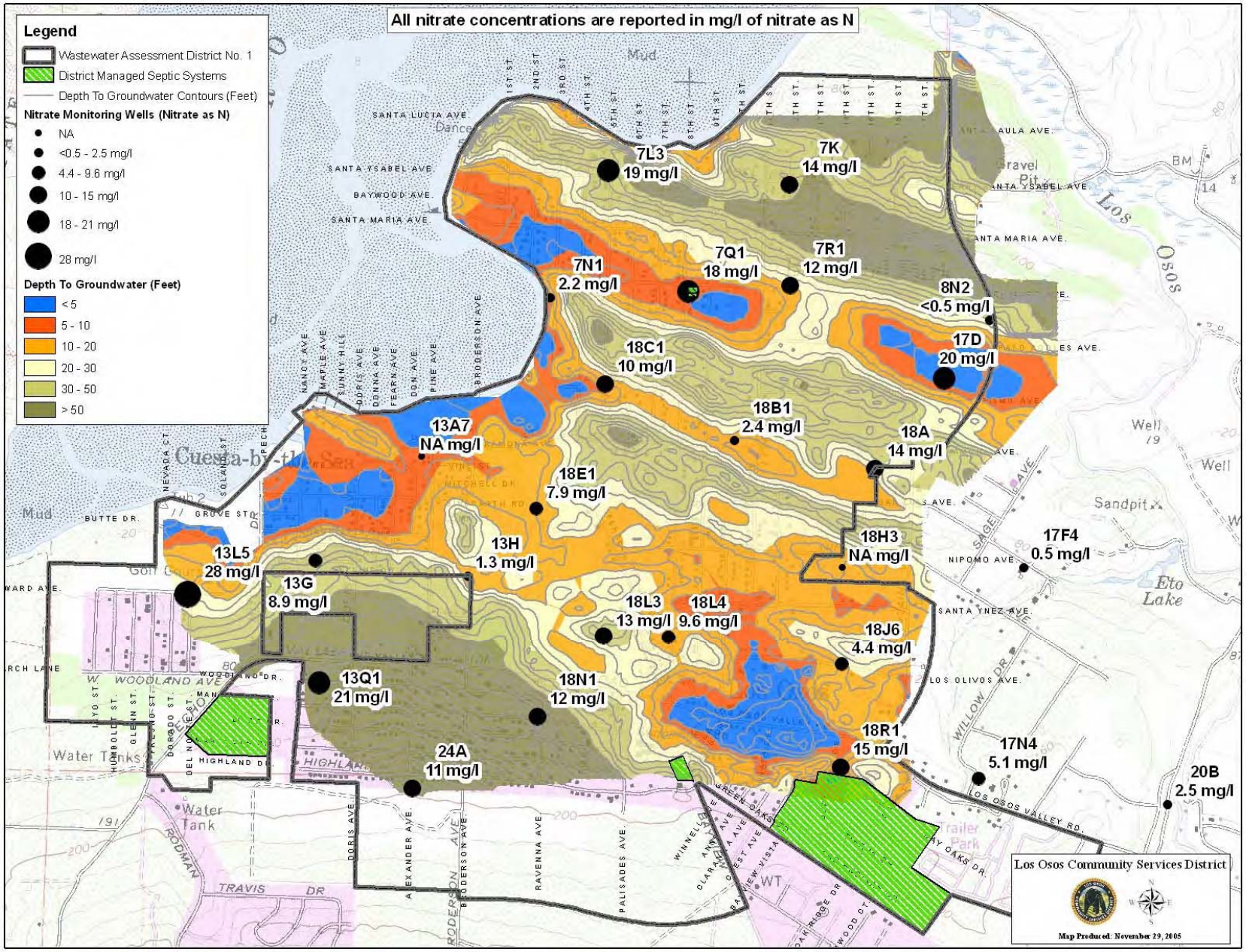
N W E S

Parcels < 3150 Sq. Ft. and < 5 Ft to Ground Water



NOTE: The nitrate as nitrogen concentration contours on this map are based on monitoring well data that do not necessarily represent first water. The areas of high ground water are displayed for reference only and it should not be assumed that the water quality data and contours in such areas represent first water.
Base map: USGS Topo, Morro Bay South
Map Scale: 1 inch = 1,000 feet
Network monitoring location
Inferred NO3-N concentration contour (mg/l)
NO3-N concentration (mg/l)
N
1000 feet
Figure 2
NO3-N Concentrations (mg/l)
LOCSD Monitoring Network
October 2005 - Revised*
Los Osos CSD
Cleath & Associates
* Sample 7L3 revised from 52 mg/l to 18 mg/l NO3-N based on resample collected January 2006
Depth To Groundwater (Feet)
< 5
Los Osos Community Services District
Map Produced: May 2006
Baywood Park
Cuesta-by-the-Sea
EAST SIDE
WEST SIDE
Golf Course
South Bay Community Park
Sunnyside Sch
Mobile Home Park
Water Tank
Elfin forest
18
6.1
14
0.8
2.1
20
17
17
12
14
6.9
9.6
14
22
15
10
6.2
0.6
20
21
12
17
5.6
6.2


All nitrate concentrations are reported in mg/l of nitrate as N
Legend
Wastewater Assessment District No. 1
District Managed Septic Systems
Depth To Groundwater Contours (Feet)
Nitrate Monitoring Wells (Nitrate as N)
NA
<0.5 - 2.5 mg/l
4.4 - 9.6 mg/l
10 - 15 mg/l
18 - 21 mg/l
28 mg/l
7L3 19 mg/l
7K 14 mg/l
7N1 2.2 mg/l
7Q1 18 mg/l
7R1 12 mg/l
8N2 <0.5 mg/l
17D 20 mg/l
18C1 10 mg/l
18B1 2.4 mg/l
18A 14 mg/l
13A7 NA mg/l
18E1 7.9 mg/l
18H3 NA mg/l
17F4 0.5 mg/l
13L5 28 mg/l
13G 8.9 mg/l
13H 1.3 mg/l
18L3 13 mg/l
18L4 9.6 mg/l
18J6 4.4 mg/l
13Q1 21 mg/l
18N1 12 mg/l
24A 11 mg/l
18R1 15 mg/l
17N4 5.1 mg/l
20B 2.5 mg/l
Los Osos Community Services District
Map Produced: November 29, 2005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10 - 15 mg/l
18 - 21 mg/l
28 mg/l
Depth To Groundwater (Feet)
< 5
5 - 10
10 - 20
20 - 30
30 - 50
> 50
7L3 19 mg/l
7K 14 mg/l
7N1 2.2 mg/l
7Q1 18 mg/l
7R1 12 mg/l
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18H3 NA mg/l
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13G 8.9 mg/l
18L3 13 mg/l
18L4 9.6 mg/l
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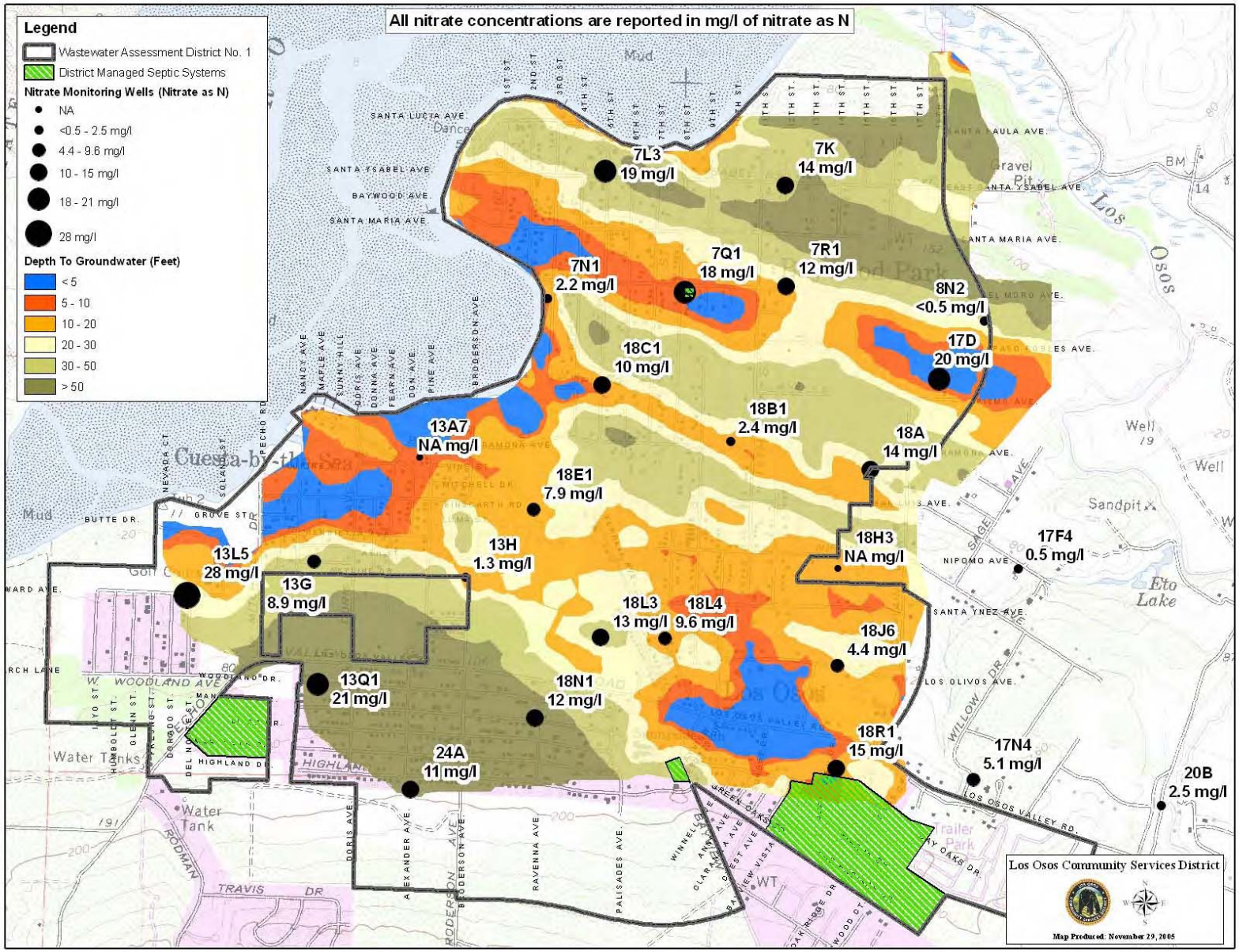
24A 11 mg/l
Los Osos Community Services District
Map Produced: November 29, 2005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18N1 12 mg/l
18R1 15 mg/l
17N4 5.1 mg/l
20B 2.5 mg/l
24A 11 mg/l
Los Osos Community Services District
Map Produced: November 29, 2005

Alon Perlman, January 30, 2009 (Letter P40)

Response to Comment P40-1

This comment expresses concern that using secondary treated waste to agricultural land will not replenish the aquifer. See Topical Response 4, Tertiary Treatment, regarding agricultural reuse.

Response to Comment P40-2

This comment expresses concern that the project will result in unplanned migration out of the Los Osos area and asked why this potential demographic alternation was not considered a land use effect. It is speculative that the proposed project would result in a substantial migration out of the Los Osos area. Furthermore, an Environmental Justice Analysis was provided in Appendix O-1 that addressed whether the project would result in disproportional environmental impacts on low-income and minority residents. Finally, see Topical Response 2, Project Costs.

This comment also asked why the projects potential impact on tourism was not considered. The implementation of the proposed project would not result in long-term environmental impacts associated with tourism. The scope of the EIR does not address financial impact of the project on tourism because the purpose of the EIR is to address potential environmental impacts associated with the project.

Finally, this comment asked if the effect of the sprayfields on bike trails along Turri Road have been considered. As identified in the Preferred Project as discussed in Appendix Q, the spray heads will be located along Turri Road and the spray will be directed away from Turri Road. In addition, the Preferred Project will only include spraying for evapotranspiration which is at a lower rate than the previously envisioned percolation areas. These two features would reduce potential impacts on bicyclists along Turri Road from the proposed spray irrigation.

Response to Comment P40-3

This comment expresses a desire for clarification regarding the percentage of the septage return flow that is attributed to the existing septic system. See Tables 9 and 10 of Appendix D-2 to understand the remaining amount of septic system return flows that remain after project implementation. See Topical Response 3, Water Resources and the Project Scope. See response to comment P11-37. The Broderson disposal component of the project is not a mitigation because it is a required design component included with all project alternatives and it is not optional. Without Broderson, spray irrigation operations would roughly double in size and the loss of septic system recharge would result in adverse groundwater conditions.

Response to Comment P40-4

This comment expresses a concern regarding on-site flooding. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P40-5

This comment is concerned with soils adjacent to Broderson (i.e., downslope) that will become liquefiable and the concern that a "no impact" determination has been made regarding the potential for liquefaction and landslide at Broderson. The proposed infiltration rate at the Broderson leachfields would not result in surface water runoff from the leachfields to downstream areas. In addition, upstream surface water could run onto the leachfields, but the surface water would be captured and allowed to infiltrate and not runoff downstream of the leachfields. See the Preferred Project Description in Appendix Q regarding surface water runoff at Broderson. See also Response to Comments A8-25, A8-28, A8-104, A8-107, and P36-22.

Response to Comment P40-6

This comment expresses a concern regarding Table 5.4-: Geology Significance Determination and the lack of a discussion regarding the disposal site. Page 5.4-15 to 5.4-16 of the Draft EIR discusses the potentially significant impact associated with Impact 5.4-F. Review of this section should eliminate the concerns expresses with regard to impacts associated with the project being located on a geologic unit or unstable soil.

Response to Comment P40-7

This comment expresses a concern regarding the comparison between Proposed Project 1 with Proposed Project 2, 3 and 4. Section 5.4 of the expanded analysis provides a discussion related to seismic-related ground failure on page 5.4-18 through 5.4-21. Review of this section should address the discussion regarding seismic ground failure.

Response to Comment P40-8

This comment expresses concern regarding impacts from soil erosion or the loss of topsoil on the collection system. These issues are discussed in Section 5.4, Geology (pages 5.4-12, 13, 14) and in the Expanded Analysis in Section 5.4, Geology (pages 23, 24). Review of these sections should eliminate the concerns expressed with regard to impacts from soil erosion or less of topsoil.

Response to Comment P40-9

This comment expresses a concern regarding the need for USFWS authorized biologists as dictated by Mitigation 5.5-A4. The need for approved monitors will be limited. Movement of snails will primarily occur on the Broderson site and the removal can take place over a period of time. Snail removal from the pump stations entails a very small area and again removal can be accomplished quickly. Difficulty for snail removal may occur when connection to individual houses occurs (in suitable habitat areas) and particularly if a STEP system is employed.

Response to Comment P40-10

This comment identifies Mitigation Measure 5.6-B6 as having incomplete text. Table 2-9 on page 2-41 of the Draft EIR should read:

5.6-B6	Preconstruction monitoring shall occur in areas ranked as high in sensitivity for buried

	deposits. Two such areas have been identified within the proposed project area: (1) along Los Osos Valley Road from Los Osos Creek east to the Cemetery Parcel; and (2) in the western portion of the Tonini Parcel. Mechanical backhoe trenching shall be conducted within the sensitive areas where any construction impacts will occur and shall be monitored by a qualified geoarchaeologist. Any identified intact deposits will be evaluated, and any deposits determined to be eligible to the California Register and/or National Register shall require project redesign to avoid impacts, or data recovery to mitigate unavoidable impacts.

Response to Comment P40-11

This comment expresses a concern with unknown emerging contaminants in the waste stream. See Response to Comments A8-27, A8-120, and P19-19.

Response to Comment P40-12

This comment is concerned that aerosol mist health impacts are not discussed in the Draft EIR. The proposed sprayfield will locate spray heads pointed in towards the property (away from Turri Road) and have a 30-foot setback from the road right of way (approximately the outer edge of the road shoulder). This setback, coupled with the directional spraying, will minimize the potential for overspray onto Turri Road that could disturb users of the roadway. Care in operation of the sprayfields will be paramount to not spray during times of high winds that may carry water particles away from the sprayfield. In addition, the proposed disposal under the Preferred Project, as discussed in Appendix Q, is evapotranspiration. Therefore, the level of spray is less than under the previously proposed spraying for percolation. This comment is also concerned that the proposed sprayfields would impact bicyclists. Due to the orientation of the spray nozzles and the use of spray for only evapotranspiration, no significant impacts on bicyclist would occur with project spraying.

Response to Comment P40-13

This comment concerns fencing and buffer zones around the sprayfield disposal area. The majority of the Tonini site will be used for sprayfields as shown in Appendix Q's Exhibit Q.3-2 in the Preferred Project description. Areas that will not be sprayfields are the wastewater treatment plant facilities, storage ponds, a powerline easement, and protected areas like ESHAs, Sensitive Resource Areas and wetlands. The sprayfields will be fenced to prevent access. As required by the California Coastal Commission, 100-foot buffer zones will be provided from coastal creeks and other protected areas on the site as shown in Exhibit Q.3-2.

Response to Comment P40-14

This comment expresses a concern regarding potent allergens. See Response to Comment P40-12 regarding spray impacts at Tonini.

Response to Comment P40-15

This comment expresses the concern that the APCD would not allow a mitigation showing only one catalyzed diesel particulate filter used on the largest emitter. The SLOAPCD was solicited in the process of writing the Draft EIR and the mitigation as written in the Draft EIR was supplied verbatim by the SLOAPCD.

Response to Comment P40-16

This comment asks if the carbon balance that occurs through the life cycle of grasses grown on Tonini site was considered in the GHG evaluation. Under international greenhouse gas accounting methods developed by the Intergovernmental Panel on Climate Change[1], biogenic carbon is part of the natural carbon balance and it will not add to atmospheric concentrations of carbon dioxide. It is therefore recognized practice to not include this type of GHG emissions in any inventory activity.

Response to Comment P40-17

This comment expresses a concern regarding the impacts on birds through the use of pile driving. Noise-related impacts to birds would be covered under the following two mitigation measures:

5.5-A11	If <u>the removal or trimming of any trees or shrubs</u>~~-~~<u>construction</u> is proposed during the general bird breeding season (February 1 through August 31), a pre-construction survey shall be conducted by a qualified biologist within 10 calendar days prior to grading activities within any project impact area to identify all active nests in areas impacted throughout project construction and implementation. If an active nest is identified during the pre-construction survey, no construction activity shall take place within a minimum of 250 feet of any active nest until the young have fledged (as determined by a qualified biologist) and/or the nest is no longer determined to be active. Construction activity in the vicinity of any active nest shall be conducted at the discretion of a qualified monitoring biologist. For sensitive species, including Allen's hummingbird, yellow warbler, and loggerhead shrike, the distance and placement of the construction avoidance shall be a minimum of 250 feet unless otherwise determined through consultation with the CDFG.

[1] Intergovernmental Panel on Climate Change. Greenhouse Gas Inventory Reference Manual: Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 3, Pg. 6.28

5.5-A12	If ~~the removal or trimming of any trees or shrubs~~ construction is proposed during the general raptor breeding season (April 1 through July 31), a pre-construction survey shall be conducted by a qualified biologist within 10 calendar days prior to grading activities within any project impact area to identify all active raptor nests in areas impacted throughout project construction and implementation. If an active raptor nest is identified during the pre-construction survey, no construction activity shall take place within a minimum of 500 feet of any active raptor nest until the young have fledged (as determined by a qualified biologist) and/or the nest is no longer determined to be active. Construction activity in the vicinity of any active nest shall be conducted at the discretion of a qualified monitoring biologist. Pursuant to Section 2050 of the CFG Code, the CDFG will not permit any impacts to the California state fully protected raptor white-tailed kite. If an active nest or breeding territory is detected during preconstruction surveys for nesting birds, no construction activities shall take place within 500 feet of the location of the active nest. The area shall be completely avoided and fenced to allow for an adequate buffer from construction activities. A qualified biologist shall be retained to monitor the activity of the nest during the breeding season until it is determined that the nest is no longer active (i.e. all young have fledged the nest and are no individual kites are dependent on the nest).

These measures would allow for monitoring for noise during construction. Other methods could be employed instead of traditional pile driving to reduce noise.

Response to Comment P40-18

This comment expresses a concern regarding noise impacts on natural environment. See Response to Comment A8-167 and A8-168 regarding noise impacts on the natural environment.

Response to Comment P40-19

This comment expresses a concern regarding conflicts with policies in the general plan associated with tourism. See Response to Comment P40-2 regarding tourism.

Response to Comment P40-20

This comment identified an additional threshold missing from Table 5.10-1 in the Draft EIR. The analysis of noise issues included the use of the noise thresholds from Appendix G of the California Environmental Quality Act Guidelines. There are six noise thresholds identified; however, Section 5.10 in the Draft EIR combined two separate noise thresholds into one threshold. The new threshold is the first one listed on page 5.10-5 in Table 5.10-1 in the Draft EIR.

This comment also asked why the back-up generator is discussed as a permanent impact and not a temporary impact. The back-up generator will be available for use during the operation of the project. Therefore, it is considered an operational and permanent impact.

Response to Comment P40-21

This comment reiterates impact conclusions from the second paragraph on page 5-10-10 of the Draft EIR. The appropriate mitigation for the potential stationary noise impacts is provided in Mitigation Measure 5.10-A2 which states that a 250-foot setback from the nearest residence is required.

This comment also asked why Proposed Project 1 included a discussion of traffic noise contours and Proposed Projects 2 through 4 did not. The inclusion of the discussion in Proposed Project 1 was in error because the purpose of the EIR document is to provide discussions of potentially significant impacts. As noted on page 5.10-13, no significant, long-term combined noise impacts from Proposed Project 1 vehicle noise would occur along the study area roadways. The full discussion of traffic noise contours is provided in Appendix L-1.

Response to Comment P40-22

This comment asks how many trips there are to serve the gravity sewer and back-up generator inspections. The assumptions made for the analysis within the Draft EIR are approximately 328 miles per day for the maintenance and operational activities (including back-up generator inspections) related to the collection and conveyance pipelines. This figure is an average and includes materials that are needed for maintaining the pipelines. A description of the staff that is required for maintenance and operation of the various components of the project is described in Sections 3.3.3 and 3.3.5 of the Draft EIR.

Response to Comment P40-23

This comment is concerned noise impacts associated with "reworking" the Broderson leachfields "every few years" and the fact that this would not be a noise impact. Noise impacts associated with the removal of vegetation and a portion the existing leachfield piping and gravel system would not create any more noise than the original installation of the system. This would result in a significant temporary noise impact, similar to that of the original installation.

Response to Comment P40-24

This comment is concerned with calling the STEP/STEG effluent "raw wastewater." The wastewater leaving the STEP/STEG tanks would not contain solids as would occur in the Proposed Project 2-4 scenarios. "Raw wastewater" would still be an appropriate term.

Response to Comment P40-25

This comment restated the assumption of how much each biosolids truck would hold. Page 5.10-16 in the Draft EIR indirectly identifies that the assumption is 10 cubic yards of earth material per truck.

Response to Comment P40-26

This comment refers to Table 5.10-5 in the Draft EIR and states that conveyance is much smaller than collection. The table presents the noise levels that are anticipated from collection of a STE collection system. As shown, the construction equipment associated with the conveyance system is projected to result in a higher noise level than construction equipment associated with the collection system. It is noted that fewer people would be affected by construction equipment associated with the conveyance system than the collection system.

Response to Comment P40-27

This comment provides recommendations regarding septic tank inspections and pumping. A 5 year pumping frequency for septic tanks in a STEP system is a conservative estimate based on conditions that may be required by permit conditions in order to ensure proper system operation, prevent spills, and protect water quality. Various texts and operators have expressed varying opinions and recommendations on what the pumping intervals of a STEP tank should be. While one objective of pumping the tank is to remove solids that accumulate over time and therefore reduce the volume of the tank that is available for treatment processes, the literature suggests that pumping at five year intervals should not be necessary strictly for solids removal. However, the more immediate need is to ensure the proper functioning and condition of the tanks. Although operators are expected to clean or replace filters on a two-year schedule, the inside of the tanks cannot be examined for condition (damage, leaks, deterioration) while the tank is full. The need to empty the tank at five year intervals is driven by this inspection requirement. As the system ages, pumping and inspection intervals can be adjusted up or down depending on the results of the prior inspections.

Response to Comment P40-28

This comment expresses a concern regarding the economic burden of regulation that must be recognized. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P40-29

This comment is concerned with the use of secondary treatment as the method of disposal. See Topical Response 3, Water Resources and the Project Scope, and Topical Response 4, Tertiary Treatment.

January 30, 2009

Mr. Mark Hutchinson
Environmental Programs Management
San Luis Obispo County Department of Public Works
County Government Center, Room 207
San luis Obispo, CA 93408

Subject: Comments on the Draft Environmental Impact Report (DEIR) for the Los Osos Wastewater Project (LOWWP)

Dear Mr. Hutchinson:

The Los Osos Sustainability Group is submitting a relatively long list of recommendations, included with our project recommendations from January 6, which we are requesting to have reviewed in a subsequent EIR.

In general, we are disappointed with the Draft—as we have been with the LOWWP alternatives review and selection process so far. The selection/planning process does not seem to be leading the community of Los Osos nor the County of San Luis Obispo toward a sustainable future; even though it could provide a tremendous opportunity to create a model of 21st Century sustainable development.

In the attached list of specific DEIR comments, we note numerous serious omissions, inconsistencies, and inaccuracies, which, if not adequately addressed, will not only lead to an unsustainable project long term, but may lead to an unsustainable project in the relatively near future.

The following is a summary of the most serious problems.

1. The DEIR finds "no significant impacts" to the Los Osos Valley Water Basin and sensitive aquatic ecosystems, including the Morro Bay Estuary, from the removal of 400-700 AFY of water from the basin to be "disposed of" on spray fields (i.e., Project 2b, the recommended "reuse/disposal" options). Studies of the basin, including the Cleath and Associates Seawater Intrusion Assessment (2005) and the Yates and Williams study, (2003) have found that the Los Osos Valley Water Basin is a relatively self-contained system, with little water flowing in from its boundaries, except for the seawater currently replacing the freshwater now overdrafted. Removing 400-700 AFY from a basin already seriously out of balance, without adequate mitigations, will undoubtedly cause significant impacts. Failing to acknowledge and address these impacts is sure to undermine efforts to sustain the freshwater supply and preserve vital ecosystems for future generations. P41-1

2. The DEIR fails to review a reasonable range of collection options, or to recognize the benefits of sealed, small-pipe systems over gravity systems for the particular conditions in Los Osos. Many communities with hilly terrains, high groundwater, and proximity to P41-2

surface waters are choosing sealed, small-pipe collection systems to lower collection system costs and reduce the environmental harm resulting from leaks inherent in gravity systems. The DEIR omits any substantive discussion of the gravity alternative's increased potential 1) to harm sensitive ecosystems due to serious overflows, 2) permanently damage community infrastructure (due to deep trenching down the middle of streets), 3) exceed project cost estimates (e.g., due to problems encountered during installation, e.g., extensive high groundwater), 4) result in wastewater flows exceeding system capacity or treatment levels (due to excessive I/I or future sea level rises), and 5) incur prohibitive costs in the event of an earthquake. It also fails to review the vacuum collection alternative despite the NWRI's recommendation to consider vacuum collection near the bay, and it eliminates the low-pressure collection alternative on limited and inaccurate information. These last two alternatives could not only emerge as environmentally superior options but allow the project to meet state and federal affordability levels—key to project sustainability.

P41-2 CONT

3. Finally, the DEIR fails to include a triple bottom line analysis of project options to ensure the highest value project long-term for the community, or a substantive analysis of numerous sustainable strategies and processes, including decentralized wastewater collection, constructed wetlands, clean and renewable energy use (wind and solar), co-generation, graywater and rainwater reuse, carbon sequestering, and beneficial recycling of all system byproducts (see our Sustainability Scoping Recommendations from May 6, 2008).

P41-3

We believe a subsequent EIR is necessary to address these deficiencies and we hope you agree. In our opinion, the "environmentally preferred" alternative identified by the DEIR—95% conventional gravity collection, oxidation ditch treatment, spray fields with limited beneficial reuse and conservation, and a treatment site several miles out of town—is one of the least sustainable alternatives available.

Per our phone conversation today, please attach the appendices and attachments for the "EIR Recommendations for a Sustainable LOWWP" (submitted on May 6, 2008 to the Board) and the "Sustainable Los Osos Wastewater Project Criteria and Recommendations," and "Achieving a Sustainable Los Osos Valley Water Basin," (submitted to the Board on January 6, 2009.) Please be sure that the title page and table of contents page are attached to the last document. Thank you.

Yours truly,

Keith Wimer
Los Osos Sustainability Group (LOSG)

1. The volumes of septic flows removed from the basin with the LOWWP—in addition to the volume of septic flows not contributing to recharge of the upper aquifer—should be re-analyzed and corrected throughout the report to accurately reflect the potential impacts of the project and to determine appropriate alternatives to avoid or mitigate for the impacts. The DEIR states 957 AFY of septic flows will be eliminated, of which about 600 AFY are recharging the upper aquifer. However, 957 AFY represent the septic flows with the project's conservation element in place (160 AFY) (see Table 5, Appendix 2-D, DEIR). The conservation element is not in effect until project start-up. This is supported by the fact that between 1800 and 2000 AFY of water is used in within the Prohibition Zone (based on the purveyor production shown in County Planning Department's Resource Capacity Study and Table 1 of Appendix D-2 of the DEIR). Since typical indoor use is between 60% and 70% of this in coastal areas, based on studies (e.g., Gleick et. al., *Waste Not Want Not*, p. 67), the total water going to septic systems is closer to 1200 AFY. Further, the *Fine Screening Report* estimates total septic flows at 1120 AFY (p. 2-21). Therefore, a reasonable estimate of total septic flows eliminated with the project is between 1100 and 1200 AFY. Of this, between about 800 AFY and 1050 AFY currently contribute to upper aquifer recharge. The Fine Screening Report states septic flows in the Prohibition Zone recharging the upper aquifer are 850 AFY (p. 2-21). The Yates and Williams 2003 study indicates septic flows contribute about 36% to upper aquifer recharge within the basin after "perching effects" (1267 AFY/3527 AFY) (Table 4). About 36% of 2995 AFY (the total upper aquifer recharge, per Table 8, Appendix D-2, DEIR, p.24) is about 1078 AFY. Both the *Fine Screening Report* and the DEIR indicate that there are only a small percentage of septic systems outside of the Prohibition Zone (less than 10%). Due to the uncertainties inherent in basin groundwater studies, septic return flows recharging the upper aquifer (removed with the project) should be assumed to be as high as 1100 AFY (a safe estimate), and as low as 850 AFY, a minimum estimate. This means a minimum of 250 AFY of inflow should be added to septic flow figures throughout the DEIR, including calculations estimating the impacts of removing septic flows (e.g., Tables 8-10, Appendix D-2.). P41-4

The error apparently arises from a failure to adequately account for septic flows in the perched aquifer contributing to upper aquifer recharge (e.g., Tables 8-10 of Appendix D-2 and Table 2 of Appendix C of D-2). Tables 8-10 appear to unreasonably predict that removing septic flows from the perched aquifer will impact Willow Creek outflow by over 90%, while affecting inflows to the upper aquifer by less than 10%. This is not consistent with the Yates and Williams study, which allocates nitrogen in the perched aquifer "to the four pathways in the same proportions as flow" (p. 9). The four pathways include leaks through the clay to other aquifers, lateral movement off the perched aquifer to other aquifers, transpiration, and discharges to Willow Creek. The last two are losses to groundwater flow, according to the study, so the first two contribute to aquifer recharge. Note that Table 2, Appendix C of D-2, omits perched layer inflows to the upper aquifer altogether (i.e., "Leakage/subsurface outflow to upper aquifer" does not appear as inflows to the upper aquifer on the table).

2. Key impact areas (e.g., Sections 5.2, 5.2, and 5.5) should be re-analyzed—using numbers that accurately reflect the potential impacts of removing septic flows from the basin—with alternatives for avoiding or mitigating for these impacts, and a feasibility analysis. The Los Osos Valley Water Basin is in critical overdraft due to seawater intrusion. Therefore, the effects of removing about one-third of the recharge to the basin is likely the most critical environmental factor to be considered in the LOWWP EIR. If removal of septic flows is not adequately mitigated, seawater intrusion could destroy the upper and the lower aquifers, rendering the project a waste of time and money—as well as the primary cause for a more destructive source of aquifer contamination than nitrates—saltwater contamination. P41-5

Some critical areas that will need to be re-analyzed, in order to avoid serious potential harm to the environment are the following:

a. Potential impacts on upper aquifer water levels, including the ability to pump from the upper aquifer at current levels post-septic systems without causing seawater intrusion or impairments to water quality. The Hopkins Groundwater Consultants report (Appendix D-2, Tables 8, 9, &10) will no longer show the upper aquifer is balanced once adjustments are made. With a minimum of 250 AFY of inflows removed, outflows to the bay and the lower aquifer are likely to decrease, and/or current well production will overdraft the aquifer. This requires an analysis of potential impacts and ways to avoid or mitigate for them. Potential impacts include seawater intrusion (i.e., saltwater contamination) in the upper aquifer due to over pumping, in addition to potential harm to estuarine ecosystems due to reduction in "Subsurface Outflows" (see Tables 9 & 10, Appendix D-2, DEIR). The latter would change the balance of freshwater and seawater inflow into the Estuary, negatively impacting ecosystems. Possible alternatives to avoid or mitigate for these impacts would include reduced production levels from the upper aquifer, greater levels of conservation, securing imported water, and a plans for desalination—which should be evaluated (also see # 10 below). P41-5 CONT

b. Potential impacts on the lower aquifer resulting in increase rates of seawater intrusion. Upper aquifer leakage has been found to be the single largest source of lower aquifer recharge (about 68% of the freshwater recharge per the Seawater Intrusion Assessment, Cleath and Associates, 2005, p. 76). Thus, seawater intrusion will increase without alternatives that avoid or mitigate for the beneficial recharge effects septic systems currently provide. P41-6

c. Potential impacts on surface water features due to reduction in subsurface flows, e.g., Willow and Los Osos Valley Creeks, Baywood Marsh, and Sweet Springs. Septic flows now provide 46% of the flows to the perched aquifer (per Appendix D-2, Tables 8-10) and much of the flows to aquatic ecosystems around the bay (Overflows from the upper aquifer supply these ecosystems, and significant reductions in flows, in addition to those already occurring with Projects 2a and 2b (i.e., about 150 AFY—see " "Subsurface Outflow," Appendix 2-D, Tables 8, 9 & 10) will cause negative impacts. P41-7

d. The potential benefits of the reuse/disposal element including Broderson recharge (i.e., Projects 2a and 2b). In several places, the DEIR indicates Projects 2a-2c will provide "a beneficial" impact" (e.g., 5.2-19) However, a downward adjustment in basin inflows of at least 250 AFY results in Projects 2a-2c potentially increasing seawater intrusion in the lower aquifer and/or causing seawater intrusion in the upper aquifer (see Table 10, Appendix D-2, DEIR). P41-8

3. The analysis of recharge sources to the basin should be revised to be clear, consistent, and understandable to the reader (e.g., Section 5.2 and Appendix D). Vineyard Area Citizens v. Rancho Cordova (2007) found that information had to be consistent in EIR analyses and intelligible to readers. Currently, the DEIR is inconsistent in identifying recharge amounts and sources of water for various aquifers, as well as sources supplying sensitive ecosystems. For instance, on Page 5.2-2 of the DEIR and Page 6 of Appendix D-2, different amounts of inflow are reported. These sources and amounts are inconsistent with sources and amounts on Tables 8-10 of Appendix D-2, while the sources and amounts on Tables 8-10 are inconsistent with Appendix C of D-2 (e.g., Table 2) (even though it is the supporting study for Appendix D-2). Both of these reports are inconsistent with sources of recharge to the basin reported in the Yates and Williams study (even though it is the supporting study for Appendix C of D-2). The Yates and Williams study (the source document for Appendix C of D-2), makes it very clear there are only three significant sources of recharge to the aquifers (rainwater, irrigation return flows, and septic return flows), adding that water sources from outside the basin are a "…minor part of the overall water budget" (p. 4). The inconsistencies effectively confuse the reader and tend to obscure and downplay the potential negative impacts of removing septic flows from the basin. <u>The DEIR should use consistent</u> P41-9

recharge labeling and numbers, list fewer recharge sources, and be very clear about the three primary sources of recharge to the basin, to clearly represent the potential negative impacts of removing septic return flows from the basin.

P41-9 CONT

4. The DEIR should acknowledge and discuss the level of uncertainty of information, findings, and mitigations presented, and it should analyze a reasonable range of alternatives to address uncertainties, along with mitigations and the feasibility of alternatives and mitigations. Vineyard Area Citizens v. Rancho Cordova (2007) found that EIRs had to acknowledge uncertainties and provide alternatives when mitigations were uncertain.

Some of the uncertainties not acknowledged in the DEIR are the following

a. The DEIR consistently states and implies Broderson leach fields are certain to recharge the upper aquifer and fully mitigate for the removal of septic flows, at times indicating the leach fields will provide net benefits to the basin (e.g., p. 5.2-19 ; Table 7-8, pp. 7-60 through 7-6; and Appendix D-2, pp. 18 & 40). In fact, the potential for Broderson to mitigate for the project and provide benefits is not certain.

The DEIR states,

> "…the disposal component of the project (Broderson leach fields) would ensure that there would not be a net loss in groundwater recharge to the aquifers that support overlying beneficial land uses and associated impacts would be less than significant. Furthermore, the proposed disposal of treated effluent at Broderson would reduce the current rate of seawater intrusion into the lower aquifer, thus resulting in a benefical impact" (p. 5.2-19).

Later, the DEIR reiterates,

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> " The study results indicate that Broderson disposal will provide beneficial impacts that restore groundwater recharge and maintain a balance in the hydrologic budget that provides outflows for local well production and freshwater features (marshes and springs) around the bay" (p. 5.2-19).

These statements do not accurately represent Broderson leach field capability nor the uncertainty associated with Broderson leach fields. For one thing, "the study" referred to in the second quote (which is not provided or specifically cited in the DEIR) undoubtedly has a substantial margin of error (as do all basin studies, e.g., 10% or more, since they rely on steady-state groundwater models). Further, it is not possible for Broderson leach fields, discharging at a rate of 448 AFY, to provide all of the benefits of approximately 1150 AFY of septic flows discharged to septic leach fields. Aquifer balance calculations (Tables 8-10, Appendix D-2) illustrate this point (i.e., outflows must equal inflows). Thus, with 448 AFY at Broderson replacing 606 AFY of septic flows (by the current calculations in the DEIR), outflow to sensitive ecosystems and the lower aquifer will be reduced (see "Subsurface outflow," Tables 9 & 10). As pointed out in #1 above, the actual reduction in flows to aquifers and ecosystems will likely be even greater, although the exact effects of removing septic system flows from the basin's hydrologic system are not known.

Further, the 2005 *Draft Basin Management Plan* by Cleath and Associates recommended that 560 AFY of imported water was "actively pursued" as a "place holder" to stop seawater intrusion when the prior project went into effect (p. 10). The prior project provided for even more recharge at Broderson (about 900 AFY vs. 448 AFY). That plan also called also for testing the upper aquifer water quality "…to determine the actual production and water quality constraints on upper aquifer use for potable supply" and it recommended evaluating the feasibility of water sources other than the upper aquifer (e.g., ag exchange) (p. 10). Clearly, the Draft Plan did not consider Broderon's benefits to be a sure thing. At one point, the DEIR implies the uncertainty, indicating that much less than the 448 AFY planned for recharge will be dispensed at Broderson initially, to allow testing to see if Broderson leach fields perform as expected.

On one table (Table 14, Page 40 of Appendix D-2), the DEIR appears to (inconsistently) suggest that Broderson leach fields might result in upper aquifer levels dropping to dangerous levels (i.e., drop from "0 to -5.") The lowering of water tables by five feet would induce seawater intrusion in the upper aquifer. Nevertheless, directly below Table 14, the DEIR states "…Broderson discharge effectively replenishes the B and C zones beneath the perching layer…" The DEIR should acknowledge the uncertain benefits, and even potentially negative impacts of Broderson leach fields, and analyze alternatives to Projects 2a-2c to avoid impacts or mitigate for them—and to adequately inform decision makers of the potential impacts and range of alternatives. These include imported water, reduced upper and lower aquifer well production, ag reuse and exchange, and higher levels of conservation. The Los Osos Sustainability Group recommends that the conservation-reuse-recharge plan, which integrates several of the these options (see Achieving a Sustainable Los Osos Valley Water Basin attached). P41-10 CONT

b. The DEIR represents that Broderson leach fields are safe and will not cause impacts to homes due to liquefaction or landslides, and that it will not result in water surfacing downhill causing harm to homes or ecosystems. However, soil science experts such as Dr. Tom Rhuer and Larry Raio have contradicted this claim (see Geology analysis submitted by LOCAC). At one point, the DEIR discusses returning water pumped to the Broderson site to spray fields (possibly in tankers). However, this is not a mitigation, as it does not mitigate for the project's negative impacts on aquifer balance. This reinforces the need to analyze alternatives to Broderson leach fields. P41-11

c. The DEIR consistently refers to the required level of treatment for recycled water discharged at Broderson leach field as secondary, and the Waste Discharge Requirements (WDR) for Broderson discharge as identical to the prior project's WDR; however, both of these assumptions are uncertain. One of the primary objectives of the project is "RWQCB Waste Discharge Requirements (WDR)," explained as the same discharge requirements issued by the RWQCB for the prior project in 2001 (pp. 3-8 & 3-9). However, the California Department of Public Health (CDPH) has since proposed stricter wastewater recycling guidelines, and the RWQCB has not set the WDR for this project. Further, Broderson is clearly intended for indirect potable reuse, rather than simply disposal, so discharging recycled water treated to secondary standards at the site has potentially negative impacts on the drinking water supply. The potential for stricter treatment requirements is reinforced by the potential for Broderson leach fields to allow water to percolate relatively rapidly to the upper aquifer and/or the potential for the vadose zone to become saturated and less effective at removing contaminants. This uncertainty should be acknowledged in the DEIR and alternatives to treating recycled water for Broderson to secondary standards should be analyzed along, along with their potential impacts and relative feasibility. Some of these include treating the water to tertiary standards, treating it using advanced treatment such as oxidation and reverse osmosis (RO) treatments. Further, an option that does not use P41-12

Broderson leach fields at all should be analyzed e.g., one that uses greater levels of conservation and also ag exchange to mitigate for project impacts (see the alternatives in "a" above). P41-12 CONT

d. The DEIR consistently represents that the LOWWP is certain to have beneficial impacts on water quality in the basin by reducing nitrates. This assumption is based on one study, the Yates and Williams study in 2003, which found that nitrate levels would potentially decrease by 19% in 30 years. However, at the beginning of the study, its authors recommend "…a major overhaul and recalibration of the model to achieve a reasonable confidence in its results," which they say is not feasible in the present study. The authors go on to state, "…the greatest limitation of the present analysis is the use of steady-state rather than transient simulations. Steady-state calibration fails to make use of historical fluctuations and trends in water levels and nitrate concentrations, which provide much more information about the hydrogeologic system than single, averaged values" (pp. 2-3). Accurately representing the uncertainty of benefits from the project is needed for informed decision making. P41-13

e. The DEIR implies certainty regarding basin safe yields and the amount of recharge required to balance particular aquifers and the basin (e.g., Tables 8-10, Appendix D-2). All findings related to basin balance and basin safe yields (e.g., those stating the inflows required to offset well production and other outflows from the basin) are based on steady-state models, which have a relatively large margin of error. The 2005 Draft Basin Management Plan recommended converting the "…the steady state model into a transient model, with stress period intervals and overall simulation periods appropriate for solute transport simulation and long-term impacts analysis (p. 11). Cleath and Associates had to revise their 2002 basin safe yield estimates down by about 300 AFY after its Seawater Intrusion Assessment in 2005, and, over the years, basin safe yields have ranged from 1300-1800 AFY in 1974 to 3560 AFY in 2002 to 3250 AFY currently, showing the uncertainty of safe yield estimates (Source: SLO Planning Department Los Osos *Resource Capacity Study*, 2007). The DEIR should add a margin of safety to basin safe yields/aquifer balance estimates, using estimates 10-20% lower than current estimates, to ensure adequate mitigation for addressing potential project impacts. P41-14

f. The DEIR represents that the installation of the hybrid gravity collection system designed for the prior project will be feasible, technically and economically. However, the DEIR states or implies in several places (e.g., p. 5.2-19) that the exact location and movement of high groundwater is not known. A local soil scientist, Larry Raio, who's drilled water test wells in the area, confirms the unpredictability of high groundwater (see "Geology" comments submitted by LOCAC). If extensive high groundwater is encountered during construction of a gravity system, the costs of the system could become prohibitive, and/or the ability to mitigate for the impacts of deep trenching on infrastructure and sensitive ecosystems (e.g., the bay if large volumes of contaminated water are encountered) could make gravity system installation technically and economically infeasible. Further, if I/I is much greater than predicted by the DEIR, due to high groundwater or other factors, the LOWWP system's capacity could be exceeded as soon as it's built. <u>The above uncertainties should be acknowledged and alternatives discussed, along with their mitigations and feasibility.</u> P41-15

5. Where impacts to area ecosystems can be reasonably assumed, the DEIR should provide mitigations and discuss their feasibility, per CEQA, Section 15126.6 (b). In several places, the DEIR asserts that the impacts of removing septic flows from the basin on "surface water features is speculative" (e.g., Appendix D-2, p. 44). If roughly one-half of the perched layer inflow is septic return flows (per Appendix D-2, p. 24, and Appendix C of D-2); then it can be reasonably assumed the removal of septic return flows will cause significant impacts. It can also be reasonably assumed Broderson leach fields will P41-16

not mitigate for many of these effects, including impacts to Baywood Marsh and Willow Creek, since the Broderson leach fields are located some distance away from these ecosystems. It should also be noted that Appendix D-2 (Tables 9 & 10) estimates flows to Willow Creek will be reduced by almost 100% or about 500 AFY (although a more accurate estimate of the distribution of septic flows may reduce this number,—see #1 above). Surely stopping most of the flow to a creek system will cause a significant impact. Further, the impacts are known with a level of certainty at least equal to the certainty on which other groundwater-related conclusions are based. Willow Creek supplies Los Osos Creek, which supplies Los Osos Creek Estuary, which supplies the State Marine Reserve. No doubt, impacts to aquatic ecosystems (e.g., creeks and marshes) in the basin will be significantly impacted with removal of septic flows. These impacts must be analyzed, and alternatives to avoid or mitigate for the impacts discussed.

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6. Water use estimates in DEIR for the Prohibition Zone, and the estimated wastewater flows (which provide the basis for calculating project capacity, treatment requirements, energy needs, storage capacity, and other project elements) should be re-evaluated to ensure an accurate analysis of potential project impacts, and ways to avoid or mitigate them—including potential growth inducement from the project. Current and future water use figures and wastewater flow estimates derived from these figures are overstated in the DEIR (e.g., pp. 3-19 & 20). The estimates are based on LOCSD water use figures cited in the Fine Screening Report and Technical Memorandum: Flow and Loads for winter months when outdoor water use is assumed to be minimal. However, there is likely to be some outdoor use during this time. The estimates also do not take into account recent indications that water use has gone down due to the tiered rate structure implemented by the LOCSD (per John Schempf, LOCSD General Manager, in a report to the Los Osos Community Advisory Committee on January 22, 2009). Further, buildout water use figures are based on what is very likely an inflated population number. With the current total Los Osos population very near what it was for the 2000 Census (14, 351) due to the building moratorium in place, with the Prohibition Zone population about 85% of the total; the current Prohibition Zone population is about 12,200. The build out estimate used to establish wastewater flows in the DEIR is 18,500 (DEIR, p. 3-20), whereas, the 2002 LOCSD *Water Master Plan* estimated potential infill within the Prohibition Zone would add 25% to the population (p. ES-2). Whereas, the Master Plan assumes buildout in the Prohibition Zone to be 17,803, adding 25% to estimate based on the 2000 Census would make the population would closer to 15, 250 than 17, 803 or 18, 500, indicating the DEIR may overestimate buildout population by as much as 3, 250, or over 20%. This results in a 20% oversizing of the system. Current and future population numbers should be analyzed, and the project appropriately sized. A smaller project will reduce impacts including the energy needed for pumping and treating wastewater and the land needed for effluent storage and disposal. An oversized facility will tend to create a vicious cycle of water overuse and/or over-development of the area. Excess facility capacity can (and undoubtedly will) be used to justify both.

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7. The DEIR should provide a complete analysis of the significant potential negative environmental impacts of the hybrid gravity collection system (versus the STEP/STEG system and other flexible, small-pipe sealed systems) with regard to its potential for leaks and pollution of ground and surface waters—along with ways to avoid or mitigate for the impacts. The DEIR finds that Alternative 4, using a hybrid gravity collection system, is the environmentally preferred option. However, gravity systems are known to have more I/I than sealed systems. I/I is inflow (water leaking into a system from the surface) and infiltration (water leaking in to a system from underground.) I/I is the primary cause of sanitary sewer overflows (SSOs) known to be the leading cause of pollution and environmental harm from wastewater systems. An EPA study entitled *Exfiltration in Sewer Systems* (attached) states, "SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to

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surcharged pipe conditions" (p. 1). The *California Beach Closure Report 2000*, published by the State Water Resources Control Board (July 2001) (attached), states "The primary causes of beach closures were sewer line overflow, breakage, and blockage" (p. 13). The State Water Resources Control Board (SWRCB) issued a state-wide Waste Discharge Requirements (WDR) for sewer systems in 2006 (SWRCB Order No. 2006-0003) due to wide-spread pollution and health risks caused by sewer overflows in California. That WDR is responding to the widespread destruction caused by gravity collections systems, rather than STEP/STEG or other sealed pipe systems—a conclusion drawn for three main reasons: 1) few STEP/STEG (and sealed-pipe) systems exist in California, 2) STEP/STEG and sealed pipe systems generate relatively little I/I, and 3) three of the most important causes of overflows cited in the WDR are common only to gravity collection systems, e.g., "manhole structure failures, pump station mechanical failures…excessive storm or ground water inflow/infiltration,…" (p. 1). Note that most all grease remains in a STEP/STEG tank, so does not clog the lines.

In one storm in January of 2006 in the Central Valley, hundreds of thousands of gallons of raw or partially treated sewage were released due to SSO's (attached). The California Men's Colony's wastewater system, with a gravity collection system, has overflowed several times during rainstorms sending many thousands of gallons of sewage into Morro Bay Estuary.

A gravity system in Los Osos would be particularly prone to overflows for two reasons 1) gravity pipes laid in sandy soil are more likely to shift or wash out causing leaks in bell and spigot joints (e.g., due to ground movement, exfiltration, and/or underground water flows), and 2) many gravity pipes are likely to be laid in high groundwater areas (i.e., unmapped perched water zones throughout the basin), so they will likely take on water even during non-wet-weather periods (unless they are sealed—not a part of the plan for a gravity system alternative). This fact suggests the I/I estimates, focused only on wet-weather flows, for a gravity system are low. Los Osos is particularly vulnerable to overflows that will pollute surface waters for a couple of reasons: 1) It has a hilly terrain requiring the gravity system to have a relatively high number of lift stations for the acreage served; pump stations and manholes are points in the system vulnerable to breeches and overflows, and 2) overflows from many locations in town will flow downhill reaching Morro Bay Estuary or one of the sensitive ecosystems along the bay.

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The gravity system in Los Osos will also likely leak more raw sewage out of a system than a STEP/STEG system. The EPA study on exfiltration attached points out that it results from the same cause as I/I—leaks in the system (p. 3). Thus, a system more prone to I/I is more prone to exfiltration. According to the study, exfiltration "…can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways" (p. 1). The EPA study states "Areas with significant portions of the system above, but in close proximity to, the groundwater table are probably at greatest risk" (p. 25). For this reason, Los Osos may be particularly vulnerable to ground water pollution from exfiltration because, in many locations, groundwater levels are likely to be in close proximity to the gravity pipes.

One reason, gravity systems are more likely to have greater negative impacts over time is that leaks in pipes are more difficult to detect than in small-pipe, pressurized systems (e.g., STEP/STEG systems) while repairs, including digging up and replacing pipes, are much more costly, reducing the likelihood a community will perform timely repairs (even when leaks are detected). Further, higher I/I into systems

robs groundwater recharge, instead sending it to the treatment facility, adding pumping and treatment costs, also reducing the efficiency of the treatment process.

The *Fine Screening Report* states, "Properly installed bell-and-spigot sewers will be watertight at first, and then slowly lose their integrity as the surrounding soils shift, compressing the pipes, and compromising their seals at the joints" (p. 1-9). The Report goes on to state that the water tightness of a gravity system can be "preserved if a maintenance program is conducted on an ongoing basis to detect and repair leaks…"; however, it adds "This program would add to the cost of a gravity sewer compared to a STEP/STEG sewer with similar levels of I/I" (p. 1-9). The Report also finds that gravity collection system will have flows almost 20% greater in wet weather due to more leaks [i.e., 1.4 million gallons per day versus 1.2 mgd for a STEP/ STEG system] with an even greater difference in peak flows during wet weather (2.5 versus 1.7 mgd).

The *Fine Screening Report* indicates I/I estimates for gravity systems are conservative, but the report's estimates are based on standards (or recommended tolerances) for newly installed systems (p. 1-10), not older systems. In fact, even new systems can have very high levels of I/I, especially in high ground water areas such as Los Osos. In Lathrop, California, for instance, a system built only a few years ago experiences flows in wet weather double those of dry weather flows, due to I/I (see attached graph of water and wastewater use for the city dated November 2006).

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In a phone conversation with Keith Wimer of the Los Osos Sustainability Group on September 19, 2007, Dr. George Tchobanoglous, a well-known authority on wastewater management, indicated that gravity pipes in Los Osos should be sealed or "butt welded" in high ground water areas and along the bay, where they might be impacted by seawater from rising sea levels in the future. Dr. Tchobanoglous added that saltwater contamination of wastewater could prevent the water from being used for beneficial purposes or require reverse osmosis at considerable addition cost. He added that gravity systems will never be as watertight as STEP/STEG systems, even with aggressive maintenance, which, he said, rarely happens, pointing out that San Francisco spends about $1 million annually on maintenance for its $2 billion system, but it would have to spend 1% or $20 million annually to do the job right.

In a 2007 textbook entitled *Water Reuse*, Dr. Tchobanoglous and other leading authorities in the field of wastewater, compare gravity and small-pipe sealed collection systems:

> "In addition to the high installation costs of centralized collection systems (gravity systems), issues with nonwatertight joints and damaged sections result in potentially high volumes of inflow and infiltration, or exfiltration in the collection system. Infiltration can more than double the flowrate and dilute wastewater constituents concentrations arriving at treatment facilities in extreme cases. Long-term infiltration into a collection system can also lower groundwater levels. Exfiltration from collection systems may result in groundwater or surfacewater contamination. While large centralized collection systems are not intended to leak, the nature of large rigid pipes buried in various soils results in more leaks and damage to pipe sections over time. Further, it is costly to identify and repair sections of damaged underground collection system, especially when located below roads and buildings in developed urban areas. Piping used for decentralized facilities (STEP/STEG, etc.) is mostly small diameter flexible plastic pipes, typically of polyvinyl chloride (PVC) with solvent welded joints or medium density polyethylene (MDPE) with compression joints which can be designed for high pressures or vacuum where alternative collection systems are used. Flexible

> plastic piping is much less likely to leak under normal bedding conditions. These pipes can be installed easily in narrow trenches or by directional drilling that results in minimal disturbance to property and roads" (p. 769).

In a 1998 textbook entitled *Small and Decentralized Wastewater Management Systems* by Drs. Tchobanoglous and Crites, point out that gravity sewers can also limit conservation measures:

> "In some areas the use of gravity sewers is becoming counter productive because the use of water conservation devices continues to increase. The minimum flows required for gravity-flow sewers to operate make them problematic where development occurs slowly in a large development or where water conservation reduces the wastewater flows significantly. In many cases, the water used to flush conventional gravity-flow collection systems for the removal of accumulated solids far exceeds the water saved through water conservation measures" (p. 8)

Dr. Tchobanoglous was a member of both National Water Research Institute (NRWI) peer reviews of proposed projects for Los Osos, the first the Ripley STEP/STEG plan in 2006 and the second a review of the current LOWWP recommended alternatives. The panel endorsed use of a STEP/STEG collection system (in the first and second reports) and a gravity collection system (in the second report). In the second, it also supported the principles stated in the *Key Environmental Issues Statement* (KEIS) on collections systems presented by a number of local not-for-profit groups. , which recommended STEP/STEG as the environmentally preferred system for Los Osos. Two principles of the KEIS supported by the NWRI were "1) Provide the greatest possible protection against overflows and other releases of partially treated or untreated wastewater from the system, which could pollute Morro Bay Estuary and other sensitive coastal ecosystems (e.g. Sweet Springs Nature Preserve), and 2) Provide the greatest possible protections to the groundwater of the Los Osos water basin." Although the panel did not state its position directly on the I/I and exfiltration issues discussed here—given its endorsement of the KEIS principles, the well-established fact gravity systems have greater I/I, and the statements of Dr. Tchobanoglous to Keith Wimer, which leads to increased chances of overflows—it is reasonable to conclude the NWRI panel endorsed a gravity system for Los Osos if the system was sealed, in particular in high groundwater areas and along the bay (e.g., to avoid seawater contamination in the future). The panel may not have realized that the low pressure component of the hybrid system (5 %) is intended only to pump water uphill when homes are located below the level of mainlines, as indicated in the Fine Screening and project design-build Request for Qualifications (RFQ). The panel may have also have assumed a gravity system would have the special, on-going maintenance program in place to minimize I/I and exfiltration (i.e., the program mentioned in the Fine Screening Report to detect and repair leaks at an added expense compared sealed small-pipe systems). This is a reasonable understanding of the NWRI panel's intent when it endorsed the KEIS principles. <u>If necessary, the EIR process should clarify the panel's intent when it approved the hybrid gravity system, obtaining its input on the need for sealing the system, maintenance, relative feasibility, and other aspects of the gravity system (e.g., its potential construction impacts on roads and infrastructure, especially in sandy soils and high groundwater), including a written response from the NWRI panel in the final EIR.</u> (Note: When a local not-for-profit group offered to pay for the NWRI panel to return to clarify its statements, County staff rejected the proposal).

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A summary of the potential negative impacts of a gravity-hybrid system compared to the STEP/STEG system (or another small pipe sealed system) include:

a. Significantly greater chance of overflows and pollution of surface waters—due to greater I/I, higher peak flows, more likelihood of blockages from fat, oils, and grease (FOGs)(retained in a STEP/STEG tank), and the inherent vulnerability of system design (e.g., manholes and the relatively limited number of pump stations susceptible to power outages and failure, in addition to the limited inability of the system to equalize flows). A gravity system is expected to handle at least 180% of its design capacity during storms (2.5 mgd vs. 1.4 mgl), with very limited capacity to absorb sudden inflows in the collection system. Manholes have some capacity in manholes but it this is relatively limited compared to system flows and manholes are often a source of inflow during wet weather. A STEP/STEG system (and to a lesser extent low pressure and vacuum systems) have reserve capacity in STEP/STEG tanks, allowing sudden inflows to be taken in and distributed through the collection system over time, equalizing flows. A STEP/STEG system also has remote monitoring capabilities to coordinate the release of wastewater into the collection system and to enable detection and elimination of onsite I/I. Finally, it is easier and less costly to detect and repair shallow, small-pipe, pressurized systems (e.g., STEP/STEG systems) making it more likely a community will have the resources to perform timely repairs.

b. Significantly greater potential for exfiltration and pollution of groundwater: The EPA study entitled *Exfiltration in Sewers* (2000) points out that exfiltration results from the same causes as I/I—leaks in the system (p. 3). Therefore, because a gravity system is more prone to I/I, it is more prone to exfiltration. (Note: The DEIR is inaccurate when it indicates that small-pipe sealed systems will have greater exfiltration, e.g., in Table 7-5, (pp. 7-23 through 7-25) (see quote from *Water Reuse* above). The EPA study cited above states, "Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways" (p.1)

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c. Signficantly more prone to earthquake damage and costlier to repair and replace. Los Osos lies in an earthquake-prone area close to many active faults. The chances of a serious earthquake occurring within the life of the wastewater project (50-100 years) are very high. Applying the rule of reason, the level of damage and the cost of repairs will be significantly greater for a gravity collection system than a STEP/STEG or other sealed-pipe system. This is because 1) gravity systems use rigid pipes, have a greater number of vulnerable connections (manholes, etc.), and rely on exact gradients and specifications to function properly (i.e., any ground movement that affects pipes will likely require extensive repairs); whereas, small pipe-sealed systems use flexible pipes, are fused, and have fewer vulnerable connections, to they are less likely to break or separate with ground movement); 2) detection and repairs of leaks will be more difficult and time-intensive due to the depth or gravity pipes, the size of pipes, and the infrastructure affected (e.g., streets and utility lines); whereas, leaks from a shallow, pressurized system, installed of pavement at the edges of streets, will more likely show at the surface and be easier to access and repair, and 3) potential impacts on the environment will be greater due to larger volumes of wastewater in a gravity collection system and the potential for it to flow downhill into the bay; whereas, most of the wastewater in a STEP/STEG system will be retained in the tanks, less vulnerable to leaking in an earthquake. The DEIR acknowledges Los Osos soils are subject to liquefaction, but it calls for a study, which does not quality as mitigation. Further, more mitigation will be required for a gravity system than a STEP/STEG or other sealed piped system. Sewer lines in the Los Angeles area are still being repaired from the Northridge Earthquake that struck in 1994. A similar-size quake hitting Los Osos—if a gravity system were installed—would cost a tremendous amount to repair (likely more than it

costs to install the gravity system initially), with an inestimable amount of damage to vital ecosystems in the area.

d. The potential to reduce the use of conservation measures in Los Osos: As indicated in the quote from *Small and Decentralized Wastewater Management Systems* above, a gravity system can require greater use of water, effectively preempting strong conservation measures in Los Osos, which not only will save water but also energy. Given the severe imbalance of the basin, it is likely a strong conservation effort will be needed. This constitutes a potentially signficant impact caused by this system. P41-18 CONT

e. Significantly greater potential to deplete the groundwater: Based on the flow differences of the two systems in the *Fine Screening Report*, a gravity system in Los Osos will take in 50-100 AFY more rainwater as I/I than a STEP/STEG system during peak and wet-weather flows, potentially reducing groundwater recharge by as much. (Note: This difference is not reflected in groundwater balance estimates, e.g., Tables 9 & 10 of Appendix D-2, so the basin will be even more out of balance with a gravity system than shown in #1 above).

8. Upgrades to the proposed gravity hybrid system should be discussed, along with mitigations for potential impacts and feasibility. The *Fine Screening Report* indicates that an active maintenance program or fusion welding the pipes in a gravity system will reduce I/I and exfiltration to levels closer to those of a STEP/STEG system—however, the Fine Screening Report indicates these measures add to costs compared to a STEP/STEG system. These additional costs were not elaborated on in the *Fine Screening Report* nor the DEIR, nor was their feasibility, nor the potential beneficial and negative impacts. The DEIR should analyze in some detail what is required for a maintenance/repair program or fusion welding to reduce the I/I-exfiltration of a gravity system closer to that of a STEP/STEG or other sealed system (i.e., avoid or mitigate for the system's impacts). Further, the EIR should analyze the potential impacts of the mitigations (e.g., flushing the system). Finally, the feasibility of repairing each system after a serious earthquake should be evaluated. Increased potential for I/I, overflows, exfiltration, and earthquake-related damage and costs clearly distinguish the two collection systems, making the gravity system potentially more impactful to the environment and less feasible. Analyzing these upgrades to the gravity system is the only way to adequately compare the two systems (i.e., for the EIR to be a co-equal analysis). P41-19

9. Several project alternatives should be analyzed (which have not been) to assure a reasonable range of alternatives, sufficient to make informed choices and determine the most feasible, environmentally preferred project.

These include the following:

a. A collection system alternative that includes a dedicated (100%) low-pressure system using grinder pumps or a collection system using a hybrid low-pressure-vacuum system. Both of these systems provide most of the environmental benefits mentioned in #7 above for STEP/STEG systems since they are sealed small-pipe system. However, these systems did not receive adequate consideration in the project screening or DEIR processes (e.g., consideration of environmental benefits and feasibility). The DEIR indicates that they are Level C alternatives, rejecting them for their high energy use and maintenance costs (p. 7-21). The analysis is inadequate to make this finding, and the DEIR cannot rely on the project screening process (e.g., the *LOWWP Technical Memorandum: Low-pressure Collection*). The LOWWP TM update assumes grinder pumps to be 2hp pumps, while the E-One pumps—possibly the P41-20

most widely-used pumps for low pressure systems in the world—are 1 hp. Further, E-One pumps generate considerable hydraulic head, so they may alleviate the need for lift stations and booster pumps, potentially making the system less energy intensive than a gravity collection system. Because a low pressure (grinder pump) system moves the entire wastewater stream, including solids, to the treatment facility via a pipe system; they alleviate several environmental impacts associated with STEP/STEG systems, including energy use for pumping septic tanks and the methane (GHG) production from STEP/STEG tanks. Further, wastewater systems using low pressure collection don't require an additional source of carbon (e.g., methanol) in the treatment process to achieve nitrate levels (although less environmentally impactful substitutes exist for STEP/STEG systems as well). Finally, the price for a complete system, estimated by company representatives (at a presentation in the Los Osos Community Center in November of 2008) showed the systems to be one-half or less the current cost estimates for collection system alternatives. Given the potential beneficial impacts of these systems, including their potential for being more economically feasible than other options (of major importance to the community), the EIR should review this alternative to provide an adequate range of alternatives for the public and decision makers to make an informed choice.

Another system with similar benefits, including the potential for greater economic feasibility, is the vacuum collection system. It uses very few pumps and much less energy overall that all the systems. Its total costs, too, can potentially be half or less of the systems currently under consideration in the DEIR, according to company representatives. While vacuum collection systems have slope limitations, theycan be effectively combined with low-pressure system components in steep areas to serve all of Los Osos, according to company representatives (at a presentation in the Los Osos Community Center in November of 2008). The vacuum system was brought forward from the LOWWP *Rough Screening Report* and recommended in the first NWRI peer review along the bay, but it was dropped without explanation from further analysis. Vacuum collection should also be reviewed to address high groundwater issues and to allow informed choices by decision makers and the public.

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b. An integrated conservation-reuse-recharge plan using appropriate technologies and low impact development as an alternative for the Project 2a-2c reuse/disposal options. A sample plan is attached entitled "Achieving a Sustainable Los Osos Water Basin." It is designed to be installed concurrently with the project and to fully mitigate for its impacts. It emphasizes conservation, onsite reuse, and ag exchange to reduce pumping from the aquifers and mitigate for seawater intrusion impacts of the project. By enabling a significant reduction in pumping by the startup of the project, the plan provides greater flexibility in how potential environmental impacts are addressed (i.e., to the upper, lower aquifers, and sensitive ecosystems). It also provides for an integrated onsite-community low impact development and rainwater infiltration system to recharge the aquifers, support sensitive ecosystems, and reduce stormwater run off. By relying enhancing rainwater recharge of the basin, the plan increases the rate at which the water quality of the upper aquifer improves. The cost for Prohibition Zone residents would be approximately the same cost as the cost of the conservation and Broderson leach field components of Projects 2a-2c (see conservation-reuse-recharge plan attached, entitled *Achieving a Sustainable Los Osos Valley Water Basin*).

c. A decentralized system that with only two treatment sites, using the integrated conservation-reuse-recharge plan referenced in "b" above.

d. A partial system alternative that includes a sealed, small-pipe system serving homes near the bay or and other homes where septic systems may pose an unusual threat to ground water (possibly 20%

of homes in the Prohibition Zone), which combines a basin-wide nitrate management program, an indoor and outdoor conservation program (using appropriate technologies), and an LID program (focused on recharging the aquifers, supporting sensitive ecosystems, and stopping stormwater pollution). Most of the vital environmental systems in the basin are now in equilibrium, except for the lower aquifer which is being overdrafted. Nitrates in the upper aquifer are in equilibrium (i.e., not going to get worse), according to the 2005 Cleath and Associates nitrate study, while inflows to the upper aquifer and freshwater flows to sensitive ecosystems (the estuary and creeks) are keeping these systems in balance. The LOWWP will cause a major hydrologic disruption to the basin by removing about one-third of the recharge. Due to the complex interrelations of basin systems, the consequences of upsetting basin equilibrium is unpredictable and may cause seawater intrusion will get worse. Seawater intrusion, in fact, is a more serious groundwater contamination problem than nitrate because it is destroying drinking water in the basin at a faster rate. The nitrates in the upper aquifer remain at about drinking water standards on average (per the DEIR), allowing that source to be cost-effectively pumped for drinking with nitrogen treatment (now occuring). On the other hand, a growing number of community wells are being contaminated by seawater intrusion—rendering the water unusable without expensive desalination. The cost estimate of the Nipomo desalination plant is $100 million (according to The Tribune), and the cost estimate for importing water (if it is available) is at least $30 million (according to the LOWWP *Technical Memorandum: Imported Water*. Therefore, careful consideration must be given to upsetting the equilibrium of the basin, established over the past 30 years. One approach is to implement a partial plan, designed not to remove all septic systems in the basin. A conservative cost estimate for the entire system would be around $50 million. P41-20 CONT

(For descriptions of the above two projects, see recommendations submitted to the SLO Board of Supervisors by the Los Osos Sustainability Group on January 6, 2009—attached).

10. The DEIR should have a more in depth energy and GHG analyses, in which clean and renewable energy options are discussed in detail for powering various system components, which includes an analysis of alternatives for offsetting or reducing GHG production with carbon sequestering, biodiesel, algae production/cultivation, and co-generation. Currently, these options are inadequately evaluated. The analysis should assess how the system can be carbon neutral and even restorative, in order to help the region reach AB 32 carbon reduction goals. P41-21

11. The DEIR should re-analyzed treatment sites, e.g., Toninni as the preferred site doing, a more in-depth analysis of energy use, potential for growth inducement, and impacts on limited farmland in the Los Osos Valley. These impacts were not adequately addressed, and they are key to determining the environmental impacts and sustainability of the project. The energy needed for pumping wastewater to the various sites and recycled water back, or to receiving locations such as farms, should be compared for various sites, using a life-cycle analysis. Also, the potential for growth trend that impact limited farmland in the Los Osos Valley and growth inducement should be analyzed for various sites. Paavo Ogren suggested that a conservation easement might need to be established for a pipeline to the Toninni site to prevent future connections to the system. This and other alternatives should be discussed, along with mitigations and feasibility. P41-22

12. The impacts associated with displacing a relatively large percentage of the Los Osos community and the issue of whether the project itself is feasible should be analyzed with alternatives to avoid the impacts of citizen displacement. The estimated project costs ($250 per month per household) exceed the affordability level for 90% of the homeowners in the community. Affordability guidelines are P41-23

based on mean household incomes. Thus, it can be reasonably assumed that a relatively large percentage of homeowners will not be able to sustain the costs and will have to move from the community shortly after the full assessment takes effect or at a future date when the financial burden becomes too great. An affordability study recently completed and provided to LOCAC found that the presently-estimated cost of the LOWWP would exceed affordability levels for over 60% of the community, and about 35% of residents would have to move. The relocation of a percentage of the community has primary environmental impacts (e.g., relocating increases vehicular trips and GHC production). It also causes secondary impacts on the services and the infrastructure of other communities. These potentially significant impacts should be analyzed. The DEIR and CEQA (Section 15126.6) state that "economic viability" is among the factors that may be taken into account when addressing feasibility. Referencing CEQA Guidelines in Section 15364, "feasible" (for CEQA processes) means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." The County would not be capable of completing the project without Proposition 218 assessment funding, and a project or mitigation would not normally be considered feasible if it caused a company or an individual responsible for project severe financial hardships. Many Los Osos residents paying the assessment will not be able to sustain $250 per month without either relocating or undergoing severe personal hardship. The percentage of people likely to move and/or the level of hardship people will face are factors in determining the feasibility of this project. They should be analyzed and discussed. Grants and low-cost funding may reduce potential environmental impacts and increase project feasibility, but they have not been secured at this point. These and other alternatives should be discussed within the context of feasibility and as mitigations to avoid the impacts of relatively large-scale migration of people out of the community. Finally, it should not be assumed that the passage of a Proposition 218 assessment implies the ability of homeowners' to pay for the project because residents were under the threat of a Notice of Violation from the Central Coast Water Quality Control Board prior to the assessment. Homeowners' willingness to comply with an order that carries possible $5000 dollar per day fines does not reflect their ability to pay.

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13. The DEIR should include a substantive climate change impact analysis, including a discussion of the potential impacts related to sea level rises. Governor Schwarzenegger signed Executive Order S-13-80 into effect on November 14, 2008 requiring project planning to account for the impacts of climate change and recognizing the particular threat sea level rises pose for coastal communities (see http://gov.co.gov/executive-order/11036/). This requires public projects after that date to include climate change planning, and it recommends that projects in the works also prepare those plans. The Intergovernmental Panel on Climate Change and the State of California (e.g.,, Department of Water Resources California Water Plan) report that the potential for seawater intrusion in coastal aquifers will increase with sea level rises. In order to avoid seawater contamination of the septic effluent (requiring expensive reverse osmosis to decontaminate the water for reuse), the EIR will have to consider alternatives for preventing seawater contamination of wastewater in the system near the bay (e.g., sealing the gravity collection system or using a sealed, small-pipe system in vulnerable locations). Further, the DEIR should analyze the long-term potential impacts on aquifers from sea level rises, predicted to increase seawater intrusion in coastal aquifers (e.g., ways to begin bringing aquifer levels up).

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11. The DEIR should include an analysis of green and appropriate technologies for their energy saving benefits and co-benefits, as well as a sustainability (triple bottom line) analysis determine the highest value system for citizens long-term. Sustainable development is the accepted planning paradigm of the 21st Century advocated by every state and federal agency involved in resource management and public infrastructure planning. Many EIR's have "sustainability" sections. A good

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example is an EIR prepared by the City of Lodi for the Reynolds Ranch Project in 2002. That EIR provides a thorough analysis of sustainable energy use, including the potential for alternative energy use and generation. Michael Brandman Associates included a section for the San Ramon City Center EIR, which discussed water use efficiency "intended to promote sustainability through trip reduction and energy and water conservation" which included the use of a number of green and appropriate technologies to improve the project's sustainability. Darla Inglis, the Director of a new Low Impact Development (LID) Center in the region, related in a recent meeting with Mark Hutchinson and local environmental groups, that all public projects in Seattle now require a triple bottom line "asset management analysis," to determine project alternatives with the highest environmental, social, and economic value for customers long term. The EIR Scoping recommendations the Los Osos Sutainability Group submitted with other groups to the SLO Board of Supervisors on May 6, 2008 includes sustainability criteria for wastewater projects, plus suggested sustainable project alternatives for review. Also attached is the sustainability criteria and sustainable project recommendations we recently submitted to the SLO Board of Supervisors on January 6, 2009. The DEIR should identify a range of green and appropriate technologies and processes, as well as a project that produces the greatest value long-term, for a sustainable project that design-build teams could then integrate into specific, innovative project proposals to achieve project goals.

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California Beach Closure Report 2000

July 2001

DIVISION OF WATER QUALITY
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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INTRODUCTION

California Health and Safety Code Section 115910 requires local health officers to submit to the State Water Resources Control Board (SWRCB) by 15th of each month a survey documenting all beach postings and closures that occurred during the preceding calendar year due to threats to the public health. The law also requires the SWRCB to (1) make available this information to the public by 30th of each month, (2 publish a statewide annual report documenting the beach posting and closure data provided by health officers for the preceding calendar year by July 30, and (3) distribute this report to the Governor, the Legislature, major media organizations, and public within 30 days of publication of the annual report.

The SWRCB staff enters the monthly beach posting and closure data provided by the local health officers on its website (http://www.swrcb.ca.gov) for easy public access. The coastal Regional Water Quality Control Boards (RWQCBs) also post this information on their websites or link to the SWRCB's website.

This annual beach closure report contains beach posting and closure information submitted by local health officers for the year 2000. It also includes a brief description of SWRCB and RWQCBs activities to keep the beaches clean and healthy.

Significance of Beaches

Various statistics have been reported regarding the economic significance of beaches. Nationwide, beaches contribute over $640 billion (85 percent of all tourist revenues) to the United States economy annually. The U.S. Environmental Protection Agency (USEPA) estimates that Americans make a total of 910 million trips to coastal areas each year, spending about $44 billions. According to the U.S. Lifeguard Association, beach usage in California is higher than the other 49 states combined. California's coastline is one of its most important natural features. It extends over 1,000 miles from the rocky cliffs of the north coast to the sandy, sun-drenched beaches in the south. Approximately 80 percent of California's 33 million residents live within a 30-mile drive of its coastline. The coastal areas represent a desirable place to live. Millions of visitors come to see its beauty and play on the shore and in its waters. Southern California beaches attract 175 million visitors each year, who spend more than $1.5 billion during their visits. For instance, according to one estimate Mission Bay in San Diego County is visited each year by approximately three million people and creates over $25 million in revenue for the County. On a typical summer day, some of the more popular beaches attract 75,000 people. On a statewide basis, California beaches generate $17 billion per year in tourism revenue.

Increasingly the public is becoming concerned about beach closures, swimmers' illnesses, and the lack of public confidence due to the up and down nature of posting of warning signs. When a beach is closed due to contamination, the economic effect can be devastating to local business owners. Much attention has been given to the number of beach closures and warnings, especially along the southern California coast, which is a direct result of the very active beach water quality monitoring programs conducted primarily by county health agencies and municipal waste treatment facilities.

Causes of Beach Closures

Beaches are closed due to water contamination by toxic chemicals or pathogens, which can potentially impact the health of the beachgoers when they are exposed to the contaminated water through skin contact (swimming or surfing) or ingestion. Fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, hepatitis, and other illnesses have been associated with waterborne pathogens. Table 1 lists a number of pathogenic bacteria, protozoa, and viruses; their observed effects on exposed population; and the diseases commonly associated with them. A 1996 epidemiological study sponsored by the Santa Monica Bay Restoration Project and partially funded by the SWRCB validated the cause and effect relationship between elevated levels of bacteria in beach water and health problems observed in exposed beachgoers. Beach closures can also result from other events, such as a leaking sewage pipe or an oil spill.

Sources of Beach Pollution

The ocean is the final deposition site for most land-based pollutants entering California's coastal watersheds. Nearshore pollution can result from dumping industrial waste, dredge spoils, agricultural and urban runoff, and municipal sewer discharges. Although this pollution has been controlled to a great extent in recent years, the increases in population and development offer a constant challenge to those agencies responsible for pollution control. As California's coastal population increases, the number and volume of discharges from industrial and municipal facilities into our coastal waters also increase.

Another primary source of coastal water pollution comes from the untreated runoff flowing from the land through storm drains and hundreds of natural stream courses. Runoff from creeks, rivers, and storm drains is a significant source of pollution to the southern California beaches. This runoff may come from roof tops, streets, yards, gardens, open spaces, parking lots, animal yards, construction sites, logging roads, and any other surface exposed to rain or snow. It collects animal waste, oil and rubber residue from cars, asbestos and metals from brake linings, pesticides, silt, and various types of vegetable matter. It may contain high bacterial counts and viruses, may be toxic to marine life, and may carry tons of garbage and silt that litter the ocean and its beaches and kill or injure marine life. Since this runoff does not come from a discrete source, such as a pipe, it is regarded as a "nonpoint source discharge." Some of these types of wastes are collected in urban storm drains. Storm drain discharges are considered "point source" under the federal Clean Water Act's Storm Water Program, and require National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface waters.

SWRCB's Role

One of the SWRCB's primary responsibilities is to protect California's valuable coastal waters by controlling what goes into them. The six RWQCBs bordering the coastline also have primary responsibility for protecting coastal waters. Anyone wishing to discharge waste to the ocean from a pipe or waste facility (a "point source") must obtain an NPDES permit from the RWQCB. The RWQCBs establish monitoring programs to be conducted by the discharger as a way of measuring compliance with permit provisions. The RWQCBs currently issue NPDES permits for

Table 1. Waterborne Pathogens, Diseases they Cause, and their Effects on Exposed Population.

Pathogen		Disease	Effects
Bacteria	Escherichia coli (enteropathogenic)	Gastroenteritis	Vomiting, diarrhea, death in susceptible populations
	Legionella pneumophila	Legionellosis	Acute respiratory illness
	Leptospira	Leptospirosis	Jaundice, fever (Weil's disease)
	Salmonella typhi	Typhoid fever	High fever, diarrhea, ulceration of the small intestine
	Salmonella	Salmonellosis	Diarrhea, dehydration
	Shigella	Shigellosis	Bacillary dysentery
	Vibrio cholerae	Cholera	Extremely heavy diarrhea, dehydration
	Yersinia enterolitica	Yersinosis	Diarrhea
Protozoans	Balantidium coli	Balantidiasis	Diarrhea, dysentery
	Crytosporidium	Cryptosporidiosis	Diarrhea
	Entamoeba histolytica	Amedbiasis (amoebic dysentery)	Prolonged diarrhea with bleeding, abscesses of the liver and small intestine
	Giardia lamblia	Giardiasis	Mild to severe diarrhea, nausea, indigestion
	Naegleria fowleri	Amoebic meningoencephalitis	Fatal disease; inflammation of the brain
Viruses	Adenovirus (31 types)	Respiratory disease	
	Enterovirus (67 types, e.g., polio, echo, and Coxsackie viruses)	Gastroenteritis	Heart anomalies, meningitis
	Hepatitis A	Infectious hepatitis	Jaundice, fever
	Norwalk agent	Gastroenteritis	Vomiting, diarrhea
	Reovirus	Gastroenteritis	Vomiting, diarrhea
	Rotavirus	Gastroenteritis	Vomiting, diarrhea

discharges from municipal storm sewer systems serving a population of 100,000 or more. The SWRCB has also adopted two statewide general storm water permits for industrial and construction activities and a statewide permit to address all road construction activities of the California Department of Transportation. These permits require the storm water dischargers to implement programs to reduce and/or eliminate storm water pollution to the maximum extent possible. If nonpoint source waste causes serious pollution, the RWQCBs may work with the dischargers to require the application of measures to control the waste (known as best management practices or BMPs) and prevent pollution. If those measures are not carried out effectively, the RWQCBs may issue waste discharge permits or take enforcement action.

Beach Closure, Beach Posting (Warning Sign), and Rain Advisory

County health officers can take three discrete actions based on beach water quality monitoring data, sewage spills, and storm events. Beaches, or more precisely the ocean waters adjacent to the beaches, are posted with warning signs or are closed when certain kinds of indicator bacteria are found in the water at levels that are considered a problem. These indicator bacteria imply the potential presence of microscopic disease-causing organisms originating from human and animal wastes. Water samples are collected in the surf zone to determine if recreational waters are contaminated with indicator bacteria (total coliform, fecal coliform, and enterococci). If tests using indicator bacteria show levels above State standards (Table 2), the beach will be posted with warning signs or closure notices to notify the public of the potential health risk. The beach is reopened when further sampling confirms that the density of bacteria in water does not exceed the State standards.

A "Beach (ocean) Closure" occurs as a result of a sewage spill or **repeated** incidences of excedeences of bacterial standards from an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. Closure occurs when health risks are considered greater than those associated with posting that some evidence of monitoring indicates a problem. A beach closure does not result in the closure of the entire beach for recreational activities. In most cases, the ocean is closed to swimming and other water contact recreation while the beach area is open for sunbathing, volleyball, and other activities that do not involve water contact.

A "Beach Warning" sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short term when a single bacterial indicator standard is exceeded or more permanent where monitoring indicates repeated contamination (e.g., from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).

A "Rain Advisory" is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, indicator bacteria counts usually exceed the State standards for recreational water use. For this reason, county health officials usually recommend that beach users should not swim or surf during rain and three days after a rainstorm. Rain advisories are issued by radio or newspaper during rainstorms to warn people to avoid areas where rainwater flows onto the beach and may not be based on the actual evidence of contamination.

Assembly Bill (AB) 411

Pursuant to AB 411 (Wayne, Chapter 765, Statutes of 1997), DHS adopted procedures that increased consistency in the way county agencies measure beach water quality, post warnings, and close beaches (Sections 115880, 115885, and 115915 of the Health and Safety Code). Beginning in 1999, the law required local health officers to conduct weekly bacterial testing (total coliform, fecal coliform, and enterococci bacteria) between April 1 and October 31 of waters adjacent to public beaches which have more than 50,000 visitors annually and are near storm drains which flow in the summer. If any one of these indicator organisms exceeds the DHS standard (Table 2), the county health officer is required to post warning signs at the beach and make a determination whether to close that beach in the case of extended exceedences. The law also requires the county health officer to establish a telephone hotline to inform the public of all beaches that are closed, posted, or otherwise restricted. Ten coastal counties (San Mateo, Sonoma, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Orange, Los Angeles, and San Diego) and one city (Long Beach) have reported that they have beaches that meet the AB 411 criteria, i.e., beaches that are near storm drains and are visited by more than 50,000 people annually.

Before AB 411 became law, county health officers had discretion to post or close any beach that violated total coliform standards. Under the new regulations, county health officers are required to post warnings whenever any one of the bacterial standards is violated in areas near storm drains, but they have the discretion to close the beach when appropriate. Many beaches near storm drains (which are covered under the AB 411 regulations) frequently violate at least one of the standards established by the DHS. These violations increase the number of postings regardless of whether there have been changes in water quality from previous years. Information collected under the mandate of AB 411 provides a new baseline against which the number of future beach warning postings and closures could be compared.

Figure 1 shows a suggested protocol for posting and closure based on the results of bacterial monitoring or reported sewage spill. This protocol was developed by the Monitoring and Reporting Subcommittee of the Beach Water Quality Workgroup, an ad-hoc committee of State, federal, and local agency representatives and environmental groups that have a stake in beach water quality programs. The decision tree provides guidance to the county health staff on whether a beach should be posted or closed. AB 411 specifies when to post or close a beach which has input from storm drains. However, there is discretion for posting or closure of beaches in areas away from the influence of storm drains. The key to this discretionary action is whether the county health staff is confident that high levels of bacterial indicators will be detected on a repeated basis (leading to beach closure) or not (leading to beach posting).

Indicator Organisms

Since identification and enumeration of pathogens, such as viruses in water, are difficult, time consuming, and expensive laboratory methods have been developed to measure the presence and density of "indicator" organisms. The indicator organisms may not cause human health impacts, but their presence indicates the potential for water contamination with other pathogens that are harmful, such as bacteria, viruses and protozoa. Indicator bacteria are carried to coastal waters in

a variety of ways. Bacteria typically enter coastal waters from sewage spills; overflows of sewage-treatment plants and sanitary sewers; and storm water runoff from urban, suburban, and rural areas. An ideal indicator would be found only when disease-causing agents were present at densities that could cause problems. Since the coliform bacteria group (total, fecal, E. coli and enterococci) is found in the intestines and feces of warm-blooded animals, their presence indicates that pathogens from untreated or partially treated sewage or contaminated runoff may be present in water. Other advantages of using coliform bacteria group as indicator organisms include: (1) they are easily detected by simple laboratory methods; (2) they are not usually present in unpolluted waters; (3) their concentration in water can be correlated with the extent of contamination; and (4) they are safe to work with in the laboratory.

In 1967, USEPA recommended a fecal coliform water quality criterion for protection of human health. The criterion recommended that the maximum density of fecal coliform not exceed the geometric mean of 200 organisms per 100 milliliter (ml) in recreational waters. Again in 1986, USEPA issued more criteria for bathing (full body contact) in recreational waters based on E. coli and enterococci. In fresh waters, the geometric mean of bacterial densities should not exceed 126 per 100 ml for E. coli, **or** 33 per 100 ml for enterococci. For marine waters, the geometric mean of enterococci should not exceed 35 per 100 ml.

Table 2 presents the California Department of Health Services (DHS) bacterial standards for water-contact sports. The standards are for total coliform, fecal coliform, and enterococci for a single sample or for a 30-day log mean basis. Further, the ratio of total to fecal coliform should not exceed 10 ml when the total coliform density is more than 1,000 ml.

The current indicators are not very precise to assess human health impacts. Rather, these bacteria are produced by many types of animals, and they represent a range of potential risks of disease. For example, birds using wetland areas can excrete indicator bacteria in densities that would suggest a potential risk to human health. However, birds do not carry the same types of pathogens as people. The risk of illness to people is assumed to be lower when the indicator bacteria come from animals instead of humans. Further research is needed in this area.

Beach Mile-Day (BMD)

The BMD is a measure of beach availability for recreation per year. It is a product of the number of miles of coastline and 365 days (the number of days the beach may be available for recreation in California). For instance, if a county has 50 miles of open coast, bay, and harbor beaches, it has 18,250 BMDs available (50 X 365). However, if 15 miles of the beach are closed or posted for 10 days, then 150 BMDs are not available for recreation resulting in 0.8 percent beach impairment (150/18250 X 100). In other words, 99.2 percent of beach usage met the standards.

The BMD is a useful measure for comparing the health of beaches from year to year. The comparison is how much of the year's BMDs has been impaired in a particular county. It is a more meaningful measure of comparison than the number of incidences or the number of days of postings or closures.

Table 2. California Department of Health Services Bacterial Standards for Water-- Contact Sports		
Sample Type	**Bacteria**	**Standard**
		(Organism or Colony forming unit per 100 ml of water)
Single		
	Total Coliform	10,000
	Fecal Coliform	400
	Enterococci	104
	Total to fecal Coliform ratio (when total is 1,000)	10
30-day log mean		
	Total Coliform	1,000
	Fecal Coliform	200
	Enterococci	35

YEAR 2000 BEACH CLOSURE AND POSTING INFORMATION

The information presented in this report is derived from SWRCB's Beach Closure/Posted Warning Database which identifies the beach name and the extent of closures and posted warnings in miles (or yards). This database makes it possible to report beach postings and closures by BMDs. Detailed county reports on individual posted warnings, beach closures, and rain advisories for year 2000 are included in the Appendix of this report in geographical order of counties starting from the north of the State to the south. At the end of each individual county report, the total sum of the incidences of posted warnings/beach closures/rain advisories, days (duration), and BMDs are specified. Each time a portion of a beach was posted or closed, the event was counted as a day. The number of days of posted warnings or closures are mentioned to indicate the magnitude of the posting/closure events.

Beach Warning Postings

Table 3 presents the data on beach warnings posted during year 2000 from the City of Long Beach and 11 counties, ten of which (Sonoma, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) meet the reporting AB 411 requirement criteria as mentioned previously. San Francisco County also reported these data although the County is not required to do so pursuant to AB 411. The coastal counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda did not have a monitoring program since these counties do not have beaches that meet the AB 411 criteria. Mendocino County on the other hand reported no posting of beach warnings during year 2000. On a statewide basis, 1,285 beach warnings were posted lasting for a total of 8,133 days. This resulted in approximately 1,100 BMDs of posting. Los Angeles County had the maximum number of incidences (325), and San Diego County had the maximum number of days of postings (2,450). Orange County had the maximum number of BMDs posted (about 596). These three counties along with the County of Santa Barbara and the City of Long Beach accounted for over 85 percent of the posting data. The primary cause of the bacterial contamination leading to postings was either unknown or rainfall resulting in storm events.

Figure 2 shows that statewide the source of 35 percent of all BMDs with warnings posted was contamination carried to the beach through creeks/rivers, and 18 percent was through storm drains and urban runoff. The source was unknown for 42 percent of the BMDs with posted warnings.

Six counties (San Mateo, Santa Cruz, Ventura, Los Angeles, Orange, and San Diego) reported permanent beach postings at certain beaches (Table 4). The majority of these permanent postings are due to storm drains or creeks/rivermouths that enter the ocean. Some counties do not opt for permanent postings at beaches near storm drains if the drains are seasonal. Since there is no uniform reporting system of permanent beach postings among the counties, these data are not included in the beach posting data. SWRCB staff is working with county health staff to improve the reporting system for this category. This is the first time the permanent beach postings are presented in the Beach Closure Report.

As a precautionary measure, people should never swim or surf within 100 yards of any posted storm drain or creek/rivermouth.

Table 3. Beach Warnings Posted in California By County--2000				
County	**Number of Incidences**	**Number of Days**	**Beach Mile-Day Posted**	**Primary Cause(s)**
Del Norte	NM*			
Humboldt	NM			
Mendocino	NP**			
Sonoma	12	29	2.7	Rain, Unknown
Marin	NM			
San Francisco	13	31	49	Rain
Contra Costa	NM			
Alameda	NM			
San Mateo	17	387	21.5	Unknown
Santa Cruz	7	44	19.8	Unknown
Monterey	16	42	13.8	Unknown
San Luis Obispo	6	16	2.2	Rain
Santa Barbara	152	1,296	73.5	Rain, Unknown
Ventura	72	237	13.4	Unknown
Los Angeles	325	1,150	126.1	Unknown
Long Beach (City)	99	161	4.6	Unknown
Orange	290	2,055	595.8	Unknown
San Diego	274	2,450	168.9	Bacteria Levels Exceed Standards
TOTAL	1,283	7,898	1,091.3	

*** No monitoring**

**** No postings**

Figure 2. Sources of Contamination Resulting in Warnings Posted--2000
(Based on Beach Mile-Days)

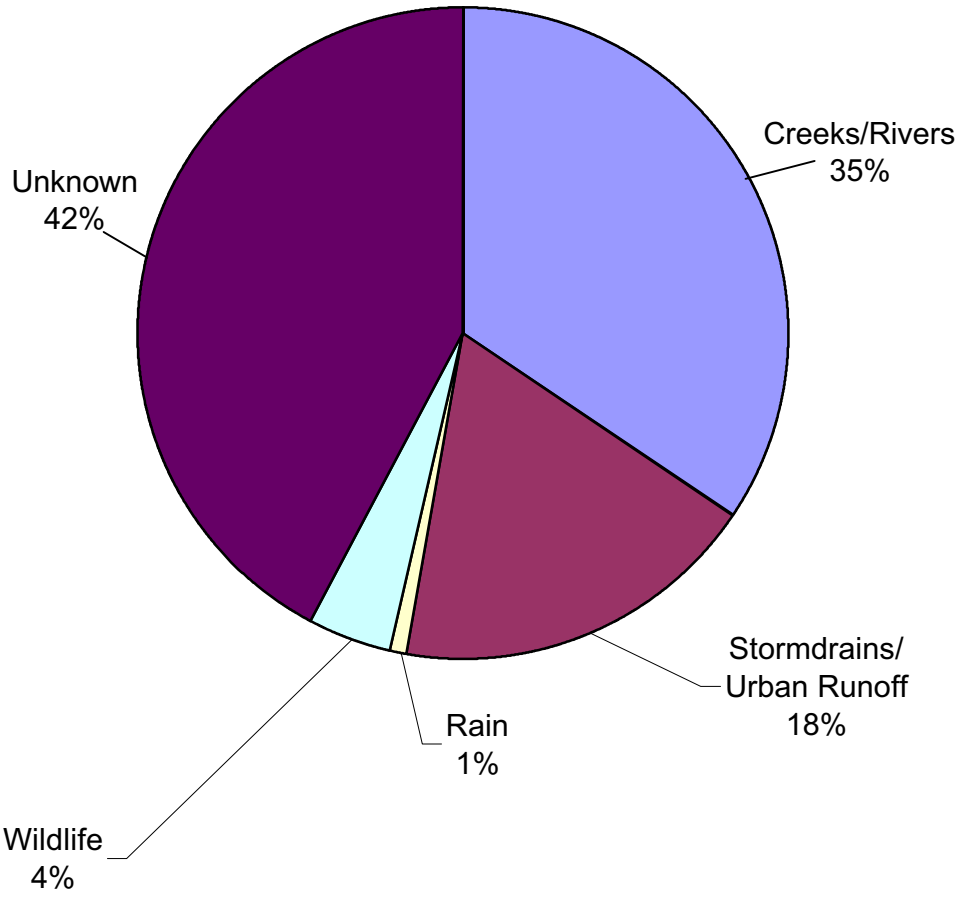

Table 4. Permanent Beach Postings By County--2000

County	Permanent Postings
San Mateo	Half Moon Bay @ San Pedro Creek
	Half Moon Bay @ San Vicinidi Creek
Santa Cruz	Monterey Bay @ San Lorenzo Rivermouth
	Twin Lakes Beach @ Schwan Lagoon
	Capitola Beach @ Soquel Creek
	Rio Del Marr Beach @ Aptos Creek
	Cowell Beach @ Neary Lagoon
Ventura	Rincon Parkway North
	Faria County Park
	Solimar Beach (Cypress Tree)
	Surfer's Point (Mouth of Ventura River)
	Promenade Park @ Figueroa St., Redwood Apts., Oak St., & California St.
	San Buenaventura State Beach @ Karlorama St.San Jon St.,Dover Lane, Weymouth Lane
	McGrath State Beach @ McGrath Lake Drain
	Oxnard State Beach @ Falkirk Ave
	Channel Islands Harbor Beach Park @ Kiddie Beach
	Ormond Beach @ Oxnard Industrial Drain
	Sycamore Cove Beach
	County Line Beach
Los Angeles	Santa Monica Canyon Creek
Orange	Dana Point Harbor @ North side of the East Basin at K-O Docks
	Newport Bay @ Harbor Marina, 33rd St. Channel, & 43rd St. Beach
	Sea Beach/Surfside @ San Gabriel River
	Huntington City Beach @ Storm Drains 1rst St., 7th St., 13th. St., and 23rd St.
	Huntington State Beach @ Talbert Channel and Santa Ana River
	Newport Beach @ Santa Ana River and Buck Gully
	Crystal Cove State Park @ Pelican Point Creek, Waterfall Creek, Los Trancos Creek, Muddy Creek, & El Moro Creek
	Emerald Bay @ Emerald Bay Drain
	Laguna Beach @ Broadway Creek
	Laguna Beach @ Storm Drains at Heisler Park, Cleo St., Bluebird Canyon, Dumond St., Lagunita/Blue Lagoon, South Coast Highway at Hospital, Thalia St., Oak St., Irvine Cove, Crescent Bay, Laguna Ave., Ocean Way, West St., & Table Rock Circle
	Aliso Beach @ Aliso Creek
	1000 Steps County Beach @ 1000 Steps Drain
	Monarch Beach @ Salt Creek
	Salt Creek Beach @ Dana Strand and Salt Creek Service Rd.
	Doheny State Beach Park @ North Beach and San Juan Creek
	Capistrano County Beach @ Capo Beach Storm Drain
	Poche Beach @ Poche Drain
	San Clemente City Beach @ Storm Drains at Pico, Lifeguard Headquarters, under pier, El Portal stairs, Mariposa Linda Lane, South Linda Lane, Trafalgar Canyon, La Ladrea, Riveria Beach, Salem Tressel, & Cypress Shores
San Diego	La Jolla Community Beach @ Casa Beach Children's Pool

Beach Closures

Table 5 presents the calendar year 2000 beach closure data from nine coastal counties. The Counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda had no monitoring programs. The counties of San Francisco, Santa Cruz, and Santa Barbara along with the City of Long Beach reported no beach closures. There was a total of 117 incidences of beach closures which lasted for 772 days statewide. Approximately 324 BMDs were closed in the State in 2000. San Diego County had the maximum number of closures reported--47 beach closures, 310 beach closure days, and 187 BMDs closed. This County accounted for over 40 percent of the total number of beach closure incidences and days and over 50 percent of BMDs closed statewide. The primary causes of the beach closures were sewer line overflow, breakage, and blockage.

Figure 3 shows that statewide creeks/rivers and sewer lines accounted for almost all the BMDs of closures. It should be noted that counties are not specific and consistent in their reporting of the sources and causes of beach closures. Some counties may report sewer lines as source of beach closures while others may report them as the cause of beach closures. In either case, problems with sewer lines, such as line breaks, blockages due to grease, roots, or rocks, and pump failure, have led to a significant number of beach closures.

Figure 4 shows the contribution of pollution sources when beach postings and closures are combined. Creeks/rivers account for 37 percent, sewer lines and storm drains/urban runoff account for 12 percent each, and the cause for beach posting or closure is unknown for a little over one-third of the cases (37 percent).

Rain Advisories

Six counties (Monterey, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) reported issuing a total of 129 rain advisories during year 2000 lasting for a total of 737 days (Table 6). Ventura County has the highest number of rain advisories (103) and the duration (571 days). This is a result of different reporting methods used by counties. Ventura County reported a separate rain advisory for each beach in the County, while the other counties reported the number of rain advisories that are issued for all beaches in the counties.

Data Evaluation

California beaches have the most stringent set of public health standards, and they are monitored more than anywhere in the nation. For these reasons, there are more beaches posted or closed in California than anywhere else. The year 2000 beach posting and closure data are not comparable with the year 1999 data set. Since the AB 411 regulations were not officially adopted until July 1999, the beach posting and closure data included in the SWRCB's year 1999 Beach Closure Report did not cover the entire testing period required by law. Consequently, there were only over 5,000 days of postings and closures during 1999 compared to over 8,000 days in year 2000. This should not be interpreted as a worsening trend in beach water quality. As the monitoring baseline is improved, the data will be comparable and will be able to demonstrate the trend.

Table 5. Beach Closures in California By County--2000				
County	**Number of Incidences**	**Number of Days**	**Beach Mile- Day Closed**	**Primary Cause(s)**
Del Norte	NM*			
Humboldt	NM			
Mendocino	1	15	2.6	Sewer Main Break
Sonoma	2	4	0.4	Unknown, Other
Marin	NM			
San Francisco	NC**			
Contra Costa	NM			
Alameda	NM			
San Mateo	9	217	41.9	Rain
Santa Cruz	NC			
Monterey	6	16	3.9	Line Break, Sewer Manhole Overflow
San Luis Obispo	1	1	0.1	Sewer Overflow at Residence
Santa Barbara	NM			
Ventura	4	12	0.7	Blockage
Los Angeles	7	45	33.6	Sewer Main Break, Blockage due to different sources
Long Beach (City)	NM			
Orange	40	152	53.4	Blockage due to different causes
San Diego	47	310	187	Sewage
TOTAL	117	772	323.6	

*** No monitoring**

**** No closures**

Figure 3. Sources of Contamination Resulting in Beach Closures--2000.
(Based on Beach Mile Days)

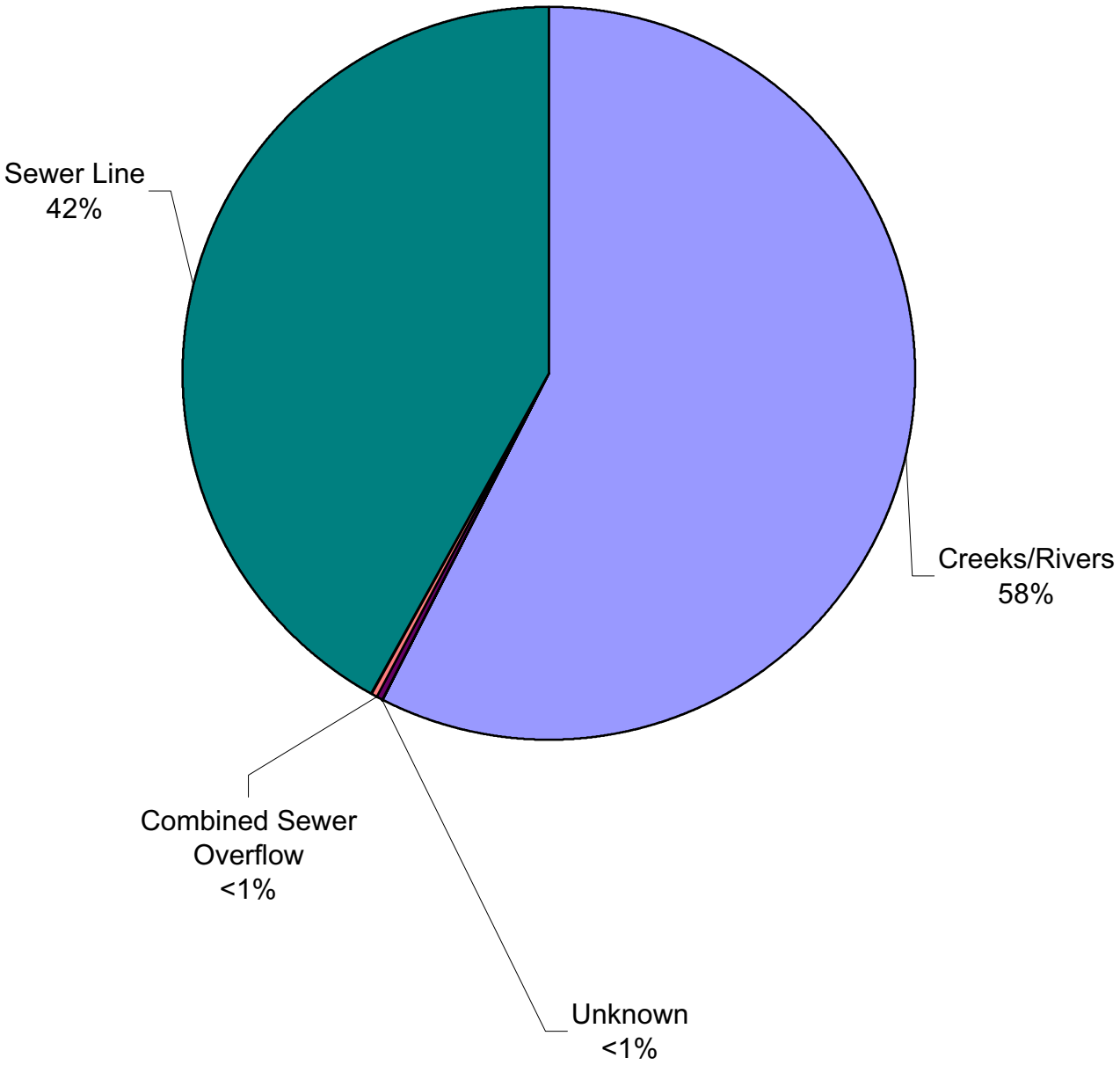

Figure 4. Sources of Contamination Resulting in Warnigs Posted and Closures Statewide--2000. (Based on Beach Mile Days)

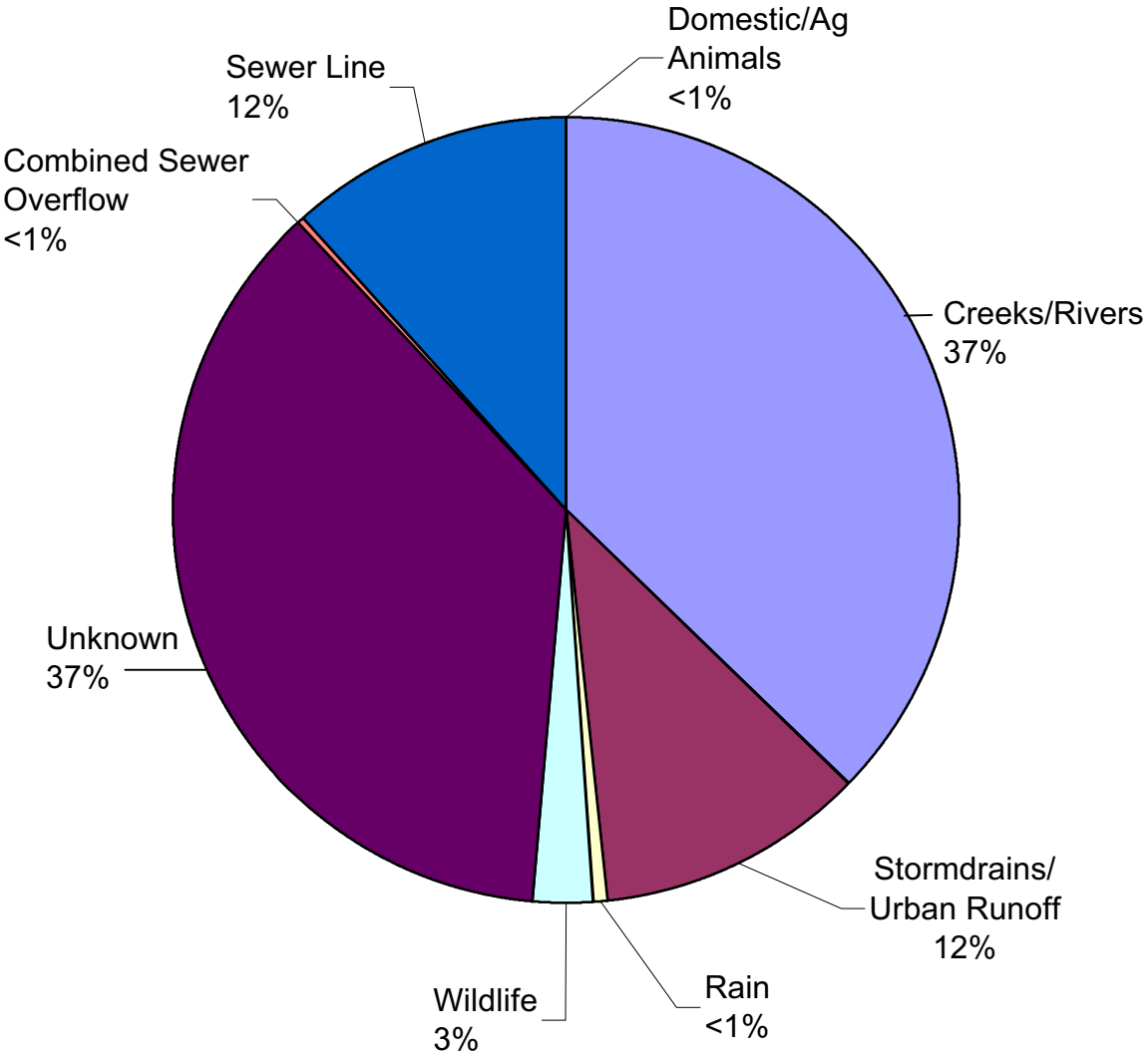

Table 6. Beach Rain Advisories by County--2000		
County	**Rain Advisories**	**Duration of Advisory (Days)**
Monterey	2	11
Santa Barbara	3	10
Ventura	103	571
Los Angeles	9	49
Orange	6	58
San Diego	6	38
TOTAL	129	737

According to the extensive research of Heal the Bay, an environmental advocacy group, the majority of California beaches are clean and safe during dry weather. Heal the Bay's 2000-2001 Beach Report Card evaluated 375 Southern California beaches from Point Conception in Santa Barbara County to the Mexican Border and assigned A-F grades based on daily and weekly bacterial pollution levels in the surf zone in correlation to the risk of adverse health effects to humans. Some of their findings are:

- Over 60 percent of southern California beaches (234 of 375) received an "A" grade during dry weather.
- Over 80 percent of open beaches (i.e., locations not within an enclosed bay, harbor, or marina and not impacted by a storm drain) received an "A" grade.
- Over 90 percent of the 21,100 beach sample days during dry weather met State bathing water standards for all bacterial indicators.

Heal the Bay's report documents the disparity in the beach water quality during the dry and wet seasons. Southern California beaches are impacted by rain events through untreated storm drain runoff, which carries bacteria, motor oil, animal wastes, pesticides, yard waste, and trash to the beaches. Close to 70 percent of monitored beaches received an "F" grade during inclement weather conditions as compared to a little over 11 percent during dry weather. The complete report can be accessed at Heal the Bay's website (http://www.healthebay.org).

In July 2000 the USEPA released the results of its third annual National Health Protection Survey of Beaches. State and local environmental and public health officials voluntarily returned information on 1,891 beaches. The survey showed that 459 beaches (24 percent of the reported beaches) were affected by at least one posting or closure. Complete results of this survey are available at the USEPA's Beaches Environmental Assessment, Closure and Health (BEACH) Watch website (http://www.epa.gov/OST/beaches).

It is difficult to conduct an inter-county comparison of beach posting and closure data even with the implementation of AB 411. The reason for this is that some counties have year round monitoring, which is not required by AB 411. Counties may have different sampling

locations with respect to storm drains. For instance, Los Angeles County has monitoring stations 50 yards from a flowing storm drain whereas San Diego County monitors at the point of discharge. In general, open ocean beaches are cleaner than beaches adjacent to storm drains and beaches located within enclosed bays which have poor water circulation.

It should be noted that beach posting and closure data collected under the requirement of AB 411 may not be an accurate measurement of beach water quality for the following reasons:

1. As mentioned earlier, the indicator bacteria may not be the right indicator of pathogens in shoreline waters.

2. The indicator bacteria assay takes 18 to 36 hours or longer to complete. During this time, the beachgoers may be exposed to harmful pathogens. By the time a beach is posted based on monitoring data, the indicator bacteria may not be present in the shoreline waters. Thus a beach may be open when it is contaminated and posted when it is clean. There is a need for rapid, simple, and inexpensive assays of beach water quality to mitigate this problem.

3. There are many sources of variablity in shoreline bacteria monitoring. According to research conducted by the Southern California Coastal Water Research Project, different laboratories reported different bacterial counts for the same sample (inter-laboratory variability). Water samples collected from very close locations in the surf zone had different bacterial counts (spatial variability). Further, water samples collected from the same location but at different times of the day had different bacterial counts (temporal variability).

However, with all these shortcomings, a monitoring program for indicator bacteria remains the best available choice for assessing beach water quality and making posting or closure decisions.

GOVERNOR'S CLEAN BEACH INITIATIVE AND SWRCB'S IMPLEMENTATION PLAN

In January 2001 Governor Gray Davis proposed a "Clean Beach Initiative" to combat the problem of contaminated ocean water and beach postings/closures. The initiative will enable State and local agencies to address this contamination, making California beaches safer and ensuring the economic vitality of coastal areas.

The proposed activities of the initiative include assistance to local agencies in areas that have chronic beach contamination problems and high beach usage, leveraging ongoing strong support from local communities. Measures to curb urban runoff include the diversion of dry weather flows from storm drains, construction of infiltration basins, catch basin inserts, as well as isolating controllable sources of pollution. Construction and restoration of wetlands should decrease the amount of pathogens reaching beaches. The initiative will also provide funding for research to develop rapid, inexpensive methods for detecting and analyzing bacteria and pathogens. This will result in timely beach postings or closures and also will assist in source identification which will allow regulators to more quickly track pollution sources and mitigate the problem.

One of the key projects in the SWRCB's 2001 draft Strategic Plan deals with the implementation of the Governor's Clean Beach Initiative. The SWRCB's Clean Beach Project will develop and implement a comprehensive plan incorporating a watershed approach and involving all SWRCB and RWQCB pertinent water quality programs. A detailed road map will be developed to coordinate the efforts of the SWRCB's regulatory and local assistance functions with the efforts of local, State and federal agencies. The project will have detailed specific actions and milestones. The goal of the project is to significantly and steadily decrease beach closures and postings over the next ten years. The SWRCB has designated a Clean Beaches Coordinator to oversee the development and implementation of the Clean Beach Project and to track and report its progress.

SWRCB staff has taken the lead in scheduling and organizing the meetings of the ad-hoc Beach Water Quality Workgroup. The Workgroup includes representatives from organizations responsible for the protection and reporting of beach water quality including SWRCB, coastal RWQCBs, county environmental health departments, DHS, California Coastal Commission, USEPA (Region 9), sewage treatment plants, Heal the Bay, and other environmental groups. The Workgroup provided valuable input to the SWRCB staff in the development of the beach water quality database. One of the objectives of the SWRCB's Clean Beach Project is to develop capability to share beach closure information through the geographical information system.

As part of the Governor's Clean Beach Initiative, funds will be made available for beach water quality improvement projects. A number of loans and grant programs, such as the SWRCB's Cleanup and Abatement Account (CAA), federal Clean Water Act Sections 205(j) and 319(h) allocations, and Propositions 12 and 13 resources will be tapped for this activity.

For instance, in July 2001, the SWRCB allocated approximately $1 million to the San Diego RWQCB from the CAA to fund the identification of the presence and source(s) of pathogenic viruses and bacteria in the recreational waters of Mission Bay and associated threats to human health.

On March 7, 2000, California voters passed Proposition 12 (Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act) and Proposition 13 (Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act). Proposition 12 provides funding to the State Coastal Conservancy for coastal protection programs. This includes an allocation of $25 million to the Santa Monica Bay Restoration Project to fund grants to public entities and nonprofit organizations to implement storm water and urban runoff pollution prevention programs, habitat restoration, and other priority activities specified in the Santa Monica Bay Restoration Plan.

Proposition 13 provides funding for coastal nonpoint source programs to improve water quality and environment of coastal waters, estuaries, bay and nearshore waters, and groundwater. Grants of up to $5 million per project are available for projects to improve water quality at public beaches and to make improvements for the purposes of ensuring that coastal waters adjacent to public beaches meet the State's indicator bacteria standards for water recreation; improvements to existing sewer collection systems and septic systems for restoration and protection of coastal water quality; storm water and runoff pollution reduction and prevention programs for restoration and protection of coastal water quality; and comprehensive capability for monitoring, collecting and analyzing ambient water quality, including maintenance technology that can be entered into a statewide information base with standardized protocols;, and sampling, collection, storage and retrieval procedures.

SWRCB will also apply for federal funding that became available this year exclusively for beaches pursuant to the Beaches Environmental and Coastal Health (BEACH) Act of 2000 (Public Law 106-284, October 10, 2000). During this first year, $2 million in development grants will be made available to coastal and Great Lakes states to improve monitoring and public notification of human health risks at beaches. It is anticipated that in the future this grant program will have a full authorization of $30 million per year to fund states' clean beach implementation programs.

SWRCB staff has been actively working on other beach related projects. In January 2001, staff submitted a report to the Legislature on a comprehensive coastal water quality monitoring program pursuant to AB 1429 (Chapter 899, Statutes of 1997). Staff is working with the University of California to develop protocols for use in source investigations of storm drains that produce chronic exceedences of bacterial standards in adjacent beach waters, cost to implement these investigations, and a timeline for completion. A report of this information will be submitted to the Legislature by December 1, 2001 as required by Water Code Section 13178.

APPENDIX

County Closure, Posted Warnings, and Rain Advisory Reports
In Geographical Order from North to South

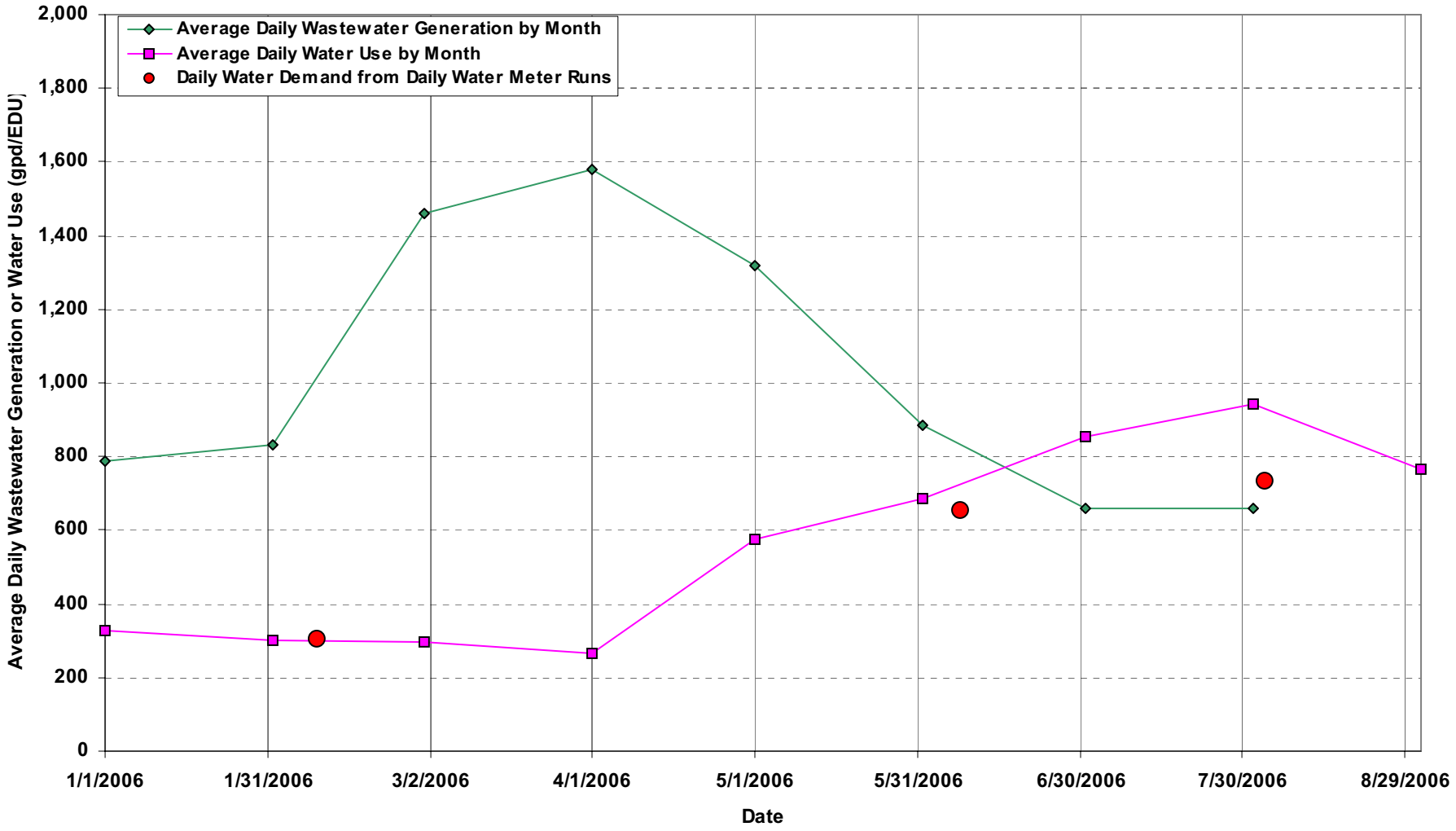

Figure 4
Average Daily Water and Wastewater Rates Per EDU Per Month – Basin 4

California Regional Water Quality Control Board
Central Valley Region

26 January 2006

ITEM: 3

SUBJECT: Executive Officer's Report

DISCUSSION:

1. NEW YEAR'S STORM

Heavy rainfall hit central California over the New Year's holiday weekend. Record rainfalls fell at many locations. Sustained periods of heavy rainfall generally cause problems for wastewater collection and treatment facilities, and this series of storms was no exception. Such problems include:

Stormwater, particularly from flooded streets and homes, can flow into the sewers causing local overloading of the sewer pipes and overflow of sewage from the collection system. This type of discharge generally subsides quickly after the rain stops and flooding ebbs.

High sewage flows entering a treatment plant can disrupt the treatment process, can hydraulically overwhelm the plant causing the bypass of partially or untreated sewage around the treatment system, and can sometimes physically damage the treatment plant. Damage to the sewage treatment facilities is more serious because it may take days or weeks to get the treatment plant fully operational, during which time discharged wastewater may not be adequately treated.

Flood waters can directly inundate treatment plants, pump stations and other infrastructure. Flood waters can also keep treatment plant and maintenance staffs from reaching equipment needing attention. Erosion can damage collection and treatment facilities. Power outages are common during storms, and backup power is not always available or functioning.

Dischargers experiencing compliance problems, particularly spills of raw sewage, are required to notify Board staff within 24 hours of knowledge of the problem and submit a written report generally within 5 days. Large spills are also reported to the State Office of Emergency Services. Not all dischargers report promptly, sometimes forgetting the need to report, and sometimes they are just too busy dealing with an emergency to call. Waste Discharge Requirements mandate that dischargers minimize the extent and severity of any violations, and collect monitoring data to assess the impact of the spills.

Regional Board staff is heavily involved in response to storm problems. Several staff are 24-hour contacts for the Office of Emergency Services and received numerous calls at home over the weekend. Staff contacts dischargers to assess problems, assure that reasonable steps to correct and contain the problems are being taken, and verify appropriate notification of potentially impacted downstream parties. Following the immediate crisis, staff contacts dischargers we have not heard from, continues telephone and field contact to followup on known problems, and begins documenting and prioritizing problems for possible enforcement. If there are severe water quality or public health problems that are not being dealt with, the Executive Officer can quickly issue a Cleanup and Abatement Order to responsible parties. That has not been needed as of this writing. Evaluation of each discharge will be conducted, including review of the written reports submitted by the dischargers, to determine whether: no regulatory action is needed: further information must be submitted (pursuant to California Water Code Section 13267); minor operational or physical improvements are needed (generally dealt with using Notices of Violation); major, long-term corrective action is needed (generally handled with a Cease and Desist Order, Cleanup and Abatement Orders, and Time Schedule Orders); or Administrative Civil Liability Complaints should be issued. Evaluation and enforcement followup from these storms will continue for several months.

The following is a list of currently known problems organized by county. The list is not complete as staff is still contacting dischargers and the list is growing. As of this writing (5 January) staff's priority is identifying and responding to significant ongoing discharges. We anticipate having a more complete listing of storm-related problems available by the Board meeting.

ALPINE COUNTY

The Bear Valley Water District reported that excessive rain on the snow pack flooded the main sewage pump station for nearly 24-hours on 1/1/2006. Up to 200,000 gallons of raw sewage was released into Bloods Creek.

EL DORADO COUNTY:

El Dorado Irrigation District discharged greater than 4200 gallons of raw sewage into Deer Creek from an overflowing manhole.

El Dorado Irrigation District discharged 3.8 million gallons of blended wastewater and stormwater into Carson Creek from overwhelmed storage ponds from the El Dorado Hills Wastewater Treatment Plant.

El Dorado Irrigation District discharged greater than 10,800 gallons of raw sewage into Deer Creek in Cameron Park from a collection system manhole.

El Dorado Irrigation District discharged raw sewage from three lift stations, New York Creek, Alleghany Road and Malcolm Dixon Road into Deer Creek, Webber Creek and New York Creek. A threatened fourth lift station failure, at the Marina-1 pumping plant near Folsom Lake, was not confirmed.

The City of Placerville discharged an unknown volume of partially treated wastewater from their wastewater treatment plant to Hangtown Creek due to excessive flow. The discharge consisted of a mixture of tertiary and secondary disinfected wastewater from the outfall along with overflow from the primary clarifiers.

FRESNO COUNTY
Heavy rains and road landslides forced Southern California Edison to bypass tertiary treatment units and discharge 5000 gallons of secondary, undisinfected wastewater to Big Creek, a tributary to the San Joaquin River.

KERN COUNTY
Excessive infiltration and inflow at the City of Tehachapi WWTF caused overflow from the primary clarifier that was contained and pumped into a storage pond.

LAKE COUNTY
The City of Lakeport Municipal Sewer District No. 1, reported that on 12/31/06 approximately 500 gallons of untreated wastewater discharged from a sewer main at north main and 11th street in Lakeport into a drainage culvert that leads to Clear Lake. The City did not contact State OES.

The Clearlake Oaks County Water and Sanitation District reported a spill to OES on 12/31/05 of approximately 100 gallons of raw sewage from a pump station that surged due to a power failure. The wastewater entered a storm drain that leads to Clear Lake.

The Lake County Sanitation District, Southeast Wastewater Treatment Facility, notified OES of a spill on 12/31/05 of approximately 5,500 gallons of raw sewage from manholes located across from Burns Valley Road in Clearlake. The spill resulted from a sewer collector surcharge due to a pump station control failure. The wastewater drained into a flooded channel that leads to Clear Lake.

The Lake County Sanitation District, Southeast Wastewater Treatment Facility reported a second spill to OES on 12/31/05 of approximately 10,000 gallons of raw sewage from three manholes on Meadowbrook Drive and Bay Street in the Highlands Harbor subdivision in Clearlake. The wastewater drained into storm drains that lead to Clear Lake.

The Lake County Sanitation District, Northwest Wastewater Treatment Facility notified OES of a spill on 12/31/05 of approximately 5,000 gallons of raw sewage from two manholes and a floor drain in business located along Lakeshore Drive in Lakeport. The manhole overflows discharged into Clear Lake. The wastewater discharge from the floor drain was contained within the business bathroom.

Lake County reported on 1/1/06 a release of leachate from the Eastlake Landfill. Leachate was seeping from the active face of the landfill due to the heavy rainfall (reportedly 15 inches) in the area over the previous weekend. The County reported that a temporary pond was constructed to capture the leachate to prevent it from flowing offsite into Molesworth Creek, and that the leachate was being pumped from the temporary pond into the onsite Class II surface impoundment. The County reported that an unknown quantity of leachate had flowed offsite into the creek prior to the construction of the temporary pond. (WLB)

NEVADA COUNTY:
City of Grass Valley spilled approximately 1-million gallons of raw sewage from their wastewater treatment plant to Wolf Creek when their primary clarifiers overflowed.

The City of Nevada City discharged blended secondary and tertiary wastewater due to high water flows.

The Lake Wildwood wastewater treatment plant bypassed filtration of approximately 120,000 gallons of secondary quality effluent to Deer Creek.

The Lake Wildwood collection system discharged greater than 3,000 gallons of raw sewage into Little Deer Creek.

PLACER COUNTY:
Placer County Sewer Maintenance District No.3's sludge dry beds were inundated with stormwater and overflowed into Miners Ravine. The facility also bypassed filtration due to high stormwater flows, discharging secondary quality effluent.

Placer County Sewer Maintenance District No.1 bypassed primary treated, undisinfected wastewater due to flooding, followed by a blend of filtered and unfiltered wastewater during much of 12/31/05 to Rock Creek.

Placer County Sewer Maintenance District No.1 discharged raw sewage into surface waters when a lift station and 2 manholes overflowed.

The City of Auburn discharged an unknown volume of raw and partially treated sewage into Auburn Ravine when storage ponds were inundated and flood water volumes overwhelmed the treatment plant.

The City of Roseville discharged an undisclosed amount of raw sewage to Dry Creek from an overflowing manhole.

The City of Roseville discharged an unknown amount of raw sewage into Dry Creek when emergency storage ponds at the wastewater treatment plant were inundated with floodwater.

The Donner Summit wastewater treatment bypassed a blend of filtered and unfiltered wastewater for approximately 18 hours due to high flow rates.

Placer County's Applegate Wastewater Treatment Facility spilled approximately 1,000 gallons of raw sewage from two temporary storage tanks that are used to handle additional storage during the winter months. The spill was contained and did not enter surface waters.

SACRAMENTO COUNTY:
The City of Folsom spilled 1000 gallons of sewage from a manhole, but contained it and cleaned it up.

The City of Galt discharged sewage to a storm drain from a pump station failure.

The County Service District 1 (CSD-1) reported many sewage spills during the storms. An interceptor surcharged on Mira Del Rio Dr, and flooded 4 homes with a large quantity of raw sewage. CSD-1 also reported multiple manholes in the vicinity of Elk Grove-Florin and Tiogawoods Dr were discharging an unknown quantity of raw sewage. A large release was also reported from manholes on Florin-Perkins Road and Fruitridge Road into the storm drain and then Morrison Creek. CSD-1 also reported spills from various locations on Manger Way and Linda Creek Court in Citrus Heights to surface waters. A spill of unknown quantity of sewage was reported on Island View Way in Walnut Grove.

Sacramento Regional County Sanitation District (District) also reported several spills and releases. Due to a newly constructed interceptor being inundated with water from Laguna Creek, and plugs in the interceptor failing, the sewage treatment plant was inundated with excessive influent. Influent flows reached 550 million gallons per day (MGD), which exceeds the peak wet weather capacity by 200 MGD. The District discharged partially treated effluent to the river until repairs could be made.

The District also reported a break in a pipeline on-site that resulted in almost 1 million gallons of chlorinated secondary effluent (chlorine residual was 9.5 mg/L) being discharged to Laguna Creek.

The District also reported the release of 700,000 gallons of raw sewage near Kilgore Ave. in Rancho Cordova due to the failure of an interceptor plug at a construction site.

The City of Sacramento reported a 46,000-gallon raw sewage outflow on 10th Av. and a 1,500-gallon outflow on 35th Ave. and Park Way from the combined wastewater collection system due to excessive rain.

SHASTA COUNTY
City of Redding's Sewage Collection System and Clear Creek Wastewater Treatment Plant.On 3 January 2006, the City's Clear Creek Wastewater Treatment Plant began discharging partially treated wastewater to the Sacramento River at a rate of approximately 20 million gallons per day. The spilled wastewater was a combination of bypassed raw influent and bypass out of the primary clarifiers. The wastewater filled and traveled through a series of ten emergency storage ponds that collectively hold approximately 240 million gallons prior to overflowing to the river. At this time it is estimated that the bypass discharge will continue for a total of three to seven days, depending on additional rainfall intensity and patterns. Spills from the City's sewage collection system also occurred at several locations.

SIERRA COUNTY
The City of Loyalton experienced a discharge of secondary treated wastewater into Smithneck Creek that is expected to continue for approximately one week, and a raw sewage was discharge to Smithneck Creek as a result of a pump failure at the headworks. The Discharger is unable to estimate the volume of wastewater from either spill event.

SUTTER COUNTY:
Yuba City's wastewater ponds, located within the Feather River floodplain, were inundated with river water.

YUBA COUNTY
The City of Wheatland reported on 1/3/06 that the Bear River rose above the wastewater infiltration bed levees and spilled into the infiltration beds. The river level continued to rise until the wastewater infiltration beds were completely inundated. An estimated maximum of 270,000 gallons of wastewater, mixed with river water, flowed into the Bear River until the river levels dropped below the infiltration bed levees.

The City of Marysville reported on 12/31/05 that the Feather River had risen and flooded five of the wastewater percolation ponds. An unknown volume of wastewater, mixed with river water, flowed into the Feather River

ENFORCEMENT

2. Status Report On Humboldt Road Burn Dump
The responsible parties and counsel met with Regional Board staff and counsel to discuss the following issues: Regional Board Staff's direction from Board, Amendments to or revision of Cleanup and Abatement Orders, City's position regarding use of partially completed disposal cell, status of permitting efforts by property owners to assure remediation in 2006, and status of pending ACL Complaint and continuation of November hearing.

The Simmons and Drake parties have indicated they are cooperating to obtain necessary permits for cleanup in Summer 2006. The City of Chico representatives stated their position that the City is not a responsible party and does not intend to participate directly, but may contribute funds towards cleanup of Area 8. Staff discussed proposed revision of the 2003 Cleanup and Abatement Order and the acting Executive Officer is considering further action with respect to administrative civil liability.

3. Cleanup and Abatement Order, Markley Cove Resort, Napa County
On 6 December 2005, the Executive Officer issued a Cleanup and Abatement (C&A) Order to Markley Cove Resort, Inc. and the United States Department of Interior Bureau of Reclamation (Discharger). The C&A Order was issued as a result of wastewater being detected in Coleman Spring, which is on the hillside below the facility's percolation/evaporation ponds. Approximately 14,197 gallons of spring water containing wastewater was discharged into a surface water drainage leading to Lake Berryessa before the Discharger constructed a collection sump. The C&A Order requires the Discharger to continue collecting the water from the Coleman Spring and transporting it to the wastewater collection system. This activity must continue until a tracer dye test confirms that the wastewater ponds have been adequately sealed to prevent the discharge of wastewater to the spring. In addition, the Discharger is required to submit the following reports: (a) a report describing the visual inspection of the pipeline between the lift station and the wastewater ponds for signs of leaks, (b) a Pond Reconstruction Completion Report describing the repairs made to the wastewater ponds, (c) a Water Balance Report demonstrating whether or not the wastewater ponds contain adequate storage and disposal capacity to ensure full compliance with the WDRs, (d) a Dye Test Report describing the results of the dye test, and (e) quarterly progress reports describing the status of the pond reconstruction project. (GJC)

4. Anderson Landfill, Inc., Notice of Violation, Shasta County
On 22 December 2005, Redding staff issued an NOV to Anderson Landfill, Inc. (ALI) for discharges of waste to surface waters, failure to install erosion and sediment control structures, and failure to maintain containment and control facilities in accordance with Waste Discharge Requirements. Late season construction with inadequate erosion and sediment control structures resulted in waste and sediment discharges to surface waters during the month of December 2005. Additionally, storm water intrusion into the active waste disposal Unit at the site has resulted in flooding of the Unit's leachate collection and removal system sump area. ALI has historically submitted facility design plans late into the construction season resulting in construction activities occurring during the wet weather season. Additional enforcement including an ACL is being considered. (DPS)

5. Cleanup and Abatement Order, Circle Oaks County Water District, Napa County
On 16 December 2005, the Executive Officer issued a Cleanup and Abatement (C&A) Order to the Circle Oaks County Water District. The C&A Order sets forth a specific scope of work and enforceable time schedule for the Discharger to make the necessary repairs to the wastewater system and come into compliance with Waste Discharge Requirements, and to install groundwater monitoring wells. The C&A Order requires the Discharger to submit the following reports: (a) a Revenue Plan

that describes the costs associated with implementation of all tasks in the C&A Order, (b) a workplan describing methods that will be used to provide an assessment of those segments of the collection system known to exhibit significant inflow and infiltration (I/I), (c) a report that provides results of the survey to determine the thickness and volume of sludge in each of the ponds, (d) a Revised Sludge Management Plan that includes at a minimum a detailed program and schedule for periodic pond cleanout and disposal of biosolids removed during pond cleanout, (e) a Groundwater Monitoring Well Installation Report of Results, (f) an I/I Assessment Report, and (g) quarterly progress reports describing the completed work. (GJC)

6. Issuance of Administrative Civil Liability Complaint and Proposed Settlement Agreement, Mokelumne Rim Vineyards, San Joaquin County

On 1 November 2005 the Executive Officer issued an Administrative Civil Liability Compliant (ACLC) in the amount of $30,000 for Rodney and Gayla Schatz, Mokelumne Rim Vineyards for incomplete self-monitoring reports, violations of the Waste Discharge Requirements (WDRs), and incomplete or non-submitted technical reports required by the WDRs. The Discharger subsequently met with staff to discuss settling the ACLC, and provided information regarding its ability to pay the liability. The Executive Officer subsequently offered to agreed to settle the ACLC by payment of $20,000, while holding the remaining $10,000 in abeyance pending satisfactory submittal of technical reports that consist of: Groundwater Well Installation Report of Results (by 17 February 2006), Salinity Reduction Study (by 28 February 2006), Abbreviated Report of Waste Discharge (by 30 March 2006), and Background Groundwater Quality Study Report (by 30 March 2007). The Discharger has agreed to the terms of the Executive Officer's settlement agreement. (TRO)

7. Bonzi Landfill Owners to Pay Fine in Settlement of Water Pollution Violations

The Stanislaus County District Attorney's Office and the Regional Board's Executive Officer have reached a $1.95 million settlement with Ma-Ru Holding Company and Bonzi Sanitation Landfill for failure to comply with the permit and enforcement orders issued by the Regional Board.

The Bonzi Sanitation Landfill is on Hatch Road near Carpenter Road, and has been in operation since the late 1960's. The majority of the landfill is not constructed to today's standards, and a portion of the wastes are in contact with the shallow groundwater. The landfill has created a plume of groundwater pollution, which must be contained and treated through a groundwater extraction and treatment system. On 29 April 2005, the Regional Board issued a Cease and Desist Order (CDO) to the Bonzi Landfill for numerous violations of its Waste Discharge Requirements. Although the operator complied with a few aspects of the CDO, it did not comply with the majority of the requirements, as evidenced by the seven Notices of Violation that have been issued since the CDO was adopted.

In September 2005, the District Attorney and the Water Board began a joint enforcement action against the landfill. The District Attorney's complaint alleged that Bonzi has failed to comply with numerous requirements of the CDO, including failing to demonstrate that the groundwater detection and extraction system is adequate for site conditions and failing to post financial assurances for corrective action, closure, and post closure maintenance activities at the landfill. In addition, Bonzi has failed to provide a least one foot of interim soil cover on two of the landfill units and has allowed un-permitted waste to be deposited in the active unit. Of gravest concern to the neighbors living next to the landfill, Bonzi failed to operate the groundwater extraction and treatment system for at least one year, from March 2004 through March 2005.

The parties agreed to a Stipulated Judgment, which has now been filed with the Superior Court of Stanislaus County. Terms of the stipulated judgment include: Payment of $450,000 to the Stanislaus County District Attorney's Office and the State of California; payment of $1.4 million in penalties have been stayed contingent upon Bonzi's satisfactory completion of 21 studies and improvements to the landfill. These tasks must be completed by the timelines described in the judgment; and payment of $100,000 if Bonzi violates Penal Code Section 115 at any time in the next three years.

The stipulated judgment does not relieve the landfill owners and operators from the need to comply with all aspects of their Waste Discharge Requirements and the CDO, nor does it prohibit the Water Board from taking additional enforcement actions for items not addressed in the judgment. (WSW)

8. Lakeshore Resort, Fresno County

On 6 December a 13267 Order required Technical Reports from the owner/operator of Lakeshore Resort. The Lakeshore Resort is a restaurant and resort at Huntington Lake in Sierra National Forest with a package aeration plant, percolation pond, and leachfields. Violations include: unreported sewage spills potentially tributary to Huntington Lake, treatment bypass, inadequate containment capacity, and late and incomplete self-monitoring reports. The Order is requires technical reports describing corrective measures. (HA)

9. Morning Star Packing Company, Merced County

On 21 November, a NOV was issued to Morning Star Packing Company for discharging tomato processing wastewater to land not authorized by the WDRs, incomplete self-monitoring reports, and threatened conditions of pollution and nuisance. The NOV requires several technical reports describing corrections actions. (JKW)

10. Riverdale Public Utilities District, WWTF, Fresno County

In January a NOV was issued to Riverdale PUD for discharging sludge to an unlined pond, exceeding the daily maximum BOD5 effluent limit, and threatening nuisance and groundwater pollution. The NOV requires several technical reports describing correction actions. (JKW)

11. City of Modesto, Sanitary Sewer Overflow, Stanislaus County

On 19 December 2005 the Executive Officer issued an Administrative Civil Liability Complaint (ACLC) in the amount of $152,000 to the City of Modesto in response to the October 2004 raw sewage overflow to Dry Creek in Stanislaus County. The approximately 1.2 million-gallon sewage overflow resulted from a dislodged pressure plate on a section of the force main sewer line that runs from a lift station under Dry Creek. The cause of this sewer overflow was originally reported as a suspected act of vandalism, and referred to the Modesto Police Department. Subsequent investigations concluded that bolts that retained the pressure plate failed as a result of corrosion fatigue. The City has until 18 January 2006 to decide whether to pay the civil liability and waive a hearing before the Regional Water Board, or to contest the ACLC and proceed to a hearing. (JME)

12. Cleanup and Abatement Order Issued to AmeriPride Services, Inc., 4620 Wilbur Way, Sacramento, Sacramento County

A 1,800-foot long and 200-foot deep PCE plume emanates from the AmeriPride property on Wilbur Way. Prior to 1982, an industrial dry cleaning facility polluted the soil and groundwater beneath the AmeriPride site. AmeriPride purchased the property in 1983 and though it did not operate a dry cleaning operation, it is a responsible party for cleanup of the polluted soil and groundwater. On 25 April 2003, Regional Board staff issued a Cleanup and Abatement Order (CAO) to AmeriPride and previous owners which required cleanup of the polluted soil and groundwater, and replacement water supply for three water supply wells which were closed due to PCE pollution. One well adjacent to the AmeriPride site is owned by California-American Water Supply (Cal-Am), and two wells in the toe of the plume are owned by Huhtamaki. In August 2003, AmeriPride began soil vapor extraction beneath the facility and, in December 2005, began groundwater extraction and treatment in the source area below and immediately downgradient of its site. However, AmeriPride did not believe it was responsible for replacing water supply lost to Cal-Am or Huhtamaki, nor for cleaning up the entire plume.

Over the last two years, AmeriPride petitioned State Board and the Superior Court of California challenging the 2003 CAO. State Board denied the petition. On 2 November 2005, Regional Board staff met with AmeriPride representatives in mediation to discuss noncompliance with the existing CAO. In this meeting, the two parties agreed: 1) to several actions and dates that Regional Board staff would include in a revised CAO; 2) that AmeriPride would withdraw its petition to the Superior Court, which it did following the mediation meeting; and 3) that AmeriPride would not challenge the new CAO. In September 2005, in a separate lawsuit, AmeriPride settled with Cal-Am and agreed to pay Cal-Am $2,000,000 for water supply replacement.

On 21 December 2005, the Water Board issued a new CAO that requires AmeriPride to provide in-kind replacement water for the industrial and drinking water supply lost to the Huhtamaki facility, and to properly abandon the polluted supply wells. The CAO also requires cleanup of the entire PCE plume. By September 2006, AmeriPride is required to have replaced the water supply for Huhtamaki and provide a work plan for remediating the entire plume. By January 2007, AmeriPride is required to start up an extraction and treatment system to capture and clean up the toe of the plume.

13. Cleanup and Abatement Order Issued to Bureau of Land Management for Mercury Mine Cleanups, Colusa County

A Cleanup and Abatement Order was issued to the Bureau of Land Management for two abandoned mercury mines located in Colusa County in December 2005. Water Quality objectives for mercury are exceeded during storm runoff events. C&A Order objectives require a 95% load reduction to Cache Creek and its tributaries. This load reduction is required to meet the TMDL requirements for Cache Creek and its tributaries. BLM mines are Rathburn and Rathburn-Petray, which are located in the Bear Creek watershed. The BLM was provided a draft Order but declined to comment. The Order requires BLM to submit a Work Plan By 1 March 2006 describing the methods that will be used to establish background levels of mercury in the soil and surface water at each mine site, and the means and methods for determining the vertical and lateral extent of waste piles, mining waste and soil and sediment contaminated with mercury at each mine site. The Work Plan must describe the sampling rationale that will be used, how runoff calculations will be determined, address the slope stability of each mine site and assess the need for slope design and slope stability measures. The Work Plan must also describe how the hydrogeologic regime at each mine site will be determined, and propose a surface water and ground water monitoring plan. The Work Plan shall also propose time schedules for implementation of the Site Evaluation and completion of an Engineering Evaluation/Cost Analysis to evaluate cleanup options. (CLC)

WASTE DISCHARGES TO LAND

14. E. & J. Gallo Winery Waste Characterization Efforts, Merced County

In 2004, a NOV was issued to E & J Gallo Winery (Gallo), Livingston Winery, in part, for degrading groundwater with salt. Gallo has been systematically evaluating its wine production process to identify and characterize high salinity waste streams and will propose processing improvements to reduce discharge salinity. In November, Gallo submitted a status report that describes

processing improvements it has implemented to improve discharge quality, such as replacing sodium-based cleaners with potassium-based cleaners, modifying sanitation activities, implementing water conservation, and improving equipment efficiency. (ARP)

15. Merced County Regulation of Onsite Systems

Recent staff letters that comment on several proposed rural subdivisions in Merced County reliant on onsite wastewater treatment systems (OWTS) indicated their potential to adversely impact groundwater quality for nitrate. In response, Merced County Department of Environmental Health proposed a model to determine the minimum lot size for OWTS-reliant development. After staff indicated the model was insufficiently conservative to preclude groundwater pollution for nitrate, the County modified the approach to require all major OWTS-reliant subdivisions to install systems capable of reducing total nitrogen to 10 mg/L, and to form "zones of benefit" for the operation and maintenance of the new OWTSs. (JLK)

TMDLs

16. Pesticide TMDL CEQA Scoping Meetings and Public Workshops

CEQA scoping meetings and public workshops on a Central Valley Pesticide TMDL and Basin Plan amendment currently under development will be held on 2 February 2006 in Modesto, on 8 February 2006 in Chico and on 9 February 2006 in Rancho Cordova. The TMDL and Basin Plan amendment are being designed to establish water quality objectives and a program of implementation for pesticides that are impacting or could potentially impact aquatic life uses in surface waters and benthic sediments. The public announcement for the meeting is available online at: hhtp://www.waterboards.ca.gov/centralvalley/programs/tmdl/pest-basinplan-amend/ceqa-public-notice-att-1.pdf

LAND DISPOSAL

17. Empire Mine State Historic Park, Nevada County

Regional Board staff in the NPDES, Storm Water, and Land Disposal Programs are coordinating with staff at DTSC to oversee environmental remedies at the Empire Mine State Historic Park in Grass Valley. Deltakeeper sued the Department of Parks and Recreation for storm water and tunnel discharges without NPDES permits. The Park is the site of one of the oldest, largest, and richest gold mines in California. The park contains many of the mine's buildings, the owner's home and restored gardens, as well as the entrance to 367 miles of abandoned and flooded underground mine workings. The park covers over 800 acres, including forested backcountry and eight miles of trails.

The park's environmental issues are associated with wastes from the historic mining and milling operations that contain arsenic minerals and metals. Areas of concern include a large tailings impoundment and a drain tunnel discharge. Controlling dust exposure for trail users and storm water pollution from the tailing impoundment is a major focus of the current effort. Park staff and others are investigating the drain tunnel and possible remedies for the discharge that is tributary to Wolf Creek. (SER)

DAIRIES

18. Update on Dairy Industry Response to Board Request for Reports of Waste Discharge

The November 2005 Executive Officer's Report included an item which summarized the dairy industry's response to staff's 8 August 2005 request that all owners and operators of existing milk cow dairies submit a Report of Waste Discharge (RWD). Staff has continued to process the RWDs received and follow up with dairies that did not submit a RWD by the 17 October 2005 deadline. The table below is an updated summary of RWDs received and shows that 98 % of the existing dairies in the Region have submitted a RWD as of early January 2006. Staff will continue to follow up with those dairies that have not submitted a RWD. (PAL, CMH, DAS)

Regional Board Office	County	Number RWDs Requested	Number RWDs Received	% RWDs Submitted
Fresno	Tulare	305	304	100
	Kings	152	151	99
	Fresno	110	110	100
	Kern	53	52	98
	Madera	48	48	100
Sacramento	Merced	318	305	96
	Stanislaus	293	283	97
	San Joaquin	138	138	100
	Glenn	51	50	98
	Sacramento	45	45	100

	Solano	4	4	100
	Yuba	4	4	100
	Yolo	3	3	100
	Placer	1	1	100
	Sutter	1	1	100
Redding	Tehama	16	22	138
	Butte	6	2	33
	Shasta	2	1	50

CEQA REPORTING

19. Riverside Motorsports Park Draft Environmental Impact Report, Merced County

In December staff commented on the draft EIR for the Riverside Motorsports Park, a proposed 1,180 acre regional recreation facility near the City of Atwater that features motorsport venues (e.g., NASCAR speedway with permanent seating for 50,000). The project's water supply would be provided by Merced County, and its sewage would be treated by an onsite wastewater treatment facility, with effluent disposal by percolation and recycling on project landscaped areas. The draft EIR lacked sufficient technical information to support its determination that the project will not significantly impact groundwater. Staff recommended the project connect to the City of Atwater municipal sewer, and indicated that if the project's report of waste discharge did not provide sufficient information to justify the discharge as consistent with Regional Board plans and policies, a discharge prohibition may result. (ARP)

20. Old Sugar Mill Specific Plan, Draft Environmental Impact Report, Yolo County

On 19 December 2005, staff provided comments to the revised DEIR for the Old Sugar Mill Specific Plan. The proposed project consists of converting a former sugar mill to a wide range of commercial and industrial uses, and constructing residences on other parts of a 106-acre site in Clarksburg, a town directly adjacent to the Sacramento River. The project would include a domestic wastewater treatment facility (WWTF) to serve the development. While the domestic WWTF would be owned and operated by a County Services Agency (CSA) to be formed by Yolo County, management of industrial wastewater would be the responsibility of the individual business owners. Staff's comments expressed concern that: industrial uses allowed are not compatible with the proposed wastewater management plan because no land is designated for disposal of industrial wastewater. Staff recommended that the project include either a POTW designed to accommodate all domestic and industrial wastewater from the proposed development, or connection to the Sacramento Regional Wastewater Treatment Plant (SRWTP). The DEIR appears to rule out connection SRWTP based on capital costs alone. Staff recommended that this alternative be more fully explored in light of the Basin Plan's preference for regionalization versus multiple small treatment plants. Groundwater at the project site is very shallow and subject to major changes due to high river levels, which the DEIR acknowledged could cause failure of the proposed subsurface effluent disposal system. Finally, staff recommended that the CSA be formed prior to submittal of the Report of Waste Discharge to ensure that the CSA is a full, decision-making participant in the system design and WDR permitting process. (ALO)

21. Borden Ranch Surface Mine Rezone and Use Permit, Draft Environmental Impact Report, Sacramento County

On 21 December 2005, staff provided comments to the Draft EIR for the proposed Borden Ranch Surface Mine in southeastern Sacramento County. The proposed project would create a 330-acre gravel mine on agricultural land that is bounded by Dry Creek on the north and a tributary of Dry Creek on the south. The site is underlain by a shallow perched aquifer that drains into Dry Creek approximately one mile downstream of the site. Approximately fifteen feet of soil would be removed and sold as fill. Subsequent removal of approximately twenty feet of sand and gravel would expose the shallow water table, creating a 200-acre lake that would remain after site reclamation. Staff expressed concern about the following potentially significant impacts: The inadequate levees surrounding the site do not provide 100-year flood protection, and levee failure could result in major sediment discharges to Dry Creek and deposition of contaminated runoff into the groundwater exposed in the lake. Based on groundwater modeling, Dry Creek will lose approximately 1,700 acre-feet per year to the perched aquifer once mining is complete. A pond would be used to capture storm water runoff from the site, bringing storm water contaminants in very close proximity to the shallow water table. Sediments from upstream mining may have been deposited within the stream channels, and flooding may transport mercury-contaminated sediments into the lake. Sacramento County staff plans to revise and recirculate the DEIR. Staff recommended that additional site-specific technical studies be completed to better characterize the threat to water quality, and that additional mitigation measures be developed prevent those impacts. (ALO)

22. Baldwin Hallwood Mine Expansion, Draft Environmental Impact Report, Yuba County

On 12 December 2005, staff provided comments to the Draft EIR for the proposed Baldwin Hallwood Mine Expansion in Yuba County. The project would expand an existing sand and gravel mining operation by 200-acres. Staff expressed the following concerns: 1) Because the processing of material from the proposed project may cause significant changes to the Baldwin Hallwood aggregate processing operation and/or the discharge from it, revision of WDR Order No. 5-00-101 may be required to reflect those changes. 2) Although it has been reported that historical dredging has never been conducted on the project site,

the potential exists that other historical practices, such as the tilling of dredge waste fines into agricultural soils, could have introduced mercury at levels of concern onto the project site, and therefore it is necessary to determine whether mercury is present in the source material at levels that could adversely affect surface water, groundwater, or human health. 3) The existing aggregate processing facility must be evaluated to demonstrate whether it contains adequate treatment and storage capacity for the existing facility plus the expansion. 4) The nature of the hydraulic connection between the wastewater ponds, surface water and groundwater should be evaluated and the potential for any impact from the facility on surface water and groundwater identified. (MRL)

23. Notice of Preparation for Sacramento County GreenCycle Project, Sacramento County

On 3 January 2006, staff provided comments to the Sacramento County Department of Environmental Review and Assessment on a Notice of Preparation (NOP) for the proposed Sacramento GreenCycle project. The NOP stated that the County currently exports its green waste to facilities outside of the county, and identified four potential Sacramento County locations for this project that will compost green waste outdoors. Staff's stated that the County must submit a Report of Waste Discharge so the staff can prepare waste discharge requirements (WDRs). Staff also informed the County that draft general WDRs for discharges of green waste within the Central Valley Region will soon be distributed for review and comments, and that the notice will be sent to the County. Staff anticipates that the facility should be able to obtain coverage under the general WDRs, if and when they are adopted by the Board. (WLB)

GRANTS & FUNDING

24. Integrated Regional Water Management Grant Program Update

The Integrated Regional Water Management Grant Program has two components: a Planning grant and an Implementation grant.

The preliminary evaluation results for the Planning Grants were posted on the Department of Water Resources (DWR) and State Water Board websites on September 16th. The preliminary funding list was presented to the State Water Board during its 20 October 2005 meeting. For the Planning grants there is approximately $12 million available during this first funding cycle with a maximum funding limit per grant of $500,000. The DWR Director has not given final approval to the Integrated Regional Water Management Planning grant funding list at this time. If approved there will be up to 11 Planning grants awarded within Region 5 totaling approximately $5 million.

Step 1 Implementation Grant proposals have gone through technical reviews and senior level reviews and are now being reviewed at the management level. A total of 18 grant applications were submitted within Region 5 for a total funding amount requested of $64.6 million. Following the completion of the management level reviews, staff anticipates that DWR and State Board will be developing a preliminary Call Back List for the Step 2 full proposals in late-January 2006; at which time DWR and State Water Board will hold a public meeting to discuss the results of the Step 1 review effort. DWR and State Water Board are revising the Step 2 Proposal Solicitation Package (PSP) to address many of the concerns expressed during the public comment period and to address issues identified during the Step 1 review process. The Step 2 PSP will be released concurrently with the Call Back List. (PDB)

25. Dairy Water Quality Grant Program Update

This program provides grants for projects that reduce threats to, or impairment of, surface or ground waters from dairy operations. The Selection Panel was comprised of representatives from the following agencies: Regional Water Quality Control Boards; State Water Board; California Dairy Quality Assurance Program; US Environmental Protection Agency; Sacramento-Yolo Mosquito Vector Control District; and the California Bay-Delta Authority. The Selection Panel finalized the Recommended Projects List at a 16 December 2005, meeting. The Recommended Projects List will be presented to the State Water Board at its 4 January 2006 meeting. Applicants with projects on the Recommended Projects List will be offered funding in the priority order of the Recommended Projects List until all available funds are committed. There are three projects within Region 5 that may be funded for a total of $3,680,000. (PDB)

26. 2005-06 Consolidated Grants Program Update

The 2005-06 Consolidated Grants Program integrates and coordinates related grant programs for Watershed Protection, Water Management, Agricultural Water Quality, Drinking Water, Urban Storm Water, and Non-Point Source (NPS) Pollution Control. A total of approximately $142 million will be made available from eight interrelated grant programs administered by the State Water Board's Division of Financial Assistance.

Staff continues to work with the State Water Board's Division of Financial Assistance on the development of the 2005-06 Consolidated Grants Program. Staff are attending regular meetings and reviewing and providing comments on drafts of the concept proposal questionnaire, concept proposal review criteria, full proposal evaluation criteria, the grant program guidelines, and participated in testing of the online grant application system, Financial Assistance Application Submittal Tool (FAAST).

Draft Program Guidelines were posted for public comment until 5 December 2005. Following the public comment period the program guidelines will be presented at the 4 January 2006 State Water Board meeting for adoption. Once the program guidelines have been adopted, the State Water Board will announce the request for "Concept Proposals" in mid January 2006. A Concept Proposal workshop has been scheduled for 17 January 2006 in Sacramento at the CalEPA building. (PDB)

SPILLS NOT RELATED TO NEW YEAR'S STORMS

27. Notice of Violation for Wastewater Spill, City of Escalon, San Joaquin County

On 30 December 2005 a Notice of Violation (NOV) was issued to the City of Escalon for a 100,000-gallon wastewater spill. The cause of the wastewater spill was attributed to animals burrowing through a wastewater pond berm; the wastewater discharged to an adjacent almond orchard that had already been harvested. The wastewater percolated into the orchard soil. By 15 March 2006, the Discharger is required to submit a technical report describing the condition of all exterior berms and recommendations for improvements as needed to prevent future spills. Staff will then evaluate additional enforcement actions. (TRO)

28. Wastewater from UST Excavation Discharged Without Permit, Former USA Service Station #93, Shasta County

In December 2005, the Former USA Service Station #93 began UST removal and over excavation of petroleum contaminated soils. Although City of Redding staff had provisionally allowed USA to discharge of tank pit water into the sanitary sewer, heavy rains prompted the City to disallow further discharge. With insufficient aboveground storage tanks on-site to accommodate excavation dewatering, the Discharger requested Redding staff approve discharge to surface waters without a permit. Instead of obtaining the necessary permit or securing additional aboveground storage for the wastewater, on 28 December 2005, USA discharged up to 3,000 gallons of wastewater into Calaboose Creek, a tributary of the Sacramento River. Additional enforcement including an ACL is being considered. (EJR)

29. Multiple Raw Sewage Spills By Tuolumne Utilities District, Tuolumne County

The District reported multiple sewage spills for the last two months; one spill in November and two spills in December. The November spill occurred on the 9th from a collection line plugged by roots and debris; involved an estimated 400 to 500 gallons; and an unknown volume reached the nearby Sonora Creek. The District unplugged the line. Two December 5th spills occurred due to grease blockage, involved 75 gallons and 150 gallons, and were contained. The District removed the grease. The District has scheduled the line for camera, root treatment, and flushing. For all three spills, the District vacuumed the spills, disinfected the immediate area, and notified County Health. The District also sampled the creek near the spills after the first and third incident and results are pending. Regional Board staff is not considering enforcement actions at this time. (HA)

30. CDC Sierra Conservation WWTP Spills Wastewater, Tuolumne County

On 6 November, the California Department of Corrections (CDC) reported a disinfected secondary treated effluent spill of 66,000 gallons from a "tertiary filtration unit" at its WWTP southwest of Jamestown. The majority of the spill and was contained onsite. Staff requested more information on the measures CDC implemented to prevent any future similar spills. (HA)

SITE CLEANUP

31. Latest Remedial Activities at Iron Mountain Mine Significantly Reduce Metal Discharges to Sacramento River, Shasta County

The Slickrock Creek Retention Reservoir was designed to collect surface water contaminated with heavy metals from a large mineralized portion of Iron Mountain Mine and route the water to the treatment facilities at the base of the mine. The reservoir has been in operation for over a year and has resulted in an additional 50 percent reduction of copper and zinc discharged to Keswick Reservoir and the Sacramento River. The overall reduction of copper and zinc resulting from all remedial activities at Iron Mountain Mine are now greater than 95 % and 98 % respectively. Where copper concentrations in the discharge to Keswick Reservoir, prior to the Slickrock Creek Reservoir, had been over 400 ppm, the current maximum discharge is just above 200 ppm. Zinc has shown similar reductions; past discharges could exceed 1,000 ppm and are currently in the 500 to 600 ppm range. During the recent storm periods, the concentrations were even lower, often under 100 ppm for copper and under 300 ppm for zinc. This reduction has resulted in no increases in discharges from Shasta Dam for dilution purposes in order to meet the downstream water quality objectives below Keswick Reservoir. (PVW)

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Kenneth D. Landau
Acting Executive Officer
26 January 2006

Addenda that follow:

1. Personnel and Administration
2. Completed Site Cleanups (UST)
3. Public Outreach
4. Irrigated Lands Update
5. Waste Discharge Requirements Program Report

Attachments:

1. Summary Report
2. Line Item Report
3. Fund Report

Addendum 1

EXECUTIVE OFFICERS REPORT
PERSONNEL AND ADMINISTRATION
December 2005 – January 2006

PERSONNEL

Total Positions	Vacancies	Gained	Lost
258.3	42.5	2	4

Gains:

Dan Warner	SEA	Redding
Jeff Pyle	WRCE	Fresno

Separations:

Lisa Gymer	ES	Fresno
Ray Bruuns	WRCE	Redding

Internal Transfers:

Bryan Smith	SWRCE	Redding
George Day	SWRCE	Redding
Linda Bracamonte	RAII	Sacramento

Retirements:

Dennis Westcot	EPMI	Sacramento
Tom Pinkos	EO	Sacramento

RECRUITING

Recruiting is on-going for the positions that the State Water Resources Control Board has approved for filling. We are working with State Board to try and expand our candidate pools. Given the current economic environment within California our current pay scale is not very competitive.

TRAINING

Course Names	# of Attendees
Aquatic Ecological Assessment Workshop Part 2	2
CLE ESA and HCP Annual Conference	1
Defensive Drivers Training	2
Forum on Public Health on Fish Contamination	2
GIS Applications in Watershed Management Part 2	1
GIS Data Development and Integration	1
Hardware Troubleshooting A+	1
Hazwopper Refresher Training	4
Health and Safety Refresher Training	2
Introduction to Project Management-Pilot	1
Leading Change	4
Pesticide Regulatory Update	1
Sexual Harassment Prevention Training	4
Tahoe and Beyond: International Erosion Control	1
Technical Report Writing #625	5
Technical Writing- Being Clear and Concise	21
TMDL Program Management Training	1

Addendum 2

COMPLETED SITE CLEANUPS

No Further Action Required - Underground Storage Tanks (UST)
Following are sites where Board staff determined that investigation and remediation work may be discontinued and that no further action is required. Further, any residual hydrocarbons remaining do not pose a threat to human health and safety or anticipated future beneficial uses of water. This determination is based on site-specific information provided by the responsible party, and that the information provided was accurate and representative of site conditions. Article 11, Division 3, Chapter 16, Title 23 of the California Code of Regulations requires public notification when the Board determines that corrective actions have been completed and that no further action is required at a leaking underground storage tank site. This document serves to provide public notification.
For more information regarding a site, the appropriate office personnel should be contacted: Fresno (559) 445-5116, Redding (530) 224-4845, and Sacramento (916) 464-3291.

FRESNO OFFICE

Fresno County
Gas 4 Less, 3076 E. Gettysburg Ave. Fresno - In January 1998, three 12,000-gallon gasoline USTs and one 8,000-gallon diesel UST, associated dispensers, and product lines were excavated and removed from the site as part of a station remodeling project. Soil sampling conducted at the time of removal revealed a release of petroleum hydrocarbons occurred at the site and resulted in the degradation of the underlying soils. The extent of impacted soils was subsequently evaluated and the underlying groundwater was monitored for potential impacts. The impacted soils were remediated to the extent feasible and practical using SVE technology. The results of monitoring and sampling events conducted for the site reveal that the underlying groundwater has not been significantly impacted. The residual petroleum hydrocarbons in the underlying soils will naturally degrade and are not anticipated to pose a public health risk or pose a threat to the beneficial use of groundwater in the area. Closed 15 November 2005. (DAM).

Martens Chevrolet, 1760 11th Street, Reedley - Three gasoline USTs were removed from the site during June 1990. Soil beneath the USTs was found to contain relatively high concentrations of gasoline constituents. Subsequent investigation found that gasoline extended to groundwater, which ranged from 50 to 60 feet, and that groundwater was significantly impacted. Floating product was detected in one of the on-site monitoring wells. A municipal supply well is within a 250 feet of the release, however, impacted groundwater did not migrate offsite. Soil vapor extraction commenced during March 2001 and air sparging commenced during March 2004. Concentrations of gasoline in the extracted vapor were as high as 4700 parts per million but reduced to 15 parts per million by June 2005. Only low concentrations of gasoline and trace concentrations of VOCs were detected in groundwater from November 2004 through April 2005, and do not pose a threat to human health or beneficial uses of the groundwater. An estimated 57,000 pounds of gasoline were removed from the site. Residual gasoline concentrations will degrade with time and the site closed on 22 November 2005. (JWH)

Madera County
Pines Marina, 54250 Road 432, Bass Lake - Three gasoline USTs were removed during July 1999. Gasoline constituents were detected in soil. Groundwater monitoring wells were installed and groundwater was found to be impacted. The site is on the north shore of Bass Lake and the depth to water ranged from 12 to 21 feet. Soil vapor extraction was performed at the site during periods of lower groundwater elevations, December 2003 through March 2204; and again from December 2004 through January 2005. Sampling performed during March 2005 did not detect any gasoline constituents in groundwater. The remedial activities were successful and the site closed on 21 November 2005. (JWH).

Merced County
Santico Station, 5150 E. Broadway Ave., Atwater - Three USTs were removed in February 1990 and gasoline constituents were detected in one soil sample under one UST. Merced County referred the subject case to the Regional Board because of owner non-compliance. Following the 2003 sale of the property, the new owner established a business at the site and provided a report upon which our closure evaluation is based. A soil boring completed in March 2005 within a few feet of the original detection of gasoline constituents identified only traces of TPHg and MTBE. No groundwater was encountered and no groundwater monitoring wells were installed. There are no water supply wells on the property and the surrounding area is on a community water supply. The nearest community water supply well shows no detections of volatile organic compounds of concern. A relatively small mass of petroleum hydrocarbons was released and residual concentrations should attenuate with time. Closed on December 2005. (WWG)

REDDING OFFICE

Shasta County
Formerly Gary's Exxon, Pine Grove 76, Shasta Lake – In March 1996, the Central Valley Regional Water Quality Control Board became lead agency after Shasta County Division of Environmental Health found BTEX and fuel oxygenates in shallow groundwater during tank removals. However, pollutants have attenuated following related soil removal. Data indicate no potential threat to nearby Salt Creek or other receptors. (EJR)

Plumas County
Unocal Fuel Star, 106 Crescent Street, Quincy, – While the Plumas County Environmental Heath Department reported no threats to water quality, staff requested a preliminary site investigation due to the facility's proximity to the Norton Municipal Well, a water supply well with historical MtBE. Preliminary groundwater samples show dilute MtBE and BTEX, and no reasonable threat to the Norton Well. (EJR)

SACRAMENTO OFFICE

Placer County
705 A Street, Lincoln - A single 650-gallon underground storage tank, installed before 1938, was excavated and removed from the site on 12 December 2002. Although hydrocarbon concentrations were detected in the initial soil and groundwater investigation, subsequent quarterly groundwater monitoring indicates that only minor hydrocarbon concentration remain in groundwater beneath the site. No detectable concentrations of benzene or MTBE were ever detected in any of the site's seven groundwater monitoring wells, and only minor concentrations of TPH-D have been detected in groundwater during the last two quarterly sampling events. Furthermore, the closest sensitive receptor is located over 800 feet cross gradient, the residual mass is limited in its extent, and has not migrated any significant distance. Therefore, the remaining hydrocarbon mass is expected to attenuate without migrating any significant distance or posing a threat to human health or waters of the state. (PRS)

Sutter County
Harley Jarrel Property, 730 Kiley Street, Yuba City - The Harley Jarrell property in Yuba City, was formerly used as a county maintenance garage. In March 1998, one gasoline underground storage tank (UST) was removed from the site. Impacted groundwater and soil has been adequately defined and delineated, based upon data submittals and Regional Board staff evaluations of all data. Several quarters of monitoring have shown the plume to be stable, limited in extent, and declining. A letter of "No Further Action Required" for this site is appropriate and warranted. The letter was issued 12 December 2005. (BPK)

Local Agency UST Closures with Concurrence of Board Staff Review

San Joaquin County
Sunwest Liquors, 2449 W. Kettleman Lane, Lodi

Solano County
Rio Vista high School Bus Garage, 410 S. 7th Street, Rio Vista

Sacramento County
CalTrans Fruitridge Maint Station, 5521 34th Street, Sacramento
Former PDF Park and Gas, 1200 F Street, Sacramento
Arco Station #6168, 222 Jibboom Street, Sacramento
Former 76 Service Station # 7257, 5001 Madison Avenue, Sacramento

Local Agency UST Closures Independent of Board Staff Review

Merced County
Dan's Import Auto Service, 1790 Yosemite Parkway, Merced, Remedial Action Completion Certification letter dated 27 October 2005

Fresno County
Consolidated Freightways, 2737 S. East Ave., Fresno, Certification of Response Action issued 9 November 2005
Jura Farms, Inc., 5545 W. Dakota Ave., Fresno, Certification of Response Action issued 15 December 2005
Smith Tank Lines, 2999 S. Orange, Fresno, Certification of Response Action issued 15 December 2005

Addendum 3

PUBLIC OUTREACH

On 1 November, Karen Larsen and Holly Grover attended the Central Valley Drinking Water Policy Workgroup meeting. The group discussed comments on the draft organic carbon conceptual model and development of the water quality monitoring plan.

On 7, 8 and 9 November Lori Webber and Holly Grover attended the Third Biennial Non-point Source Conference in Sacramento. The theme of the conference was "Measuring Water Quality Improvements". The oral and poster presentations focused on efforts to control non-point sources of pollution from agriculture and urban sources, among others.

On November 7, Dan Little met with the Project Oversight Committee of the Laguna Creek Watershed Grant Project (Prop 50 Watershed Program). Topics on the agenda included watershed assessment updates regarding the Watershed Assessment Plan and Stakeholder Input, public outreach, education updates for the primary and secondary school programs, and a preview of the new website which has since been officially launched.

On 14 November, Karen Larsen attended a public meeting on the decline of pelagic organisms in the Sacramento-San Joaquin Delta. Presenters summarized studies completed in 2005 and the development of work plans for 2006. Among the participants was a scientific review panel charged with providing input to investigators regarding 2005 conclusions and 2006 studies.

On 17 November and 9 December, Anne Olson participated in two industry outreach meetings hosted by CMAC. The purpose of the meetings, which were held in Fresno and Redding, was to inform CMAC members about proper management of concrete wash water at ready mix concrete plants and the planned General WDRs. (ALO/MRL)

On 21 November, Karen Larsen met with City of Sacramento Utilities Department staff to brief them on the development of the Central Valley Drinking Water Policy.

On 6 December, Betty Yee attended a meeting of the recently formed Sacramento-San Joaquin Delta Chapter of the California Clean Boating Network. The focus of the meeting was on abandoned vessels and the legislation and programs to address this issue.

On 7 December, Wendy Wyels, Mark List, and Anne Olson attended the third of several planned working group meetings with members of the Construction Materials Association of California (CMAC). CMAC previously requested that staff delay the Regional Board's consideration of the General Waste Discharge Requirements (WDRs) for temporary storage and/or recycling of concrete wash water. In the interim, CMAC has conducted industry outreach meetings, and plans to perform additional concrete wash water characterization, complete bench scale and pilot testing to assess the effectiveness of concrete admixtures and sealants to minimize seepage from concrete sumps, and develop standardized plans and specifications for such sumps. The culmination of these efforts will be revision of the tentative General Order, which staff plans to present to the Regional Board for its consideration in 2006.

On 13 December, Michelle Wood and Patrick Morris attended a meeting of the Delta Tributaries Mercury Council. Michelle presented information on the Delta methylmercury TMDL and staff's proposals for a control program.

On 15 December, Michelle Wood, Chris Foe, and Melanie Medina-Metzger attended a meeting at the Delta Protection Commission to discuss the Delta methylmercury TMDL. Michelle presented the TMDL information and staff's proposals for a control program. Staff is planning to present the Delta methylmercury control program to various stakeholder groups that may be affected by a methylmercury Basin Plan amendment.

On 16 December, Gail Cismowski attended the regular monthly meeting of the Grassland Basin Drainers Steering Committee in Los Banos. This group is responsible for operating the Grassland Bypass Project.

On 16 December, Betty Yee attended a meeting of the Watershed Subcommittee of the California Bay Delta Authority to continue discussion of the structure of a statewide watershed program.

On 16 December, Karen Larsen and Holly Grover attended the Central Valley Drinking Water Policy Workgroup meeting. The group discussed augmenting the Department of Water Resources delta and upstream tributary volumetric and water quality modeling and the schedule for developing policy alternatives.

Addendum 4

Irrigated Lands Conditional Waiver Program
EO Report January 2006

Status of Conditional Waivers
At the 28 November 2005 Central Valley Water Board meeting, staff presented a tentative Irrigated Lands Conditional Waiver Orders (2005 Tentative Orders) for consideration of adoption, proposed to become effective on 1 January 2006. The Central Valley Water Board did not adopt the 2005 Tentative Orders but voted to extend Resolution No. R5-2003-0105 by six months beyond the expiration date of 31 December 2005 and directed staff to continue to collaborate with stakeholders to address major issues associated with the following proposed waiver conditions:

- Coalition Group Water Quality Plan Submittal,
- Coalition Group Membership Lists Submittal,
- Monitoring and Reporting Program (MRP) Order Revisions, and
- "Triggers for Monitoring Follow-up Requirements (Table 1 of Attachment A)

Staff is proposing to conduct professionally facilitated meetings with stakeholders within the first few months of 2006. The goal of these meetings is to discuss and potentially reach agreement on the major issues listed above. The Irrigated Lands Program Technical Issues Committee (TIC) will discuss the technical issues associated with the MRP Order revisions and provide recommended language. Staff will evaluate all TIC recommendations to confirm that they are reasonable, feasible, protective of water quality, and in compliance with State and federal law. The schedule for the TIC meetings is discussed later in this EO Report.

Staff proposes to circulate the tentative Conditional Waiver documents for public comment in April 2006 and provide a public workshop during the Central Valley Water Board's 4/5 May 2006 meeting. Staff will review and respond to comments received during the public comment period and the May 2006 workshop and revise the tentative documents as appropriate. The proposed revised Conditional Waiver package will then be placed on the Central Valley Water Board's 22/23 June 2006 meeting agenda for the Central Valley Water Board's consideration and adoption.

Monitoring and Reporting Program Revisions
On 6 December 2005, the TIC developed the schedule for discussions of topics relevant to the Tentative MRP Orders that some members believe warrant a review. The TIC will develop and provide recommendations to Central Valley Water Board staff for their consideration in revising the Tentative MRP Orders for Coalitions Groups, Individual Dischargers and Water Districts. Staff will incorporate TIC recommendations, as appropriate, and release draft MRP Orders for a 30-day public comment period. The revised orders will then be provided to the Central Valley Water Board Executive Officer (EO) for approval or included with the Conditional Waiver package and placed on the Central Valley Water Board's 22/23 June 2006 meeting agenda for consideration of approval.

Three proposed TIC meetings are scheduled on the following dates to provide information, discussion and potential technical recommendations on the following items:

24 January 2006:	Proposed "triggers" for follow-up monitoring requirements, resampling requirements, and compliance monitoring;
14 February 2006:	Reporting requirements, required follow-up procedures for exceedences to Basin Plan objectives, and phased and long-term monitoring strategies;
14 March 2006:	Summary of first two meetings, update of discharger MRP Plans and other reporting and administrative items.

TIC Focus groups will be meeting throughout this period to provide initial information and preliminary recommendations for further discussion and approval of recommendations at the TIC meetings.

De Minimis Conditional Waiver
Staff is drafting a De Minimis Conditional Waiver to address comments from rural counties, small growers and other parties who believe that their discharges from irrigated lands pose no, or insignificant, effects on water quality. This proposed De Minimis Conditional Waiver is intended to serve as an alternate regulatory option for dischargers who implement management practices for erosion control, nutrient management, irrigation management, and pesticide management to specifically protect surface water quality.

Potential dischargers who may be regulated by a De Minimis Conditional Waiver was the focus of numerous staff discussions with stakeholders during the last seven months. Proposed criteria for dischargers to qualify for a De Minimis Conditional Waiver may include, but not be limited to, owners and/or operators of irrigated lands that (1) do not discharge to surface water during the irrigation season, (2) show documented evidence (via a Farm Water Quality Plan) of implementing approved water quality management practices as specified in the State Water Board's Nonpoint Source Implementation and Enforcement Policy, and (3) do not apply pesticides that contain organophosphates, organochlorines, carbamates, or pyrethroids.

Staff has considered elements of the "Low-Risk Discharge Classification" of the Los Angeles Water Board's newly adopted Conditional Waiver for Dischargers from Irrigated Lands. Thus, the criteria in the proposed De Minimis Conditional Waiver may be similar to the criteria in the Los Angeles Region Low-Risk discharge classification.

In Spring 2006, staff proposes to hold additional stakeholder meetings, complete the draft De Minimis Conditional Waiver and corresponding Mitigated Negative Declaration documents, and circulate the tentative documents for public review. Upon completion of these tasks, staff will schedule an Information Item to discuss the proposed De Minimis Conditional Waiver with the Central Valley Water Board.

Environmental Impact Report
The contract with Jones and Stokes Associates (JSA) for an Irrigated Lands Program Programmatic Environmental Impact Report (EIR) includes the development of an Existing Conditions Report (ECR) to describe the existing regulatory setting, surface and groundwater conditions, and management practices within the Central Valley Region. The ECR will be used to develop a long-term water quality regulatory program (Long-Term Program) to address discharges of waste from irrigated agriculture within the Region.

Staff provided comments to JSA on the administrative draft ECR in November and December 2005. Staff tentatively plans to release the draft ECR for public review in January or February 2006, followed by stakeholder outreach meetings to explain and receive comments on the draft ECR.

After completion of the final ECR, JSA will begin development of the Long-Term Program, which also will be subject to stakeholder outreach meetings and public comments. Finally, program alternatives will be evaluated in an EIR.

Coalition Membership List Request
To assist Irrigated Lands Program staff with enforcement duties, on 26 August 2005 the EO issued a request for submittal of membership documents to nine coalition groups. The membership list submittal due date, per the EO's 15 September 2005 follow-up letter, was 1 November 2005. Four coalition groups submitted alternative information (or a detailed plan to provide alternative information) per their discussion with staff. These coalition groups include the Westside San Joaquin River Watershed Coalition, the East San Joaquin Water Quality Coalition, the San Joaquin County and Delta Water Quality Coalition, and the Sacramento Valley Water Quality Coalition (The Sacramento Valley Water Quality Coalition proposes submittal of membership information by 31 January 2006.)

The five remaining coalition groups did not submit membership information or an approvable plan for alternative information that addresses staff's enforcement needs. The Southern San Joaquin Valley Water Quality Coalition submitted a letter stating that the representatives will meet later with staff to further develop alternative information. This response was left open-ended with no proposed plan or schedule for submittal of information. The San Luis Water District Coalition and Westlands Water District Coalition submitted letters stating that they will not submit any information per the EO's request. The Goose Lake Coalition emailed Program staff a partial list of members (names only, no contact information) after the due date and followed up with a letter stating that they can not force

any growers in their district to provide anything more than voluntary information. Lastly, the Root Creek Water District Coalition submitted no response to the EO request. Staff will continue working to resolve pending issues surrounding the submittal of Coalition membership information be contacting these five coalitions to schedule further discussion.

Staff is concerned that the accountability of the Irrigated Lands Conditional Waiver Program is jeopardized by unresolved issues associated with the submittal of coalition group membership information, as demonstrated by the overall response to the EO's request for information. Therefore, staff continues to emphasize the need for firmer membership list submittal requirements as a Board-adopted condition of the proposed conditional waivers, tentatively scheduled for consideration of adoption in June 2006.

Phase II Monitoring Contract (Phase II) – UC Davis John Muir Institute and California Department of Fish & Game Laboratories
Sample collection for the Phase II study of water quality in agriculturally dominated waterways in the Central Valley Region is continuing through the final year of funding. The report that is scheduled for completion by December 2006 will include an assessment of monitoring data from two irrigation seasons (2004 and 2005), and from two storm seasons (2004/05 and 2005/06). Sample locations that have been utilized in the study include sites from within six Coalition boundaries, encompassing 16 different counties. Irrigation season sampling is conducted at two-week intervals, up to five times each. During storm sampling, sites were sampled up to three times a day during rain events. To date, 262 samples have been analyzed for water column toxicity from 60 locations. Sampling will continue during storm events in January and February of 2006.

Out of the 262 samples collected, four samples were marginally toxic to fathead minnow and 26 samples (10%) were significantly toxic to water flea. Toxicity to algae with significantly reduced growth was observed in about 30% of the samples from the 2004 irrigation season and 2004/2005 storm season. In contrast to that, only one sample from the 2005 irrigation season was toxic to algae.

Organophosphate pesticides were determined to be the primary cause of toxicity to water flea in 25 of the 26 samples. Eight organophosphate insecticides and two carbamate insecticides, alone or in combination, are implicated in virtually all the toxicity to water flea that has been observed in the study so far. These specific compounds are Chlorpyrifos, Diazinon, Dimethoate, Disulfoton, Malathion, Dichlorvos, Parathion-methyl, Azinphos-methyl, Methomyl and Carbaryl. Although the final report has not yet been prepared, results from the study thus far suggests that adequate control of this relatively small group of products would greatly reduce or possibly eliminate toxicity to the water flea test species in field samples.

The toxicity results for algae are more difficult to interpret, and further evaluation of the results is pending. One factor that complicates the evaluation process is that test samples often exhibit enhanced growth when compared to control samples. This could be the result of fertilizers and other nutrient products from agriculture. On the other end of the spectrum, measurements of reduced growth in algae test species indicate the presence of a herbicide, metal or other toxicant.

Ninety-four sites have been analyzed for sediment toxicity to date, including samples collected in summer of 2004, spring of 2005, and summer of 2005. Twenty percent of these resulted in significant toxicity. The information that has been developed thus far implicates the pyrethroids Esfenvalerate, Bifenthrin, lambda-Cyhalothrin, and Cypermethrin, as well as organophosphate Chlorpyrifos. Pyrethroids adhere strongly to particulate matter and are seldom detected in the water column.

The Phase II data assessment will be completed in June 2006, after 2005/2006 storm season sampling and analysis is completed. A final Phase II report is scheduled for completion by December 2006. Two status reports detailing the results of analyses were recently revised and will be posted on the Irrigated Lands website.

December 2005 Coalition Group Monitoring Reports
The August 2005 approval of Monitoring and Reporting Program Order No. R5-2005-0833 (Order) changed the monitoring report frequency requirements for all Coalition Groups, with the exception of the California Rice Commission. Reports had previously been required once per year and are now required two times per year. Irrigation season monitoring reports are to be submitted by 31 December and dormant season monitoring will be due

on 30 June of each year. Coalition groups had been fully advised of this change in reporting date prior to approval of the Order in August via the comment period of the Tentative Order, and through discussions at the PAC and TIC meetings. Additionally a letter was sent in mid-December to all Coalition Group representatives reminding them of the 31 December 2005 requirement.

As of 4 January 2006 monitoring reports were received from six of the ten approved Coalition groups. Two additional groups, Westlands Coalition and San Luis Water District, submitted written information indicating that they did not have any irrigation water runoff during irrigation season and monitoring was not conducted. The Southern San Joaquin Valley Water Quality Coalition and the Root Creek Water District Coalition have not submitted monitoring reports.

Review of the reports that have been received has begun, and staff will provide summary reports of the findings as soon as they are available. (DCM)

Waste Discharge Requirements Program
PROGRAM REPORT

Overview
The Waste Discharge Requirements (WDR) Program regulates all point source discharges of waste to land that do not require full containment (which falls under the Land Discharge Program), do not involve confined animal facilities, and involve no discharge of a pollutant to a surface water of the United States (which falls under the NPDES Program), but does include discharges to surface waters not subject to the NPDES Program. Each point of potential release of waste constituents, whether a feature for waste storage, treatment, disposal, or recycling, must be evaluated separately to determine under what program it must be regulated. Waste discharge requirements adopted under the WDR Program protect surface water by either proscribing discharge of a pollutant to waters of the U.S. or prescribing requirements for discharge to surface waters not waters of the U.S., and they protect groundwater by prescribing waste containment, treatment, and control requirements. Over 1200 discharges in this Region are regulated by orders adopted under the WDR Program.

Laws
A person discharging waste or proposing to discharge waste (other than into a community sewer system) that could affect the quality of waters of the State must file a report of waste discharge. Filing of a report of waste discharge requires a fee, standard forms, and supporting technical information. The Water Code allows up to 140 days to adopt waste discharge requirements for discharge once a filed report of waste discharge has been determined complete, and more time when CEQA documents must be prepared. The Water Code requires that all possible steps be undertaken to encourage water recycling and any person who proposes to produce or use recycled water must file a report and obtain water reclamation requirements or a master reclamation permit.

Each waste discharge requirements order contains conditions intended to ensure the discharge conforms to the Water Code. Multiple factors must be considered in determining reasonable conditions of discharge and the quality that should be maintained in groundwater, including the relevant water quality control plans and water quality objectives. Where a group of discharges are similar, use similar treatment, and occur under similar conditions, a general order containing waste discharge requirements for everyone within the group can be adopted. Compliance with requirements is monitored under authority to conduct investigations and require technical and monitoring reports.

Waste classification determines whether a waste discharge to land must be regulated under the WDR Program or Land Disposal Program (except for sewage, fertilizer, and radioactive material, which are always regulated under the WDR Program). Title 27, California Code of Regulations, section 20005, et seq., contains the regulations that establish the waste classification system. If any constituent in or derived from a waste requires that it be classified as designated waste, the waste must be fully contained unless it qualifies for exemption and regulation of the discharge falls under the Land Disposal Program. If a waste is not subject to Title 27, regulation of the discharge falls under the WDR Program.

Any authorization to discharge is a revocable privilege, use of waste assimilative capacity of groundwater can be limited, and waste discharge requirements may be reviewed and revised at any time. Orders containing discharge requirements have review periods of five, ten, and fifteen years to ensure they are effective in precluding unauthorized water degradation and nuisance, and waivers must be reviewed at least every five years and require renewal.

Laws governing the WDR Program include statewide plans and policies of the State Water Resources Control Board (State Water Board) and Regional Board plans and policies. The plans and policies of the State Water Board applied most frequently in the WDR Program are the "Antidegradation" Policy; the "Reclamation" Policy; the "Cleanup and Abatement" Policy; and the "Water Quality Enforcement Policy." The policies of the Central Valley Water Board are set forth in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition;* and the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition.*

Discharges Regulated Under the WDR Program
Sources: WDR Program discharges are the most diverse of the three core regulatory programs and include:

- Discharge of sewage from municipal treatment plants, private utility treatment plants, small private treatment plants and larger septic tank/ leachfield systems serving commercial, industrial, and residential developments.
- Production of recycled water from municipal sewage and the distribution and use of recycled water by various types of users.

- Treatment and discharge of domestic sewage sludge and biosolids.
- Discharge of processing wastewater from sand and gravel and other mining operations not involving navigable surface water and not subject to Title 27.
- Discharge of industrial wastewater from power plants, oilfield production, etc.
- Discharge of wastewater, waste residuals, treated sludge, and recycled water from food processing plants and operations (packing, cooling, peeling, dicing, fermenting, brining, canning, etc.) for milk, cheese, tomatoes, olives, wine, and many other fruits and vegetables, etc.
- Discharge of wastes from minor surface water dredging projects and all discharges in addition to dredging that occur to surface waters not waters of the United States.
- Discharge of wastes from water supply treatment plants.
- Discharge of treated water supplies for aquifer storage and recovery projects, and similar disposition of untreated water supplies and storm water used for groundwater replenishment and as water banking projects.
- Discharge of treated groundwater from remedial actions at leaking underground tank and other spill sites.

Irrigated Lands. As discharges of runoff from irrigated lands are exempt from the NPDES Program, they are subject to WDR Program requirements. In 2002, a separate Irrigated Lands Program was created with funding taken from the WDR Program. In Fall 2005, some of these positions were restored to the WDR Program but continue to work on irrigated land discharges.

Discharge Methods. Incidental release occurs from collection systems, sumps, treatment units, and surface impoundments (evaporation ponds) of varying construction and integrity, and from surface applications and impoundments of recycled water. Intentional discharge occurs from disposal ponds, seepage pits, leachfields, from spreading or spraying onto the land surface, and direct injection into groundwater.

Means of Regulation

Individual WDR. Individual waste discharge requirements orders for specific projects are the most common means of regulation due to the many variables and factors that must be considered in establishing conditions of discharge and ensuring accountability.

General Orders. Similar treatment and discharge conditions have allowed development and use of several general orders. General orders currently available or soon to be available in this program are for:

- Discharges to Land by Small Domestic Wastewater Treatment Systems, State Water Board Order No. 97-10-DWQ
- Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvacultural, Horticultural, and Land Reclamation Activities, State Water Board Order No. 2004-012-DWQ.
- Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside Federal Jurisdiction, State Water Board Order No. 2004-0004-DWQ.
- Dredged or Fill Discharges, State Water Board Order No. 2003-0017-DWQ.
- Discharges to Land with a Low Threat to Water Quality, State Water Board Order No. 2003-0003-DWQ
- Sewer Collection System Agencies, State Water Board (pending)
- Discharge of Groundwater or Surface Water from Cleanup of Petroleum Pollution, Order No. R5-2003-0044.

Water Reclamation (or Recycling) Requirements and Master Reclamation Permits. Water recycling requirements are determined by the DHS as necessary for the public health, safety, or welfare and, if a project will not affect water quality, are imposed through a water reclamation requirements order. Master Reclamation Permits allow the permit holder to control recycling by individual users, and they contain waste discharge requirements as necessary to implement effluent limitations and other requirements for protection of groundwater.

Standard Conditions. Many discharge requirements are applicable to to major groups of dischargers and rarely change. As established standards, these are listed separately in a document incorporated by reference into each adopted order.

Individual Waivers. An individual waiver of waste discharge requirements can be adopted if appropriate.

General Waivers. General waivers apply to categories of waste discharges. In some cases they waive submittal of a report of waste discharge and in other cases they allow staff to administratively determine, based on the filed report of waste discharge, whether a specific discharge meets the conditions for waiver of waste discharge requirements previously established by the Central Valley Water Board. General waivers currently in effect for this program are:

- Pesticide Applicators and Retail Fertilizer Facilities, Resolution No. R5-2002-0147
- Various Minor Discharges, Resolution No. R5-2003-0008 (e.g., air conditioner, cooling, and elevated temperature waters; drilling muds; Inert solid wastes; swimming pool discharges; agricultural commodity wastes).
- Small Food Processors, Including Wineries, Resolution R5-2003-0107

General waivers can also be granted to individual dischargers based upon regulatory oversight by a local public entity that administers a program at least as stringent as the Central Valley Water Board's. Historically, this has included waiver of reports of waste discharge and waste discharge requirements for individual sewage disposal systems for persons in all counties, and for land application of biosolids and of food processing solids residuals in certain cities and counties. General waivers of this nature include biosolids projects under oversight of Merced County (expired and pending renewal) and land application of food processing waste solids under oversight of Stanislaus County (currently pending).

Funding and Staffing

Annual fees provide all the funding allocated to the WDR Program. The Region received a $3.28 million budget to start FY 2005-2006, which supports the equivalent of 24.3 staff. For perspective, over 116 staff would be necessary to sustain an effective WDR Program within the Central Valley.[1]

From 1999 to 2001, the WDR Program received a short-term resource supplement to process backlogged waste discharge requirements. In 2002, the WDR Program was reduced to pre-supplement funding levels, and some lost positions were shifted into the newly created Irrigated Lands Program. The position reduction created an unequal workload among the technical staff remaining. Work of Stanislaus and Tuolumne Counties and Musco Family Olive Company was shifted to the Fresno office, and work of Glenn County was shifted to the Redding Office. This FY, attrition created work imbalances again and an opportunity to shift cases back to the Sacramento Office, but the shifts remain pending due to protracted delays in filling vacant positions. In December, a supplement increased the budget sufficient to support 29.8 staff but the increase is misleading as it supports continuing work in the Irrigated Lands Program. Current distribution of program personnel funds is shown below:

Line	Staff	Sacramento	Fresno	Redding	Total
1	Total number of staff using program funds	39	29	12	80
2	Total number of staff charging > 3 months to WDR Program	19	13	7	39
3	Technical staff in Line 2 that are Supervisory (in PYs)	3.3	2.7	.8	6.8
4	PYs in Line 2 allocated to Line technical staff	10.7	7.7	2.3	20.5
5	PYs in Line 4 where positions are vacant	2.5	3	1	6.5
6	PYs in Line 4 doing Irrigated Lands work	4.8	0	0	4.8

Issues

Consistency – Implementation of the basin plans for all waste releases to land has not always been consistent, particularly with respect to application of the Antidegradation Policy and Title 27 Regulations. Similar waste discharged under similar circumstances should be subject to similar waste discharge requirements fully consistent with the basin plans. Staff has been working over the past several years to improve consistency among the offices and programs in application of policy, strategy, documents, and goals. The manager and seniors of the WDR Program regularly participate in meetings of the Region's Consistency Program, the statewide WDR Program roundtable, and internal program and enforcement roundtables. The program manager and assigned attorney receive a copy of all draft WDR and enforcement orders for review, and management and legal both must approve tentative orders prior to Regional Board consideration. Improvements have been necessary to ensure consistency with respect to waste classification, Title 27 exemption, containment requirements, adequate liner designs, effective land treatment, and evaluation of impacts on soil and groundwater, and changes have been incorrectly perceived by many dischargers to be new regulatory requirements.

[1] The estimate is based upon 1999 workload standards that lack any estimate for: CEQA reviews, new responsibilities added by law since then for waivers, work related to or resultant from the AB885 requirement for statewide regulations for septic tank systems, and review of technical reports.

Staffing – The WDR Program supports in part 80 staff, but just 39 of them work in it more than three months a year. Funding currently supports 29.8 equivalent full-time positions. Staff-equivalents assigned budget for technical work total 27.3 PYs (2.5 PYs are for administration and support personnel). Of these, 15.7 PYs are line technical staff (exclusive of supervisory staff and line technical staff assigned to irrigated lands), which causes on average each person to manage a caseload of 76 sites. As 8.6 PYs must be expended performing nondiscretionary tasks, such as caseload management (e.g., investigating complaints and responding to discharger requests for regulatory advice or actions, etc.) and data entry, less than one-half the resources are actually available to produce measured work results (e.g., staff inspections, informal and formal enforcement actions; updated or new WDRs, etc.). 6.5 PYs of these line technical staff positions are currently vacant, and have been for months.

The State Water Board's "Compliance Assurance and Enforcement Strategy" of 1998 indicated that this Region's WDR Program received only 60% of the statewide average funding per regulated WDR site. Similarly, the report showed that the WDR Program received 38% and 25% of what the NPDES and Land Disposal Programs in this Region received per site. The NPDES Program subsequently received a resource supplement that continues essentially intact and has been supplemented with contracted help. The caseload is one factor that contributes to the difficulty of retaining staff in the WDR Program.

Backlogged Applications and WDR Updates – The WDR update backlog was the original reason for a short-term program resource supplement that occurred from 1999 through 2001. With an update backlog of 320 orders in 1999 and additional updates coming due in succeeding years, it would have taken an annual renewal rate of 125 orders (18.3 PYs) over six years to eliminate the backlog by now, and an update rate of 105 orders (15.3 PYs) annually to maintain a zero backlog thereafter. Thus, the two-year supplement of 11 PYs temporarily slowed but did not reduce the increasing backlog, which has continued to increase. Only 1.9 PYs are allocated this FY to address backlogs.

Self-Monitoring Reports – The primary means of Regional Board staff, as well as dischargers, to monitor compliance with waste discharge requirements is through review of self-monitoring reports. Unfortunately, some dischargers do not submit the required information, or they submit the required information erratically or only when specifically reminded. The reports typically receive only cursory review by staff until a site inspection occurs. The 2.4 PYs allocated this FY are considerably less than the 18.1 PYs that would be required to perform the effective level of review described by procedures. Hence, this regulatory tool is ineffective and adversely affects other program areas.

Inspections – Validation of conditions described by self-monitoring data must be done through periodic inspection, and inspection is the only means to evaluate system maintenance and observe unreported activities. Adhering to the inspection schedule identified as the minimum necessary to be effective by the State Water Board would require 19.1 PYs. The FY allocation for this program component is 2.5 PYs. Lack of inspection capability adversely affects other program areas.

Enforcement – The Enforcement Policy emphasizes timely, fair, firm, and consistent enforcement as critical to the success of water quality programs. However, formal enforcement inevitably requires diversion of resources from other program functions already operating at subsistence levels. As illustrated by the recent enforcement action against Hilmar Cheese Company, enforcement action against contentious dischargers can consume significant program resources. Even with enforcement a priority, 0.7 and 2.9 PYs are allocated for informal and formal enforcement, respectively, this FY. This is 10% of the resources the State Water Board projected as necessary to sustain effective enforcement in the Region's WDR Program.

Land Treatment Systems – Historically adopted waste discharge requirements allow application of untreated or partially treated food processing or winery waste onto land for additional treatment and for "reuse" benefits, typically as proposed in a waste management plan. These land treatment systems have historically been tacitly and informally exempted from waste classification that would place them under Title 27. A major assumption supporting the historic waste discharge requirements for land treatment systems, and the Title 27 exemption, was that residual waste constituents were effectively attenuated within the soil column before reaching groundwater. Title 27 requires a site-specific pilot demonstration as a prerequisite for each land treatment site to develop design and operating parameters that protect groundwater, but nothing comparable has been required of agricultural waste applied to land though it usually will qualify as designated waste. Monitoring data and inspections indicate that few dischargers have adhered to the proposed waste management plans and many have either significantly degraded or polluted groundwater. The attenuation process itself is not scientifically documented or adequately monitored for process control. Since staff's initial report in March 2000 about groundwater problems caused by the land treatment of winery and food processing waste, both the California League of Food Processors (CLFP) and Wine Institute have worked toward documenting sound design and operating criteria for land treatment to provide to their members. This has meant additional staff workload for meetings, participation in conferences, and technical

reviews not associated with specific discharges. The Wine Institute has thus far developed incomplete hypotheses regarding the science and controlling parameters of land treatment (that failed a formal peer review) and only in 2005 did it begin to specifically address control of inorganic salts. CLFP revised its manual of good practice and in 2005 committed to address remaining deficiencies in the revised manual, and began that revision process just recently. Because of lack of a scientifically sound design, historical regulatory practices, inadequate monitoring, historically poor operational control, discharger contentiousness, no required pilot demonstration, and political factors, regulation of land treatment in the WDR Program is not reliable or effective and several polluted sites exist. No remediation is occurring at most these sites, but this will be the expectation as sites are addressed by staff. Compared to regulation by effluent limitations, land treatment systems are high risk and consume disproportionately high resources.

Monitoring – During review of the effectiveness of older orders, it became evident that historical monitoring, particularly of groundwater, has not been sufficient for early detection of degradation and prevention of pollution. Deficiencies include inadequate monitoring well construction and networks, and inadequate monitoring with respect to frequency and monitored constituents. These monitoring deficiencies have been addressed as encountered by staff. Inconsistencies of older monitoring and expense of recent monitoring have been the basis of criticism. Similar monitoring under similar circumstances, and monitoring sufficient to address all appropriate constituents of potential concern is our objective and staff is working toward consistency in this area.

Best practicable treatment or control (BPTC) – No defined procedures exist to ensure thorough and objective evaluation of what alternative treatment technologies and control methods can be considered the "best efforts" intended by the Antidegradation Policy. No statewide or regional guidance exists to instruct staff and direct a discharger on what demonstration must be made for a selected treatment or control alternative to qualify as the best efforts. Economic feasibility tends to receive disproportionate weight in discharger arguments when in actuality it is but one factor of many that must be weighed and balanced by the Regional Board. Guidelines and procedures on determining what constitutes BPTC, and appropriate perspective on economics, would improve efficiency of staff in permitting and ensure effectiveness of requirements in minimizing degradation and protecting groundwater.[2] Work is currently underway by several major Tulare Lake Basin municipal dischargers (e.g., Cities of Fresno, Porterville, Bakersfield, Hanford, etc.) to perform comprehensive BPTC evaluations of their waste source control, and wastewater collection, treatment and disposal systems. Once complete, these evaluations will ensure all reasonable and effective municipal wastewater treatment technologies and control methods are implemented and that the highest water quality attainable by reasonable measures is maintained. Historically, few private entities have been required to make a similar study and demonstration, but this will be the expectation as sites are addressed.

Treatment and Disposal Capacity – Strategies in the 1970s included generous federal and state financial assistance in upgrading, expanding, and consolidating public wastewater treatment and disposal systems for the purpose of achieving performance standards and meeting water quality objectives. Since then, Title 23 has specified that public facilities begin planning for additional capacity at least four years in advance of when it will be needed and then either insure the capacity is in place before needed or restrict growth until the expansion is in place. Standard requirements applied to all dischargers also specify a duty to: perform proper operation and maintenance, halt or reduce any activity as necessary to maintain compliance with waste discharge requirements, notify the Regional Board of noncompliance problems, take all reasonable steps to assess and minimize impacts that result from noncompliance, and accept consequences if violations are caused from a failure to do so. Another standard requirement states that any material change must be preceded by a report of waste discharge. Too many dischargers ignore these performance expectations.

Indirect Dischargers – Over the last several years, categorical and significant industries have relocated from large cities in other regions to small communities in the Central Valley. Although a standard provision for years has identified addition of a significant indirect discharger as a material change that must be reported and result in re-evaluation of terms of discharge, this circumstance is rarely reported. Consequently, the controls by the small community are typically inadequate, and the WDR orders and their monitoring and reporting requirements are inadequate to effectively regulate the altered character of waste. USEPA has taken enforcement against a couple of these indirect dischargers.

Consolidation – The "State Policy for Water Quality Control" requires consolidation of wastewater collection and treatment facilities where feasible and desirable to implement sound water quality management programs. In general, consolidation provides capital and operational savings, increased reliability, and opportunities for recycling that are otherwise not feasible.

[2] For example, the State of Washington developed a Permit Writer's Manual that instructs technical staff on how to evaluate and implement it's "BPTC. "

Growth in the Region has created an increasing number of large development projects that propose separate community systems, including projects near existing municipal sewage collection systems. New projects must be consistent with this principle.

Septic Systems – Regulation of discharges from residential septic tank-leachfield systems was conditionally waived (informally and formally) to the 38 counties within this Region in the 1970s with the expectation that they implement criteria at least as stringent as that in the basin plans. In the years since some counties have deviated from the basin plan minimums. In addition, the formal waiver expired and renewal has been postponed pending the expected promulgation of statewide regulations in response to AB885. The regulations are still pending. In the meantime considerable rural residential development reliant on septic tank-leachfield systems is occurring throughout the Region.

Groundwater Quality – When evaluating whether a discharge has caused or will cause groundwater degradation, the point of reference is 1968, the year the Antidegradation Policy went into effect. Data from this era is limited and general, but good enough for a reasonable perspective of baseline quality and essential to consider in correct application of policies. Discharge requirements must protect the highest quality groundwater that will be in hydraulic continuity with the discharge. Both must be factored into future analyses of appropriate waste discharge requirements, which will continue to consider more recent and site-specific data and subsequent influences on groundwater quality.

Discharge Points – Historically regulation has focused on only the declared and obvious discharges, such as a pond or land disposal area. Each point of potential release (sumps, tanks, storage ponds, etc.) and intended release (percolation pond, disposal area) must be evaluated for consistency with policies.

Science and engineering – Historically, authorization for discharge has been based upon poor data for many aspects of a waste discharge, particularly for land discharge of non-domestic waste. The scientific and engineered rigor of project analysis must increase. Each waste constituent that is released or may be released must be evaluated for its potential to degrade or pollute groundwater and then subjected to rigorous analysis as to variability and technically feasible methods of treatment and control to minimize the degradation. If treatment and control is not sufficient to ensure resultant degradation of groundwater will be acceptable, the constituent must be fully contained or it must be scientifically demonstrated that the constituent will be attenuated within the upper zone of the soil profile. Concentrations that must be achieved at the point of release to ensure achievement of the predicted result must be quantified. Documentation of the baseline and extant condition of groundwater and the engineered design of the project must be provided by the discharger.

Uncontrollable Factors – Authorization to discharge a waste constituent to groundwater that already exceeds a water quality objective for the constituent is acceptable in just three situations. It may occur where no designated beneficial uses are involved and thus no objective applies. It may occur if the exceedance results from controllable factors if the discharge will not contribute to the exceedance. And, it may occur if the exceedance results from "uncontrollable factors," and the discharge will not make the existing quality worse. Uncontrollable factors are factors not influenced by human activities. The Central Valley has many areas where shallow groundwater exceeds one or more water quality objectives due to human activities, beneficial uses remain designated, and adopted orders are based upon no degradation of the degraded quality. Instead, it should be determined whether control of all factors could restore the aquifer, a less stringent water quality objective may be reasonable, or de-designation of the impacted beneficial use is appropriate.

Salt – Inorganic salt is the single greatest pollutant group affecting the San Joaquin River and Tulare Lake Basins and it adversely affects both surface water and groundwater. Both basins are accumulating salt from importation of materials containing salt and from importation of vast quantities of surface water that contain salt. The salt issue affects numerous and varied stakeholders and multiple programs and agencies. An overview of the broader salt issue was described in a 2005 Regional Board status report and will be the subject of a State Water Board workshop in January 2006. Point sources of salt contribute to the broader salt issue, but reasonable controls have been defined by a regulatory framework reliant on waste classification and on technology and controls to preclude degradation of groundwater quality beyond (or to require its restoration to) the highest quality that can reasonably be maintained or restored that does not exceed water quality objectives. Some domestic and non-domestic waste discharges are currently inconsistent with the framework.

Blending – Historically some projects have been approved that blend wastewater with freshwater to the point that a crop can be successfully grown with the blend, with little analysis of whether the waste could or should be classified and contained, whether waste constituent concentrations could and should first be reduced with BPTC, and whether the consequential affect on groundwater quality (accounting for application methods, evaporative effects, and leaching factors) is acceptable. Use of freshwater for dilution of waste is both wasteful and unreasonable if for the purpose of avoiding feasible waste treatment and control methods and where it results in impacts inconsistent with other water quality policies.

Water treatment wastes – The quality of available water in some geographical areas requires removal of certain constituents to be potable, such as radioactivity, nitrates, inorganic salts, and arsenic. This occurs for both community water supplies and individual water supplies, and the most common treatment method is reverse osmosis, which creates a reject with concentrated amounts of the waste constituent and other constituents. The reject of RO is designated waste and thus expensive to dispose of properly. Other treatment methods generate similar wastes. Nothing is being done to control this at the individual level, and at the community level the common proposals are to return the reject to groundwater by means of the community sewage and/or by blending it with an irrigation supply where the relative volumes ensure it does not significantly alter the chemical character of the irrigation supply. The former essentially returns the removed constituent to where it would be if not removed. The latter simply dilutes it. Both methods have supportive arguments, but all release constituents where they are already a problem and over the long term will exacerbate the condition. The rate of incidence is expected to increase as dwindling water supplies force users to tap poor quality groundwater to meet population needs.

Reclamation and water conservation – While policies are clear that recycling should be encouraged in water-short areas, historic encouragement has resulted in approval of non-municipal "reclamation" projects that have economically unsustainable yields and that are inconsistent with other applicable policies, particularly those concerning waste classification, degradation, and pollution. Encouragement of municipal reclamation projects has resulted in turning private land into public land and cultivation of new land, which may not extend the water supply, be of maximum public interest or cause least impact on water quality. Neither reclamation nor conservation justifies inconsistency with other water quality policies. Support of reclamation and conservation must be limited to projects that both extend the water supply and are consistent with water quality policies.

Soil Amendments – Benefit to soil is only realized from decomposable and nutritive waste constituents. Historically, approval of reuse of a waste has focused too much on potentially beneficial constituents and ignored the potentially harmful, and typically more mobile, waste constituents. Waste classifiable as designated waste due to non-decomposable, non-nutritive waste constituents does not qualify for exemption from Title 27 despite the soil benefits and should not be authorized as a soil amendment. Similarly, the benefits to soil from any non-designated waste must be balanced against the adverse affects caused by non-beneficial waste constituents consistent with the Antidegradation Policy.

Indirect reclamation – Three recent project proposals include a system for extraction of groundwater beneath or near wastewater treatment facilities to control groundwater mounding and to take advantage of the natural filtration of the unsaturated soil column to meet Title 22 criteria for recycled water. Groundwater limitations implement the water quality objective for bacteria, but DHS does not consider the naturally filtered groundwater that meets bacterial limitations as suitable for unrestricted uses without disinfection due to other potential contaminants, such as viruses. DHS requires the extracted groundwater to be disinfected to Title 22 criteria. Thus, infiltration of un-disinfected, unfiltered wastewater in the view of DHS does not adequately protect the beneficial uses of domestic water supply and agricultural water supply. Well-established technology is defined in Title 22 for unrestricted use, and the sole benefit of the proposed projects over the established Title 22 technology is the cost savings from not providing filtration.

Priorities

Enforcement and consistency have been the two highest priorities the last three years. Applications, backlogged applications, WDR updates, complaints, self-monitoring report review, database maintenance, enforcement, public outreach, CEQA review, consistency, prioritization itself, etc., are all considered important and each requires subsistence level resources. As no area has resources significantly above the subsistence level to direct onto a priority activity, establishing any area as high priority for redirection of discretionary resources cannot have a dramatic effect on measured outputs in that area but can cause problems if the area from which resources are taken this area significantly falls below subsistence levels.

Performance

Performance typically meets or exceeds commitments made in work plans when compared in proportion to resources expended, but the mix of measured outputs usually varies from work plan projections as circumstances change during the year.

California Regional Water Quality Control Board, Central Valley Region

Fiscal Report Based on November Expenditures
(An average of 42% should have been expended to date)

PERSONAL SERVICES

Our personal services budget was $24.4 million. We have spent 38% of our personal service budget. We continue to recruit for all vacant positions.

OPERATING EXPENSES

As of November we spent 37% of our operating expense budget.

FUND ISSUES

Key Fund Sources	Percent Expended
General Fund	39.2%
Federal Funds	38.6%
Waste Discharge Permit Fund	38.8%
Prop 13, 40 & 50 Bond	57.8%

FY 05/06 UPDATE

Contract negotiations resulted in our Engineers receiving a 7% raise that was effective 7/1/05. Additional funds to cover this increase were provided. A decreasing technical adjustment of approximately $500,000 was also made to our budget by State Board.

ORGANIZATION -- Region 5

	POSITIONS/PYS BUDGETED	$ BUDGETED	$ EXPENDITURES EXPENDED	BALANCE	% EXPENDED
PERSONAL SERVICES					
Authorized Positions					
Permanent Positions	246.6	16,150,614	5,783,309	10,367,305	36 %
Temporary Help	0.0	0	0	0	0 %
Overtime		0	577	(577)	0 %
Board Stipend		12,000	3,500	8,500	29 %
Total Authorized Positions	246.6	16,162,614			
Salary Increases		0			
Workload & Admin. Charges	0.0	0			
Proposed New Positions	0.0	0			
Partial Year Positions	0.0	0			
Total Adjustments	0.0	0			
Total Salaries	246.6	16,162,614			
Salary Savings	(12.7)	(748,524)			
Net Total Salaries	233.9	15,414,090			
Staff Benefits		5,060,125	1,949,021	3,111,104	39 %
TOTAL PERSONAL SERVICES(PS)	233.9	20,474,215	7,736,407	12,737,808	38 %
LINE ITEM OPERATING EXPENSES & EQUIPMENT DETAIL					
General Expense		265,755	36,587	229,168	14 %
Printing		47,421	50,967	(3,546)	107 %
Communications		159,729	34,962	124,767	22 %
Postage		43,907	6,468	37,439	15 %
Travel In-State		230,162	18,469	211,693	8 %
Travel Out-Of-State		3,160	0	3,160	0 %
Training		97,653	12,403	85,250	13 %
Facilities Operations		1,151,297	380,958	770,339	33 %
Utilities		226,578	38,586	187,992	17 %
Contracts - Internal		653,630	1,416,840	(763,210)	217 %
Contracts - External		4,593,982	954,945	3,639,037	21 %
Consolidated Data Center		0	0	0	0 %
Central Adm.Serv. - Prorata		0	0	0	0 %
Central Adm.Serv. - SWCAP		0	0	0	0 %
Equipment		83,500	0	83,500	0 %
Other		0	61,479	(61,479)	0 %
TOTAL OPERATING EXPENSE & EQUIPMENT(OEE)		7,556,774	3,012,664	4,544,110	40 %
TOTAL PS & OEE		28,030,989	10,749,071	17,281,918	38 %
Indirect		5,289,588	1,858,142	3,431,446	35 %
GRAND TOTAL		33,320,577	12,607,213	20,713,364	38 %

Fund Source		$ Allotment	$ Expenditures	% Expended
NPS Pollution Contral Program-Prop 13 -- (00BOND-NPSC)	=	441,221	117,796	26.7
Watershed Protection Program -- (00BOND-WPP)	=	282,460	25,680	9.1
Cleanup & Abatement Account-Management -- (CAA)	=	5,548,915	2,129,560	38.4
F(104B3) Aquatic Pest Monitoring -- (F(104B3))	=	151,234	62,437	41.3
NPDES -- (F(106))	=	712,265	218,022	30.6
205(J) Phase XVI -- (F(205J-XVI))	=	0	648	0.0
Non-Point Source -- (F(319H))	=	1,053,490	471,463	44.8
DoD Cost Recovery -- (F(DOD-CR))	=	135,871	38,556	28.4
Lawrence Livermore - Site 300 -- (F(LL300))	=	98,414	29,509	30.0
Sacramento River Toxic Program -- (F(SRTP))	=	215,111	92,473	43.0
General -- (G)	=	3,692,436	1,447,234	39.2
Indirect Distributed Cost -- (IDC)	=	0	0	0.0
-- (IDC-D)	=	0	0	0.0
Integrated Waste Mngmt Acct (AB 1220) -- (IWMA)	=	1,605,923	655,638	40.8
Proposition 50 -- (PROP 50)	=	318,688	141,391	44.4
Proposition 40/2002 -- (PROP40)	=	203,195	160,463	79.0
Aerojet Gen Corp Oversight of Cleanup -- (R(AEROJET))	=	186,429	44,085	23.7
Basin Plan Amendments - Drinking Water -- (R(BASIN-DW))	=	242,236	85,804	35.4
DTSC Brownfield Coordination -- (R(BROWNFIELDS))	=	22,709	5,539	24.4
CALFED Cooperative Program -- (R(CALFED))	=	939,770	175,775	18.7
Redevelopment Agency Reimbursements -- (R(REDEVEL))	=	12,258	333	2.7
R (Dept of Defense Cleanup Oversight) -- (R(SLCDOD))	=	968,166	373,030	38.5
Westley and Tracy Tire Facilities -- (R(WESTLEY))	=	295,833	2,900	1.0
Surface Impoundment Assessment Account -- (SIAA)	=	183,245	72,540	39.6
State/Federal Revolving Fund-Federal -- (SRFFED)	=	11,289	0	0.0
Tobacco Tax -- (TBT)	=	146,915	76,731	52.2
Underground Storage Tank Cleanup Fund -- (UTSCF)	=	2,408,950	954,749	39.6
Waste Discharge Permit Fund -- (WDPF)	=	13,443,531	5,211,825	38.8
Water Rights Fund -- (WRF)	=	0	13,032	0.0
TOTAL		33,320,554	12,607,213	37.8 %

Supplement to Executive Officer's Report
26 January 2006

1. ***Hilmar Cheese Administrative Civil Liability Complaint Settlement Negotiation Update***
   The parties are negotiating toward a revised settlement agreement, consistent with the Board's direction on November 29, 2005, and intend to bring a revised settlement agreement to the Board for consideration at its March Board meeting.

2. ***Tehama Market Associates, LLC, Administrative Civil Liability Complaint, Butte County***
   The Executive Officer issued a $100,000 Complaint to Tehama Market Associates for stormwater construction violations at the Linkside Place Subdivision development near Oroville.

3. ***New Year's Storm Spill Update***
   Attached is a spreadsheet providing an update on spills related to the New Year's storms

4. ***Future Board Activities***

The following are significant Board meeting actions anticipated for the next few months. This is not a complete listing of all Board meeting items. This listing is tentative and subject to change for many reasons. The listing is intended to give a longer-range view of planned Regional Board activities.

January 31, 2006 – Joint State Board/Central Valley Region Salinity Workshop

February 8, 2006 – Staff Workshop on San Joaquin River Salt and Boron Standards Upstream of Vernalis, Modesto

March 2006 Board Meeting

- Basin Plan Triennial Review
- Irrigated Lands De Minimis Waiver Information Item
- City of Tracy NPDES Permit
- Hilmar Cheese ACL Settlement Proposal
- Stanislaus County Reuse of Solid Food Processing Waste Waiver

May 2006 Board Meeting

- Irrigated Lands Waivers Renewal Workshop
- Clear Lake Nutrient TMDL Workshop

Waste Discharge Requirements Under Consideration

- Aerojet General Corporation, Sacramento Facility
- Alturas WWTP
- Atwater WWTP
- Barrel 10 Winery, San Joaquin County

- Bell Carter Olive Company Inc
- Biggs WWTP
- Brentwood WWTP
- Burney Forest Products, Burney Sawmill/Cogeneration
- Ca Dept Of Corrections-Jamestown Sierra Conservation Ctr-WWTP-2
- California Milk Producers, Inc., Tipton Plant
- Calmat Of Central California, Sanger Plant
- Canada Cove L.P., French Camp Golf & RV Park
- Cedar Ridge, Amador County
- Chevron Texaco Inc., Produced Water Reclamation Project
- City of Angles WWTP,
- Clear Creek CSD WTP
- Clovis WWTP
- Colfax STP
- Copper River Ranch
- Cutler-Orosi Joint WWTP
- Dark Horse WWTP, Nevada County
- Dunsmuir STP
- Euhlers Estate Winery, San Joaquin County
- French Camp Recreational Vehicle Park, San Joaquin County
- Galt WWTP
- Glenn Oaks Mobile Home Park, Placer County
- Grizzly Lake Resort Imp Dist, Dellecker WWTP
- Grizzly Ranch WWTP
- Hidden Valley Sand & Gravel, Lake County
- Indian Springs School District Geothermal Project
- Jackson WWTP
- Kinder Morgan Energy Partners, LP, Elmira Remediation Project
- Kinder Morgan Energy Partners, LP, Fox Rd Pipeline Release Site
- Klondike California Mining Corp, Klondike, Dutch & Telegraph
- Linda County Water District Wastewater Treatment Plant
- Lodi White Slough Water Pollution Control Plant
- Los Banos Milk Processing Facility
- Malaga CWD
- Manteca Pretreatment Program Approval, San Joaquin County
- Mariposa PUD WWTP
- Mirant Delta LLC, Contra Costa Power Plant
- Modesto WQCF
- New Chaparral Petroleum, Inc., Poso Creek Oil Field
- Oxy USA, Inc , Kern Front Field
- Pace Diversified Corporation, McVan Area, Poso Creek Oil Field
- Placer Co Facility Services 1 SMD No 3 WWTP
- Plumas County, Lake Davis WTP
- Port of Stockton Dredging WQ Certification, San Joaquin County
- Rio Vista WWTP
- Roseville Dry Creek Wastewater Treatment Plant

- Roseville Pleasant Grove Wastewater Treatment Plant
- Sacramento Co DPW-Goethe Rd Kiefer Landfill GW Treatment
- Sacramento Regional WWTP
- Saddle Creek Golf Course
- Secor International Inc., Purity Oil Sales Site
- Shasta Lake WWTP
- Sierra Pacific Industries, Sierra Pacific, Burney Division
- Steele Canyon Landfill, Napa County
- Stockton Cogeneration Facility
- Tricor Refining LLC, Oildale Refinery
- Tuolumne UD/Jamestown WWTP
- Turlock WWTP
- UC Davis Aquatic Center/Animal Science
- US Dept Of Agriculture, UCD Aquatic Weed Laboratory
- Vacaville Easterly Sewage Treatment Plant
- Valley Waste Disposal Co., Cawelo Reservoir
- Visalia WWTP
- Williams WWTP
- Willows WWTP
- Yuba City WWTP

Wastewater Collection and Treatment Facility Spill Summary

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Alpine	1/1/06	Bear Valley Water District		S	MRL	Yes	Yes	Yes	Raw sewage	200,000	~24	Bloods Creek						
Amador	12/31/05	Jackson, City of	Collection system	S	RPM	Yes	Yes	Yes	Raw sewage	?	?	Jackson Creek		No	Cannot trace/confirm			
El Dorado	1/3/06	El Dorado Irrigation District	Deer Creek collection system	S	RPM	Yes	Yes	Yes	Raw sewage	4,200	2.5	Deer Creek	Excessive rain uncovered a manhole	Yes		13267 to determine storm return frequency	Need more information to determine appropriate response	
El Dorado	12/31/05	El Dorado Irrigation District	El Dorado Hills WWTP	S	RPM	Yes	Yes	Yes	Groundwater, filter backwash, rainwater, possibly some secondary effluent	5.3 million	17	Carson Creek	Pond overflowed	Yes		13267 to determine storm return frequency and protection of pond from flooding	Was this or was this not a 100-year storm event? Was appropriate flood protection provided?	
El Dorado	1/1/06	El Dorado Irrigation District	Deer Creek collection system	S	RPM	Yes	Yes	Yes	Raw sewage	10,800		Deer Creek	Log knocked off a manhole causing a release	No	Probably outside discharger's control			
El Dorado	12/31/05	El Dorado Irrigation District	Collection system	S	RPM	Yes	Yes	Yes	Raw sewage			Deer, Webber and New York Creeks	Storm caused lift stations to spill	Yes		13267 to determine storm return frequency and design capacity of system	Was this or was this not a 100-year storm event?	
El Dorado	12/31/05	Placerville, City of	Hangtown Creek WWTP	S	RPM	Yes	Yes		Tertiary plus secondary			Hangtown Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
El Dorado	12/31/05	Placerville, City of	Hangtown Creek WWTP	S	RPM	Yes	Yes		Raw sewage/ primary		12	Hangtown Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Fresno	1/3/06	Southern CA Edison	Big Creek Powerhouse No. 1 WWTF	F	WDH	Yes	Yes	Yes	Secondary, undisinfected wastewater	5,400	10	Big Creek	Rainfall overwhelmed collection system	No	SCE has an emergency plan to haul excess wastewater offsite and responded appropriately. Plan implementation was overwhelmed by record rainfall (9.5 + in.), overturned truck, and landslide.			
Kern	1/1/06	City of Tehachapi	City of Tehachapi WWTF	F	DKP	Yes	NA	Yes	Raw sewage	0		Contained	Surge in flow caused bypass of primary clarifier. No wastewater was actually spilled.	No	All wastewater was contained			
Lake	12/31/05	City of Lakeport	Municipal Sewer Dist. No. 1	S	MRL	Yes	Yes	TBD	Raw sewage	500		Culvert leading to Clear Lake						
Lake	12/31/05	Clearlake Oaks County Water and Sanitation Dist.		S	MRL	Yes	Yes	TBD	Raw sewage	100		Clear Lake						
Lake	12/31/05	Lake County Sanitation District	Southeast WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	5,500		Channel leading to Clear Lake						
Lake	12/31/05	Lake County Sanitation District	Southeast WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	9,000		Streets to storm drains leading to Clear Lake						

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General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Lake	12/31/05	Lake County Sanitation District	Northwest WWTF	S	MRL	Yes	Yes	Yes	Raw sewage	5,500		Clear Lake						
Lake	1/1/06	Lake County	Eastlake Landfill	S	SER	No	No	Yes	Leachate	UNK	~ 3 days	Molesworth Creek	Seepage through cover	Yes		Evaluating measures discharger has undertaken		
Nevada	1/1/06	Donner Summit PUD	WWTP	S	RPM	No	No		Filtered and unfiltered wastewater	UNK	18	South Yuba River	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/31/05	Grass Valley, City of	WWTP	S	RPM	Yes	Yes	Yes	Raw sewage	1 million		Wolf Creek	Primary clarifiers were overwhelmed by flows and overflowed.	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/27/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	48,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/28/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	48,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/29/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	59,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency.	Was this or was this not a 100-year storm event?	
Nevada	12/30/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	59,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada	12/31/05	Nevada County SD	Cascade Shores WWTP	S	RPM	No	No	Yes	Filtered and unfiltered secondary	44,000		Gas Canyon Creek	Filter capacity insufficient for flows received; heavy rains; I/I	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Nevada	12/31/05	Nevada County SD	Lake Wildwood WWTP	S	RPM	Yes	Yes	Yes	Secondary, disinfected	120,000	4	Deer Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Nevada		Nevada County SD	Lake Wildwood Collection System	S	RPM	Yes	Yes	Yes	Raw sewage	3,000		Little Deer Creek	Grease and debris blocked a sewer main in storm	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer		Placer County	Sewer Maintenance Dist. No. 3	S	RPM	Yes	Yes	Yes	Sludge, unfiltered secondary	UNK	12.5	Miner's Ravine	Heavy rains in previous 24 hrs	Yes		13267 to determine flood protection provided, and to determine storm return frequency and flood stage	Permit requires facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.	
Placer	12/31/05	Placer County	Sewer Maintenance Dist. No. 1	S	RPM	Yes	Yes	Yes	Primary (filtered and unfiltered) and secondary (filtered and unfiltered)	13,500	1.5	Rock Creek	Heavy rains in previous 24 hrs	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Auburn, City of	WWTP	S	RPM	Yes	Yes	Yes	Tertiary plus filtered, disinfected primary	14.93 million	140	Auburn Ravine		Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Auburn, City of	collection system; manhole near WWTP entrance	S	RPM	Yes	Yes	Yes	Raw sewage	68,400	9.5	Auburn Ravine		Yes		Discharger plans to isolate manhole to determine if blockage exists		
Placer	12/31/05	Auburn, City of	collection system; 588 High Street	S	RPM	Yes	Yes	Yes	Raw sewage	2,400	2	Storm drain to Auburn Ravine?	Blockage in line removed; spill cleanup infeasible due to 'deluge'	No				

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General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Placer	12/31/05	City of Roseville		S	RPM	Yes	Yes	Yes	Raw sewage	3.8 million	10	Dry Creek	Surcharging of collection system due to flooding	Yes		13267 to determine flood protection provided, and to determine storm return frequency and flood stage	Permit requires facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency	
Placer	1/4/06	City of Roseville		S	RPM	No	Yes		Raw sewage	UNK	>48	Dry Creek	Discovered after flood waters receeded	Yes		13267 to determine storm return frequency	Was this or was this not a 100-year storm event?	
Placer	12/31/05	Placer County	Applegate WWTF	S	MRL				Raw sewage	1,000		Spill was contained						
Sacramento	12/31/05	City of Folsom	Manhole	S	PHL	Yes	Yes	Yes	Raw sewage	1,000		Spill was contained	Manhole overflow	No	Small spill			
Sacramento	12/31/05	City of Galt	Manhole	S	PHL	Yes	Yes	No	Raw sewage	<1,000			Manhole overflow	No	Small spill			
Sacramento	12/31/05-1/2/06	Sacramento County CSD-1	Walnut Grove	S	PHL	Yes	Yes	Yes	Raw sewage	250,000	48+	Unnamed	Manhole overflow	Yes		Inspected		
Sacramento	12/31/05	Sacramento County CSD-1	Manger Way	S	PHL	Yes	Yes	Yes	Raw sewage	>1,000	>7	Storm drain	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento County CSD-1	Linda Creek Ct	S	PHL	Yes	Yes	Yes	Raw sewage	>1,000	>6	Drainage ditch	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento County CSD-1	Fruitridge Rd	S	PHL	Yes	Yes	Yes	Raw sewage	560,000	>12	Drainage ditch, street, property	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Mira del Rio Station N-16	S	PHL	Yes	Yes	Yes	Raw sewage	15 million		Street, homes, American River	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05-1/3/06	Sacramento Regional County Sanitation Dist.	SRCSD WWTF	S	PHL	Yes	Yes	Yes	Chlorinated secondary effluent	1 million		Laguna Creek	Line breakage	Yes		Inspected 1/5/06		

General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Elk Grove/Florin Road	S	PHL	Yes	Yes	Yes	Raw sewage	650,000		Drainage channel	Manhole overflow	Yes		Inspected 1/5/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Kilgore/ Sunrise Site	S	PHL	Yes	Yes	Yes	Raw sewage	700,000		Contained on construction site	Failed plugs	Yes		Inspected 1/6/06		
Sacramento	12/31/05	Sacramento Regional County Sanitation Dist.	Bradshaw 6B Project	S	PHL	Yes	Yes	Yes	Raw sewage	<10,000		Contained on construction site	Failed plugs	Yes		Inspected 1/6/06		
Sacramento	12/31/05	City of Sacramento		S	PHL	Yes	Yes		Combined wastewater	46,000		Street	Excess storm flow	No				
Sacramento	12/31/05	City of Sacramento		S	PHL	Yes	Yes		Combined wastewater	1,500		Street	Excess storm flow	No				
San Joaquin		City of Ripon	Industrial sewer disposal fields	S	MRL	Yes		Yes				Industrial disposal field inundated due to rising river levels on the Stanislaus River						
Shasta	1/3/2006	City of Redding	Clear Creek WWTP	R	BJS	Yes		Yes	Partially treated and diluted wastewater	20 million per day at worst	3-5 days	Sacramento River and small tributary creeks	Excess I/I due to storm intensity and duration. May be other Discharger contributing factors	Yes		Inspected WWTP and collection system overflow sites; waiting on WQ samples of effluent and receiving water; requested data on contributing factors	Other local WWTPs did not have same degree of problem	
Sierra	12/31/05	City of Loyalton		S	MRL	Yes	Yes	TBD	Raw sewage/ rain water mix	4000		Smithneck Creek						

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General Information						Notice/Reporting			Nature of Spill					Follow up				
															If No	If Yes		
County	Spill Date	Agency	Facility	RB Office	Sr.	Notify RB in 24 hrs?	Notify OES?[1]	Submit Written Spill Report?[2]	Waste Type	Total Volume Spilled (gallons)	Duration of Spill (hours)	Discharged to	Reason for Spill	Follow up?	Rationale	Description	Rationale	Timeline
Sierra	12/31/05	City of Loyalton		S	MRL	Yes	Yes	TBD	Secondary treated wastewater mixed with stormwater/ groundwater	4 million		Smithneck Creek						
Sutter		Yuba City, City of	WWTF	S	RPM	Yes	NA	NA	Reportedly empty disposal ponds were overtopped by Feather River	NA		Feather River	Inundation of disposal ponds inside levee	No	Addressed through permitting process - permit requires closure of ponds within floodplain			
Yuba	1/3/06	City of Wheatland	WWTF	S	MRL	No	Yes		Wastewater mixed with river water	270,000	15	Bear River	Bear River toppled levee and spilled onto infiltration beds					
Yuba		Linda County Water District	WWTF	S	RPM	No	No	No	Secondary treated wastewater	UNK		Feather River	River level rose and inundanted ponds	No	Addressed through permitting process - proposed permit renewal requires closure of ponds within floodplain			
Yuba	12/31/05	City of Marysville		S	MRL	Yes	Yes	Yes	Wastewater mixed with river water			Feather River						

[1] The "reportable quantity" for notification of OES is 1000 gallons (CWC section 13271 and 23 CCR section 2250). This field is not applicable for spills of less than 1000 gallons.

[2] Spill report due in 5 days for NPDES Program; spill report due in 14 days for WDR Program.

NA = Not applicable TBD = To be determined UNK = Unknown at this time

Executive Summary

This plan outlines a conservation-reuse-recharge element for implementation concurrent with the Los Osos Wastewater Project (LOWWP) that will enable the County of San Luis Obispo to address the Level III of Severity water shortage, stop seawater intrusion, and balance the Los Osos Valley Water Basin shortly after start up of the project.

To achieve this goal—vital to the coastal ecosystems, the people, and the economies of the area—the plan applies a sustainable development approach, using green and appropriate technologies, in a manner that maximizes water-use efficiency, the beneficial uses of water sources, and the natural rainwater recharge of the Los Osos water basin.

By focusing on water-use efficiency, water quality improvement, and environmental stewardship—the plan aligns with the California Water Plan and the missions of key environmental agencies, organizations, and programs, including the state and local water boards, the Sierra Club, Surfrider Foundation, and the National Estuary Program. As a result, it optimizes grant opportunities offered by these agencies and groups. Further, it provides the most cost-effective and reliable option for achieving basin sustainability.

The plan achieves its goals in two phases: First it calls for a retrofit and leak repair program to begin immediately that applies the latest high-efficiency fixtures and appliances, targeting a 25% reduction in indoor residential water use. This is combined with an outdoor residential conservation-reuse program using xeriscape, graywater reuse, and/or rainwater harvesting, targeting a 50% reduction in potable outdoor water use. To promote water use awareness and program effectiveness, the first phase provides a professional water auditor to explain the program to homeowners and identify the most cost-effective, site-specific strategies. The plan also allows a portion of Phase I funding to go to non-residential strategies if they produce greater benefits.

The plan's second phase, calls for an ag exchange and urban reuse program implemented when the project goes on line to reduce pumping of the aquifers and pollution of the Los Osos watershed and Morro Bay National Estuary from nitrate fertilizer use.

The plan's first and second phases provide multiple benefits. In addition to reducing seawater intrusion, the first phase recharges the aquifers with clean rainwater, reduces energy use related to water and wastewater pumping, prevents stormwater pollution of Morro Bay Estuary, supplies aquatic and terrestrial ecosystems with freshwater flows, supports local businesses, and provides attractive landscaping features within the community. The second phase ensures Los Osos remains independent of imported water, and the basin stays healthy long-term.

The seawater intrusion mitigation benefits of this plan and its costs are as follows:

Phase I (conservation-onsite reuse-aquifer recharge)		
	Seawater intrusion mitigation=261 AFY (.55 x 474 AFY)	***Cost*=$9.6 million**
Phase II (ag exchange and urban reuse)		
	Seawater intrusion mitigation = 395 AFY (.55 x 718 AFY)	***Cost*=$3-4 million**
Total	*Seawater intrusion mitigation* = 656 AFY (.55 x 1192 AFY)	***Cost=$12.6-13.6 million***

The costs of the plan would be shared among water users in the basin, with about one-third going to Prohibition Zone residents. Additionally, costs would be reduced by grant funding, rebates, impact fees (for future development) and a reduction in the size, energy use, and related costs of the LOWWP—potentially covering the entire cost of the plan (see "Potential for Cost Reductions").

The LOWWP *Fine Screening Report* estimates the mitigation needed to stop seawater intrusion with implementation of the project is 550 AFY (Carollo Engineers, p. 2-3). This plan achieves that with a margin of safety. Thus, it builds water reserves and system resiliency in preparation for climate change impacts. The Governor's Executive Order S-13-80, signed November 14, 2008, requires project planning to account for the impacts of climate change, recognizing the particular threat sea level rises pose for coastal communities (see http://gov.ca.gov/executive-order/11036/). This plan prepares for those impacts.

Preserving the Los Osos Valley Water Basin long-term requires immediate and concerted action (see Appendix J for the progress of seawater intrusion). This plan offers a cost-effective way to halt seawater intrusion and begin preparing for the future, saving an invaluable resource for this and future generations, while setting a standard for sustainable development in the state and nation. The opportunity should not be wasted.

Introduction

The Los Osos Wastewater Project (LOWWP) affords a unique opportunity to address the Level of Severity III water shortage in the Los Osos Valley Water Basin—through an integrated planning approach that addresses water, wastewater, and stormwater all at once. Virtually all authorities and agencies in the fields of water basin management, environmental protection, and sustainable development emphasize the need for integrated, whole-systems planning to achieve sustainable watersheds and long-term water supplies.

Currently, basin recharge at Broderson (448 AFY) represents the entire reuse plan for the project, while basin planning is proceeding in a separate basin planning process, involving area water purveyors and the County. Meanwhile, most of the recycled water from the project is slated to be disposed of in spray fields outside of the basin, and the project's planned conservation element targets a 10% reduction, far under what is achievable with current water-saving technologies.

This plan offers an integrated solution that ensures seawater intrusion will stop within a few years of start up of the LOWWP. Consistent with sustainable development guidelines, it achieves this vital goal by applying appropriate technologies, green, and low impact development (LID) strategies in ways that maximize their benefits for the environment, the community of Los Osos, and the economy of the region. The plan also emphasizes the California Water Plan's three Foundational Actions for achieving sustainable water supplies: 1) Use water efficiently, 2) Protect water quality, and 3) Support environmental stewardship (CDWR, 2005 & 2008)

Calling for an integrated conservation-onsite reuse-recharge element as a first phase to start immediately, and an ag exchange-urban reuse element to begin when the LOWWP goes on line; it provides the most efficient and cost-effective way available to halt seawater intrusion.

Development of the LOWWP represents a unique opportunity to preserve the Los Osos Valley Water Basin, while making Los Osos a model of 21st Century sustainable watershed planning. Given the increasingly severe water shortages in California and worldwide, this opportunity must be optimized.

Current Water Use

This plan assumes daily indoor water use in the Prohibition Zone is 60 gallons per capita per day (gpcd). The estimate is lower than the per capita daily use assumed in the LOWWP *Fine Screening Report* and *Technical Memorandum: Flow and Loadings* (66 AFY gpcd), but it is consistent with the 2002 landmark study on California water use, *Waste Not, Want Not*, as well as studies done for the USEPA in 2003 and 2004 (Gleick et al., Mayer, et al.). Furthermore, the *Fine Screening Report* and TM estimates are based on Los Osos Community Services District (LOCSD) monthly charges, which include non-residential users.

The 60 gpcd figure reflects a conservative estimate for two reasons: 1) The 2002 LOCSD *Master Water Plan* estimate 14, 233 for the Prohibition Zone (used in the plan) most likely overstates the actual population of Los Osos (Note: The 2000 Census showed a total population for Los Osos of 14, 351. The Prohibition Zone represents less than 90% of the population of Los Osos, and a building moratorium has been in place since the census.); and 2) this plan intentionally chooses a low domestic water use figure, relative to the *Fine Screening Report's,* to avoid overestimating water savings and seawater mitigation benefits. If actual water use proves to be higher, this plan achieves greater benefits.

Based on studies of other coastal communities, this plan assumes outdoor use is about one-half of indoor use or one-third (33%) of total usage (30 gpcd), and based on the 2007 *Resource Capacity Study* for the basin, the plan assumes non-residential use in the Prohibition Zone is between 400 and 600 AFY (Gleick et al., SLO). (Note: The estimated total Prohibition Zone water use of 2000 AFY may not reflect the latest water use and/or may include relatively high amounts of leakage from the system. The LOCSD has been repairing leaks in the utility-owned distribution lines; leaks may now be concentrated onsite.)

Prohibition Zone Water Use

Indoor residential = 957 AFY (60 gpcd x 14, 233)
Outdoor residential = 479 AFY (30 gpcd x 14, 233)
Total residential = 1436 AFY
Class II (non-residential) = between 400 and 600 AFY
Total= approximately 2000 AFY (SLO)

Water Use Targets

Residential Indoor Targets

Gleick el al., in *Waste Not, Want Not*, estimate average water use per capita in California can be reduced from 60 gpcd to 37 gpcd without inconveniencing water customers. This is achieved by retrofitting homes with indoor water-saving fixtures and appliances (water-efficient toilets, washers, dishwashers, shower heads and faucets), while also fixing leaks (Gleick et al.). The studies done for the USEPA by Mayer et al. confirm indoor retrofits will cost-effectively reduce water use to around 40 gpcd, with homeowners giving high approval ratings to newly-installed fixtures (2003, 2004).

Since the Gleick and Mayer studies, high-efficiency fixtures have become even more water efficient, with consumer satisfaction seeing similar gains (Gauley, Veritec & Keoller). The Mayer et al. studies used ultra low-flow (ULF) toilets averaging about 1.5 gallons per flush (gpf); whereas, high-efficiency toilets (HETs) today use under 1.28 gpf. At least one toilet on the market (the one recommended in this plan), a Caroma Smart 305 dual-flush, uses of about 1 gpf on average (.8 gpf/1.28 gpf) (http://www.caromausa.com/smartRFP, EPA *Water Sense*).

Substituting the Caroma Smart toilets for toilets used in the Mayer et al. studies reduces total water use with conservation to under 40 gpcd (assumes the established average of about five flushes per day per person) (USEPA *Water Sense*). If high-efficiency clothes washers are excluded (because they're not included in this plan's basic retrofit package), average use is still under 45 gpcd (Mayer et al., 2003 & 2004). Thus, this plan sets a target of 45 gpcd, without high-efficiency washers.

To ensure the target is achievable the plan provides funds for 100% implementation within the Prohibition Zone (100% saturation), while allowing for less than full homeowner participation. It does this by 1) recommending money is allocated where it will do the most good, 2) enabling some homeowners to exceed targets, and 3) providing the services of a water auditor to promote the program and strategically apply strategies.

The plan's basic retrofit package includes two HETs, low-flow showerheads, faucet aerators, leak repairs, and auditing services; however, homeowners could also chose from a supplemental package of hotwater recirculators, high-efficiency washers, and/or toilet-lid sinks, if these achieved greater savings. Retrofit funding schedules and distribution policies would be determined on the basis of water savings potential.

Homeowners, working with water auditors, would decide how funding is best used once a basic level of water savings is achieved (i.e., high-use toilets are replaced and leaks are repaired). For instance, homeowners with 1.6 gpf toilets might decide to keep them, applying funding—allocated on the basis of potential water savings—to other options (e.g., hotwater recirculators or high-efficiency washers). Customers who can achieve the greatest water savings per capita (e.g., large families currently using a low-efficiency washers) would receive the largest funding incentives to reduce water use..

The plan also allows for funding to be allocated as rebates (or incentives) if greater savings can be achieved. Further, the plan recommends a tiered rate structure and a local conservation and/or landscape ordinance implemented concurrently with the plan. Rebates and ordinances can potentially reduce per capita use to an average of 40 gallons per day within the Prohibition Zone, exceeding plan targets and/or reducing allocated funding.

Residential Outdoor Targets

The plan's outdoor potable water use target (an average of 15 gpcd, down from 30 gpcd) is achieved through xeriscape, graywater reuse, and rainwater harvesting strategies. Gleick et al. indicate xeriscape can reduce water use up to 80% with plant selection and up to 50% with installation of drip systems, while rainwater and/or graywater systems can eliminate potable use altogether (pp. 71 & 73). Since rainwater and graywater recycling systems provide a new outdoor water source, they can allow total outdoor use to remain at, or near, current levels.

Residential Potable Water Use Reduction Targets

Indoor reduction 25% (from 60 gpcd to 45 gpcd average)
Outdoor reduction 50% (from 30 gpcd to 15 gpcd average)
Total reduction 33% (from 90 gpcd to 60 gpcd average)

Class II and Community Option

Finally, the plan allows for a portion of the funding for outdoor strategies to go to Class II (commercial/institutional/industrial) uses within the Prohibition Zone and/or to neighborhood rainwater harvesting, LID, and other reuse strategies—if they produce greater benefits. Upon closer examination of water use patterns (e.g., with water audits), it may be determined funding is best spent using green and appropriate technologies and strategies at schools and businesses, or in community rights of way and open spaces. If so, money can be directed to these sites (see "Class II Applications and Community Rainwater Harvesting").

Plan Description and Costs

Residential Indoor Strategies

***Water auditor*:** The services of a professional water auditor are provided to help homeowners understand the program (including the need for it), assess inefficient water use, and identify the best onsite strategies for achieving plan goals. In a recent phone conversation, Jamie Lean, Conservation Manager with the Atascadero Mutual Water Company, indicated that studies consistently show water auditing services reduce total water use in a community by 20%. She related that auditors for the Atascadero water company check both indoor and outdoors uses, often correcting problems at the time of the visit (e.g., replacing emitters in drip irrigation lines). While the auditors usually identify ways customers can significantly reduce water use, Jamie believes their most important function is customer relations. She says homeowners appreciate the personal service they receive, often don't realize they're wasting water, and are happy to make changes to benefit the community and environment. An important role of the auditors with this plan would be to convey the seriousness of seawater intrusion and the benefits of stopping it in the near future. Jamie estimates the average cost for a routine audit is about $150, which covers the company's costs for the auditor's time, training and other expenses. Auditors can typically complete about five audits per day on smaller properties (phone conversations, October 23 and December 8, 2008).

Leak Repairs: The Gleick et al. and other studies (e.g., the AWWARF study, 1999; Mayer et al. 2003 & 2004) point out that most leaks can be fixed relatively inexpensively by adjusting fixtures, appliances, and connections rather than replacing them. They also note that the majority of leaks occur in toilets (replaced in this plan), while leaks tend to be concentrated in a relatively small percentage of homes (AWWARF, Gleick, et al.). For these reasons, $100 per home is allocated in the plan, or $480,000 total ($100 x 4800 homes), to be used as needed.

***Indoor retrofits*:** This plan's basic retrofit package (two dual-flush HETs, low-flow shower heads, low-flow faucet aerators, leak repairs, and auditing services) provides the maximum water saving benefits for the money (Gleick, et al., Lean, Mayer et al.). The supplemental package includes hotwater recirculators, front-loading washers, and toilet lid sinks. (Toilet lid sinks are available

January 2009 for the Caroma 305 Smart toilet, per a phone conversation with John Garza, Caroma representative, November 20, 2008).

Purchased in bulk (i.e., orders of $6000 or more) a Caroma 305 Smart dual-flush toilet costs about $150 (for a round front model) (see Appendix D). This plan assumes the costs of low-flow shower heads and aerators for a typical home are about $50 total, based on the cost of a low-flow showerhead offered through Real Goods at $12 (www.realgoodscatalog.com).

The cost for installing the basic package is about $300, plus $50 for disposal of old toilets (per a conversation with a sales rep at Home Depot in San Luis Obispo. (Note: This is the cost for a retail customer having two toilets installed. It does not include travel costs, assumed to be incidental if installers perform several installations at a time, as proposed in this plan.). Installation of shower heads and aerators is assumed to be done by homeowners or as part of the toilet installation costs. Thus, the total cost of the basic retrofit package for this plan is $1000 ($ 700 for two toilets, low-flow shower heads, and faucet aerators, with installation and old fixture disposal; $150 for auditor services; $100 for leak repair; and a 5% contingency).

Homeowners with 1.6 gpf toilets would be able to install front-loading washers, recirculators, and/or toilet-lid sinks in lieu of toilets to achieve or exceed targets. As with toilets, the latest front-loading washers are more efficient than models used in the Gleick et al. and Mayer et al. studies, i.e., about 18 gallons per load (gpl) for a full-size washer as opposed to 22-24 gpl (per a phone conversation with a sales representative at Idler's Appliances in San Luis Obispo, November 19, 2008).

The cost for a hotwater recirculator is about $200, with professional installation assumed to be about $100, for a total of about $300. The cost for a toilet-lid sink is $89 (plus tax and shipping), and professional installation is not required (www.realgoodscatalog. com). The cost for a high-efficiency washer ranges from about $600 to $1500 (http://shopping.yahoo.com).

Residential Outdoor Strategies

Outdoor strategies include the full range of xeriscape techniques (native and drought tolerant plants, moisture retaining soils and mulches, maintenance and care techniques, drip irrigation and timers, low-flow hose nozzles, etc.). The California Department of Water Resources' (CDWR) "Landscape Water Use Conservation Methods" are provided in Appendix A, any of which can be used for this plan. Strategies also include graywater reuse and two types of rainwater harvesting, with tank storage and with earthworks retention and infiltration systems.

The plan allots an average of $1000 per home for outdoor strategies. Like funding for indoor measures, the money is allocated to achieve the greatest benefits (i.e., an average of 15 gpcd throughout the Prohibition Zone). Because plan allotments for outdoor measures don't cover full costs for several outdoor strategies in this plan, they must be applied as stipends or rebates.

Water auditors (provided as part of the indoor conservation package) will assess outdoor use, recommend strategies, and determine what percentage of the $1000 allotment to offer individuals, based on funding/rebate schedules, developed according to potential water savings.

This plan assumes the vast majority of homeowners in the Prohibition Zone will take advantage of outdoor rebates (also indoor rebates, if implemented) since rebates will be very generous (especially

with supplemental grant funding). Also, auditors will promote the program as they help homeowners identify effective strategies. Tiered rates and/or ordinances will provide incentives to homeowners, while its cost-effectiveness (e.g., relative to imported water or building desalination plant) should motivate homeowners to participate in the program (see "Implementation").

***Xeriscape*:** The water auditor will be able to help homeowners determine the best xeriscape techniques to use. Assuming a conservative average of two people per home in Los Osos (the 2000 Census indicated 2.4 per household) and reducing outdoor use to 15 gpcd, provides 30 gallons of water per day (210 per week and about 850 per month) for outdoor watering.

Per the 1995 State of California *Graywater Guide* issued by the Californa Department of Water Resources (CDWR), 210 gallons per week will irrigate about 1000 square feet of "low water using" vegetation, 600 square feet of "medium water using" vegetation, and 400 square feet "high water using" vegetation (CDWR). These square footages are measured as plant canopies or total plant coverage; therefore, 1000 square feet of coverage, even 500 square feet, with hardscape (patios) and other landscaping features (e.g., rock gardens), provide adequate vegetation to create attractive yards at most homes in Los Osos. The average-sized lot is 50 feet by 125 feet or 6250 square feet, with the house, garage, and driveway taking up about half. This leaves about 3000 square feet for landscaping; thus, low water-using vegetation would cover about one-third of an average-sized yard, and cover 100% of a smaller lot (e.g., 25 feet wide).

Currently, I use about 75 gallons per week to water my backyard landscaping. I have about 75 plants altogether, about 75% of which are drought tolerant, and I water with a standard drip system. If I double that amount to include my front yard (not yet planted), I'd be using well under 30 gallons per day (210 per week and 850 per month). My lot is average-sized for Los Osos (50' by 125'). Therefore, using a drip line and mostly drought tolerant plants allows the vast majority of Prohibition Zone homeowners to easily meet target reductions.

One of the most intensive uses of outdoor water is turf or lawns. Replanting these with drought-tolerant shrubs or grasses—or removing a portion of them—will greatly reduce outdoor water use (Gleick et al.) The $1000 allotment per home will cover a site design, materials, and possibly some installation, based on the installation estimates for the installation estimates for the integrated xeriscape-rainwater-graywater systems below.

***Graywater Systems**:* While xeriscape reduces outdoor water use, graywater and rainwater systems provide a substitute water source, allowing homeowners to meet plan goals without substantially reducing outdoor use.

According to Barry Tolle, of the San Luis Obispo County Planning Department, two basic systems are permittable in the county: those connecting just to the washing machines and those connecting to all graywater sources (bathroom sinks, tubs, showers and/or showers) (phone conversation, December 8, 2008). Since graywater may contain pathogens, systems are subject to the Uniform Plumbing Code, with enforcement falling to the County (in the case of Los Osos). According to Barry, graywater systems remain legal in the Prohibition Zone despite a zero-discharge designation by the water board.

Basic washer systems will provide between 10 and 30 gallons per day (gpd) for a two-person household (depending on the efficiency of the washer) (Asano et. al., Gleick et al., Mayer et al.).

Systems connecting to sinks, showers, tubs, and washers will produce over 50 gpd for a two-person household (Asano, et al.; Mayer et al.). Thus, the basic washer system will achieve plan goals (i.e., reduce outdoor potable water use to a 15 gpcd average), and more extensive systems will exceed targets by 200% or more.

Most homeowners in the Prohibition Zone will likely select a washer system over the more extensive systems for several reasons: 1) they're less expensive and easier to install (enabling more homeowners to install the systems themselves), 2) they don't require pumps (reducing costs and allowing more options for where graywater can be applied); and 3) their permits are less expensive and less hassle (i.e., $124 for an over-the-counter process versus about $625 for a process requiring on-site inspection) (conversation with Barry Tolle, December 8, 2008).

One obstacle to a basic washer system is the extensive code requirements for distributing water to landscaping. Barry Tolle explained that irrigation systems require installing a 3" leach line in a trench 96 feet long by one-foot wide, filled to a depth of one-foot with leach field rock (3/4 to 1 ½ inch in diameter). The leach line must be covered with 10 inches of soil, and specific setbacks apply, e.g., 5 feet from property lines, 10 feet from water lines, 10 feet from leach fields, 3 feet from ground water, 8 feet from building foundations, and 100 feet from water courses, streams, creeks, or lakes (Planning@co.slo.ca.us).

"Appendix J" of the "Graywater System Standards"—included as part of the 1995 *Graywater Guide* issued by the California Department of Water Resources (CDWR)—describes a "mini-leachfield" or "irrigation field" (assumed to be the system Barry describes). "Appendix J" sets trench depths at 17 to 18 inches, trench widths at 6 to 18 inches, and maximum allowable grades at three inches per 100 feet. Setback requirements vary slightly from those on the County website, e.g., 50 feet from streams and lakes, 5 feet from on-site domestic water lines, and 8 feet from foundations (2 feet with a water barrier approved by the "Administrative Authority") (CDWR, 1995, pp. 224.8 and 224.9—available at Planning@co.slo.ca.us).

Basic washer systems—with irrigation lines ("mini-leachfields"), permitting, and homeowner installation—are assumed be under $500 (based $40 per yard for 3.5 yards of rock and a conservative doubling of the costs for washer system and mini-leachfield materials in the 1995 *Graywater Guide*) (CDWR). Professional installation is assumed to be around $1000, based on the installation estimates for the integrated xeriscape-rainwater-graywater systems below, for a total cost of about $1500.

The cost for a graywater system connected to bathroom fixtures (plus a washer) is about $1500, including drip system materials, but not including installation or a permit fee (based on a doubling of costs in the 1995 *Graywater Guide)*. A commercially-produced 40-gallon BRAC system with a pump costs about $1900 (http://www.bracsystems.com). Drip system materials are assumed to be about $300 (based on a doubling of the costs in the 1995 *Graywater Guide*) (CDRW). Installation is assumed to be between $1500 and $2500 (based on the costs for installing the xeriscape-rainwater-graywater systems below and the cost to install a BRAC system (see Appendix C). With a permit fee of about $625, the total project costs for the above systems would be between $3600 and $4600 for the non-commercial system and $4300 to $5300 for the commercial system.

Note on innovative graywater systems: *The code requirements for a washer irrigation field (96 feet of trench, 3.5 yards of rock, numerous setback requirements, etc.) undoubtedly will limit the use of the systems, especially on small lots. At a recent local event sponsored by SLO Greenbuild, Art Ludwig of Oasis Design in Santa Barbara—one of the world's foremost authorities on graywater—highlighted the need to update graywater codes in California to bring them more in line with the codes of states like Arizona, which do not require permits for basic graywater systems as long as they meet basic criteria. Given California's water shortages and high energy demand from water and wastewater pumping, Art's concerns are well taken. Recently the California Legislature enacted SB 1258 (Lowenthal) calling for the relaxing of California's graywater regulations, reinforcing Art's point.*

To offer solutions in the short-term, Art suggested local authorities implement innovative programs and policies to promote graywater use. The Uniform Plumbers Code allows the "Administrative Authority" some discretion in how it implements standards (i.e., Under "Special Provisions"it states…"Other collection and distribution systems may be approved…")(CDWR, 1995, Appendix J, p. 224.8—available at Planning@co.slo.ca.us) Art mentioned a low-cost washer system he'd designed for Santa Barbara County (that, I believe, simplifies and/or reduces some of the requirements above). One suggestion he had is the issuance of blanket permits for a community like Los Osos with serious water shortages. Implementation of a standardized design with blanket permitting should be seriously considered for Los Osos. The LOWWP process offers an excellent opportunity to implement an innovative community-wide water-saving program. The integrated xeriscape-rainwater-graywater concept of Josh Carmichael (below) may be ideally suited for such program (see Appendix I).

Rainwater Harvesting Tank Systems*:* Rainwater tank systems will provide as much irrigation water as desired, limited only by tank capacity. An average roof in Los Osos will provide about 10,000 gallons of water per year with 12 inches of rain (HUD, Lancaster). Los Osos has about 16 inches of rain on average (Yates and Williams). Loomis Tanks, in Arroyo Grande, sells a complete 300-gallon gravity rainwater system for about $800, which can be expanded by adding tank capacity (see Appendix B). A 1500 gallon system from Loomis would cost about $1300 and a 2500 gallon system about $1800. These attach to rain gutter downspouts, and most homeowners would be able to install the systems themselves. A 2000 gallon gravity system installed would cost about $3200, and the same system with a pump would be about $4400 (see Appendix C). Combining a 2000 gallon system with xeriscape would meet plan goals.

Having space for rainwater storage onsite can pose a problem for some homeowners in Los Osos. Several solutions are possible. When homeowners connect to the wastewater system, they may be able to retain existing septic tanks, using them as cisterns for storage (usually 1000 gallon capacity). Homeowners can also have an underground tank installed. A complete rainwater filtering and pumping package for an underground tank is $1699, available through RainHarvest Systems (http://www.rainharvest.com). Also, "pillow" tanks, designed for installation below decks and in crawl spaces under homes, are available, e.g., through Rainwater Collection Solutions Inc. Complete systems cost about $4000, and the company furnishes complete do-it-yourself installation instructions on its website (http://www.rainwaterpillow.com/).

Rainwater Harvesting with Earthworks: In his book *Rainwater Harvesting*, Brad Lancaster provides a complete list of earthworks strategies. Some of these include berms, basins, terraces, swales, and French drains. Earthworks harvesting features are designed to capture, retain, and

percolate rainwater onsite (2008). Despite the sandy soils in Los Osos, during storms runoff from roofs, driveways, and other impervious surfaces collect and run off properties, often polluting the Estuary. Earthwork features capture the stormwater, optimize its benefits for trees and plants, filter and treat the rainwater via natural processes (e.g., microbial action in the soil) and allow the rainwater to percolate, eventually recharging the aquifers. They can reduce water use in Los Osos by enriching the sandy soil with organic materials (mulch). This promotes rainwater retention and infiltration, slows evaporation, spreads percolation, and ensures more complete water use by plants (Lancaster). Because they help prevent pollution of the Estuary, recharge aquifers, improve groundwater quality, and ensure adequate uncontaminated subsurface freshwater flows to sensitive ecosystems; they are particularly valuable for a Los Osos water basin management plan.

The $1000 allotment for outdoor strategies would cover professional consultation for homeowners, materials (e.g., stones, plants, mulch, and piping), and some installation (based on the Josh Carmicheal estimate for the combined system below). Homeowners would be responsible for the remainder of the installation.

***Integrated Xeriscape-Rainwater-Graywater Systems*:** This plan also recommends a bioswale design that combines xeriscape, rainwater harvesting, and graywater reuse in one feature, to achieve plan goals. Josh Carmichael of Carmichael Environmental has designed earthworks rainwater harvesting features at all scales (onsite and community), which also disperse graywater via a subsurface distribution systems similar to the washer irrigation fields mentioned above (see Appendix I).

Combining all of the outdoor strategies into one well-designed system can save money, time and space. These features add value by supplying an automatic flushing mechanism for the graywater system (periodic flows of rainwater) and a cost-effective alternative for yard restoration after installation of onsite wastewater components. Properly designed and installed, they should be a permittable option for homeowners in Los Osos to address the Level of III severity water shortage and help avoid or mitigate for the impacts of the project.

Josh estimates the systems will cost about $800 for site-specific designs and materials, and another $800 for installation, for a total of about $1600 (conversation, December 11, 2008). The cost of materials and installation for connecting the washer to the system is assumed to be less than $400 (a conservative estimate that doubles the materials price from the 1995 *Graywater Guide,* adding $250 for professional installation) (CDWR).

Summary of Residential Costs (Without Reductions)

Indoor strategies = $1000 per home average or $4.8 million total ($1000 x 4800 homes)
Outdoor strategies = $1000 per home average or $4.8 million total ($1000 x 4800 homes) (To be used as rebates toward full system costs.)
Total for both programs = $2000 per home average or **$9.6 million**

Class II Applications and Community Rainwater Harvesting
(including an alternative for the Broderson site)

Class II Strategies

This plan allows some of the funding to go for Class II applications (schools, institutions, or industry) if these strategies achieve greater overall benefits. With the high percentage of small lots in the Prohibition Zone, the level of conservation awareness, the widespread use of drought-tolerant plants, and reduced outdoor water use due to the LOCSD tiered rate structure—it is likely many water users in the Prohibition Zone are already meeting plan targets.

Distinguishing between residential and non-residential water use, currently, is difficult based on available data (e.g., LOCSD water use); thus, as water auditors evaluate current use during Phase I of this plan, they may find the most cost-effective approach for improving water use efficiency is retrofitting schools or other non-domestic sites—and/or encouraging xeriscape, graywater reuse, or rainwater harvesting among Class II customers (possibly through rebate programs).

Some non-residential water customers likely use more than 50% of their water out of doors (e.g., schools with large turf areas), while others (restaurants and retail stores) may have very high indoor use (e.g., public restrooms), multiplying the benefits of water-saving retrofits. Gleick et al. found the greatest potential for outdoor water conservation to be among Class II users, while the Association for Water Efficiency (AWE) reports large water savings are possible by retrofitting Class II customers. Furthermore, rebates for Class II users, in many cases, are more generous than for domestic customers, e.g., the $400 per toilet CUWCC rebate (CUWCC).

Community Strategies and Broderson Alternative

Outdoor funding might also be applied to the installation of community rainwater harvesting or LID features, strategically placed in a passive stormwater collection and infiltration system. Rainwater harvesting/LID systems can often be installed at very low cost, producing considerable benefits. Josh Carmichael estimates that a landscaped bioretention system on several blocks of the undeveloped portions of Pismo Street—designed to prevent stormwater run off to the Estuary, infiltrate the rainwater, restore habitat after installation of a section of the wastewater collection system, and provide a community parkway (see Appendix H)—would cost about $10,000 to install (conversation, December 11, 2008).

Brad Lancaster and other authorities emphasize that watershed management and runoff control should start at the top of the watershed where runoff originates. Stopping run off onsite is one way to do this, but stormwater also originates in public rights-of-way and on other public lands. If community/neighborhood systems are constructed to capture overland run off or overflows from onsite systems in key locations during heavy storm events, it may be possible to stop virtually all stormwater pollutants from entering the Estuary.

Well-designed community and neighborhood systems, strategically located and designed to achieve the dual benefits of preventing runoff and maximizing groundwater recharge, will potentially achieve both water quality goals and recharge goals more effectively than any other approach—including the centralized effluent recharge strategy at Broderson (see "Benefits of this Plan over Recharge at

Broderson"). Furthermore, they can do it much more cost-effectively, as indicated by the Pismo Street plan mentioned above.

If the Broderson site were used as a rainwater recharge site instead of an effluent recharge site, capturing overland runoff from the hills above the site and allowing stormwater to infiltrate and percolate to the groundwater, several goals would be achieved: 1) stormwater runoff would be controlled before it becomes a greater problem downhill, 2) ground water would be recharged with clean rainwater (rather than recycled wastewater containing trace contaminants), 3) the site could be used to mitigate for habitat loss at the Midtown site, 4) the planned replacement of the Broderson leach fields every 5-10 years and resulting habitat destruction would be avoided (Carollo Engineers, 2007, p. 2-24), 5) the high energy costs for pumping recycled water uphill to the Broderson site would be avoided, and 6) the Broderson site would remain community owned (an integral part of a water-wastewater-stormwater project), providing open space, passive recreation opportunities for the community, and a buffer between urban development and surrounding habitat.

This solution for Broderson would be a fraction of the cost for Broderson leach fields (in the tens to hundreds of thousands of dollars, rather than $ 3-5 million), and it would save the $160,000 per year in estimated energy costs, not counting periodic leach field replacement costs and the monitoring wells needed for the project (Carollo, 2007, pp.2-11, 2-12 & Table A1).

A rainwater harvesting system, either a tank or earthworks system (e.g., a constructed wetlands) might also be constructed or installed at the Midtown site to capture and infiltrate runoff from curb-and-gutter neighborhoods above the site. This would beautify the area, create recreational opportunities, increase natural habitat, and help restore the original vision for the site.

Also, the run off that collects on 2nd Street in Baywood could be routed into neighborhood raingardens and/or rainwater harvesting tanks to be infiltrated for groundwater recharge or used by the two inns in the area. Currently, large volumes of stormwater drain into the bay, even in moderate storms, through culverts near the 2nd Street pier. If the rainwater were captured and infiltrated—or used for irrigation at the inns in drier months—both the bay and ground water would significantly benefit.

The 2001 *Los Osos Drainage Feasibility Report* recognized the considerable potential for improving stormwater control and beneficial uses of rainwater in many areas of the community, including the Broderson recharge site. Instead of using the Broderson site for leach fields, it suggested creating a rainwater detention/infiltration basin (Natural Systems International, LLC.).

The *Feasibility Report* provides an excellent analysis and many practical community/neighborhood rainwater harvesting solutions. These community systems, as part of an integrated mitigation approach for the project, would help avoid harm to the basin from removal of septic flows and restore habitat after installation of LOWWP. They would do so cost-effectively, adding value with their many co-benefits. For the price of Broderson leach fields, multiple rainwater harvesting/community green spaces could be constructed, helping to restore the basin's natural hydrology and providing sustainable solutions for recharge of the basin.

Ag exchange and Urban Reuse

Ag Exchange

This plan calls for ag exchange and urban reuse as a second phase to maximize the benefits of recycled water from the LOWWP. Of these two options, ag exchange will produce the greatest benefits for several reasons: 1) it has the potential to offset more seawater intrusion cost-effectively (Carollo Engineers, January 2008), 2) effluent treatment levels for many agricultural uses are lower than for urban reuse reducing treatment requirements and costs Carollo Engineer, April 2008), and 3) applying nutrient-rich water on ag lands will decrease the use of nitrogen and phosphate fertilizers in the watershed, reducing pollution of groundwater and surface waters (e.g., the Estuary). Ag exchange also reduces the cost of fertilizers for farmers, as well as their energy use for pumping groundwater, providing them strong incentives to participate in the program.

The first phase of this plan reduces wastewater flows through indoor conservation to about 718 AFY (.75 x 957 AFY). When combined with the indoor non-residential use (at least 200 AFY, or half of the most conservative estimate for total non-residential use in the Prohibition Zone), it represents the approximate amount of recycled water available for ag exchange and urban reuse (about 920 AFY). This amount would be reduced by the amount of graywater reuse occurring in the Prohibition Zone because graywater use redirects indoor water outside, decreasing total septic flows. Applying only the recycled water from residential sources (718 AFY), ag exchange mitigates 395 AFY of seawater intrusion (0.55 x 718 AFY). This, combined with the mitigation from the indoor and outdoor strategies above, should completely stop seawater intrusion, with a margin of safety, within a few years of start up of the project (Carollo, 2007; Cleath & Associates, 2005; Ripley; SLO).

The remainder of the 920 AFY of recycled water (about 200 AFY) can be used for urban reuse, an ag project at the treatment site to sequester carbon. It can also be used to allow a very favorable exchange rate for farmers to encourage their participation in the programs. Whether ag exchange occurs inside or outside the basin, it will benefit ground and surface waters by reducing pumping of the aquifers and the use of applied fertilizers in the basin (Ripley).

Present and past basin planning has identified the Creek Compartment (the basin east of Los Osos Creek) as a likely source of potable water to offset lower aquifer pumping in ag exchange programs (e.g., Cleath and Associates, 2005). The LOWWP *Technical Memorandum: Effluent Reuse and Disposal Alternatives* estimates there is a potential to reuse from 460-690 AFY of recycled water in the basin (almost all in the creek compartment); thus, a large percentage of the recycled water under this plan could be reused within the basin.

Although the Creek Compartment has less influence on seawater intrusion than reduced pumping of the Western Compartment, seawater intrusion mitigation can be enhanced if more water is provided to farmers in the basin than is pumped. Therefore, if some ag reuse is implemented along with ag exchange, additional seawater intrusion mitigation will be achieved (especially long-term—since water from this part of the basin eventually affects seawater intrusion) (Cleath & Associates, 2005).
The *Fine Screening Report* estimates the cost of ag wells is about $.75 million and the cost of a return line for recycled water is about $1 million (assumed to be equal in cost to a line to spray fields) (Table 1). Ag exchange storage is estimated to be $1-$2 million, based on the cost of spray field ag storage in Table 1 (adjusted for smaller total flows resulting from this plan) (Carollo, 2007). These minimal costs would likely make ag exchange the most cost-effective alternative to mitigate seawater

intrusion (if project costs are not counted), even if the water from ag wells requires treatment before distribution (i.e., 395 AFY for a capital cost of less than $4 million).

Note: The relatively low cost for ag exchange is one reason it is recommended in this plan. However, experts agree (e.g., Gleick et al. and AWE) that conservation is the most reliable and cost-effective way to extend water supplies, in part due to its energy saving benefits. Therefore, the most cost-effective approach may be to extend the conservation and onsite reuse components of this program to the entire community, relying more on water efficiency and less on ag exchange. The approach may also allow for more rapid implementation of the plan and a quicker end to seawater intrusion.

In any case, negotiations with farmers, inside and outside the basin, should begin immediately. The Ripley Pacific Los Osos Watewater Management Plan Update estimates 392 AFY of recycled water can be used on ag lands within five years of start up of the project. If negotiations begin now, and initial offers are very attractive (e.g., high-quality water at exchange rates that favor the farmers), it is likely a substantial percentage the 392 AFY e.g., 100 to 200 AFY, could be negotiated by project start up. With 392 AFY of ag exchange added to the Phase I seawater intrusion mitigation achieved by this plan, present seawater intrusion can be stopped with a margin of safety (i.e., allowing for limited buildout) (see "Seawater Mitigation"). The very strong incentives for participation should be emphasized: a reduction (possibly the elimination of nitrate fertilizer use), a substantial reduction in energy consumption required to pump groundwater, and a way to comply with Regional Water Quality Control Board regulations aimed at reducing nitrates in the area. If the treatment site for the project is at Tonini, farming operations nearby would allow for convenient (possibly gravity flow) distribution of recycled water. Also, the Tonini site itself provides a source of ground water that can either be pumped back to the community or blended with recycled water to improve its quality for ag use.

Urban Reuse

Urban reuse will also provide seawater intrusion benefits. The *Fine Screening Report* and *Technical Memorandum: Effluent Reuse and Disposal Alternatives* estimate about 60 AFY of outdoor potable water use can be offset at sites west of Los Osos Creek, with another 50 AFY applied at the cemetery. Note that this estimate (i.e., the potential for in-town use of recycled water by large users) seems low, relative to estimated outdoor use for non-domestic customers (see "Current Water Use"). These estimates should be reviewed. Nevertheless, a purple pipe system for the largest urban users may be cost-effective. On the other hand, recycled water for urban reuse must be treated to high standards, and residents may object to its use for applications such as schools; thus, a more environmentally, socially, and economically feasible approach may be to allow large users to develop upper aquifer wells (staying within aquifer safe yields) as part of an overall basin management plan. Another possibility—consistent with sustainability guidelines—is for large users (e.g., schools) to have their own satellite wastewater treatment facilities, recycling water to tertiary standards for onsite outdoor use.

Potential Cost Reductions

1) This plan's emphasis on conservation and integrated water-wastewater-stormwater management optimizes opportunities for grants and other private and governmental incentive programs (e.g., low interest loans).

State and federal grants focus on integrated watershed planning and water-use efficiency, as well as LID and other sustainable strategies that save energy and multiply benefits. This plan achieves many of the goals and initiatives of various groups (e.g., the National Estuary Program and Central Coast Regional Water Quality Control Board) through an integrated approach

2) Established rebate programs are available to support this program.

The California Urban Water Conservation Council (CUWCC) offers rebates for Best Management Practices, BMPs, many of which are the strategies and practices proposed in this plan (i.e., up to $100 for HETs and $200 for high-efficiency washers. PG&E offers rebates on front-loading washers because they save the energy needed to heat a pump water for washing. Note that the County or water purveyors would have to be CUWCC members and participate in a rebate program for users to qualify for rebates. Among local water purveyors and agencies, Golden State Water Company is the only member, but it does not appear on the CUWCC website listing participating rebate program members (http:// www.cuwcc.com/smartrebates-utilities.aspx.).

3) A rebate approach for this plan may achieve goals at lower total costs.

If a rebate strategy is used effectively, it can save 25% or more of total costs. The conservation program recommended in the DEIR ($1 million for a 10% reduction in water use by buildout) assumes homeowners will pay for the installation of toilets; thus, it does not plan to fully fund a retrofit program. The DEIR indicates homeowners may be mandated to install the toilets as a condition of hook up to the wastewater project. This plan recommends an ordinance is enacted to encourage participation. In combination with generous rebates, an ordinance may achieve benefits equivalent to fully funding the retrofits (Carollo Engineers, 2007). *(Note: A good way to determine the potential effectiveness of conservation rebates is to include related questions on the LOWWP Community Survey.)*

4) A percentage of LOWWP funding allocated for the repair and restoration of yards and street rights-of-way disturbed by the project can go to this plan.

Project money that would go to repairing yards or street rights-of-way where wastewater lines are installed can go toward onsite or neighborhood rainwater harvesting features, which also provides a community green spaces. Also—rather than septic tanks being crushed—they can be used for rainwater storage for landscape irrigation.

5) If Los Osos has a relatively high percentage of inefficient fixtures (e.g., 5-7 gpf toilets) or leaks in homes, this plan will achieve water reduction targets with less that the estimated costs.

6) Project costs, especially long-term O&M costs, can be offset with "work trade" programs.

These programs would allow area residents to earn "water credits" toward payment of their water bills in exchange for helping to maintain community amenities such as rainwater harvesting/parkway features (conversation with Josh Carmichael, December 11, 2008).

7) The LOWWP costs for Broderson leach fields ($2-4 million), the $1 million for conservation, and some of the spray field-related expenses (e.g., some of the cost for land acquisition, maintenance machinery, and O&M—$1-3 million) can be applied to offset the costs of this plan.

(Also see Appendices F & G for grant programs, innovative programs, and internet links.)

Dividing and Covering Plan Costs

Dividing Plan costs

The cost of this plan may be apportioned among various groups of water users in the community on the basis of the how much seawater intrusion each must mitigate to offset its impacts (i.e., how much each group benefits). The total water use in the Western Compartment of the basin, where seawater intrusion is occurring, is 2520 AFY (including all water supplied by water purveyors and private domestic water use (SLO). Seawater intrusion is occurring at a rate of 460 AFY (Carollo Engineers, 2007; SLO), and the percentage of water used by the Prohibition Zone is 57%, or 1436 AFY (per this plan) of the 2520 AFY currently pumped. When this plan's total seawater mitigation potential is divided by total costs (656 AFY/$13.6 million—see "Seawater Intrusion Mitigation"), the cost per acre foot of mitigation is $20, 732. Thus, plan costs can be divided as follows:

Residential—Prohibition Zone = 262 AFY (57% of 460) *$5.4 million*
Class II—Prohibition Zone = 73 to 106 AFY (15.8-23% of 460 AFY) *$1.5 to $2.2 million*
Residential & Rural Residential—outside Prohibition Zone=97 AFY (21% of 460 AFY) *$2 million*
Future Development —inside and outside Prohibition Zone=about 190 AFY, *about $ 4 million*

> (Note: For the purposes of this plan, total seawater intrusion at buildout (i.e., necessary mitigation) is assumed to be about 600 AFY, with 56 acre feet of additional mitigation to provide a margin of safety (i.e., bank water in the aquifers). Future development is shown as paying for the margin of safety in calcuations; whereas, the margin would likely be spread evenly. The calculations also assume the costs of rainwater harvesting/LID strategies called for in this plan costs are equally divided and mitigate for removing septic return flows.)

Covering Plan Costs

Prohibition Zone Costs (residential and non-residential)*:* The costs for the Prohibition Zone can be added to the cost of the project—less grant funding and other cost reductions, e.g., elimination of Broderson leachfields. Deducting the $2-4 million for Broderson leach fields leaves total costs well under $5 million. With other cost reductions, e.g., related to reduced spray field use, water storage, and wastewater pumping, the Prohibition Zone's share shrinks further, possibly becoming cost neutral or a net reduction in LOWWP costs.

***Residential & Rural-Residential—outside Prohibition Zone*:** These costs can be covered by grants or low interest loans obtained by either the County or the water purveyors. The loans will be repaid via water rate increases and/or assessments.

***Future Development —inside and outside Prohibition Zone*:** All the costs for future development will either be paid via Proposition 218 assessments (e.g., for undeveloped properties inside the Prohibition Zone) or impact fees collected with building permit fees. To achieve plan goals by startup of the project, the County or water purveyors would cover costs with grants or loans, repaid as building occurs.

Plan Benefits/Cost Effectiveness

Capital Costs of This Plan Compared to Capital Costs for Imported Water

This plan:
Phase I = *$20, 253/AF* ($9.6 million/474AFY)
Phase II = *$5,571/AF* ($ 4 million/718 AFY)
Total plan = *$11,409/AF* ($13.6 million/1192 AFY)

Imported water:
Nacimiento = *$22,000/AF*
State water = *$40,000/AF*

The above costs for Nacimiento and state water are based on the LOWWP *Technical Memorandum: Imported Water* (pp. 12 & 17). They include capital costs (plus buy-in costs for state water) only. They do not include the costs of imported water per acre-foot (AF) per year, which the TM states is $1180 or about $.56 million per year for 474 AFY. The County *Resource Capacity Study* estimates the cost for desalinated water is $4000/AF (2007, p. 12).

The Gleick et al. study provides a complete cost analysis of various conservation and outdoor water-efficiency measures, with energy savings and water savings calculated over the life of each fixture or measure. The study concludes that all residential conservation measures, including leak repairs and outdoor "irrigation management measures" (i.e., the same ones recommended in this plan) are cost effective when the cost of water is $580 acre feet or more (p. 118). Other studies (e.g., the 2003 Mayer et al. and 2008 Veritec & Koeller studies) conclude indoor conservation measures (toilets, shower heads and washers) are cost-effective.

Of course, the capital costs for the ag exchange called for in this plan do not include the costs of negotiating contracts or obtaining permits. However, this is also true for imported water and desalination, both of which must clear many permitting and approval processes before they are implemented—in fact, many more than for ag exchange. The *Technical Memorandum: Imported Water* points out, the legal costs and difficulties of negotiating water rights with the City of San Luis Obispo, etc., for both Nacimiento and state water could be significant. Further, the costs of imported water do not reflect the potential unreliability of both water sources as climate change impacts them. Recently, communities contracting for state water were told they would receive only 15% of their allotments. Lake Nacimiento water levels and quality are also likely to be impacted by global warming in the future, while the source is bound to experience greater use impacts as local communities shift reliance away from state water.

Seawater Intrusion Migitation

Phase I (by start up of the project):

Reduced pumping of aquifers = 474 AFY (33% x 1436 AFY)
Seawater intrusion mitigation = 261 AFY (.55 x 474 AFY)

Phase II (within 2-5 years of start up of the project)*:*

Reduced pumping of the aquifers = 392 AFY
Seawater intrusion mitigation = 216 AFY (.55 x 392 AFY)
Total for Phases I & II =477 AFY

Seawater Intrusion Migitation (cont.)

Phase II (within 10 years of start up of the project) **(includes the first 2-5 years of Phase II)**:

Reduced pumping of the aquifers = 718 AFY (Ajusted downward by graywater reuse)
Seawater intrusion mitigation = 395 AFY (.55 x 718 AFY)

Total of Phases I & II**:**

Reduced pumping of aquifers = 1192 AFY (474 AFY + 718 AFY)
Seawater intrusion mitigation = 656 AFY (.55 x 1192 AFY)

The *Fine Screening Report* estimates about 550 AFY of mitigation is needed to stop seawater intrusion when the project goes on line, with about 681 AFY of mitigation needed at buildout (p. 2-3). Thus, this plan should stop seawater intrusion, with a margin of safety. The margin of safety allows water banking (building water reserves in the aquifers) to prepare for climate-related impacts, such as sea level rises (which requires raising aquifer levels). The eventual expansion of this program to other parts of the community and/or expanded ag exchange should fully balance the basin at buildout with a margin of safety.

Note: This plan emphasizes ag exchange (Phase II) to mitigate for the portion of seawater intrusion resulting from future water use outside of the Prohibition Zone, in part due to the cost effectiveness of ag exchange. However, ag exchange will take longer to implement than conservation, and is not as reliable a source of water. Therefore, conservation measures may need to be emphasized to a greater extent than presented here for these users to achieve basin balance with a margin of safety (e.g., to keep pace with any development that occurs after start up of the project. Also, the conservation ordinances recommended in this plan, if implemented, could result is less need for ag exchange water to balance the basin and the possibility of using water to generate revenue for the community (see "Future.")

Building in a margin of safety—along with immediate implementation of measures, including negotiations with farmers—is essential to successful basin management plan, given the uncertainties of climate change. Governor Schwartzenegger on November 14, 2008 signed into effect Executive Order S-13-08 requiring new projects (and recommending projects under development) to "consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise" (Item No. 5) (see http://gov.ca.gov/executive-order/11036/).

Other plan benefits

1. ***Reduces LOWWP costs and energy use***—reduces wastewater pumping, energy use, and GHG production.
2. ***Reduces community and farm water costs and energy use***—reduces potable water heating, pumping, and GHG production .
3. ***Protects costal ecosystems***—Reduces surface water pollution from runoff and ensures ample water clean supplies to sensitive area ecosystems, e.g., the Estuary, creeks, and terrestrial habitats.
4. ***Improves Water quality efficiently***—Increases the rate at which the water quality of the upper aquifers improves by recharging it with clean rainwater, rather than recycled water, and protects the quality of the unpolluted upper and pristine lower aquifers by reducing total aquifer pumping, allowing longer residence time for water (i.e., slower turnover rates)
5. ***Maximizes the beneficial uses of water sources—***Allows maximum use of the lower aquifer for drinking, the upper aquifer and recycled water for urban and ag irrigation, and rainwater for aquifer recharge.
6. ***Supports the health of the Watershed—***Reduces nitrate pollution entering the ground water and surface waters by reducing fertilizer use, with recycled and/or blended (recycled and upper aquifer water) with nitrate levels for optimal for ag exchange and urban reuse.
   Note: The Morro Bay National Estuary Program (NEP) and Central Coast Regional Water Quality Control Board (CCRQCB) fund a variety of projects supporting the health of the local watersheds and Morro Bay Estuary

(**Also see Appendix K for a list plan benefits for the three major systems affected by the project: environmental, social, and economic.**)

Implementation

The goals of this plan will likely be best achieved with concurrent enactment of two ordinances, one requiring indoor retrofits and the other requiring outdoor conservation-reuse measures. Both could require compliance as a condition of hook up to the LOWWP and/or trigger rate increases (or other consequences) for non-compliance.

Prior to the previous Los Osos Project, the LOCSD approved a conservation ordinance aimed at a 20% reduction is indoor water use (see Appendix D). The ordinance (# 2004-01) cited reduced groundwater pumping and reduced effluent flows to the treatment plant as justifications. Compliance was a condition of hook up to the wastewater project, with increases in sewer service charges resulting from non-compliance, barring a hardship exemption . It was funded with a grant from the State Water Resources Control Board (SWRCB).

Currently, all reuse alternatives for the LOWWP include a 10% conservation toilet retrofit program. While it is not certain how this will be implemented, the most reliable mechanism is to condition compliance on hook up to the wastewater system. Clearly the same conditions can apply to this plan.

A number of communities have developed outdoor water use efficiency ordinances (see example in Appendix E), and state law requires an outdoor ordinance by 2009 (AB 2717 and Article 10.8 of the California Government Code). An outdoor efficiency ordinance targeting a 50% reduction (as

recommended in this plan) is more ambitious than other ordinances, but it sets a standard other communities in California are likely to emulate in the future.

The nexus between a conservation-reuse-recharge plan and the LOWWP is clear. Indoor conservation will reduce wastewater flows; therefore, it has a direct effect on the cost and size of the project. Further, outdoor measures are needed because the project will remove water from the basin, necessitating mitigations to reduce seawater intrusion, enhance basin recharge, and ensure subsurface flows to sensitive ecosystems. Since the exact effects of the LOWWP are not known (e.g., the effects of removing septic return flows from the basin, on seawater intrusion and the Estuary), erring on the side of caution is prudent and justified. Furthermore, this plan recognizes the reality that seawater intrusion, caused by human impacts on the environment, is polluting a natural fresh freshwater source and threatening its beneficial uses at a faster rate than nitrate pollution (Cleath and Associates, 2005; Yates and Williams). The approximately $14 million dollars it will take to address this source of pollution, makes it the most cost-effective component of the project relative to beneficial impacts on groundwater pollution.

Finally, the County is able to implement measures to effect basin balance as the lead agency in charge of managing the basin (per conversations with Paavo Ogren, Public Works Director, and John Ogren, Project Engineer). Further, AB 2701 specifically grants the County the right to implement this plan. Referring to the County's implementation of the project, AB 2701 states: "These efforts may include programs and projects for recharging aquifers, preventing saltwater intrusion, and managing groundwater resources to the extent that they are related to the construction and operation of the community wastewater collection and treatment system" (emphasis added) (Government Code, Section 25825.5 c).

Reasons for concurrent implementation with the LOWWP

1. Stops seawater intrusion and balances the basin as soon as possible (i.e., saving as much of the most valuable water in the basin as possible, the lower aquifer—3000-7000 year old water not affected by modern contaminants.)

2. Enables the considerable resources assembled for the LOWWP (both financial and human, including consultants and lobbyists) to achieve greater benefits more cost-effectively (e.g., seek grant funding at state and federal levels for conservation and beneficial reuse).

4. Ensures all impacts from the project are avoided or safely mitigated, i.e., the project will not harm the resources and ecosystems it is meant to protect.

5. Reduces total water management costs (i.e., for water, wastewater, and stormwater) through integrated planning and implementation (e.g., avoids duplicated costs).

6. Begins to capture the environmental and cost benefits of stormwater management and conservation immediately (e.g., reduced energy use from pumping and heating potable water and reduced pollution of the Estuary).

7. Provides an effective mechanism for implementation of the plan (i.e., homeowners would implement strategies as a condition of hook up to the project).

The conservation plan and ordinance proposed prior to the previous project had this condition, and the current conservation plan apparently does also, per the LOWWP DEIR.

8. Avoids the possibility of a protracted ISJ process that may not ultimately balance the basin.

Historically, water purveyors have not been inclined to take dramatic steps to lower production via strong conservation and reuse measures; therefore the primary cause of seawater intrusion (overdraft of the aquifers) is not likely to be addressed immediately (LOCSD). Instead, Broderson recharge will likely be the focus of current basin planning efforts to enable purveyors to continue a relatively high level of production by shifting it to the upper aquifer—although the strategy won't achieve basin balance (see "Benefits of this plan over recharge at Broderson"). The Golden State Water company, along with several agencies and organizations e.g., the CUWCC and Pacific Institute) signed a letter to the California Public Utilities Commission (CPUC) in 2006, explaining the disincentives for water purveyors to aggressively pursue conservation. It suggests decoupling rates from water use and financial incentives, for water purveyors, including the ability to finance conservation measures with bonds. Through grant funding and integrated implementation, this plan should enable the profitability of the program for purveyors. Another approach is to define conserved water a new water source, as Sonoma County did, to enable water purveyors to adjust water rates accordingly (Hulme). Conserved water, stored for the future when the cost of water will be higher, is a good investment for water companies and citizens. In the future, water companies, the LOCSD, and County will undoubtedly have to assume greater responsibility for conservation, in order to sustain water supplies. Forward-looking companies and agencies are making conservation a centerpiece of their operations by implementing the CUWCC's Best Management Practices (BMPs) and hiring water-use efficiency/conservation experts, such as Jamie Lean of the Atascadero Mutual Water Company.

Benefits of this plan over recharge at Broderson

1) The specific benefits and potential harm of a Broderson recharge strategy are not known (e.g., for the upper aquifer, lower aquifer, the Estuary, or nearby homes).

Jeffrey Mosher, director of the National Water Research Institute (NWRI) related in a phone conversation on November 1, 2008, that NWRI panel members were not convinced Broderson would achieve either of its intended purposes: recharge the upper aquifer or mitigate seawater intrusion in the lower aquifer. Studies of the Broderson option have raised questions about its benefits, as well as its potential harms to homes and ecosystems downhill from the site, while its construction and periodic leach field replacement will harm coastal dune habitat on the site itself (Carollo Engineers, 2007, p. 2-24). The 2005 *Draft Water Management Plan* highlighted the lack of certainty of a Broderson strategy by recommending upper aquifer water downhill from the site is tested "to determine the actual production and water quality constraints on the upper aquifer use for potable supply," adding that "supplemental water sources for up to 560 AFY (should be) actively pursued" (Cleath and Associates, 2005, p. 10). Even with Broderson operating at full capacity per the previous project (about 900 AFY of recharge), and other recharge sites recharging another 500 AFY or so, the *Draft Plan* states "255 afy of supplemental water" (i.e., imported water) will be needed at build out" (p. 21). The Yates and Williams study in 2003 (predicting the previous project's affects on nitrate levels in the

groundwater) found recharging at Broderson with recycled water would slow the rate of nitrate reduction in the basin due to the relatively high nitrate levels in the recycled water (7mg/l required for the previous project) (p. 20; Carollo Engineers, 2007, p. 2-23). It also projected groundwater levels in upper water zones would drop 10 feet, completely drying up in some locations (p. 18). These facts show that a plan relying on Broderson has significant risks, while it will not ultimately balance the basin. Implementing the LID recharge strategies in this plan, in combination, with the significant reductions in lower aquifer pumping via strong conservation measures, is much more likely to balance the basin without the need for imported water.

2) This plan provides the most direct and certain way to stop seawater intrusion and balance the basin—reduced pumping of the basin.

The relative benefit of reduced pumping (with conservation and reuse) versus Broderson recharge is clearly reflected in the mitigation factors assigned to each in the *Fine Screening Report*—a 0.55 for conservation/reuse versus a 0.22 factor for Broderson recharge (p. 2-4). The 0.22 factor is based on scientific analysis and hydrogeologic modeling with a substantial level of uncertainty; the 0.55 factor appears to be based on a more direct calculation of how much will be pumped from westside wells where seawater intrusion is occurring versus wells on the eastern side of the Western Compartment when pumping is reduced (Carollo Engineers, 2007, p. 2-4). Logically, when all the pumping from westside wells stops, seawater intrusion should stop. Given the basin's complex hydrogeology (i.e., five distinct aquifer zones functioning independently and interdependently, divided by clay layers of varying thicknesses), the 0.22 factor (not explained in the *Fine Screening Report*) is likely based on several estimations (e.g., the approximate percentage of septic flows recharging the upper aquifer multiplied by the percentage of lower aquifer recharge from the upper aquifer). These estimates would be estimates of total recharge when sources are distributed throughout the basin (as it is now); thus, 0.22 could easily overstate the benefits of a centralized recharge strategy at Broderson (Cleath and Associates, 2005; Yates and Williams).

3) This plan provides greater flexibility in how potential project impacts to the upper and lower aquifers can be avoided; Broderson recharge relies on shifting production from the lower aquifer to the upper to protect the basin—a strategy that may not work (Cleath & Associates, 2002, 2005).

Shifting production to the upper aquifer, ultimately does not balance the basin, and it can cause over drafting of the upper aquifer resulting in seawater intrusion. The upper aquifer's safe yield, with septic return flows, is 1150 AFY (in the Western Compartment). About 800 AFY is currently being pumped (DEIR). Therefore, shifting 900 to 1000 AFY of production to the upper aquifer (enough to stop all pumping from the western-most lower aquifer wells) will overdraft the upper aquifer (Carollo Engineers, 2007, p.2-5). Cleath and Associates reports that the upper aquifer is only "relatively stable" with the potential for seawater intrusion "during extended drought periods" (2005, p. 27). Further, the upper aquifer's safe yield will go down when septic return flows are eliminated (Carollo Engineers, 2007, p. 2-5). The *Fine Screening Report* estimates septic return flows for the Prohibition Zone contribute about 850 AFY of recharge to the upper aquifer (Carollo Engineers, 2007, p. 2-21). This represents 28% of upper aquifer recharge (2995 AFY), based on total aquifer inflow estimates from the LOWWP Draft EIR (DEIR) (see Appendix D-2, Table 8). The Yates and Williams study estimates septic return flows are closer to 36% of basin recharge (Table 4). Since these reports/studies are based on modeling, with a level uncertainty, it is prudent to err on the high side (i.e. 900-1100 AFY) when estimating the total septic flows contributing to upper aquifer balance. If about one-third

of the upper aquifer recharge to the basin is removed, it is very possible the current levels of pumping will exceed the upper aquifer safe yield post septic systems (even if Broderson recharges the upper aquifer at 448 AFY). (Note: The DEIR appears to have underestimated septic return flows to the upper aquifer at 600 AFY. When upper aquifer balance estimates (e.g., Appendix D-2, Tables 9 & 10) are reduced by 250-500 AFY (i.e., the inflow from septic systems apparently not counted), the upper aquifer appears to be out of balance with Broderson recharge (DEIR). Thus, a plan like this that reduces pumping of the entire basin to well within safe basin yields—and also allows the flexibility to reduce pumping from the upper aquifer if necessary—is needed to prepare for the impacts of an LOWWP. It is worth noting that Cleath and Associates had to revise its 2002 basin safe yields down about 300 AFY in 2005 because seawater intrusion was progressing faster than expected (SLO). Therefore, a margin of safety must be built into safe yields to protect the basin—also to bring water tables up in preparation for sea level rises.

4) This plan will likely provide a more cost- and environmentally-effective means of recharging the upper aquifer and maintaining essential freshwater flows to sensitive ecosystems via natural rainwater recharge.

If rainwater harvesting and LID features are strategically planned and constructed on individual properties and in public spaces throughout out the community, they will provide an inexpensive and sustainable solution for capturing the large amounts of rainfall now lost to the bay during moderate and heavy storms. A substantial percentage will percolated to the upper aquifer, eventually to the lower aquifer, recharging both aquifers. Spreading these systems around the community will help to restore the natural hydrology of the area ensuring greater benefits to the basin as a whole.

5) This plan will provide more rapid improvement of basin water quality, in part by avoiding use of recycled water to recharge the aquifer, which contains trace contaminants.

Recycled water has relatively high nitrate levels compared to naturally filtered and infiltration rainwater, and much higher levels of emerging contaminants, including by-products of the disinfection process of wastewater (Cleath & Associates, 2006; Yates and Williams). Potentially harmful emerging contaminants have already been found in the upper aquifer at reportable levels, and the potential for adding further contaminants should be avoided (Cleath & Associates, 2006).

6) This plan allows the basin to be balanced upon implementation of the LOWWP; whereas a Broderson plan may delay basin balance for years—possibly until it is too late to save the basin.

Commiting resources to Broderson leach fields puts that expenditure at risk and puts the County and community on a path that will most likely lead to more expenditures. The energy and maintence costs are relative high for Broderson compared to the options presented in this plan—while the options in this plan provide many co-benefits.

(Also see Appendix F for a comparison of this plan with LOWWP reuse/disposal Project 2a, recommended by the DEIR, and Project 3a designed to balance the basin under current conditions.)

The Future

This plan will provide Los Osos enough water to cover all future water needs if water is used wisely. With careful planning, it will further allow its most pristine water source, the ancient lower, aquifer—unaffected by modern contaminants—to be used for drinking only; with recycled and upper aquifer water used primarily for farming and outdoor urban applications. With community-wide implementation of conservation and reuse, it may even be possible for Los Osos to become a water exporter in the future, supplying Morro Bay a portion if its water.

A word of caution is warranted. Because implementation of this conservation-reuse-recharge element will enable the building moratorium to be lifted and development to begin again in the area, caution should be taken to ensure that a vicious cycle of water overuse leading to the current basin overdraft does not repeat itself. Therefore, ordinance language, ISJ agreements, statues and/or special legislation should be enacted to ensure that the water saved through this plan first goes to balance the basin, with an adequate margin of safety to protect against future uncertainties such as droughts and sea level rises.

Furthermore, land use policy must be consistent with prudent and wise use of water in the future. The California Coastal Commission's report on climate change estimates sea levels will rise about one foot by mid century. This is a conservative estimate compared to some predictions. The IPCC warns that coastal aquifers will experience increased seawater intrusion due to sea level rises. To prepare for these pressures and ensure a sustainable water supply for future generations, additional water must be stored in the aquifers to gradually bring up aquifer levels.

Ordinances, agreements, statutes and/or special legislation should also ensure water is not exported until the basin is fully balanced, with a margin of safety.

Finally, the community of Los Osos—and the local and regional economies—should benefit first from this conservation plan. Ordinances, agreements, statutes and/or legislation should ensure local businesses provide a significant percentage of the goods and services needed to implement and maintain this plan.

Conclusion

The County of San Luis Obispo has the opportunity to halt seawater intrusion in the Los Osos Valley Water Basin and save a precious water source by implementing an integrated conservation-reuse-recharge plan concurrent with development of the LOWWP.

This plan, which raises overall project costs only slightly (if at all), outlines how it can be done with a sustainable development approach maximizing benefits for all the systems that depend upon the resource.

The opportunity to preserve a rare and ancient natural groundwater, treasured coastal ecosystems depending on it, and the vital social and economic resources of an area all at once—does not come along often. The opportunity should not be wasted.

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ACHIEVING A SUSTAINABLE LOS OSOS VALLEY WATER BASIN
(DRAFT)

An integrated conservation-reuse-aquifer recharge plan for concurrent implementation with the Los Osos Wastewater Project, using low impact development (LID) and appropriate technologies

Prepared by Keith Wimer
Los Osos Sustainability Group
Los Osos, CA 93402

Table of Contents

Los Osos Wastewater Project (LOWWP) Team May 6, 2008
C/O County Public Works Department
County Government Center
San Luis Obispo County

Subject: EIR Recommendations and Goals for a Sustainable LOWWP

Project Team:

We appreciate your decision early in the LOWWP process to make sustainability a chief goal with the following commitment stated in the project's mission statement:

> "To evaluate and develop a wastewater treatment system for Los Osos, in cooperation with the community water purveyors, to solve the Level III water resource shortage and groundwater pollution, in an environmentally sustainable and cost effective manner, while respecting community preferences and promoting participatory government, and addressing individual affordability challenges to the greatest extent possible."

We commend your team and the Board of Supervisors for recognizing the reality that declining resources and other environmental pressures—locally, statewide, nationally, and worldwide—require that sustainability is the new development paradigm—and we congratulate you for taking a proactive, leadership role to ensure that present and future residents of our county enjoy a healthy environment and thriving economy.

The US Environmental Protection Agency Office of Research and Development has stated, "achieving sustainable environmental outcomes must be a long-term national environmental goal" ("Sustainability Research Strategy," October 2007), and the California State Water Resources Control Board has declared sustainability a "core" value, defining it as "balancing environmental, economic and social factors in an equitable manner to maintain and protect the water resources needs of the present generation without compromising the ability of future generations to meet their own water resources needs" (SWRCB Meeting, Division of Financial Assistance, January 2005). In June 2006, the Board of Supervisors endorsed "Building Principles of Smart Growth," adopting sustainable development principles, which balance "economics, the environment, and social equity (the three E's) to create sustainable growth" ("Smart Growth Criteria for Development Projects," SLO County Planning & Building, September 2006).

We encourage the Board to continue in this direction, emphasizing the 3E's of sustainable development, Economy, Environment, and Equity, often referred to as the "Triple Bottom Line." Consistent with this approach, we urge the Project Team to apply the criteria for sustainable development we've compiled, along with the American Planning Association (APA) guidelines for wastewater infrastructure (see Attachment #2). To maximize project outcomes, we suggest that Brandman Associates and the Project Team develop a sustainability matrix for evaluating and optimizing benefits to the environment, the economy, and the people.

We also believe that the following must be part of the EIR process for the LOWWP to be a sustainable project. We understand that some of the alternative analyses and principles listed were already named in the Notice of Preparation, but we want to reinforce their importance.

Recommended alternatives for review in the EIR

1. A review of water conservation alternatives within the discussion of Water Supply Alternatives and other pertinent areas, including an analysis of conservation at various levels of reduction, up to a 30% reduction in current use, for their beneficial impacts on water resources, energy use, sustainability, etc. (Note that the current per capita indoor use for Los Osos is estimated to be about 67 gpd, whereas greater use of water saving appliances and devices can reduce water use to under 50 gallons per day—see Attachment #1, Item 1 for additional justification for the 30% target.)
2. A detailed analysis of project alternatives' contribution to the generation of greenhouse gasses, which factor in the goals of AB 32 (e.g., to reduce and eliminate a project's carbon footprint and to promote sustainable energy technologies) and a review of renewable clean energy alternatives (solar and wind) to power various project alternatives.

3. A review of project alternatives for their potential impacts on archeological sites, with the emphasis on which technologies and construction methods best honor the traditions and customs of the cultural groups likely affected (e.g., the Chumash).
4. An analysis of how the project will support an integrated water/wastewater plan for the Los Osos Valley Basin—aimed at the long-term sustainability of water resources—which integrates storm-water runoff control; groundwater balance, protection, and restoration; surface water and habitat protection and restoration; and projected future impacts from global warming and rising sea levels.
5. An analysis of treatment-collection-reuse project configurations, with a focus on how the components can be most effectively combined in a system to achieve the greatest environmental, economic, and social benefits.
6. A review of disposal/reuse/recycling alternatives—with the focus on short- and long-term resource sustainability, life-cycle costs, and impacts to sensitive habitat when septic systems no longer contribute to subsurface flows and aquifer recharge (including a review of purple pipe systems for on-site and urban reuse, constructed wetlands, on-site and community storm water retention/percolation strategies, a community owned ag project, and ag reuse/exchange.
7. A review questioning the viability of the Broderson site disposal alternative with the same focus as #6 above.
8. A detailed review of the feasibility of project alternatives, based in part on a detailed review of community affordability data generated as part of the EIR process or parallel to the EIR process.
9. A review of nature-based treatment systems and systems using bio-mimicry, including greenhouse technologies as well as surface- and subsurface constructed wetlands, e.g., systems by Todd Ecological and Lombardo and Associates.
10. A review of beneficial uses of recycled water and solids—with an analysis of beneficial impacts on energy use, carbon footprint, etc.—e.g., application to community- or privately-owned redwood, switch grass, or algae cultivation for carbon sequestering, resale, and/or bio-diesel production.
11. A long-term analysis considering global warming and sea-level rise impacts, taking a precautionary approach, with a review of options best suited for future adaptability, e.g., the purchase of land/water rights out of the basin or trading water for future water rights.
12. A review of STEP/STEG collection system alternatives, including cluster systems with 2-12 homes per tank and tanks located in public utility easements; also a system with the STEG (gravity) component of STEP/STEG system included in the estimates (i.e., to show truer system costs and impacts).
13. A review of a decentralized alternative with 2-6 treatment sites within the Prohibition Zone, using nature-based treatment systems and systems using bio-mimicry, with the facilities designed for multiple uses, e.g., landscaped and developed as open-space, parks, and/or eco-tourist destinations (see # 9 above).
14. A review of an on-site system alternative operated under a centralized, on-site maintenance program.
15. A review of a phased approach to project implementation, in which a first phase would include a decentralized system serving homes near the bay and in high ground-water areas, with on-site system enhancements and a maintenance program, followed by a later phase in which more homes would be connected to a community system as needed (e.g., if water quality improvements do not occur).
16. A review of a conventional gravity collection alternative—and a combined conventional gravity-low pressure alternative—for potential impacts to the environment, stemming from I/I, exfiltration, sewer overflows, grinder pumps and vault installation, fusion welding gravity pipes, enhanced maintenance to reduce the potential for I/I, etc.,—in addition to the potential for illegal discharge and fines.

Additionally, we wish to highlight the following goals and objectives the project and EIR should work to achieve:

1. A key objective that the project will be sustainable—producing win-win-win solutions for the environment, people, and economy.
2. A goal or objective to strive for a zero or negative carbon footprint for the project.
3. Reduce water use by at least 25% (easily achievable with available technologies, according to authorities).
4. Relative affordability for ratepayers.

We look forward to partnering with your Board and the County Project Team to create a truly sustainable LOWWP that will be a showcase for sustainable development in the county, state, and country. Thank you for integrating these essential elements into the LOWWP EIR.

(See Attachments #1 & #2 for scoping recommendation detail and sustainable development criteria and guidelines.)

January 6, 2009
San Luis Obispo County Board of Supervisors
County Government Center, San Luis Obispo

RE: SUSTAINABLE LOS OSOS WASTEWATER PROJECT CRITERIA AND RECOMMENDATIONS

Honorable Board of Supervisors:

The Los Osos Sustainability Group has prepared sustainable project criteria and project recommendations. We appreciate the opportunity to present them to you today.

To arrive at our recommendations, we first did an extensive review of literature related to sustainable development and the project, including the following:

1) Definitions, principles, and guidelines of recognized authorities, agencies, and organizations in the fields of sustainable planning, environmental protection, and water/wastewater management (see Appendix A for excerpts).

2) The "EIR Recommendations and Goals for a Sustainable LOWWP" we submitted on May 6, 2008, and the "Statement of Key Environmental Issues" we submitted with the San Luis Bay Chapter of Surfrider Foundation, SLO Green Build, Santa Lucia Chapter of the Sierra Club, the Terra Foundation, The Northern Chumansh Tribal Council on September 9, 2008 (see Appendix B for excerpts).

3) The Los Osos Valley Water basin studies and basin plans (see Appendix C for a summary of research and references)

4) LOWWP documents since 2006, including staff updates to the Board of Supervisors, the NWRI reports, and the Draft EIR with appendices (see Appendix C2).

Our survey of this literature yielded the following key sustainability principles and conclusions, sustainability project criteria, and recommended wastewater projects.

Key Principles and Conclusions

I. Sustainable development requires balancing and maximizing benefits for all systems.

Sustainable development implies coexistence and equity among major systems: environmental, social, and economic. By definition, it requires balancing benefits for these systems, ensuring no system is harmed and all systems survive and thrive (see Appendix A). In terms of the Los Osos Project, it means no family should have to leave the community due to project costs, and that water balance should not be harmed in the effort to achieve improved water quality. Further, it means we should not put a burden on future generations by bequeathing them a project that requires intensive energy use and costly maintenance and repairs. For the LOWWP to be sustainable it must maintain the social fabric of the community, all ecosystems and subsystems, and the economic health of the community now and in the future.

II. Sustainable development requires integrated, whole-systems, long-term planning and solutions.

For the LOWWP to be sustainable, it must be part of an integrated water-wastewater-stormwater management plan for the basin that avoids the negative impacts of the project and maximizes its benefits long term. Unless the project avoids, or adequately mitigates for, removal of septic return flows (about one-third of the recharge of the basin), it could increase seawater intrusion in the lower aquifer, start seawater intrusion in the upper aquifer, and harm sensitive ecosystems by drying up subsurface freshwater flows. In fact, a lack of whole-systems planning could render the project a waste of time and money by speeding the demise of the freshwater basin from seawater intrusion. This would require Los Osos to spend another $30-100 million for a desalination plant or imported water—neither of which is feasible. The current reuse-disposal plan for the project removes water from the basin and wastes recycled water on spray fields. It also relies almost solely on Broderson leach fields to avoid negative impacts from the project. This puts most of the eggs in one basket, betting on a strategy that is risky, inefficient, and energy intensive. What is needed is an integrated conservation-reuse-recharge plan, with a range of strategies, flexible enough to address the major hydrological changes coming to basin. A well-designed plan would maximize benefits for all systems and begin to prepare for climate change impacts, including sea level rises predicted to increase seawater intrusion in coastal aquifers. (We have provided a blueprint for such plan, based on the three Foundational Actions of the California Water Plan and emphasizing appropriate technologies, entitled "Achieving a Sustainable Los Osos Valley Water Basin").

III. Sustainable development requires a new approach and new thinking to avoid the mistakes of the past.

So far, the LOWWP process is leading us toward the kind of project advocates of sustainable development warn against: an oversized, energy-intensive, centralized project, vulnerable to earthquakes and climate change. To enable a sustainable project, a strong conservation program must be implemented concurrently to help avoid the viscous cycle of water overuse that has led to the Level III of severity water shortages. The process must also ensure green, small-scale, nature-based solutions are incorporated into the project to reduce energy use, life-cycle costs, and environmental impacts. Finally, market-driven solutions should be used in innovative ways to achieve and support sustainable development. In terms of the LOWWP, this means the selection process should include onsite and decentralized system alternatives, constructed wetlands and greenhouse treatment technologies, a dedicated low pressure and hybrid low pressure-vacuum collection system, and appropriate technologies. The project should also be sized 15-30% smaller than currently planned, with a strong conservation element using water-saving technologies currently on the market. Finally, the best-value design-build process should be used to its full potential, providing sustainable development performance criteria to potential bidders, along with a cap on project costs set at affordability levels for the community, that allows bidders to present innovative and integrated options to achieve sustainability goals. Currently, the LOWWP Request for Qualifications and DEIR restrict project alternatives, competition, innovation, and the potential for overall project sustainability.

Criteria for a Sustainable LOWWP

I. Balances and maximizes benefits to all systems

Sub-criteria:

- Meets affordability guidelines now and in the future (without the need for grants and special funding) (e.g., by using sustainability criteria, encouraging sustainable alternatives, and setting cost limits in a best-value design-build process).
- Uses a small-pipe sealed collection system to promote clean, renewable energy use (solar) and avoid and/or minimize construction impacts and environmental damage (e.g., damage from sewer overflows, exfiltration, and deep trenching, including impacts to archeological sites and infrastructure).
- Minimizes burdensome operation, maintenance and repair procedures and costs for future generations (i.e., is easy and inexpensive to operate, repair and/or replace), e.g., with the use of nature-based ponding or constructed wetlands treatment

II. Uses a whole-systems long-term planning approach.

Sub-criteria

- Is part of an integrated conservation-reuse-recharge plan that offsets the potential impacts of the project with a margin of safety and maximizes benefits to all systems.
- Is designed to minimize environmental damage and repair/replacement costs due to flooding and earthquakes (e.g., uses shallow, small-diameter, flexible piping and nature-based and redundant systems)
- Considers full life-cycle costs looking out 60 years or more (i.e., the life of the longest-lasting components of the system).
- Prepares for climate change impacts (sea level rises, increased storm intensity and/or longer dry periods between storms) (e.g., by using a sealed pipe system to avoid overflows, depletion of groundwater and seawater contamination of wastewater via I/I.)

III. Uses conservation and decentralized, small-scale, nature-based solutions to reduce or offset costs, energy use, and GHG production—also to reduce or eliminate waste and toxic by-products.

Sub-criteria

- Incorporates a conservation plan for project sizing and to mitigate for impacts
- Uses ponds, constructed wetlands, and/or greenhouse technologies for centralized and cluster system treatment.
- Consideres cradle-to-grave materials costs and environmental impacts (e.g., using HDEP piping and other components to reduce or eliminate toxins
- Employs clean, renewable energy use (e.g., solar power and wind generation) to operate onsite and major system components.
- Uses recycled water in a manner that optimizes its benefits and reduces (e.g., ag exchange) and for crops that sequester carbon or offset GHG.

System Recommendations

(See Appendix D for further detail)

I. Centralized System:

Brief description: A centralized system, using the best-value, small-pipe, sealed collection system (e.g., STEP/STEG, a dedicated low-pressure, or a hybrid low-pressure-vacuum system) with Air Diffusion System (ADS) treatment at a site out of town, integrated with the conservation-reuse-aquifer-recharge plan attached.

Benefits: A small-pipe sealed system has lower capital costs than a hybrid gravity collection system. (Note: A dedicated low pressure system or hybrid low-pressure-vacuum system may be as little as one-half current collection system cost estimates—based on company representative estimates at a presentation in Los Osos in November of 2008). Sealed, small-pipe systems also provide several environmental benefits over a hybrid gravity system for Los Osos. The area's hilly terrain, sandy soils, proximity to the Estuary, and location in an active earthquake zone make the gravity system—known to leak more than a sealed-pipe system—more susceptible to overflows and seeps that will pollute the bay and groundwater. (See the Appendices C for related research, including an account or overflows during one storm event in the Central Valley in 2006.) Furthermore, the shallow, flexible pipes of a sealed system are less vulnerable to earthquakes and easier and less expensive to repair when damaged. An integrated conservation-reuse-recharge element avoids project impacts to the basin with a measure of safety, reduces energy requirements and GHG's, and prepares for sea level rises—while the ADS ponding system, a nature-based system, requires minimal energy and sludge handing.

Considerations: A centralized system, with a treatment site out of town, will require a significant amount of conventional energy initially, resulting in significant GHG production. This can be reduced by maximizing wind and solar power use for major system components, and by encouraging the solar operation of on-site pumps with photovoltaics (possibly through rebates from grants or project funding). GHG's can also be avoided and reduced via an ag reuse/exchange program or community farming project designed to sequester carbon or produce biodiesel. Also, the integrated conservation-reuse-recharge plan will reduce project GHG's.

II. Decentralized system, with all septic systems eliminated

Brief description: A decentralized system, using the best-value, small-pipe, sealed collection system (e.g., STEP/STEG, a dedicated low-pressure, or a hybrid low-pressure-vacuum system) with two (2) in-town treatment sites, using constructed wetlands or greenhouse technology, and the integrated conservation-reuse-recharge plan attached.

Benefits: With treatment located in town, this system would reduce project costs for pipeline construction and energy use for pumping wastewater, helping meet project affordability guidelines. The conservation-reuse-recharge plan, which reduces wastewater flows, would reduce the size and costs of the decentralized alternatives presented in the LOWWP *Technical Memorandum: Decentralized Treatment*, while helping to avoid impacts to the basin and reduce

overall energy use. Constructed wetlands or living-machines (greenhouse treatment) solutions would provide co-benefits for the environment and community, e.g., additional habitat and attractive green spaces. This system also reduces the growth inducement potential of the project.

Considerations: Initial resistance to in-town treatment sites could be minimized with appropriate placement and design of treatment sites, along with community and agency outreach. (See Appendix F for an example of a constructed wetlands, landscaped to provide an attractive community green space.)

III. Decentralized system, with upgraded septic systems

Brief description: A decentralized system, using the best-value, small-diameter sealed system (e.g., STEP/STEG, dedicated low-pressure system, or a hybrid low-pressure-vacuum system), with constructed wetland treatment at one in-town location, and a cluster system serving sites with the potential to pollute the bay (approximately 1000 sites in relatively close proximity to the bay) with the remainder of sites in the Prohibition Zone receiving septic system upgrades. This would be combined with a basin-wide nitrogen management program and the integrated conservation-reuse-recharge plan attached.

Benefits*:* This solution would be the least costly, use the least energy, and cause the fewest impacts to basin hydrology from the project. Collecting wastewater from homes near the bay would prevent the potential for seeps to the bay, while the basin-wide nitrate management plan would reduce basin nitrate loading improving groundwater quality (see Appendix A1—II.A.3).

Considerations: This alternative may be necessary, if the costs or environmental impacts of other alternatives fail to meet affordability levels for the community or they are determined to pose too great a risk to the basin.

Conclusion

The Los Osos Sustainability Group appreciates the County's commitment to pursuing sustainable development. As we've mentioned in previous presentations, the LOWWP offers your Board and the County a unique opportunity to create a model of sustainable development for the state and nation. We hope this information and these recommendations will help in developing that project,

Sincerely,

Los Osos Sustainability Group (LOSG)

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EPA/600/R-01/034
December 2000

Exfiltration in Sewer Systems

by

Robert S. Amick, P.E.
Environmental Quality Management, Inc.
Cincinnati, Ohio 45240
and
Edward H. Burgess, P.E.
Camp, Dresser & McKee
Cincinnati, Ohio 45249

Order No. 8C-R551-NASX

Project Officer

Ariamalar Selvakumar, Ph.D., P.E.
National Risk Management Research Laboratory
Edison, New Jersey 08837

National Risk Management Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

Notice

The U.S. Environmental Protection Agency through its Office of Research and Development funded and managed the research described here under contract 8C-R551-NASX to Environmental Quality Management, Inc. It has been subjected to the Agency's peer and administrative review and has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Foreword

The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threatens human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

E. Timothy Oppelt, Director
National Risk Management Research Laboratory

Abstract

This report was submitted in fulfillment of Order No. 8C-R551-NASX by Environmental Quality Management, Inc. and Camp, Dresser & McKee of Cincinnati, Ohio under the sponsorship of the United States Environmental Protection Agency. This report covers the period from September 1998 to February 2000 and work was completed in April 2000.

The study focused on the quantification of leakage of sanitary and industrial sewage from sanitary sewer pipes on a national basis. The method for estimating exfiltration amounts utilized groundwater table information to identify areas of the country where the hydraulic gradients of the sewage are typically positive, i.e., the sewage flow surface (within pipelines) is above the groundwater table. An examination of groundwater table elevations on a national basis reveals that the contiguous United States is comprised of groundwater regions (established by the U.S. Geological Survey) which are markedly different. Much of the northeastern, southeastern, and midwestern United States has relatively high groundwater tables that are higher than the sewage flow surface, resulting in inflow or infiltration. Conversely, a combination of relatively low groundwater tables and shallow sewers creates the potential for widespread exfiltration in communities located in the western United States.

This report presents information on typical sewer systems, identifies and assesses the factors that cause or probably cause exfiltration, presents commonly used and advanced corrective measures and their costs for dealing with exfiltration, identifies technology gaps, and recommends associated research needs and priorities. This report also examines urban exfiltration, including a case study of Albuquerque, New Mexico.

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Tables

Acknowledgement

The contributions of several individuals are acknowledged and appreciated for the preparation of the project report. Dr. Ariamalar Selvakumar and Mr. Richard Field were the Project Officer and Technical Advisor, respectively for EPA's National Risk Management Research Laboratory (NRMRL), and contributed toward the review and preparation of the project report. Mr. Robert Amick, P.E., was the Project Manager for Environmental Quality Management, Inc. Mr. Edward Burgess, the Technical Manager for Camp, Dresser & McKee, was responsible for the quantification of exfiltration on a national level.

Chapter 1
Introduction

1.1 Background

Many municipalities throughout the United States have sewerage systems (separate and combined) that may experience exfiltration of untreated wastewater from both sanitary and combined sewers. Sanitary sewer systems are designed to collect and transport to wastewater treatment facilities the municipal and industrial wastewaters from residences, commercial buildings, industrial plants, and institutions, together with minor or insignificant quantities of ground water, storm water, and surface waters that inadvertently enter the system. Over the years, many of these systems have experienced major infrastructure deterioration due to inadequate preventive maintenance programs and insufficient planned system rehabilitation and replacement programs. These conditions have resulted in deteriorated pipes, manholes, and pump stations that allow sewage to exit the systems (exfiltration) and contaminate adjacent ground and surface waters, and/or enter storm sewers. Exfiltration is different from sanitary sewer overflows (SSOs). SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to surcharged pipe conditions. SSOs can be in the form of direct overflows to receiving water, street flooding, and basement flooding; whereas exfiltration is not necessarily caused by excess I/I and is merely caused by a leaking sewer from its inside to its surrounding outside.

Untreated sewage from exfiltration often contains high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways.

1.2 Objectives

Although it is suspected that significant exfiltration of sewage from wastewater collection systems occurs nationally, there is little published evidence of the problem and no known attempts to quantify or evaluate it on a national basis. Accordingly, the objectives of this

study were to quantify through desk-top estimates the magnitude of the exfiltration problem in wastewater collection systems on a national basis; identify the factors that cause and contribute to the problem; and document the current approaches for correcting the problem, including costs. The resulting information was used to identify information and technology gaps and research priorities.

Chapter 2 identifies and qualitatively assesses the causative factors and health impacts of exfiltration; the methodology employed for quantification of exfiltration on a national scale is presented in Chapter 3; Chapter 4 presents corrective measures applicable to exfiltration; national magnitude of exfiltration and corrective measure costs results are presented in Chapter 5; and Chapter 6 identifies existing information/data gaps and makes recommendations for further research.

Chapter 2
Identification and Assessment of Causative Factors and Health/Environmental Impacts

2.1 Causative Factors

A search for publications regarding exfiltration of sewage from wastewater collection systems did not locate any exfiltration-specific discussion of unique/causative factors because most factors which cause inflow/infiltration are identical to those associated with exfiltration (i.e., they both occur through leaks in pipes, depending on the relative depth of the ground water).

Factors that contribute to exfiltration include:

- size of sewer lines
- age of sewer lines
- materials of construction (sewer pipe, point/fitting material, etc.)
- type and quality of construction (joints, fittings, bedding, backfill)
- depth of flow in the sewer

Geological conditions that contribute to exfiltration include:

- groundwater depth (in relation to sewer line/depth of flow of sewage)
- type of soil
- faults

Climate conditions that influence exfiltration include:

- average frost line in relation to sewer depth
- average rainfall, which helps determine groundwater depth

In a typical exfiltrating sanitary sewer system, with the groundwater level below the sewage flow surface, exfiltration can occur in several areas. Figure 2-1 schematically represents these exfiltration sources, including defective joints and cracks in the service laterals, local mains, and trunk/interceptor sewers. The level of ground water and the depth of flow in the sewer will influence the extent of exfiltration rates, since the pressure differential

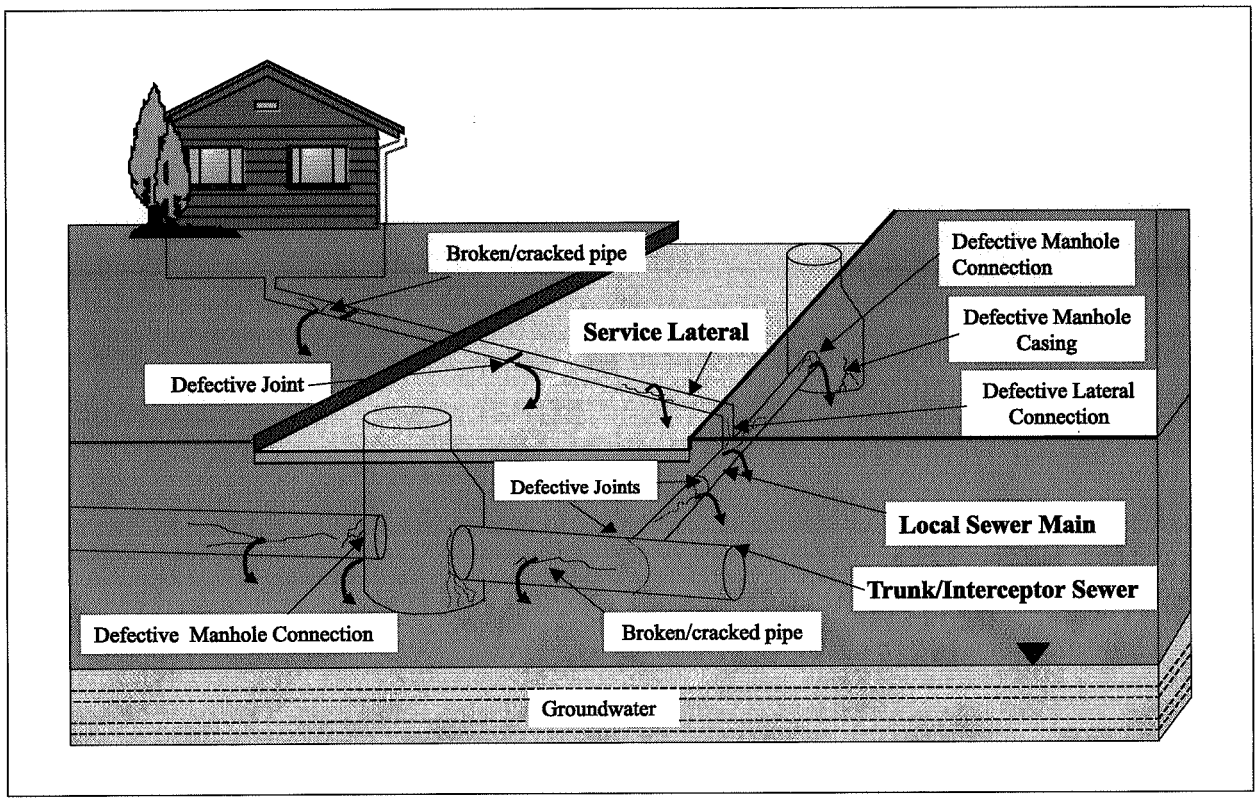

Figure 2-1. Sanitary sewer system components and exfiltration sources.

between the hydraulic head in the sewer and the groundwater hydraulic head will force water out of the sewer apertures into the surrounding soil material.

2.2 Health and Environmental Impacts

This section addresses the potential health impacts of exfiltration on ground water, drinking water distribution systems, and surface water.

2.2.1 Ground Water

Little published data is available on specific incidents of groundwater pollution and associated health/environmental impacts arising from leaking sewers, despite the widespread acknowledgment that these incidents occur. Several studies have indicated widespread pollution of ground water in urban areas arising from the general leakiness of sewers, including bacteria and ammonium reported from Wisconsin and general pollution in the San Joaquin Valley in California.[1]

Transport of the sewage and pollutants leaking into the subsurface/ground water depends on a variety of factors, including but not limited to: the difference in hydraulic head between the sewage surface and the groundwater table level, the substrate physical/chemical/ biological characteristics (which determines attenuation potential), and the sewage pollutants and their concentrations. Fecal bacteria contamination is the most serious health risk associated with domestic sewage exfiltration. Contamination by viruses, protozoa, and other microorganisms is also a concern. Increased concentrations of total organic carbon, nitrate, chloride, and sulfate, however, can also make the water unfit for consumption. Phosphate and boron are good indicators of sewage pollution since they are not naturally occurring in ground water.[2]

The solids present in sewage can plug the porous media beneath the pipe and rapidly decrease the exfiltration rate. In an experiment completed to examine this effect, the leakage was reduced to a steady state within an hour.[3]

As evidence of pollution from sewage, chloride and nitrate have been found to travel together. A California study indicated that ammonium disappeared within 4 feet, probably by adsorption and bacteriological activity. Bicarbonate and nitrate increased several hundred percent and nitrite disappeared.[4]

2.2.2 Water Supply Distribution Systems

Because of minimum separation requirements for potable water supply distribution systems and sanitary sewers and vigilant application of cross-connection control programs, the opportunity for sewer exfiltration to contaminate drinking water supplies is theoretically rather limited. Only one such potential documented case was found in a comprehensive data/information search.[5] Sewage from exfiltration can enter a distribution system through a broken water main or, under reduced pressure conditions, through a hole which leaks drinking water out under normal positive pressure conditions. Situations which could allow infiltration of the sewage through a lowering of water main pressure primarily involve backflow and surges.

Main Breaks

Despite the best efforts of utilities to repair water main breaks using good sanitary procedures, these breaks represent an opportunity for contamination from exfiltration to enter the distribution system. When a main breaks, utilities typically isolate the affected section, superchlorinate, and flush the repaired pipe. Flushing velocities may not always remove all contaminated debris, however, and microbiological testing of the final water quality may not detect contaminating microorganisms. In 1989, Cabool, Missouri[5] experienced a suspected cross-connection between sewage overflow and two major distribution system line breaks (backflow may have occurred during simultaneous repair of numerous water meters) caused by freezing temperatures, resulting in 243 cases of diarrhea, 32 hospitalizations, and four deaths due to *E. coli* O157:H7 strain. This town of

2000 was on an untreated groundwater system and did not superchlorinate during repairs of the water main breaks.

Backflow

Backflow devices to prevent the entry of contaminated water constitute an important distribution system barrier. Because of cost considerations, backflow-prevention devices are primarily installed on commercial service lines at facilities that use potentially hazardous substances. Such facilities include hospitals, mortuaries, dry cleaners, and industrial users. It is uncommon for all service connections to have backflow prevention devices; thus, back siphonage can occur at these unprotected points. Furthermore, installation of backflow devices at all service connections would make routine checking of the devices nearly impossible. Without routine inspection, proper functioning of the units cannot be determined.

Surges

Recent research is focusing on transient pressure waves that can result in hydraulic surges in the distribution system. These waves, having both a positive and negative amplitude, can draw transient negative pressures that last for only seconds and may not be observed by conventional pressure monitoring. Because these waves travel through the distribution system, at any point where water is leaking out of the system, the transient negative pressure wave can momentarily draw water and sewage (if present) back into the pipe.[6]

2.2.3 Surface Water Pollution

No data or narrative information in the literature demonstrate, or even suggest, that sewer exfiltration has directly contaminated surface waters. Several factors that control the occurrence of sewer exfiltration may explain the absence of a linkage between exfiltration and surface water pollution.

The occurrence of exfiltration is limited to those areas where sewer elevations lie above the groundwater table. Since groundwater elevations near surface water bodies are typically near the ground surface, sewers near surface water bodies generally are below the groundwater table, and infiltration (rather than exfiltration) will dominate the mode of sewer leakage in these areas. In areas of steep topographic conditions, where sewers are located near surface waters and at elevations that lie above the surface water, exfiltration impacts may be possible. However, these situations are assumed to be sufficiently rare that exfiltration impacts on surface waters are not observed.

Chapter 3
Methodology for Determining the Magnitude of Exfiltration on a National Scale

The process of estimating the magnitude of the exfiltration problem on a national scale has been performed as a series of two independent steps:

- Qualitatively assessing the portion of the nation's sewer systems that are susceptible to exfiltration;
- Applying assumptions about exfiltration rates (percent of base sewer flow) to the exfiltration susceptible sewer systems to provide an assessment of the extent of sewer exfiltration on a national scale.

3.1 Identification of Exfiltration Susceptible Sewer Systems

The key factor influencing the occurrence of exfiltration is the direction of the hydraulic gradient between the sewer flow surface and the groundwater table (GWT) external to the sewer. Where (and/or when) the direction is toward the sewer, exfiltration will be <0 (i.e., the hydraulic gradient will cause infiltration, rather than exfiltration). This situation is probably best analyzed by evaluating the depth of the sewers (and service laterals) relative to the groundwater table. In much of the northeastern, southeastern, and midwestern United States, relatively high groundwater tables typically result in infiltration conditions. Exceptions include shallow sewers, service laterals, and seasonal variation in GWTs that can significantly change the spatial extent of the sewer system that lies above the GWT (i.e., that can be considered to be "exfiltration susceptible"). To a lesser degree, short-term reversals in the gradient that may occur during wet weather (e.g., surcharged sewers which temporarily experience high sewage flow surface above the GWT, and may therefore briefly exfiltrate) may also need to be considered.

Given the importance of first screening out those areas that are not "exfiltration susceptible," the initial desktop analysis task was to perform spatial analysis of sewer depth relative to regional GWT elevations. Existing national-scale groundwater information was examined, such as that provided by the U.S. Geological Survey (e.g., USGS Groundwater Regions of the United States). As the various national groundwater data sources were reviewed, however, it was determined that mapping in support of the purposes of this study was not readily available. For this reason, a national depth-to-groundwater map was prepared under this project from groundwater level data available

in the national databases (U.S. EPA STORET and USGS WATSTORE) and presented in Section 5 of this report.

It is recognized that there may be seasonal variability in the portion of sewer systems susceptible to exfiltration in some areas, as GWTs can vary seasonally. The extent to which seasonal differences must be accounted for was assessed in reviewing the correlations to sewer depth.

National-scale sewer depth data does not exist, but for purposes of the desktop analysis some assumptions about this parameter can be made. For example, typical service lateral depth can be assumed to be 8 feet for buildings with basements, and 2 to 4 feet for houses built on slabs. Typical sewer main depth can be assumed to be 6 to 10 feet; it may be possible for more detailed assessments to develop a typical depth distribution (i.e., x % 4-10 ft deep, y% 11-15 ft deep, z% > 15 ft deep). Regional differences should be considered; for example, sewer depths typically are shallower in the western United States than in other areas of the country. Sewer system density (miles/acre) can be correlated with readily available national population density data to create a GIS coverage of sewer system density.

GIS processing incorporating the general spatial (mapped) relationships between sewer depth and groundwater elevations allowed the development of a characterization of the "exfiltration susceptibility" of various areas. This was attempted at the national level, but the data required to support this analysis are unavailable; thus, a representative area (Albuquerque, New Mexico) for which a recent exfiltration study had been completed, was selected on which to perform the analysis. National exfiltration rate assessments can be extrapolated from this analysis. However, more detailed identification and inventory of exfiltration susceptible areas is required to support a meaningful quantification of national exfiltration rates.

3.2 Estimating National Exfiltration Rates

Estimation of the extent of exfiltration that actually occurs was addressed with the same set of parameters that are applied to characterize and quantify the infiltration problem: sewer condition, joint type, pipe material, age, etc. Similarly, correcting the problem can be assumed to involve the same technologies as are applied to infiltration (various lining approaches, etc.). For purposes of this project, however, it was necessary to make simplifying assumptions about exfiltration rates and corrective actions. More detailed investigations in the future can examine the spatial variability in exfiltration rates that can be correlated to the sewer condition, joint type, pipe material, and sewer age parameters. Corrective action costs can also be refined later with more detailed assessments of required actions.

For purposes of this study, unit rates for exfiltration (gallons/day/inch/mile) available from the 1989 EPA study[7] were used to generate the assessment of the magnitude of the

national exfiltration problem. These unit rates were applied to the "exfiltration susceptible" areas (together with assumptions about the inch-miles of sewers/service laterals in those areas) to generate exfiltration rates in the Albuquerque case study. The unit rates based on gallons/day/inch/mile were compared with estimates based on percent of base sewer flow. Comparisons of the two methods proved useful in developing the final estimates.

Chapter 4
Corrective Measures

The proper selection of corrective or rehabilitation methods and materials depends on a complete understanding of the problems to be corrected, as well as the potential impacts associated with the selection of each rehabilitation method. Pipe rehabilitation methods to reduce exfiltration (and simultaneously infiltration) fall into one of the two following categories:

- External Rehabilitation Methods
- Internal Rehabilitation Methods

Certain conditions of the host pipeline influence the selection of the rehabilitation method. It is therefore necessary to assess these factors to prepare the pipe for rehabilitation. Rehabilitation is proceeded by surface preparation by cleaning the pipe to remove scale, tuberculation, corrosion, and other foreign matters.

4.1 External Sewer Rehabilitation Methods

External rehabilitation methods are performed from the aboveground surface by excavating adjacent to the pipe, or the external region of the pipe is treated from inside the pipe through the wall. Some of the methods used include:

- External Point Repairs
- Chemical Grouting
  - Acrylamide Base Gel
  - Acrylic Base Gel
- Cement Grouting
  - Cement
  - Microfine Cement
  - Compaction

4.2 Internal Sewer Rehabilitation Methods[8, 9, 10]

The basic internal sewer rehabilitation methods include:

- Chemical Grouting - Internal grouting is the most commonly used method for sealing leaking joints in structurally sound sewer pipes. Chemical grouts do not stop leaks by filling cracks; they are forced through cracks and joints, and gel with surrounding soil, forming a waterproof collar around leaking pipes. This method is accomplished by sealing off an area with a "packer," air testing the segment, and pressure injecting a chemical grout for all segments which fail the air test. The three major types of chemical grout are:

  - Acrylic
  - Acrylate
  - Urethane

- Sliplining - In this method, pipes are inserted into an existing line by pulling or pushing pipes into a sewer. The space between the existing pipe and liner pipe is grouted. Sliplining can be segmental or continuous. Small pipes including service laterals are usually continuous, with the larger sizes being segmental. Major types of sliplining are:

  Continuous Pipe - insertion of a continuous pipe through the existing pipe

  - Polyethylene
  - Polypropylene

  Segmental - Short segments of new pipe are assembled to form a continuous line, and forced into the host pipe. Generally, this method is used on larger sized pipe and forced into the host pipe.

  - Polyethylene
  - Polyvinyl Chloride
  - Reinforced Plastic Mortar
  - Fiberglass Reinforced Plastic
  - Ductile Iron
  - Steel

- Cured-in-Place Pipe (CIPP) - The CIPP process involves the insertion of a flexible lining impregnated with a thermosetting resin into a cleaned host pipe using an inversion process (hot water or steam). The lining is inserted using existing manholes.

  Because the liner initially is flexible, the pressurized steam or water also serves to form it in the shape of the existing pipe. The resin hardens with the application of

heat and with the passage of time (generally a few hours) to form a pipe within the existing pipe.

- Closed-fit Pipe - This involves pulling a continuous lining pipe that has been deformed temporarily so that its profile is smaller than the inner diameter of the host pipe. After installation, the new pipe expands to its original size and shape to provide a close fit with the existing pipe. Most lining pipe is deformed in the manufacturing plant.

- Fold and Form Pipe - This is similar to sliplining, except that the liner pipe is deformed in some manner to aid insertion into the existing pipe. Depending on the specific manufacturer, the liner pipe may be made of PVC or HDPE. One method of deforming the liner is to fold it into a "U" shape before insertion into the existing pipe. The pipe is then returned to its original circular shape using heated air or water, or using a rounded shaping device or mandrel. Ideally, there will be no void between the existing pipe and the liner pipe after expansion of the liner pipe with the shaping device. For the "U" shape liner, the resulting pipe liner is seamless and jointless.

- Spiral Wound Pipe - This involves winding strips of PVC in a helical pattern to form a continuous liner on the inside of the existing pipe. The liner is then strengthened and supported with grout that is injected into the annular void between the existing pipe and the liner. A modified spiral method is also available that winds the liner pipe into a smaller diameter than the existing pipe, and then by slippage of the seams, the liner expands outward.

- Pipe Bursting - Pipe Bursting is a method of replacing existing sewers by fragmenting the existing pipe and replacing the pipe in the void.

    1. Hydraulic Method - In this method a solid rod is inserted into the existing pipe and a bursting head is attached to the rod, which is then attached to a new replacement pipe. Hydraulic power is used to retract the rod and bursting head, and draw in new pipes. Existing sewer pipe is broken into fragments, which are driven into the surrounding soil.

    2. Pneumatic Method - This system consists of a pneumatic burster unit that splits the existing pipe while simultaneously installing a new polyethylene pipe of the same size or larger. Over 90 percent of the bursting is done by this method.

    3. Static Head - Static heads have no moving parts. The head is simply pulled through the old pipe by a heavy-duty pulling device.

- Spot (Point) Repair - Point repairs are used to correct isolated problems in a pipe. Sometimes they are used as the initial step in the use of other rehabilitation

methods. Point repairs include:

1. Robotic Repair
2. Grouting/Sealing
3. Special Sleeves
4. Point CIPP

4.3 Issues Related to the Limitations of Existing Technologies

The City of Houston, Texas recently completed model simulations and determined that comprehensive rehabilitation was not cost-effective.[11] It was found cheaper to relieve Houston's collection system bottlenecks for the short duration. This study noted that many types of rehabilitation and varying levels of rehabilitation, however, were not tested and could prove to be cost-effective. Soil characteristics and climatology vary from region to region, as do sewer system conditions and available system capacity, and the conclusions found in Houston may not be applicable to other parts of the country.

Thousands of communities have rehabilitated portions of their collection systems; yet very few know whether or not they have been successful. The problem is that no one can forecast how effective the rehabilitation will be. A recent literature search found that only 91 sewer sheds worldwide have post rehabilitation infiltration/inflow (I/I) reduction information available.[12] Average reported reduction is 49 percent of peak I/I rate. No data was found on the amount of exfiltration reduction from rehabilitation.

Pipe bursting may be limited in use where the pipe has sags. This technology's use is limited to cast or ductile iron pipe or concrete encasement. Pipe bursting may not be applicable where other existing utilities are close to the pipe.

Some sliplining applications require a round host pipe. Clearance should be checked before this method is employed.

Chapter 5
Results

This section describes the results of using various methods to estimate exfiltration from sewers. These methods have been developed and used in several locations in the United States and Europe. Some of these methods have been applied to calculate potential exfiltration in Albuquerque's sewer system, for which one of the most extensive exfiltration studies in the United States to-date has been completed.[12] For this reason, Albuquerque has been selected as a case study, from which the national extent of sewer exfiltration can be assessed.

The results of the 1998 exfiltration study from Albuquerque are extrapolated qualitatively by evaluating the exfiltration susceptibility of sewer systems throughout the United States. Susceptibility is defined by the relative depths of the sewers and groundwater table. In cases where sewer depths are generally shallower than the surrounding ground water, the potential to exfiltrate exists (because the direction of the hydraulic gradient is toward the exterior of the sewer) and these sewers can therefore be considered exfiltration susceptible. A national depth-to-groundwater map has been prepared for use in this assessment of the national extent of exfiltration susceptible sewer systems.

The findings of the Albuquerque case study were combined with the national depth-to-groundwater mapping to present a qualitative assessment of the extent to which sewer exfiltration represents a risk to water quality and human health on a national scale. Much of the information presented in Section 5.1 is taken from the 1998 Albuquerque study.[12]

5.1 National Scale Quantification

Although exfiltration is not a widely studied phenomenon, several exfiltration studies and investigations have been completed throughout the world. These include work completed in the United States for the U.S. EPA and several studies in Europe, the majority of which are focused on Germany. Some of the more applicable previous studies are discussed below.

Three basic approaches have been used to quantify sewer exfiltration rates: 1) direct measurement of flow in isolated sewer segments, 2) theoretical estimates using Darcy's Law and related hydraulic theory, and 3) water balance between drinking water

produced/delivered and wastewater collected/treated. Each of these approaches has been applied to the Albuquerque case study and is described below.

5.1.1 Estimates Based on Direct Measurements (U.S. EPA Study)

An EPA study entitled "Evaluation of Groundwater Impacts of Sewer Exfiltration" was completed in the late 1980's.[7] The work estimated exfiltration in two California city sewer systems to develop a correlation between exfiltration and infiltration. The tests were conducted in areas of vitrified clay pipe (VCP) predominance, where older pipe of known or suspected poor condition existed. Only those pipe segments located above groundwater levels were tested. Water consumption was metered for all sewer service connections corresponding with each measured sewer line to determine the actual quantity of wastewater flow entering the system. It was assumed that all internal household water entered the sewer system. Measurements of sewage flow in the sewer lines were made by continuous flow monitoring and hydrostatic testing. Calculated sewer exfiltration was reported in units of gallons per inch diameter per mile length per day (gpimd). Table 5-1 presents a summary of the exfiltration rates.

Table 5-1. Summary of Exfiltration Rates from Continuous Flow Monitoring and Hydrostatic Testing (Engineering Science, Inc., 1989)

Location	Pipe Information	Exfiltration Rate Cont. Flow Monitoring (gpimd)[a]	Exfiltration Rate Hydrostatic Testing (gpimd)
Berkeley, CA Pardee Street	320 linear feet (lf) of 8-in. - diameter VCP	5,649 (34% of flow)	6,327
Berkeley, CA 7th Street	298 lf of 6-in. - diameter VCP	5,283 (56% of flow)	5,649
Santa Cruz, CA Beach Street	260 lf of 8-in. - diameter VCP	6,557	2,417
Santa Cruz, CA Riverside Parking Lot	124 lf of 6-in. - diameter VCP	77,745	8,324

[a] gallons per inch diameter per mile length per day

This table shows that a large discrepancy exists between the results from the continuous flow monitoring and the hydrostatic testing at one Santa Cruz location. The study concludes that the continuous flow monitoring achieved reliable data and that the hydrostatic test data was influenced by the tidal cycle. A correlation model between exfiltration and infiltration was developed, but not field tested.

A second evaluation was performed using field measurements at another location to verify the correlation model. This evaluation used similar methodologies as the first task.

Exfiltration measurements were made in the Washington Suburban Sanitary Commission (WSSC) sewer system near Washington, D.C., and in Lexington, Kentucky. Table 5-2 presents a summary of the measurement results from the evaluation.

Table 5-2. Summary of Exfiltration Measurements (Engineering Science, Inc., 1989)

Location	Pipe Information	Average Exfiltration Rate (gpimd)[a]	Exfiltration as Percentage flow (%)
WSSC John Hanson Highway	1,400 lf of 8-in. - diameter VCP	16,248	16.6
WSSC University of MD	832 lf of 10-in. - diameter VCP	63,312	49.1
Lexington, KY Lumber Yard	455 lf of 8-in. - diameter VCP	17,103	22.6
Lexington, KY Car Lot	1,029 lf of 8-in. - diameter VCP	9,061	31.3
Lexington, KY Various Shops	586 lf of 10-in. - diameter VCP	5,664	11.9
Lexington, KY Various Shops	586 lf of 10-in. - diameter VCP	15,689	34.5

[a] gallons per inch diameter per mile length per day; lf = linear feet

Several problems with the measurement methodologies were noted, and overall the hydrostatic test method was judged to be not successful. It was resolved that the flow monitoring procedure worked well and should be applied to areas with a minimum of 400-500 linear feet of pipe with little or no service connections.

5.1.2 Estimates Based on Darcy's Law and Related Theory (European Studies)

The study of exfiltration has been of great interest in Germany. This country has a very old, deteriorated infrastructure. The cost to complete the necessary repairs to Germany's sewer systems is estimated to be nearly $100 billion (U.S.). Therefore, several exfiltration studies have been conducted to prioritize repair work. These studies have both applied theoretical (Darcy's Law) approaches and direct measurements to estimate sewer exfiltration. Excerpts from some of the studies are summarized below.

- A report from England[13] provided an estimate of 300 x 10^6 m^3/yr (793 x 10^8 gal/yr) or approximately 1 liter/day/m (397 gal/day/mile) for the exfiltration of the 880,000 km (547,000 miles) of sewer lines in Germany, although the basis of the estimate is not clear. This very low sewer leakage rate is actually net exfiltration, which is the difference between exfiltration and infiltration. The study indicates that total exfiltration and infiltration in Germany are nearly equal, but the amounts are not provided.

- To better understand the mechanics of exfiltration, sewage migration from leaking pipes to ground water was correlated in a study using Darcy's Law (see Equation 1).[3] The rate of exfiltration is linearly dependent on the area of the pipe exfiltrating and the pressure head:

  (1) $Q = L\ A\ dh$

  where Q is the exfiltration rate (ft^3/s) through a pipe leak area A (ft^2) at a pressure head of dh (ft), and L is leakage factor (s^{-1}).

  The leakage factor is defined in Equation 2:

  (2) $L = K/dL$

  where K is the permeability of the surrounding soil (ft/s) and dL is the thickness of the settleable soil layer (ft).

  This study found that the settleable solids in the wastewater act to reduce the permeability of the bedding material and lower the exfiltration rate rapidly at low flows and velocities. This clogging reduces the rate of exfiltration immediately. In fact, a steady-state rate of exfiltration was reached after one hour, even with large area of joint damage.

- A research project undertaken by the Institute of Environmental Engineering (ISA) at the University of Technology of Aachen, Germany, studied the water pollution hazard of leaking sewers.[14, 15, 16] The ISA developed and used a special exfiltration measuring device at every joint in several sections of sewer pipe on several tests conducted throughout Germany. This study determined that the most significant VCP sewer damages which permit exfiltration are leaking service junctions, leaking sewer joints, pipe cracks, and pipe fractures. At a pressure head below the sewer crown, which is typically the case in gravity flow sewer lines, exfiltration rates were minimal. At a pressure head of one pipe diameter, the exfiltration rate increased dramatically, to more than 26 gal/hour (gph) per joint in some segments. This high leakage rate can, in part, be attributed to the generally poor condition of the old sewer systems. A linear correlation between pressure head and exfiltration rate for several types of sewer defects was noted for pressure heads greater than 500 mm (20 inches). It was also noted that at lower flows and pressure heads, the exfiltration rate decreases exponentially, most likely from self-sealing from sewer film and settleable solids in the sewage. If the flow and pressure head increases, however, this self-sealing property is broken and the exfiltration rate increases rapidly.

5.1.3 Estimates Based on Drinking Water - Wastewater Balance

In this section, exfiltration from Albuquerque's sewer system is estimated using a water/sewage balance calculation, backed up by some previous local studies on infiltration. The results are then compared with leakage rates calculated from the other methodologies and unit rates derived from the EPA and European studies presented above.

A direct method for estimating exfiltration is to compare water pumpage and usage with wastewater received at Albuquerque's Southside Water Reclamation Plant (SWRP). To make this comparison, it is necessary to identify the base water demand, which is the indoor component of the total household use. Demands during mid-winter (January and February) are assumed to be near base flow because no or very minimal outdoor water usage occurs. Water and wastewater data obtained from the City for January 1998 revealed the following:

- Average daily influent flow at the SWRP: 51.4 mgd
- Average daily water pumpage into transmission/distribution system: 61.2 mgd (this is then considered to be the daily base flow for that month)

Subtracting wastewater flow from the pumpage rate yields a difference of 9.8 mgd, which is the first approximation of sewage leakage. However, several other factors also impact the water balance in the water and wastewater systems. These are:

- Sewer infiltration
- In-house water consumption
- Water distribution system leakage
- Sewer exfiltration

City of Albuquerque staff, using a range of available information (including meter and billing records, pumpage records, and other data), have estimated losses in the water system at about 11 percent of the total amount pumped. A 1997 study[17] found water system losses ranging from 8 percent in Hong Kong, which is considered to have a relatively "tight" and high-quality system, to the 20-25 percent range in England, which has many very old distribution systems. An 11 percent loss in the system would account for a daily average loss of about 6.73 mgd.

In-house consumption is the portion of the water entering the house that does not leave as sewage, but is consumed in cooking, drinking, watering plants, cleaning, etc. National experience indicates that about 3 percent of water entering the home is consumed on an average day in January 1998. With negligible non-domestic consumption, the remaining amount of water, about 1.4 mgd, represents the net difference between the two other factors in the water balance: sewer infiltration and exfiltration. The net amount is positive, indicating that exfiltration exceeds infiltration by 1.4 mgd, which is plausible given that the

great majority of Albuquerque's sewers, and particularly those most susceptible to exfiltration (older VCP), are in exfiltration areas (well above groundwater levels).

In order to estimate the exfiltration volume, previous studies addressing infiltration in the Albuquerque sewer system were reviewed. One of the studies[18] utilized several approaches to gain an approximation of inflow and infiltration in the Albuquerque system, most of which was attributed to infiltration in the valley of the Rio Grande. Some of these methodologies are described below:

- A flow comparison between winter water use and sewage flow. This methodology resulted in an infiltration flow of 3.7 mgd. However, the report stated that "this estimation is probably within ± 50 (percent) of the actual value..."

- Early morning sewage flow versus water use. This methodology resulted in an infiltration flow of nearly zero.

- Sewage flow versus population. Using a 100-gallons-per-capita-per-day wastewater flow and a population of 300,000, infiltration was estimated at 5 mgd. It was also noted that the average sewage flow for Albuquerque at this time was actually 117 gpcd.

- Influent BOD versus domestic wastewater BOD. The expected BOD concentration in the wastewater was calculated based upon a generally accepted BOD loading of 0.17 lb/cap/day. This BOD concentration was compared with the average influent concentration to calculate an infiltration flow of 5.9 mgd. However, this was thought to be a high estimate based upon the relatively small industrial component and the high institutional contribution.

In addition, the study field-verified the areas subject to infiltration. Based upon the above calculations and results of the field tests, infiltration was thought to be somewhat less than 3 mgd, or 9 percent of the wastewater flow in 1975. Nine percent of today's wastewater flow would be in the 5 mgd range.

Another infiltration analysis was completed as part of the Albuquerque ASAM Model Loading and Verification Task.[19] Interceptor manholes that were within 2 feet of ground water were identified. Flow monitoring was completed in a sewer subbasin, and the resulting flows were compared with the predicted flows to determine infiltration. The infiltration rate for Albuquerque was calculated at 0.925 mgd, but, again, the impact of exfiltration was not included. Therefore, the work revealed a net infiltration rate, indicating that actual infiltration is about 1 mgd greater than total exfiltration.

From the foregoing investigations, it is estimated that the total average infiltration rate for the Albuquerque system is in the vicinity of 3.5 mgd. The 9 percent field-verified rate

reported in the Molzen-Corbin report is probably high, given the repair and replacement of major interceptors in the valley that have occurred since 1975, as well as the use of better quality materials and construction techniques for new pipelines since then. On the other hand, repairs have generally not been made to the sewers most susceptible to exfiltration -- old vitrified clay pipes (VCP).

The total exfiltration rate is obtained by adding the 1.4 mgd remaining in the water balance to the infiltration rate, for a total of 4.9 mgd, or approximately 5 mgd.

5.1.4 Comparison of the Various Methodologies – Albuquerque Case Study

Unit Rates from U.S. EPA Study

The 1989 U.S. EPA exfiltration study is discussed in Section 5.1.1 above, and some of the results are summarized in Tables 5-1 and 5-2. Application of measured exfiltration rates from this study (in gpimd) to the 66.5 miles of Albuquerque VCP sewers (average diameter of 8.57 inches) that are potentially in condition C (major cracks) or D (severe cracks) results in total exfiltration rates ranging from 1.38 mgd to 44.1 mgd (504 Mg/yr to 16,907 Mg/yr). These calculated quantities are listed in Table 5-3. Although there is a very wide range in calculated rates, many of them are in the 3 to 4 mgd range calculated above using a water balance.

Table 5-3. Calculated Exfiltration Rates Using United States EPA Study Results

Location	Measured Unit Rates (gpimd)	Equivalent Albuquerque Quantities[a] (mgd)
Berkeley, CA, Pardee Street	5,649; 6,327	3.2; 3.6
Berkeley, CA, 7th Street	5,283; 5,649	3.0; 3.2
Santa Cruz, CA, Beach Street	6,557; 2,417	3.7; 1.4
Santa Cruz, CA, Riverside Parking Lot	77,745; 8,324	44.3; 4.7
WSSC, John Hanson Highway	16,248	9.3
WSSC, University of MD	63,312	36.1
Lexington, KY, Lumber Yard	17,103	9.8
Lexington, KY, Car Lot	9,061	5.2
Lexington, KY, Various Shops	5,664; 15,689	3.2; 8.9

[a] For 66.5 miles of suspected Class C and D pipe, average diameter 8.57 inches.

European Methods

Section 5.1 discusses the results of several exfiltration studies carried out in Germany. Applying these methods and unit rates to the Albuquerque sewer system yields several estimates as follows:

- The study by Lerner and Halliday[13] presented an estimated net exfiltration rate of 397 gal/day/mile for the whole of Germany. Applying this figure to the entire length of clay and concrete sewers in Albuquerque's system yields a total net exfiltration rate (net leakage) of about 0.46 mgd. This is reasonably close to the net exfiltration rate of 1.4 mgd calculated by the water balance in Section 5.1.3. It is expected that, on average, a greater percentage of Germany's sewers are in infiltration areas than is the case in Albuquerque. On the other hand, Germany's sewers are also older and undoubtedly in overall worse condition, therefore more susceptible to exfiltration. Thus, a near balance in exfiltration and infiltration is possible. Albuquerque has a greater percentage of sewers above groundwater level, but a smaller portion that is likely to heavily exfiltrate.

- The study completed by Rauch and Stegner[3] determined that exfiltration could be correlated by Darcy's Law. A leakage factor dependent upon the bedding grain size and permeability affects the exfiltration rate (refer to Equations 1 and 2 in Section 5.1.2). For this study, the leakage factor was back-calculated using Darcy's Equation with the data presented in Rauch's report. This calculated leakage factor was then used in Darcy's Equation to calculate the exfiltration rate for 8-inch-diameter pipes flowing half full, with every joint separated one-quarter inch to approximate conditions for Albuquerque. The exfiltration rate was calculated as 7.9 mgd (2,900 Mg/yr). However, not every joint will have a quarter-inch separation. The ISA German studies discussed above[14, 15, 16] summarized the sewer damage noted in the project. About 30 percent of the VCP sewers have leaking sewer joints. The infrastructure in Albuquerque is not as old as that of Germany and therefore is in better condition. If we assume every fourth joint (25 percent) will be separated one-quarter inch, the exfiltration quantity is 2 mgd or 725 Mg/yr.

- The German ISA project determined that at a 4-inch head (equivalent to an 8-inch pipe flowing half full), the exfiltration rate was nearly zero. However, a storm sewer was found to have an exfiltration rate, dependent upon the type of damage, ranging from 4 to 10.5 gallons per hour per joint. This rate yields an exfiltration quantity of 8.2 to 21.9 mgd (3,000 to 8000 Mg/yr) for the Albuquerque sewer system. It is probable, however, that not every joint is leaking even in pipe of condition C or D. Assuming every fourth joint is leaking (25 percent as discussed above) presents an estimate of 2 to 5.5 mgd (769 to 2,000 Mg/yr).

Table 5-4 presents a summary of the estimates of sewer exfiltration for the Albuquerque area based on data from the European studies.

Table 5-4. Estimates of Sewer Exfiltration Quantities for the Albuquerque Sewer System Based on Published European Exfiltration Rates

Source/Study Location	Daily Quantity	Annual Quantity
Munich, Germany measurement of 24,600 gpmd	1.65 mgd	600 Mg/yr
Darcy's Equation, every joint offset 0.25 inch	7.9 mgd	2,900 Mg/yr
Darcy's Equation, every 4th joint offset 0.25 inch	2 mgd	730 Mg/yr
ISA Study – every joint leaking 4 g/hr	8.2 mgd	3,000 Mg/yr
ISA Study – every joint leaking 10.5 g/hr	22 mgd	8,000 Mg/yr
ISA Study – every 4th joint leaking 4 g/hr	2 mgd	730 Mg/yr
ISA Study – every 4th joint leaking 10.5 g/hr	5.5 mgd	2,000 Mg/yr

Based on a review of the above exfiltration rates for Albuquerque as calculated with the various EPA and European unit figures and methodologies, it can be seen that the rate of 5 mgd determined in Section 5.1.3 is very much within the range that would be expected. Although the calculated rates vary widely, the majority are within the 2 to 10 mgd range. Therefore, the rate of 5 mgd, as determined by the water balance described in Section 5.1.3, is presented as the best estimate of the average daily wastewater exfiltration rate from Albuquerque's sewer system.

It is further concluded that the majority of this leakage will occur in those areas most susceptible to exfiltration, as approximately 15 percent of the sewer system in Albuquerque is estimated to be below the groundwater table and therefore not exfiltration susceptible.

5.2 National Depth to Groundwater Mapping

In order to extrapolate the Albuquerque findings to a national scale, a qualitative assessment of exfiltration susceptibility has been made using depth-to-groundwater information. Since no such mapping at a national scale suitable for this purpose was readily available, an initial mapping effort was undertaken as part of this study.

The development of a nationwide depth-to-groundwater atlas is difficult at best due to the lack of easily obtainable data for most of the country. Data to determine the depth to the shallowest water table may be gathered from local, state, federal, and private sources through well logs, water level measurements, location of wetlands and seeps, characterization of streams and rivers, and locations of lakes and other water bodies. A thorough characterization of the U.S. water table is a long and exacting process.

Within the context of this study, the depth-to-groundwater map presented in Figure 5-1 is a generalized view created using readily available data from the EPA STORET and USGS WATSTORE databases of depth-to-groundwater parameters. The data were downloaded

from CDROM databases resident at the CDM Hydrodata Center in Denver, Colorado. The data were screened to eliminate missing depth-to-water values, missing latitude and longitude, duplicate data, and easily recognized anomalous data. The resultant set contained approximately 93,000 data points in the coterminous United States, Alaska, and Hawaii (only the coterminous U.S. is shown below). Since the data retrieved from STORET and WATSTORE is dependent upon the data owner for accuracy, there is no comprehensive method of quality control. USGS data are continually reviewed, however, and these data may be deemed reasonably accurate. The STORET and WATSTORE databases, while certainly robust, do not contain all data available; therefore, data gaps exist which are labeled (in the data tables) as insufficient data.

Despite the large dataset applied to build the map, many regions of the United States have relatively limited data; these areas are unshaded on the map. Areas with the greatest concentration of valid data points within the deep groudwater range are generally west of the Mississippi River and along the Appalachian Mountains.

The data set was plotted upon a map of the United States using ESRI Arcview 3.1 GIS application with a Spatial Analyst extension. A grid was produced with a cell size of 10000 for the coterminous U.S. and Alaska and 1000 for Hawaii. An inverse distance weighted interpolation method (IDW) was used based on the 12 closest points. The IDW interpolator assumes that each point has a local influence that diminishes with distance.

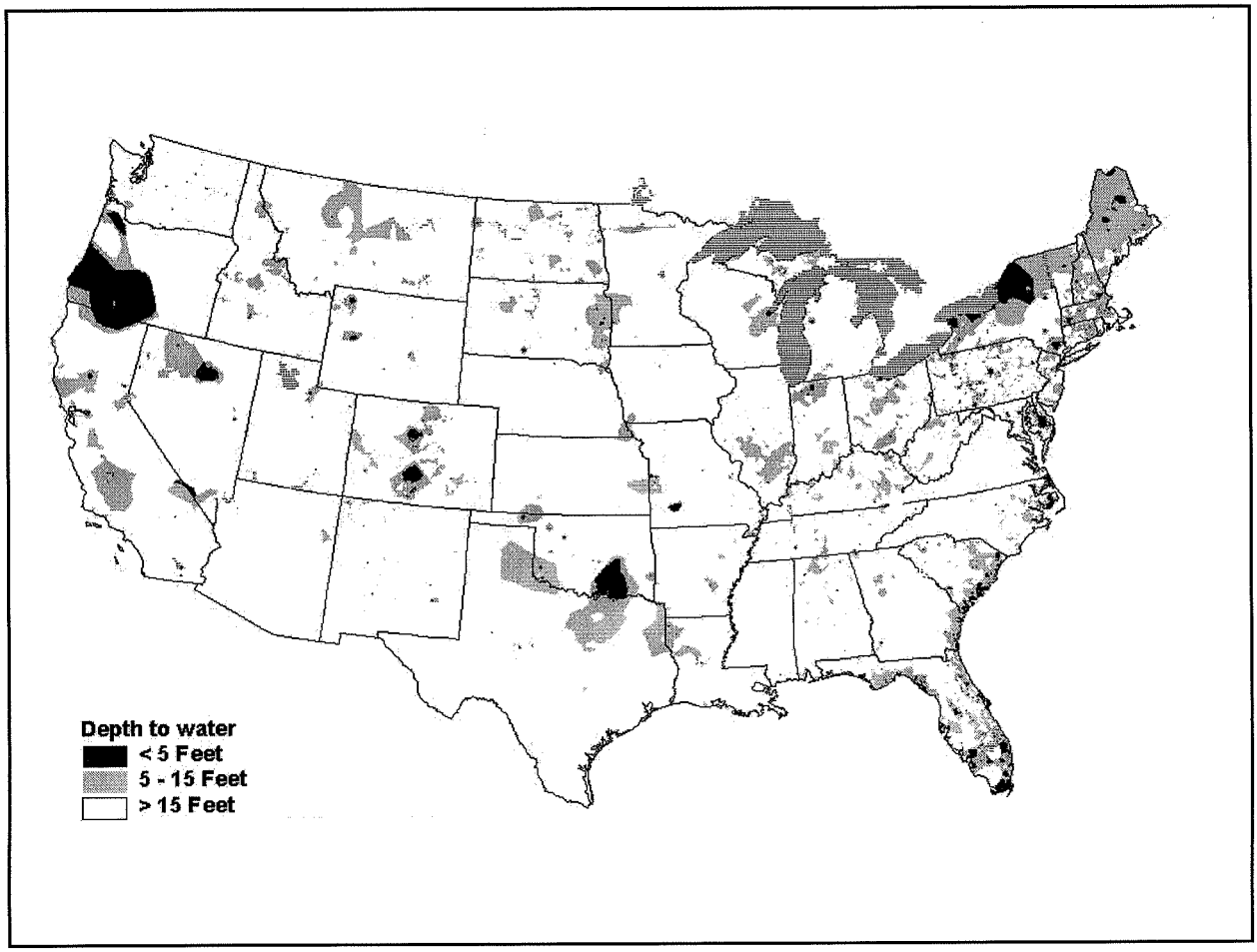

Figure 5-1. National depth-to-groundwater map.

Note: It is important to read Section 5.2 for a detailed explanation of background data basis.

5.3 Conclusions

Most of the urban areas in the northeastern, southeastern, and coastal areas of the U.S. have relatively shallow groundwater tables (<15 feet). In these areas, where a significant portion of the population (and therefore sewer systems) exists, relatively few exfiltration-susceptible sewer systems are expected. One caveat is exfiltration from service laterals. Even in the areas mentioned, many shallow service laterals may exist above groundwater tables. However, the hydraulic head available to drive exfiltration in these service lines is generally very low (typically only one or two inches, and intermittent). Further study in this area may be warranted to assess the extent of service lateral exfiltration.

Based on a review of the depth-to-groundwater map, it is expected that widespread exfiltration is probably limited to a relatively small portion of the total U.S. population, as relatively few large urban areas in the U.S. are located in these deeper groundwater areas. Cities such as Albuquerque, Phoenix, Tucson, and others, are among the larger urban areas where significant exfiltration potential exists. Further study of exfiltration conditions in cities such as these, with relatively large areas with sewers above the groundwater table, may be warranted on a case-by-case basis where evidence of exfiltration (e.g., groundwater contamination) has been observed, or is revealed by more detailed evaluations. Areas with extremely deep groundwater tables probably experience relatively less risk associated with exfiltration due to the long subsurface travel times and distances of the exfiltrated sewage from the sewer to the groundwater table. Areas with significant portions of the system above, but in close proximity to, the groundwater table are probably at greatest risk. There is an increased risk in the relatively few areas with significant exfiltration potential when there is, for example, a thin soil and fractured rock hydrogeologic setting which allows pathogens and other contaminants from the sewage to reach the ground water quickly and with minimal attenuation. However, since public water supplies are treated with chlorination, ozonation, or other systems to kill fecal bacterial contamination, an added measure of protection is provided.

A greater potential problem, albeit isolated, may be exfiltration from sewers carrying industrial wastewater. Organic and inorganic constituents of industrial sewage can be much more persistent than those of domestic sewage, and therefore much more likely to reach the ground water in areas of significant exfiltration potential. The disposition of industrial sewage contaminants which reach ground water used for drinking water supplies may not be the same as that of fecal bacteria from domestic sewage [i.e., the treatment processes (flocculation, filtration, chlorination, activated carbon filtration, etc.) may not eliminate or reduce these contaminants to render them harmless]. Untreated well water in some rural, small community, commercial, and private-owner drinking water systems does not enjoy this added protection. However, these systems are not typically in close proximity to large municipalities and associated sewer systems/exfiltration potential.

The Albuquerque Case Study concluded that the rate of exfiltration from that sewer system, expressed as a percentage of base flow, is on the order of 10% of average daily base wastewater flow - in absolute terms, roughly 5 mgd. This rate, expressed as an average annual rate, is 1,825 Mg/yr. Another relevant conclusion of the Albuquerque study was that there is a greater impact on ground water from septic tank usage than from sewer exfiltration. As the foregoing depth-to-groundwater analysis indicates, however, exfiltration is expected to vary significantly on a regional basis. Further study should expand the initial depth-to-groundwater analysis performed here and identify more precisely the "exfiltration susceptible" sewer systems throughout the U.S. and the extent to which exfiltration impacts ground water in these systems.

In summary, exfiltration appears to be a problem in certain cities in the United States (mainly located west of the Mississippi River and along the Appalachian Mountains) based on an evaluation of: 1) available groundwater table data to nationally assess the extent to

which sewer systems are susceptible to exfiltration, 2) past studies of measured and estimated exfiltration rates, and 3) protective mechanisms, particularly natural soil/hydrogeological setting attenuation and drinking water treatment plants. Exfiltration may be a regional, or more likely, local problem where the GWT lies closely under the sewage flow surface. Situations where the exfiltrate can reach even deep ground water through a thin soil/fractured rock hydrogeologic setting, especially where persistent, potentially toxic contaminants are present (such as those often associated with industrial sewage) also pose a problem.

5.4 Corrective Measure Costs

Given the relatively high rates of exfiltration that potentially discharge from exfiltration-susceptible sewer systems in the U.S., corrective measures may be required to adequately protect groundwater resources, and in some limited instances surface waters, in these areas. The site-specific nature of exfiltration problems, however, requires a more detailed assessment of the larger urban areas in the exfiltration-susceptible western U.S. be completed before a meaningful estimate of corrective costs can be developed.

Corrective actions to address exfiltration in those situations where local-level evaluation calls for such action will generally be accomplished with similar technologies as those used to address infiltration. These technologies are described in Section 4. Although an estimate of national-scale costs to address exfiltration must follow more detailed evaluation of exfiltration-susceptible sewer systems, it is possible to identify corrective action costs on a unit basis (i.e., cost ($) per linear foot of sewer) in this study. The following table provides an example of those costs assuming the use of cured-in-place lining as the method of sewer rehabilitation.[20]

Table 5-5. Example Sewer Rehabilitation Costs for Exfiltration Corrective Action

Sewer Diameter (inches)	Cost ($) per linear foot
8	60
10	71
12	77
15	130
18	160
21	225
24	295
27	310
30	535
36	590

Chapter 6
Recommendations

This study identified the following data/technology gaps associated with exfiltration. Recommendations for research and development to fill these gaps were developed for each data/technology gap identified.

1. Data Gap - comprehensive national depth-to-groundwater maps: Although a large portion of the U.S. has readily available, accurate depth-to-groundwater data, many regions of the United States have relatively limited data.

   Recommendation:

   An effort to refine the initial depth-to-groundwater mapping produced in this study with an expanded and updated database would support a more detailed national estimate of exfiltration and the cost of associated corrective measures.

2. Data Gap - extent of exfiltration in municipalities: There are relatively few large urban areas in the U.S. which have the potential for widespread exfiltration. Western arid U.S. cities such as Albuquerque, Phoenix, and Tucson are among the larger metropolitan areas where significant exfiltration potential exists and little is known about it. Albuquerque's exfiltration has recently been studied extensively.

   Recommendation

   Further study of localized exfiltration conditions in cities with high exfiltration potential may be warranted on a case-by-case basis where evidence of exfiltration has been observed, or is revealed by more detailed groundwater study. This study should be preceded by assessment using the refined depth-to-groundwater mapping recommended above to produce a national inventory of exfiltration susceptible areas. This localized study will be of greater value than an attempt to quantify the problem nationally, due to the localized nature of the problem.

3. Data Gap - exfiltrate fate and transport: No information is available regarding the biological disposition of sewage exfiltrate. Also, it would be useful to determine if a biological crust forms in the bedding below an exfiltrating sewer that would serve to insulate/protect groundwater and/or water supply distribution systems.

Recommendation:

Research to fill the exfiltration disposition data gap could involve the use of existing sewage systems known or determined to be leaking in significant amounts (using carefully excavated examination of the bedding beneath and adjacent to the leaking sewer joints), or by construction of an experimental leaking sewer system (artificially introducing sewage into the sewer systems bedding). An analysis of bedding samples from points at increasing depths and horizontal distances from the leak would help to reveal the extent of exfiltrate transport.

4. Combined/Separate Sewer Considerations for Detailed Urban Study

Recommendation

The sewer systems to be considered in future exfiltration assessments should include both combined and separate sewer areas, since combined sewers are often located in highly urbanized areas where imperviousness is high. The result is a decreased rainfall infiltration into the soil and lowering of the GWTs, making these sewers potentially more susceptible to exfiltration. Additionally, combined sewers are often shallower than separate sewers, older than separate sewers, and constructed with less-watertight pipe joints - all factors that can contribute to higher exfiltration rates. Another special case that must be considered in more detailed studies is force mains. Although they are often constructed with tighter pipe joints and more durable pipe material, they nonetheless operate under pressure and may therefore be more exfiltration susceptible.

5. Inclusion of Service Laterals

Recommendation

It will be important to more detailed exfiltration assessments of urban areas to consider service laterals together with public sewers in identifying and evaluating the exfiltration susceptible sewers. Service laterals are the shallowest portion of the sewer system (largest hydraulic gradient difference with GWT) and typically of the poorest construction.

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Glossary Of Terms[1]

1. Combined Sewer

   A sewer intended to serve as a sanitary sewer and a storm sewer, or as an industrial sewer and a storm sewer.

2. Excessive Infiltration/Inflow

   The quantities of infiltration/inflow which can be economically eliminated from a sewer system by rehabilitation, as determined by cost-effectiveness analysis that compares the costs for correcting the infiltration/inflow conditions with the total costs for transportation and treatment for the infiltration/inflow.

3. Exfiltration

   Exfiltration is the leaking of wastewater from a sanitary or combined sewer into the surrounding soil, and potentially, into the groundwater. Exfiltration occurs when the sewer condition degrades to an extent where pipe defects (cracks, joint separation, etc.) allow wastewater to leak out of the sewer. Exfiltration can cause groundwater pollution if the rate and/or volume of wastewater leakage exceeds the ability of the subsurface soil to filter, absorb or immobilize certain pollutant constituents that may be present in the wastewater. Exfiltration is distinguished from infiltration (see below) by the direction of the hydraulic gradient across the sewer wall boundary. For exfiltration to occur, the hydraulic gradient must drive flow external to the sewer; with infiltration, groundwater depths above the flow line in the sewer drive flow into the sewer.

4. Infiltration

   The water entering a sewer system and service connections from the ground, through such means as, but not limited to, defective pipes, pipe joints, connections or manhole walls. Infiltration does not include, and is distinguished from, inflow.

5. Infiltration/Inflow

   The total quantity of water from both infiltration and inflow without distinguishing the source.

6. Infiltration/Inflow Analysis

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[1] U.S. Environmental Protection Agency, Office of Water Program Operations, Handbook for Sewer System Evaluation and Rehabilitation, December 1975.

An engineering and, if appropriate, an economic analysis demonstrating possibly excessive or nonexcessive infiltration/inflow.

7. Inflow

The water discharged into a sewer system, including service connections, from such sources as, but not limited to, roof leaders, cellar, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross connections from storm sewers and combined sewers, catch basins, storm waters, surface run-off, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

8. Internal Inspection

An activity of the Sewer System Evaluation Survey. This activity involves inspecting sewer lines that have previously been cleaned. Inspection may be accomplished by physical, photographic and/or television methods.

9. Physical Survey

An activity of the Sewer System Evaluation Survey. This activity involves determining specific flow characteristics, groundwater levels and physical conditions of the sewer system that had previously been determined to contain possibly excessive infiltration/inflow.

10. Preparatory Cleaning

An activity of the Sewer System Evaluation Survey. This activity involves adequate cleaning of sewer lines prior to inspection. These sewers were previously identified as potential sections of excessive infiltration/inflow.

11. Rainfall Simulation

An activity of the Sewer System Evaluation Survey. This activity involves determining the impact of rainfall and/or runoff on the sewer system. Rainfall simulation may include dyed water or water flooding the storm sewer sections, ponding areas, stream sections and ditches. In addition, other techniques such as smoke testing and water sprinkling may be utilized.

12. Rehabilitation

Repair work on sewer lines, manholes and other sewer system appurtenances that have been determined to contain excessive infiltration/inflow. The repair work may involve grouting of sewer pipe joints or defects, sewer pipe relining, sewer pipe replacement and various repairs or replacement of other sewer system appurtenances.

13. Sanitary Sewer

A sewer intended to carry only sanitary and industrial wastewaters from residences, commercial buildings, industrial plants and institutions.

14. Sewer System Evaluation Survey

A systematic examination of the tributary sewer systems or subsections of the tributary sewer systems that have demonstrated possibly excessive infiltration/inflow. The examination will determine the location, flow rate and cost of correction for each definable element of the total infiltration/inflow problem.

15. Storm Sewer

A sewer intended to carry only storm waters, surface run-off, street wash waters, and drainage.

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Los Osos Sustainability Group, Keith Wimer, January 30, 2009 (Letter P41)

Response to Comment P41-1

This comment expresses a concern regarding the removal of 400-700 AFY of water from the water basin. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P41-2

This comment expresses concerns about the analysis of a reasonable range of alternatives for collection options, including vacuum systems, and the benefits of sealed, small diameter pipes to prevent accidental spills or overflows. The comment further states that gravity systems are not discussed in detail regarding harm to the environment due to spills, potential damage to community infrastructure due to deep trenches, perceived excess costs for construction, higher wastewater flows due to I/I, and costs related to repairs caused by seismic events. See also Topical Response 10, Infiltration, Inflow and Exfiltration.

Response to Comment P41-3

This comment requests the Draft EIR include a triple bottom line analysis of project alternatives to ensure the highest value project long-term for the community. The comment also suggests a substantive analysis of numerous sustainable strategies and processes for the project. The basic letter references the Los Osos Sustainability Group report, "EIR Recommendations for a Sustainable LOWWP," provided to the County on May 6, 2008, "Sustainable Los Osos Wastewater Project Criteria and Recommendations" and "Achieving a Sustainable Los Osos Valley Water Basin" submitted to the County on January 6, 2009. The reader is referred to Topical Response 2, Project Costs; Topical Response 3, Water Resources and the Project Scope; Topical Response 4, Tertiary Treatment; and Topical Response 8, The Broderson Leachfield.

Response to Comment P41-4

This comment expresses a concern regarding the volumes of septic flows removed from the basin with the LOWWP. See Response to Comment P20-2.

Response to Comment P41-5

This comment expresses a concern regarding the data that was used to analyze the removal of septic flows from the basin. See Topical Response 3, Water Resources and the Project Scope; Topical Response 7, Alternative Disposal Options; Topical Response 8, The Broderson Leachfield; and Topical Response 9, Water Conservation Measures.

Response to Comment P41-6

This comment expresses a concern regarding the potential impacts on the lower aquifer resulting in increase rates of seawater intrusion. See Topical Response 8, The Broderson Leachfield, and Topical Response 9, Water Conservation Measures.

Response to Comment P41-7

This comment expresses a concern regarding the potential impacts on surface water features. Commentor's estimated volumes are so noted. The identified habitats/ecosystems existed prior to Los Osos community development and were sustained by natural surface water runoff and groundwater discharges. The commentor's statement that reduced groundwater flow from this fresh water component (septic discharges) will cause significant negative impacts is considered speculative. See also Response to Comment A8-9.

Response to Comment P41-8

This comment states potential benefits of the reuse/disposal element including Broderson recharge. See Topical Response 3, Water Resources and the Project Scope; Topical Response 8, The Broderson Leachfield; and Topical Response 9, Water Conservation Measures.

The commentor's estimated volumes are so noted.

Response to Comment P41-9

It is unclear exactly what the commentor intends by this statement because page 5.2-2 of the Draft EIR sited by the commentor has no reference to inflow amounts. See Response to Comment P20-2.

Response to Comment P41-10

This comment expresses a desire for a discussion on the level of uncertainty of information, findings and mitigation. Over the last 25 years substantial study of the groundwater basin has been conducted by State and local agencies to define and understand the system and allow development and refinement of the available model which has been utilized to aid in design of the LOWWP components. While the steady state model has uncertainty, like all models, it has been the common tool used and refined by all previous studies (including the seawater intrusion assessment and lower aquifer source investigation) which form the basis of information available for the Draft EIR analysis of impacts.

The opinion of the commentor is so noted.

See Topical Response 3, Water Resources and the Project Scope; Topical Response 7, Alternative Disposal Options; Topical Response 8, regarding Broderson leachfield, 9 regarding Water Conservation Measures, and response to comments P41-7 and A8-56.

The commentor appears to attribute the reduction in Broderson discharge volumes (from 896 AYF to 448 AFY) to a percolation performance issue, when in fact the designed reduction was to maintain the upper aquifer C Zone water levels (down by the bay) at a level comparable to the existing water levels. This reduced discharge volume was designed to preclude the need for the previously considered harvest wells. Should additional discharge at Broderson prove beneficial to the aquifer system and not require the LOWWP to install and operate additional facilities, the treated effluent remains available.

The commentor also appears to misunderstand the information presented in Table 14, page 40 of Appendix D-2. The information presents the single effect of each project component on upper and lower aquifer water levels as well as the resulting project alternatives affect that combine project components. The table lists the modeled water levels in the upper aquifer as 5 feet above mean sea level with the VPA-2A and -2B alternatives with relative changes around the bay that increase by up to 1 foot and decline by up to 1 foot because of Broderson disposal (not a drop from 0 to -5 feet).

Response to Comment P41-11

This comment expresses a concern regarding the safety of the Broderson leachfields with regard to liquefaction and landslides. This issue was discussed in Responses to Comments A8-104,A8-105, A8-1-7 and A8-108; Section 5.4-C on pages 5.4-9 to 5.4-13; Topical Response 8, The Broderson Leachfield, in the Draft EIR Appendix F on Geology; and in the Draft EIR Appendix D-1, the Expanded Groundwater Resources Analysis; and Draft EIR Appendix D-2, the Preliminary Hydrogeological Impacts Study. The Draft EIR Section 5.4-C states, "Based on previous investigations (detailed in Appendices D-1 and F), the depth to groundwater is greater than 100 feet below the existing ground surface and except for the near-surface loose dune sand deposits, the deeper soils encountered beneath the site are generally dense and not susceptible to liquefaction or seismic settlement. The near-surface loose dune sand would not be considered potentially liquefiable based on a 2004 geological study conducted for the LOCSD by Fugro Engineering.

This comment also expresses a concern regarding the potential for water to surface downstream from the Broderson leachfield. This issue was discussed in Response to Comment A8-114, Topical Response 8, The Broderson Leachfield, and in the Draft EIR Appendix D-1, the Expanded Groundwater Resources Analysis.

The commentor does not provide a citation for their comment that the Draft EIR discusses returning effluent pumped to the Broderson site back to the sprayfields, possibly in tankers. This is not a part of the proposed project; therefore no further response is required.

Response to Comment P41-12

This comment expresses a concern regarding the Waste Discharge Requirements referenced for the Broderson discharge. See Topical Response 3, Water Resources and the Project Scope; Topical Response 4, Tertiary Treatment; Topical Response 7, Alternative Disposal Options; and Topical Response 8, The Broderson Leachfield. The RWQCB mandate for the LOWWP recognized the groundwater quality improvement that would result from nitrate removal. The placement of treated effluent at the Broderson site is clearly a disposal project, not a groundwater recharge project. The County has coordinated with the California Department of Public Health throughout the project development process. The State Health Department has consistently confirmed the project approach. See also Comment Letter A-02 from the California Department of Public Health.

Response to Comment P41-13

This comment expresses a concern regarding impacts on water quality in the basin by reducing nitrates. See Response to Comment P41-12.

Response to Comment P41-14

This comment expresses a concern regarding the amount of recharge required to balance the aquifers and basin. See Response to Comment P41-10 and Topical Response 3, Water Resources and the Project Scope.

Response to Comment P41-15

This comment expresses a concern regarding the feasibility of implementing the proposed project. See Topical Response 6, Alternative Treatment Systems.

Response to Comment P41-16

This comment states that mitigations should be provided where impacts to area ecosystems can be assumed. See Response to Comment P41-7.

Response to Comment P41-17

This comment expresses a desire for the reevaluation of the water use estimates for the Prohibition Zone. As documented in the Rough Screening Report (March 2007) Population Estimates are based on previous reports by Montgomery Watson Americas, Inc. (2001) and Ripley Pacific Company (2006) using population estimates provided by the Los Osos Wastewater Committee. The estimates were based on the 1990 census and knowledge about existing and future development. The build out population to be served by the future wastewater treatment facility was estimated to be 18,428 people. These estimates are consistent with the General Plan projections for Los Osos minus the areas outside the prohibition zone. The resulting wastewater flows are fully described in the Flows and Loads Technical Memorandum (November 2008). These figures are appropriately conservative in that population densities are likely to increase over the life of the project as communities throughout the nation, including San Luis Obispo County, adopt growth policies that focus additional population into existing urbanized areas. The Flows and Loads Technical Memorandum includes a sensitivity analysis to identify cost implications if changes were made to population and flow estimates. According to the sensitivity analysis: "The treatment component comprises approximately 12 percent of the cost of the entire wastewater project. This sensitivity analysis shows that changing the dry weather or wet weather flow assumptions change the cost of the treatment facility by up to six percent, which corresponds to less than one percent of the total project cost."

Response to Comment P41-18

This comment expresses a desire for a complete analysis of the significant potential negative impacts associated with the hybrid gravity collection system. See Topical Response 10, Infiltration, Inflow, and Exfiltration. The NWRI report contains the following statement: "The Panel believes that the two collection system options are both viable. Both options have risks and benefits that are unique to themselves and, when viewed as a whole, make them functionally equivalent." Draft EIR Section

5.4, Geology, and Section 5.7, Public Health and Safety, along with Appendices F and I evaluate the projects geological and public safety impacts. The statements regarding the performance of gravity vs. STEP system in a seismic event are highly speculative and not supported by scientific evidence or professional opinion. The conclusions regarding exfiltration are contrary to those reached in the Draft EIR analysis and supporting documents. For instance, pressurized pipes have the capacity to leak a greater volume of fluid than non-pressurized pipes; those leaks would only be detectable at the surface if they were catastrophic. Sandy soils in Los Osos would ensure that the majority of leaks would only be detected through a monitoring program using leak detection equipment that is placed into the pipelines, not through visual observations of surface indications. The Draft EIR does not depend on a study of liquefaction effects as mitigation, rather, the Draft EIR calls for all facilities to be designed to meet the particular conditions that exist at each site, and requires the details of those conditions to be verified as part of the design process. See also the response to comment P36-10 regarding the effects of conservation on the collection system.

Response to Comment P41-19

This comment expresses a desire for the inclusion of a discussion regarding upgrades to gravity hybrid systems. See Response to Comment P36-37 regarding the costs of various "upgrades" to the gravity system. See also Topical Response 12, Sewer System Management Plan. Sections 5.4 and 5.7 along with Appendices F and I evaluate the projects geological and public safety impacts.

Response to Comment P41-20

This comment states that several project alternatives should be analyzed. See Topical Response 3, Water Resources and the Project Scope and Topical Response 5, Alternative Collection Systems.

Response to Comment P41-21

This comment expresses a desire for more in-depth analysis on energy and greenhouse gas options. The Greenhouse Gas Technical Memorandum, Section 5.9 of the EIR and Appendix K of the EIR contain a complete analysis of the project's energy and greenhouse gas impacts. Of the four level A alternatives, two (alternatives 2 and 3) contribute to reaching the goals of AB32 by reducing carbon emissions below current levels. Alternatives 1 and 4 would result in an increase in carbon emissions.

Response to Comment P41-22

This comment states that additional analysis of energy use, growth inducement, and farmland impacts should be provided. Energy use information is provided in Table 3-7 in the Draft EIR, Section 5.9 in the Draft EIR, and Appendix K-2.

Table 3-7 in the Draft EIR provides a summary of the proposed projects, including a description of energy consumption (electricity) for the collection and treatment plant sites. Table 1 provides a summary of the information for Proposed Projects 1 through 4 as well as the Preferred Project.

Table 1: Electricity Usage

	Collection (kWhr/year)	Treatment Process and Wastewater Flows (kWhr/year)
Project 1[a]	425,000	1.07 million
Project 2[a]	500,000	1.36 million
Project 3[a]	500,000	1.36 million
Project 4[a]	500,000	1.24 million
Preferred Project[b]	500,000	1.36 million

[a] Data obtained from Table 3-7 in the Draft EIR.
[b] The electrical usage is estimated based on data from Appendix K-2.

Appendix K-2 includes vehicle miles traveled for construction and operational activities. Based on a general assumption of 12 miles per gallon for on-street vehicles, fuel estimates are derived for construction and long-term operations. A summary of the fuel consumption for Proposed Projects 1 through 4 as well as the Preferred Project is shown in Table 2 below.

Table 2: Fuel Usage[a]

	Construction (total gallons)	Operation (gallons/day)
Existing	NA	22
Project 1	473,715	62
Project 2	431,958	59
Project 3	399,028	59
Project 4	428,880	51
Preferred Project	423,444	59

[a] Data derived from Appendix K-2 and a general assumption of construction and operational on-street vehicles traveling at 12 miles per gallon.

To reduce energy consumption, Mitigation Measures 5.9-C1(e) and 5.9-C1(h) have been provided. Mitigation Measure 5.9-C1(e) encourages the use of heavy duty off road vehicles modeled after year 1996, as feasible. Mitigation Measure 5.9-C1(h) encourages the use of Compressed Natural Gas (CNG), liquefied natural gas (LNG), biodiesel, or propane for on-site mobile equipment instead of diesel- powered equipment. In addition to reducing short-term construction energy use, long-term energy conservation design measures are included in the project. The collection system is designed as a hybrid in order to incorporate low pressure pipelines and gravity. Additionally, the treatment plant headworks have also been moved to the north side of the Tonini site to allow for the flow of gravity throughout the treatment plant to reduce the need for additional pumps from one treatment process to another.

The project design is required to comply with all applicable state-of-the-art Title 24 Energy Efficiency Standards. Compliance with Title 24 as well as incorporation of the mitigation measures and project design features described above would ensure the efficient use of energy. The project will not result in the inefficient, wasteful, or unnecessary consumption of energy and therefore the project will not create a significant impact on energy conservation.

In addition, the potential for growth inducement is provided in Section 6 of the Draft EIR. Finally, farmland impacts associated with the project is discussed in Section 5.11 in the Draft EIR and Appendix M-1.

Response to Comment P41-23

This comment expresses a concern regarding the possibility of citizen displacement. See Topical Response 2, Project Costs.

Response to Comment P41-24

This comment expresses the concern that the Draft EIR did not do a substantial climate change impact analysis, for example a discussion of the effects of sea level rise. See Response to Comment P08-4 regarding climate change effects on the project.

Response to Comment P41-25

This comment expresses a desire for additional analysis on green and appropriate technologies for energy saving benefits. The process used by the County to develop project alternatives is based on evaluating economic, environmental, and social issues (i.e. triple bottom line). However, the project is being developed in response to a prohibition order issued by the Regional Water Quality Control Board. Technologies which do not have a proven track record of clearly addressing the prohibition order have not been brought forward. All project costs have been expressed in terms of life-cycle costs. It can be stated with certainty that the current situation in Los Osos relative to wastewater disposal is not sustainable; because it seeks to eliminate groundwater pollution the project's overall goals are clearly intended to move the community to a more sustainable situation.

EPI-Center, 1013 Monterey Street, Suite 202, San Luis Obispo, CA 93401
Phone: 805-781-9932 • Fax: 805-781-9384

San Luis Obispo **COASTKEEPER®**

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center Room 207
San Luis Obispo, CA 93408

VIA FACSIMILE: 805-781-1229 and email

Subject: Public Comment – Los Osos Wastewater Project Draft EIR

Mr. Hutchinson

Thank you for the opportunity to comment on the County's Draft EIR for the Los Osos Wastewater Project.

San Luis Obispo **COASTKEEPER®**, a program of Environment in the Public Interest, is organized for the purpose of ensuring that the public has a voice with agencies and official responsible for enforcing water quality, watershed protection, and environmental regulations. As such, SLO **COASTKEEPER®** and our 800 Central Coast supporters are concerned that the proposed DEIR is deficient in that the alternatives analysis ignores a feasible project and site previously demonstrated to require a smaller project "footprint" and would likely avoid significant and/or potentially significant impacts. P42-1

Additional deficiencies exist in the identification of the "environmentally superior alternative" through an inadequate analysis of likely cumulative impacts. P42-2

Our specific concerns follow:

INADEQUATE CONSIDERATION AND DISCUSSION ALTERNATIVES:

CEQA Guidelines section 15126.6 requires that:

> "An EIR shall describe a range of reasonable alternatives to the project, or to the location of a project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives." 15126.6(a)

Section 15126.6(b) gives further guidance on an adequate consideration and discussion of alternatives:

> "Purpose. Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or it's location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly."

P42-3

In 2001 an EIR for a community-wide wastewater project in Los Osos was certified, subsequently acquired all necessary permits and began construction in 2005. This project, referred to as the Mid-Town project, presented a smaller footprint than the alternatives considered in the DEIR; provided superior treatment (tertiary as opposed to secondary treatment proposed in the DEIR); and provided a disposal system designed to improve the community's water overdraft as well as saltwater intrusion.

While the 2001 project was halted in 2005, the reasons were political and not for any technical deficiency. In fact, while the DEIR implies that the EIR was "rescinded" in 2006, no legal foundation exists to support a claim that the Los Osos CSD had the legal authority for such action, and no successful legal challenge to the Certified EIR for the 2001 Los Osos Wastewater Project exists.

The failure to consider a project alternative that is less impactive renders any analysis under either CEQA or NEPA defective.

INADEQUATE ANALYSIS OF CUMMULATIVE IMPACTS

P42-4

The project under consideration in the DEIR is unarguably an infrastructure. CEQA guidelines and the Courts have settled the issue of the County's responsibility to analyze the cumulative impacts of a proposed project – especially the provision of urban infrastructure to and

undeveloped rural agricultural area such as Turri Road.

The County cannot simply ignore major projects currently being processed. For instance the Warden Ag Cluster Subdivision is sufficiently close to the Turri Road project site that the proposed development cannot be ignored in the DEIR's cumulative analysis.

P42-4
CONT

Without adequate analysis of the combined effects of development project currently being processed, the County's analysis of the impacts presented in this DEIR is hopelessly inadequate.

Respectfully Submitted,

Gordon Hensley,
San Luis Obispo **COASTKEEPER** ®

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San Luis Obispo COASTKEEPER, Gordon Hensley, January 30, 2009 (Letter P42)

Response to Comment P42-1

This comment expresses a concern that the Draft EIR is deficient in that the alternatives analysis ignores a feasible project and site previously demonstrated to require a smaller Project "footprint" and would likely avoid significant and/or potentially significant impacts. It should be noted that "feasible" as used in the Coastal Plan includes consideration of environmental, social, economic and other factors. The Mid-town site has been rejected by a majority of the community's voters, providing evidence of its social infeasibility, and is shown as costing as much as 20 million dollars more than an out of town treatment plant, providing evidence of economic infeasibility, given the overall cost of the project and its impact on the community.

Response to Comment P42-2

This comment expresses a concern that the environmentally superior alternative is identified through inadequate analysis of cumulative impacts. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P42-3

This comment expresses a belief that failure to consider a project alternative that is less impactive renders an analysis under CEQA or NEPA as defective. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P42-4

This comment is concerned with not including a proposed development along Los Osos Valley Road, the Warden Ag Cluster Subdivision. After further review with the County, the Warden Ag Cluster Subdivision has the potential to have eight residential units. Furthermore, the distances from the proposed Warden development to Los Osos commercial centers is approximately 6 miles, while the distance to San Luis Obispo commercial centers is approximately 3.5 miles. Given the location of the Warden Subdivision, traffic volumes west of Turri Road are expected to be nominal from this proposed project, given the daily trips associated with daily needs (i.e., market, restaurants, etc.). The trips associated with this subdivision would increase noise and air emissions, however nominally based on the assumption of 10 trips per day resulting in 80 total trips along Los Osos Valley Road. The development of the Warden Ag Cluster Subdivision would also result in the loss of agricultural land and this loss would be considered part of the historic pattern of farmland conversion as shown in Section 5.11 and Appendix M-1 of this EIR. Therefore, assuming residents are more likely to travel into San Luis Obispo for their daily needs, impacts to air emissions, noise, and traffic volumes would be nominal, and the fact that the loss of agricultural land is consistent with the historic pattern of farmland conversion, the Warden Ag Cluster Subdivision is not cumulatively considerable.

Babak Naficy
LAW OFFICES OF BABAK NAFICY
569 Higuera Avenue, Suite C
San Luis Obispo, CA 93401
phone805.593.0926
fax 805.593-0946
babaknaficy@sbcglobal.net

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Dept. of Public Works
San Luis Obispo, CA 93408

RE: Los Osos Waste Water Project Draft Environmental Impact Report

Dear Mr. Hutchinson,

This office represents the Environmental Center of San Luis Obispo, on whose behalf these comments are submitted.

The Draft EIR is flawed because it does not contain relevant facts and analysis.

The Draft EIR (DEIR) violates CEQA because its conclusions rely on information and analysis that is not contained in the document itself. In chapter after chapter, the DEIR contains bare conclusions (e.g. land use planning, surface water quality, etc.) and refers the reader for more information and analysis to an appendix which is provided in electronic format on a disk. This practice has been rejected by California courts, which have recognized that the EIR must include at least a summary of the facts and analysis that is contained in more detailed appendixes. See, California Oak Foundation v. City of Santa Clarita, et al. ("information "scattered here and there in EIR appendices," or a report "buried in an appendix," is not a substitute for "a good faith reasoned analysis . . ." (2005) 133 Cal. App. 4th 1219, 1239 (internal citation omitted). Accordingly, the EIR must be revised to include at least a summary of the information and analysis that is contained in the appendixes on which the EIR's conclusions rely. P43-1

The Final EIR should re-evaluate the Tertiary Treatment Option.

Without adequate analysis, the DEIR rejects the option of designing a tertiary treatment waste water treatment facility. Tertiary treatment promotes public health and water quality and produces the cleanest feasible effluent by removing pathogens and dangerous pollutants from the wastewater. Although the DEIR claims the Regional Board has not required the tertiary treatment in Los Osos, tertiary treatment is required of wastewater treatment facilities that discharge into State waters. Accordingly, the contention that the Regional Board will not require P43-2

tertiary treatment in Los Osos must be verified and better explained. Moreover, the Final EIR should consider whether tertiary treatment is required under existing law, including the Porter-Colgne Act or the Federal Clean Water Act, and consider whether a decision to plan a secondary treatment facility in Los Osos would subject the County to litigation by advocacy groups with a track record of opposing secondary wastewater treatment, , such as the Natural Resources Defense Council.

It should be noted that other wastewater treatment facilities, such as the one operated by the City of San Luis Obispo, provide tertiary level treatment. This practice has enabled the City to reuse the treated effluent for landscaping and other municipal and urban needs, thereby significantly reducing the City's overall water demand.

As the County has recently acknowledged, as a component of a proposed economic stimulus plan, the federal government may contribute substantial sums to the construction of the LOWWP, thereby reducing the cost to the County and its residents. It would make little sense, therefore, to choose secondary treatment to save upfront capital costs when the County may legitimately ask the federal government for sufficient funding to construct a state of the art tertiary treatment facility.

The DEIR fails to adequately analyze the benefit of tertiary treatment. Although it admits that tertiary treatment would permit reuse of the treated effluent, the DEIR essentially rules out tertiary treatment because, it claims tertiary treatment is not required for the County to satisfy RWQCB requirements. Even if this were true, satisfying the Board should not be pursued as the only defining objective of this project. Providing tertiary treatment would be benefit the community by (1) better protecting the health and safety of the community by producing the cleanest possible output, (2) protect beneficial uses of local coastal streams and water quality in the Morro Bay estuary (3) protect agricultural resources and reduce the need for land application of secondary treated discharge, thereby reducing land use conflicts, and (4) address the community's potable water needs. The DEIR does not adequately analyze these potential benefits of tertiary treatment.

P43-2
CONT

California State Water Resources Board and Regional Boards regulate domestic wastewater discharges under Federal Clean Water Act ("CWA") by issuing NPDES permits. CWA Section 101(a)(2), declares that "it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983." Pursuant to Federal Regulations that implement the requirements of the CWA, all waters are presumptively designated as fishable and swimmable. Federal regulations require that all waters of the State must be regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. 40 CFR §131.2 and 131.10. Discharging secondary treated effluent through land application in close proximity to ephemeral streams a short distant from a nationally recognized estuary is not protective of beneficial uses of waters of the State. To protect the beneficial uses of our waters and as well as public health, the County should require tertiary treatment.

The pathogens present in raw sewage consist of bacteria, parasites, and viruses. Total and/or fecal coliform organisms are used as the most common indicator of the presence of these pathogens. Tertiary treatment has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream.

In California, reuse of wastewater is regulated under California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22). Pursuant to this regulation, for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater must be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 m*l* as a 7-day median. Although Title 22 is not directly applicable to surface waters, an equivalent level of treatment should be required if receiving waters are used for irrigation of food crops and for contact recreation.

As the EIR admits, the project is in the near vicinity of sensitive water resources, including the Morro Bay Estuary, Sweet Springs Marsh, and numerous coastal creeks including Los Osos Creek, Warden Creek, Eto Creek and several smaller unnamed tributaries. Appendix, Table 5.1-3 reveals that many of these local creeks are listed in the State's list of impaired water bodies due to the presence of fecal coliform. Although Total Maximum Daily Limits (TMDLs) have yet to be established for these creeks, it seems obvious that the County should not potentially exacerbate the contamination problem by allowing partially treated wastewater to be sprayed in areas where the contaminated water could reach these impaired water bodies. P43-2 CONT

Another factor that would recommend serious consideration of tertiary treatment is the possibility of contributing to the groundwater supplies and reducing salt water intrusion which the EIR admits poses a serious threat to Los Osos groundwater supplies. We question why the County has not identified reduction of seawater intrusion as a project objectives, and ask that this goal be included as a project objective. Moreover, we ask that the County explain its reluctance to involve the water supply purveyors in this planning process. As an informational document, the EIR must be more forthcoming in its explanation for why the water purveyors are not more actively involved.

Land Use Conflict

The Land Use Planning (Appendix C) discusses potential land use planning conflicts associated with each of the 4 alternative site locations. This analysis is flawed, however, because it assumes that each alternative under consideration is the only feasible alternative. In this regard, App. C claims that "there are no feasible locations for the proposed treatment plant and sprayfield facilities; therefore, Proposed Project 1 would be consistent with Sections 23.04.050 and 23.08.288 of the CZLUO." The EIR's discussion of alternative technologies reveals, however, that some of the feasible alternatives could avoid or reduce land use conflicts by reducing the size and foot print of the treatment facility. This is true of Alternative 2, for example, which would require a substantially smaller footprint. This alternative, therefore, would result in fewer or less intense land use conflict than the alternatives with larger footprints. P43-3

The EIR must acknowledge that the alternatives with a smaller footprint will result in the

conversion of fewer acres of designated prime agricultural lands and would therefore result in less intense land use conflicts. The Land Use Planning section of the EIR must then be revised to consider the relative compliance of each of the alternative with the applicable land use plans, goals and policies.

Likewise, the EIR must recognize that leachfields and sprayfields are not necessary components of a sewer treatment plant. The necessity for these facilities has been artificially created by the County's decision not to consider tertiary treatment. If the waste water is treated to tertiary standards, it can be disposed of by direct discharge into State waters or used for crop irrigation, landscaping or other beneficial uses. Tertiarity treatment, therefore, would eliminate or substantially reduce the need for conversion of prime agricultural lands to non-ag uses, thereby resolving a significant land use conflict.

P43-3 CONT

Agricultural Resources

The DEIR concludes that all four alternatives would result in significant and unavoidable impacts on agricultural resources. Although the impact on agriculture is undoubtedly significant, the DEIR does not contain adequate analysis or substantial evidence to support a finding that this adverse impact cannot be substantially reduced or adequately mitigated.

Among the four proposed alternatives, alternative 2 would result in a smaller overall impact on agricultural resources. The County could therefore minimize the impact on agricultural resources by selecting this alternative, or a hybrid alternative that similarly reduces the project's footprint. Moreover, the County could likewise reduce the significance of the impact on agriculture by eliminating the need for land application of secondary treated effluent if it chooses to use tertiary treatment. Any finding of infeasibility must be supported by substantial evidence, including an economic feasibility analysis.

P43-4

Visual Resources.

The visual resources analysis, found in Appendix N, is severely lacking in both qualitative and quantitative analysis; does not provide adequate review of potential impacts from more than a single viewing location (a single viewing location for project 1, 2, and 3 and a separate single viewing location for project 4); and does not evaluate the impact on public views from any relevant roads other than Los Osos Valley Road, and does not distinguish between the relative differences which project sites 1, 2, 3 and 4 have with regard to existing topography, vegetative screening, foreground views, or scenic character from various public viewing sites.

P43-5

Intriguingly, the document spends time discussing the potential impacts on views from Highway 1 and 41, although the topography of the Morros provides a dramatic topographic separation of all the project sites from both Highways. At the same time, the document never mentions potential impacts to views from any public viewing location within site of the project alternatives except for Los Osos Valley Road (LOVR). When considering aesthetic impacts relating to the

treatment facility, the document appears to only evaluate two viewing locations, one location for alternatives 1, 2, and 3, and one location for alternative 4. By using only a single location, the document fails to identify the extent which each of the treatment plant facility options may be visible from LOVR or other public viewing points.

When considering the visibility of each project option, the document repeatedly defers to whether the project sites would be visible from private viewing locations, namely residences. Typically, CEQA analysis focuses on potential impacts to public rather than private views.

The result is that the visual resources section fails to provide reviewers with an understanding of the actual potential impacts to public views associated with each of the proposed alternatives. Repeatedly the document states that "Impacts would be the same for Proposed Projects" 1, 2, 3 and 4, even though the various treatment facility sites have distinct differences. This conclusion is reached even though most reasonable people would clearly reach a different conclusion simply viewing the two photo simulations included in Appendix N. While the treatment plant projects are visible in each simulation, the context and the impact is dramatically different. Relative to context, proposed project 1 is located north of cemetery at the edge of a residential rural visual setting, where structures and development begin to dominate the landscape. Views of the treatment plant in this simulation show the plant located in the distance and visible only between signs and landscaping. The impact of the proposed project at this site appears nominal in the photo simulation, as though the treatment plant might only be visible for a fraction of second. By way of comparison, proposed project site 4 is located in a large area that slopes toward LOVR and that is clearly visible from LOVR for a distance of approximately 1 linear mile. The view from LOVR when heading westbound is nearly in a direct line of site rather than perpendicular. In addition, project site 4 would be clearly visible for a distance of approximately 1 linear mile along Turri Road, a public road that currently offers essentially pristine views of the Morros, the Irish Hills, and the lowland agricultural fields and homesteads.

P43-5 CONT

Thresholds and mitigation

5.12-C: The project would substantially degrade the existing visual character or quality of the site and its surroundings.

The draft EIR reaches the conclusion that project alternatives 1, 2, 3 and 4 would "would be noticeable and would change the visual character" and thus concludes that the impact based upon this threshold is significant. However, a change to the visual character in and of itself does not result in a significant impact. The changes need to degrade the existing visual character. If the existing visual character when viewed from public locations is already degraded, it is not clear if the project results in a further degradation that would be considered significant. Project sites 1, 2, and 3 are located in an area where the existing visual character is currently degraded by rural residential and other developed uses, while alternative 4 is located in an essentially pristine agricultural viewshed.

P43-6

Mitigation 5.12-F-1

This proposed mitigation measure requires designing the industrial wastewater treatment facilities to conform to an agricultural landscape. Such a requirement is vague and may not be feasible. Wastewater treatment facilities are clearly industrial public works facilities bearing no relationship to an agricultural landscape. Further, such as requirement clearly does not mitigate for the identified threshold: "Does the project locate structures that would disrupt views of AG zoned parcels." Industrial structures designed to look like barns are still structures. P43-7

Mitigations 5.12-F-1 and 5-12-C-2

Using "sufficient planting to screen views" and "visually integrating the project into the rural landscape" does not appear clearly feasible based upon the size and scale of the facility. These proposed mitigations do not address whether such screening is in fact feasible and will result in noticeably reducing the aesthetic impacts of the proposed project, and nothing in the analysis provides evidence that views from public viewing locations can be preserved and enhanced as required by this measure. This would appear to be especially true for a facility located on proposed project site 4, as this site would be clearly visible from an extended portion of Turri Road, including portions of the road which are elevated well above the proposed industrial structures, offering clear views on these facilities. P43-8

DEIR Alternatives to Proposed Project

The rationale provided on page 7-68 relative to the environmentally superior alternative does not appear to relate to the technical review found in Appendix N. There is no evidence that supports the simplistic conclusion that because Proposed Project 4 is located further from LOVR it will have fewer visual impacts. As noted above, the Proposed Project 4 site is eminently visible from Turri Road, is also nearly near a direct line of site for westbound drivers on LOVR, and is in a essentially pristine area visually, consisting of agricultural crop production and open views of stunning hillsides. Conversely, proposed project sites 1, 2, and 3 are located downslope from LOVR, are screened by existing development and vegetation, and are located in a area where the existing visual character is impacted by existing development. P43-9

Biological Resources

The DEIR violates CEQA because it does not include adequate site surveys, which are deferred. Without adequate surveys, it is impossible to determine the significance of project impacts on sensitive species. The DEIR should be recirculated after adequate surveys have been conducted and the presence or absence of sensitive, protected or "rare" species has been established. P43-10

The DEIR does not contain an adequate analysis of the proposed mitigation measures that are intended to address the project's biological impacts. Even the expanded Biological Appendix does not contain a sufficient description of mitigation measures. Yet, the DEIR concludes that these mitigation measures will reduce the project's significant impacts to a less than significant level. It is difficult to understand how the County can reach this conclusion without any analysis. P43-11

While some of the proposed mitigation measures include specific performance standards as required by CEQA Guideline 15126.4, (e.g. replacement mitigation for Morro Manzanita proposed at a ratio of 5:1.), mitigation ratios have not been established for other proposed measures. Although the County has determined that it must consult with the appropriate resource agencies (US Fish and Wildife Service and California Department of Fish and Game, etc.) and obtain all necessary permits, it does not necessarily follow that all impacts on sensitive or protected species will be reduced to less than significant. Accordingly, the DEIR's speculation that all of the project's impacts on biological will be reduced to less than significant is unwarranted.

P43-11
CONT

Appendix G, at page 50, provides that "Mitigation lands [for Morro Shoulderband Snail and Morro Bay Kangaroo Rat] will likely be required within existing lands designated as Critical Habitat for the species and/or shall be contiguous with existing preservation lands located in the vicinity of the community of Los Osos within areas studied for the Greenbelt Program by the Land Conservancy. To evaluate the effectiveness of this mitigation strategy, the DEIR should analyze whether lands matching this description are currently available for acquisition. Without this information, it would be impossible to know whether this proposed mitigation could feasibly be implemented.

Evaluation of Alternatives

CEQA requires that an EIR identify feasible alternatives that could avoid or substantially lessen the project's significant environmental impacts. Pub Res Code §§ 21002, 21002.1(a), 21100(b)(4), 21150; The EIR must compare the merits of each feasible alternative and explain in some detail how the alternatives were selected. CEQA Guideline 15126.6. The discussion of alternatives must include sufficient information about each alternative to allow evaluation and comparison of alternatives to the Project. CEQA Guideline 15126.6(d). Association of Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383, 1400 (The EIR's alternatives analysis must contain "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project.' [Citation.]")

P43-12

The DEIR here does not meet these standards. Because the DEIR fails to acknowledge potentially significant visual and land use (among other) adverse impacts, none of the considered alternatives are intended to reduce or at least address these significant impacts. In fact, it is difficult to discern which adverse environmental impacts the DEIR's proposed alternatives are intended to address. Moreover, the proposed alternatives do not discuss the problem of seawater intrusion and ways in which the proposed project could help the County address this issue. Rather than alternatives within the meaning of CEQA, the four scenarios considered in the DEIR should be considered alternative project descriptions.

Appendix N includes the following discussion of an alternative involving tertiary treatment:

P43-13

Alternative B.3: This alternative allows for the evaluation of tertiary

treatment and effluent reuse. Alternative B.3 involves constructing an oxidation ditch/Biolac with tertiary treatment and appurtenant facilities on the Giacomazzi site. In addition to conservation, leach fields (Broderson), and spray irrigation (Tonini), both agricultural reuse and urban reuse would be used for treated effluent disposal. Up to 160 AF of treated effluent would stored on the Tonini site to provide for seasonal reuse demands. Either STEP/STEG or gravity would be used for the collection system, and the collection/conveyance system would use Eto Lane as part of the alignment.

P43-13
CONT

The DEIR fails to adequately analyze this potential alternative. The DEIR does not accurately describe the benefits of tertiary treatment, including the possible use of the highly treated effluent to meet the community's over all water demand or addressing salt water intrusion. Moreover, the DEIR does not disclose that the treated effluent can be discharged into the aquifer thereby reducing the impact on agricultural resources. The DEIR also fails to disclose that the highly treated effluent will contain considerably less pathogens and will therefore result in a smaller public health risk or potential to degrade surface water quality. The DEIR must be revised to include a more thorough analysis of the benefits of tertiary treatment and an evaluation of the feasibility of implementing this alternative.

Conclusion

It is clear that the County staff has worked tremendously hard to prepare this DEIR. They are to be commended for that effort. Some significant problems remain. We are confident that County staff and the County consultants can remedy these problems. We welcome the opportunity to be part of that effort

Sincerely

/s/
Babak Naficy for ECOSLO

ECOSLO, Babak Naficy, January 30, 2009 (Letter P43)

Response to Comment P43-1

This comment expresses concerns about the Draft EIR having information and analysis spread throughout the document in various appendices, referenced reports and the like. The comment suggests the Draft EIR contain a summary of the information and analysis it contains on which the conclusion rely. The organization of the Draft EIR is somewhat different than most in that the major impact areas defined in the CEQA Guidelines (such as, Water Resources, Geology, Biologic Resources, Cultural Resources, etc.) are presented as stand alone sections summarizing the salient facts and conclusions of supporting documentation (each section is backed up by detailed appendices and other referenced reports.) This formatting is considered appropriate for the complexity of the LOWWP and the level of analysis required for the four project alternatives. A reader of the Draft EIR can be as general or specific as needed when reviewing the information presented.

Response to Comment P43-2

This comment suggests further analysis be made of the use of tertiary treatment for the wastewater. Refer to Topical Response 4, Tertiary Treatment.

Response to Comment P43-3

This comment expresses a concern about land use conflicts associated with the various alternative projects. Each of the treatment technologies analyzed has a different footprint of development area. However, there is the need for the sprayfield disposal of treated effluent at the Tonini site for each treatment alternative. The size of the sprayfield operation is the same for each alternative. By co-locating the treatment facilities at Tonini in conjunction with the sprayfield operation there is no need to convert the agricultural lands at Branin, Giacomazzi, or the Cemetery sites. This results in lesser impacts to agricultural lands being converted to other uses.

The comment also references the idea that sprayfield operation would not be required if tertiary treatment of the wastewater effluent was used. See Topical Response 4, Tertiary Treatment. Further, even if tertiary treatment was used, there would still be the requirement for sprayfield operations and seasonal storage of the effluent until other means of disposal are identified (urban reuse, agricultural in lieu, or other means).

Response to Comment P43-4

The comment makes several points. The comment makes a general statement that the Draft EIR does not contain adequate analysis to support the premise that adverse impacts to agriculture cannot be substantially reduced or adequately mitigated.

The comment specifically states that alternative 2 would result in a smaller overall impact on agricultural resources.

Finally, the comment indicates that the County could reduce the significance of impacts to agriculture by eliminating the need for land application for secondary treated effluent by choosing tertiary

treatment. Any finding of infeasibility of tertiary treatment needs to be supported by substantial evidence, including an economic feasibility analysis.

Regarding the comment that alternative 2 would have smaller agricultural impacts, Table 5.11-8 shows that potential agriculture revenue lost is more than $200,000 greater for proposed project 2 than for proposed project 4, suggesting that alternative two would have larger agricultural impacts.

In Section 7 of the Draft EIR, on page 7-43 is a discussion on why tertiary treatment is not evaluated as part of this project.

Response to Comment P43-5

The comment makes several points. One point made is that the visual analysis does not distinguish between impacts from Proposed Projects 1, 2, 3, and 4. The second point made is that only an analysis of two viewing locations is conducted when views from additional locations should be analyzed. The final point made is that the analysis focuses on views from private areas rather than public viewing areas.

Regarding the first point, all four parcels represent rural landscapes, and before mitigation, all four parcels would have significant impacts. Mitigation Measure 5.12-C3 is designed to make the treatment facility appear as an agricultural building so that it will not degrade the rural visual character on all four parcels, reducing the impact to less than significant. Refer to Response to Comment P22-8. Regarding the second point, analysis was made from two points because views of the proposed facility features (predominantly the treatment facility) do not change substantially since the distances from Los Osos Valley to proposed facilities only range from about 0.4 miles to 1.55 miles (refer to Exhibit 5.12-2 and Table 5.12-1 the visual resource analysis, expanded section 5.12). Regarding the third point, the locations of the proposed projects are such that most features will not be visible from public locations. Highways 1 and 41 were included in the analysis (pages 5.12-14 and 5.12-15 in expanded section 5.12) to clearly demonstrate that these state scenic highways public don't offer views of any of the proposed project features. As noted on page 5.12-2 of expanded section 5.12, the park across the street from the Mid-town parcel offers views of this site. However, direct views of the facility from the park would be obstructed by surrounding vegetation, and the facility to be built there would be a pump station (refer to Exhibit 5.12-4 in expanded section 5.12).

Response to Comment P43-6

The comment states that impacts to visual character should not be the same for Proposed Projects 1 through 4. The comment further states that Project sites 1, 2, and 3 are in an area where the existing visual character is already degraded. However, as stated on page 5.12-13, there are farm structures present on Tonini and Giacomazzi parcels, and a cemetery on the southern portion of the Cemetery parcel. All four parcels represent rural landscapes, and before mitigation, all four parcels would have significant impacts. Mitigation Measure 5.12-C3 is designed to make the treatment facility appear as an agricultural building so that it will not degrade the rural visual character on all four parcels, reducing the impact to less than significant.

Response to Comment P43-7

The comment states that the mitigation measure requiring the industrial wastewater treatment facilities to conform to an agricultural landscape is vague and may not be feasible. The comment does not provide any evidence as to why the mitigation measure is not feasible. As noted in response to Comment P43-6, several of the parcels including the Tonini parcel, are occupied by built structures. The purpose of Mitigation Measure 5.12-C3 is make the treatment facility appear as an agricultural related building, similar to those that already exist on several of the parcels.

The comment also states that mitigation would not mitigate for the identified threshold of the project locating structures that disrupt views of AG zoned parcels. The dimensions of the facilities are discussed on page 5.12-33, and are such that the proportion of the views disrupted, if at all, would be negligible.

Response to Comment P43-8

The comment states that mitigation measures of sufficiently planting to screen views and visually integrating the project into the rural landscape is not feasible. The comment does not provide any evidence as why these mitigation measures are not feasible. However, given the area occupied by the facility, the quality of the soils on the four project sites and the maximum height of 35 feet of the treatment facility, planting trees for effective screening seems feasible. Refer to Exhibit Q-6 in the Preferred Project discussion for the specific types of vegetation that would be used in landscaping for the Tonini site.

Response to Comment P43-9

The comment states the rationale to support the environmentally superior alternative does not appear related to technical review found in Appendix N. The commentor is apparently referring to technical analysis of visual resources. Visual resources were not one of the resources listed in the rationale for selecting the Preferred Project. Refer to Response to Comment A6-5.

Response to Comment P43-10

The comment states that the Draft EIR did not prepare an adequate analysis of potential effects of the Preferred Project, and that one photo simulation from a substantial distance is not sufficient. The comment also states that an analysis of the Morros viewshed should be conducted.

Refer to Response to Comment P43-5. Also, refer to analysis conclusions regarding visual impacts to AG zoned parcels on page 5.12-44 in the expanded visual resources section, where the conclusions are that impacts of proposed project 4 are significant prior to mitigation. Regarding the comment of a more complete analysis of the Morros viewshed it is not clear how the Morros viewshed is defined, or how a simulation of this viewshed would change the conclusions of the analysis. Exhibit 5.12-6 shows that the treatment facility is clearly visible from LOVR, and justifies the conclusion about a significant impact before mitigation.

Response to Comment P43-11

This comment states the Draft EIR does not contain an adequate analysis of the proposed mitigation measures to address biological impacts. Mitigation for the project will include impact reduction when species are present, relocation of Morro shoulderband snails to the maximum extent available and preservation of 72 acres of suitable habitat for Morro shoulderband snail, Morro Bay kangaroo rat, Morro manzanita, and Indian knob mountainbalm.

Crossing of Los Osos Creek and Warden Creek will now be on the bridge avoiding any instream impacts to steelhead streams (see Appendix Q.3).

Red-legged frogs have been found on the Tonini property. Design parameters have been employed to avoid impacts to any of the drainages on site and to place a permanent 100 foot buffer around each of the drainages to prevent any impacts from overspray from the sprayfields (see Appendix Q3).

Construction impacts would occur at the drainages when the waster water and treated effluent lines are installed and when the sprayfield lines are extended across the drainages. There will be no loss of habitat as the line will be buried and the drainages restored. During construction, permitted biologists will be present to move any red-legged frogs to other potions of the drainage to avoid any "take". Appropriate exclusion methods shall be used to keep red-legged frogs out of the construction zone.

The Broderson site meets the critical habitat requirements for the Morro shoulderband snail. While the Broderson site is not in critical habitat for the Morro Bay kangaroo rat, it would provide suitable habitat for the species.

Response to Comment P43-12

This comment expresses a concern that the Draft EIR did not adequately identify feasible alternatives, compare the merits of the feasible alternatives and explain how the alternatives were selected. Particular concern is expresses regarding visual, land use and seawater intrusion issues. The LOWWP conducted an extensive evaluation of the various types of wastewater treatment facilities and potential facility sites through the Rough Screening, Fine Screening and environmental review process as documented in the Fine Screening and Rough Screening Reports; the introduction to the Draft EIR Section 3, Project Description; Section 7 of the Draft EIR on Alternatives; Draft EIR Appendix C-1; the Expanded Land Use Analysis; Draft EIR Appendix N-1, the Expanded Visual Resources Analysis; Appendix D-1, the Expanded Groundwater Resources Analysis; and Draft EIR Appendix D-2, the Preliminary Hydrogeological Impacts Study. The four Level A proposed projects in the Draft EIR and the hybrid Preferred Project in the Final EIR represent a range of alternatives that were analyzed in the EIR. Level B and C alternatives that had been evaluated extensively in the Fine Screening and Rough Screening Reports and the series of Technical Memoranda prepared by the County and reviewed by the Los Osos Technical Advisory Committee, were not included in the four Level A proposed projects for various reasons as summarized in the Draft EIR Section 7 on Project Alternatives. The reasons for not considering the component alternatives further included environmental constraints, not meeting the project objectives, and technical or financial infeasibility.

Response to Comment P43-13

This comment expresses a concern that the Draft EIR did not adequately analyze Alternative B.3 that is mentioned in Appendix N. Although Alternative B.3 is not mentioned in Appendix N, which addresses Visual Impacts, it is discussed in Appendix P-2, which is Technical Memorandum 2.2, Evaluation of Component Alternatives. As discussed in the Response to Comment P43-12, the Level B alternatives were screened out based on the extensive technical and environmental alternatives screening process preceding preparation of the Draft EIR for the LOWWP. The issue of tertiary treatment alternatives is explained in detail in Topical Response 3, Water Resources and the Project Scope, and Topical Response 4, Tertiary Treatment.

Comments on the DEIR
from :Linde Owen

Overall comments
This draft EIR provides little if any clarity on what an overall sewer treatment system might entail or provide as an environmental impact, while completely ignoring what the cost differences are.

This DEIR Alternative analysis has cost the taxpayers of the Los Osos PZ $2 million and appears to hide the alternatives rather than compare them. The County has spent over $5 million preparing for this DEIR.

Why was the community-rejected MWH hired by Carollo to assist with this EIR? And is it coincidental that both corporations build Gravity collection systems. Obviously that is why most of this DEIR s prior project info that no longer relates to community desires, appears to be current. Obviously 'cut and paste' drove this EIR' production. Re-using the prior EIR may have seriously led this one away from a fair analysis.

Reviewing the TAC analysis, one notes that much that showed validity from this group's analysis and review was dropped, ignored, or exagerated.

Paavo Ogren's recent decision to support the rejected MWH Collection plan as superior and also 'shovel ready' ignores the bigger question: Is the County ready to vet a collection system without adequate and fair analysis, just to grovel for Obama infrastructure money? P44-1

Paavo's affordability plan seems to be about choosing the most expensive, energy inefficient, corporate/County Admin-friendly project with the savings being made up in grants, loans and the Obama Infrastructure funds.

The more ethical approach would be for the County team to have honestly reviewed options that would be sustainable and less costly.

Because we have accessed ourselves $128 for a project, we DO NOT APPEAR ELIGBLE for the Obama infrastructure money. Like the old $35 million Federal carrot, it's not happening. For the County to bypass the fair evaluation through this Gravity-leaning DEIR is unethical, political, and fails to meet Obama's criteria for Green & Sustainable infrastructure improvements.

Also. Where did the STEP information come from if not the $1/2 Million design description that Ripley Design presented with his engineers stamp? Neither TriW or Broderson are needed by any of the other alternatives presented. Why? Because they have smaller footprints and have safer plans for disposal. Mr. Ogren admitted that if Broderson disposal plan didn't work, they'd have to find

something else. He also stated that the County will be responsible for any damage caused by the potential liquifaction should the hill destabilize.

The Tonini site is in a separate aquifer, crosses two creeks, and destroys prime ag land, currently in crops & grazing. It has farm buildings of importance in the criteria of anything older than 50 yrs will be considered 'historic' significance, the Tonini Ranch is over 100 yrs old. Using sprayfields to evaporate over half of our 'treated effluent' water overtook ‘Due Diligence’ and the far more water re-use friendly AG Exchange potential was dropped. Tonini is 600 acres MORE THAN IS NEEDED. How will the County cover the extra cost that is truly uneeded and far too distant. Choosing a technology that produces daily sludge when integrated pond technology produces NONE for approx 20 years, is a questionable reason to even suggest that this site could become a sludge treatment facility. More disclosure needed.

Collection. 70% of the project cost. Potential of high pumping cost, costly maintenance, and system failure (inflow/outflow, spillage, and extensive maintenance). Installation can also differ ie. impact to community: installation impacts have huge differences. Cultural sites discovery, Dewatering in high ground water areas (30% of project area), 42 miles of street impact (includes hauling away & new fill), Earthquake preferable, Lawsuit safe, Agency By-in, and Financing all have major roles ahead in choosing a low impact, sustainable alternative.

P44-1
CONT

Safety (pipe failure, potential spills & fines, sewage back-ups,, system longevity, lower installation impact, lower monthly overhead ~ simple/best performance maintenance, lower energy draw, less social impact, best water re-use, best salt water control through basin balance, and most long term affordable are my EXPECTATIONS.]

Treatment. Location. Choice of Treatment. Equals community support, Basin future depends on current actions oncoming from the County team. Our community relys on an informed process not this sped up Project 4 support. Nacimiento Water is NOT an option for LosOsos, Water Re-use potential begins here. Treatment is tied into the final disposal desire and potential re-use. Stopping salt water intrusion and impending basin failure are intimately tied into the disposal option and more imortant than the .5 mg nitrate that we currently have in our aquifer. .

Nacimiento Water would be expensive and coming from a lake that is at 26% capacity in Winter 2009. Broderson disposal to get 20 % INTO THE LOWER AQUIFER. This is a total experiment and could fail. The DEIR fails to evaluate other options such as reduced aquifer pumping through purple pipe disposal, (the preferable form of re-use), AG Re-use (the 2nd best re-use) and any discussion

of Recreated wetlands, a financially/environmentally viable possibilty at Warden Lake. P44-1 CONT

Several other questions that deserve answers:

1. Impacts to wetlands and vegetation due to changes in groundwater regime - doesn't appear to be evaluated or mitigated in the deir P44-2

2. Staging areas - have they been identified or evaluated - they also require env review and mitigation if appropriate P44-3

3. Water quality and disposal of deep trenching activities - bio and public health P44-4

4. Cultural impacts due to trenching activities - are they being evluated for both mainline and laterals? P44-5

5. Air quality in light of new legislation on greenhouse gases etc P44-6

Here's just a little view of what the County team didn't want to consider...

Advantages: (From http://en.wikipedia.org/wiki/Vacuum_sewer

Vaccum Collection (NOT EVALUATED BY THE COUNTY)
• Closed, pneumatically controlled system with a central vacuum station. Electrical energy is only needed at this central station
• No sedimentation due to self-cleansing high velocities
• Spooling and maintenance of the sewer lines is not necessary
• Manholes are not required
• Usually only a single vacuum pump station is required rather than multiple stations found in gravity and low pressure networks. This frees up land , reduces energy costs and reduces operational costs.
• Investment costs can be reduced up to 50 % due to simple trenching at shallow depths, close to surface
• Flexibility of piping, obstacles (as open channels) can be over- or underpassed reduced installation time
• Small diameter sewer pipes of HDPE, PVC materials; savings of material costs aeration of sewage, less development of H2S, with its dangers for workers, inhabitants, as well as corrosion of the pipes may be avoided; sewage is kept fresh
• No odours along the closed vacuum sewers
• No infiltration, less hydraulic load at treatment station and discharge sewers absolutely no leakages (vacuum avoids exfiltration)
• Sewers may be laid in the same trench with other mains, also with potable water or storm-water, as well as in water protection areas
• Lower cost to maintain in the long term due to shallow trenching and easy identification of problems

Please understand that the weight and volume of this DEIR has NOTHING to do with Quality. Most of it was produced by MWH for a pleasant profit on the prior project.

This community deserves a fair review of our options and this draft bypasses the TAC work, The NWRI comments (Problem: by the second NWRI review, MWH, Corollo & Assoc, and Kennedy-Jenks all are shown as executive donors and the tone changes radically). It's a very questionable sell for bad technology at too high a cost and is no where close to Green or Energy-conscious. Please review Ripley, Air Vac, and Low Pressure Collection. P44-7

Thankyou,

Linde Owen

1935 10th B Los Osos,
CA 93402

Linde Owen, January 30, 2009 (Letter P44)

Response to Comment P44-1

This comments opinions on the draft EIR, the cost of the process, the consultant team members, the Technical Advisory Committee, the project manager, stimulus funding, information sources, the Tonini site, project costs, safety, wastewater treatment and effluent disposal are acknowledged. It should be noted that MWH (Montgomery Watson-Harza), the engineering firm that did substantial work on the previous LOCSD project, was not involved in the preparation of the draft EIR and has not been hired by Carollo Engineers to assist in writing the Draft EIR. The Draft EIR was prepared by Michael Brandman Associates, together with a list of sub consultants (see section 10 of the EIR) under contract directly to the County of San Luis Obispo. The comment regarding the use of the TriW or Broderson sites by other alternatives is unclear.

Response to Comment P44-2

The comment is concerned about impacts to wetlands and vegetation due to changes in groundwater regime. Any changes to the groundwater regime are speculative. The changes to the wetlands and the associated vegetation within the community of Los Osos is unknown. See also Response to Comment A8-9 and P41-7.

Response to Comment P44-3

This comment expresses a concern regarding the identification and evaluation of staging areas. See Response to Comment P24-35. The construction staging areas have been considered in the Draft EIR and are evaluated in greater detail in the Preferred Project evaluation in Appendix Q.

Response to Comment P44-4

This comment expresses a concern regarding water quality and disposal of deep trenching activities. See Topical Response 13, Construction Excavation regarding the disposal of deep trenching activities.

Response to Comment P44-5

This comment is concerned about evaluations for cultural resources for both the mainline and laterals. See responses to A8-118 and P5-1 for details on the cultural resources program.

Response to Comment P44-6

This comment states that air quality in light of new legislation on GHGs should be addressed. The Draft EIR air quality analysis used the most current adopted legislation as the basis for the analysis.

Response to Comment P44-7

This comment expresses a concern about the lack of review of various options for collection and treatment including the Ripley Report, Air Vac, and Low Pressure systems. On-site and other alternative treatment options were addressed in Technical Memoranda prepared by Carollo Engineers and presented to the Technical Advisory Committee for public review and comment and these memoranda are incorporated by reference into the Draft EIR. Further, detailed technical reports by

Kennedy-Jenks Consultants reviewed these different options and formed the basis for further analysis in the Draft EIR. In all these reports it was found that these types of collection and on-site treatment systems were less than satisfactory to warrant further study or review.

The comment also implies a conflict of interest in that MWH, Carollo, and Kennedy-Jenks are corporate contributors to the National Water Research Institute (NWRI). Sponsorship of NWRI comes from many nation-wide engineering companies, trade associations, universities, and water agencies, to name a few types. Composition of a NWRI panel for any particular study is a collection of acknowledged subject matter experts in their respective fields and is taken from engineering practice, academia, and other sources and brings an objective view to the study. NWRI was retained in summer of 2008 by the County to conduct their own review of the project options for wastewater collection and treatment. Results of the NWRI study were considered as part of the overall analysis in the Draft EIR and are included in Section 7, Alternatives, to the Proposed Project, of the document.

Jeffrey Buckingham
Cerro Alto Ranch
2710 Turri Road
San Luis Obispo, CA 93405

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center, Room 207
San Luis Obispo, CA 93408

Subject: Los Osos Wastewater Project Draft Environmental Impact Report

The purpose of this letter is to express concerns about the findings of the draft EIR for the Los Osos Wastewater Project. My name is Jeff Buckingham and my family lives at 2710 Turri Road two miles north of Los Osos Valley Road at the base of Hollister Peak.

My experience in San Luis Obispo includes graduating from Cal Poly in 1981 and building two successful companies in the area. The first, Call America Business Communications Corporation, employed 200 people at its peak and was one of the top 20 employers in the county. Our current company, also called Call America, was founded in 2001 and employs 25 people in San Luis Obispo with plans for continued growth. During my time in San Luis Obispo I have served on the San Luis Obispo Chamber of Commerce Board in a number of positions and was Chair of the board in 2007. I currently serve as the Chair of the committee to re-write the Chamber's Economic Vision Document. My other involvement with the community includes membership in the Rotary Club of San Luis Obispo de Tolosa where I will be President in 2010-2011, The Cuesta College Foundation Board, The San Luis Obispo County Farm Bureau Board, The San Luis Obispo County Farm Supply Company Board of Directors, and the KCBX Community Advisory Board. P45-1

During my time in San Luis Obispo I have come to see that preserving and enhancing the quality of life and natural beauty of San Luis Obispo is absolutely critical to our economic well being. Companies that provide head of household jobs do not locate or stay in San Luis Obispo because of the financial benefits. They locate or are founded here because people value our quality of life and the natural beauty of our county. Enhancing our quality of life and preserving the natural beauty of San Luis Obispo County will only become more important due to the tough economic times before us.

Turri Road is one of the crown jewels of San Luis Obispo County and on any day there is a continuous stream of people walking, running, biking, and skateboarding on Turri Road. There are organized activities such as bike races and skateboard competitions, and many television commercials are filmed on Turri Road as well. There are a number of times during the year when it is easy to lose count of the artists painting the views from all directions along Turri Road. We often see people stopped in their cars or standing along the road using the natural landscape to help heal the turmoil in their lives. My personal favorites are the cars that move very slowly along Turri Road and as they approach we can see that they contain some of our senior citizens. Often, their white haired heads are barley tall enough to see over the dashboard but their eyes are bright as they gaze upon the cows in the fields. The cars move slowly to allow the occupants a chance to go back in time, to a landscape that is unchanged since they were young. How did these once common natural landscapes become so rare?

It is important for San Luis Obispo County to build a wastewater treatment plant for Los Osos but using permanent urban sprawl as a part of the solution is not the answer. The Draft EIR points out several alternatives with sites closer to Los Osos and some of the experts agree that these sites would actually work better without damaging one of the few remaining unspoiled landscapes in San Luis Obispo County. Given the link between quality of life and economic well being, how can the County justify the potential long term damage to our economy by degrading one of San Luis Obispo's most unspoiled places? How can the damage to our economy, recreation, and agriculture be mitigated? I know of no way to re-create a place where artists will line up to paint the beautiful views.

P45-1
CONT

Using the unspoiled natural landscape as a place to locate urban problems is one of the oldest mistakes we make in our society. These kinds of mistakes are evident all around us and San Luis Obispo's remaining natural beauty is one of our greatest assets for quality of life and economic well being. It is particularly disappointing to see our County government favoring the most damaging alternative, especially as we are heading into tough economic times. How can our county possibly mitigate the loss of a crown jewel such as the natural beauty of Turri Road?

I strongly oppose the location of the treatment plant or spray fields on the Tonini property on Turri Road.

Sincerely,

Jeffrey Buckingham
Cerro Alto Ranch
(805) 545-5100
jeff@cerroalto.com

Jeffrey Buckingham, January 30, 2009 (Letter P45)

Response to Comment P45-1

This comment letter expresses concern about the location of the proposed treatment facility site being the Tonini Ranch site. The commentor cites loss of quality of life in the rural environment if the facility is located at Tonini. The purpose of the Draft EIR is to disclose to the public and decision-makers that nature and extent of potential impacts on the environment due to a proposed project undertaking. The Draft EIR analyzed four primary alternatives and selected the Environmentally Preferred Alternative. This alternative located the wastewater treatment facilities, seasonal effluent storage and wastewater disposal on the Tonini site for many reasons. The County is sensitive to the nature of the community and the rural environment of the Tonini site. Buildings and other facilities will be designed and constructed to minimize exposure from Turri Road and will be agrarian in nature. The sprayfield operations will also be an agrarian use with crops grown and harvested for fodder. The overall nature of the site will be retained to the maximum degree possible. The reader is referred to exhibits in Appendix Q, Preferred Project Evaluation, as well as the discussion of the visual analysis in the Draft EIR.

Jeffrey Buckingham
Cerro Alto Ranch
2710 Turri Road
San Luis Obispo, CA 93405

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center, Room 207
San Luis Obispo, CA 93408

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P45-1
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RECEIVED

JAN 30 2009

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center Room 207
San Luis Obispo, CA 93408

Frank Ausilio
P. O. Box 7072
Los Osos, CA 93412
805-528-5679

SUBJECT: Draft Environmental Impact Report
County of San Luis Obispo
Los Osos Wastewater Project

Dear Mr. Hutchinson:

These are my comments and questions on the Draft Environmental Impact Report for the proposed Los Osos Wastewater Project.

1. Several reports provide different figures on the amount of seawater intrusion in the Los Osos ground water basin. What is the actual amount of seawater intrusion in the Los Osos ground water basin? Why has the Draft EIR underestimated the amount?

> A number of studies and reports have investigated the degree of seawater intrusion into the Los Osos Ground Water Basin and have reached various conclusions. In the 2005 Seawater Intrusion Assessment, Cleath & Associates concluded that "[u]pper aquifer leakage is the primary component of recharge to the lower aquifer" of the Los Osos ground water basin. The Cleath report estimated that the amount of seawater intrusion in the lower aquifer is 560 acre feet per year (AFY). This estimate was based on the average of analytical and model results. (pp. 76-77) In February 2007, the Resource Capacity Study of the Water Supply in the Los Osos Area reported that the water basin is being overdrafted by about 600 AFY from the lower aquifer, causing seawater intrusion. This estimate was originally reported in a 2003 Sea Water Intrusion Assessment completed by the Los Osos Community Services District. (p. 6 of the Resource Capacity Study) The Draft EIR states the current seawater intrusion is 460 AFY and that removing septic leakage from the upper aquifer could increase seawater intrusion by 90 more AFY, to a total of 550 AFY. (p.7-59)

P46-1

2. Several reports provide different figures on groundwater production from private and agricultural wells. What is the correct data regarding groundwater production from private and agricultural wells? Why has the Draft EIR presented figures that are lower

P46-2

than those presented in previous studies? Since these data were compiled, additional development in the water basin has increased the AFY pumped by private domestic and agricultural wells. According to the Coastal Zone Land Use Ordinance, more wells can be added in the future outside the Prohibition Zone. (P. Sittig,, 8/31/07, email)

According to Appendix D of the Draft EIR, recent groundwater production estimates indicate that private domestic wells pump 80 AFY and agricultural and domestic wells within the Los Osos Creek valley pump 870 AFY. (p. 5.2-11) A Hydrogeology and Water Resources Report prepared in 1988 indicated that private domestic wells pumped 210 AFY in 1986 and agricultural pumpage was 970 AFY in 1986. (p. 31) The Sea Water Intrusion Assessment by Cleath & Associates from 2005 indicated that private domestic wells pumped an average of 200 AFY from 1985-2001 and agricultural pumpage averaged 950 AFY. The 950 AFY figure includes 70 AFY at Sea Pines Golf Course. (Table 2, p. 14)

P46-2 CONT

3. Several places in the Draft EIR provide different figures on the seawater intrusion benefit at the Broderson leach field. What is the correct number of acre feet per year that will reach the lower aquifer and reduce seawater intrusion?

The Draft EIR states, "If 448 AFY is discharged to the Broderson leachfield, the resulting seawater intrusion benefit would be 100 AFY." (p.7-60) The Detailed Proposed Project Descriptions portion of the Draft EIR states, "Groundwater modeling analysis has indicated that discharging 448 AFY through the Broderson leachfield could reduce seawater intrusion by 187 AFY." (p. 3-45) Table 7-8 indicates that seawater intrusion mitigation at the Broderson leachfield would be 99 AFY. (p. 7-60) The Hopkins Report, included in Appendix D of the Draft EIR, stated, "With the initial proposed capacity it is anticipated that at least 100 AFY will percolate through the regional aquitard into the lower aquifer system. The remaining 348 AFY will be a component of annual recharge to the upper aquifer system." (Appendix D, Preliminary Hydrogeological Impacts Study, p. 33)

P46-3

4. What will happen to treated effluent when the leachfield is being maintained and/or repaired during the rainy season when the spray fields are unusable? What effect will a temporary suspension of the disposal of effluent at the leachfield have on seawater intrusion?

P46-4

5. When the Draft EIR discusses rainwater runoff from the Broderson leachfield, it is not clear if the reference is to rain that falls on the site, stormwater runoff from higher elevations, or both. What will be the effect of rainwater runoff from higher ground onto the Broderson leachfield? What will happen when severe stormwater runoff from higher elevations combines with the treated effluent and the on-site stormwater runoff at the Broderson site?

P46-5

According to Spencer Harris, Cleath & Associates, the Broderson site has a 10 percent slope, approximately. (12/23/08 email)

The Draft EIR states, "The leachfields would be designed so that stormwater runoff does not leave the site. Grading would contour the earth to ensure that runoff passes into the leach trenches and infiltrates to the groundwater below." (p. 5.3-29)

P46-5 CONT

In describing the Broderson leachfield and the potential stormwater runoff from it, the Draft EIR states, "The secondary treated effluent directed to the Broderson site would infiltrate into the 8-acre leachfield. The 6.5-foot deep trenches would be backfilled with a 4-foot layer of gravel for drainage, which would then be covered by geotextile fabric and a final cover of 2.5 feet of native soil. The system is designed so that it would not create or contribute any additional stormwater runoff in the vicinity." (p. 5.3-48)

Included in Appendix D of the Draft EIR, in section D-2, is the Hopkins Hydrogeology Impacts Study, which states, "The Broderson disposal facilities will be the primary source of disposal during the wet weather months. During the rainy season, treated wastewater passing through the treatment process could reach as high as 1.5 mgd [million gallons per day] for short periods (60 days or less) and require storage and disposal."

P46-6

The capacity of the storage ponds at the treatment facility will be 15 million gallons. At the rate of 1.5 million gallons of treated wastewater processed per day, the ponds will reach capacity after 10 days. When the ponds are full, what will happen to the rest of the effluent? How many million gallons per day of treated effluent can the Broderson leachfield absorb during the wet weather months?

On 6/3/08 and 6/9/08, I submitted to the Los Osos Technical Advisory Committee several photographs from the Telegram-Tribune and the Sun Bulletin that were printed on 12/26/79, 12/27/79, and 1/3/80. These photos depicted the flooding of homes and property in the Highland Drive and Bayview Heights Drive areas following a severe winter storm. The proposed Broderson leachfield is contiguous to these areas that received such severe damage due to the stormwater runoff from higher elevations.

How will the Broderson leachfield be able to absorb the rainwater that falls on it combined with the stormwater runoff from higher elevations, especially when there is a high increase in the amount of effluent pumped from the wastewater treatment plant during the wet weather months?

6. The Draft EIR does not explain the effects that adding septage from the septic tanks outside the Prohibition Zone into the wastewater treatment system will have on seawater intrusion and treated effluent disposal prior to buildout. These septic tanks will have to be pumped out about every 5 years and the resulting septage will be treated at the wastewater treatment plant.

P46-7

> The Draft EIR states, "Septage pumped from the 4,679 STEP/STEG tanks (Proposed Project #1 only) and 749 septic tanks remaining outside the Prohibition Zone (All Proposed Projects) would be about 3 percent solids. Based on pumping each tank every 5 years, total septage is about 6,400 gallons per day for Proposed Project 1 or 720 gallons per day for Proposed Projects 2, 3 and 4 for 250 days per year." (p. 3-21)

P46-7 CONT

7. The Draft EIR contains two different estimates for the reduction of water consumption through conservation. What is the correct estimate for the reduction of water consumption through conservation?

> The Draft EIR discusses conservation measures that may be taken to reduce water consumption by 10% per capita over the 2006 average daily per capita wastewater generation rate. (p. 3-42) These measures are expected to conserve 160 AFY by the year 2020. In another location in the report, the reduction in per capita water demand is stated as 12% over the 2006 rate. (p. 7-58)

P46-8

It is not clear from the Draft EIR exactly when water conservation measures will begin and how many acre feet will be conserved in each year in order to meet the goal of 160 AFY by the year 2020.

8. In addition to the three residential water purveyors in Los Osos, there are a large number of private domestic and agricultural wells that also draw water from the Los Osos ground water basin. However, the Draft EIR leaves improvement of local water resources solely to the water purveyors. Why is the County planning to leave the improvement of local water resources solely to the water purveyors, especially when AB 2701 (Section 1.c) states, "The county may undertake any efforts necessary to construct and operate a community wastewater collection and treatment system...These efforts may include programs and projects for recharging aquifers, preventing saltwater intrusion, and managing groundwater resources to the extent that they are related to the construction and operation of the community wastewater collection and treatment system."?

P46-9

> As of 9/24/07, there were a minimum of 350 private domestic and agricultural wells in the water basin. (C. Rattigan, Public Health Department, email) Per an 8/31/07 email from Paul Sittig, Department of Planning & Building, additional wells may be added within the basin. As of 2005, well users pumped 1/3 (33%) of the total AFY pumped out of the basin. (Cleath & Associates, Sea Water Intrusion Assessment, p.14)
>
> The Draft EIR states, "Another important consideration of the Project involves water resource issues related to seawater intrusion that is contaminating the Los Osos groundwater basin. While the purpose of the LOWWP is to develop a community wastewater system, implementation measures for effluent disposal can

enhance opportunities for the water purveyors to improve the local water resources." (p.1-10)

P46-9 CONT

9. According to the DEIR, water conservation measures will only apply in the Prohibition Zone. Why is the County not ensuring that **all** water users in the basin are included in water conservation measures?

In discussing the preferred alternative project, the Draft EIR states, "It would also not be necessary to develop joint programs and secure agreements with local water purveyors and agricultural interests, which could conceivably delay project completion." (p. 7-61)

In contrast to the Draft EIR, the Resource Capacity Study recommended the adoption of "an ordinance to institute water conservation requirements for parcels outside of water purveyor service areas that mirror the efforts undertaken by purveyors within their service areas." (p. 3)

In a "Report Back on the Resource Capacity Study for the Los Osos Water Supply, it was stated, "Lastly, no solution to these issues *[seawater intrusion issues]* can be pursued without consideration of the wastewater treatment project. The information needs of both overlap and can inform each other." (p.2)

P46-10

On 2/13/04 the Los Osos Community Services District filed a complaint in Superior Court against Golden State Water Company, S&T Mutual Water Company, the County of San Luis, Sea Pines Golf Course, and 500 Does (unnamed private domestic and agricultural well users) regarding the relative rights of the parties to use water resources from the Los Osos Water Basin. An Interlocutory Stipulated Judgment among the parties, in which they agreed to participate and cooperate in developing a plan for resource preservation and management within the basin, was filed on 8/5/08. This agreement **does not** include the 350+ private domestic and agricultural well users who use 33% of the water produced in the basin. (C. Rattigan, Public Health Department, email) (Cleath & Associates, Sea Water Intrusion Assessment, p.14)

10. The words "sea water" and "seawater" both appear in the Draft EIR in numerous places. The words "leach field" and "leachfield" both appear in the Draft EIR in numerous places. The use of 2 different spellings for the same word makes it difficult to search the document for information on each of these issues.

P46-11

Sincerely,

Frank Ausilio

Frank Ausilio

Attachments

Exhibit A - 9/24/07 email from C. Rattigan (crattigan@co.slo.ca.us)

Exhibit B - 8/31/07 email from P. Sittig (psittig@co.slo.ca.us)

Exhibit C - 12/23/08 email from Spencer Harris

Exhibit A

Subj: Fw: Approx. number of wells in Los Osos
Date: 9/24/07 4:15:20 PM Pacific Daylight Time
From: crattigan@co.slo.ca.us
To: fjaunion@aol.com
Sent from the Internet (Details)

By the way the records started showing up in our database in the early 1960's but there are very few records until the early 1970's.

Cindy
----- Forwarded by Cindy Rattigan/PH/COSLO on 09/24/2007 04:14 PM -----
Cindy Rattigan/PH/COSLO
09/24/2007 04:07 PM

To fjaunion@aol.com
cc
Subject Approx. number of wells in Los Osos

Hi Frank.

I went ahead and ran two reports. One out of our current database, then one out of our older database. I then deleted any duplicate records that I could visibly find, and the temporary monitoring wells.

The number I came up with of domestic water wells is: 350. This will include irrigation, livestock, ag, etc... but not temporary monitoring wells.

I hope this helps.

Cindy

The information in this e-mail is confidential and protected by the physician-patient or psychotherapist-patient privilege. This privilege is not waived by using e-mail as a form of transmission. Only the above-named individual(s) can lawfully receive and read this information. If the person actually receiving this e-mail or any other reader is not the named recipient, or the employee or agent responsible to deliver it to the named recipient, any use, dissemination, distribution or copying of the communication is strictly prohibited by law and subject to sanctions. If you have received this communication in error, please immediately notify us by telephone, send it back to us, and delete all copies from your computer.

Exhibit B

Subj: Potential for Additional Wells in Los Osos
Date: 8/31/07 9:59:29 AM Pacific Daylight Time
From: psittig@co.slo.ca.us
To: fjaunion@aol.com
Sent from the Internet (Details)

Hello Frank,

We talked at the front counter yesterday, August 30th, about the possibility of adding personal wells within Los Osos. I first told you that the limit would be for properties of at least 2.5 acres in the Residential Suburban land use category (Coastal Zone Land Use Ordinance 23.04.027b).

After you had left, I talked with another planner who works primarily in the Coastal Zone of the County, and she told me of the section in Title 19 (Building and Construction ordinance for the County) that prohibits wells to be used for Single Family Dwellings within the service boundary of a community water system (19.20.236b). There is a small area of Residential Suburban beyond the Urban Reserve Line, which might be the limit to the community water systems of Los Osos (but I don't know the water purveyors limits, you should ask them for maps). To the north of Los Osos Valley Road, there are 9 parcels larger than 2.5 acres, accessed from the end of Lariat and Sombrero Drives. The 1 acre parcels in front would be too small to have both on-site septic and on-site wells, unless there was some agreement or tests to say otherwise.

There is section of 7 Residential Rural lots, ranging from 4.5 to 5.5 acres in size, just south of LOVR and to the west of Clark Valley Road, and an additional 4 lots that are each just over 1 acre in size. There is nothing in the CZLUO that defines the lot size requirement for Residential Rural lots in relation to any on-site wells and septic systems, but I believe that the actual size limit is 5 acres, so many of these parcels would seem to be nonconforming. It appears that the rest of the land adjacent to Los Osos is defined as Agriculture or Open Space, with some Public Facility lots here and there.

If you'd still like the pictures, I'll work on compiling them for you by Monday.

Thanks, and have a good weekend -
Paul Sittig
Planner - Coastal Team

County of San Luis Obispo
Department of Planning & Building
976 Osos Street, Room 300
San Luis Obispo, CA 93408
(805) 781-4374
psittig@co.slo.ca.us

Exhibit C

Subj: **FW: broderson slope**
Date: 12/29/2008 8:31:43 A.M. Pacific Standard Time
From: jharper@losososcsd.org
To: fjaunion@aol.com

Frank, FYI. Hope your holiday was fabulous. Later, Jan

Jan Harper, LOCSD
805.528-9370

Please consider the environment before printing this e-mail.

From: Spencer Harris
Sent: Wednesday, December 24, 2008 9:41 AM
To: Jan Harper
Subject: RE: broderson slope

Jan,

The data (ground surface elevation contours) can be found on the U.S.G.S. topographic map of Morro Bay South. This topographic map is used as a base map in all our reports. The LOCSD also has more detailed topographic data in electronic format.

Spencer

--- On **Tue, 12/23/08, Jan Harper** <*jharper@losososcsd.org*> wrote:

> From: Jan Harper <jharper@losososcsd.org>
> Subject: RE: broderson slope
> Date: Tuesday, December 23, 2008, 4:43 PM
>
> Thanks Spencer, Where could someone find this data? Have a great holiday and enjoy your time off. Jan

Jan Harper, LOCSD
805.528-9370
Please consider the environment before printing this e-mail.

From: Spencer Harris
Sent: Tuesday, December 23, 2008 2:33 PM
To: Jan Harper
Subject: broderson slope

Hi Jan,

The average slope between the Borderson site and Los Osos Valley Road is about 7 percent. It is not a uniform slope, but steepens as you go uphill from LOVR. At the Borderson disposal site, the slope is closer to 10 percent. Let me know if you need anything else.

Spencer

This page intentionally blank.

Frank Ausilio, January 30, 2009 (Letter P46)

Response to Comment P46-1

This comment expresses a concern regarding the different figures on the amount of seawater intrusion in the Los Osos groundwater basin. See Topical Response 3, Water Resources and the Project Scope.

Response to Comment P46-2

This comment expresses a concern regarding the different figures on groundwater production from private and agricultural wells. The LOWWP can not control present or future groundwater production. The groundwater production figures provided by Cleath & Associates, 2005 Seawater Intrusion Assessment reflect the most recent estimates of groundwater production in the basin and include pumping pattern changes and water conservation measures implemented since the time of earlier studies. See Topical Response 3, Water Resources and the Project Scope.

Response to Comment P46-3

This comment expresses a concern regarding the different figures on seawater intrusion benefit at the Broderson leachfield. See Appendix D-2 Table 6.

Response to Comment P46-4

This comment expresses a concern regarding the treated effluent when the leachfield is being maintained or repaired during the rainy season when the sprayfields are unusable. Scheduled operations and maintenance of portions of the Broderson leachfield can be conducted incrementally without removing the entire 8 acres from operation. However, water can be diverted to disposal at Tonini as well as stored in the retention ponds included in the project design and subsequently disposed.

Response to Comment P46-5

This comment expresses a desire for clarification regarding the definition of rainfall runoff from the Broderson leachfield. Vegetation on the Broderson site will be restored and the site will be graded to capture stormwater runoff so there will not be increased runoff from the site. Soil testing at the site has demonstrated an ultimate soil infiltration capacity of 180 gallons per day per square foot. This is many times more capacity than the amount of rainfall that may be produced, even during a severe event. For example, a storm that produced 6 inches of rain in one day equates to 3.7 gallons per day per square foot. The Broderson site is expected to receive a maximum hydraulic loading of 3.1 gallons per day per square foot, or 0.8 MGD, of treated effluent during wet weather. The combined loading during wet weather is many times less than the infiltration capacity of the soil. The leach lines will be buried several feet deep, below any surface water flows.

Response to Comment P46-6

This comment expresses a concern regarding concern regarding the Broderson site's ability to absorb rainwater and stormwater runoff. See the Response to Comment P46-5 and Topical Response 8, The Broderson Leachfield.

Response to Comment P46-7

This comment concerns the impact on seawater intrusion and treated effluent disposal from treating septage pumped from the Los Osos area septic tanks outside the Prohibition Zone at the wastewater treatment facility. The four Proposed Projects and the Preferred Project include constructing a septage receiving station at the wastewater treatment plant for the septage pumped from the 749 existing and future septic tanks in Los Osos at buildout that will be outside the Prohibition Zone. Proposed Project 1 will also accept septage from the 4,769 STEP/STEG tanks when they are pumped about every five years. The impacts of adding the septage to the LOWWP treatment raw wastewater influent are described in the Draft EIR Section 3.3.1 Subheading Wastewater flows, the Flows and Loads Technical Memorandum February 2008, and the Septage Receiving Station Option Technical Memorandum April 2008.

Because the raw wastewater influent and treated effluent will include the septage, the overall LOWWP project description applies to the septage treatment and disposal when the Draft EIR describes the effluent disposal sites in Section 3.2 Project Location; and the effluent disposal facilities in Section 3.3.2 Proposed Projects, subheading Effluent Disposal (pages 3-41 to 3-44); and in Section 3.3.3 Detailed Proposed Project Descriptions. The detailed impacts on seawater intrusion and treated effluent disposal are included throughout the Draft EIR with particular focus in Section 5.2 Groundwater Resources and the expanded Groundwater Quality Resources Appendix D.

Response to Comment P46-8

This comment expresses a desire for clarification regarding the correct estimate for the reduction of water consumption through conservation. LOWWP water conservation goal is about 10 percent per capita. As stated on Draft EIR page 3-42, at buildout, this would represent about 160 AFY or, with rounding, 0.1 million gallons a day (MGD) that could be conserved. This will reduce the required LOWWP plant capacity by 0.1 MGD and the treated effluent that will be disposed by the treatment plant by 160 AFY. To correct these numbers in the Draft EIR, the relevant sections on page 7-58 will be changed as follows:

> All four proposed projects assume that water conservation measures will be implemented to reduce water demand and the associated wastewater generation by 160 AFY. This represents about a ~~12~~ 10percent reduction in per capita water demand over 2006 estimated wastewater generation rates of 66 gallons per capita per day. Since the LOWWP wastewater conveyance, treatment and effluent disposal facility capacities have been based on the reduced wastewater generation rates, there will be significant savings in capital construction costs and operations and maintenance. Without implementing the water conservation measures, wastewater generation could continue at the historical rates and the LOWWP facilities would have to be enlarged to treat higher wastewater flows.
>
> In order to reduce wastewater generation, the water conservation measures must focus on plumbing fixtures and residential and commercial water uses other than landscape irrigation,

which does not generate wastewater. A ~~12~~ 10percent reduction in non-irrigation water uses is significant, so the Los Osos community will need to make a concerted effort to reach the water conservation goal. Three primary water conservation measures to be implemented could include:

1. Mandate that property owners, including residents, commercial establishments and schools, retrofit their buildings with all low-flow plumbing fixtures, including low-flow toilets, showerheads and faucets, prior to hooking up their buildings to the sewer.
2. Conduct a Public Education campaign to increase awareness of water conservation practices.
3. Promote High-Efficiency appliance programs that are sponsored by the gas and electric utility companies. Many of these programs cover appliances such as energy-efficient dishwashers and washers that would reduce both energy and water consumption.

The LOWWP would institute additional water conservation measures as needed to achieve the target ~~12~~10percent per capita water consumption rate reduction and the resulting wastewater generation reduction. Because of water conservation's importance to achieving the LOWWP project goals of sustainability, affordability, and mitigating the project's impacts on water resources, implementing water conservation measures has been designated a Level A alternative."

Response to Comment P46-9

This comment expresses a concern about the improvement of local water resources and suggests the County should take the lead in making the improvements in action with the local water purveyors. The reader is referred to Topical Response 3, Water Resources and Project Scope. Over the past two years, following the guidelines of the Court approved Interlocutory Stipulated Judgment; the County has met with the community, the purveyors, environmental and cultural groups, and each regulatory agency to develop a solution that is the best possible outcome for the community considering the complexity of the challenges. Developing a wastewater project for Los Osos must be based on the practical realities of the challenges the community faces; the roles and responsibilities of the County, the purveyors, the public, the Courts, regulatory agencies and others; and with the clear understanding that solving all issues will not be accomplished with a single project – that multiple issues exist and that the County's multi-faceted approach and process is the most viable.

Response to Comment P46-10

This comment expresses a concern that the County is not requiring all water users in the basin to implement water conservation measures. The water conservation measures described as part of the project apply to the prohibition zone because they can be required and verified as a condition of hooking up to the project. Because the County is not a water purveyor in Los Osos, other measures need to be developed and implemented in cooperation with the three water purveyors, which the County is pursuing through the groundwater litigation process mentioned in the comment.

Ordinances may be developed that pertain to parcels outside the water purveyors service areas, in coordination with the implementation of land use planning programs. These ordinances would be pursued on a separate track from the wastewater project. See Topical Response 3, Water Resources and Project Scope, and Topical Response 9, Water Conservation Measures.

Response to Comment P46-11

This comment says there are inconsistencies in spellings of terms; sea water vs. seawater and leach field vs. leachfield. Comment is noted.

1

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P.O. Box 15755 • San Luis Obispo, California 93406
Phone: (805) 543-8717 • Fax: (805) 543-8727
http://www.sierraclub.org/chapters/santalucia

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Dept of Public Works
County Government Center Room 207
San Luis Obispo, CA 93408
State Clearinghouse Number: 2007121034

Dear Mr. Hutchinson,

Following are the comments of the Santa Lucia Chapter of the Sierra Club on the Draft Environmental Impact Report of the Los Osos Wastewater Project. The majority of our comments pertain to the CEQA requirement to accurately describe the project and alternatives.

We commend the County for its efforts in moving the LOWWP forward. We urge the project team, in its public outreach, to adopt our primary recommendation at 3.2.2 of the DEIR and immediately begin educating Los Osos Valley growers and ag landowners on agricultural exchange. This would be best effected by bringing together representatives of the Monterey Regional Water Pollution Control Agency (MRWPCA) and their customers with local growers, water purveyors and the County in a series of meetings and field trips. Along with the requirement of selecting the collection system with the least environmental impact that is best suited to the area, we believe taking steps now to assure the establishment of agricultural exchange as quickly is possible is central to the success of the LOWWP.

For the record, we strongly urge the County not to prematurely truncate the design-build process and environmental review of the collection systems in order to declare the gravity system "shovel-ready." The Statement of Overriding Concerns in the 2001 EIR on which this claim is based has been rescinded, nullifying the Final EIR's conclusion that the SOC supports construction of a wastewater treatment plant at the Tri-W site and a gravity collection system. The environmental findings of the FEIR have been left intact, including the finding of a STEP/STEG collection system as the environmentally superior alternative. Moreover, the 2001 EIR was prepared prior to the enactment of AB 32, the creation of the State Marine Reserve, and the necessity to assess the impact of sea level rise on a project that would involve the placement of pumping stations on the shore of an estuary, to name three conditions that have changed since the previous environmental review. The need to fully review each component of the present project is clear, as is the need for the County to proceed with the originally planned project timeline and receive all bids before deciding on the LOWWP's largest component.

Thank you for the opportunity to comment on this project.

For the Executive Committee,

Andrew Christie
Chapter Director

Comments of the Sierra Club on the Los Osos Wastewater Project DEIR

Executive Summary, p. 12:
"It will be necessary to pump solids from the STEP/STEG tanks on a periodic basis (every five years) and transport the solids to the wastewater treatment facility."

The pump-out of STEP tanks every five years has been represented by the County as a system design requirement, not a regulatory requirement (Mark Hutchinson, Bruce Gibson, pers. comm., 1/23/09). In communicating this to us, we presume the County is aware that the assertion on this subject in the Technical Memorandum "Septage Receiving Station Option" Final Draft, April 2008 is in error (*"...the State Water Resources Control Board's On-Site Wastewater Treatment System Regulations (AB 885) and the Central Coast Regional Water Quality Control Board's (Regional Board) pending Basin Plan update will require that all septic tanks be pumped and inspected once every five years, which will essentially double the current amount of septage pumping").* STEP is not an onsite wastewater treatment system (OSWTS). A STEP tank is a wastewater interceptor and solids digestion tank as part of a collection system. P47-1

The County's belief that STEP tanks will require a 5-year pump-out interval has been repeatedly corrected by wastewater treatment system designers and engineers, who state that this interval is not consistent with O&M protocols for centralized managed STEP systems (see chart, Attachment 1). In this regard, the 4/08 Tech Memo is correct (*"From the available information, one can deduce that on average, septic tanks are pumped once every ten year").* The County's continued use of 5-year pump-outs in its calculations, resulting in significantly increased GHG emissions, energy use and O&M costs die STEO in the EIR's estimates and comparisons of same between potential STEP and gravity system components, is in error.

The final EIR should correct this assertion and recalculate all environmental impacts and cost estimates attributed to a STEP system based on pump-out interval.

Executive Summary, p. 13:
"The 8-acre active leachfield area at the Broderson site would require extensive preparation to function properly including excavation, backfill with gravel for drainage, installation of perforated piping, and then covered by geotextile fabric and native materials."

The EIR needs to clarify the infiltrative surface area of the trenches proposed for the Broderson disposal site, and whether this is to be a leachfield or a Rapid Infiltration Basin (RIB). The 2001 EIR and various consultant memos circa 2000-2008, incorporated by reference in the Draft EIR, use terminology that should apply either to leachfields or Rapid Infiltration Basin dispoal methods, but not both. Terms specific to each appear to be used interchangeably. P47-2

The geotechnical report on which the DEIR's calculations for Broderson infiltration rates and application rate appear to rely (Fugro, March 2004, p. 6-42), relies in turn on "the EPA (1981) guidelines [for] infiltration rates for effluent disposal basins...." but appears to have used the guidelines for Rapid Infiltration Basins, not leachfields. The Fugro analysis goes on to refer to "percolation lines," which are not a feature of disposal basins. This strongly indicates that all calculations for this project based on the use of EPA disposal basin guidelines for P47-3

infiltration rates are incorrect if the Broderson site is to be used as a leachfield. The EIR should clarify how the EPA guidelines for rapid infiltration basin disposal came to be conflated with EPA guidelines for leachfield disposal, and clarify which use for the site is contemplated and which EPA guidelines obtain. P47-3 CONT

The design rate's safety factor of 6:1, seventeen percent of the application rate defined in prototype testing (MWH, Feb. 2005), is a safety factor appropriate to a RIB, not a leachfield. This application rate is based on the rate "for the hydraulic percolation of high quality treated effluent..." (MWH, Feb. 2005). The DEIR contemplates the disposal of secondary, not tertiary, treated effluent at Broderson, which, due to higher bacterial content, is likely to cause the Baywood fine sands to seal and repel percolation. The EIR must evaluate this impact. P47-4

The Carollo Fine Screening report states: *"For the purposes of this report, percolation ponds will be considered equivalent to leachfields since they both are located at the same site, and they have the same capacity and seawater intrusion mitigation potential. Both of these alternatives will be referred to as 'Broderson.'"* If both leachfield and RIBs at Broderson are being considered, both alternatives should both be presented in detail in the EIR (infiltrative surface area dimensions, application rate, wet/dry cycles, gpd and AFY), along with three separate monthly water balances based on dry, average, and wet-year scenarios.

"If the pores beneath the leachfield become clogged over time, the leachfield would be excavated and the ground beneath it would be ripped or disked. The estimated frequency of ripping ranges between 5 and 10 years." (Appendix B, Project Description Data, and Carollo April 2008b)

As secondary treated effluent is proposed for disposal at the site, the soils are likely to seal and repel percolation in far less time than the proposed 5 to 10 year replacement schedule. The EIR must evaluate the impacts of proposed gravel washing, the necessary construction of a gravel washing plant on site, the water source for washing the gravel and impacts thereof.

This proposal entails excavating the gravel, destroying the distribution piping, geotextile cover, etc. to gain access to the infiltrative surface, then rebuilding the same leachfield at the same location. Disking or ripping the infiltrative surface of open percolation ponds or RIBs is common practice, but the proposal of this procedure here appears to be without precedent in the design and maintenance of leachfields, which are supposed to last indefinitely as constructed. Demolishing and reconstructing the Broderson leachfield every five years appears to constitute an acknowledgment that the Broderson disposal site is likely to fail, and must be continuously rebuilt. The EIR needs to clarify this point. P47-5

The proposed monitoring of Broderson in the EIR does not constitute mitigation under CEQA and will not mitigate for the failure of the Broderson disposal site or the "increased potential for liquefaction for residences immediately downslope of the infiltration area" (Cleath, Nov. 2000), nor get the County its money back should Broderson become a stranded asset. Should monitoring indicate the site has failed, the EIR needs to determine how the project will dispose of effluent it can no longer dispose of at Broderson. This evaluation should include significantly expanded pond storage and agricultural exchange as a disposal component and mitigation measure to be brought on line sooner rather than later.

Project Description, Proposed Project 1 includes:
A septage receiving station to accept and process the septage pumped from the 4,769 STEP/STEG systems plus the 749 septic tanks (at buildout) that will remain in Los Osos but outside the Prohibition Zone. P47-6

The EIR should analyze the alternative of clustering multiple residents on one STEP tank.

Project Description, 3.2.2:

"The Supplemental Notice of Preparation mentioned two other potential effluent disposal and reuse locations: urban reuse and agricultural reuse. After extensive analysis of technical, environmental, and economic issues, these types of locations were eliminated from further consideration for the current LOWWP project. The alternatives review process that led to this conclusion is summarized in Section 7, Alternatives to the Proposed Project, and in Technical Memoranda P-1, Alternatives Development and Descriptions Index and P-2, Systems Components Appendix" (3-19).

There is virtually no discussion of agricultural exchange in the Sections or Technical Memoranda listed. The DEIR cites the significant advantage of ag exchange over disposal at the Broderson site in mitigating seawater intrusion. By deferring ag exchange to an unknown future date and relying wholly on Broderson disposal for seawater intrusion mitigation, the EIR appears to be proposing a dangerously inadequate level of mitigation, which is estimated at a necessary 550 AFY (Fine Screening Report, Carrollo, 2007). Ag exchange has a seawater intrusion mitigation benefit 150% greater than Broderson disposal.

The County's position that ag exchange will take many years to bring about and is wholly the responsibility of the water purveyors is not compelling. Following are the remarks of Bahman Sheikh, Ph.D., P.E., Water Reuse Consultant:

"Indeed, it took 20 years to get recycled water delivered and sprayed on vegetable crops grown in Northern Monterey County. The reason it took so long was that we first did an eleven-year pilot project to investigate safety of use of disinfected tertiary recycled water for irrigation of raw-eaten food crops. Once we finished that, we had to go out and get USBR funding for the treatment and distribution of recycled water. Then, the design and construction of the facilities took a few years...and we ended up with 20 years total from planning to distribution of recycled water.

"In Los Osos, we do not have to investigate safety! It has been done, and for the last ten+ years, large-scale recycled water irrigation of food crops (lettuce, broccoli, cauliflower, strawberries, etc.) has been ongoing without a glitch on 12,000 acres of prime farmland surrounding Marina.

"Several farmers from Los Osos were treated to a guided tour of the Monterey farms using recycled water about two years ago and they were quite positively inclined to emulate the experience once recycled water became available.

"The only time needed now is for completion of design and construction of the treatment and distribution facilities to get recycled water to the farmers. During this period, negotiations can be concluded with farmers to use the available recycled water at rates that are mutually agreeable--with possible incentive pricing in the first few years to assure the availability of enough demand to account for all the produced recycled water from the Los Osos treatment plant. Any suggestion that Los Osos would also take 20 years to get recycled water to the farmers ignores the historical perspective and the vastly different attitude of the Los Osos farmers who actually recognize limitations of their groundwater supplies.

"We have spoken with several of these growers and they are ready to take the recycled water as long as the price is right. Once they get off the aquifer and start using recycled water, hydraulic gradelines in the confined aquifer will respond and push fresh water toward the ocean, reversing the seawater intrusion trend" (pers. com., 12/20/08).

P47-6
CONT

We note, from Project Goal #3, that the project should *"Address water resource issues by mitigating the project's impacts on water supply and saltwater intrusion. Further, the wastewater project will maintain the widest possible options for beneficial reuse of treated effluent."* To that end, the EIR should cite agricultural exchange as mandatory mitigation for reduced septic returns and require that the LOWWP include intensive outreach to local growers and water purveyors to facilitate the beginning of negotiations to use recycled water when available, and otherwise being preparations for a phased ag exchange program at or before build out. The County's outreach should be at least equivalent to that undertaken by Ripley Pacific as reported in the 2006 Los Osos Wastewater Management Plan update (See LOWWMP Update, Tech Memo #7, Attachment 2).

The Los Osos Wastewater Management Plan Update (Dec. 18, 2006, Ripley Pacific), presents a four-phase implementation plan in which the first phase of water recycling coincides with the first year of a two-phase buildout of the Wastewater Treatment Plant, representing an estimated 700-1000 AFY of water demand via ag exchange on adjacent acreage over five years. The EIR should assess the feasibility of this as a means to realize Project Goal #3.

3.3.1:
"Since the influent 5-day biological oxygen demand (BOD) and suspended solids (SS) are significantly less for the STEP/STEG system, the wastewater treatment plant for Proposed Project 1 would need to handle and dispose of fewer biosolids and meet a lower aeration demand."

The EIR needs to assess the environmental impact of the sludge produced by the proposed projects. Sewage sludge ("biosolids") constitutes a highly complex, unpredictable, biologically active mixture of organic material and human pathogens, some of which are resistant to antibiotics or cannot be destroyed through composting. This project's sludge can contain dozens of carcinogens, hormone disrupting chemicals, toxic metals, dioxins, radionuclides and other persistent bioaccumulative poisons. In 1993, the US EPA issued the land application rule 40 CFR Part 503 for the Use and Disposal of Sewage Sludges. There is growing agreement among scientists and environmentalists that the 503s need serious improvements. In 1997 the Cornell Waste Management Institute concluded that current regulations governing land application do not protect human health, agricultural productivity, and the environment (http://cwmi.css.cornell.edu/Sludge.html). In 2002, the National Research Council of the National Academy of Sciences (NAS) warned that the scientific underpinning of the 503s was based on outdated or nonexistent science. The NAS panel also warned that even if all of the contaminants of this complex and unpredictable waste mixture were known, single agent risk assessment and standard risk management strategies would not be protective of human health.

The EIR must acknowledge evolving scientific opinion on sewage sludge and evaluate and compare the relative potential impacts of the levels of sludge production from STEP and gravity systems.

P47-7

Project Description 3.3.4:
"There is about a five percent reduction in the total collection system excavation requirement if a STEP/STEG collection system is constructed instead of a gravity collection system. Because the STEP/STEG collection system will be installed about four feet below grade compared to the average eight-foot depth for the gravity sewer, excavation requirements for the STEP/STEG collection pipeline will be about 64,000 cubic yards compared to 247,000 cubic yards for the gravity pipeline..... These collection pipeline excavation savings are offset by the approximately 181,000 cubic yards (CY) of excavation required to install the 4,769 new STEP/STEG tanks in the front yard of each property. Although about 17,000 CY of excavation is required to install the sewer manholes and pump stations for the gravity sewer system, this is a fraction of the STEP/STEG tank excavation requirement."

There are 254,180 lineal feet of gravity sewer pipe in the proposed project. To achieve numbers as low as those stated by the EIR for total excavated soil for a gravity collection system would require installation of the gravity sewer in a trench that was 3.3 feet wide and 8 feet deep on average. Within that 3.3 foot width, a worker would have to pull a trench box (required to support trench walls) that has 8" walls, get an excavation bucket inside the trench box to excavate material, pull the box, place bedding material, etc. The trench has to be wide enough to pull the trench without binding. The pipe layer has to work within the limits of the trench box and navigate an 8" pipe to the base of the excavation. To facilitate this, the worker would be working in an area less than 2 feet wide with a 12-inch excavation bucket.

P47-8

This seems unlikely. Typical trench boxes are 6 feet wide. A service lateral for each property would also be included in this calculation. An accurate soil displacement number for a gravity sewer 254,000 feet long with a trench of realistic width would be in excess of 400,000 cubic yards. The EIR should recalculate the figures and totals it presents as measurements of comparative soil displacement.

This is a particularly vital calculation as the Draft EIR contradicts the finding of the 2001 EIR which found a STEP/STEG system to be the "Environmentally Superior Alternative" (Attachment 3). If the County has changed this finding in whole or in part on the basis of

comparative soil displacement between STEP and gravity system, this claim needs considerably more substantiation than the Draft EIR provides.

The EIR also needs to reconcile its calculations with those in its document "Summary of Findings for STEP and Gravity Collection System," SLO County Dept. of Public Works, KEIS/DEIR Meeting Agenda, 12/19/08: *"Soil Disturbance: STEP Collection excavation = 322,000 cubic yards; Gravity collection system = 344,000 cubic yards."*

The EIR elsewhere notes that "the land under or immediately adjacent to existing roadways is typically already disturbed, so potential environmental conflicts can be minimized." (7-26). The same is true of front yards that have already had septic tanks installed, and the EIR should so note.

P47-8
CONT

Ibid.:
"[It is] assumed that half of the STEP/STEG collection system will be installed by boring rather than open trench excavation."

If the STEP system were 100% directional bored the soil disturbance would be in the range of 4,000 cubic yards. If it was 100% trenched, it would be in the range of 80,000 cubic yards. If half bored and half trenched, it would displace 42,000 CY, not 64,000 CY.

"...the average wastewater generation rate of 1.2 million gallons a day estimated for the LOWWP assumes that water conservation measures would be implemented to reduce water consumption and the corresponding wastewater generation rate by 0.1 million gallons a day or 160 AFY. Reducing wastewater generation by 160 AFY by 2020 represents about a ten percent reduction from the 2006 average daily per capita wastewater generation rate." (3-42)

This 10% conservation rate represents one-third of the household water conservation rate urged by the EPA (Steve Allbee, Project Director, Gap Analysis, USEPA). The EIR must assess whether the minimum flow requirement of the gravity collection system could serve as a bar to more aggressive conservation measures, and whether the necessity of flushing the pipes of a gravity system would partially or wholly offset water conservation efforts, and by how much. We note:

P47-9

"In some areas the use of conventional gravity sewers is becoming counterproductive because the use of water conservation devices continues to increase. The minimum flows required for gravity-flow sewers to operate make them problematic where development occurs slowly in a large development or where water conservation reduces the wastewater flows significantly. In many cases, the water used to flush conventional gravity-flow collection systems for the removal of accumulated solids far exceeds the water saved through water conservation measures." -*Small and Decentralized Wastewater Management Systems*, Crites and Tchobonaglaus, 1998, Nolte & Associates)

Project description, 3-53, Project 1:
"Two 1-person crews to pump about 936 STEP/STEG tanks every year since each STEP/STEG tank needs to be pumped at least every five years after an initial startup up period.
- 2 to 3 people to inspect and clean each STEP/STEG tank every two years.
- One 2-person crew to maintain and periodically replace the 1,000 carbon filters on the air-vacuum valves and the 4,679 pumps once the system has been in operation for a few years."

P47-10

Projects 2 through 4:
"One 2-person crew to maintain the pump stations and appurtenances throughout the collection system.
- Annually, a 2-person crew for two months to clean the collection system.
- Every year or two a crew to inspect the physical integrity of the collection system and make any necessary repairs.

- Additional staff time to operate and maintain the raw wastewater and treated effluent conveyance systems, the storage ponds, leachfield, and sprayfields; respond to emergencies; and to process, dewater and haul the biosolids removed from the wastewater."

"The capital construction cost savings for STEP/STEG collection systems are offset by the higher operations and maintenance costs for maintaining the 4769 pump stations and periodically pumping and hauling the accumulated septage." (7.3.2)

A STEP system generally requires one maintenance worker for every 2,000 connections. Initially 2 and eventually 3 full time employees should be able to maintain a STEP system in Los Osos. Each service worker would only require a pick-up truck and a basic set of tools for maintenance. Tank pump-outs should average at least ten years between pump-outs and will normally be contracted to a septic contractor.

A gravity system requires at least 3 workers for most tasks. Lift stations generally are visited daily and at a minimum weekly. Any work within a lift station is a confined space entry and requires monitoring, ventilation, possibly pumped oxygen, a tripod and three workers. A utility truck with a boom (c. $75,000) is required to remove and service pumps. A full service preventative maintenance visit on a lift station normally occurs one to two times annually. A jet truck and three-man crew is required to inspect and clean sewer, which should be done at intervals no longer than 5 years. A TV inspection truck must either be contracted or purchased for inspection of mains. A typical truck (c. $300,000) requires a 3-man crew. Any repairs to a gravity sewer will require a rubber tired back-hoe at a minimum and track-hoe in most instances. Repairs must either be contracted or the equipment purchased. A repair crew should have 3 people at a minimum.

P47-10
CONT

There are many lines in the MWH design that are designed at minimum grades. In pipes with lower flow, sedimentation and odor problems can result. To assure that these mains are not problematic, frequent line inspection and cleaning should be required. The EIR does not define the maintenance protocol required for the gravity system. The EIR needs to define costs of the O&M program for a gravity collection system as to whether estimates are based on the MWH design or on a sewer built with more grade.

The DEIR's assertion of a higher O&M costs for a STEP/STEG collection system over the O&M costs of a gravity system conflicts with the estimates of the NWRI peer-reviewed Los Osos Wastewater Management Plan Update (Dec. 18, 2006, Ripley Pacific). The LOWWMP estimated $2.61 million in O&M costs for the previously designed project (gravity collection, treatment, and disposal at Broderson) and $1.65-$1.82 million for O&M of a STEP/STEG system, with treatment, storage and ag exchange. The two project's total annualized costs were estimated at $18.4 million (gravity) and $9.5-11 million (STEP/STEG). The Final EIR should explain and resolve the significant discrepancy between the County's estimates and those of the Wastewater Management Plan Update.

In addition to comparing staffing requirements, the EIR should state comparative costs for required O&M of a gravity and a STEP system and restate totals for both staff – including number of staff and **number of man hours** -- and the cost of maintenance equipment.

Table 3-5: Proposed LOWWP Effluent Disposal System
[all projects]
Effluent Disposal Method: Broderson Leachfield
Available Area (acres): 8
Estimated Capacity per Acre (AFY1/acre): 64
Capacity (AFY1) Proposed: 448

P47-11

The Los Osos Wastewater Project Geotechnical Report (Fugro, Fugro March 9, 2004, page 6-42,) cites a dispersal application rate of 30 gallons per day per square foot (gpd/sf) for the Broderson leachfield. Since then, the application rate for Broderson appears to have become a moving target, ranging steeply downward from 30gpd/sf:

LO Technical Advisory Committee Meeting, June 2008, public comment:
- CSD Director Joe Sparks, P.E.: *"County proposes a maximum application rate of 3.5 gpd/ft2."*
- TAC/CSD Engineer Robert Miller, P.E.: *"3.5, 2.5 [gpd/ft2] or less, or whatever the project engineers felt comfortable with... there is no need to put any application rate on paper until the [empirical] data is in."*

The site's reported capacity, however, has remained a constant 448AFY. We do not understand how the application rate has gone from 30 gpd/sf to an apparent 0.8 gpd/sf, a reduction of 97 percent, while the annual capacity of 448AFY and the estimated amount of mitigation for seawater intrusion have remained constant. The EIR should calculate infiltrative surface area (square feet) multiplied by application rate (gallons per day per square foot) in order to state daily capacity (gallons per day).

P47-11 CONT

"O&M costs range from $2 to 3.1 million for Proposed Project 1 and $1.6 to 3.0 million for Proposed Projects 2, 3, and 4." (3-65).

The data included in the fine screening indicates that the STEP oxidation ditch is ¼ the volume of a gravity sewer oxidation ditch, making the $3.1 million estimate appear questionable.

The EIR's assertion of a higher O & M costs for a STEP/STEG collection system over the O & M costs of a gravity system conflicts with the estimates of the Los Osos Wastewater Management Plan Update (Dec. 18, 2006, Ripley Pacific). The LOWMP estimated $2.61 million in O&M costs for the previously designed project (gravity collection, treatment, and disposal at Broderson) and $1.65-$1.82 million estimated O&M for STEP/STEG collection, with treatment, storage and ag exchange. The two project's total annualized costs were estimated at $18.4 million (gravity) and $9.5-11 million (STEP/STEG). The Final EIR should explain and resolve the significant discrepancy between the County's estimates and those of the Wastewater Management Plan Update.

P47-12

5.2-16:
"With the implementation of the STEP/STEG wastewater collection system, wastewater would no longer leach from the existing septic system into the Los Osos groundwater basin. Proposed Project 1 would eliminate the current leaching of approximately 997 AFY of which approximately 600 AFY currently leaches directly into the upper aquifer (Zone C) which is the main water supply. The treated effluent disposal associated with Proposed Project 1, in combination with the proposed water conservation program, would balance the inflow and outflow to/from the upper aquifer...."

The EIR simply asserts that the combination of effluent disposal and conservation will replace the recharge provided to the aquifer by septic flows. The EIR elsewhere states that *"The removal of septic recharge from the prohibition zone in the Los Osos Basin would reduce recharge to the upper aquifer zones, which in turn would reduce leakage from the upper aquifer Zone C that recharges the lower aquifer zones."* (5.2-18).

The EIR does not quantify the AFY of septic flow that eventually reaches the lower aquifer at present and therefore does not provide a direct comparison to the total AFY of seawater intrusion reduction provided by Broderson disposal and conservation. Such direct comparison should serve as the basis for the assertion that the project will not result in an adverse impact on the aquifer and will maintain or improve current levels of seawater intrusion. We do not know if the 99 AFY that will hopefully percolate to the lower aquifer via Broderson disposal is equivalent to the septic return flow that is currently making that passage via the perched/upper/lower aquifers. These figures must be presented and substantiated if we are to determine if the Broderson recharge plan represents a positive or negative environmental impact of the project.

P47-13

5.2-19: Project-Specific Impact Analysis:
Long-term operational effects for all four proposed projects include the statement:
"Implementation of the proposed project would reduce septic effluent discharge into the perched aquifer (Zone A). Therefore, the project would reduce the quantity of groundwater within the perched aquifer. However, the exact quantity of reduction within the perched aquifer is unknown, and the potential impact on groundwater flow to surrounding surface water features is speculative given that the amount of perched groundwater currently flowing to surface water features is not known."

P47-14

In view of the fact that the project will have a known impact to groundwater of unknown magnitude, the project should include additional groundwater mitigation. To that end, we urge the LOWWP to contact the Central Coast LID Center to incorporate infiltrative bioswales in the project design. See: http://www.lowimpactdevelopment.org/greenstreets/background.htm

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5.2.4 - Level of Significance Prior to Mitigation
"All impacts associated with groundwater quality and water supply for each of the proposed projects (project-specific as well as cumulative) were found to be Less Than Significant."

The EIR should specify the amount of dewatering likely to be required for a gravity collection system (12,000 gallons @ minute for Salinas Sewer Line Project), including pocket pumps and pump stations vs. minimal dewatering for STEP collection.

The County does not appear to wish to account for the high likelihood of I/I and exfiltration as the inevitable consequence of the selection of a gravity collection system, and has expressed the belief that a maintenance program will alleviate any possible future problems. Experience elsewhere indicates this is not an adequate response to a problem inherent in the design of the system, and that a belief in the efficacy of future maintenance efforts is not sufficient mitigation for a design flaw in a collection system that would be installed next to a National Marine Estuary and State Marine Reserve. We note:

P47-15

"Untreated sewage from exfiltration often contains high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Exfiltration can result in discharges of pathogens into residential areas; cause exeedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, groundwater, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways."
- "Exfiltration in Sewer Systems," (Amick and Burgess, Natl. Risk Mgmt. Research Laboratory, USEPA, 12/2000).

5.6-13:
"The gravity collection systems allow some flexibility in the placement of the lateral across private property and thus has the potential to be less impacting than the collection system associated with Proposed Project 1."

This analysis appears to misstate the case as to which system offers more or fewer opportunities and more or less flexibility to avoid impacts to sensitive archaeological locations, and does so by impermissibly narrowing analysis to only on-lot impacts, with the apparent intent of making the impacts of a gravity system appear to be less. A STEP/STEG system uses flexible, small-bore pipe, not dependent on grade, laid by directional boring, and can easily avoid sensitive locations. The drilling head can be deflected by changes in soil composition, rocks, etc. Directional boring is not practical for a gravity sewer because it is virtually impossible to maintain line and grade. A gravity system uses a large, rigid pipe, laid in a deep trench and is required to maintain grade. While it may be possible to utilize boring on service laterals, the EIR needs to state how this can be done with sewer mains installed at minimum grades, include

P47-16

a cost analysis, and reassess the likelihood of this procedure being used in avoidance of impacts to sensitive archaeological locations in view of its cost.

In discussion of avoidance of on-lot disturbance (5.6-36), the EIR mentions the option of replacing an existing septic tank with a STEP tank, impacting only previously disturbed soils. Consideration of that measure should be carried forward here, and impact reassessed accordingly.

P47-16 CONT

Appendix H: Cultural Resources

"The gravity collection systems allow some flexibility in the placement of the lateral across private property. In areas of high archaeological sensitivity (e.g., within site boundaries or in the vicinity of known human burials) it may be possible to bore beneath the deposit for placement of the lateral."

Stating what "may be possible" does not constitute avoidance or mitigation of impacts under CEQA. The EIR must re-calculate its gravity collection system cost estimates to factor in the additional cost for the necessity of converting from trenching to planned and unplanned boring or tunneling to avoid impacts in areas of high archaeological sensitivity. The estimate should include cost of contractor compensation for down time, demobilizing and mobilizing the trenching crew to another location, administration costs, and costs attributed to a change order above bid.

ibid:

"The STEP/STEG method offers fewer opportunities to avoid impacts to sensitive archaeological locations, as it requires the property owner to place the new STE tank on their land thus creating new impacts."

P47-17

The EIR appears to be conflating excavation of undisturbed sites for large gravity collection pipes with the excavation of front yards for STEP tanks. The potential for cultural resource impacts is far greater when excavation occurs at undisturbed sites and is of far more consequence under CEQA than the disturbance of soil in the front or back yards of homes, disturbed soils that have been previously excavated and filled for the placement of septic tanks.

The EIR's analysis should include the fact that on-site work for gravity requires installation in a trench up to 4 feet deep; the existing septic tank must be removed or crushed in place, requiring excavation. STEP on-site can be either done by replacing the existing tank in the same location. Excavated material can be stockpiled on tarping and equipment can be driven on plywood to minimize impacts. Services can be installed with a walk-behind trencher that cuts a trench that is only a few inches wide.

The EIR does not note that construction of a STEP system can normally be completed without road closures, nor does it state that gravity construction will create significantly more local impact than STEP or analyze these impacts. The EIR should evaluate the potential of leaving the existing septic tank in place for rainwater/graywater catchment.

Appendix K: Air Quality

Odors, 5.9-E

"The potential for odors exist in the collection system for Proposed Project 2, but not nearly to the same extent as Proposed Project 1, which is anaerobic.... In general, the only potential for odor is at the pump stations or if there are long lines with low flow, which is not the situation with Proposed Project 2. Therefore, odor impacts generated from operational activities associated with the collection system in Proposed Project [2 - 4] would be less than significant."(5.9-57)

P47-18

Level of odor is determined by the organic content in the wastewater. A gravity sewer has a higher organic content and therefore has a higher ability to emit odors, which are common at

gravity lift stations and in minimum grade gravity sewer runs. The EIR needs to consider odor impacts based on the fact that in order to minimize the number of lift stations, the County's preferred gravity collection system is designed with minimum, shallow grades. This will result in more opportunity for stagnant wastewater flow, which can lead to significant odor problems. P47-18 CONT

Appendix K
Greenhouse gas emissions, 5.9-F:

"The implementation of the collection system under Proposed Project 1 would contribute to the annual reduction in GHG emissions. Therefore, GHG emissions associated with the operation of the collection system of Proposed Project 1 would not hinder or delay the State's ability to achieve the year 2020 goals of AB 32. The operation of the proposed collection system under Proposed Project 1 would contribute a net reduction in GHG emissions, thus, the operation of the proposed collection system would contribute to a beneficial impact on GHG emissions." (5.9-65)" P47-19

CAPCOA indicates that a project emitting more that 900 metric tons/yr of GHG will have a significant impact to global warming. This would include Operational GHG Emissions of Project 1 and Project 4. See next comment for likely misstatement of methane impacts by the EIR, and our comment on **Revised Table 5.9-15: Operational GHG Emissions** for the EIR's likely misstatement of methanol impact, and methanol alternatives that could reduce emissions of Proposed Project 1 to no significant impact.

"Also included in the long-term operations of Proposed Project 1 is the methane emissions from septic tank venting. Methane emissions are generated from the anaerobic biodegradation of domestic wastewater within septic tanks and are vented to the atmosphere, contributing to the total carbon footprint calculated for Proposed Project 1. Estimates of the annual methane emissions vented from septic tanks are included for the prohibition zone only at build-out." (5.9-69)

Domestic wastewater methane emissions in the United States are estimated using IPCC methodology. 2006 IPCC Guidelines for National Greenhouse Gas Inventories stated that "below 15°C, significant CH4 production is unlikely because methanogens (the bacteria responsible for producing methane) are not active." The same document states that "Frequent solids removal reduces CH4 production." Ground temperatures in Los Osos are below 15°C. Based on IPCC Guidelines and the County's insistence on 5-year pump-outs, it does not appear that methanogens will establish, or at least that very little methane will be produced due to the low soil temperatures. P47-20

If the EIR continues to maintain that methane production from a STEP system would be significant, it should fully evaluate the potential of biogas collection in a STEP system and the use of methane to supply the project's energy needs, potentially turning a negative environmental impact into a beneficial use.

Revised Table 5.9-15: Operational GHG Emissions:
"Chemical production offsite/ Project 1: 356 metric tons CO2e/yr"

The majority of GHG emissions posited for offsite chemical production for Project 1 are calculated as coming from the production of methanol ("GHG from Chemical Production," Carollo, GHG-8). Methanol has been utilized in the EIR's analysis to substantially justify greater capital cost for the treatment plant, increased operating cost for the plant and increased GHG emissions that would be associated with STEP effluent. The Methanol Institute states that methanol production has seen significant reductions in GHG emissions, and that plants are P47-21

producing Methanol with a GHG emission rate of 3.8 lbs of equivalent CO2 per gallon of methanol produced. The EIR analysis appears to have utilized the figure of 13.9 lbs of equivalent CO2 per gallon of methanol produced. This should be corrected.

Expanding the methodology utilized for determining the methanol use from the current population has magnified the impact by 60%. The EIR discusses the GHG impacts of the gravity collection system's construction component – a gravity system's greatest GHG impact – in figures that are annualized over 30 years; the methanol component of a STEP system is not thus annualized. The EIR should use the same methodology to compare both.

The EIR should provide a detailed discussion on methanol that establishes immediate methanol use, anticipated methanol use at build-out and a discussion for alternative strategies for mitigating the use of methanol, including alternative carbon sources, (Micro C, et al) alternative methods for reducing nitrogen in the proposed treatment process, alternative treatment processes and alternative disposal/water reuse strategies, including ag exchange as part of the immediate project, which would reduce methanol significantly or eliminate methanol use.

P47-21
CONT

Alternatives to the Proposed Project 7.2.1
Table 7-3: Summary of Project Screening Evaluation Criteria:
"Energy: A. Contribute to air quality improvements - Project should minimize particulate emissions and minimize release of airborne pathogens and exposure to vectors.
B. Promote sustainability - Project should optimize energy efficiency and reduce overall use of natural resources."

The EIR states that operation of gravity collection system would consume 500,000 Kwhr/yr., whereas a STEP/STEG system would consume 425,000 Kwhr/yr. The lower energy consumption of a STEP system makes feasible the use of on-site, clean alternative energy sources to power the system. We note the concurrence of the NWRI Independent Advisory Panel (Final Report, 10/23/08) with the *Statement of Key Environmental Issues* by Surfrider Foundation et al that "the collection system for the Los Osos Wastewater Project should…provide the most energy-efficient solution and enable the use of clean, renewable energy sources, avoiding environmental impacts related to non-renewable energy production."

P47-22

"Supplemental environmental documentation may be required to evaluate some aspects of the final Proposed Project and provide adequate public review of the Proposed Project's environmental impacts. The County has committed to consider thoroughly the final Proposed Project's potential environmental impacts and public comments before completing and certifying the Final EIR." (7.2.1)

The County must fulfill this commitment. Because the foregoing comments constitute significant new information added to the EIR after public notice was given of the availability of the draft EIR for public review; and because agricultural exchange is a feasible mitigation measure considerably different from others analyzed that would clearly lessen the environmental impacts of the project, but the project's proponents have declined to adopt it; and because the draft EIR is so fundamentally inadequate and conclusory in nature that meaningful public review and comment were precluded, the County must recirculate a revised draft EIR prior to certification, pursuant to *CEQA Guidelines* § 15088.5(a)(1); § 15088.5(a)(2); and § 15088.5(a)(3).

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Santa Lucia Chapter
P.O. Box 15755
San Luis Obispo, CA 93406
(805) 543-8717
www.santalucia.sierraclub.org

COMMENTS ON NOP – RESUBMITTED

January 9, 2008

Mark Hutchinson
SLO County Public Works Dept
County Gov't Center, Rm 207
San Luis Obispo, CA 93408

RE: Notice of Preparation, Los Osos Wastewater Project

Dear Mr. Hutchinson,

On behalf of the 2,500 members of the Santa Lucia Chapter of the Sierra Club, please accept our compliments on the very thorough job of scoping the Los Osos Wastewater Project. We look forward to an equally thoroughgoing EIR based on Public Works' preliminary environmental scope.

We have a concern regarding the presentation of the De-Centralized Treatment option, of which it is stated that "the County is producing an engineering report on this option to determine if it has the potential for use in Los Osos. If so, the EIR will need to include an analysis of the environmental effects of this approach." (p. 18). This follows a paragraph on regional treatment, for which is stated that there will be an "initial evaluation of the environmental consequences…in concert with an engineering evaluation." No initial environmental evaluation is mentioned in the context of the de-centralized option.

The contrast in wording gives the impression that the engineer's evaluation will be weighed in concert with an environmental evaluation in considering regional treatment, but that in considering de-centralized treatment, should the engineering report determine that this option does not have "potential," the EIR will not engage in a full examination of de-centralized options. P47-24

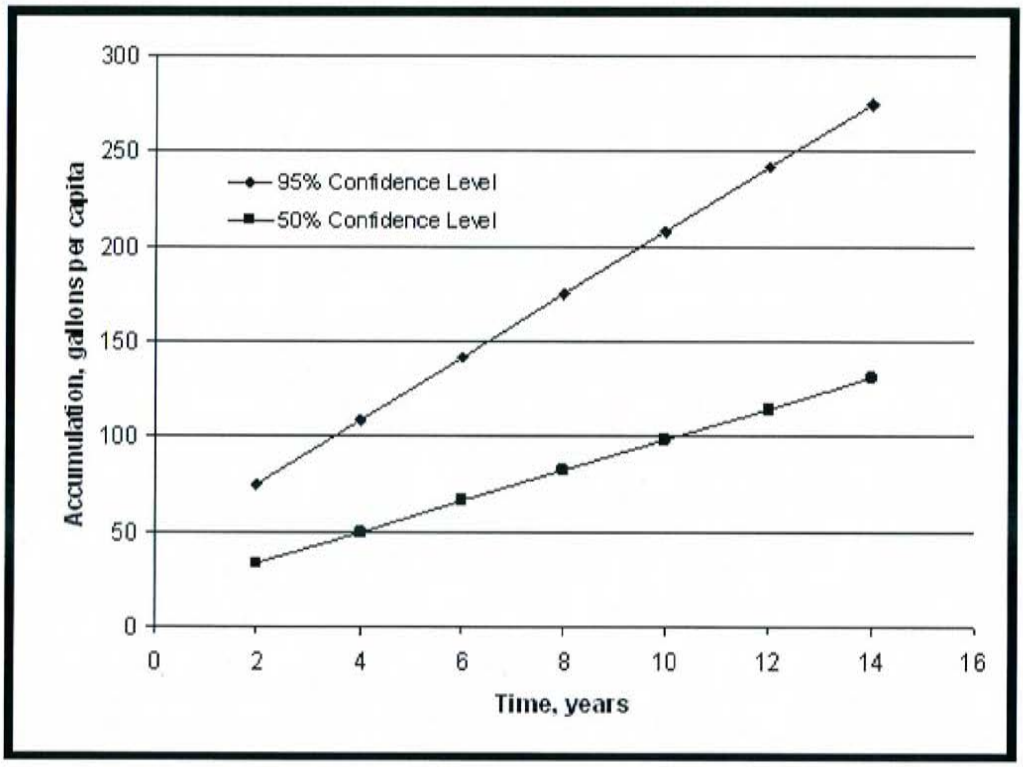
This is of concern as, presumably, the engineering report has not itself undergone a scoping process, hence we don't know how the County's engineers define "de-centralized treatment" -- if, for example, they are evaluating effluent sewers for conveyance, cleanouts in lieu of manholes, or a mix of on-site systems, cluster systems and more centralized systems within a decentralized management concept.

For conformity and parity, we recommend that the EIR's methodology of environmental and engineering evaluations undertaken "in concert" for the regional treatment option be adopted in evaluation of the de-centralized treatment option as well.

For the Sierra Club,

Andrew Christie
Chapter Director

Attachment 1: STEP Tank Pump-Out Intervals



Source: Crites, R. and Tchobanoglous, G., *Small and Decentralized Wastewater Management Systems,* McGraw Hill, 1998, Fig. 5-50 (from USPHS).

This chart shows septage accumulation per person, which at the 50% confidence level equals about 10 gallons per person per year. 25% of a 1,500 gallon tank equals @ 375 gallons. 3 persons x 10 gal/person/year x 10 years = 300 gallons. This argues for a 10-15 year pumpout, which would consist of 500-700 gallons of scum and sludge.

The chart does not factor in water conservation. With hydraulic flows per person reduced, the septage accumulation should be even lower due to increased hydraulic residence time in each STEP tank. Based on 3 persons per house in a moderate climate, 1,500-gallon STEP tanks should be pumped in a 10 to 15-year interval.

Attachment 2

Ripley Pacific Team
Los Osos Wastewater Management Plan Update

TECHNICAL MEMORANDUM # 7

Author: Mike Huck

Reviewer: Bahman Sheikh

Date: July 24, 2006

TM Title: Los Osos Growers' Field Trips to Monterey Area

General Information

Field trips to Monterey area were organized for Los Osos area nurserymen, growers and landowners on June 16 & July 20, 2006. Although water recycling in agriculture is also being done more locally in the Santa Maria area, the Monterey Regional Water Pollution Control Agency (MRWPCA) program was specifically selected for the tours since it has over eight years of operating history. Additionally, of the over 12,000 acres served by the project, only 76 acres are non food crops (ornamental flowers and bulbs). Additionally a nearby recycled water reservoir similar in size to what the Los Osos project would require was toured in the Del Monte Forest, on the Monterey Peninsula within the Pebble Beach community.

Attendees

Over a dozen individuals representing nursery and agricultural concerns from the Los Osos area were invited via personal visits and phone calls to attend these trips. Unfortunately many of these individuals had previously scheduled personal and professional obligations (weddings, vacations, and other work related obligations, etc.) that interfered with their attendance and only four individuals were able to attend the field trips. Those individuals who could not attend mentioned that they would contact one of the attendees to discuss the information gathered regarding the Monterey water recycling project tours.

It is important to recognize that the individuals who did attend are potentially "key players" in the Los Osos recycled water irrigation reuse / agricultural exchange plan. They had interest in the program, desired more information and also represented as the landowner or land lessee over 250 irrigated acres over the groundwater basin in Phase A and over 450 acres in Phase D area off the groundwater basin.

The individuals representing the Los Osos area nursery and agricultural community attending the field trips included:

- Elliott Paulson - Owner, Clearwater Color Nursery (June 16)
- John Giacomazzi - Landowner of Site D, and Landlord to Dohi Vegetable Farms (June 16)
- Hugh Dohi – Dohi Vegetable Farms (July 20)
- Alan Eto – Agricultural Seed Salesman, Landowner and Landlord to Dohi Vegetable Farms (July 20)

Also in attendance representing the Ripley Pacific team included:

- Dana Ripley (June 16)
- Bahman Sheikh (June 16)
- Tom Ruehr (June 16 & July 20)
- Mike Huck (June 16 & July 20)

Field Trip Activities and Key Messages Presented

Each trip departed from Los Osos at approximately 7:00 am and returned around 5:00 pm. During the drive to and from the Monterey area Tom Ruehr provided an invaluably comprehensive discussion with the growers regarding the chemical differences between recycled water & groundwater and how the water can be treated to adjust pH and/or SAR. Various other subjects regarding soil science, plant nutrition and other general agricultural topics were also discussed while enroute. In Monterey, the participants were provided the following opportunities:

- Touring the Monterey Regional Water Pollution Control Agency (MRWPCA) water recycling facilities to allow the Los Osos growers to better understand what is involved in the production of Title 22 disinfected tertiary treated recycled water.
- Meeting Monterey area growers and asking questions regarding their experiences using recycled irrigation over the past eight years, regarding soil salinity management, plant nutritional and food safety concerns.
- Discussions with MRWPCA staff regarding seawater intrusion as the driving force for instituting the water recycling program.
- Touring various vegetable crop fields irrigated with recycled water, observing the turnout connections and discussing system operations with MRWPCA operational staff.
- Touring the Forrest Lake Reservoir located on the nearby Monterey Peninsula within the Del Monte Forrest's community of Pebble Beach. This tour al-

lowed growers to visualize the storage requirement for Los Osos. The Forest Lake Reservoir is comparable in size to the projected storage needed for the Los Osos project. This also demonstrated that with proper management stored recycled water presents no concern regarding odor, since multi-million dollar homes are located within 200 to 300 feet or the eastern shoreline overlooking the reservoir.

The growers learned that the MRWPCA currently has 95% voluntary participation of growers irrigating with recycled water and more recycled water would be used if recycled water was available for 100% of their needs.

As reported by the MRWPCA, they estimate that during a severe drought there would only be a 5% reduction of recycled water production.

Attendees of the July Monterey Field Trip discuss recycled water monitoring with the MRWPCA laboratory staff.

Attendees of our June Monterey Field Trip discuss field operations with MRWPCA operations staff.

Tour Results and Other Interested Parties

After the completion of the two field trips it was apparent that many of the concerns and questions of growers and landowners had been resolved. Mr. Giacomazzi shortly after his attendance to our June trip sent a letter of interest for consideration of enough water to irrigate approximately 150 acres. Mr. Eto commented that he is willing to consider recycled water when it becomes available. Mr. Paulson wanted to know when recycled water deliveries might be available for his nursery. Mr. Dohi said he feels confident there would be no problem growing his vegetable row crops with recycled water and the final decision in his case would be in the hands of his landlords. Mr. Dohi also commented that in dry seasons recycled water would assure him he had an adequate quantity of water available for irrigation.

In addition to growers on the basin two inquiries for recycled water have been received for currently dry-farmed land off the groundwater basin. Both individuals were investigating purchase of the 640 acre ranch that is currently for

sale on the west side or Turri Road and wanted to acquire an irrigation water source. Each individual has been informed that the first priority for recycled water will go towards in-lieu recharge (exchange of groundwater extracted from the Los Osos aquifer now used for irrigation purposes). After that any remaining recycled water may become available for irrigation use off the groundwater basin.

Ranking of Alternatives
(Environmentally Superior Alternatives Shown In Bold)

Project Component	Alternative
Collection	STEP/STEG
	STEP/STEG Hybrid
	Gravity (proposed)
Treatment	Extended Aeration Hybrid (proposed
	Extended Aeration
	Sequencing Batch Reactor
Treatment Sites	Andra
	Holland
	Morro Shores Southwest
	Tri-W (proposed)
	Pismo
Disposal	Subsurface Leach Fields (proposed)
Bio-solids	Hauling

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Sierra Club - Santa Lucia Chapter, Andrew Christie, January 30, 2009 (Letter P47)

Response to Comment P47-1

This comment expresses a concern regarding the intervals needed to pump the STEP tanks. See Response to Comment P40-27.

Response to Comment P47-2

This comment concerns the size and characteristics of the Broderson leachfield. As explained on page 3-42 of the Draft EIR, the Broderson leachfield has an 8-acre active leachfield area. It is a leachfield and not a rapid infiltration basin.

Response to Comment P47-3

This comment is concerned that the infiltration rates identified for Broderson are for Rapid Infiltration Basins and not for leachfields. As stated in Table 3-5 in the Draft EIR, the estimated capacity of the Broderson leachfield is 64 acre feet per year per acre. This rate is consistent with leachfields.

Response to Comment P47-4

This comment expresses a concern regarding impacts associated with higher bacterial content from the use of secondary treated effluent. The application rate referenced in the comment is the maximum design application rate for the effective infiltration area of the leachfield trench, which was determined to be 30 gallons per day per square foot. The application rate for disinfected secondary effluent considered in the EIR for the effective infiltration area of the leachfield trench is an average of 3.4 gallons per square foot. This application rate is less than 2 percent of the observed infiltration rate and 12 percent of the maximum design application rate, which allows for operational considerations such as soil column drying and system maintenance. Also see Topical Response 8, The Broderson Leachfield.

Response to Comment P47-5

This comment expresses a concern regarding the disposal of effluent if Broderson is no longer a viable option. The EIR states that the Broderson leachfield site will need ongoing maintenance, including potential excavation and rehabilitation of the leachfields every 5 to 10 years. It is not anticipated that a portable gravel washing plant, or any other similar equipment, would be used. Rather, in the first cycle, new trenches, located between the existing trenches, would be excavated and filled with new gravel, and fitted with new distribution piping. Depending on the performance of the leachfield, the next cycle, would then excavate and remove the original trench gravel, or possibly, simply put that part of the system back in operation. The potential for specific impacts associated with rehabilitation of the leachfield depends on the extent of rehabilitation required and the specific methods used. If the work is extensive, at some unknown future date, it may require its own specific permitting and environmental document. As noted in the Response to Comments P47-1, P47-2, P47-3 and P47-4 describe the appropriate calculation of application rates and hydraulic loading. The claim that the system is likely to fail is not supported by the evidence in the record. Also see Topical Response 8, The Broderson Leachfield.

Response to Comment P47-6

This comment expresses a concern about lack of discussion of urban reuse and agricultural exchange utilizing recycled water from the wastewater treatment process. See Topical Response 4, Tertiary Treatment.

Response to Comment P47-7

The comment suggests that the environmental impact of biosolids is not fully discussed and that the Draft EIR must acknowledge evolving scientific opinion on biosolids and to evaluate the differences between STEP systems and gravity systems. The wastewater treatment effluent will comply with all requirements set forth by the Regional Water Quality board for the Wastewater Disposal Requirement (WDR) Permit. It is possible further scientific research may reveal trends that will become a part of future WDR's for the Treatment Facility by defining limits or thresholds for these particular constituents. The County's plans for the Treatment Facility allow room for expansion of various components (such as filters, disinfection alternatives and the like) to deal with these constituents to operate in full compliance with their operating and disposal permits. The comment suggests that there is a substantial difference in the environmental impacts of sludge handling, and in human health effects, attributable to the differences in the volume of sludge produced between STEP and gravity. As described in the Draft EIR and project Technical Memorandums, gravity would produce up to 4,000 pounds of sludge per day. All of the sludge would arrive at the treatment plant via the collection system, be processed, and then hauled to a sanitary landfill and buried. With STEP, approximately 1,000 pounds of sludge is hauled to the plant per day, in wet form in a pumper truck, and added to the inflow of the plant. From that point, it would be processed the same way as sludge from a gravity system, except there would be 75 percent less volume. The discussions in the comment regarding issues surrounding sewage sludge are valid for both systems, however, there is no plan to apply sludge to land with the current proposal. Existing landfills have the capacity to accept either volume; no substantial differences in the risk to human health or the environment exist.

Response to Comment P47-8

The first part of this comment expresses a concern that the gravity collection system excavation requirement is underestimated. A detailed breakdown of the excavation calculations is provided in the Errata Section for the LOWWP Draft EIR Appendix K-2: Air Quality and Climate Change Calculations. One of the supporting tables in Appendix K-2 is titled Surface and Soil Disturbance. For the 230,000 linear feet of collection system pipeline with a 4-foot wide trench, the excavation requirement would be 247,000 cubic yards (CY). As explained in Topical Response 13, Construction Excavation, a shored four-foot wide trench is the standard construction method. Additional excavation is required for the pump stations, manholes, and laterals bringing the total gravity collection system excavation total to 340,000 CU. The lateral trenches have been assumed to be 2 feet wide by 4 feet deep. Both the gravity and STEP/STEG collection systems will have the same excavation requirements for the 28,500-foot conveyance pipeline to the treatment plant (16,000 CY for the Preferred Project) and the 33,300-foot conveyance pipeline from the treatment plant to the Broderson leachfield (18,500 CY for the Preferred Project).

The second part of this comment expresses a concern that yards excavated in the past to install septic tanks should be considered already disturbed if land under existing roadways is considered already disturbed. Some of the property owners have paved over the portions of their front yards where the existing septic tanks are located; others have installed landscaping, sidewalks or other improvements over the septic systems. When the contractor excavates a front yard to install a new STEP/STEG tank, there is the potential to disturb these improvements as well as cultural resources and Morro shoulderband snail habitat that is reestablished over time.

The third part of this comment expresses a concern that the Draft EIR analysis does not assume that 100 percent of the STEP/STEG collection system will be directionally bored rather than only 50 percent directionally bored. See Topical Response 13, Construction Excavation, for a discussion of this issue. The Appendix K-2 Surface and Soil Disturbance table provides more detail on the STEP/STEG collection system excavation calculations.

Response to Comment P47-9

This comment expresses a desire to assess the necessity of flushing the pipes of the gravity system. See the Response to Comment P36-10.

The collection system operational issues referenced arise from situations where there is not enough development or regular use of the collection system to ensure sufficient flows to transport solids. In a community such as Los Osos, the density of development and percentage of year-round residents essentially guarantees sufficient flows to operate a gravity system, even when wastewater flows are reduced due to conservation.

Response to Comment P47-10

This comment expresses a concern regarding the O&M cost estimates for the gravity and STEP/STEG sewer collection systems. The Fine Screening Report provides estimates of the O&M costs for the LOWWP. Table 7.5 indicates that the annual O&M costs in April 2007 dollars would be $800,000 for a STEP/STEG collection system and $500,000 for a gravity collection system. For a project that includes 160 AFY of conservation, 448 AFY of effluent disposal at Broderson and 742 AFY at the sprayfields, the total O&M costs are estimated to be $2.0 to 3.1 million for a STEP/STEG system and $1.6 to 3.0 million for a gravity collection system as stated on page 3-65 of the Draft EIR. These O&M costs were based on experience with similar systems and the assumptions in Appendix C of the Fine Screening Report and Topical Response 2, Project Costs. The gravity collection system estimate was based on the MWH design prepared for the LOCSD project. Since a STEP/STEG collection system has not yet been designed for the Los Osos area, Carollo Engineers made assumptions regarding the collection system facilities and maintenance requirements.

Normal maintenance for gravity sewer collection systems is handled by two-person crews since confined space entries are seldom required. Only infrequently when major repairs are undertaken is a three-person crew required.

Response to Comment P47-11

This comment concerns the effluent application rates for the Broderson leachfield. See Topical Response 8, The Broderson Leachfield.

Response to Comment P47-12

This comment concerns the differences between the annual O&M costs and annualized costs including both capital costs and O&M costs that were estimated for the Fine Screening Report and the December 2006 Ripley Pacific Report. Although an oxidation ditch paired with a STEP/STEG system is smaller than when an oxidation ditch is paired with a gravity collection system, the difference is because the BOD and SS loading is less; the quantity of wastewater treated is the same. Consequently, most of the constructed project treatment facilities are sized about the same for both gravity and STEP/STEG collection systems. The capital construction costs for these two options are compared for Level 2b (sprayfields, Broderson and conservation) in Table 7.3 in the Fine Screening Report and are only slightly different. There will be some savings in the chemicals and energy required to operate the two different plants, but the costs for the conveyance system and effluent disposal systems will be the same.

Response to Comment P47-13

This comment expresses a concern regarding the lack of figures associated with the amount of septic return flows. See Draft EIR Appendix D-2, Appendix C, Groundwater Model Hydrogeologic Budget Results, and Tables 8, 9, and 10.

Response to Comment P47-14

This comment states that the project should include additional groundwater mitigation. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P47-15

This comment states that the EIR should specify the amount of dewatering likely to be required for a gravity collection system, including pocket pump stations vs. minimal dewatering activities for STEP collection. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P47-16

This comment expresses a concern about the level of on-site disturbance due to excavation to install service lines by trenching for gravity systems opposed to directional drilling for a STEP system. The Draft EIR and the Carollo Fine Screening Report presented alternative construction methods for on-site trenching work for the house laterals. The actual construction method employed to build the collection systems is not fully known at this time and will be determined after the County's Design-Build proposals are evaluated and the contract awarded for work. It is possible a contractor could propose directional drilling for gravity lines and this would have minimal impact on the on-site conditions (somewhat similar to the assertion in the comment). The Draft EIR took the approach of

analyzing trenching for the laterals so full impacts of the method can be reviewed for environmental impact, rather than a more conservative approach of lesser construction impacts.

Response to Comment P47-17

This comment expresses a concern regarding the cost estimates of the gravity collection system with regard to costs associated with cultural resources mitigation. See Responses to Comments P36-8 and P36-31.

Response to Comment P47-18

This comment expresses a concern regarding odor impacts. See Response to Comment P36-26 regarding the relative equivalence of each project with regards to odor.

Response to Comment P47-19

This comment suggests the use of the CAPCOA significance threshold for GHGs. CAPCOA has only attempted to discuss potential thresholds. The CAPCOA documents titled "CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act" published in January 2008, was written to discuss conceptual approaches toward developing GHG criteria. The comment refers to one of the potential threshold approaches presented in the document but the document does not set thresholds. The Draft EIR uses an established method of GHG threshold.

Response to Comment P47-20

This comment suggests that the Draft EIR maintains that the methane production from the STEP system would be significant and therefore suggests the collection and potential usage of methane by biogas. The Draft EIR does not reach the conclusion that methane production from septic tanks is significant.

Response to Comment P47-21

This comment expresses the desire to have a revision of the analysis of methanol effects on GHG emissions. See Responses to Comments A8-136, P19-21, P36-34.

Response to Comment P47-22

This comment expresses an opinion that the STEP/STEG system would consume less energy on an annual basis. No specific comment on the contents of the Draft EIR were provided; therefore, no further response is required.

Response to Comment P47-23

This comment stated that the County needs to provide additional supplemental information. See Appendix Q which provides additional environmental documentation for the Preferred Project. This additional environmental documentation does not substantially alter the conclusion provided in the Draft EIR. Therefore, no recirculation of the Draft EIR is required.

Response to Comment P47-24

This comment expresses a recommendation that the EIR's methodology of environmental and engineering evaluations undertaken "in concert" for the regional treatment option be adopted in evaluation of the de-centralized treatment option. Because there are no comments on the contents of the Draft EIR, no further response is required.

County of San Luis Obispo
Department of Public Works
1050 Monterey, Room 207
San Luis Obispo, CA 93408

Attention: Mark Hutchinson

January 30, 2009

RE: DRAFT ENVIRONMENTAL IMPACT REPORT, COUNTY OF SAN LUIS OBISPO, LOS OSOS WATERWATER PROJECT (LOWWP)
State Clearinghouse No. 2007121034

Dear Mr. Hutchinson,

The primary purpose of the following comments is to advance a proposal (Gorby) as contrasted to the DEIR preferred project (i.e. Tonini). It is the position of the author that the Gorby site offers significant advantages as a wastewater treatment and discharge site location over Tonini. The advantages would likely reduce the environmental impacts of Gorby as compared to Tonini. The DEIR identifies only one Class I unavoidable adverse environmental site for the Tonini project which appears to be understated.

The DEIR investigates the Tonini property extensively as well as the Cemetery "complex" of properties including Giacomazzi, Branin and Cemetery. In essence, the DEIR really provides co-equal analysis for only two alternatives. A co-equal analysis of the Gorby as a third alternative is essential. It is not the intent of the author to perform that necessary co-equal analysis, however I believe it exposes a significant flaw in the environmental document because so few viable options were analyzed.

P48-1

Gorby Alternative Project Description Summary

Gravity sewerage collection system, use of an approximately 3-4 acre Oxidation Ditch for treatment to full tertiary-level. The raw wastewater conveyance system carries the collected wastewater from the Mid-town pump station across Los Osos Creek to the Gorby wastewater treatment plant. Treated wastewater will be conveyed to the Broderson discharge site between the months of December through May (wet weather discharge). Instead of leachfields at Broderson, gravity wells would be employed to allow discharges at a considerable depths below the soil surface (e.g. 15-25 ft.) with overall well depth between 50-60 ft. The conveyance to Broderson will involve a crossing of Los Osos Creek and follow an alignment northwest along Bayview Heights Dr. and west on Highland Dr. to the discharge site. From June through November (dry weather discharge) treated wastewater will be discharged into on-site percolation ponds (approximately 2-3 acres) adjacent to Los Osos Creek. Appurtenant structures and

parking would occupy the remainder of the site. Given the excellent southern exposure of the site an array of solar panels on buildings or over ponds would provide an efficient use of the space available. Greenwaste processing with biosolids may also be an option available on site. (Project Location Map, Attachment I, Gorby Alternative Project Site, Attachment II, Gorby Assessors Parcel Map, Attachment III, Gorby Ground Level Site Photo, Attachment IV.)

Gorby/Tonini Pro-Con Analysis

Advantages of Gorby Property

(Los Osos Valley Equine Farm, 1869 Los Osos Valley Rd.)

Gorby is 50 acres in total area with approximately 10 acres usable flat land presently occupied by the equestrian facility in the box canyon at the South west corner of the valley. Site is accessible from Los Osos Valley Road approximately six-tenths of a mile to the South.

* Currently boards dozens of horses with their associated waste stream; which would be removed, further protecting Los Osos Creek and Morro Bay from these point and non-point pollution sources.
* Nearest receptors (homes) are **up**wind and across the creek from the site.
* Adjacent to the Los Osos Urban Reserve Line and LOCSD boundary. This location addresses "growth inducing" arguments that plague sites further removed from the urban reserve line.
* Proximity to Los Osos Creek for potential summertime creek discharge (use of percolation ponds adjacent to creek). The Paso Robles Formation surfaces at Los Osos Creek in this vicinity. Also, the site strategically overlies the creek valley alluvial aquifer shown in Attachment V (creek compartment, currently under study in Task II of the Basin Management Work Program). Sound management of the basin will address the existing seawater intrusion situation.
* Additional flows to Los Osos Creek provide potential for Steelhead trout habitat enhancement (similar to Cuesta College/CMC wastewater treatment facility benefits to Chorro Creek).
* Redevelopment of an existing disturbed site reduces or eliminates biological impacts. No impacts to Red-legged frog or Morro shoulderband snail.
* Nearby agricultural interests have been willing to consider participation in an ag-exchange or in-lieu program. Gorby overlies the Los Osos Groundwater Basin (Attachment VI).
* SLO County has considered discharge potential in the vicinity of the site in 1987 project and the LOCSD did so subsequently.
* The wastewater facilities would be out of site, hidden in the canyon and out of the scenic view corridors.
* The site has excellent solar access for installation of solar panel arrays.
* No impact to prime Ag soils and no Williamson Act issues.

P48-1
CONT

* Proximate to the Broderson recharge facility (approximately 1.5 miles) and 3 miles closer to the community than the Tonini site (DEIR Preferred Project).
* Construction of the collection system can begin and the treatment facility may be phased subsequently to allow the equine facility business time to discontinue its operations over a 1-year period before treatment facilities begin construction.
* The property including business opportunity is valued at around $2.5- $3 million in contrast to the $7 Million price tag on the Tonini property.
* In combination with the Broderson discharge site the overall wastewater project is contained within a small "footprint" and optimizes the length of collection system and transmission of treated wastewater pipelines ultimately reducing costs.
* With effective winter and summertime discharge strategies a balance between supply and demand for water within the basin may be achieved without the importation of state or Nacimiento water.
* The use of Gorby in connection with wastewater treatment and disposal sets the stage for viable water purveyor participation in further groundwater basin management strategies.
* The development of a wastewater project at this location is consistent with the Estero Area Plan update and resulting amendments to Title 23 (CZLUO).

The DEIR diminishes the potential for Gorby for a number of reasons. Most notable is the statement of unwillingness to sell on the part of the property owners. Other misplaced reasons include the potential presence of the Los Osos Fault (Strand A), Los Osos Creek is subject to flooding, sensitive receptors nearby, potential archaeological resources along Los Osos Creek and the need for potential road improvements where the site access intersects Los Osos Valley Rd. P48-1 CONT

Strand A of the Los Osos Fault is shown to bisect the property in Exhibit 5.4-1 Faults and Surface Features shown as Attachment VII. In fact, this an inferred fault because the fault line as shown is based upon questionable fault traces. At the Gorby site a break-in-slope (bis) is of uncertain origins, this bis may be associated fault presence; however it may also be an errosional feature. The only way to verify the origin of the bis and the potential presence of a fault is to conduct field testing. This field testing has not been done to date, please see Attachment VIII, P.G. & E. 1988 Fault Mapping of the area.

The Gorby site is shown to be affected by being partially within the 100-Year Flood Hazard map in Exhibit 5.3-1. Most, if not all facilities would be located outside the affected area given the Los Osos Creek setback requirements that would be imposed.

The only homes in the vicinity are part of a low density neighborhood that lies upwind from the Gorby site. The Los Osos Creek also separates the Gorby site from the nearby receptors. Also, additional buffer is achieved because of the elevational differences (i.e. Gorby is in the valley below the hillside homes).

Potential impacts to archeological resources will be addressed with monitoring and creek setbacks.

Finally, the Gorby site was screened out because of insignificant road improvements that may be necessary including channelization (westbound left turn lane, eastbound deceleration lane) for vehicle access to the site from Los Osos Valley Road. These minimal improvements should hardly be a reason to exclude the subject site from further consideration.

Carrollo Engineers Rough Screening report (2007) discounted Gorby precluding its evaluation in a co-equal fashion in the DEIR so as to eliminate the potential consideration of the site as an alternative. Only a full evaluation of the potential environmental impacts of Gorby would verify or refute the sites superiority to the Tonini site by way of a reduction in potential environmental impacts.

Disadvantages of Tonini Ranch

(DEIR Preferred Project, 3515 Turri Road)

Approximately 637 acres, the Tonini Ranch lies approximately 4.5 miles from downtown Los Osos and is near the intersection of Los Osos Valley Road and Turri Road from which it takes access.

* Lies outside the Los Osos Groundwater Basin (approximately 2 miles) where about 750,000 gpd of secondary treated wastewater will be sprayed for evaporation and plant transpiration in a "grow and mow" scenario.
* Outside of the Urban Reserve Line and beyond the LOCSD boundary. This will necessitate construction of transmission pipelines an additional 3-3.5 miles one way or 6-7 miles for both collection system and treated wastewater conveyance. The cost implications will range from $8 to $12 million higher than transmission to and from Gorby.
* Transmission crosses two (2) blue line streams, one of which has a known presence of Red-legged frog.
* Agricultural interests overlying the Los Osos Groundwater basin have been willing to consider participation in an ag-exchange or in-lieu program however, the Tonini site is not central to those interests.
*The site has high groundwater as evidenced by depth to water measurements in wells on the ranch. In three wells (A, B and C) depth to groundwater ranges from 7.1 feet to 19.5 feet (Table 2, Tonini Site Reconnaissance, Cleath and Associates Memorandum, February 7, 2008). The high groundwater may rise given the introduction of 750,000 gpd at this location increasing the potential for liquefaction. Runoff from spray field operations especially in the winter may result in water quality degradation downstream and eventually in Morro Bay (100-Year Flood Hazard Map, Exhibit 5.3-1)
* Existing onsite surface drainage (criss-crossing of drainage ways) and springs may be adversely impacted by the additional hydraulic load resulting in the downstream water quality degradation listed above (Attachment X).
* Fresh water supply wells and springs appear to offer limited sustainable yields based on the size of the basin it overlies and the well production data for the ranch.
* Loss of Coastal Prime Agricultural soils (approximately 200) with needed cancellation of the existing Williamson Act Contract.

P48-1
CONT

* Highly visible location at Los Osos Valley and Turri Roads (within Sensitive Resource Area – Title 23 CZLUO changes effective in Jan. 2009) The DEIR fails to describe the impacts whatsoever especially in the context of the Morros viewshed. At nighttime, given the limited ambient light, it will be very difficult to mitigate the impacts.
* In contrast to noises resulting from current agricultural operations there should be a considerable increase, especially at nighttime when wastewater plant operations continue in a reduced ambient noise level condition.
* Potential for impacts to seven known cultural resource sites likely from wastewater treatment plant construction including transmission facilities.
*In combination with the Broderson discharge site the overall wastewater project is contained within an overly large "footprint" and given the significant length of collection system and transmission of treated wastewater pipelines ultimately increasing costs.
* Given the distance to the Los Osos community Urban Reserve Line the use of the Tonini site for wastewater purposes creates the potential for growth inducing impacts between the facility and Los Osos as well as between the facility and the City of San Luis Obispo.
* The asking price of the property is $7 million which is more than double the value of Gorby.
* Return transmission of treated wastewater to the Borderson facility is 5 miles away which is 3.5 miles further than Gorby adding additional cost to the return line in the $3-5 million range.
* The proposed disposal scheme anticipates purveyor participation to achieve further seawater intrusion mitigation which may be beyond the capabilities of the LOCSD or the Golden State Water Company.

P48-1
CONT

The DEIR investigates the Tonini property extensively as well as the Cemetery "complex" of properties including Giacomazzi, Branin and Cemetery. In essence, the DEIR really only provides coequal analysis for two alternatives. A co-equal analysis of Gorby as a third alternative is necessary. In short, the DEIR concludes that the Tonini site is the "preferred project" alternative because it has almost no neighbors (i.e. politically acceptable) and it is outside of the Los Osos Urban Reserve Line and consequently outside of Environmentally Sensitive Habitat Areas. While in fact, the significant environmental impacts from Tonini are numerous (between 6 and 7 unavoidable impacts) in contrast to the stated significant impacts in the DEIR of only one. The use of spray fields at Tonini will result in a self fulfilling prophesy of water importation from sources with uncertain futures (i.e. State or Nacimiento water). If imported water is either unavailable of too costly, it is likely no future growth will occur in the community and economic stagnation will result. The permanent loss of our lower groundwater basin may also result from continuous exportation of water to Tonini.

Mr. Hutchinson, please find additional comments on the DEIR below.

Land Use and Planning – It appears the DEIR has failed completely to review and analyze the recent Area Plan update for the Estero Rural Area including resulting amendments to Title 23 (CZLUO). Given the potential impacts to agriculture, biology, water resources, archeology, and scenic visual resources, it would appear a Class I unavoidable adverse impact to the environment would result. P48-2

Groundwater Resources – Presently the community of Los Osos is in a Level of Severity III for groundwater resources due to an overdraft of the groundwater basin of over 400afy. The DEIR Preferred Project addresses only a fraction of the overdraft condition and leaves further action to the primary water purveyors in the community (LOCSD and GSWC). The water purveyors cannot and will not perform functions outside of their usual operations to deliver water to customers. For example, purveyors can site new supply wells, increase storage capabilities and improve distribution systems. They are not suited to negotiating ag-reuse or in-lieu agreements with farmers, or be responsible for delivering water to specific sites in the context of an urban reuse program. The wastewater project that returns water to the basin is the "cornerstone" of effective management of the groundwater basin. A significant concern exists as to whether, or not the wastewater project will be a positive or negative contributor to basin management strategies. The existing overdraft must be addressed in total by the DEIR Preferred Project to conclude there is no Class I unavoidable adverse environmental effect. That is not the case with the current proposal. P48-3

Drainage and Surface Water Quality-- The site has high groundwater as evidenced by depth to water measurements in wells on the ranch. In three wells (A, B and C) depth to groundwater ranges from 7.1 feet to 19.5 feet. The high groundwater may rise given the introduction of 750,000 gpd at this location increasing the potential for liquefaction. Runoff from spray field operations especially in the winter may result in water quality degradation downstream and eventually in Morro Bay. Existing onsite surface drainage (criss-crossing of drainage ways) and springs may be adversely impacted by the additional hydraulic load resulting in the downstream water quality degradation. P48-4

Geology – No Comment

Biological Resources -- The DEIR Preferred Project will require a Section 7 consultation with the USFWS in connection with the Morro shoulderband snail and the Red-legged frog. This presumes impacts to the species in question and therefore should result in a Class I impact. If not, why not? P48-5

Cultural Resources -- No Comment

Public Health and Safety -- No Comment

Traffic and Circulation -- It appears that a Class I impact for traffic and circulation during construction of the DEIR Preferred Project. P48-6

Air Quality -- It appears that a Class I impact for traffic and circulation during construction of the DEIR Preferred Project. P48-7

Noise -- It appears that a Class I impact for traffic and circulation during construction of the DEIR Preferred Project. P48-8

Agricultural Resources -- Acknowledge the presence of Class I impacts. P48-9

Visual Resources -- It is disappointing that $2 million the DEIR could not perform an adequate analysis of the potential effects of the DEIR Preferred Project. One photo simulation from substantial distance is hardly adequate to fully assess the project impacts. A much more detailed analysis should be completed, including an analysis of the Morros viewshed which the immediate backdrop to the project site. Other photo simulations of project components are also inadequate given their limited analysis. Without such an analysis it is unclear whether a Class I impact would result. P48-10

Environmental Justice – The DEIR Preferred Project is setting the community of Los Osos up for disaster. The use of spray fields at Tonini will result in a self fulfilling prophesy of water importation from sources with uncertain futures (i.e. State or Nacimiento water). If imported water is either unavailable of too costly, it is likely no future growth will occur in the community and economic stagnation will result. The permanent loss of our lower groundwater basin may also result from continuous exportation of water to Tonini. The community of Los Osos has been under a building moratorium for over 20 years. Businesses have come and gone and there is little continuing economic activity presently. Los Osos desperately needs some growth so there may be some employment base locally so that a jobs/housing balance may be better achieved. Such a balance is a key element of Strategic Growth Principals adopted by the County. P48-11

Summary

It appears there is the potential for as many as 10 Class I unavoidable adverse environmental impacts from the DEIR Proposed Project. Only further analysis will determine the exact number based upon the issues raised above. In any event, the number of Class I impacts will be significantly more than one as currently suggested. This fact may greatly influence conclusions about the Environmentally Superior Alternative. Related to conclusions about the P48-12

Environmentally Superior Alternative is work undertaken for Task I and Task II of the Los Osos Basin Management Work Program. Completion of this work may be essential to such conclusions.

P48-12 CONT

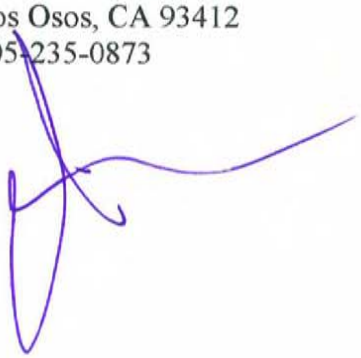
Conclusion

To adequately determine the Environmentally Superior Alternative a co-equal analysis of the Gorby site should be completed. Also, given that the DEIR Preferred Project most certainly give rise to the need for imported water to the community, impacts of water importation to the community should be assessed as part as part of the current project proposal. Finally, the impacts associated with a cost of between $20-$36 million (Fine Screening Report, Imported Water, Table 3) depending on the source must also be analyzed.

P48-13

Respectfully submitted,

Jeffrey H. Edwards
P.O. Box 6070
Los Osos, CA 93412
805-235-0873



Attachment I

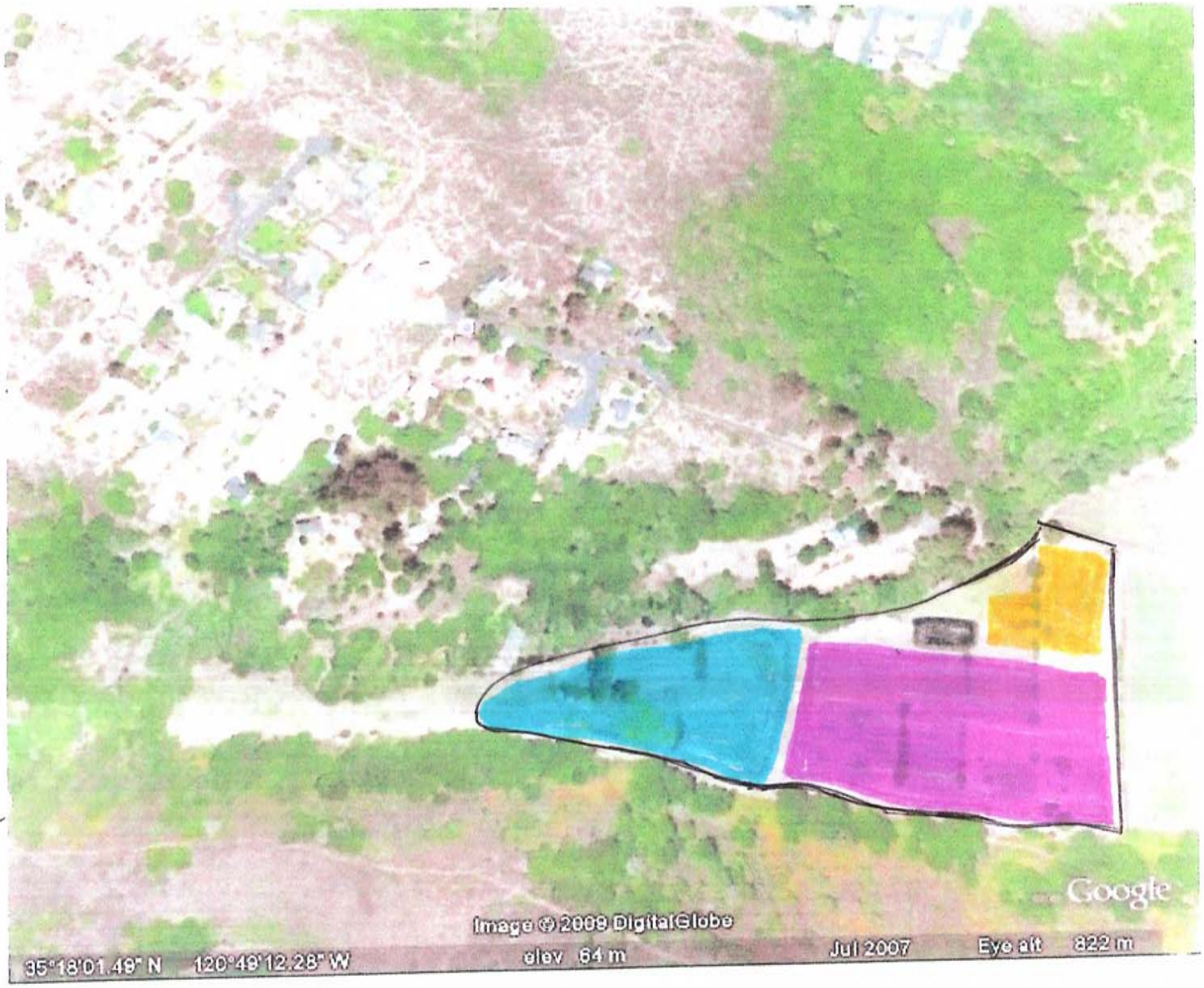
Figure 1-2

Project Location

Los Osos Wastewater Project EIR

3-9-17

Attachment II



N ≒ 300 SCALE

GORBY ALTERNATIVE PROJECT SITE
(CONCEPTUAL SITE PLAN)

APPURTENANT STRUCTURES

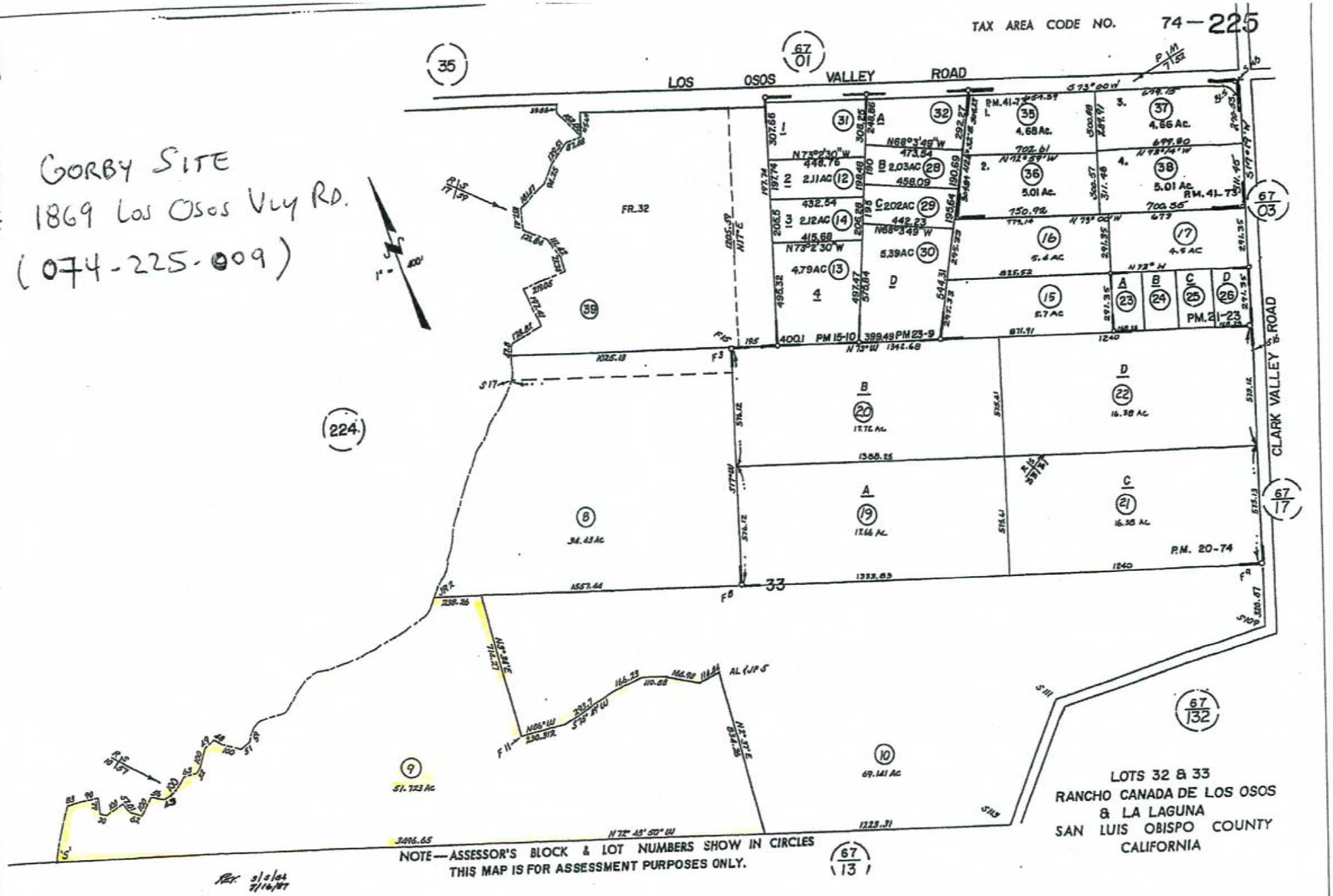
PARKING

OXIDATION DITCH

PERCOLATION POND
(DRY WEATHER RECHARGE)

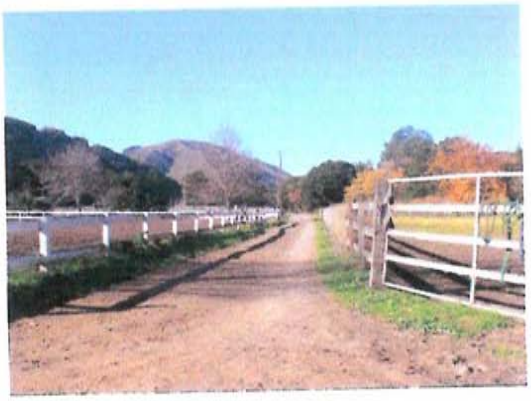
Attachment III

GORBY SITE
1869 Los Osos Vly Rd.
(074-225-009)



Attachment IV

Gorby



Attachment V

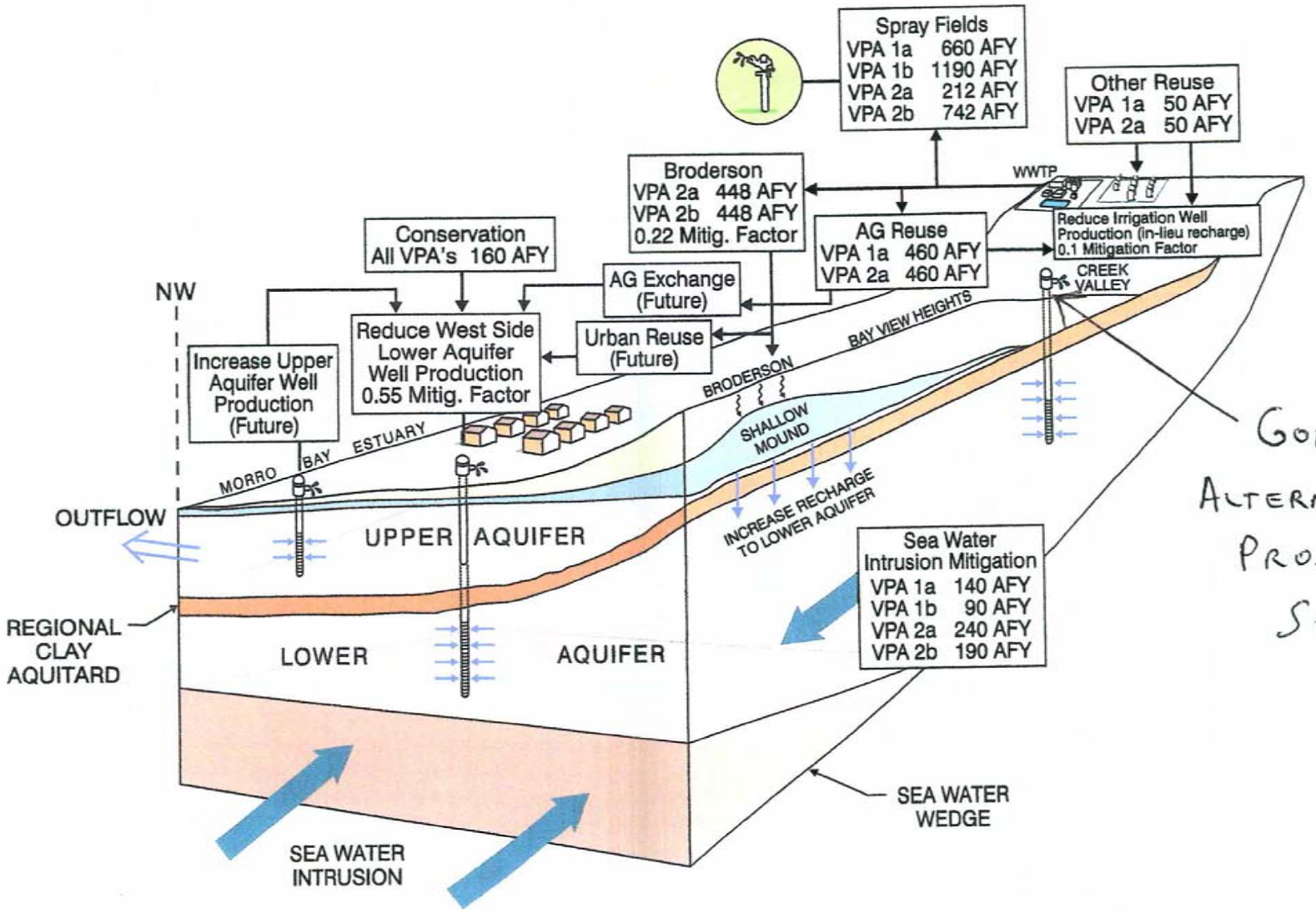


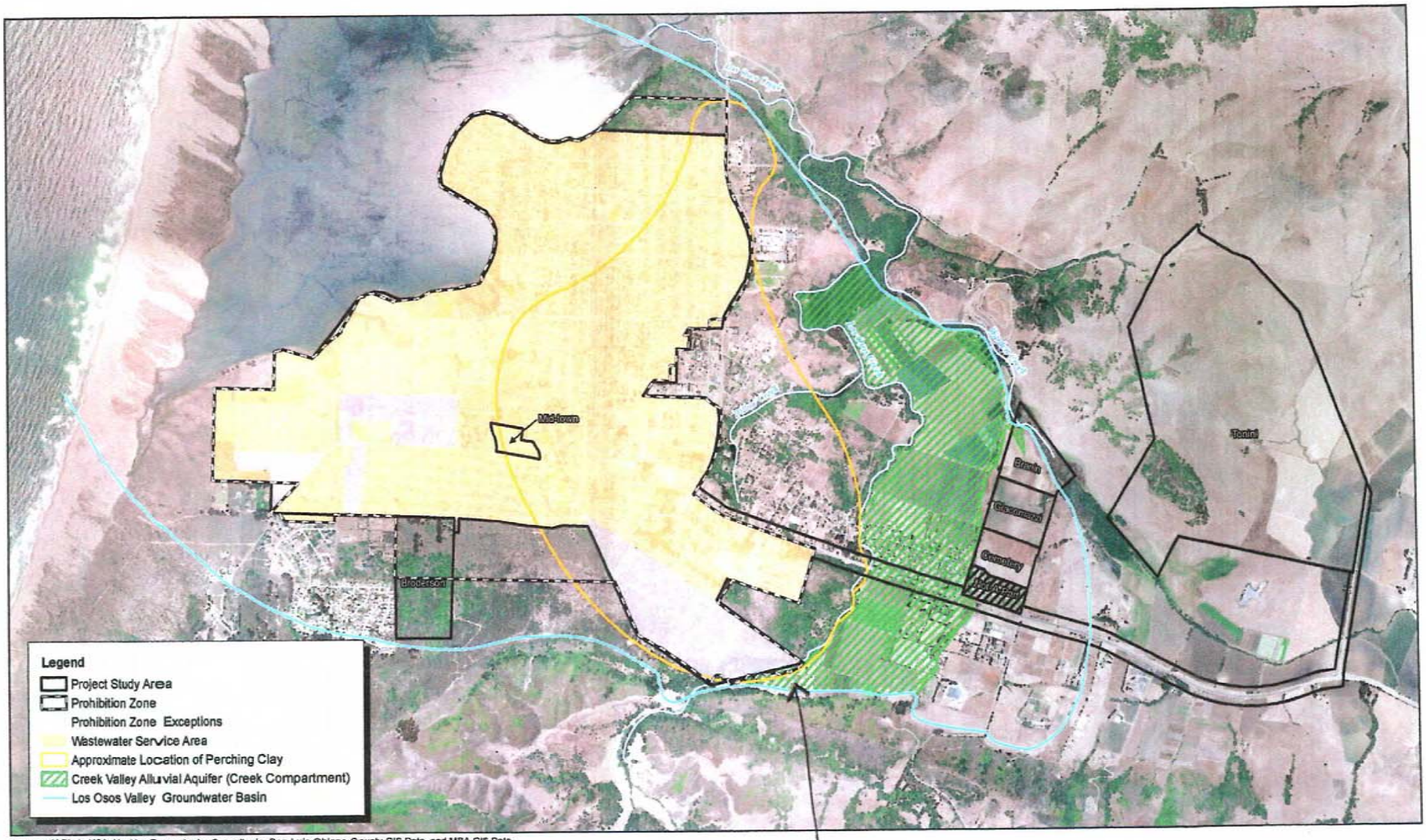
Figure 2.1
SEA WATER INTRUSION MITIGATION STRATEGIES
LOS OSOS WASTEWATER TREATMENT PROJECT
SAN LUIS OBISPO COUNTY

Cleath & Associates
May 2007

slo507f8-7630.ai

Attachment VI

3-622



Source: AirPhoto USA, Hopkins Groundwater Consultants, San Luis Obispo County GIS Data, and MBA GIS Data.

NORTH

2,000 1,000 0 2,000 Feet

Michael Brandman Associates

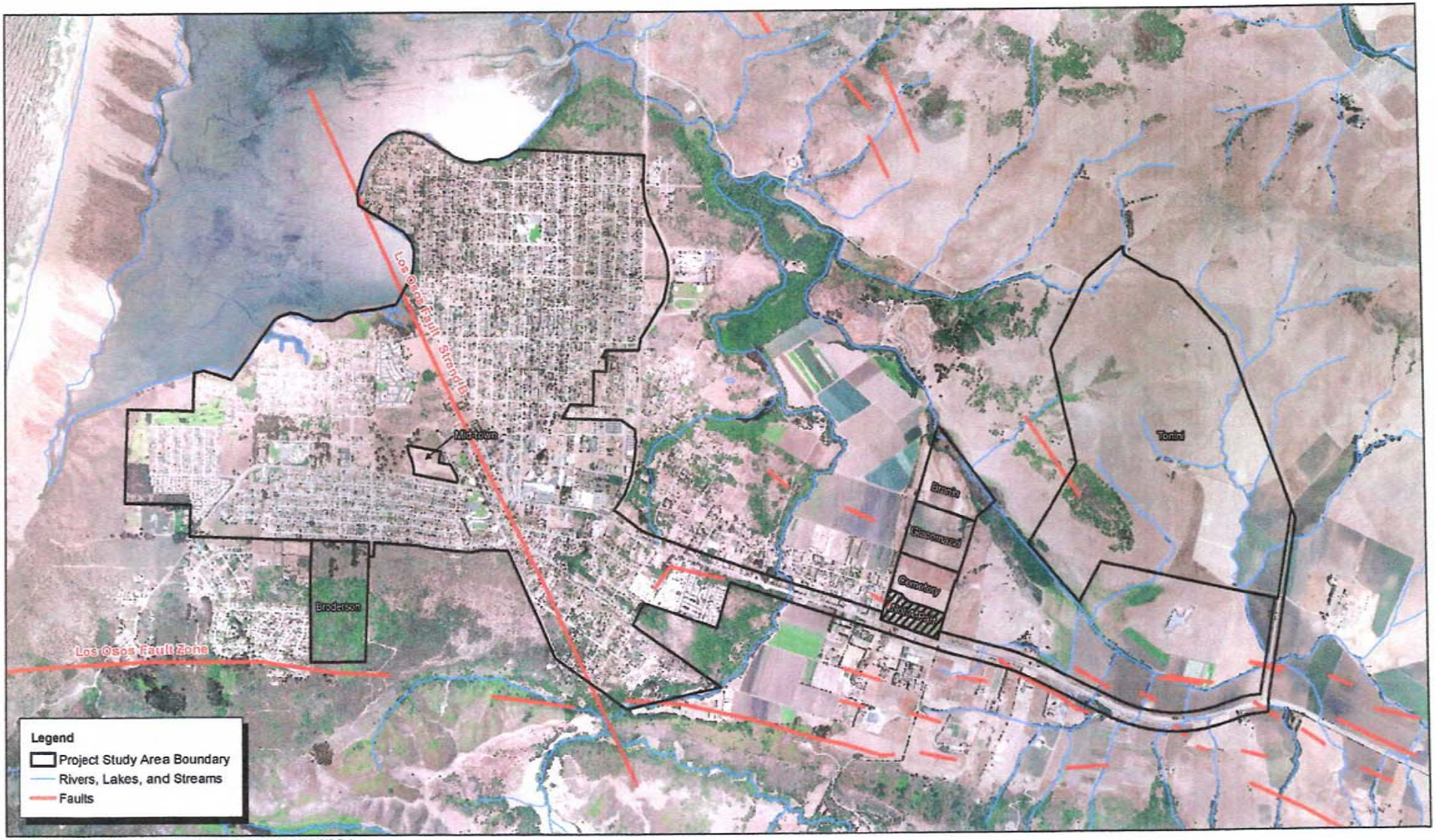
02240002 • 11/2008 | 5.2-1_groundwater_basin.mxd

Exhibit 5.2-1
Los Osos Groundwater Basin

COUNTY OF SAN LUIS OBISPO • LOS OSOS WASTEWATER PROJECT
GROUNDWATER QUALITY AND WATER SUPPLY EXPANDED ANALYSIS SECTION

GORBY
ALTERNATIVE PROJECT SITE

Attachment VII



Source: AirPhoto USA, San Luis Obispo County GIS Data, and MBA GIS Data.

NORTH

2,000 1,000 0 2,000 Feet

Michael Brandman Associates

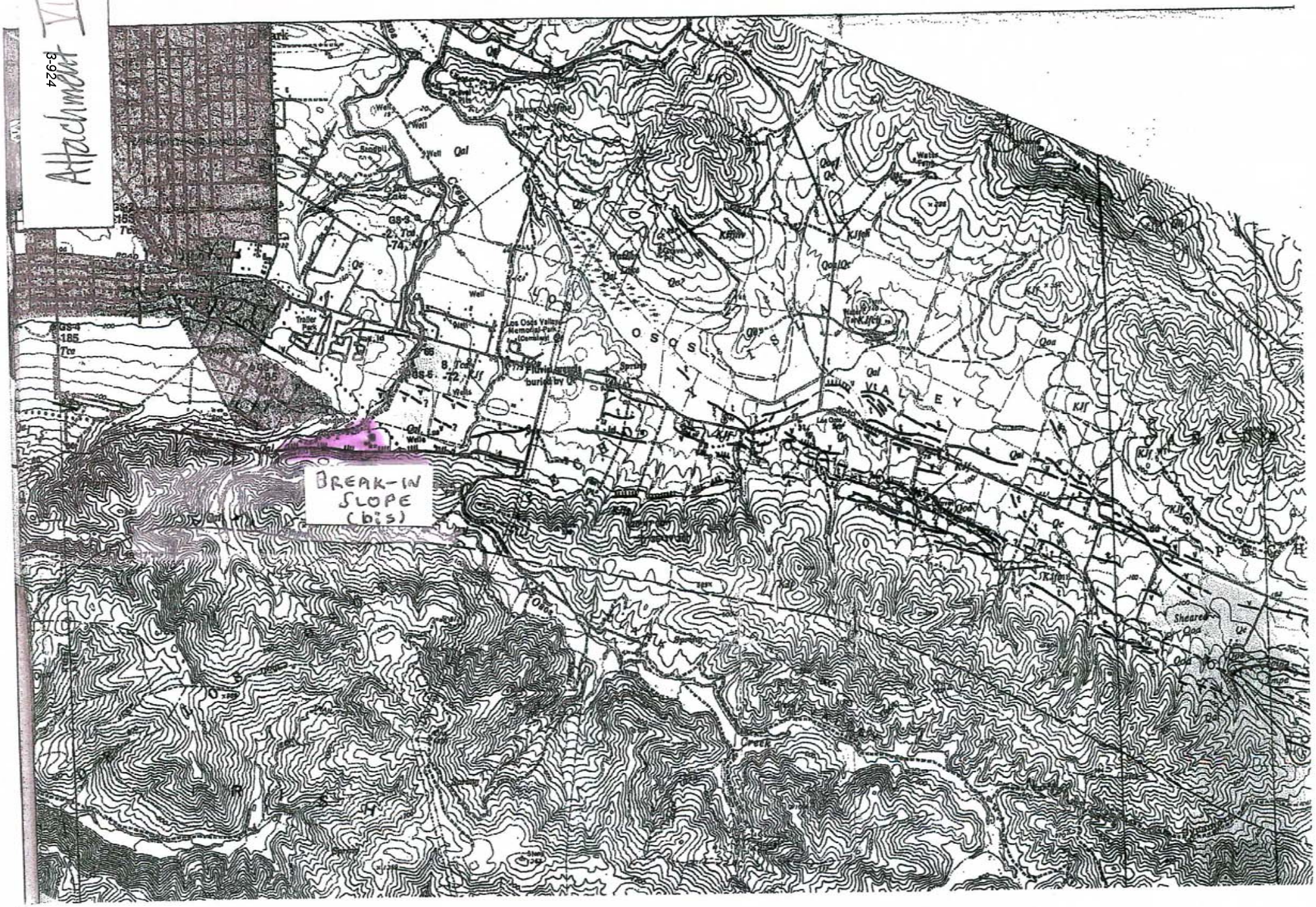
02240002 • 11/2008 | 5.4-1_fault_map.mxd

Exhibit 5.4-1
Faults and Surface Features

COUNTY OF SAN LUIS OBISPO • LOS OSOS WASTEWATER PROJECT
GEOLOGY EXPANDED ANALYSIS SECTION

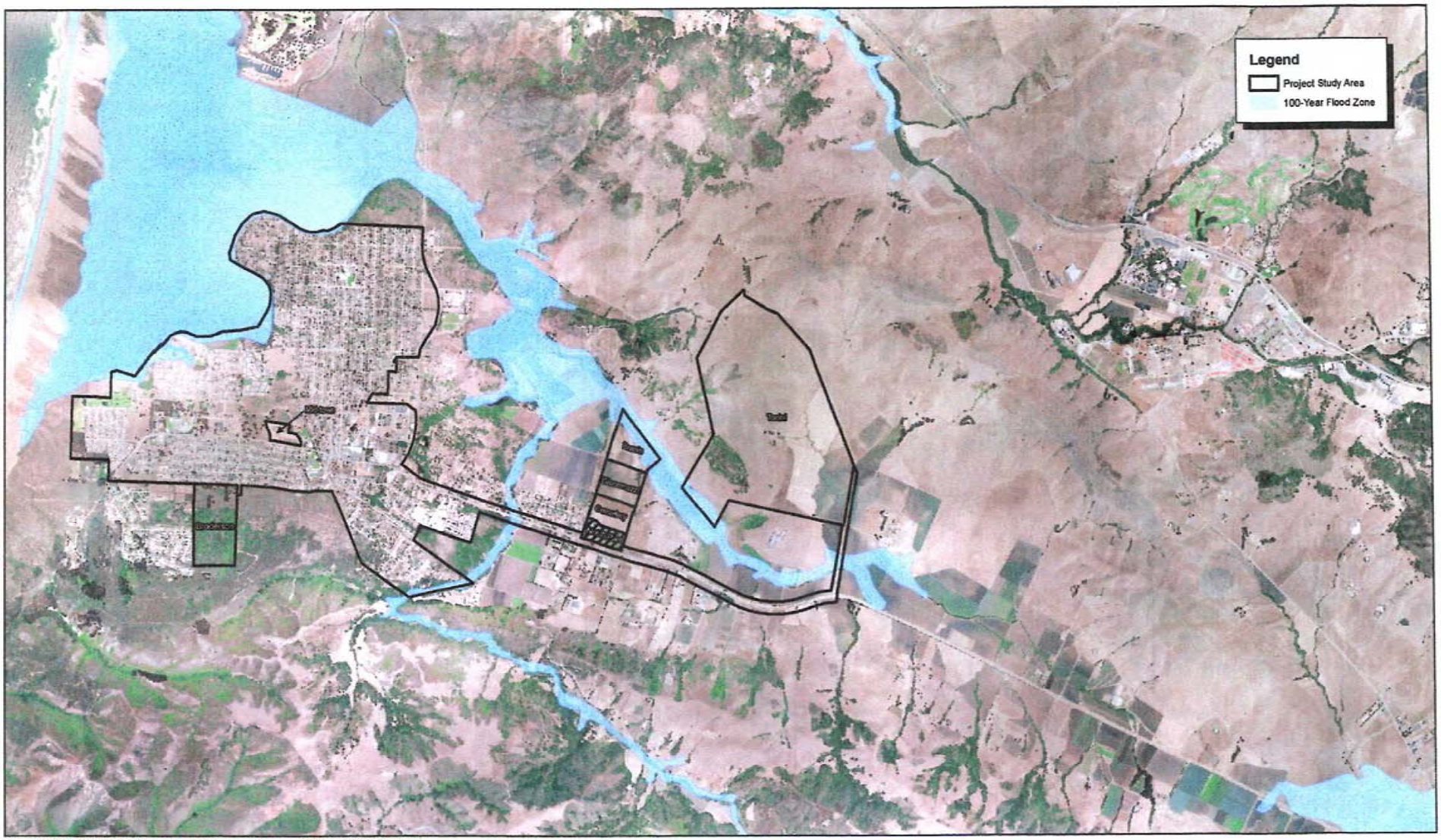
Attachment VIII

B-924



GORBY SITE

Attachment IX



Source: AirPhoto USA, Federal Emergency Managment Agency (2007) and MBA GIS Data.

NORTH

3,000 1,500 0 3,000
Feet

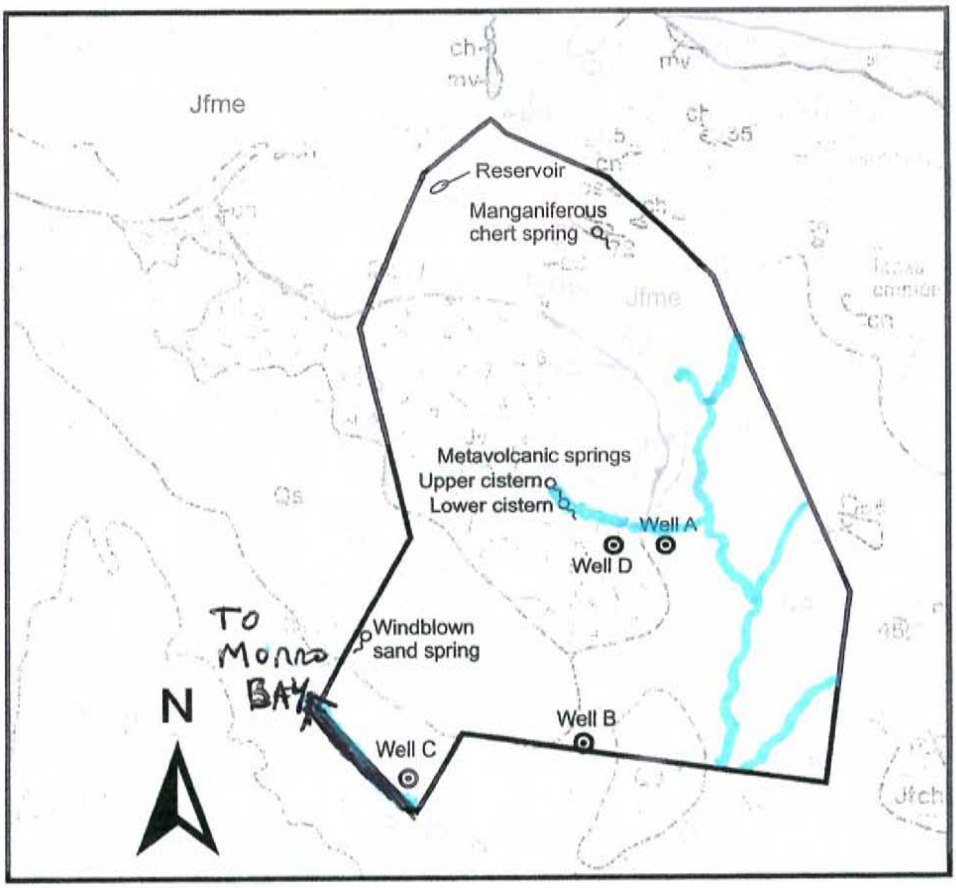
Michael Brandman Associates

02240002 • 11/2008 | 5.3-1_flood.mxd

Exhibit 5.3-1
100 - Year Flood Hazard Map

COUNTY OF SAN LUIS OBISPO • LOS OSOS WASTEWATER PROJECT
WATER DRAINAGE AND WATER QUALITY EXPANDED ANALYSIS SECTION

Attachment X



Geology: C.A. Hall, 1973, Geologic Map of the Morro Bay South and Port San Luis Quadrangles

Map Scale: 1 inch = 2000 feet

Legend

Well
Spring

Qal - alluvial deposits
Qs - sand dune deposits, including older stabilized dune deposits. Portions possibly Paso Robles Fm.
Qls - landslide deposits
Jv - Franciscan Fm. metavolcanics
Jfme - Franciscan Fm. Mélange with ch (chert), mv (metavolcanics) and bs (blue schist)

Figure 1

Tonini Geology
and Water Features
Los Osos Wastewater Project

Cleath & Associates

Jeffrey H. Edwards, January 30, 2009 (Letter P48)

Response to Comment P48-1

This comment suggests that another site, the Gorby property, should have been considered in evaluating alternatives for siting the wastewater treatment facility. The Draft EIR analyzed four alternative sites, the cemetery property not currently being used for cemetery purposes, the Giacomazzi property, the Branin property, and the Tonini property. The comment states there are numerous environmental impacts with the Tonini site and questions the use of Tonini as a sprayfield because of potential impacts on water resources for the community necessitating use of imported water for domestic needs. The Draft EIR considered eleven sites, including the Gorby site, and they are discussed and evaluated in Section 7.3.4. Further discussion of various siting alternatives is included in the Fine Screening Report by Carollo Engineers (incorporated by reference to the Draft EIR). The Fine Screening Report ranked the Gorby property as lowest priority noting it was a property with numerous higher constraints that rendered it least feasible. The Draft EIR noted that the Gorby property was also lowest priority due to its sloping conditions with only 20-25 acres of level, buildable area. The Draft EIR also noted other issues including: the property has prime agricultural lands with well-developed agricultural uses; it lies along the Los Osos fault line requiring special design features and mitigations; it lies in the 100-Year floodplain requiring facilities to be either protected from flooding or built on elevated pads; there are viewshed impacts due to its adjacency to Los Osos Valley Road; and the nature of site being adjacent to and including surface water features increases the likelihood of the presence of endangered species aquatic habitat and the site has the potential for cultural sites of interest. See also the Response to Comment P24-20. Regarding the water supply and water resource issues refer to Topical Response 3, Water Resources and the Project Scope.

Response to Comment P48-2

This comment states that the Draft EIR has failed to review and analyze the recent Area Plan update for the Estero Rural Area including resulting amendments to Title 23 (CZLUO). Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P48-3

This comment expresses the opinion that the water purveyors are not capable of operating outside of their current functions. We disagree. The County is participating with the three water purveyors through the current groundwater litigation to make substantive changes in the way water resources are managed in Los Osos. See Topical Response 3, Water Resources and the Project Scope; Draft EIR Section 5.2, Groundwater Resources; and Appendix D, Groundwater Quality Resources, for a discussion of the groundwater basin characteristics and how the effluent disposal at Broderson will alleviate saltwater intrusion into the lower aquifer.

Response to Comment P48-4

This comment stated that high groundwater conditions exists at Tonini and asked if the introduction of spray irrigation would increase the potential for liquefaction. There is relatively high groundwater

conditions in the southern portion of the Tonini site. In October 2008, borings were conducted within areas of the treatment plant facilities and also within the proposed sprayfield areas. The majority of the borings within the treatment plant area were extended to 21.5 feet and the borings in the sprayfield areas were extended to 11.5. Only one boring within the treatment plant facility was extended to 50.1 feet, and only this boring encountered groundwater which was at 27 feet. Previous boring encountered groundwater at elevations as low as 7.1 feet. Fugro West prepared the Preliminary Geotechnical Report, Los Osos Wastewater Project in January 2009 to provide more detailed geotechnical information for the Tonini site. This report is located in Appendix Q.6, identifies the potential for liquefaction, and states that the areas within the south and southwestern portions of the site are underlain by generally shallow sandy alluvium or dune sand deposits. Based on the proposed structures, these soils would be removed during grading to reduce the potential for liquefaction.

This comment is also concerned that runoff from the sprayfield operations during the winter may impact the water quality in the onsite streams as well as eventually into Morro Bay. As discussed in the Preferred Project Evaluation located in Appendix Q, the operation of the sprayfield is modified from the operation described in the Draft EIR. The sprayfield operation would only use evapotranspiration and not percolation. In addition, the sprayfield would be set back from the existing onsite streams by 100 feet to further reduce the potential of spray irrigation be conveyed to the creeks. Furthermore, the concern regarding runoff during the winter would be reduced because the operation of the sprayfield would be reduced during the winters and the operation of the Broderson leach field would increase. During the summer, the operation of the sprayfield would increase while the Broderson leach field would decrease.

Response to Comment P48-5

This comment expresses a desire for clarification regarding the impacts to the Morro shoulderband snail and the red-legged frog. We agree with this comment's assessment on the need for consultation. Consultation with the US Fish and Wildlife Service does not represent a Class I Impact. If after consultation USFWS issues a Jeopardy Opinion, that would be a Class I Impact. Discussions with USFWS and California Department of Fish and Game will be completed. The placement of the 72 acres of the Broderson Parcel into conservation (something that currently does not exist) will provide adequate protection for the limited loss of habitat for the Morro shoulderband snail. Project design will avoid any permanent impact to the red-legged frog. Construction monitoring and avoidance practices will be used during construction, the drainage crossings will be restored and adequate buffering of the stream from facilities will be employed.

Response to Comment P48-6

This comment stated that there were no comments on the Public Health and Safety section of the Draft EIR. In addition, this comment states an opinion that it appears that a Class I impact for traffic would occur during construction of the project. As described in Section 5.8 in the Draft EIR and Appendix J-1, potential significant traffic impacts could occur during construction activities;

however, mitigation measures are included to reduce potential significant impacts to less than significant. Since mitigation measures are available to reduce impacts, traffic and circulation impacts would be considered Class II and not Class I which is significant and unavoidable.

Response to Comment P48-7

This comment expresses a concern regarding a Class I impact associated with traffic and circulation for the Preferred Project. See Response to Comment P48-6 regarding the level of traffic impacts that could occur during construction activities.

Response to Comment P48-8

This comment stated that it appears that a Class I impact for traffic and circulation during construction is identified for the Preferred Project in the Draft EIR. Class I impacts are categorized as significant and unavoidable impacts. Section 5.8 in the Draft EIR identifies potentially significant traffic impacts during construction; however, mitigation measures are recommended to reduce the potential impacts to less than significant. Therefore, the construction traffic impacts associated with the proposed project are considered Class II impacts which are potentially significant but can be mitigated.

Response to Comment P48-9

This comment acknowledged that the Draft EIR included a finding of significant and unavoidable impact for agricultural resources. No further response is required.

Response to Comment P48-10

The comment states that the Draft EIR did not prepare an adequate analysis of potential effects of the Preferred Project, and that one photo simulation from a substantial distance is not sufficient. The comment also states that an analysis of the Morros viewshed should be conducted.

Refer to Response to Comment P43-5. Also, refer to analysis conclusions regarding visual impacts to AG zoned parcels on page 5.12-44 in the expanded visual resources section, where the conclusions are that impacts of proposed project 4 are significant prior to mitigation. Regarding the comment of a more complete analysis of the Morros viewshed it is not clear how the Morros viewshed is defined, or how a simulation of this viewshed would change the conclusions of the analysis. Exhibit 5.12-6 shows that the treatment facility is clearly visible from LOVR, and justifies the conclusion about a significant impact before mitigation.

Response to Comment P48-11

This comment expresses a concern about how the water resource management of the groundwater basin may force the community into using imported water for potable needs. The County is taking active steps to resolve the water resource issue but that issue is not a part of the LOWWP. Refer to Topical Response 3, Water Resources and Project Scope.

Response to Comment P48-12

This comment provided an opinion that there could be as many as 10 Class I unavoidable adverse environmental impacts. As described in the Section 8.1 of the Draft EIR, agricultural resources is the only environmental issue that would experience a significant unavoidable adverse impact with the implementation of the proposed project.

Response to Comment P48-13

This comment expresses a concern about the need for utilization of imported water if the Tonini site is selected as well as additional costs inherent in utilizing imported water. These issues are addressed in Topical Response 3, Water Resources and the Project Scope.

CCW-PZLDF
P.O. Box 6095
Los Osos CA 9340

See 10/2005 test No3 on Folloing Graphs

Bys Prue...

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Dept of Public Works
County Government Center, Room 207
San Luis Obispo, CA 93408

Also Note the Low Nitrates on those that were Tested 1985

RECEIVED
JAN 30 2009
COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS

Re: Comments on LOWWP DEIR

I have Wade Brim's evaluation of the wells

Dear Mark:
Please note: the wells have not been testet since 2006. We may be spending millions # for a project that is not Necessary. Please look at this info P49-1

Sample results presented in Table 3 and Figure 2 shows NO_3-N concentrations measured at monitoring network wells range from less than 1 milligrams per liter (mg/l) to 23 mg/l. The median NO_3-N concentration for the 28 wells is 11 mg/l. The greatest concentrations of NO_3-N are reported at wells in Baywood Park and also south of Los Osos Valley Road.

TDS concentrations in shallow ground water shown in Figure 3 are typically between 200 and 400 mg/l, with a low of 57 mg/l in well 30S/11E-8N2 along South Bay Boulevard and a high of 1,400 mg/l in Sunset Terrace monitoring well 30S/10E-13L5. The high TDS value measured at well 13L5 is not associated with sea water intrusion, but is interpreted to be a result of water softener discharges in the area.

I have lots more Info. on Illegal wells which makes this info fraudulent!

Total Ammonia

Total ammonia concentrations have been historically detected in ground water collected from several of the nitrate monitoring program wells. Many of the detections are isolated and/or at levels close to detection limits, but two wells have consistently been reported with total ammonia concentrations greater than 1 mg/l. These two wells are a former upper aquifer community supply well on 8th Street in Baywood Park (30S/11E-7Q1) and a monitoring well tapping the perched aquifer near downtown Los Osos (30S/11E-18J6). A summary table of total ammonia results is included in Appendix D.

Total ammonia includes NH_3 (ammonia) and it's ionized form, NH_4^- (ammonium). The fate and transport of these compounds in the soil column depends on several factors, but subsurface conditions in Los Osos typically promote nitrification during the leaching process. Where the subsurface is deficient of oxygen, however, the conversion of ammonia/ammonium into nitrate can be inhibited. Ammonium is the principal form of dissolved nitrogen being discharged from septic tanks in Los Osos. Ammonium is also easily adsorbed onto clay or organic constituents in soils, and is much less mobile in ground water than anionic nitrate compounds. Therefore, the persistent detections of significant total ammonia concentrations in

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Bruce Payne, January 30, 2009 (Letter P49)

Response to Comment P49-1

This comment—with well logs and nitrate testing data attached—questions one basis for the Regional Water Quality Control Board's discharge prohibition order in Los Osos. See Response to Comment A8-36.

January, 2009

THE WORLD LEADER IN
VACUUM SEWER TECHNOLOGY

TAMPA OFFICE
AIRVAC, INC.
200 Tower Drive, Suite A
Oldsmar, FL 34677 U.S.A.
Phone: (813) 855-6297
Fax: (813) 855-9093
Web: www.airvac.com

Mr. Mark Hutchinson
County of San Luis Obispo
County Government Center, Room 207
San Luis Obispo, CA 93408
(805) 781-5252

AIRVAC response to Draft Environmental Impact Report

Mr. Hutchinson

The guiding philosophy behind the Los Osos wastewater project is to evaluate and develop the most environmentally sustainable and cost effective system of wastewater collection and treatment that meets the needs and concerns of the citizens of Los Osos.

Although, many alternatives were researched and evaluated in the various screening reports that were performed, many residents have expressed their concerns with the methods being proposed for the collections system and feel that a vacuum system is a viable and environmentally superior system for their collection needs.

Based upon numerous applications worldwide, many years of experience in the field, and a long list of satisfied clients; it is our belief that an AIRVAC system presents enormous environmental and ecological benefits to the community of Los Osos.

With that being said, AIRVAC would like to provide the Board of Supervisors and staff with a response to the Draft EIR report along with supporting information and documentation for the further review and evaluation of vacuum sewers

Sincerely,

Dean K. Ouellette
AIRVAC, Inc.
200 Tower Dr. Suite A
Tampa Fla., 34677
Office : 813-855-6297
Mobile : 321-356-4280
deano@airvac.com
www.airvac.com

Los Osos Wastewater Project

AIRVAC VACUUM SEWER ALTERNATIVE

Jan. 2009

The following is a response to Draft Environmental Impact Report by Michael Brandman Associates Dated, 2008. The response follows the same evaluation path as described in the Draft Environmental Impact Report as well as the Fine screening report (by Carollo, 2007). Please see attachments for support documentation to the following.

CORE COMMUNITY VALUES

1. **Affordability:** (capital & construction cost, O&M cost, Financing factors, grant eligibility and engineering and project management costs) vacuum systems are typically cost 10% more than pressure systems and sometimes 60% less than gravity systems with similar pipe sizes. In the 1970's the EPA supported many grant programs for the implementation of innovative technologies which is how many early vacuum projects were funded. Engineering and project management costs are typically in-line with other technology design fees and management costs. P50-1

2. **Environmental Stewardship:** (environmental impacts, potential risks due to system failure, carbon footprint) Vacuum systems pose the least amount of environmental impacts of all technologies evaluated, shallower narrower

3. trenches (smaller installation equipment) minimize groundwater impacts as well as surface impacts. Risk of failure in vacuum system is very low; every vacuum station is equipped with back-up generators to provide uninterrupted service during any power outage or significant storm event. The elimination of infiltration and inflow as well as no opportunities for ex-filtration and smaller installation equipment further reduce the carbon footprint of a vacuum system. P50-2

4. **Flexibility:** (flexibility for future: expansion, higher regulations and potential alternative energy opportunities) If future service area build-out is considered at the design phase, vacuum systems can be easily expanded and constructed in various phases. Vacuum systems currently exceed most standards regulatory requirements in regards to environmental impacts.

P50-3

5. **Sustainability:** (restoring and protecting groundwater, mitigating sea water intrusion, minimizing energy usage and sludge production) Vacuum systems are totally closed and eliminate any opportunities to ex-filtrate raw sewage directly into the environment protecting groundwater resources from pollution. Vacuum sewers also provide substantial energy savings as well; no power required at the home connection eliminates need to upgrade homeowner service, with the 3 pumping stations (4 vacuum pumps and 2 sewage pumps per station) containing a total of 18 pumps versus a grinder pump at each home (4,769 grinders) or the 19 pumping stations (minimum 2 pumps per station) for a total of 38 pumps as required for the gravity system. As a result Vacuum systems present a significant savings and reduction in overall power consumption. In regards to sludge production; due to the operating flow velocities of 15-18fps within the piping network sludge production is reduced and sludge hauling is eliminated with a vacuum system.

P50-4

6. **Community:** (impacts to homeowners, residents and businesses, stakeholder support and community acceptance) Vacuum presents the least impact to the homeowners (no upgrade to individual homeowners electrical service), on-lot impacts are directly comparable to gravity. Vacuum is currently strongly supported by a growing number of the residents of Los Osos.

P50-5

7. **Controllability:** (Risks of third party decisions and policies, design for maximum system control and financial risks associated with wastewater projects) all technologies are susceptible to the same & similar risks in design and system control both politically and financially.

P50-6

SCREENING CRITERIA

During the comparison of system alternatives in the fine screening report (Carollo engineers 2007), vacuum sewers were rated or classified as a Level "C", which clearly states that the project components do not meet one or more of the project objectives or are non-viable due to a "fatal flaw" therefore dropped from consideration. The report provides no specific data to support this classification. The evaluation again is further described later in the Baseline criteria, shown in table 7-5: Screening of Collection System Alternatives (Final Draft EIR 2008) as follows.

1. **Groundwater Quality & RWQCB Waste discharge requirements:** The report indicates that vacuum meets requirements for elimination of pollution to groundwater.

   a. Meets RWQCB requirements for elimination of pollution to groundwater

   b. No opportunity for ex-filtration of raw sewage into the environment

   c. Septic tank effluent that currently recharges aquifer is removed.

   (See WEF manual chapter 3, vacuum sewer systems)

P50-7

2. **Water resources:** Vacuum not evaluated.

   A vacuum system is totally sealed system that eliminates infiltration and inflow as well as opportunities for ex-filtration within the piping network.

   a. Inflow: As any system ages, inflow can occur at the house lateral, inflow within the piping network would result in a vacuum loss and would be immediately detected.

   b. Infiltration: Infiltration is minimized; any leak within the piping network would result in a vacuum loss and would be immediately detected.

   c. Septic tank effluent that currently recharges aquifer is removed.

   (See WEF Manual chapter 3, vacuum sewer systems)

3. **Energy/Air Quality:** Highest energy required.

   AIRVAC interface valves are completely pneumatic and no power is required at the home connection, the only power requirements are at the vacuum stations and comparable to that of a standard tri-plex lift station.

   a. Three proposed vacuum stations (18 total pumps) as compared to 19 gravity pumping stations (38 total pumps) and 4,769 individual grinder pumps.

   b. Vacuum pump daily run-time average is 2-3hrs a day.

   c. 200-400 KW/hr/yr/per connection

   d. Odor is minimized and controlled by bio-filtration bed.

   (See WEF Manual chapter 3, page 191 Table 3.32)

4. **Costs:** Highest maintenance cost

   a. O&M costs are comparable to other technologies.

   b. Pump stations: Three vacuum stations (4 vacuum pumps and 2 sewage pumps per station) as well as 1,589 interface valves (1-4 homes per valve) to serve the 4,769 connections as compared to the 4,769 grinder pumps for the LPS system and the 19 pump stations for the gravity system.

   c. Vacuum is the least invasive of all technologies (smaller installation equipment). Trunk lines are located within the R/W outside the edge of pavement in shallow narrow trenches (averaging 3'-5' in depth). Valve pits are located within the R/W on a common lot line to serve up to 4 homes, dramatically reducing the on lot disruption.

   d. Vacuum can incorporate other technologies (hybrid systems), to best utilize the most appropriate technology for the service area.

   e. No sewage hauling required.

   f. Same staff requirements as other technologies.

   g. No permanent public easement required.

   (See WEF Manual chapter 3, pages 184-187)

P50-7
CONT

5. **Permit ability:** Vacuum not evaluated.

   a. Noise: Less noise disruption during construction due to smaller installation equipment and comparable to gravity during operation.

   b. Cultural resources: Lowest environmental impacts and lowest on lot impact.

   c. Aesthetics: Vacuum stations are housed in building that is designed to match the architecture of the existing community making them very difficult to identify. All other system equipment is below grade.

   d. Traffic is not an issue during construction due to trunk lines being located outside the edge of pavement. Temporary open-cuts may be required. Equipment will not be within close proximately to sensitive areas.

   e. Existing systems currently in operation in California. (Big Bear Lake, Oyster Point Ca.)

   (See WEF Manual chapter 3)

P50-7
CONT

CONSTRUCTION BENEFITS

While it can be agreed that a more conventional gravity system or STEP/STEG system is a possibility, that does not necessarily mean it is the best solution or choice. With an AIRVAC vacuum system main trunk lines are located within the R/W outside the edge of pavement averaging 3'-5' in depth, resulting in less costly street restoration as well as simplified maintenance of traffic. Valve pits are located within the R/W on a common lot line to serve up to 4 homes, dramatically reducing the on lot disruption resulting in less overall surface disruption and less costly restoration. Vacuum mains are also very flexible both horizontally and vertically giving vacuum system the ability to avoid existing utilities and obstacles with-out sacrificing efficiency or incurring troublesome change-orders.

P50-8

ECONOMIC BENEFITS

The construction estimate is currently 32.2 million which is based on component cost and on the estimated lineal feet of pipe with an associated per lineal foot cost. The cost represented in the Draft EIR report versus the cost represented in the estimate is not a cost comparison and does not include such items as the 15% contractor mark-up and

P50-9

profit, the 8% sales tax and nor does it include the 10% contingency. Vacuum main installed costs will be dictated by the market for pipe installation at the time that a design build team has been selected and a design has been finalized and approved.

Another major economic benefit to a vacuum system is the elimination of infiltration and inflow (I/I). Unlike a gravity sewer, the AIRVAC sewer is a completely closed system. This results in less of a burden on the downstream collections systems and treatment facility as well as an increase in plant capacity. It also results in a more consistent effluent, which is not impacted during a storm event. In particular if an AIRVAC system is implemented in Los Osos, a total flow of 300,000gpd or 0.30mgd would be eliminated (per flows and loads technical memorandum Nov. 2008). By providing this reduction in infiltration and inflow, treatment costs would be reduced resulting in an overall cost savings for the community.

P50-9
CONT

LONG TERM VIABILITY & USEFUL LIFE

As of December 31, 2006, AIRVAC had 244 vacuum stations and 45,030-3" valves (typically serving 1-4 homes) throughout the united states, with an additional 514 vacuum stations and 46,914-3" valves installed in 33 other countries. These systems have been in operation for a number of years, most over 10 years old and some over 30 years old. While AIRVAC has nearly 100,000 valves in operation around the world, less than 100 valve rebuild kits were sold in 2008. How significant is this? Considering that on average every 2 homes are served by 1 valve, an average daily flow rate of 150gpd/home, and that every 10 gallons causes a valve to cycle, each valve would cycle 30 times per day. With 91,300 operating vacuum valves, this equates to 2.74 million valve cycles each and every day. Stated another way, on average, there are nearly 2,000 AIRVAC valves cycling every minute of every day somewhere in the world.

P50-10

The components of an AIRVAC vacuum system are not all that different than that of the traditional gravity sewer/lift station design, vacuum systems are better thought of as vacuum assisted gravity. Vacuum sewer mains utilize PVC pipe (same as gravity), valve pits are made of either corrosion resistant fiberglass or polyethylene (longer useful life than a concrete manhole or tank), the wet-well instead of being open and exposed is a completely closed tank made of epoxy coated steel (no tanks have failed in 35+ years), and the sewage pumps are the same as typically used in conventional lift stations. The only other components of the system are the vacuum pumps (same useful life as the sewage pumps) and the vacuum valves (valves installed in the early 1970's are still in operation today).

Furthermore, one of the biggest misconceptions regarding vacuum systems is in regards to the useful life of a vacuum valve. While it is perceived to that the valves only have a useful life of 10 years, this is simply not the case. In fact, in the 35 years AIRVAC has been in operation, AIRVAC has never performed a wholesale replacement of the valves on any project. Instead AIRVAC recommends performing preventative maintenance by rebuilding the vacuum valve controller every 5 years and rebuilding the vacuum valve every 10 years. These both can be done very inexpensively and with minimal manpower.

P50-10
CONT

OPERATIONS & MAINTENANCE

Another misconception relates to the amount effort required for operations and maintenance (O&M) of the system, while maintenance of the system is required for optimal performance, AIRVAC systems are easily and inexpensively maintained. AIRVAC provides a week long training course (in Rochester In.) free of charge. The operations personnel will learn the proper techniques for operating an AIRVAC system, including "hands-on" experience performing the maintenance procedures.

While emergency situations can occur (as they can with any system) the majority of the recommended O&M involves daily operation of the vacuum station and completion of valve pit preventative maintenance procedures. As mentioned previously, the preventative maintenance can be done inexpensively and with ease. The table lists the recommended valve pit maintenance.

P50-11

AIRVAC recommended Valve Pit Maintenance

Maintenance	Interval	Persons req'd	Labor (hours)	2007 Cost
Physical inspection	1 year	1 person	0.50	-
Controller rebuild	5 years	1 person	1.00	$31/kit
Valve rebuild	10 years	1 person	1.75	$31/kit

In situations where the owner is uncomfortable or is unable to perform the operations of the system, AIRVAC can be contracted to perform complete system operations and maintenance. This would include routine (day to day) maintenance, inspection of home connections/installations, emergency maintenance and preventative maintenance. Additionally, by contracting with AIRVAC, the vacuum station warranty is extended from 1 year to 2 years and the vacuum valve, controller, and pit warranties are extended to match the length of the service contract.

P50-11
CONT

CONCLUSION

AIRVAC is the World leader in vacuum sewer technology and would very much the opportunity to have vacuum sewer systems reinstated as a viable collection alternative and would also like the opportunity to participate in the design build process. AIRVAC believes the implementation of a vacuum sewer system would result in substantial savings for the community residents of Los Osos and for San Luis Obispo County as well. Additionally, the impact of construction and the on-lot impact would be greatly reduced when compared to the gravity and STEP options. Also, while maintenance of the system is required for optimal performance, it is rather inexpensive and not labor intensive. It is the professional opinion of AIRVAC that a vacuum sewer system is a long term solution that presents significant benefits to all entities involved in the Los Osos waste water project.

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AIRVAC, Dean K. Ouellette, January 30, 2009 (Letter P50)

Response to Comment P50-1

This comment and those following describe an alternative wastewater collection technology. While the comment and its attachments provide a good overview of the technology, the various statements regarding the superior nature of the system are necessarily generic. Although the technology appears to be a good fit in some installations, as described in the literature, there is no information specific to the Los Osos application. However, the project selection process through the Design/Build Request for Qualifications was specifically designed to elicit alternative technology proposals. However, the costs provided in the comment are incomplete regarding what is and is not included. Also see Topical Response 5, Alternative Collection Systems.

Response to Comment P50-2

This comment states that the vacuum systems poses the least amount of environmental impacts. See Topical Response 5, Alternative Collection Systems.

Response to Comment P50-3

This comment states that the vacuum system exceeds regulatory requirements in regards to environmental impacts. The project is proposed to serve the buildout of the prohibition zone, which is currently estimated at 85 percent buildout. Vacant parcels are scattered throughout the prohibition zone; there appears to be little or no opportunity to defer phases that would serve build out parcels. Also see Topical Response 5, Alternative Collection Systems.

Response to Comment P50-4

This comment notes that vacuum systems may have advantages over STEP, low pressure, or gravity systems depending on the issue under consideration. Regarding sludge production, both gravity and vacuum would transmit sludge generated at each service connection to the treatment plant, it is not clear how the overall volume of sludge that requires treatment and disposal can be reduced by a vacuum system. Also see Topical Response 5, Alternative Collection Systems.

Response to Comment P50-5

As noted in the comment, on-lot impacts are directly comparable to gravity, unless the vacuum station is located on or near a property (one out of three or four), in which case homeowner impacts would be comparable to a low pressure system. In addition, the vacuum/pump stations would have impacts on adjacent homeowners in a manner greater than the gravity pump stations as the vacuum system requires slightly more above-ground components at the stations. Also see, Topical Response 5, Alternative Collection Systems.

Response to Comment P50-6

This comment includes assertions regarding issues that are not germane to the environmental analysis; therefore, no further response is required.

Response to Comment P50-7

This comment expresses a concern regarding the determination of a Level "C" for vacuum sewers in the Fine Screening Report (Carollo 2007). The Fine Screening Report states that vacuum collection technology is viable when combined with areas of gravity collection to create a (hybrid gravity) collection system for the "optimization of construction and operation and maintenance (O&M) costs as compared to a dedicated gravity system." The Draft EIR, in Table 7-5, classified a dedicated vacuum system as a Level C alternative, citing higher costs when compared to a hybrid gravity system.

Response to Comment P50-8

This comment includes conclusions that can only be verified during a detailed design process. Vacuum main lines can be located outside of pavement only where there is no interference with existing underground utilities (water, gas, and communications), where off-pavement areas are not already being utilized for drainage, and where off-pavement areas do not contain cultural or biological resources.

Response to Comment P50-9

This comment provides a summary cost estimate for various elements of the technology. These cost estimates lack sufficient detail to determine what elements are or are not included. The current county cost estimates are fully described in the Fine Screening Report (August 2007) and provide the detail needed for reviewers to determine each element, and the included factors, in the estimate. For instance, cost estimates in all County documents include all elements of an alternative: land costs, permitting, engineering, appurtenant structures (maintenance and administration buildings) etc. This comment provides no supportive evidence for the estimates. It should also be noted that the range of collection alternatives considered for inclusion in the EIR is based on life-cycle costs, long-term operational issues, ability to meet performance objectives consistently, etc. and not simply on initial capital costs. Also see Topical Response 10, Infiltration, Inflow, and Exfiltration, regarding infiltration and exfiltration.

Response to Comment P50-10

This comment provides information about the useful life of a vacuum valve; there appears to be no associated environmental costs or benefits. No further response is required.

Response to Comment P50-11

This comment provides information about the maintenance requirements of a vacuum system; there appears to be no associated environmental costs or benefits. No further response is required.

1-29-09

MR. HUTCHINSON,

I DON'T TYPE SO PLEASE EXCUSE MY HANDWRITING.

FIND ENCLOSED A COPY OF A 10 PAGE TAC REPORT GIVEN TO ME BY DR. TOM RUEHR BEFORE HIS DEATH LAST YEAR.

DR RUEHR WAS A WORLD-WIDE EXPERT ON WASTEWATER SYSTEMS + SOIL ISSUES CONNECTED WITH THEM. MANY OF HIS COMMENTS + OBSERVATIONS PERTAIN TO THE CURRENT LOWWPDEIR NOW GOING THROUGH PROCESS. I CAN THINK OF NO OTHER DOCUMENT THAT CONTAINS MORE USEFULL INFORMATION IN A CONDENSED, READABLE VERSION THAN THIS ONE.

P51-1

THANK YOU FOR YOUR CONSIDERATION.

Christopher D. Allebe

CALIFORNIA RIFLE & PISTOL ASSOCIATION

CHRISTOPHER D ALLEBE
PO BOX 6617
LOS OSOS CA 93412-6617

LOCAC

Los Osos Community Advisory Council

January 30, 2009

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Dept of Public Works
County Government Center, Room 207
San Luis Obispo, CA 93408

Re: LOCAC Comments on LOWWP DEIR

Dear Mark:

Members of the Los Osos Community Advisory Council (LOCAC) and the people of Los Osos who have participated in the LOCAC review of the draft environmental impact report (DEIR) for the Los Osos Wastewater Project (LOWWP) thank you for the opportunity to comment on the sufficiency of this document as we and the County prepare to select the best and affordable wastewater project for Los Osos.

Even though LOCAC had not formally reviewed the previous wastewater projects because they were not officially county land use projects, the members of LOCAC back in 1995 felt so strongly about the sustainability of the Los Osos water basin that they devoted a complete section of the 1995 LOCAC vision statement to the holistic management of water including (but not limited to):

- ***waste water treatment facility(s) based on a natural biological process rather than mechanical system approach to the highest extent possible,***
- ***graywater reclamation, management and recycling, and***
- ***development of a water supply for agricultural or irrigation purposes.***

Now that the LOWWP is a county project, and since LOCAC is the forum for public review of all discretionary and county land use projects, ~~now that the LOWWP is a county project~~, it is appropriate that LOCAC be involved in the review process at each step. We heard from the County many times during the technical review process to wait for the EIR before jumping to conclusions about which technology and project would be best for Los Osos. The people of Los Osos were promised that the EIR document would provide the answers to the recurring questions of how the various alternatives would meet the objectives of the project. Therefore, LOCAC undertook the formation of a special committee to review the draft LOWWP EIR and assist the public in reviewing and responding to this document, keeping in mind the 1995 LOCAC vision and the realities of the events of the last 13 years, ~~including~~ the failed sewer project in 2005 and the declaration of a Water Severity Level III situation in Los Osos due to seawater intrusion in the lower aquifer,

The LOCAC DEIR committee, chaired by LOCAC member Mimi Whitney and consisting of 15 or more members at times, met weekly, even through the busy holiday periods, to read and review the DEIR. This was a tremendously difficult and laborious task for the citizen members, most of whom have little or no experience in reviewing and commenting on a DEIR. Fortunately, a few committee members who have credentials in soil sc

LOCAC P.O. Box 7170 Los Osos, CA 93412-7170
E-Mail: locac@locac.us www.locac.us

337.41c

Los Osos TAC Report Comments by Tom Ruehr March 30 through April 8, 2007

Major concern for not recharging the lower aquifer. Probably no sewer system will be able to do this. We will continue to lose water to Morro Bay. This remains a serious deficiency in terms of water management. We must insure we do not connect to the state water. We must prevent connecting to Lake Naciamiento water. This water contains sufficient mercury (even when it is below the mercury detection limit) to contain millions to billions of atoms of mercury in each gallon of water.

Using the recycled water through ag exchange will help to reduce the total water pumped from the lower aquifer. Water management in terms of deep aquifer recharge is critical and can not be solved by this sewer. However, we need to insure any results of the sewer will not make the potential for deep water recharge any worse.

Ironically, the RWQCB is so concerned about nitrate and potential "pollution" eventually no water will exist to become polluted unless they change their focus from contamination to recycling and retention of useful water.

I am pleased they have finally started looking down at the end of the process first (disposal and recharge) and working backward to how to collect the sewage. This is one reason previous studies have missed the major problems. They looked too closely only on collection.

I believe we must try as much as possible to prevent any use of the State Revolving Fund monies. I believe we can have access to private funding. It will cost not much more than the state funding. Most importantly, we will be able to insure we can have a sewer with the least amount of cost overrides if we reject using the SRF. With the SRF and an early 218 vote, we will very likely end with buying a pig in a poke. By this I mean the sewer installation companies will continually increase the costs and the total cost will be a continuously changing number, mainly because they have ignored the problems encountered with water recharge and biosolids processing.

The RWQCB has continuously changed their criteria. The major past problem has been their absolute stupidity of rejecting all science and technology developed within the past 25 years. They have been excessively wedded only to multinational sewer companies providing sewer systems for cities of 2 million people. These processes are not appropriate for small communities of 20,000 people.

Many amazing technologies have recently been developed with much superior and effective water processing in the past few years. Within the past decade a major mindset change has occurred. This new mindset essentially argues previous massive sewer installations should be avoided because of the serious problems (long term they create) and the realization smaller is more efficient, effective with lower long term maintenance and providing better water quality at a much lower treatment cost.

Be aware of the previous bait and switch process. They allow the TAC to develop many useful ideas. Then at the very last minute, all previous work is negated by claiming many "fatal

CHRISTOPHER D ALLEBE
PO BOX 6617
LOS OSOS CA 93412-6617

flaws" resulting in all previous work having no value. Consequently, only the new ideas with no opportunity to evaluate their impacts publically are forced upon the community. This has occurred several times in the past in Los Osos.

The County and the RWQCB has ignored the nature of the people in Los Osos. For many years they assumed the community was full of dissidents only interested in trying to prevent having a sewer. Los Osos contains the most highly educated people per 1000 individuals between Monterey and Ventura. The reality is they do not want to pay for a non-functioning sewer rat hole with the obvious escalating costs associated with problems poorly examined (as was the recharge at the Broderson site for example).

The recharge site proposal for the Broderson site and Tri W was about 100 to 1000 times the actual water application rate which could be allowed. The County engineering and the RWQCB signed off indicating they accepted these rates. This was a major professional mistake. This is a fatal flaw regarding the recharge process. Because the County engineering and the RWQCCB signed off and approved this improper rate, we can not trust them fully to look out for the welfare the Los Osos residents. They are not considering all of the factors, only those which will make the sewer cost the most.

The RWQCB will be making more money in the form of monitoring the Los Osos wastewater situation in the future. The larger the plant, the more money will be coming to the RWQQCB. Consequently, they have a vested interest in forcing Los Osos to have the most expensive sewer possible. This helps to explain their zeal for approving anything in Los Osos regardless of whether it works or protects the overall water quality.

What is needed is not slick covered fancy multiple color brochures. They need to provide a clearly reasoned comparison step wide of why each option was chosen and why each other alternative was rejected. The people of Los Osos do not want to spend more money on glitz, they want more solid clearly argued thinking with more effective and assured results for these steps in the sewer process.

Page TS-3 estimate of 65 gallons per capita per day seems low, previous values were closer to 75 to 80. I hope they are correct with this new value.

Table TS 1 is critical to understand. The BOD loading with the conventional system is the reason for the excessive cost for grinding pumps and water flow compared to using the septic tank as a distinct part of the total treatment process. The BOD with STEP can be reduced nearly 3 fold. This means the treatment plant has a much better chance to process the waste water.

The conventional sewer processes this high BOD sewage so fast it results in a much greater mass of biosolids than will be generated with the STEP system even when the septic tank pumping added to the total process. In general, the faster sewage is processed at any central processing plant, the more total tons of biosolids which will be produced.

The County refuses to see all aspects of water for Los Osos (as the Blue Ribbon Comm.)

was charged to do a decade and a half ago. We must drastically reduce the total mass of rain water runoff by installing holding basins (possibly underground) and provide for carbon filtration to remove oils from highway surface interactions of this runoff water and reuse of this water currently lost. We must harvest the water from the upper aquifer and use this wherever possible. This will greatly reduce the total water lost from the community into Morro Bay.

We must be much more serious about sea water intrusion. This is what I mean by looking at the end of the process first. Again, this report seems to have ignored how to prevent the sea water intrusion. Without addressing these points, the total value of the sewer is completely negated.

It is absolutely critical to establish an on site treatment process for biosolids treatment. We must have an effective means for aerobic composting and total biosolids biomass reduction on site. It will be essential to provide some clear process of utilization and beneficial processing of the biosolids. The metals content should be quite low and fortunately additional toxic chemicals are usually quite low in Los Osos.

A serious consideration is the presence of pharmaceutical and personal care products. These are not being processed during the conventional sewage treatment process. Releasing these products in the treated water will have very adverse conditions. For example, birth control medications will pass through the water and will eventually place all residence on birth control when they drink this recycled water. It is not certain whether soil filtration of these products will result in the elimination of these products.

In addition to birth control products, other serious considerations are the possible body elimination of major anti-cancer medications. Fragrances and antibiotics will present major problems. If we begin drinking treated waste water even after passage through soil will probably result in converting the citizens of Los Osos into a huge guinea pig experiment where they will be exposed to the potential transfer of the antibiotic resistance genes being transferred to people. If this occurs, the health of all individuals in the community will be seriously threatened because physicians will have no alternative during the critical process of administering life saving medications when the current antibiotics are no longer effective due to the people possessing these antibiotic resistance genes.

Table TS 2 These considerations suggest we must use disinfected tertiary treated waste water plus a much more intense treatment with Ultra Violet light and possibly hydrogen peroxide. Chlorine should be avoided because the addition of chlorine gas results in uncontrolled organic chemical reactions creating organic chlorine compounds which increasingly are seen as suspected cancer causing agents.

A consideration for ag exchange is what the RWQCB considers being inside the basin. In the past, this has created problems. The Los Osos valley for about 6 miles to the east is part of this basin. Don Asquith has helped to continue to confuse people about this problem.

Percolation ponds should be avoided. Maintaining constant saturated water over the soil results in microbes forming slimes which eventually clog the soil pores and greatly reduce the

total rate of water infiltration and percolation over time. This is under appreciated. This problem will magnify if only secondary water is used for the infiltration percolation ponds. Only the highest level of water treatment should be used for this purpose. Loading rates should allow at least one full day of complete drainage before adding more water.

Leach fields should not be used for disposal of any other than the highest quality of treated waste water. Secondary waste water will eventually clog due to the many lamellae in the sand dunes. This eventually will plug up the soil pores.

Creek discharge must be prevented. A constructed terminal wetland might work. However, the proximity to the sea level and the fog will mean this system will not be able to work optimally.

Table TS 3 Energy use has been played down by past proposals. Most of the conventional sewage treatment processes are extremely energy intensive, especially for electricity to move the water around. Other systems are much less energy intensive. Past considerations suggested we would have to have a complete dedicated electrical line directly to the treatment plant and this may not be enough for a conventional sewer. An excessive energy cost should be considered as a fatal flaw for any high energy proposal. This is especially true for future increases in energy costs.

The treatment site location must consider what I consider a fatal flaw from the human health perspective. Because of the persistent fog, any viruses entrapped in the air due to movement of the sewage and wastewater will result in a major down wind direction effect of contaminating residents close to the treatment facility. This effect is well know in the wastewater community where sewage treatment personnel are often fairly sick for the first several years until they become immune through previous exposure to these various viruses and microbes. However, the problem is much more serious for susceptible individuals (infants, elderly and those with a compromised immune system). Ideally, the treatment facility should be completely inclosed and all air leaving the facility should be treated with UV radiation to reduce the possibility of this happening in Los Osos.

Oxidation ditch, trickling filters and ponds have the same problem as identified in the previous paragraph. However, ponds may be a great idea for the purpose of removing phosphate by encouraging algal growth to remove both phosphate and some nitrate. I do not see any other treatment consideration which can assist in removing the phosphate. Phosphate contamination of Morro Bay is one of the primary reasons for the decrease in water quality to Morro Bay. Once the local sand dunes become saturated with phosphate, any additional phosphate from waste water treatment will move directly into Morro Bay regardless of whatever treatment process is used, unless algal treatment is added to the process.

Class A biosolids must be generated. Then these biosolids must be further composted aerobically ideally for over 6 months to a year on sight. This might most effectively be achieved by mixing the biosolids with green waste. This will greatly enhance degradation by providing more nutrients, more water holding ability, more aeration and more rapid degradation. The

resulting composted material could be used for erosion control and other purposes, including crops harvested with a protective cover (corn, wheat, etc.) but can not be used for root crop production.

Biosolids composting must emphasize vertical processing to enhance aeration and improved microbial degradation rather than the traditional horizontal processing only. Soil inoculation should be considered to insure these systems work optimally. Inclusion of rice hulls and straw will most likely greatly enhance the rate and quality of composting.

My suggested best location is the land just south of Los Osos Valley Road across from Turri Road and to the east for until the next home is encountered. This land has a slight elevation, has higher clay content for water filtration, allows for wells down hill being able to obtain the ground water for reuse. The closer the site is to Morro Bay water, the less effective it will be overall. Any site north of Los Osos Valley Road east of Turri Road has a problem of being dominated by serpentine soils and this will greatly reduce the effectiveness for waste water remediation (clean up).

I appreciate the emphasis upon using less productive soil sites. This is fine for the treatment plant site, but the waste water application soils should have an adequate amount of silt and clay to allow for both adsorption of phosphate and metals, plus the microbial soil community allowing the microbes to decompose the organic components in the waste water including potentially decomposing the pharmaceutical and personal care products.

It might be good to explore John Alexander's electrical agglomeration process. This will reduce metals and potentially may enhance the water quality prior to the water entering into the treatment process. John is a recognized engineer who has been ignored by most of these sewer people. He is a local resident (Cayucos) and has a patented process we should at least consider for the potential benefit to residents of Los Osos.

The best site location for the treatment facility is north of the cemetery where the plant can be primarily hidden by the topography. This will reduce virus spreading to the eastward (down wind and has much less fog).

The best site for application of the waste water is on locations with more clay than in most of the sand dunes area. The land south of Los Osos Valley Road between the creek valley to the land south of Turri Road is mostly sandy loam soil which is only moderately effective for potential microbial decomposition. Application of the waste water onto the sand dunes should be avoided because of the presence of the lamellae which prevent the effective water treatment and prevent an adequate rate of water infiltration and percolation with a maximum rate of microbial decomposition (which is low in sand dunes and sandy loam soils).

Conventional gravity collection will cause several major problems. First, the large diameter pipes will leak sewage downward into the soil below each leak. This will result in many uncontrolled leaks. This will provide non-treated nitrate, phosphate, and pathogens to the soil and enhance contamination within the collection zone. Second, these large diameter pipes

will leak inward meaning in zones closes to the sea level, sea water will move into these pipes. Any sea water leakage into these large diameter pipes will have two effects. The sea salts will strongly inhibit the microbial decomposition in the treatment plant. More importantly, these sea salts will prevent this water from being used as a water source for humans. This is absolutely to be prevented under all circumstances. This is a fatal flaw for the collection system. Ironically, the RWQCB approved of the Tri W collection process because it does not care about this problem of sea water quality deterioration of the collected waste water because of its excessive zeal for the most expensive sewer being installed in Los Osos. So much for the RWQCB's true concerns over water quality for Los Osos.

Another fatal flow is the major deep soil disturbance due to installation of the large diameter pipes. This process will cause disturbance at several major locations going from high on the hillside on the south downward towards the bay to the north. The problem is this will greatly increase the problems of soil erosion when water concentrates moving down the streets oriented north to south. If any of these streets leaks water, it will result in major outwash of the soil along the route of the sewer lines. In addition, in the event of an earthquake, this may greatly increase the probability of structural damage in homes because the stability of soil can never be returned to the original stability after such a deep soil disturbance. This situation will decrease over time after the sewer is installed, but it will never go away with the number and degree of deep digging actions in this vicinity.

STEP, vacuum and low pressure allow much faster response to leakage problems and other difficulties because it has much better monitoring. The greatly improved methods of installing small diameter pipe with minimal soil disturbance avoids much of the problems identified in the previous paragraph.

Although concerns about access to private property is a concern with septic tanks in place, all home owners need to understand what the trade off is in costs. The costs for not having a septic tank and not having access to inspect these tanks results in more than double the overall cost of the sewer. Some very wealthy people will not feel this is justified, but most people will realize this is a much better trade off if the system costs one half as much and it has a much less invasive soil treatment below ground. The community has to accommodate in various was and this is one of the realizations for having the sewer imposed upon the community. Maybe the cost would have to include buying a region near the street where new septic tanks would be installed. This would allow public control especially if community septic tanks were used instead of individual septic tanks.

A STEP collection system with a lower BOD treatment plant and effective Ag water exchange can be installed and working within about 2.5 years, whereas a conventional gravity sewer with the high BOD treatment plant will require about 4 to 5 years to complete. If speed is urgent, then we should consider these trade offs.

The 218 vote must clearly define all of the benefits to be gained from adopting the completed proposal to install the sewer. The vote should only be taken once the full costs are disclosed. The final cost must not be exceeded under any circumstances. Proper contingency

expenses are included in any engineering project. We must insure the creeping costs do not exist. Note, the Tri W site and Broderson site are examples of previously approved systems with now obvious engineering fatal flaws which would have necessitated millions of dollars of creeping costs increases over time. These provisions for a definite cost maximum, assurance of no creeping costs, a clearly articulated design for collection, treatment, an water reuse, and a firm deadline for completion must be spelled out before the citizens of Los Osos can be expected to approve a 218 vote.

Since the Tri W site is very much on the table, it is extremely important to point out at every opportunity how the County engineering and the RWQCB have adopted and approved of a fatally flawed system. This is a good example of the ethics violations of the process. They hide under the CEQA regulations as if this absolves the County engineering and RWQCB of criminal action for approving of significant errors in approving of the Tri W site as would have occurred if this process had not been stopped. Even now, many want to ignore these fatal flaws in their zeal to move forward in a speedy fashion.

The Supplemental EIR and additional CEQA review should be done prior to any 218 vote, not afterward. All community and regional considerations must be made prior to the 218 vote. This is again the reason so many problems have arisen in the past. All the facts must be known to the residents before they are willing to vote to support the sewer project. Again, we can not afford to have another debacle with unknown problems occurring and tremendous cost overrides after the 218 vote. We must never buy a pig in a poke regarding the Los Osos sewer.

Nacimiento water has the fatal flaw of containing mercury. Mercury is an accumulative poison. Thus, any mercury is too much mercury to allow its use by Los Osos. Water from Morro Bay and Cayucos is state water. This appears to be an effort to force state water upon the citizens of Los Osos. This was the original intent of bringing the old County engineer to San Luis Obispo, to force Los Osos to have to buy into state water. Now it rears its ugly head again, this time in disguise. Cayucos and Morro Bay are underlain by serpentine rock and soils. Any water mixed with the state water has a disproportionately higher level of magnesium. This creates a variety of problems including water infiltration. High magnesium in water makes people more "regular" than they may care to become.

State water is dangerous and potentially fatally flawed. The state water brought into the Metropolitan Water District of Los Angeles is loaded with natural organic compounds picked up when the water flows through the San Joaquin Delta histosols (organic muck and peat soils). These organic compounds react with the chlorine treatment to form a wide variety of organo-chlorine compounds many of which are known or suspected of being cancer causing agents (carcinogens). Why should we expose our citizens to this problem. It makes no difference whether other communities continue to do the wrong thing, it is not appropriate to allow Los Osos to expose our residents intentionally to this very serious potential health threat. State water flows through the San Joaquin Delta and has this problem.

This is the major reason we must insure all aspects of the sewer do keep all of our water locally. We must be able to reduce our water loss to Morro Bay to a minimum of about one inch

of water per year. The rest must be effectively reused and must not be wasted by allowing it to enter the bay by seepage from surrounding soils from the upper aquifer.

The Community advisory survey should be made a long time prior to any 218 vote. The citizens must know clearly what they are paying for instead of continually changing the system after the 218 vote.

It appears a vast waste of time and effort to do the process of comparing ~~several cost~~ estimates after the 218 vote. This means we will have no idea of the cost prior to voting on what it will cost. This is an totally asinine approach. Again, it treats the citizens of Los Osos in a totally paternalistic fashion trying to tell them what to do instead of reasoning with them about what will be done and exactly why these things will be done and the exact cost of doing these things. We must stop this paternalistic action in Los Osos.

Another paternalistic action was the process Blakesley used to become the white knight. How often has the state government imposed its will upon the properly elected citizens of Los Angeles or San Francisco in a similar manner? Those who would lose from a major very expensive conventional sewer installation wanted to insure a major sewer project would continue in Los Osos. This state intervention was the major reason for the state intervention. It had nothing to do with local politics or the capabilities of the CSD members to provide direction to the community process. It is all about insuring multinational sewer corporations can win in Los Osos, because if they can then they can impose their own very expensive wills in every other small community in the nation. Los Osos is recognized worldwide as a test case of gigantic multinational sewer corporations versus reasonable community wide small to medium size sewer projects to use the most modern technology at ecologically applicable means and least costs.

All viable alternatives must be known and the single best one must be selected and clearly explained to the residents prior to any 218 vote. Again, we can not afford to have a repeat of the sewer debacle. Placing the 218 vote prior to all of these considerations is a pure invitation for stupidity by the County and will insure a no vote on the 218 resolution.

I am deeply troubled by the assumption only SRF funds with major government strings will be the only way to go in Los Osos. I firmly believe various firms will be able to provide private lending because they realize the ecologically friendly small and medium size sewer companies are also fighting for their existence. If any community can obtain private funding for their sewer process, I can affirm it will certainly be Los Osos because of this world wide attention and understanding of these problems.

Figure 1.1 is a classic example of the problem. It says "Proposition 218 assessment to match final project selected". Again, we see the paternalistic and blank check approach the County engineering believes is the way. Certainly, the County engineering wants to run up the total costs as much as possible. We must do everything possible to turn this around allowing the citizens of Los Osos to be in control of what they will have to pay by knowing up front the true costs of this project. It is time to treat the citizens of Los Osos with respect and mature reasoning from facts and fiscal responsibility rather than continue the paternalistic dictatorial approach

used in the past.

The bait and switch tactics consisted of the first TAC exploring the various waste water alternatives (over 20 were examined) had reached a consensus to move ahead with the sewer. After we made our presentation to the County Board of Supervisors, the engineer presumably working with us (but who had refused to meet with us or share any information) made the voodoo economics presentation charging the cost of the conventional sewer against all of the other proposals we knew were much less in cost. This was the first example

The bait and switch tactics continued with the vote to approve the creation of the CSD. The citizens were under the impression the Solutions Group's proposal for a ponding system would be used. All of a sudden from nowhere, the full blown sewer at the Tri W site with the Broderson recharge was adopted. Many citizens were waiting to learn when they would be voting on the approval of this indebtedness. The legal counsel explained they could circumvent the law in this case. Clearly, this was a form of taxation without representation of the full electorate on a bond issue as occurs in nearly every California State election on bond issues. These bonds are voted on with a clearly indicated cost and the implications of the resulting passage or failure of the vote.

The threat letter sent to all Los Osos residents will in all probability assure a no vote on the 218 vote. The threat letter in effect is saying if the community votes no, then the RWQCB will proceed with condemnation of property by declaring the entire community a toxic waste site. This will have the effect of making the residences useless and the property value will be zero. This is clearly a taking under the law. This will constitute the largest taking in U.S. history for trivial reasons. The process will be declared unconstitutional based upon related taking cases. However, it can potentially destroy the entire community of Los Osos before the Supreme Court rules on this issue. In addition, because the RWQCB has continually argued the problem is nitrates in Los Osos, they have created a problem for themselves.

The various geologic and hydrologic models clearly indicate the nitrates under Los Osos will not clear up even with a sewer for at least 40 years and in all probability it will be much longer. It the community is classified as a toxic waste dump, then the RWQCB will be required to clean it up because the took responsibility for it when they issued the letters of condemnation. Obviously, by evicting all home owners and rendering their property worthless, the property can not be sold to pay for the nitrate clean up. Where will the funds come from to be able to declare Los Osos an non-toxic waste site. All of these constitute unprecedented actions. They clearly indicate acts of desperation by the RWQCB and have not been processed to their logical conclusions.

The current TAC proposal smells all over of the same bait and switch tactics. The TAC members will be led along just as with the first waste water TAC. At the last minute I fully expect some white knight (as occurred with Sam Blakeslee) will step in and turn the whole project on its ear. This is why we must not have a 218 vote before the full cost and the consequences are known.

The community must have an Economic Impact Analysis prior to any vote. We need to know the full impact on this community, especially because of the large number of retired people living on fixed incomes. Two economic Impact Analyses are needed. One including only the residents within the prohibition zone and one including all those potentially benefitting from the proposed sewer and potential hooking up in to the future.

The fatal flaw from the last two EIRs have been allowing the community to develop to full build out of the community as projected by the County. The fact is we are well beyond our current sustainable yield. We continue to lose water from the upper aquifer into Morro Bay at an unacceptable rate. Both the over drafting of the ground water causing sea water intrusion and the current failure to capture the water from septic tank recharge flowing into the bay are serious problems. They should never be allowed to occur. Much of the sewer is being driven by this development potential. However, the fact we are currently beyond the allowable sustainable yield tells us we can not allow further development to occur on undeveloped lots in Los Osos.

The Environmental Impact Reports (EIR) have been highly flawed. For example, it failed to assess the potential impact on wetlands in Los Osos. It has continually failed to assess properly the impact of the Broderson site for waste water recharge. The presence of Don Asquith on this current TAC appears to be a conflict of interest because the firm he works for has done the previous EIRs. Continuing to use this same firm will insure the same fatal flaws will be passed on the citizens to have to pay through the nose to correct problems the EIRs should have flagged.

Both the new Economic Impact Report and the Environmental Impact Reports should be done by people completely dissociated with any investments or interest in the sewer industry or in Los Osos or in San Luis Obispo County.

I have stopped processing this document. I reached section 1.3 on page 1-7. It is highly depressing to read how the County intends to force the conventional gravity sewer onto the community of Los Osos with bait and switch tactics and a blank check mentality. All parts of the sewer as currently conceived will contain fatal flaws which should have been eliminated, but they continue to reappear time and again in report after report without correction.

Somewhere an Engineering firm will have to bite the bullet and say these are fatal flaws and they can not install this sewer. Maybe County Engineer George Gibson many times reminded the waste water alternatives TAC, the many problems in Los Osos may very likely prevent the proper functioning of any installed sewer in this community.

I recognize a sewer is needed. I only ask for a true, open and honest assessment of every single facet of the myriad of problems related to this sewer. We owe the citizens to know all of the facts and the full costs before we approve of any legislation to contract bonds for the construction of a sewer in Los Osos. We must have some guarantee the various fatal flaws will not occur. Sufficient small businesses are in the sewer game, they probably will willing step forward to provide these guarantees and do this for much less cost, with less adverse environmental impact and with much less social disruption for this community than will occur by approving the Tri W site with the Broderson recharge and the failure to treat the biosolids problem or the initial hookups from each home to the sewer pipes.

Christopher D. Allbe, January 30, 2009 (Letter P51)

Response to Comment P51-1

This comment states that many of Dr. Tom Ruehr's comments and observations pertain to the "current LOWWP Draft EIR." In addition, the TAC report is attached to this comment letter. Because there are no comments on the contents of the Draft EIR, no further response is required.

1543 Eighth St.
Los Osos, CA 93402
January 30, 2009

Mark Hutchinson, Environmental Coordinator
SLO County Public Works Dept. Room 207
San Luis Obispo, CA, 93408
mhutchinson@co.slo.ca.us 805-781-5252
Comments submitted electronically on January 30, 2009.

RE: Comments submitted for the record – DEIR Los Osos Wastwater Project – State Clearinghouse Number 2007121034

Dear Mr. Hutchinson:
I am a 20 year resident of Los Osos, and work as a biologist and environmental professional (25+ years expericence). I served as an elected official on the LOCSD Board of Directors from 2004 – 2008 and had direct knowledge and 1/5 voting authority regarding the planning, design and revision of a wastewater project for Los Osos during 2004-2008.

I was also part of a group of environemental scientists and engineers formed in late 2003 called the Los Osos Technical Task Force (LOTTF), who supported a sustainable and responsible wastewater project. We published numerous reports and technical analyses and of the LOCSD's 2001 Project Report and Final Environmental Impact Report, the 2001-2005 State Revolving Fund Loan application, and the 2003 Coastal Development Permits and appeal process, and we shared these reports and findings with our community. LOTTF testified regularly at all public hearings including the Costal Commission, the Regional and State Water Boards and the Board of Supervisors because we were concerned that the project being proposed in 2001 was flawed. LOTTF exposed health and safety, environmental, engineering and socio-economic flaws that had not been addressed and the community agreed with our findings. Four members of LOTTF ran for public office to change the project and in 2004 and 2005, members of the LOTTF (Chuck

Cesena, John Fouche, Steven Senet and myself), along with a citizen environmental activist, (Julie Tacker) were elected by the community to serve as LOCSD Directors (Julie and I in Nov. 2004, the others in the recall election September 27, 2005 2005).

Less than 3 weeks before the scheduled recall election, the prior LOCSD Board majority (3-2 votes) ignored both legal advice and pleas from the community, and let major construction contracts and began construction at the TRI-W property, resulting in a legal and economic damaging situation for the LOCSD. Our Board immediately embarked on an earnest attempt to revise the project as promised; we held countless public hearings, and actively sought help from agencies, our legislators and the County. Our request for agency cooperation and County financial assistance was denied, and in the fall of 2006, Assemblyman Blakeslee's AB 2701 transferred project authority back to the County, where it had been prior to 1998.

I am submitting this very short version of history in my DEIR comments because I do not want to see the same mistakes made again this time around. Los Osos citizens are paying for this report and the services of our County and consultants – we want a fair, honest and unbiased process to occur – that is all we have ever requested. Los Osos citizens are educated and informed on these matters and it is important to them and their future – *no where in the USA, are citizens being asked to pay so much for the privilege of flushing and treating their waste; the cost currently estimated at $200-250/month.*

I have focused my comments on the following sections:

- environmental justice and affordability,
- impacts caused by changes to the water regime and continued saltwater intrusion, including the use of sprayfields,
- potential growth inducing impacts from possible oversizing of the plant,
- cultural and biological impacts not fully evaluated or mitigated - for trenching and gravity system construction,
  and
- undisclosed environmental impacts to our coastal wetland areas and to our vegetation, including our beautiful trees.

This document is very long and time is short. I have prepared comments that are my best attempt at digesting 10,000 pages of paper in a short amount of time over the holidays and an unavoidable illness – I would have liked more time and formally request that you extend the public comment period.

P52-1

I submit these comments in a sincere attempt to contribute to constructive dialogue between the SLO County government and Los Osos citzens, something that may will help assure a successful project this time around – and one that all of us can afford.

Thank You Mark for your dedicated work on this project and for consideration of my comments.

Most Sincerely,

Lisa Schicker
Former LOCSD Director (2004-2008)
and Environmental Planner/Biologist

DEIR Comments

Los Osos Wastewater Project – January 30, 2009

General Comments

Format

Can you please revise the format of the document to include a brief description of the analysis of impacts. Cutting and pasting from the environmental checklist, then stating a conclusion only, gives the reader no idea how conclusions were reached. CEQA asks for a summary of the analysis to be contained within the main document.
Please add more analysis to the main document, not just appendices. See CEQA guidelines "Incorporation by Reference":

(c) Where an EIR or Negative Declaration uses incorporation by reference, the incorporated part of the referenced document shall be briefly summarized where possible or briefly described if the data or information cannot be summarized. The relationship between the incorporated part of the referenced document and the EIR shall be described

P52-2

(f) Incorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand.
Note: Authority cited: Section 21083, Public Resources Code; Reference Sections 21003, 21061, and 21100, Public Resources Code."

For instance, in the case of the Environmental Justice analyses, the actual analyses that led to the conclusions are missing from the EIR and they should be included as part of the DEIR – please provide the analysis that led to the conclusions within the EIR. The approach used in the DEIR does not lend itself to proper full disclosure of environmental impacts and the reader is unable to glean anything from the main document.

Is this document also created to comply with "CEQA Plus"? If this document is supposed to be used for consideration for State Revolving fund Loans, perhaps is should state in the Introduction that the document also complies with what the SWRCB calls "CEQA-Plus". I do not see this disclosure in the introduction of this document, although I see mention of it in the Executive Summary Please disclose to the public

P52-3

what "CEQA Plus" actually means, and how it relates to NEPA and list the Government code that authorizes use of a CEQA Plus Project for EPA.

P52-3 CONT

Has a Notice of Completion been filed, per secton 15085 CEQA? Although I saw the DEIR on the OPR website, I did not see the NOC.

15085. Notice of Completion
(a) As soon as the draft EIR is completed, a notice of completion must be filed with the Office of Planning and Research in a printed hard copy or in electronic form on a diskette or by electronic mail transmission.
(b) The notice of completion shall include:
(1) A brief description of the project,
(2) The proposed location of the project (either by street address and cross street, for a project in an urbanized area, or by attaching a specific map, preferably a copy of a U.S.G.S. 15' or 7-1/2' topographical map identified by quadrangle name).
(3) An address where copies of the draft EIR are available, and
(4) The review period during which comments will be received on the draft EIR.
(c) A sample form for the notice of completion is included in Appendix L.
(d) Where the EIR will be reviewed through the state review process handled by the State Clearinghouse, the notice of completion cover form required by the State Clearinghouse will serve as the notice of completion (see Appendix C).
(e) Public agencies are encouraged to make copies of notices of completion filed pursuant to this section available in electronic format on the Internet.
Note: Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

P52-4

CEQA and NEPA Plus analyisis and disclosures found in an environmental document are best received when they are produced factually, independently and without bias. How does this document address the most essential CEQA manadate of being free of bias? If there is a statement about this, I could not find it, and I think it would be a valuable addtion to the introdcution.

Introduction and Executive Summary Sections
(Comments also refer to similar info that is repeated in several places within the documents)

Page 1-2 and 1-3 typo – "Section 7 Description" is listed twice

History Section page 1-8 (and repeated in several places within the documents).

Suggestions are made below but please revise the statements to read that :

- -Construction began 3 weeks before the recall election
- -the new board suspended (not halted) construction on the downtown site, in order to revise the project
- -the LOCSD rescinded the SOC's (not the findings) …

P52-5

- "replace The history section is missing key elements – the NOP and the DEIR are detailed, yet they leave out key events and actions that related to history of the wastewater project. My comments will address events where I had personal knowledge and/or voting authority.
    - there is no "default" on the SRF loan - this is currently an outstanding issue that is tied up in the courts

P52-5 CONT

Introduction, LOCSD. Section 1.2.4 , page 1-8. Please add the following. Just as with the 1997 County project described on page 1-7 the 2001 LOCSD project "for a variety of reasons, did not enjoy community wide support." Overriding concerns for the 2001 project were health and safety (treatment plant (air, noise, germs, and sludge treatment and transport) located adjacent to "at-risk" populations, schools and community center, concerns about environmetnal imapacts (sewage overflows and extreme pollution into the sensitive back bays of the National Esturary), concerns about liquefaction and flooding (at Broderson and downhill sites), concerns about loss of groundwaters and saltwater intrusion and socioeconomic impacts and costs of the downtown project. In addition the project described in the FEIR no longer resembled the project that went forward into the Coastal Development Permit process.

P52-6

Introduction, LOCSD. Section 1.2.4 , page 1-8. Please correct the following. After receipt of a CDP, and less than 15 working days before a recall election, the Board majority of three authorized construction. Los Osos citizens approved the recall and the new board suspended construction at the downtown treatment site in order to revise the project.

P52-7

Introduction, LOCSD. Section 1.2.4 , page 1-8. Please correct the following. In August 2006, the LOCSD rescinded "certification of the FEIR by rescinding the Statement of Overriding Considerations" – OPR file 2006088090 August 10, 2006 (not the findings, as stated in the document). In addition the LOCSD did not "default" on the SRF loans, work was actually "supsended per terms of the ISA

P52-8

contract"; statement in DEIR is false and this matter remains in the Courts as of 1-29-09. P52-8 CONT

Introduction Legislative Initiatives Section 1.2.5 page 1-8. Please correct the following: "At request of the LOCSD, Blakeslee attemtped to facilitate resolution of the disagreements between the LOCSD and the SWRCB regarding the ability to ammend the project." "At the request of the LOCSD, Assemblyman Blakeslee then proposed legislation". P52-9

Paragraph 2 page 1-9 Please correct the percentages of approval of the 218 vote and please report how many residents did not vote. "80-20" is incorrect. P52-10

Beginning with Paragraph 3 page 1-9 should be a new section - this is no longer "Legislative Intitiatives", it reads more like a "Project Description overview" – new section P52-11

Beginning with Paragraph 4 and elsewhere– Please Consider Expanding the viable Range of Alternatives Studied – current range of alternatives is insuffiecient. CEQA Guidelines section 15126.6 authorizes consideration of alternatives that would "avoid or substantially lessen any of the significant effects of the project." P52-12

Chapter 7 does a good job, please include some of this in Exec. summary and/or introduction – (a lot of readers might not make it to chapter 7). Please explain further justification for range of alternatives that were selected for analysis. In particular, please review analysis of vacuum and/or pressure systems; they should be added to the range of alternatives because they will reduce environmental impacts and may be substantially cheaper (biological, cultural, water quality and supply, socioeconomic, grading and excavation, etc.). P52-13

Scoping Process Page 1-13. I did not see any formal testimony made verbally before the SLO County BOS regarding the NOP – do you not included formal oral testimony - minutes, etc. I would like repeat my objections to the NOP here again P52-14

for the record that I made in person, these are the same ones I testified to in December 2007. The NOP and this DEIR omit key portions of history and background that occurred during the development of a wastewater project for the years 2004-2008. These ommissions help to explain to others (in the spirit of full CEQA disclosure) why the community rejected the previous project and what is important to them. It also helps to explain why the LOCSD Board had to suspend work in the fall of 2005 and make all attempts to revise the project and renegotiate the SRWCB loan (outstanding 218 issues, pending lawsuits, passed environmental initiatives – Measrure B, SRF issues, possible conflict of interest issues etc.)

P52-14 CONT

These are events, as an elected official that I was intimately and directly involved in and events that must be disclosed and not buried. I have conveyed my concerns to the BOS in formal public testimony and also in person to Mark Hutchinson, SLO County Public Works prior to the closing deadline of NOP comments and would like these comments included in the record.

Background and History Page 2-4. Fill in the history gap between 1974 and 1983. Please add that both the County and RWQCB authorized 1100 more homes to be built after the moratorium was in place and refer to RWQCB 83-13 and 83-12.

P52-15

Background and History Pages 2-4 and 2-5 have the same mistakes about LOCSD and legislative history that are described in my comments above – please correct these in all places throughout all documents.

P52-16

Background and History 2-5 and elsewhere regarding the 218 vote Please correct the "80-20" numbers for the 218 vote to reflect the actual voting that ocurred and number of those who did and did not vote.

P52-17

Project Objectives table 2-1 3c footnote page 2-7 Add ESA Section 7 consultation with USFWS.

P52-18

Project Objectives table 2-2, Biosolids Processing 2.4.2 page 2-10 and elsewhere in the documents Why is sludge/biosolids treatment not included in this table? Why are there no real alternatives studied for Biosolids disposal other than hauling – these evaluations should not be deferred until later –they are part of project and the purpose and need. P52-19

Why are there no quantities and comparisons of sludge produced for each alternative? This would be valuable information to disclose and woul dimpact selection of env superior alternative. P52-20

Page 2-12 Conversion Factor for "Acre Feet" to GPD. Please describe this conversion as both terms are used mixed among the documents – can be confusing when trying to check calculations. These quantities and conversions (here and elsewhere are important to correct sizing of the plant, which is important for cost and growth inducement impacts. P52-21

Page 2-12 biosolids. What is the difference in quantity of biolsolids produced for each alternative – if this is quantified in the documents I cant find it. P52-22

Page 2-13 Leachfields. I do not understand document you would say that effluent disposal in leachfields is NOT weather dependent……? It certainly makes a difference at my home in my leachfield. Is there any evaluation as to what to do when the leach fields fail at Broderson? How will more destruction of ESHA habitat at Broderson be avoided during emergency leach field failures or maintenance periods? P52-23

Page 2-13 Broderson Saltwater Intrusion Benefit – here and throughout the documents. The reports that I read state that less than 10% of all effluent disposed at Broderson will ever reach the lower aquifer if any, due to soil structure – the rest will either mound or drain to the Bay (See Fugro report 2004, and others). Where is the source of your assertions about this saltwater intrusion benefit? P52-24

Page 2-4 page 2-15 table is the same as table 2-1 P52-25

Page 2-17 NOP written comments by Lisa Schicker. Comment does not accurately reflect the letter that I sent in. Please change this to say the following:
"in response to newspaper article, commenter questions a quote made by County officials saying they are "legally required to evaluate the Tri-W site", citing examples that show that TRI-W was thoroughly evalutated on numerous occasions and came up last on most lists of suitable sites for health-safety, environmental, engineering and socioeconomic reasons." And then, add "Provides links and attachments of previous reports that evaluated Tri-W for environmental impacts." P52-26

Page 2-27 Table 2-8 Summary of Env. Impacts I read the intro paragraph on page 2-25 and I might have missed it, but I don't see where components are evaluated in the tables and where does the document actually define what the tables mean by "combined effect" and "cumulative" ? I am not familiary with exec summary tables using this terminology, and I bet the general public doesn't understand it either. Provide some highlighting or shading to bring out the most important info from these tables (significance, etc.). P52-27

Page 2-27 Table 2-8 Summary of Env. Impacts This table and the next one contain lots of CEQA generic language and very little in the way of actual impacts and quantities and intended mitigation - I suggest revising this summary table (or adding another) and also adding information to the table more about actual impacts in Los Osos. I don't see anything about quantities or locations of tree removals, for instance or of excavation quantities, miles of road to be impacted, wetland acreages, etc. I think this will make table more useful to the readers. P52-28

Page 2-35 Mitigation Summary Table . Again, maybe remove some of the majority of generic cut and paste CEQA language, but please include more actual details of the proposed mitigation and who is the responbsible entity for each mitigation commitment for the Los Osos Project up front – there is not even mention of a species until points 4 or 5, please do not just leave this info buried back here or just P52-29

in the appendices – with the size of the document, many look to this chapter for information that is missing. Please include a column that specifies when mitigation will occur and list who is the repsonsible party to ensuring it gets done

P52-29 CONT

Page 2-39 Mitigation Summary Table. I think there are impacts to wetlands and vegetation and trees throughout los osos that are not disclosed or mitigated. Please review and add this to the table.

P52-30

Page 2-39 Mitigation Summary Table. Broderson mitigation language does not address what happens during maintenance periods and if a field fails – there is potential for more that 8 acres of impacts if this happens. Please discuss.

P52-31

Hydrology and Water Quality Section

Please re-evaluate conclusions regarding environmental impacts caused by changes to hydrology and water quality in the following areas –

- Re-evaluate quantities used for determining wasewater treatment plant capacity (growth inducement);
- Additional saltwater intrusion impacts and lack of groundwater recharge;
- Sustainablity of the groundwater basin due to use of sprayfields;
- Depletion of groundwater due to use of sprayfields out of the basin;
- Biological impacts to coastal and local wetlands and vegetation (including large trees) - impacts due to changes in water regime and reduced water supplies;

P52-32

Relevant Sections Taken from the CEQA Guidelines checklist – Appendix G:

b. "Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.....

Please evaluate and mitigate for environmental impacts caused by draining and relocation of waters now found in the upper aquifer – there will be environmental impacts to seasonal wetlands throughout the community, riparian areas and local trees and native plant populations will occur due to changes in loss of septic discharge and changes to upper aquifer groundwater level. (the DEIR address wetlands and riparian areas out of town, but I did not see this evaluated or addressed or mitigated) P52-33

Construction and Air Quality Section

Please revaluate environmental impacts caused by short term temporary construction and air quality emissions – possible significant short –term impacts. P52-34

Greenhouse Gases

Please revaluate environmental Greenhouse Gas Emissions per AB 32 and the new CEQA Interim Guidelines issued January 9, 2009. P52-35

Environmental Justice

Please re-evaluate conclusions regarding environmental justice significance and impacts. I ask that the consultants please consider the impact of a STATE environmental regulation (nitrate remioval in a state regulated groundwater basin) and consider WHO is actually being asked to pay (only a portion of Los Ososo citizens), and to evaluate if this share of payment as "inequitable, disproportionate and an undue burden" to low income and elderly populations. P52-36

Please also consider the following in your review of your EJ analysis:

Prohibition zone demarcation and the "science" it was based on is old, and disputed among scientific experts. There is a general concensus that although some septics may contribute some nitrates to the goundwater, that there is no way to quantify the actual impacts of individual septic tanks on the nitrate levels of groundwater. Cats, dogs, horses, dead plants, farming practices, air pollution, historic land uses etc. also contribute to nitrates in groundwater. (see Yates Groundwater Simulation Study etc.2003). P52-37

Low income and elderly populations in Los Osos are being asked to bear a "disproportionate" share and an of the cost of cleaning up the groundwater basin, which is acutally a state mandate for a state regulated water body. The payment for the wastewater project is in part, to clean up the niitrates in the waters of the state, nitrates that come from various sources other than residences.

Many low income people and elderly populations are unable to pay the costs of the current alternatives. They do not have the same ability to create new income and their share is both disprportionate, unequal and an undue burden.

They may have to move. Where will they move to? What are the impacts of 25% of the community moving? What are the cumulative impacts (environmental and socioeconomic) of such a move? What physical impacts will occur from businesses drying up in town, less money to spend on home improvements or people having to relocate? What if people stop paying their sewer bills? Have these impacts been considered and evaluated?

P52-37 CONT

Perhaps the cost of cleaning up the groundwater basin and removing the nitrates should be "shared" with the rest of the community, the rest of the County and/or the rest of the STATE (who in the past, even after the Pro Zone was formed, allowed 1100 more homes to be built, further contributing to the nitrate problem. (see RWCQB/SLO County 83-12 and 83-13).

From page in 5.13-3 Appendix O – report states that "a financial effect is not considered an environmental effect". Please elaborate on how this conclusion was reached and refer to my questions above and the CEQA language regarding evalutation of physical effects caused by economic impacts, a nexxus for environmental justice impacts.

Purpose and Need. Where is the purpose and need section for the project described? Does the project meet the purpose and need and is it the same as the purpose and need described in the NOP? It may not completely address the saltwater intrusion and

P52-38

groundwater components as listed in the NOP– please produce a clear and defined purpose and need section for this report. P52-38 CONT

Growth Inducement is not adequately addressed and/or mitigated. Numerous public comments made at the TAC meetings and Bos repeatedly bring up errors in the calculations to the loads and flow calcuations for the treatment plant. I have never heard that these errors were corrected. If plant capacity is based on erroneous calculations, then the citizens are being asked to pay for a plant that is larger than they need and/or growth inducement is a possibility. Please address. P52-39

Section 8 – other CEQA considerations. Report lists all but impacts that are mitigated – include those here, too. Included summary of this section in EXEC summary, too. Section 8.3 Impacts to Population and Housing may also be significant, if 25% of population has to move or cant afford to pay sewer bills. Please look at this again. P52-40

Section 9-1 List of contacts. Bruce Buel is not General Manager of the LOCSD. He has not been General Manager since Fall 2005. P52-41

Additional CEQA-related Comments

CEQA 15126.2 Consideration and Discussion of Significant Environmental Impacts. Please include a summary statement of these in the Executive summary – if they were there I didn't see them. P52-42

CEQA 15126.4 Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects - excerpts:

(2) Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments. In the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design. P52-43

Please include more detail on impacts and mitigation in DEIR and Executive Summary table, not just in appendices – place a column in there that lists the responsible entity.

P52-43 CONT

From Appendix G, CEQA Checklist – Regarding Substanital Environmental Impacts Caused by Cost of Project and not meeting EPA's 2% MHI Afordability Criteria.

Please evaluate this project and this section using the affordability criteria as a threshold of significance – EPA recommends 2% MHI, and the average in the USA is less than 1.5% - this project is currently estimated well over 6% MHI and it should be considered both a significant environmental impact due to the physical env effects that will take place. And an impact that must be considered in the community survey and for the eventual project that is chosen.

Other relevant excerpts from the CEQA Checklist: - Please re-evluate

P52-44

POPULATION AND HOUSING –
Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

MANDATORY FINDINGS OF SIGNIFICANCE - Please re-evaluate this in light of comments and new substantial information on wetlands and native vegetation.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

P52-45

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

P52-45
CONT

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151, Public Resources Code; Sundstrom v. County of Mendocino, 202 Cal.App.3d 296 (1988); Leonoff v. Monterey Board of Supervisors, 222 Cal.App.3d 1337 (1990).

Sources of Information used in Comments and Evaluation of the DEIR

SLO County website
LOCSD website
RWQCB, SWRCB websites
CERES and CEQAnet http://www.ceqanet.ca.gov/ websites

LOCSD Resolutions and Actions taken regarding wastewater project 200402008 transcripts, videos, written testimony, etc. as an elected official

LOCSD Resolution – Rescinding of 2001 EIR Los Osos wastewater project Statement of Overriding Considerations – OPR File Number 2006088090 received and filed on 8-10-06

LOTTF Reports, videos and written and oral public testimony: CDP Project Flaw Reports and Revocation Report, Correspondence and Coastal Commission hearing transcripts (April 2005) and Reports and letters regarding CEQA and Project flaws submitted to LOCSD, County and RWQCB and SWRCB 2003-5.

April 2004 letters to the Coastal Commission, SLO County and RWQCB regarding Env. concerns for Tri-W site and impacts to water quality, national estuary, water supply, wetlands and tree impacts from wastewater projects with gravity pipes – LKS

Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas Emissions (Released January, 2009) – found

EPA Environmental Justice website
http://epa.gov/region09/socal/justice.htm
Office of Environmental Justice National Hotline (800) 962-6215
Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.
Contact: EJ Program Manager: **Lily Lee** (lee.lily@epa.gov) (415) 972-3795.

EPA EJ Mission Statement To achieve equal environmental protection so no segment of the population, regardless of race, ethnicity, culture or income bears an undue burden of environmental pollution and to ensure that the benefits of environmental protection are shared by everyone.

15064. Determining the Significance of the Environmental Effects Caused by a Project (excerpts used in my Environmental Justice comments)

(b) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

//////////////////////

(d) In evaluating the significance of the environmental effect of a project, the Lead Agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project.

(1) A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project. Examples of direct physical changes in the environment are the dust, noise, and traffic of heavy equipment that would result from construction of a sewage treatment plant and possible odors from operation of the plant.
(2) An indirect physical change in the environment is a physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect physical change in the environment. For example, the construction of a new sewage treatment plant may facilitate population growth in the service area due to the increase in sewage treatment capacity and may lead to an increase in air pollution.

3) An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project. A change, which is speculative or unlikely to occur, is not reasonably foreseeable.

(e) Economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant. For example, if a project would cause overcrowding of a public facility and the overcrowding causes an adverse effect on people, the overcrowding would be regarded as a significant effect.

Thank you and sorry for any redundancy – please extend the public comment period!!!

Lisa Schicker, January 30, 2009 (Letter P52)

Response to Comment 52-1

This comment expresses a desire for an extended public comment period. According to §21091 (a), the public review period for a draft environmental impact report may not be less than 30 days. If the draft environmental impact report is submitted to the State Clearinghouse for review, the review period shall be at least 45 days, and the lead agency shall provide a sufficient number of copies of the document to the State Clearinghouse for review and comment by state agencies.

The Draft EIR for the LOWWP had a public review period of 78 days.

Response to Comment 52-2

This comment expresses a concern about the format of the Draft EIR and multiple references to other appendices and reports. See Response to Comment 43-1.

Response to Comment 52-3

This comment expresses a concern about the disclosure in the Introduction that this Draft EIR complies with the "CEQA-Plus" required by the State Water Resources Control Board. The comment notes that the disclosure is made in the Executive Summary but not the Introduction and that the meaning of the term "CEQA-Plus" is not explained and the relationship with a NEPA document is not clearly stated. The comment also requests a citation to the Government Code or reference. There is discussion about the requirements for "CEQA-Plus" on page 3-72 of the Draft EIR. The requirements for "CEQA-Plus" involve projects that derive funding from the State Revolving Fund (SRF) Loan program. Because a portion of the SRF is funded by the U. S. Environmental Protection Agency and is subject to federal environmental regulations including the Endangered Species Act, National Historic Preservation Act (Section 106 related to Cultural resources), and the General Conformity Rule for the Clean Air Act. This means the Draft EIR must provide in its analysis listing of endangered species and potential impacts, biological assessments, and other documents related to project effects on sensitive species or cultural resources. This analysis is contained in the detailed appendices G (Biological), H (Cultural Resources), and K (Air Quality).

Response to Comment 52-4

This comment asked if a Notice of Completion had been filed per Section 15085 of the CEQA Guidelines. A Notice of Completion for Draft EIR was filed with the Office of Planning and Research on November 17, 2008.

This comment also expresses an opinion that the Draft EIR was not prepared free of bias. Because this comment did not provide a specific comment on the contents of the Draft EIR, no further response is required.

Response to Comment 52-5

This comment expresses concerns about the wording of the historical perspective offered in the Introduction and Executive Summary and offers editorial changes to the wording. This comment, and

numerous others below, contains an additional perspective on the project background as viewed by a member of the LOCSD Board of Directors, and described in section 1.2-4 of the EIR. The additional information is appreciated.

Response to Comment 52-6

This comment expresses a concern regarding difference in project descriptions between Section 1.2.4 and the Coastal Development Permit. See Response to Comment P52-5.

Response to Comment 52-7

This comment provides corrections to Section 1.2.4. See Response to Comment P52-5.

Response to Comment 52-8

This comment provides corrections to Section 1.2.4. See Response to Comment P52-5.

Response to Comment 52-9

This comment provides corrections to Section 1.2.5. See Response to Comment P52-5.

Response to Comment 52-10

This comment provides corrections to Paragraph 2 of Page 1-9. See Response to Comment P52-5.

Response to Comment 52-11

This comment provides corrections to Paragraph 3 of Page 1-9. See Response to Comment P52-5.

Response to Comment 52-12

This comment expresses a concern that the Introduction (Section 1, paragraph 4) needs to be expanded to allow a further range of alternatives be studied. Section 7 of the Draft EIR illustrates the range of alternatives explored. Four basic approaches for wastewater treatment were considered (on-site, regional, decentralized, and centralized), three levels of treatment were discussed (primary, secondary, and tertiary), seven methods of wastewater treatment processes were considered (partially mixed facultative ponds, oxidation ditches, Biolac extended aeration, membrane bio-reactor, extended aeration modified, or mLE, sequencing batch reactor, and trickling filter/solids contact), as well as eleven different sites for the treatment facility. There was also discussion about various methods to deal with biosolids and disposal alternatives for treated effluent.

Response to Comment 52-13

This comment expresses a concern about lack of discussion about sewage collection alternatives, specifically vacuum and/or low pressure systems. These methods of collection are discussed in detail and addressed in many technical reports and studies (Carollo Technical Memos and the Fine Screening Report, all incorporated by reference into the Draft EIR) as well as Appendix P of the Draft EIR.

Response to Comment 52-14

This comment expresses a concern about remarks made orally before the County Board of Supervisors at the time of the Notice of Preparation. Written responses to the NOP are acknowledged as a part of the record in the Draft EIR. Testimony offered during public comments at a Board of Supervisor's meeting does not constitute a part of the official record in the Draft EIR.

Response to Comment 52-15

This comment expresses a desire for additional information regarding the Background and History on page 2-4. See Response to Comment P52-5.

Response to Comment 52-16

This comment provides corrections to Pages 2-4 and 2-5. See Response to Comment P52-5.

Response to Comment 52-17

This comment provides corrections regarding the 218 vote. See Response to Comment P52-5.

Response to Comment 52-18

This comment suggests the addition of ESA Section 7 consultation with USFWS. This requirement is a part of the CEQA-Plus provisions of the Draft EIR. See Response to Comment P52-3 above.

Response to Comment 52-19

This comment expresses a concern that additional alternatives should be addressed regarding biosolids treatment and disposal. These topics have been addressed in the Carollo Technical Memorandum (Solids Handling) and are incorporated by reference into the Draft EIR. There is also discussion of the matter in Appendix P-4, Regional Biosolids Management.

Response to Comment 52-20

The comment expresses a concern that the project description did not include the quantities of biosludge and a comparison between the Proposed Projects. Draft EIR Section 3.3.2, Proposed Projects, subheading Biosolids Processing and Disposal on pages 3-40 to 3-41, states that the solids load in the raw wastewater reaching the plant would be 4,000 pounds (lbs) per day for a gravity collection system and 1,000 lbs per day for a STEP/STEG collection system. For the STEP/STEG collection system, an additional 700 lbs per day of septage would be hauled to the wastewater treatment plant septage receiving station from the STEP/STEG tanks. In addition, the wastewater generated by both the STEP/STEG and gravity collection systems would be increased by about 700 gallons per day containing 90 lbs of suspended solids from the 749 septic tanks at build out that would remain in service outside the Prohibition Zone. This would also increase the resulting biosolids produced during the wastewater treatment process. Additional information on the wastewater characteristics are provided in Section 3.3.1 on pages 3-20 to 3-20 in the Draft EIR, in the Flows and Loads Technical Memorandum (February 2008), and in the Septage Receiving Station Options Technical Memorandum (April 2008).

For Proposed Projects 2 and 3 and the Preferred Project that all have an oxidation ditch or Biolac™ treatment plant, biosolids would be processed and hauled to a landfill for disposal daily. For Proposed Projects 1 and 4 that both have facultative ponds, the biosolids would accumulate in the ponds and degrade over time until about every 15 to 20 years when they are dredged, processed and hauled to a landfill for disposal.

Response to Comment 52-21

This comment expresses a desire for clarification regarding the conversion factor for Acre Feet to GDP. See Response to Comment P54-4 regarding the conversion of acre-feet to gallons per day.

Response to Comment 52-22

This comment expresses a desire for clarification regarding the difference in the quantity of biosolids provided for each alternative. See Response to Comment P52-20 regarding biosolids quantities.

Response to Comment 52-23

This comment expresses a desire for clarification regarding whether or not leachfields are weather dependent. See Response to Comment P46-5. Also see Topical Response 8, The Broderson Leachfield.

Response to Comment 52-24

This comment expresses a desire for clarification regarding the saltwater intrusion benefit source. See Rough Screening Analysis, Carollo, March 2007, and Fine Screening Analysis, Carollo, August 2007.

Response to Comment 52-25

This comment observes that Table 2-4 on page 2-15 is identical to Table 2-1. This comment is true. In each case the table is relevant to the particular discussion in its respective location. The first instance relates to the summary of Project Objectives and the second occurrence relates to Feasibility Criteria.

Response to Comment 52-26

This comment is concerned with paraphrasing of Lisa Schicker's written comments on the NOP summarized in Table 2-5 of the Draft EIR. Ms. Schicker indicates that the comments do not accurately reflect her written statement. Since the Table only hold a small portion of her statement, the portion in the Draft EIR is an accurate summary of her written comments.

Response to Comment 52-27

This comment suggests shading or highlighting to emphasize the important information being shown. Comment noted.

Response to Comment 52-28

This comment suggests the tables of mitigation measures presented be more detailed and reorganized to show delineation of when mitigation would occur and who is responsible for the action. The

comments refer to a table presented in the Executive Summary. As such, the Executive Summary is just that – a summary of important issues presented and analyzed in the Draft EIR. The table is a compilation of the specific analyses from each area of interest (Section 5 of the Draft EIR) and study in the Draft EIR and gives the reader an excellent overview of potential impacts with proposed mitigations and measures employed to lessen the impacts.

Response to Comment 52-29

This comment is concerned with Table 2-9 of the Draft EIR and the lack of details associated with the table. The comment also requests that a column be added for when specific mitigation would occur and who would be responsible. See Response to Comment P52-29. The lack of information on the mitigation will be included in the required mitigation monitoring plan.

Response to Comment 52-30

This comment expresses a concern regarding potential impacts to wetlands, vegetation and trees that may have been overlooked. Table 2-9 and the appropriate Sections of 5.5 of the Draft EIR address all impacts associated with the project. The loss of vegetation and trees throughout Los Osos has been determined and the loss of ornamental trees and shrubs is considered. In addition, impacts to sensitive species habitat is considered both within the community and along the pipeline routes, the Tonini Parcel as well as the Broderson site. Mitigation Measures 5.5-C1; 5.50C2; and 5.5-C3 specifically address concerns with wetlands.

Response to Comment 52-31

This comment expresses a concern about potential mitigation needed at the Broderson site during maintenance periods. Operation and maintenance of the Broderson site is an important feature of the overall project. Refer to Topical Response 8, The Broderson Leachfield.

Response to Comment 52-32

This comment expresses a desire for the reevaluation of the environmental impacts in the Hydrology and Water Quality Section. See Topical Response 3, Water Resources and the Project Scope, regarding water supply issues and seawater intrusion measures of the project.

Response to Comment 52-33

This comment expresses need to evaluate for environmental impacts caused by drainage and relocation of waters found in the upper aquifer. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment 52-34

This comment requests the reevaluation of impacts from construction emissions and short-term impacts. The Draft EIR uses recognized methods and established models from agencies in authority to estimate the construction emissions and short-term impacts.

Response to Comment 52-35

This comment requests the reevaluation GHG impacts per new CEQA interim guidelines from the Office of Planning and Research. See Response to Comment P44-6 regarding the use of currently available information. The interim document mentioned is only in draft form at this time.

Response to Comment 52-36

This comment expresses a desire for a reevaluation of the conclusions established in the Environmental Justice Section. See Topical Response 2, Project Costs, regarding cost allocations for the project.

Response to Comment 52-37

This comment expresses a desire for a reevaluation of environmental justice impacts associated with low income and elderly populations. See Topical Response 2, Project Costs, regarding cost allocations for the project.

Response to Comment 52-38

This comment expresses a concern about the purpose and need for the project described and if it is the same as was stated in the NOP. The comment is unclear regarding where the reader referring in the Draft EIR. The purpose of the project is stated in numerous places (Introduction, Executive Summary, Project Description, and Alternatives Analysis). The comment also questions whether saltwater intrusion is fully addressed in the document. Draft EIR Section 5.2, Groundwater Resources, and Appendix D, Groundwater Quality Resources, address the issues of groundwater quality and impacts on groundwater resources. See also referred to Topical Response 4, Water Resources.

Response to Comment 52-39

This comment states that growth inducement is not adequately addressed and/or mitigated for within the Draft EIR. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment 52-40

This comment requested that all impacts that are mitigated be placed in this section. Section 8 is provided for other CEQA considerations. Section 2 and Section 5 of the Draft EIR provides a listing and analysis of all of the environmental impacts that could be significant but would be less than significant with the implementation of the recommended mitigation measures.

This comment also stated that the impacts on population and housing should be reviewed again. The discussion of population and housing is provided in Section 8.3 in the Draft EIR. In addition, see Response to Comment P40-2 regarding the impact of the proposed project on housing.

Response to Comment 52-41

This comment states that Bruce Buel has not been the General Manager of the LOCSD since Fall of 2005. This comment, and numerous others below, contains an additional perspective on the project

background as viewed by a member of the LOCSD Board of Directors, and described in Section 1.2-4 of the EIR. The additional information is appreciated.

Response to Comment 52-42

This comment suggests the inclusion of a summary statement of Significant Environmental Impacts be included in the Executive Summary. This discussion is included in Section 8, Other CEQA Considerations, of the Draft EIR.

Response to Comment 52-43

This comment states under CEQA Section 15126.4 of the CEQA Statues and Guidelines, "Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects." Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment 52-44

This comment expresses a concern on the EPA Affordability criteria and is concerned with population growth and housing associated with the project. Expanded Environmental Justice Analysis (Section 5.13 of the Draft EIR) and the Growth Inducing Impacts (Section 6 of the Draft EIR) provide information on the issues of concern. Section 6.1 page 6-4 indicates that:

"the increase in population and housing that could directly occur as a result of the project could also increase the economic development (i.e., commercial and office uses). However, this increase would be consistent with the planned growth identified in the Estero Area Plan and have a beneficial economic impact on the community. The economic development objectives of the Estero Area Plan that call for a greater balance between employment and housing can only be accomplished after the discharge moratorium is removed."

Response to Comment 52-45

This comment expresses a recommendation to re-evaluate the Mandatory Findings of Significant in light of comments and new substantial information on wetlands and native vegetation. Because there are no comments on the contents of the Draft EIR, no further response is required.

HARD COPY BAK.
C1 /3

Rachel

From: "Rachel" <rachel@peopleforpeople.com>
To: <mhutchinson@co.slo.ca.us>
Sent: Friday, January 30, 2009 4:51 PM
Attach: TricklingFilter.rtf; ENERGY.doc; Ag.doc; sucroseAltForMethanoZenon.JPG; Mara-RockFilters.JPG; bactp2.JPG; sludge430.gif; RockFilterBiblio1.JPG; RockFilterBiblio2.JPG; Crowley Treatment Ponds-Rice Capital Ponds.mht; microC.JPG; Columbia, IL - Official Website - Fish in Lagoon.mht
Subject: Comment on DEIR-Hard Copy to follow

Dear Mark

Attached please find Comment docs:

Trickling Filter on Ponds Odors Preposterous - comment

Energy (and other comments)

Ag Land Use

And attached material to these comments.

Mara Rock Filters and bibliography (University of Leeds)
Sucrose for Zenon
BactPur for Nitrification/Denitrification
microC
Sludge in California stats
Crowley Louisiana WW TPonds
Columbia IL fish in Lagoon.

I am leaving to drop off but fear I will be late with hard copy.
Thank you.

Reference:

All Comments Incoporporate by Reference the entire bibliography and document list for this project and EIR at the Project Website and for the Alternatives analysis.

This is printed one time and attached.

Submitted via email

Rachel Rosenthal

Los Osos

CA Architect Lic. no. 28278 (AZ no.27503)

CDPH Water Treatment Operator T2 no. 28798

CDPH Water Distribution Operator D2 no. 33794

B. Arch (5 yr, !st Prof.) University of Arizona, Tucson, AZ

B. A. Classical Studies, Ancient Greek + English, University of Michigan, Ann Arbor, MI

email Jan 30 4:50pm

Rachel Rosenthal, Architect
PO Box 1678
San Luis Obispo, CA 93406

Friday, January 16, 2009 RR

via email; paper copy via hand delivery

TO: Mr. Mark Hutchinson, Environmental Div Manager, San Luis Obispo County Public Works

RE: Draft EIR for the Los Osos Wastewater Project
Comment regarding legibility and length of the Document
and Request for Extension of Review Time for Public and Agencies

Dear Mark;

As you know. while reading and trying to respond to the Los Osos DEIR, I have been distracted by the lack of editing, redundancy and improper use of external text in the document.

In increasing desperation and waning humour, I began writing you emails in the hope you would see for yourself the impossible text and hire an Editor.

I wrote you from pure heart and mind, from my isolated study.

I was not aware of page limits and words like "filler" when earlier lamenting that the DEIR main document could be two inches thick instead of six, if properly edited.

But just now, after brief research online, it seems my thoughts and words are almost verbatim the words of the State CEQA Guidelines and CEQA itself.

It is indeed part of Law that EIRs must be legible, comprehensible, concise, of prescribed length, internally consistent, without "filler", clear in disclosure and citation, "so that decision-makers and the public can rapidly understand the documents".

Art 10. Sec 15140; CEQA Guidelines [http://ceres.ca.gov/topic/env_law/ceqa/guidelines] :

P53-1

Article 10. Considerations in Preparing EIRs and Negative Declarations

Sections 15140 to 15155

15140. Writing

EIRs shall be written in plain language and may use appropriate graphics so that decision-makers and the public can rapidly understand the documents.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Sections 21003 and 21100, Public Resources Code.

15141. Page Limits

The text of draft EIRs should normally be less than 150 pages and for proposals of unusual scope or complexity should normally be less than 300 pages.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21100, Public Resources Code.

15148. Citation

Preparation of EIRs is dependent upon information from many sources, including engineering project reports and many scientific documents relating to environmental features. These documents should be cited but not included in the EIR. The EIR shall cite all documents used in its preparation including, where possible, the page and section number of any technical reports which were used as the basis for any statements in the EIR.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Sections 21003, 21061, and 21100, Public Resources Code.

The Guidelines say an EIR is a "public disclosure document".

San Diego County (DPLU June 2004) "Guidance for the Writing of Draft EIRs" (pdf p 5/47) interprets the CEQA Guidelines and Code, and states:

"The length of draft EIRs must be kept to the absolute minimum." and:

"Extraneous and 'filler' material must always be omitted from EIRs."

[See: http://www.co.san-diego.ca.us/dplu/docs/EIR_FORMAT.pdf]

and [attached image 'SDCO-DEIRmustbekepttomin.JPG' showing part of pdf p 5]

I visited briefly with the Consultant representative at the Monday night meeting. P53-1
I tried to ask questions and explain my comments about those pages. CONT

He seemed defensive and did not seem to wish to discuss (real or perceived) problems in composition.

I am not an idle critic. These events are jolting my memory back to a time when I wrote much lauded research, papers and Commentary at University in Literature, Classical Studies, and Con Law.

I do not want to hurt anyone's feelings, nor slight so much hard work and accomplishment (as in the DEIR) - but the County must do something to Edit this DEIR at no additional cost to Taxpayers or Los Ossians.

There are few times I am close to certain about anything on Earth.

I am certain of the degree of obfuscation evidenced in the Los Osos Draft EIR;
that the DEIR body is almost 500 pages of bloat instead of the statutory minimum 150 / 300 pages;
that the portions that are incomprehensible to the public due to distraction are critical sections -
not supplementary analysis of a technical nature.

[as in: http://ceres.ca.gov/ceqa/cases/1987/sf_reasonable_growth_081087.html]

In the County - Consultant Contract, please see:

Feb 5 2008 BOS Archives;
"Agreement For Environmental Consulting Services" (F1-10) pdf p10/60; ref. to Scope of Work Exhibit A and:

13 "Compliance with Laws";
27 "Quality Control and Quality Assurance";

and in Exhibit A: Scope Of Work:

(F1-22): (pdf p 22/60):

"Report format and content will be in full compliance with CEQA, the State CEQA Guidelines, and County's CEQA compliance procedures and specifications as well as compliance with NEPA guidelines for use by any federal agencies as identified in the request for proposal. ...
Text will be supplemented with graphics and summary tables to present information in a concise and easily understood format."

(F1-33): (pdf p 33/60):

"TASK 5: Administrative Draft EIR

The MBA Team will prepare the ADEIR, which will consist of the main document and the appendices. The main report will be a concise approximately 150 page document that summarizes the information contained in the appendices. ...To accompany the main document, the MBA Team will prepare a separately bound Executive Summary of approximately 25 pages."

P53-1
CONT

Then see the Fee Table (F1-41, 42) (pdf p41-42/60) ...
Our money is represented in those Tables. Just as with the Carollo Tech Memos, my heart is sick.

It is impossible to understand how this DEIR document came to be, reviewing the Work Plan. One must wonder: Where were the other well paid Environmental Consultants or the County's Project Manager (your extra eyes and brains) during the "Administrative Draft" phases?

But now, for a citizen responding to the DEIR, there is so little time to read, write and to also wade through the extraneous verbiage.

I hope the County will find a way to edit the Draft EIR and also to extend the Review time for the public; the Law sought to protect us and the CEQA process, but in this case failed.

Thank you so much for your hard work for all the County and the Los Osos Project.

Good Luck.

Respectfully;

Rachel Rosenthal
Los Osos

CA Architect Lic. no. 28278 (AZ no.27503)
CDPH Water Treatment Operator T2 no. 28798
CDPH Water Distribution Operator D2 no. 33794

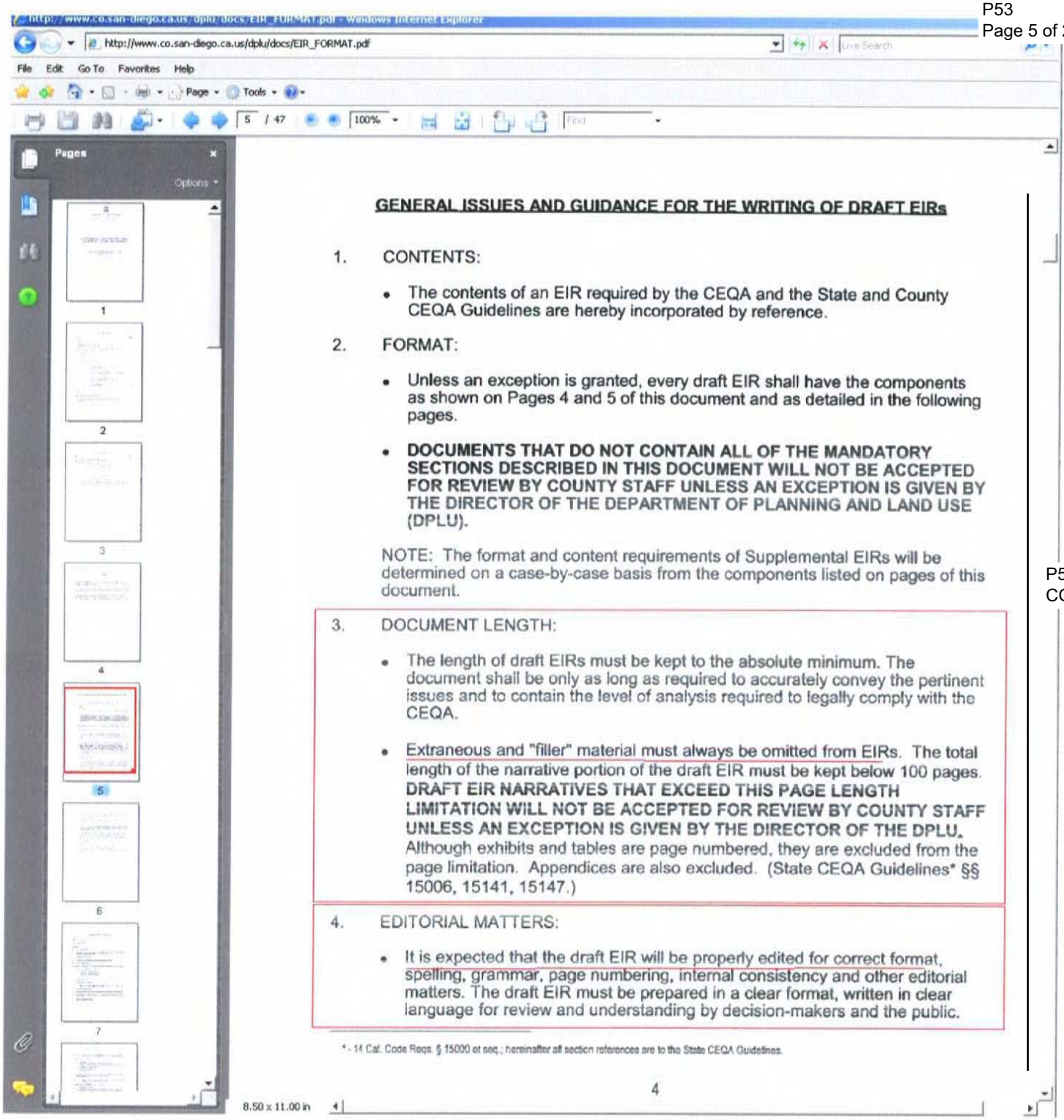
B. Arch (5 yr, 1st Prof.) University of Arizona, Tucson, AZ
B. A. Classical Studies, Ancient Greek + English, University of Michigan, Ann Arbor, MI

rachel@peopleforpeople.com

PO Box 1678
San Luis Obispo, CA 93406

805 544 7066

cc
Paavo Ogren, Director, San Luis Obispo County, Department of Public Works
Supervisor Bruce Gibson, Chairperson, San Luis Obispo County, Board of Supervisors


http://www.co.san-diego.ca.us/dplu/docs/EIR_FORMAT.pdf
File Edit Go To Favorites Help
Pages
Options
1
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7
GENERAL ISSUES AND GUIDANCE FOR THE WRITING OF DRAFT EIRs
1. CONTENTS:
• The contents of an EIR required by the CEQA and the State and County CEQA Guidelines are hereby incorporated by reference.
2. FORMAT:
• Unless an exception is granted, every draft EIR shall have the components as shown on Pages 4 and 5 of this document and as detailed in the following pages.
• DOCUMENTS THAT DO NOT CONTAIN ALL OF THE MANDATORY SECTIONS DESCRIBED IN THIS DOCUMENT WILL NOT BE ACCEPTED FOR REVIEW BY COUNTY STAFF UNLESS AN EXCEPTION IS GIVEN BY THE DIRECTOR OF THE DEPARTMENT OF PLANNING AND LAND USE (DPLU).
NOTE: The format and content requirements of Supplemental EIRs will be determined on a case-by-case basis from the components listed on pages of this document.
3. DOCUMENT LENGTH:
• The length of draft EIRs must be kept to the absolute minimum. The document shall be only as long as required to accurately convey the pertinent issues and to contain the level of analysis required to legally comply with the CEQA.
• Extraneous and "filler" material must always be omitted from EIRs. The total length of the narrative portion of the draft EIR must be kept below 100 pages. DRAFT EIR NARRATIVES THAT EXCEED THIS PAGE LENGTH LIMITATION WILL NOT BE ACCEPTED FOR REVIEW BY COUNTY STAFF UNLESS AN EXCEPTION IS GIVEN BY THE DIRECTOR OF THE DPLU. Although exhibits and tables are page numbered, they are excluded from the page limitation. Appendices are also excluded. (State CEQA Guidelines* §§ 15006, 15141, 15147.)
4. EDITORIAL MATTERS:
• It is expected that the draft EIR will be properly edited for correct format, spelling, grammar, page numbering, internal consistency and other editorial matters. The draft EIR must be prepared in a clear format, written in clear language for review and understanding by decision-makers and the public.
* - 14 Cal. Code Regs. § 15000 et seq.; hereinafter all section references are to the State CEQA Guidelines.
4
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P53-1
CONT

AG-Land Use-Coastal Act-Water Quality-Disposal-ReUse-BIOLOGY

Appendix M - Agriculture.
The Ag issues of the proposed projects are most important.

Please explore further the definition of AG land use and impact of the Alternative Treatments.

Two of the Treatment Facilities that would be located on Ag Land are Oxidation Ditch/Biolac.

These are more traditional mechanical type plants-with sludge aerobic digestion, "thickening", handling and sludge haulling,and use of chemicals (coagulants:Alum/Ferric Sulfide/polymers).

These have buildings for hiding and storing the sludge and concrete built facilities and power houses etc.-like factories.

P53-2

The third Treatment Alternative is the Pond System - a Natural system.that uses Rock Filters (Carbon from Limestone, Bio augmentation with cultured bacteria for nitrogen removal and algae control) in maturation / polishing ponds.

There would only be a small building for blowers in the Pond Alternative and the inlet pumps, septic receiving.

The ponds become aquaculture environements such as in the Louisiana Project
I attach and at Columbia IL where native fish are grown ajacent to the Missippi River....

SEE:

http://crowley-la.com/GOVERNMENT/DEPTwater.html

and link to the fish release in Columbia Ill Ponds that employ the Nelson ADS Pond system

http://www.columbiaillinois.com/index.asp?NID=140

Could the EIR study explore the Pond Treatment Alternative and accompanying Reservoirs as more closely related to an Ag use of the Land and thus NOT count the full loss of acreage with this Treatment Alternative in the same way as the other two?

Similar to Dairy Farm waste control?

What is the difference between the Wastewater Ponds for the Los Osos Project and the typical Wastewater Lagoon allowed under normal Ag Use for Dairies or wineries for example or aqua culture farms.....?

Also the Ponds do not have Sludge Processing or Sludge Hauling and Storage buildings.....
Only possibly after twenty to even sixty years and perhaps never.

P53-3

Perhaps this should be considered in the analysis of impacts and harmony with Ag Land Use?

Further perhaps the future potential for Pond Technology harmonious with Ag Use and VISUAL IMPACTS could be explored in the EIR a bit better?

Perhaps the future Project could be an asset to Agricultural Economy in the Valley.
The DEIR in the Ag Impacts contain statistics on the Revenue produced by the small farm in SLO County. It says 50% of the famrs have Revenue less the $25,000 per years.

That 90% of Farm Sales is by some small –12% of the farms in the County.

If the best pond designers and technology could come to our Los Osos project - maybe in the future we could have a learning center for technology transfer and application for all of Ag.

Perhaps we could have a small farmer survival learning center?

In addition to spray fields all over , maybe we could have an irrigation learning center?

Perhaps a learning center for Water reuse with water quality testing for farmers that may want to consider Ag Reuse but want a place to explore the idea first.

For wineries, for dairy and livestock....

P53-3
CONT

Please consider not considering the Pond Treatment Alternative as the same acreage removal of Ag Use as the other two.

Please explore the traditonal Ag Landscape that often went hand in hand with Water Reservoirs and Pond Treatment under Visual Analysis.

P53-4

Please explore the possible threats from Chemicals to the Warden Lake versus The Pond Alternative that would not have the threat of polymer spills such as happened at the Lopez water Treatment site.

P53-5

Please review the fish cultures at the Columbia IL Ponds along the Missippi River and The Louisiana Ponds and other case studies and possoble potential for harmony with The habitat of Warden Lake.

P53-6

2. Land Use - Ag Impacts

Please evaluate the impacts if the AG land were sold and developed as an Ag Cluster.

Is there a similar property in our County that has done this?
Could we compare the impacts?

Or a farm with an event Center?

Would either of these be allowed if the property were purchased by others and the penalty for removing from Williamson Act paid by the new owner?

P53-7

3. REUSE -DISPOSAL -AG USE

Finally if the ag properties along the LO valley need or want to reuse the water from the plant - please explore what is best for the Ag community whether water with treatment chemicals is worse than water treated in a Natural Pond System without polymers and coagulants and such?

Is the availability of recycled water an asset to the local farmers who are now often needing to use RO systems or sometimes affecting each other's pumping (as in Los Osos Creek area).?

P53-8

I myself dream of farming one day in that valley.

I would not accept reclaimed water from the Alternatives 2/3.
I would accept the water from the Ponds Treatment alternative knowing it does not involve polymers and treatment chemicals.

I would not want to buy Ag land or lease it if it were near a Mechanical Plant and a Sludge Processing facility.

P53-9
CONT

The Pond Treatment Alternative does not have these components.

Perhaps the other farmers feel the same way?
Has the County interviewed the farmers as the Ripley Team did?
Did not the County review the requests by Organic Farmers for more data?
Could the EIR review this ?

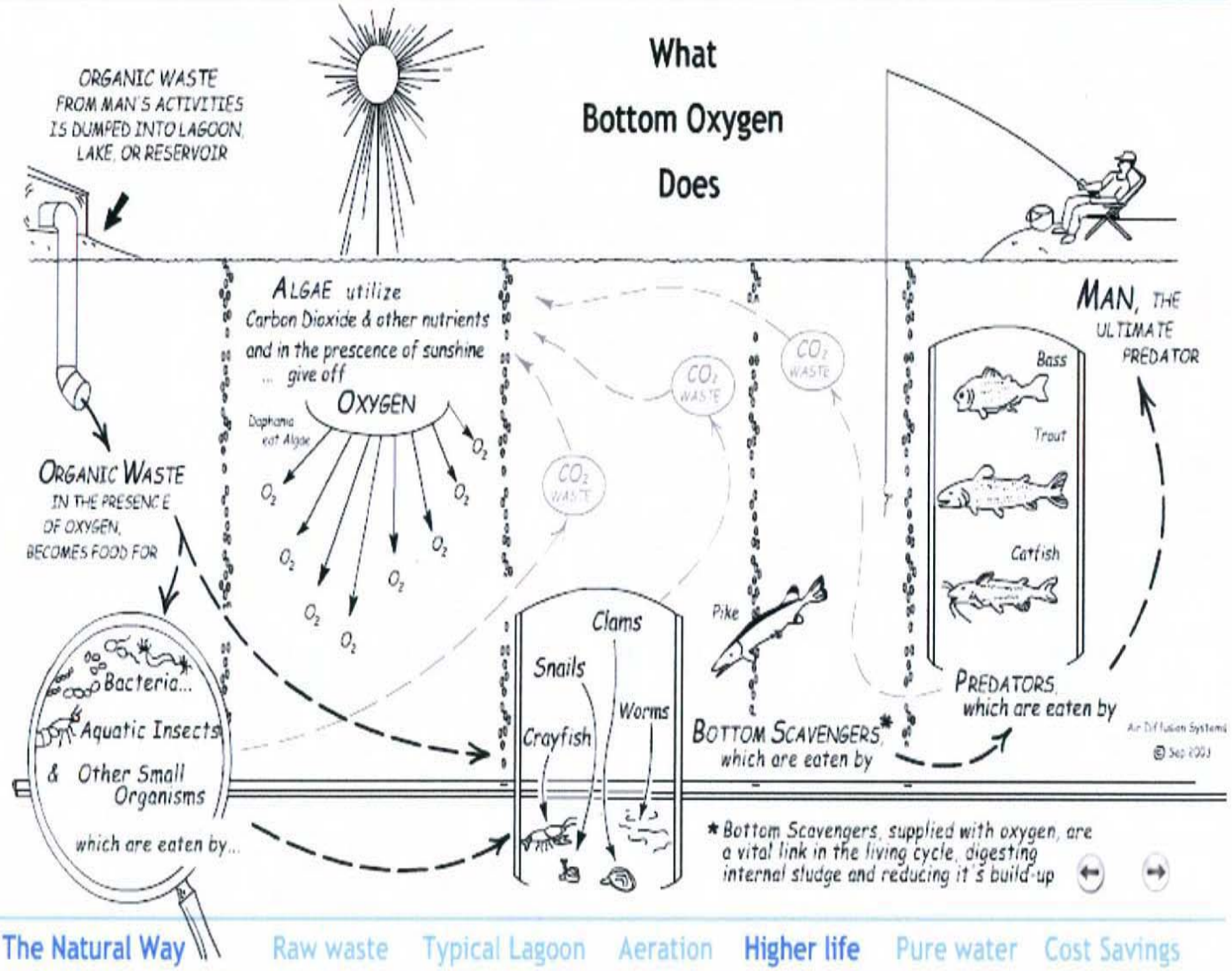
Submitted:

Rachel Rosenthal
Los Osos

CA Architect Lic. no. 28278 (AZ no.27503)
CDPH Water Treatment Operator T2 no. 28798
CDPH Water Distribution Operator D2 no. 33794

B. Arch (5 yr, !st Prof.) University of Arizona, Tucson, AZ
B. A. Classical Studies, Ancient Greek + English, University of Michigan, Ann Arbor, MI

What Bottom Oxygen Does



Project Updates
Storm Water
Street
Waste Water
Water

E-News Sign up

Columbia, Illinois Releases Fish Into Lagoon

We released native species fish (Bluegills, Fathead Minnows, and Triploid Grass Carp) into our lagoons on April 24, 2007 to show how higher life forms can survive and consume waste the "natural way".

Completing the "food-chain" is part of the engineering design for wastewater treatment in lagoons by Air Diffusion Systems. Every pound of fish growth is a pound of waste processed-starting with bacteria, then rotifers & crustaceans and finally fish, harvesting snails, worms, and other aquatic life in the aerated lagoon system. After all, we are not feeding them anything, and they grow like crazy.

Should they escape into the Mississippi River, we are restocking the waters with native species. Below are a few photos of this event and, remember, fish are a great indicator of the health of the lagoons.

Bluegills are 2 to 4 inches and will grow to 8 to 10 inches within a year.

Fathead Minnows are about 100 to 150 fish per pound of weight.

Aquaculture and Fish Treatment

Whether you raise catfish, prawns, minnows, trout, bass or any other type of aquatic life, you can double your fish production using an ADS system. Since all levels of water are made livable, stocking density can be based on acre-feet of water instead of surface-feet. You'll eliminate oxygen deficiencies during periods of extreme heat or freezing weather. Fish mortality and disease can be reduced to less than 10% by combining an ADS system with biofiltration and bioaugmentation of beneficial bacteria.

COVER·STORY

Innovative Wastewater Treatment

Crowley Facility Ranks Among Largest Systems of Its Kind

By Charles East, Jr.
Photos by David Humphreys

"Wastewater that has been treated and filtered through the local system is actually cleaner than the natural bayou water it ultimately flows into."
--Jean Simon

ASK A SOUTH LOUISIANIAN what the city of Crowley is famous for, and you'll probably be told it's the "Rice Capital of America." But Crowley has also earned its own identity in environmental circles: the city's innovative wastewater treatment facility is one of the largest combined "artificial marshrock/reed filter" systems in the world.

This emerging technology, also known by the terms "microbial rock filter" system and "constructed wetlands," features a large pond for municipal wastewater and storm-water storage and preliminary treatment, as well as a natural filter.

The filter consists of a shallow basin filled with rock, on which plants --- in Crowley's case, southern giant bulrush are grown. The plant roots are presumed to provide additional treatment by taking some nutrients from the wastewater and by introducing oxygen into the wastewater flow.

The Crowley facility was built at a cost of $3.76 million and funded by a construction grant through DEQ using U.S. Environmental Protection Agency (EPA) funds, as well as local monies.

The system began operation in June 1992. It is classified as innovative because it relies on technology that has not been proven fully and because it is designed for low energy consumption, utilizing natural treatment processes and wind-driven aeration.

The cost savings on electricity and other utilities are noteworthy. Crowley's previous plant, a mechanical operation, experienced total utility costs of about $2,500 or more per month. The average monthly utility bills for the new wastewater treatment facility have totaled only about $130.

Because the artificial marshrock/reed process practically eliminates the need for chemical or mechanical means of treatment and usually incorporates gravity flow throughout most of the system the operation and maintenance costs are substantially less than those experienced with conventional treatment processes.

Including the price of land, Crowley's new facility cost less than a new mechanical plant would have. Mayor Robert Istre and the Crowley City Council solved several problems by going to the artificial marsh-rock/reed system: (1) They closed an old treatment plant, located in a residential area, that emitted bad odors and attracted gnats, flies, and mosquitoes. (2) They now meet more stringent discharge permit requirements for less than the cost of typical plant construction. (3) They reduced maintenance costs for wastewater treatment. (4) The city doesn't have to process and dispose of sludge off-site; instead, solids form in a thin layer at the bottom of the treatment system pond and don't need to be removed for many years: perhaps as long as a century, according to project engineers. (5) And Crowley has an environmentally friendly facility that is being studied for use in establishing uniform design criteria for future treatment systems.

It should be noted that artificial marsh-rock/reed filter systems of this size are relatively new technologies and are not fully accepted by some experts in the wastewater industry. Strong opinions on both sides of the issue have demonstrated the need for further study. Nevertheless, some wastewater treatment system designers are convinced of the merits of the process and continue to design and build more systems of this kind. Crowley's treatment system includes the following components:

- **FACULTATIVE POND** The oxidation pond covers 78 acres and contains 10 aerators, which help pump dissolved oxygen into the water and also maintain an even mix of solids suspended in the water within the pond. These aerators are wind-driven, with an electric motor backup for periods when there is not enough wind. The pond provides

An aerator in the facultative pond

primary treatment and includes capacity for storm-water storage during wet weather (25 million gallons per foot of storage in the pond above the normal operating level). Organic and inorganic matter, otherwise part of a sludge disposal problem, will settle on the bottom of this pond and remain there for an estimated 100 years before requiring removal.

- **OPEN MARSH AREA** The open marsh, which spans more than 22 acres is planted with southern giant bulrush and covered with duckweed floating on the surface.

Helpful marsh vegetation.

The combination of windscreen from the bulrush and shade from the duckweed is intended to reduce the algae in the wastewater -- after the water migrates from the pond -- and to provide additional treatment. Algae is reduced because the duckweed prevents sunlight from reaching the water, partially cutting off photosynthesis and major oxygen production. Algae will otherwise cause high concentrations of total suspended solids in the discharge.

Bulrush is prominent at the acility.

we could use polyethelene balls see

A green blanket of duckweed covers the water's surface in the open marsh area (above left), while a close-up view (above right) shows the texture of the duckweed. Algae is intentionally reduced in Crowley's wastewater treatment facility, as the duckweed prevents sunlight from reaching the water; this paritaly stops photosynthesis and major oxygen production.

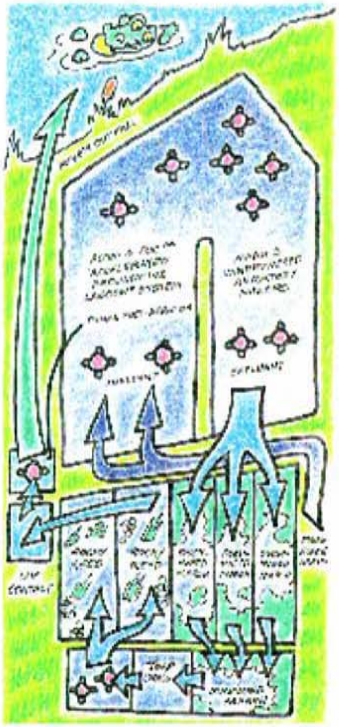
- **TORPEDO GRASS BUFFER AREA** This buffer area is about seven-tenths of an acre and is intended to filter any duckweed that may spill out of the open marsh area. It also includes two aerators to ensure adequate dissolved

oxygen in the wastewater that enters the microbial rock filter.

The microbial rock filter, made of limestone.

- **MICROBIAL ROCK FILTER** The filter, covering 18 acres planted with southern giant bulrush, is designed to provide final "polishing" of the wastewater. About 18 inches thick, the filter consists of individual pieces of large limestone rock. This layer is separated from the ground by a liner made of polypropylene mesh.
- **ULTRAVIOLET DISINFECTION** This method of disinfection was selected to meet the permit fecal coliform bacteria limit because it was more cost effective than chlorination and dechlorination.
- **RECIRCULATION SYSTEM** A single pump capable of delivering approximately one million gallons per day was recently added at the post-aeration basin, the treatment unit that receives water after it is disinfected. One purpose of this pumping system is to recirculate the treated water to the facultative pond in periods of low flow. This provides a means of constantly delivering adequate amounts of water to the artificial marsh and rock-reed plants, even during periods of relatively dry weather. The recirculation system also allows the operator to break up stagnant zones in the facultative pond that could otherwise cause odor problems.

Changing an ultraviolet bulb.



The artificial marsh-rock/reed filter system is essentially a controlled natural process for the secondary and tertiary treatment of wastewater following primary treatment in the oxidation pond, according to project engineering consultant Tim Mader of Mader-Miers Engineering, Inc. in Lafayette.

Fred Trahan, project engineer with the firm, says the system treats water in much the same way as a natural stream, in which the action of the water flowing over the rocks in the stream bed -- combined with the aquatic plants' absorption of dissolved nutrients gives the water a purity and clarity.

In fact, Crowley Wastewater

Click for full-size photo (242K).

Superintendent Jean Simon says the wastewater that has been treated and filtered through the local system is actually cleaner than the natural bayou water it ultimately flows into.

To arrive at that clean, filtered stage, the Crowley wastewater goes through a treatment process lasting about 60 days, Simon explains. (See diagram) Wastewater enters the system at the inflect area and is forced hydraulically and encouraged -- through the action of aerator/mixers to move out and around a fingerlike peninsula before traveling back down toward the effluent exit. This phase lasts a minimum of 52 days, Simon says.

After leaving the main pond, the water travels by gravity into four shallow marshes, where it remains for a minimum of three days. It then travels to the rock/reed filter area, taking about two days (under present flows) before passing through to the ultraviolet contact chamber for disinfection. Finally, the water proceeds to the post aeration basin -- equipped with its own aerator -- before discharge into Bayou Placeman Brule. The bayou empties into the Mermentau River.

During periods of hot and dry weather, Mader says, it is possible with the recirculation system for the Crowley treatment facility to function for days without any discharge into the receiving bayou.

"DEQ is highly appreciative of the leadership and cooperation shown by Mayor Istre, the City Council, and their staff in bringing about this new system," says Dale Givens, Assistant Secretary for DEQ's Office of Water Resources. "We applaud the steps they are taking to improve Crowley's wastewater collection and treatment."

Local officials are justifiably proud of the innovative system. In fact, tours of the facility can be arranged by contacting the City of Crowley.

Louisiana Environmentalist
July - August, 1993.

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Return to the Louisiana Environmentalist Magazine Home Page

ENERGY

ENERGY –GHG – AIR QUALITY - PUBLIC HEALTH

The GHG Analysis had errors due to conversion mistakes and also gross violations of CARB Protocol documented in earlier Comments from this Commenter.

It was pulled from Review announced by an email from the Environemental Coordinator of the LO DEIR and as of January 30 2009 has not been redone.

Please provide an Addendum to this DEIR that provides proper GHG and ENERGY analysis for the Alternatives. Separate Energy Analsis from GHG Analysis.

Please respect CARB open source protocol and its incorporated protocols of other organizations: WRI Project Method and IPCC protocol.

Even as completed for the DEIR other Problems existed that violate various California Codes and Planning Law: CEQA, Appendix F and the Coastal Act requirements to minimize Energy consumption.

Please provide a proper separate Energy analysis under CEQA Appendix F:

The LO DEIR embeds the Energy analysis in the GHG review.
The GHG Review is further embedded in a confusing Air Quality Analysis.
The LO DEIR confuses the Public and evades any real ENERGY Use comparison.

The GHG GAMES the outcomes by introducing random elements into the Pond Treatment Alternative that do not exist in reality.
(Methanol in GHG analysis, Trickling Filters in Odors, Algal sludge which is not produced by Advanced aerated Pond Treatment Designs of the last decade).

EXAMPLES:

OX Ditch/ Biolac Treatment use much Energy for the much reviewed "Biosolids Processing and Hauling" - this is masked in the GHG analysis. P53-10

The Pond Alternative DOES NOT produce Sludge or Biosolids and does not use the Energy in processing and hauling.

The Executive Summary 2.4.2 - Wastewater Treatment Process and Solids Processing p 2-10
does NOT make clear that the Ox Ditch/Biolac Alternative produces 4000 lbs – 2 Tons of sludge per day. (1000 lbs with a Step Collection system)

The Pond Treatment Alternative does not produce biosolids.

The Exec Summary and other sections go on about the problems with Algae.
The Exec summary discusses Sludge from Algae.

Algae is a problem in older traditional Pond Treatment or poorly maintained systems.
NOT THE ADS or newer designs that use Aeration, Bacteria and bio augmentation, Pond Covers
And various well documented means in practice to control Alge growth.

The PONDS would use less Energy than Ox Dittch/ Biolac in a proper review of Solids Handling.

Please review + clarify the different Pond type for Algae. Please review + correct the Pond TM data the bibliography shows no proper literature review was done for advanced aeration, Rock Filters and algae in modern Pond Systems.

Please show a Breakdown of all Processes and Energy Use of Components and fuel source. SEPARATE Collection from Treatment .

California CEQA Appendix F Goals:

"The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:

(1) decreasing overall per capita energy consumption,
(2) decreasing reliance on natural gas and oil, and
(3) increasing reliance on renewable energy sources."

"Appendix F: Energy Conservation., CA Environmental Quality Act"

The large area of the Tonini site, its South facing slopes and the lower overall Energy use of the Pond Treatment alternative would show that Project 4 could be a self sustaining Energy User by putting solar panels at the site in future years or as funds are available.

Workshops at the PGE energy Center and elsewhere teach how to find grants and other means to aquire solar panels and small wind and hydro Energy sources (renewable) for this project in its various forms.

(2002 June 25, Pacific Gas and Electric Company: Self Generation Incentive Program Workshop]

and

"E. Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy."

"Appendix F: Energy Conservation., CA Environmental Quality Act"
http://ceres.ca.gov/topic/env_law/ceqa/guidelines/pdf/appen_f.pdf

Please include an analysis of Alternative Energy use possibilities in the Project.

P53-11

Please remove Gaming of the outcomes:

This means not making Design decisions that would not be made at this early Phase to game the outcomes of analysis.

The Project Pre Design Engineer CHOSE METHANOL for the Pond Treatment alternative.
NO NATURAL SYSTEMS DESIGNER WHO DESIGNS POND TREATMENT WOULD USE METHANOL, A KNOWN TOXIN AND HAZARDOUS MATERIAL IN A POND TREATMENT DESIGN.

Pond Designers use Natural components (BioAugmentation and Rock Filters) to provide Carbon Sources to Processes. Even traditional designers are eliminating the use of the known toxin Methanol.

See ZENON Bio membrane literature for the alternative use of SUCROSE instead of Methanol; or the many studies comparing Molasses as a Carbon Source to Replace Methanol in various traditional Mechanical Treatment and filtration systems.

The GHG analyst then BROKE PROTOCOL and boundaries in the GHG analysis to include Energy Consumed in Chemical Manufacturing and transport.

AB 32 California requires reduction of GHG emissions.
GHG review of a "project" should inlude CARB adopted protocol and the embrases and adopts inturn "protocols" of the IPCC and the World Resources Inst. (WRI)

Presentation of the Green House Gas Study under CEQA for local entities is left to

the discretion of the Lead Agency and Local Entity according to the latest opinion of California Office of Planning and Research.

But this is no excuse for not including the Energy analysis and a clear, transparent GHG analysis.

There is much confusion among the Public between ENERGY and Greenhouse Gas Emissions. This is common even among a highly educated Public (and Environmental Professionals)

P53-11 CONT

If the identical amount of electriciy is consumed by different wastewater plants in equiv B T U or equiv KwHs consumed:

if one Electricity Source uses Coal as fuel and the second uses Natural Gas and a Third Uses Solar Thermal Plant and a fourth uses OnSite Solar Panels;

Each will consume the same KwHours of Electricity.

Each will have a very diffeent GHG emission in CO2eq.

Each will have very different Air Quality Impacts.

Reference:

All Comments Incoporporate by Reference the entire bibliography and document list for this project and EIR at the Project Website and for the Alternatives analysis.
This is printed one time and attached.

Submitted:

Rachel Rosenthal
Los Osos

CA Architect Lic. no. 28278 (AZ no.27503)
CDPH Water Treatment Operator T2 no. 28798
CDPH Water Distribution Operator D2 no. 33794

B. Arch (5 yr, !st Prof.) University of Arizona, Tucson, AZ
B. A. Classical Studies, Ancient Greek + English, University of Michigan, Ann Arbor, MI

large version

Waste Stabilization Ponds: A Highly Appropriate Wastewater Treatment Technology for Mediterranean Countries

Book	Efficient Management of Wastewater
Publisher	Springer Berlin Heidelberg
DOI	10.1007/978-3-540-74492-4
Copyright	2008
ISBN	978-3-540-74491-7 (Print) 978-3-540-74492-4 (Online)
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Pages	113-123
Subject Collection	Earth and Environmental Science
SpringerLink Date	Saturday, January 12, 2008

PDF (450.1 KB) Free Preview

Efficient Management of Wastewater
Its Treatment and Reuse in Water-Scarce Countries

10.1007/978-3-540-74492-4_10

Ismail Al Baz, Ralf Otterpohl and Claudia Wendland

Duncan Mara[3]

(3) School of Civil Engineering, University of Leeds, Leeds, LS2 9JT, UK

This chapter describes waste stabilization pond (WSP) systems for wastewater treatment. WSP systems comprise a series of anaerobic and facultative ponds and sometimes maturation ponds. Rock filters can be used instead of maturation ponds and they can be aerated to remove ammonia and to improve biochemical oxygen demand and suspended solids removals. Effluent quality is high, and properly designed and well maintained WSP systems produce effluents that can be safely used for both restricted and unrestricted crop irrigation.

Duncan Mara
Email: d.d.mara@leeds.ac.uk

Fulltext Preview (Small, Large**)**

E-WAter
Official Publication of the European Water Association (EWA)

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Source Zenon: Zeeweed Bioreactor

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- **Biological Nutrient Removal (TN/TP)**
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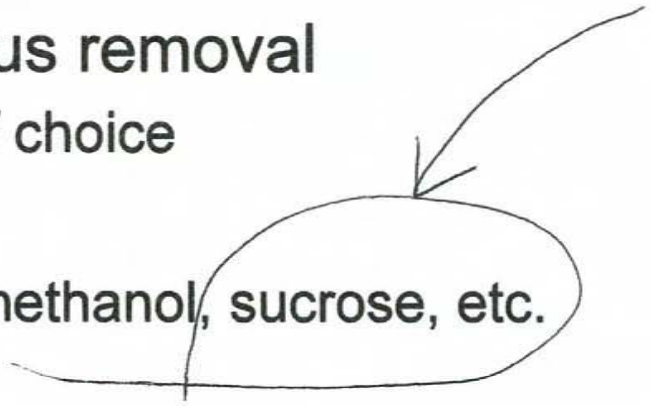
  - to 5/0.5 or better in larger plants
- Recommended for small to medium systems
- Actual performance model is temperature sensitive
- Coagulant addition for phosphorous removal
  - Ferric chloride generally coagulant of choice
- Alkalinity adjustment if required
  - Carbon source can be site specific, methanol, sucrose, etc.



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- Sucrose Solutions
- Ethanol
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- Sodium Acetate

COMPARISON VS. "SAFE" PRODUCTS PDF

Safety

Methanol is highly **flammable** and **toxic**, jeopardizing the health and safety of treatment plant personnel, facility users and nearby communities. Recent incidents including the explosion of the methanol tank at the Daytona Beach, Florida wastewater treatment plant highlight safety issues associated with methanol. MicroC™ Premium Carbon Sources are safer alternatives to methanol.

Recent Articles highlighting the dangers associated with methanol

Summary of recent accidents involving methanol.	PDF
One Person Dead in Methanol Tanker Crash	Article 1 (7/21/08) PDF
	Article 2 (7/18/08) PDF
Methanol explosion at Daytona Beach, Florida wastewater treatment plant kills two workers and severely injures a third.	Article 1 (1/14/06) PDF Web site
	Article 2 (1/12/06) PDF Web site
Suit filed against city of Daytona Beach by worker's family. Two construction contractors, an engineering consultant and two manufacturers of parts to the methanol and bisulfate tanks involved in the blast likely to be named in suit.	Web site
Methanol accident injures eight during high school chemistry experiment	PDF
Worker killed when an empty 55-gallon drum explodes	Web site
Five die as methanol tanker collides with car and bursts into flames.	Article 1 (10/9/06) PDF
	Article 2 (10/10/06) PDF
CSB releases final report on fatal methanol tank explosion.	Web site

ammonia as one twice as large but operating at 20°C.

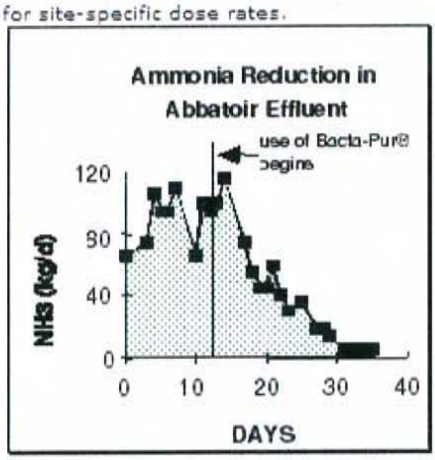
Denitrification traditionally required anoxic conditions. Denitrification increases the pH and regenerates alkalinity. The heterotrophic bacteria also require an electron donor. Products used for this purpose vary from starches to methanol among others. Bacta-Pur® N3000 was especially developed to also include bacteria, which can not only denitrify in an oxygenated environment, but these bacteria can also use carbonate as the carbon source. This means, in waste water treatment, that nitrate can be removed in the same process as nitrification rather than requiring strictly anoxic conditions in a separate part or time of the treatment. Furthermore, it is not necessary to use the same quantities of organic carbon to permit denitrification.

Why the Bacta-Pur® System is Effective

First of all, use of Bacta-Pur® N3000 and XLG assures the presence of a balanced community of nitrifying / denitrifying strains. This mixture will also control soluble organics. Secondly, preactivation the on-site technique of physiological engineering (see brochure spd10 for automatic preactivation) increases the size of the community of the beneficial microorganisms, prior to bringing the cultures in contact with the waste water to be treated.

Ammonia, Nitrite and/or Nitrate Reduction with Bacta-Pur®

Bacta-Pur® N3000 and XLG are two of the most concentrated cultures available. Small regular doses are very effective. Best results will be achieved by introducing Bacta-Pur® N3000 and XLG into the influent of the waste water treatment system. Contact IET-Aquaresearch Ltd., Bacta-Pur Europe bvba or an authorized representative for site-specific dose rates.



Previous Page | Quality Control | Equipment | Implementation | Case History
Top of page

Nitrification / Denitrification

Bacta-Pur® biotechnological products contain beneficial communities of natural bacteria, which have been on earth for millions of years. All we do is grow them in the right proportions to create powerful teams that improve water quality and accelerate the transformation of organic wastes into bacterial biomass, carbon dioxide and water. EVERY PRODUCTION of Bacta-Pur® biotechnologies is analyzed and cleared for shipment only when CERTIFIED PATHOGEN FREE using techniques from the food industry.

Summary

Symptoms

- ammonia, nitrite and/or nitrate concentrations exceed effluent permit level
- slow to recover nitrification/denitrification from toxic shocks
- no or poor nitrification/denitrification in the system

Treatment Benefits

- meet target concentrations in effluent
- recover rapidly from toxic shock
- accelerate start-up and subsequent stabilization of nitrification/denitrification

Requirements for Efficient Nitrification / Denitrification

There are two principle factors which influence the efficiency of the nitrification / denitrification process: the biological community and the water physico-chemistry.

Biological Community — Two bacterial strains involved in nitrification; Nitrosomonas converts ammonia into nitrite, and Nitrobacter converts nitrite into nitrate.

Nitrifying bacteria are very sensitive to environmental conditions; this is particularly true of Nitrobacter. Many factors can inhibit these bacteria including excessive soluble organics and even light. A balanced population of heterotrophic bacteria is essential to control levels of soluble organic pollutants and for denitrification.

Lack of any member of the nitrifying or denitrifying community will stop the processes.

Water Physico-Chemistry — Ammonia and nitrite are only sources of nitrogen for nitrifying bacteria. Other nutrients including carbon, phosphorus and trace elements are also essential. Carbon must be inorganic and is measured as carbonate alkalinity.

Sodium bicarbonate (baking soda) is commonly used to add carbonate alkalinity. Carbonate alkalinity should always be at least eight times the level of ammonia. Water with more than 100 mg carbonate alkalinity/l is normally adequate for low levels of ammonia. Lack of carbonate alkalinity will stop nitrification.

The alkalinity provides pH buffering. The optimal pH for nitrification is near 8.0. Values outside of 6.0 - 8.5 can be

Dealing with sludge

California produces more than 3 million tons of sludge, a byproduct of wastewater treatment, each year.

Disposal method	Estimated weight *in tons*	Percent
Fertilizer (no composting)	1,100,000	34%
Landfill	968,000	30%
Compost	880,000	27%
Burn	66,000	2%
Store onsite	66,000	2%
Other	132,000	4%
Total	**3,212,000**	

Note: Numbers don't add up to 100% due to rounding.

SOURCE: Environmental Protection Agency

DANIEL WIEGAND / Union-Tribune

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Rachel Rosenthal, January 30, 2009 (Letter P53)

Response to Comment P53-1

This comment expresses an opinion that the Draft EIR is not edited and has extraneous verbiage. Because there are no comments on the specific contents of the Draft EIR, no further response is required.

Response to Comment P53-2

The comment is concerned with alternative treatment processes that could be used on agricultural lands. The commentor asks about sludge digesters and a natural pond system. See Topical Response 6, Alternative Treatment Systems, and Topical Response 7, Alternative Disposal Systems. Draft EIR Section 7, Alternatives to the Proposed Project, also provides a detailed discussion on the alternatives considered and rejected during the environmental process.

Response to Comment P53-3

This comment asked if the facultative ponds and storage reservoirs could be considered agriculture, thus not result in a full loss of agricultural land on the Tonini property. The proposed treatment facilities under Proposed Project 4 (facultative ponds) would not be considered a type of agriculture; therefore, Proposed Project 4 would result in the loss of agricultural land in the area of the proposed treatment facility at Tonini.

Response to Comment P53-4

This comment requested that the proposed water reservoirs and facultative ponds be considered as part of the typical agricultural landscape when evaluating the potential effects on visual resources. The existing agricultural landscape was used as a baseline to evaluate the proposed treatment facilities. See Section 5.12, Visual Resources and Appendix N-1 of the Draft EIR for a discussion of the potential visual impacts resulting from the proposed treatment facilities.

Response to Comment P53-5

This comment requests an exploration of possible threats to Warden Lake due to chemical used with other treatment (i.e., oxidation ditch and biolac) compared to the facultative pond treatment. Both the facultative pond and oxidation ditch/biolac treatment processes would involve the use of chemical; however, the facultative pond treatment process would use less. As described in Section 5.7, Public Health and Safety, and Appendix I-1 of the Draft EIR, both treatment processes would result in the potential for spills (i.e., to the onsite creeks that are connected to Warden Lake; however, Mitigation Measure 5.7-B.1 requires the implementation of a Hazardous Materials Management Plan to address potential spills. The implementation of this plan would reduce the potential spill impacts associated with the facultative pond treatment system and the oxidation ditch/biolac treatment system to less than significant.

Response to Comment P53-6

This comment requested a review of the information related to the Columbia Illinois Ponds and the Louisiana Ponds related to harmony with the habitat of Warden Lake. The proposed facultative

ponds would treat the wastewater to secondary treatment levels. According to regulations established by the California Regional Quality Control Board RWQCB), secondary treated water is not permitted to be conveyed to surface waters. Therefore, the concepts applied at the locations referenced in the comment would not be permitted by the RWQCB.

Response to Comment P53-7

This comment expresses a desire for an evaluation of the impacts on agricultural land if it were sold and developed as an Ag Cluster. See Topical Response 2, Project Costs, regarding the impact of developing and selling the agricultural land as a cluster or a farm with an event center.

Response to Comment P53-8

This comment expresses a concern regarding future agricultural reuse. See Topical Response 4, Tertiary Treatment, regarding the different reuse options for treated effluent.

Response to Comment P53-9

The commentor's opinions regarding reclaimed water from various alternatives are acknowledged. Regarding contract with farmers, the County's project objectives focus on solving the wastewater issue first. Also see Topical Response 3, Water Resources and the Project Scope.

Response to Comment P53-10

This comment identified conversion errors in the greenhouse gas evaluation. Subsequent to distributing the Draft EIR, revisions to the Draft EIR related to the conversions for the greenhouse gas evaluation were distributed to those who received the Draft EIR.

This comment also requests that the energy analysis be separated from the greenhouse gas evaluation. Both of these evaluations are closely tied to each other. See Response to Comment P41-22 regarding energy information.

Response to Comment P53-11

This comment expresses a concern that the alternatives were not compared in terms of energy use. The consumption of energy was determined in evaluating greenhouse gas emissions. As described in Appendix K-1 of the Draft EIR, Proposed Project 4 would generate the least amount of greenhouse gas emissions compared to Proposed Projects 1, 2, and 3. See Response to Comment P53-10 regarding a comparison of energy use by project as well as for construction and operational activities.

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Dept. of Public Works
County Government Center, Room 207
San Luis Obispo, CA 93408

Mr. Hutchinson

The following comments and facts are provided for the purpose of proving that the 1.2 million gallon average daily wastewater generation estimated for the LOWWP is overstated by a minimum of 200,000 gallons.

Page 3-19&20 states that the Flow and Loads Tech Memo and the Rough Screening Analysis show "2006 water consumption rates for the approximately 8500 residents served by the LOCSD during winter months were about 66 gallons per capita per day and since there is little outside irrigation during the winter months, 66 gallons per capita per day is a reasonable current estimate of Los Osos per capita wastewater generation rates. With the estimated build out population of 18,500, this yields a baseline dry-weather generation rate of 1.2 million gallons per day."

1. The assumption that there is little outside water use during the four winter months used in the analysis, assumes that all four months (Jan – April) are wet weather months. There are no facts in the document backing up this statement and I believe if you look into the history of precipitation in Los Osos over the years you will find that precipitation is not consistent throughout those four months from year to year, but sporadic at best. Have you inquired of both schools in the LOCSD water district as to whether or not they shut off their outside irrigation completely during these four months? They are two of the top consumers of water for outside irrigation in the district. Any outdoor irrigation, even 10% of total household consumption, during the four month period analyzed, skews your average dry weather per

P54-1

capita per day wastewater flow rate of 66 by a proportional percentage downward.

P54-1 CONT

2. Why are you using 2006 water consumption rates of 66 gallons per capita per day? There have been two water rate increases fully implemented in the LOCSD water district which has resulted in an annual reduction in consumption for the LOCSD water district customers from 288,910,600 gallons in 2006 to 264,026,600 in 2008. This reduction drops the indoor per capita per day rate to 60. A 6 gallon per capita per day wastewater flow reduction, times your estimated build out population for the prohibition zone of 18,500, results in a reduction of 111,000 gallons of flow to the treatment facility.

P54-3

3. Why does this document and all documents leading up to this DEIR state the estimated build out population of the prohibition zone as either 18,428 or 18,500? As you know, estimated build out for the entire community of Los Osos is projected to be 19,713 as stated in various documents leading up to this DEIR. If build out for the entire community is 19,713, than 18,428 can not be the build out population for the prohibition zone. Fact: Reports prepared for the LOCSD by Wallace Group, and out of District Engineer Rob Miller's own mouth at a TAC meeting, state that the breakdown of population inside and outside the prohibition zone is currently 87% inside, 13% outside. An 87% -13% split of the current population for Los Osos (14,351 - 2000 census) is 12,485 inside /1,866 outside. If you assume that there will never be another home built outside the prohibition zone, then 17,847, (19,713 – 1,866), is the maximum future build out population for the prohibition zone. Multiplying 17,847 times updated 60 gallon per capita per day wastewater flow equals a 1,070,820 gallon average daily flow. This number represents a reduction of 150,180 gallon per day from your build out wastewater flow estimate of 1,221,000 (18,500 X 66). Now, if the current 87%-13% inside/outside population split remains consistent with respect to future development, then 87% of full community build out of 19,713 results

P54-3

in an inside the prohibition zone population of 17,150. Multiplying 17,150 times updated 60 gallon per capita per day wastewater flow equals a 1,029,000 gallon average daily wastewater flow to the treatment facility. This number represents a reduction of 192,000 gallon per day from your build out wastewater flow estimate of 1,221,000 (18,500 X 66). Either reduction is significant, and coupled with other points of contention in these comments, proves my belief that you have overestimated the build out wastewater flow to the treatment facility.

P54-3
CONT

4. Section 2.4.5 (attached) and elsewhere in the document states that water conservation measures would be implemented to reduce water consumption and the corresponding wastewater generation by 0.1 million gallons a day or 160 acre-feet a year. I would like to know which is it? Which is the goal? 0.1 million gallons a day or 160 acre-feet a year? They are certainly not the same. 0.1 million gallons a day is approximately 112 acre-feet a year, not 160 acre-feet a year. 160 acre-feet a year is approximately 0.143 million gallons a day, a 43,000 gallon per day reduction in required treatment plant capacity.

P54-4

In conclusion I would like to emphasize that this is not the first time I have voiced my concerns about the numbers discussed in the above comments. I have spoken numerous times at Board of Supervisor, TAC, and LOCSD meetings over the past two years about these very points, to no avail. However, I have no intention of dropping the subject in the future if the aforementioned inaccuracies are not addressed and corrected. I tried to explain my concerns as simply as possible, but believe me when I tell you that I can prove the same conclusions by approaching the underlying premises thru the front door, back door, or side door. My main concern about over sizing the project for flows, beside some degree of cost savings, is that the opportunity arises for excess capacity available for build out beyond the current build out population projections, and all the cumulative impacts related to that build out. If you have any questions or would like more information, please contact me.

P54-5

Sincerely,

Richard Margetson

Richard Margetson
Box 6721
Los Osos, CA 93412

2.4.5 - Conservation Considerations

The average wastewater generation rate of 1.2 million gallons a day estimated for the LOWWP assumes that water conservation measures would be implemented to reduce water consumption and the corresponding wastewater generation rate by 0.1 million gallons a day or 160 acre-feet a year. Reducing wastewater generation by 160 acre-feet a year by 2020 represents about a ten percent reduction from the 2006 average daily per capita wastewater generation rate. If the water conservation measures are not implemented, the capacity of the wastewater treatment facility would have to be increased by 0.1 million gallons per day, and the treated effluent disposal system would have to accommodate additional flows.

All four Proposed Projects may include the proposed water conservation measures, which would include three primary elements:

1. Mandate that property owners retrofit their bathrooms with all low-flow fixtures, including low-flow toilets, prior to hooking up their buildings to the sewer.

2. Conduct Public Education campaign to increase awareness of water conservation practices.

3. Promote High-Efficiency appliance measures that are sponsored by the gas and electric utility companies. Many of these programs cover appliances such as energy efficient dishwashers and clothes washers that would reduce both energy and water consumption.

Leachfield

Effluent disposal through leachfields is a means where treated effluent is spread on a prepared area and allowed to percolate into the ground. This method would not depend on weather conditions so it may be used on a year-round basis. Application rates may be adjusted so annual effluent disposal totals do not exceed the leachfield's design capacity and annual hydraulic loading capacity respectively. This flexibility allows the LOWWP to discharge more effluent through a leachfield during the winter wet season when the spray fields are not available and less effluent during the summer when the spray fields can be used. Approximately 8 acres of the approximately 80-acre Broderson site is suitable for a leachfield. The Broderson site is the only potential leachfield site that incurs a seawater intrusion mitigation benefit. The 8-acre active leachfield area at the Broderson site would require extensive preparation to function properly including excavation, backfill with gravel for drainage, installation of perforated piping, and then covered by geotextile fabric and native materials.

Spray fields

Spray field disposal is the practice of spraying effluent on land to dispose of the water through evapotranspiration and percolation. Spray field disposal, which requires secondary treatment, would be operated to maximize evaporation and avoid runoff. Disposal would occur through evapotranspiration, or through both evapotranspiration and percolation. The LOWWP would need

Table 2-3 and Table 3-5 (copies attached) are inconsistent with each other. I believe there are computation errors in Table 3-5.

Table 2-3 states that 7 acres at Broderson are available for leach fields and Table 3-5 states that 8 acres are available. Which number is correct?

The explanation of the capacity threshold for the Tonini spray fields needs to be clarified in order to insure that 842 AFY actually can be sprayed at the site.

Table 2-3: Proposed LOWWP Effluent Disposal System

Effluent Disposal Method	Available Area (acres)	Estimated Capacity per Acre (AFY[1]/acre)	Capacity (AFY[1])	Proposed Project Capacity (AFY[1])
Broderson Leachfield	7	64	448[2]	448
Tonini Spray fields[3]	190 (175 used)	4.8	910	842[3]
Total Effluent Disposal Capacity			1,358	1,290
Conservation Program			160	160[4]

Notes:
1 AFY = acre-feet per year.
2 This is a conservative estimate of the maximum possible estimated effluent discharge capacity that can be sustained reliably without constructing dewatering wells downstream that could pump out groundwater, if necessary, to maintain adequate depth to the groundwater table and avoid saturated soil conditions along the bay. See Section 5.2 and Appendix D for additional detail on groundwater issues.
3 The Proposed Projects will use 175 acres of the 190 suitable acres at the Tonini site. 842 AFY of proposed spray irrigation at Tonini corresponds to 175 acres of spray fields.
4 The 1,290 AFY needed effluent disposal capacity assumes that a water conservation program will be implemented that will reduce water consumption and corresponding wastewater generation by 160 AFY.
Source: Carollo, April 2008.

2.4.4 - Solids Processing and Disposal

The quantity and frequency of solids management varies significantly for the four Proposed Projects. For partially mixed facultative ponds, accumulated solids are removed from the ponds typically every 15 to 20 years. The removed solids would be processed in temporary mobile solids processing facilities. Algae must be removed more frequently from the facultative pond surfaces (algae is considered a biosolid for regulatory purposes and sufficient aeration will control algae growth). For oxidation ditches/Biolac systems, solids are settled out in the secondary clarifier tanks on an ongoing basis and then pumped to the permanent solids handling facilities.

The removed solids from both types of treatment facilities would be processed in an aerobic digestion process, dewatered by a screw press system to about 15 percent solids, and then hauled to a Class B landfill for disposal. Solar drying or composting could be used to process and dispose of the accumulated algae.

A STEP/STEG collection system handles solids in a different manner. A STEP/STEG system retains solids in the on-lot tanks instead of discharging all material to the collector system. It will be necessary to pump solids from the STEP/STEG tanks on a periodic basis (every five years) and transport the solids to the wastewater treatment facility.

Noise and odor control are important considerations for the solids processing facility, so the solids processing equipment would be enclosed within a sound insulated building. An inorganic media air scrubber would trap and scrub the interior foul air before releasing it to the outside air.

3-1023

Noise and odor control are important components for the biosolids processing facility, so the biosolids processing equipment would be enclosed within a sound insulated building. An inorganic media air scrubber would trap and scrub the interior foul air before releasing it to the outside air (Crawford, Multari and Clark Associates, 2000; and Appendix B, Project Description Data).

Effluent Disposal

All four proposed projects include disposal of 1,290 acre-feet/year (AFY) of projected treated effluent based on the wastewater generated by the buildout population and estimated wet weather infiltration into the collection system of 336 AFY for three months per year. This treated effluent flow projection assumes that the County implements water conservation measures as described below.

No single effluent disposal alternative has enough capacity to accept the entire 1,290 AFY effluent flow (Carollo Engineers April 2008). Therefore, different effluent disposal options must be combined to create sufficient effluent disposal capacity as summarized in Table 3-5. The choice of effluent disposal options also affects the groundwater water quality and groundwater management benefits created by the project, including reducing seawater intrusion. These issues are discussed below under each treated effluent disposal option. Detailed analysis of the impacts that effluent disposal has on groundwater quality and quantity issues is provided in Section 5.2, Groundwater Resources.

Table 3-5: Proposed LOWWP Effluent Disposal System

Effluent Disposal Method	Available Area (acres)	Estimated Capacity per Acre (AFY[1]/acre)	Capacity (AFY[1])	Proposed Project Capacity (AFY[1])			
				Proposed Project #1	Proposed Project #2	Proposed Project #3	Proposed Project #4
Broderson Leachfield	8	64	448[2]	448	448	448	448
Tonini Sprayfields[3]	80	4.8[4]/3.0[5]	864	842	°42	842	842
Total Effluent Disposal Capacity			**1,358**	**1,290**	**1,290**	**1,290**	**1,290**
Conservation Measures[6]			160	160	160	160	160

Notes:
1 AFY = acre-feet per year.
2 This is a conservative estimate of the maximum possible estimated effluent discharge capacity that can be sustained reliably without constructing dewatering wells downstream that could pump out groundwater, if necessary, to maintain adequate depth to the groundwater table and avoid saturated soil conditions along the bay. See Section 5.2 and Appendix D for additional detail on groundwater issues.
3 The proposed Tonini sptrayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design.
4 Capacity for ET and percolation.
5 Capacity for ET only.
6 The 1,290 AFY needed effluent disposal capacity assumes that water conservation measures will be implemented to reduce water consumption and the corresponding wastewater generation by 160 AFY.
Source: Carollo Engineers, April 2008b.

Richard Margetson, January 30, 2009 (Letter P54)

Response to Comment P54-1

This comment expresses a concern about the per capita wastewater flow rate of 66 gallons per day and questions whether or not the four winter months of January through April are truly representative of wastewater treatment flows with minimal water use for irrigation. The Technical Memorandum prepared by Carollo Engineers on "Flows and Loads" presents water utilization data of January to April for the years 2005 to 2008 (Table 2). This document is incorporated by reference in the Draft EIR. The report summarizes and averages the water usage as 68 gallons per capita per day which is not inconsistent with the amount used in the Draft EIR.

Response to Comment P54-2

This comment follows the one above and expresses concern about the per capita water usage. The comment states that the Los Osos Community Services District (LOCSD) has implemented two rate increases which has resulted in less water used in 2008 than in 2006 and that the per capita usage should decline. As stated above, the calculations in the Carollo Technical Memorandum on "Flows and Loads" average the water use for the period of 2005 to 2008. This would reflect the rate increases noted in the comment letter in the averages and the conclusion in the Technical Memorandum is consistent with the Draft EIR.

Response to Comment P54-3

This comment expresses a concern regarding the data for the build out population of the prohibition zone. See the Response to Comment P41-17

Response to Comment P54-4

This comment expresses a concern that implementing water conservation measures that reduce the wastewater generated by 160 acre-feet a year (AFY) would provide a 0.143 million gallons a day (MGD) potential reduction in the required wastewater treatment plant capacity rather than the 0.1 MGD stated in the Draft EIR Section 2.4.5 , Conservation Considerations, page 2-13. The difference is due to rounding. Although there are 325,851 gallons per acre-foot, 0.143 MGD in reduced wastewater treatment capacity is rounded to a size reduction of 0.1 MGD. With water conservation, 1.2 MGD wastewater treatment plant based on Average Day Dry Weather Flow (ADDWF) could be reduced to a capacity of 1.1 MGD ADDWF. Because the numbers are equivalent within the accuracy of rounding, no further response is required.

Response to Comment P54-5

This comment expresses a concern regarding over sizing the project for flows and the excess capacity available for build out. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P54-6

This comment concerned the capacity of the Tonini sprayfields. As discussed in the Preferred Project Description in Appendix Q, the LOWWP engineering team has conducted further geotechnical

investigations of the Tonini site and reduced the estimated sprayfield capacity. The sprayfield capacity of Tonini is now based solely on an evapotranspiration (ET) rate of 3.4 acre-feet per year per acre (AFY/acre) since the site is not suitable for combined effluent disposal by both ET and percolation. The Broderson leachfield area is 8 acres. Table 2-3 on page 2-12 of the Draft EIR is revised to read as follows:

Table 3-5 on page 3-41 of the Draft EIR is revised to read as follows:

Effluent Disposal Method	Available Area (acres)	Estimated Capacity per Acre (AFY1/acre)	Capacity (AFY1)	Proposed Project Capacity (AFY1)			
				Proposed Project #1	Proposed Project #2	Proposed Project #3	Proposed Project #4
Broderson Leachfield	8	64	448[2]	448	448	448	448
Tonini Sprayfields[3]	~~80~~257	~~4.8~~[4]/~~3.0~~[5]3.4[5]	~~864~~874	842	842	842	842
Total Effluent Disposal Capacity			**~~1,358~~1322**	**1,290**	**1,290**	**1,290**	**1,290**
Conservation Measures[6]			160	160	160	160	160

Notes:
1 AFY = acre-feet per year.
2 This is a conservative estimate of the maximum possible estimated effluent discharge capacity that can be sustained reliably without constructing dewatering wells downstream that could pump out groundwater, if necessary, to maintain adequate depth to the groundwater table and avoid saturated soil conditions along the bay. See Section 5.2 and Appendix D for additional detail on groundwater issues.
3 The proposed Tonini sprayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design.
4 Capacity for ET and percolation.
5 Capacity for ET only.
6 The 1,290 AFY needed effluent disposal capacity assumes that water conservation measures will be implemented to reduce water consumption and the corresponding wastewater generation by 160 AFY.
Source: Carollo Engineers, April 2008b. Cleath and Associates, 2009.

TO: MARK HUTCHINSON

ALBARROW C.A.S.C.

DEIR LOWWP JAN 30 09

RECEIVED
JAN 30 2009
COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS

DEIR COMMENTS CASE AL BARROW

1. A-2: Supplemental Notice of Preparation and Comments/Responses
Need another SOP to evaluate new information not provided by SLO County for OPR.

P55-1

2. Appendix B PD Data
Project data is flawed. The rough and fine screening assumptions upon which it is based are constructive fraud.
Professionals in the fields of Vacuum and LPS systems have consistently disagreed the SLO County Staff and the consultants have ignored this new information. The Airvac has repeatedly asked for a meeting with County staff and been denied. At a townhall meeting in November 2008 (available on DVD). Supervisor Patterson and Hill saw this new information as presented by the representatives who have many existing projects evidencing the viability of these less expensive and more protective technologies. The following are environmental impacts that are avoided by these technologies;

1. Vacuum: no INI (300K gpd for gravity) Reduced impacts more protective
2. Vacuum no leakage of sewage into the drinking water aquifer. CMOM show 5% to 8% leakage from gravity sewers Reduced impacts more protective. Attached studies show 16.5 to 49.1 percent exfiltration or leakage of raw sewage.

P55-2

3. Vacuum no septic tank footprint on site, no electrical panel hookup onsite, no deep trenching avoiding those gravity impacts. Reduced impacts more protective
4. Vacuum can take advantage of gravity slope opportunity similar to gravity assist (a principle of vacuum engineering). Reduced impacts more protective
5. Low Pressure System: Vacuum no septic tank footprint on site.
6. HDD: Directional drilled to avoid bio, Cultural resources, existing infrastructure. Reduced impact more protective
7. No septage hauling/pumping can be installed in wet weather
8. Without industry input these USEPA approved systems have not been vetted adequately. Airvac and Eone and the like must submit reports on these technologies and their benefits along with existing projects. Why has this been ignored? The best project with least impacts should be part of this DEIR and the RFQ, which is not the case.
9. The environmental, economic, and community preferences information has been omitted by Carollo and SLO County staff as to alternatives. Vacuum and LPS need to be vetted here. As the more protective technologies. This new information must be evaluated according to CEQA. May 2007 Carollo said cost savings from alternatives vacuum and LPS will

be insignificant. They say otherwise in fact a savings of 50% is expected and huge environmental protection from INI and exfiltration P55-2

10. Attachment, Forward collection comparisons: Here is a 14 point discussion of Step vs Gravity pointing out the many foibles of Gravity. Please address these concerns. How can gravity be preferred in 3 of 4 projects? It is a bold lie. And you have no basis for this judgement simply because the other side of the discussion was not vetted. This is an engineer that has both Gravity and Step experience. P55-3

;

11. $21,900,000 attachment: If Reverse Osmosis is required due to grab violations at Broderson the trucking cost, mileage and pollution need to be identified. Have you got those details? P55-4
12. 2-40 bulletin 118 details show half of recharge was sewer leakage. And attachment 09-15-04-8ssr speaks to Petaluma WW system upgrade, which was done by Carollo a pond wetland in an area of high rainfall. They did not vet this or award winning 2008 Carnation WA in their screening. Sustainable and low energy solutions. P55-5
13. 600r01034 attachment: pg 4 show where leakage in gravity collection systems are found...almost all joints to manholes lateral, trunks and mains. They leak a lot, what is your plan to fix them at what cost? It's time to be honest and transparent. P55-6
14. ABAG attachment; this shows the loss of life and property in earthquake which is magnified by our liquefaction conditions. Please open it. The Northridge and the Loma Prieta quakes killed people and huge lost property recorded. If the bridges into town are damaged where will help come from? The South Bay Fire Department is our emergency services if that building collapses on the fore equipment, the com goes out or telephone service which is common in strong quakes what is your plan to recover? Broderson with its lamella underlay will cause liquefaction under the SBFD and the Redfield woods housing development. Many people would need assistance, fires may start from ruptured gas mains and sewer service would not be restored without repairs, When must the county have a recovery plan? When would it be studied for adequacy? P55-7
15. Biosolids Final Report, attachment: Not a popular proposal it is again in public review due by 2010. Project like ponds STEP that have no trucking for up to 40+ years are the Number one choice environmentally. The Cal Poly marine biology toxicology team has seen Nonylphenol disrupting the lifecycles of Goby and other MBNEP biology. It is a special status not allowed. Leakage of sewer effluent either from Broderson or collection system needs to be eliminated. Czmacd attachment: notes that federal funded project must comply with Coastal Zone Management law enforced by the CA Coastal Commission in permit applications. Leaking sewer in our potable water supply is not protective of coastal resource (water), and CZLUO attachment: Says protect archeo cultural resources, which gravity P55-8

sewers do not. These trenches are all on grid with exact slopes; unlike HDD small pipe installation they do not allow avoidance of graves and artifacts. How will you mitigate these impacts? P55-8 CONT

16. DHS DWSAP attachment: The rules for new source water require an application of 120 pages detailing the new water source. When will this be available and who will fill out this application? Sewer effluent will have a high bar for treatment. Potable water supply mixed with EDC and emerging contaminants that no wastewater treatment removes, may require RO. How many truckload of brine for a one million gallon plant? Where will brine be treated Ventura? At what cost $21 million a year? How much more water will be removed from our aquifer for this? P55-9
17. Soil Slippage attachment: Homes slide off of lots in liquefaction conditions as Berkeley reports. Damage to foundations, plumbing and wall how will the SLO County restore taxpayers/property owners for the losses caused by this foolish decision if such a quake should occur and the County has caused the liquefaction conditions? Lamella will cause the effluent to run under these homes and SBFD. P55-10
18. Before development of empty lots proof of water supply and an HCP with a mitigation bank is required by Ca Coastal commission. Why would a second assessment pass (part of the capital sewer cost $27 million) if we are in RMS Level 3? Why if there is no habitat mitigation bank taking is not allowed? Is the cart pulling the horse? P55-11
19. Assessment passed by threat of Notice of Violation from CCRWQCB up to $5,000.00 fines and loss of use of your property. Coercion or encouragement? P55-12
20. Initiative petition, attachment: SECTION 1. PURPOSE "The purpose of this initiative measure is to establish standards and procedures for the location of sewer and wastewater treatment facilities to be constructed by the Los Osos Community Services District (the "District") both within and outside the District boundaries that would serve and be paid for by the people of the District. Such standards would serve to protect the people and the environment, including the groundwater, from health and environmental damage that may result from improper siting of such facilities." TRI W is slated for a lift station…that has to be put to a vote according to Measure B. Have you considered the gravity collection in that light? What impact might that have on the project. P55-13

Monowitz CCC permit, Attachment; the attorneys show that false or misleading information is grounds for denial of Coastal Development Permit.

Grounds for revocation of a permit shall be: P55-14

- Intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application, where the commission finds that accurate and complete information would have caused the commission to require

additional or different conditions on a permit or deny an application.[1]

Stated differently, all that the Commission must find to revoke the Permit is (1) the Commission was presented with incomplete, inaccurate or erroneous information; (2) the inclusion of this information was intentional; and (3) complete or accurate information would have caused the Commission to have issued at least one condition in a different manner, or have denied the application.

- 2. The Incomplete Or Incorrect Information Need Only Have Related To The Permit Application.

P55-14 CONT

B. The Information Must Have Been Intentionally Included.

The second prong is that the information was intentionally included.

1. 1. There Is No Required Showing Of Bad Faith.
2. 2. The Best Means To Determine Whether Information Was Intentionally Included Is To Determine How Often the Statements Were Made.

The County consultant Carollo has repeatedly stated unsupportable fact regarding costs and claims of the best most protective technology and that they all cost the same. How will you refute that?

21. Pipe Slopes 2 Attachment: Many pipe slopes in the MWH collection design are inadequate for 2' per second scouring speeds using the Manning formula. What will you do to make them functional? Vacuum truck daily pumping? The same slopes caused the Nipomo manholes to degrade by hydrogen sulfide and were replaced or repaired please give us the cost of R&R of decayed manholes due to inadequate slopes. To force fit gravity collection in this hilly environment the grade from South Bay to the Bay was designed at .05 or less many miles under the SLO County standards for gravity slopes. (Standard Improvement Specifications and drawings) section 11-351.1611. 100 gallons per person is the flow with double peak flow, minimum velocity of 2 foot per second minimum flow. Please explain how this will be achieved, as the stated flows in the Carollo reports are less than 70 gpp. Please account for the diurnal flows (morning and evening). The design flow and the gradient seem a challenge to meet in hilly Los Osos/Baywood Park. A 1/8 of an inch slope is a conservative and standard for gravity collection. Why not err on the side of caution rather than end up like Nipomo with replacement and vacuum sewer costs? These problems do not exist in STEP and LPS collections and to far lesser degree in Vacuum collection. So why chose the antiquated technology best suited for flatter conditions? Design flows are minimal for a community that has to conserve water reducing flows, why? Isn't this a design to fail?

P55-15

(D) The minimum gradient for 8-inch sewers
should be no less than 0.4 percent
Regardless of pipe material.
(E) The minimum gradient for 6 inch sewers

[1] Section 13105(b) provides the alternate ground for revocation of a permit: "Failure to comply with the notice provisions of Section 13054, where the views of the person(s) not notified were not otherwise made known to the commission and could have caused the commission to require additional or different conditions on a permit or deny an application."

should be no less than 0.6 percent, preferably 0.75 percent. P55-15 CONT

21. Re: Comments on fine screening, Attachment:
· Sewer plant O & M costs should be pegged through the life cycle of the loan period to the rate of energy related inflation. Will that be done?
· The sewer best option should be chosen by energy analysis. No detailed energy analysis has been done. I am really surprised at the lack of information and it's omissions. When will that be done? P55-16
· The simple mention of existing power rates in a graph has nothing to do with sustainability analysis and puts the whole project in jeopardy. Will you correct that?

· Energy availability will be a problem because of the10 to 30 percent hydroelectric related snow pack reduction and increases in peak energy demand due to Global Warming caused by higher summer temperatures. Will you take that into consideration? How? P55-17
· Loss of annual snow pack means reservoirs will have to shed winter overflow that was previously used to create spring and summer power.
· Blackout and brownouts may be the norm when this sewer plant comes on line in 2011.
· Lifting water to Broderson to achieve a 20% groundwater recharge is a fatal flaw. One it won't reach 20% and two it will pollute potable water. For every gallon recharged, five gallons have to be lifted to the sight at unknown energy costs.
· Aggressive on site greywater retrofit program would use zero energy and help clean the upper aquifer immediately. Will you consider that in calculating future water flows lower? As with Ag. Watering, there would be 'no discharge' if delivered to the root zones of home landscaping. Why not consider that? P55-18
· Conservation is the most energy efficient method for offsetting overdraft. It is not addressed adequately, When will you address that?
Comment:
The most accurate assessments of energy availability make the whole sewer project unsustainable and
contrary to good planning practices. Graphs courtesy of the Dynamic Cities Project, show a depletion
model for the United States. P55-19
Urban planning for peak oil and natural gas depletion is essential. The present sewer projects in the fine
screening would be severely impacted by any energy emergency above a class 2 emergency described
above. How ill you address this?
Final Comment:
The Fine screening is incomplete related to GHG issues, energy scenarios, sea level issues, and salt
water intrusion issues driven by sea level rise. Improving the environment is a holistic action. GHG P55-20

pollution is important for generations to come. Nitrogen mitigation that drove the original need for a
centralized project seems to have been forgotten as a goal. Consideration of the total water cycle has
been driven off course by an uncooperative Water board that has lost is way with environmental water
stewardship. The sewer project refuses to face sustainability issues that are mandated by the very same
state water agency in Sacramento that the RWQCB3 answers to.
· State GHG goals are being totally ignored in this study.
· Energy costs per ML nitrogen removed totally ignored in this study.
· Sea Level rise is being totally ignored by this study.
· Global warming impacts on energy are totally ignored.
· Nitrogen sequestering and recycling is totally ignored.
· On site and scaled cluster systems are not compared for energy efficency and omitted as viable while
considered elsewhere.
· Alternative energy is not proposed for operations.
· Sustainability's relationship to affordability and environmental justice is misunderstood and ignored.
· Co-generation is not proposed or studied although being used elsewhere in the State.
In defense of my position I would say that building a 1960's energy and resource consumptive community
sewer driven by market forces related to known engineering relationships and 'mega-project' construction
standards drives this study. Energy efficiency, global warming and GHG issues are left off the table.
Citizens should accept no excuse for their omission. – Steve Paige June 5, 2007
How will you address these concerns?

P55-20
CONT

22. 6 Table 1.1 needs to name the facultative ponds still in after fine screening. Is ADS, AIPS or Nelson
in?
7 1.2.1 Seawater intrusion reversal can be accomplished outside of the project by reducing the lower
aquifer draft in lieu of upper aquifer water with nitrate for residential landscape application. These
expenses can be paid by new development starting with the schools and park. Purple pipe is
encouraged and funded by DWR. See the 2003 white paper on reuse. (Our upper aquifer is
replenished by septic effluent and classed as partial wastewater or we would not need a sewer.
8 1.2.2 Golden State has applied to CAPUC for rate increase to pay for infrastructure and treatment

that will utilize the upper aquifer. How many ACY will that reduce the lower draft? This is an omission
that needs attention.
9 1.3 Flow projections will not change constituent treatment requirements, with ponds it is not a big
factor as with 24 hour in 24 out treatment train but that will effect disposal numbers.
10 FATAL FLAW "Properly installed bell-and-spigot..." will leak raw sewage into our drinking water
aquifer which will soon be the upper aquifer as the lower aquifer is not recharging.
11 2.1 KEEP THE WATERS IN THE BASIN unless the water is not needed then it can be sprayed and
disposed.
12 2.1.2 Lower aquifer is intruded and that portion is lost That is not necessarily so.
13 Upper aquifer water must be harvested to the point it does not leak into the bay.
14 Recharge must not have Phosphorus, which will clog soil pores. All treatments so far do not address
this.] impact on reuse. Calcium treatment that is affordable can be used in combination with wetlands
to remove phosphorus this so the treated effluent waters are safe.
15 2.3.2 Bullet 4 describes the cost per acre of grade II-III farmland as $40, 000.00 I think $10,000.00 is
a more responsible number. Giacomozzi was $323,000.00 for 35 acres at one point. More inflated
costs!
16 The case is correctly made that pumping the upper aquifer as landscape water is cheaper than
piping effluent back to town and much safer.
17 Table 2.1 page 33
18 PERCOLATION PONDS AT BRODERSON: This was a project FATAL FLAW in 1997 SLO County
plan
19 Urban wastewater reuse is a poor concept compared to upper zone nitrogen water for irrigation
instead of drinking water. Less piping and much lower health risk on school and community center.
20 They represent over 40ACF reduction in saltwater intrusion on the school/park sites.
21 2.1.2 Sea water intrusion is not irreversible. Early-indicator signals of groundwater contamination: the
case of seawater encroachment
22 FCGMA documents reversal of saltwater intrusion in Ventura County.
http://publicworks.countyofventura.org/fcgma/GMA%20Management%20Plan-

P55-20
CONT

P55-21

Final%20051506x%20electronic%20v2.pdf see page 25 for reversal of saltwater intrusion. Grants
from 319 USA were used, see page 75 reduction in seawater intrusion.
23 I recommend a cost benefit analysis for purple pipe in the reuse portion. And a note on septic INI if a
tank can be retrofitted in ground with sprayed epoxy, like manhole restoration it would only cost
$700.00 per tank. saving replacement and removal and retirement costs Replacements could take
place at the point of resale so as not to have the community dug up at once. Charlotte County did not
replace any tanks. For Gordon's benefit they used a Tarriff document to gain access to private
property i have a copy if you would like me to send it along. Tank need certification as per RWQCB3
requirements. If a tank is abandone it could be used to capture rain water and recharge through
existing leech fields. (No waste)
24 The STEP collection works well with pond treatment with low biosolids production and lowest energy
demand making the combination the most sustainable as the project goals state Many constraints
and costs have been added to STEP by this document that are not supported by the STEP Industry
data. I have screened out gravity due to the eventual leakage into the drinking water aquifer as they
have admitted. One other FATAL FLAW is the seawater intrusion around the Bay where the deepest
pipes will be trenched in. When saltwater enters the collection system then the treatment plant will
require reverse osmosis and brine trucking to Ventura County will ensue as many as 60 trucks a day. The expense of these impacts was not added to the gravity cost as I recall $60,000.00 a day or

P55-21
CONT

23. Re;Revocation of Coastal, Attachment: Revocastion of Coastal Development Permit Application No. A-3-SLO-03-113

Dear Commissioners, Peter Douglas, and Staff;

C.A.S.E. is represented by Burke, Williams & Sorensen, LLP. I say that so you will understand the gravity of our concern.

P55-22

1. The misleading and completely false information in the LOCSD/MWH sewer Project

Report led you to believe, incorrectly, that the proposed sewer was somehow located in the only place appropriate for Los Osos i.e. the Tri-W property on ESHA, upslope of the Morro Bay estuary. Raw sewage plant of this genre is responsible yearly for over 6,000 coastal spills a year. The risk of a plant upslope of the Bay is not acceptable when an environmentally preferred site is still presently available.

2. Wetland impacts have been taken lightly by the LOCSD. For example 4th and Pismo, a rout for sewer mains, has 20 foot tall willows and oaks growing halfway to 5th St upslope where a spring originates feeding the wetlands below all the way to the Bay a distance of several blocks. USF&WS have relied on LOCSD environmental consultant Crawford Multari & Clark to provide true and accurate information on wetland impacts. Th e District has 9 employees with truck that service and check the 3rd street pump station two blocks away. The willows described at the edge of the bay from the El Moro drainpipe to Sweet Springs preserve grow along the eastern side of the Bay. Such an omission could not be construed an oversight, but seem an unwillingness to redesign the collection system in that area.
3. There has been no study on the impact to that spring and it feeding of the wetland bio. The Coastal Act protects such wetlands. Routing a collection system that will require maintenance and repair through sensitive areas is improper and a FULL hearing is required, We have seen staff to staff advice between Mr. Monowitz and LOCSD General Manager Bruce Buel over the appeal process fail to address these issues by micro managing the project. That is why this method of oversight is inappropriate under Coastal Act Rules.
4. The preferred environmentally protective method in the Final EIR, STEP collection will avoid these issue. It was "too expensive" to use according to table 4-4 of the LOCSD Project Report. That was a lie. I am attaching a present cost of the environmentally preferred STEP collection and treatment plant on the preferred location in grade 3 AG land.
5. The "On Balance" argument used for this sewer location is a flat out lie. This LOCSD sewer in not more protective of the Coastal Resources. It wastes our water. It destroys wetlands. It is 10 times the National average in cost. It unnecessarily destroy ESHA in the sacred "Green Belt" where ESHA is contiguous. It may require 40 acres be negatively impacted by leech field failure as not effluent perc test have been applied to the drain filed areas.
6. The recovery plan in the Draft HCP has omitted the replanting with viable plants rather than seeds. And the likelihood of the HCP to address the perpetuity of the endangered species is very questionable. The Coastal Act/LCP require your commission CERTIFY these documents BEFORE a coastal development permit is issued.

P55-22
CONT

I respectfully request you withdraw the Coastal Development Permit for this project until the Habitat Conservation Plan is certified. At present it is going to SLO County for beginning public circulation and comment. The affected public here has yet had comment on this HCP or the final EIR/EIS from USFWS. Your cart should be behind your horse.

I respectfully request you Revoke the LOCSD CDP due to the project designs are incomplete. You may be aware that the Design Engineering firm has left out concrete and other amenities essential to build the proposed plant. The cost estimate was close to 50% in error. Only 3 of many qualified contractors bid the project showing there is a lot of risk tied to this project.

P55-22
CONT

The gravity collection design listed on the the DEIR SLO County web site is the one referred to above. That permit was cancelled by LOCSD. How will the concerns listed and answer how they will be mitigated, changed or addressed?

P55-23

24. Sewer Paper attachment:
The NRDC published some concerns in the paper "SWIMMING IN SEWAGE"
How will you address these environmental concern created by Gravity sewers? •
Endocrine toxicity;
• Gastrointestinal/liver toxicity;
• Immunotoxicity;
• Respiratory toxicity; and
• Skin or sense organ toxicity.
Bioaccumulative toxin that will store in fat tissues and all the risk associated with sewer effluent in potable aquifers well documented need to be avoided. How will you do that?

P55-24

Draft EIR available will enable Los Osos community residents, the project team and County elected
officials to consider the LOWWP's potential environmental impacts as the County identifies the
County of San Luis Obispo
Alternatives to the Proposed Project Los Osos Wastewater Project Draft EIR
7-6 Michael Brandman Associates
H:\Client (PN-JN)\0224\02240002\DEIR\1 Sections\02240002_DEIR Sec07-00 Alternatives.doc
Preferred alternative using environmental, economic, and community preferences information;
incorporates appropriate mitigations; and moves forward with the final design and permitting process.

1. The environmental, economic, and community preferences information has been omitted by Carollo and SLO County staff as to alternatives.

P55-25

Vacuum and LPS need to be vetted here. As the more protective technologies. This new information must be evaluated according to CEQA. P55-25 CONT

;

3. Appendix C Land Use
The Williamson act as related to prime ag land at Tonini is not addressed. Giacommazi has grade 3 grazing lands primarily. The impacts are quite different. Less piping for Giacommazzi. P55-26

4. Appendix D Groundwater
Recharge at Broderson is not evaluated for the impacts of the Lamellae fine lenses as they will move effluent laterally more than stated. Seawater mitigation will not happen. Water will surface down slope to destabilize housing development Redfield Woods as liquefaction conditions are caused by effluent lateral movement underneath the foundations. These home cannot get earthquake insurance. Please re evaluate. 300K gpd lost to INI in gravity collection. Please evaluate and mitigate these significant impacts. There are cumulative impacts here.

Recharge at Broderson will likely call for RO and Advanced Oxidation. Reverse osmosis membrane will reject over 30% brine that will be hauled to Venture brine receiving facility or elsewhere. Please address this missing information as complying with CA DHS Recharge regulations apply for Broderson if sewer effluent is used. P55-27
Over 60 truck loads a day at 5K gallons (42,500 pounds per truck). The air pollution is not quantified for pounds of diesel emissions.
The footprint of such treatment is not described. Please include.

5. Appendix E Drainage

NC

6. Appendix F Geology
Morro Bay gravity collection pipes were so damaged in the Dec 22, 2003 earthquake FEMA grants were awarded…In Los Osos where the water pipes were not damaged as in MB the septic tank remained intact as well. But the SLO County engineering put a penalty on STEP but not on gravity collection more bias based on not science.
The 1994 Northridge earthquake is well documented for damage to gravity collection (14years and $2 billion to repair) pipes but water pipes were much easier and quicker to repair over 60 of water was restored in 24 hours. Similar to STEP, LPS and Vacuum collections.

P55-28

4.6 GROUND LURCHING The October 17, 1989 Loma Prieta earthquake was responsible for 62 deaths and 3,757 injuries. In addition, over $6 billion in damage was reported including damage to 18,306 houses and 2,575 businesses. Approximately 12,053 persons were displaced. The most intense damage was confined to areas where buildings and other structures where situated on top of loosely consolidated, water saturated soils. Loosely consolidated soils tend to amplify shaking and increase structural damage. Water saturated soils compound the problem due to their susceptibility to liquefaction and corresponding loss of bearing strength.
Ground lurching occurs as the ground is accelerated during a seismic event. As evidenced by the Loma Prieta, Landers, Northridge, and San Simeon earthquakes, the effects;
The October 17, 1989 Loma Prieta earthquake was responsible for 62 deaths and 3,757 injuries. In addition, over $6 billion in damage was reported including damage to 18,306 houses and 2,575 businesses. Approximately 12,053 persons were displaced. The most intense damage was confined to areas where buildings and other structures where situated on top of loosely consolidated, water saturated soils. Loosely consolidated soils tend to amplify shaking and increase structural damage. Water saturated soils compound the problem due to their susceptibility to liquefaction and corresponding loss of bearing strength. See http://www.es.ucsc.edu/~es10/fieldtripEarthQ/Damage1.html
Ground lurching can damage facilities and buried pipelines. Ground lurching occurs due to
detachment of underlying stratigraphic units, allowing near-surface soil to move differentially
from underlying soil. The site is within a seismically active region of Central California that is
prone to moderate to large earthquakes. It is therefore our opinion that there is a potential for
ground lurching to impact the site. Ground lurching is generally not a geologic hazard that can

P55-29

be prevented, and therefore is mitigated by implementing preparedness measures. That is why lamellae is a new liquefaction condition not addressed. That changes the impact levels and the mitigation therefore is an unaddressed significant impact.

P55-29 CONT

The fault search routine in FRISKSP was used to identify active and potentially active mapped faults and fault segments within a 62-mile radius of the project vicinity They include: Los Osos, Hosgri, San Luis Range (S. Margin), Rinconada, Casmalia (Orcut Frontal Fault), Lions Head, San Juan, San Adreas (Cholame), and Los Alamos

5.4.5 - Level of Significance Prior to Mitigation
Less Than Significant or No Impacts were found related to the project being susceptible to fault
rupture and landslides. These issues will not be discussed further.

- Hokie and unscientific assumption in light of exisiting evidence that Los Osos has a 7.5 Hosgri fault 10 miles offshore 7 magnitudes higher than the San Simeon 2003 quake. The complete analysis and with the lamellae lenses this is inadequate. People will die, buildings will be destroyed if Broderson is implemented.
- The gravity trenching will cut through he clay lenses causing the waters to run down the trenches to the bay. A matrix of 8' deep trenches will make a creek that will drain these perched water bowls (clay lenses) out to the bay where we will lose a large mount of waters. When a quake occurs the wet soils in the trenches will consolidate and the engineered slope of the beds will be lost. The gravity sewer will cease to function as designed and Los Osos will be without sanitary services and at risk of cholera and other contagious diseases. How will services be provided? At what cost? Please detail the recovery plan as case law has adjudicated.

P55-30

rationale for determining a Less Than Significant or No Impact for each of the thresholds of
significance can be found in Appendix F-1. Table 5.4-1 is a summary of Geology Significance
Determination and provides a quick reference for items of No Impact, Less Than Significant Impact,
and Potentially Significant Impact (for which mitigation measures are proposed).

Project-Specific Analysis
Proposed Project 1
Strong seismic ground shaking can occur in response to local or regional earthquakes. The sites
under Proposed Project 1 are located within a seismically active area, and the potential exists for
strong ground motion to affect the proposed facilities at the sites under Proposed Project 1 during the
design lifetime. In general, the primary effects will be those phenomena associated with shaking
and/or ground acceleration. Given that it is likely for the proposed facilities to be impacted

Cumulative Impact Analysis
Proposed Project 1
Implementation of Proposed Project 1 may contribute to cumulative ground shaking impacts on
people and/or structures. Therefore, Proposed Project 1 may contribute to cumulative fault rupture
impacts; and this contribution is considered cumulatively considerable, therefore, significant.
Not correct as mitigation is called for but not detailed. It could be inadequate without seeing it. Kabuki. I am reading this with a tinfoil hat on.

P55-30
CONT

5.4.7 - Level of Significance After Mitigation
Project-Specific
Proposed Projects 1 Through 4
Less than significant.
Cumulative Again Not correct as a mitigation is called for but not detailed. It could be inadequate without seeing it. Kabuki. I am reading this with a tinfoil hat on.

Proposed Projects 1 Through 4
Less than significant. Not correct as a mitigation is called for but not detailed. It could be inadequate without seeing it. Kabuki. I am reading this with a tinfoil hat on.

7. Appendix G Biological

See California Native Plant Society responses which are significant and note that Native that are damaged by diesel will be invaded by nonnative like South African Veldt grass, thereby losing the mitigation for TRI-W and the excavation of the Broderson leach field will also be invaded by non natives or exposed to it. How will you mitigate those impacts? P55-31

8. Appendix H Cultural

Deep trenching of gravity collection will disturb cultural resources. Where there is an alternative of lesser impact that should be selected. See CZLOU and Coastal Act and Estero Plan which all require least impactive project to goals and guidelines. P55-32

9. Appendix I Public Hearing

10. Appendix J Traffic

21,900 brine trucks
Union Asphalt quantified the truck hours to move 2,500 trucks of river rock for leach fields at Broderson. From their Santa Maria Site; 228,690 mile, $1,262,869.05 materials, $734,349.00 trucking cost, 90 miles round trip. 170 minutes a trip at 20 yards of rock per load and each truck will weigh 80,000 pounds. A yard weighs 1.2 tons or 2400 lbs. Times 20=48,000 lbs. How much diesel fuels for all of this hauling please state the facts, the impacts and the mitigation.

P55-33

Please evaluate road impacts/damage and traffic flows. Why this obvious concern is not addressed is curious.

Similarly evaluate 3,750 truck loads of sandy soils to be removed from Broderson leach field and where it will be taken. If fill for what site? (leach field is 8 acres assuming 7 acres of leach area 6 feet deep with 4 feet of rock and 2 feet of other cover.)
Untitled 3 attachment: Shows utility pipes crossing gravity trench have to be cut, capped and replaced loss of service time needs to be identified for those properties. Have you evaluated this impact?

11. Appendix K Air Quality
All trucking mentioned above has AQ impacts. Will truck retrofits, as described by recent air quality legislation since this document was written, be implemented? That will increase the economics of this aspect of the project. Please re evaluates.

P55-34

12. Appendix L Noise created by Brodeson truck and RO trucking need quantifying, What will those potential impacts be to humans, plants and animals?

P55-35

13. Appendix M Agriculture
AG lost from Tonini is a greater impact than Giacomazzi grade three grazing land that is hard pan clay in the summer and expansive in the wet season. What will you do to reduce those impacts or mitigate them?

P55-36

14. Appendix N Visual Resources

15. Appendix O Environmental Justice
8.3 - EFFECTS FOUND NOT TO BE SIGNIFICANT
The environmental issues that were determined not to be significantly affected by the proposed
Project and therefore, do not require evaluation in the document, per section 15063(c) of the State
CEQA Guidelines, are as follows:
□Mineral Resources
□Population and Housing (Displacement of Substantial Numbers of Existing Housing and
People)
□Public Services and Utilities (Fire and Police Protection, Schools, Parks, Solid Waste, and
Other Public Facilities
□Recreation
The above environmental issues were determined not to be significantly affected by the proposed
project in the Notice of Preparation (NOP) for this Draft EIR (Appendix A), and in the Draft EIR for

P55-37

the Los Osos CSD Wastewater Facilities Project (November 2000). The NOP, 2000 EIR, and the
following discussion are intended to provide adequate environmental documentation for the issues
that will not be further addressed in the EIR.
So the impact of losing your housing does not count?
When renters lose their housing due to proposed $250.00 a month cost of this sewer as defined by SLO County. Many can barely make the rent payments. That is not an impact of this sewer. When senior lose their homes, that is not an impact? When marginal population become refugees that is not considered a project impact?
Please read Sierra Club sustainability policy for affordable housing stock:
"Affordable Housing Crisis Plagues America
More Americans than ever before live in inadequate housing or spend more than half of their monthly income on housing. As the growing population's demand for housing increases, we are failing to provide affordable, convenient options. Strip malls and cookie cutter housing developments do not represent the needs or wishes of most Americans. Suburban sprawl and limited transportation choices often fail to provide affordable housing. Even middle income Americans are feeling the affordable housing crunch as new home prices escalate.
Sprawl pulls investment and the tax base away from existing communities, and forces the expensive construction of new roads, sewer lines and other infrastructure. Smart Growth provides a solution to sprawl and the affordable housing challenge. Fighting sprawl can and should include Smart Growth and affordable housing." See http://motherlode.sierraclub.org/challenge_sprawl.html

P55-37
CONT

Gentrification: An Unnecessary Evil
Many residents of inner cities fear revitalization projects. If their community becomes a more desirable place to live because of improved services, accessible jobs, and business opportunities, won't housing prices rise? To prevent gentrification-the displacement of current residents by more affluent newcomers--community members can create a development plan that incorporates exclusionary zoning, fair-share housing, and rent controls to keep housing affordable. Replacement ordinances make sure affordable housing is not lost in the construction of better communities. Giving all citizens a voice in planning is the key to Smart Growth. Revitalization does not need to drive out low-income residents. And:

http://www.lhc.ca.gov/lhcdir/house/FrankJun01.pdf

The impacts of this project will be to reduce the affordable housing stock. Under General Plan, CZLOU and Estero Plan policies and principles that is an impact. Again case law supports protecting coastal resources for affordable housing. See CA Coastal Commission laws and Policies. And Ca Housing Policies and statutes. A project in conflict, where there is a project alternative of a lesser

impact should be selected. No where in the body of water law or state law does it state a community must implement the most costly alternative. In fact the opposite is true.

Fair Share housing to promote neighborhoods, create a vibrant,

Diverse community, and meet the needs of a variety of income levels… This project does not allow our diverse community, but forced gentrification. Our work force will need to commute causing more traffic impacts with these added costs

http://www.sierraclub.org/sprawl/affordable.pdf

P55-37
CONT

16. Appendix P Alternative information
Constructed Wetlands: Effluent disposal using constructed wetlands would create habitat as
Well as recreational and aesthetic benefits for the community. Wetlands are considered primarily
As a storage device. However, disposal through evapotranspiration could also occur.
Constructed wetlands typically operate at depths of 1 to 5 feet, and areas of both vegetation and open water allow for different types of habitat.
http://www.npr.org/templates/story/story.php?storyId=90043021
Yes and it remove the human carbon that causes disinfectant by products. Metals and emerging contaminant
sustainably. Polishing the water for AG reuse and exchange. At a low energy cost. See Clayton County Ga

"I like to say it's raining everyday in Clayton County because we're putting right now about 10 million gallons back in our water supply," says Mike Thomas, general manager of the Clayton County Water Authority.

Thomas says the reservoirs here are full and have never been in danger of being too low. That's because back in the 1980s, folks realized there wasn't enough water to support the growth, so they decided to build a system of wetlands and reservoirs that would help them save water. And… The price tag is also an advantage — it can be as little as half the cost of building a regular wastewater treatment plant.

P55-38

This idea probably won't work for bigger cities like Atlanta because it requires a lot of land. Still, it's attractive for smaller communities.

And there's an added benefit: Officials can create a nature preserve for those who live nearby.

P55-38 CONT

Table 1: Summary of Evaluation Criteria

Baseline Criteria	Sub-criteria	Comments
1. Water Balance	A. Salinity Management	Project must contribute to mitigation of saltwater intrusion into lower aquifer
		Due to lamellae lenses the effluent will not reach the lower aquifer and no seawater mitigation will occur. Project goal not met.
	B. Groundwater Recharge	Project must contribute to recharging groundwater resources in lower aquifer
		Again: Due to lamellae lenses the effluent will not reach the lower aquifer and no seawater mitigation will occur. Project goal not met.
2. Water Quality	A. Meeting RWQCB Requirements for WDR (Discharge limits)	Project must be effective in meeting effluent discharge levels for: BOD, total suspended solids (TSS), nitrogen, viruses, and bacteria.
	B. Meeting RWQCB requirements for elimination of pollution to groundwater	Project must involve mitigation of potential effects of effluent discharge on domestic water wells.
	C. Addressing emerging contaminants: pharmaceutical and other constituents	Project is required to be consistent with EPA standards for emerging Contaminants

P55-39

P55-40

Project fails to meet this goal. RO and Advanced Oxidation required, not included in project description.

P55-40 CONT

3. Energy The project is a higher energy user...not sustainable. See ponds and wetlands and AG exchange data in Ripley Project Report 2006.

A. Contributing to
Improvements in air
quality

Project must demonstrate:

• Minimizing particulate emissions

As stated above in Traffic and AQ the trucks trips necessary for Broderson and RO brine hauling will have significantly greater impacts than Ag exchange in Lieu of pumping where RO and trucking 3,700 truck of dirt are not required.

• Effectiveness in minimizing release

Los Osos EIR Technical Memorandum 2.1 Page 13
Kennedy/Jenks Consultants

Baseline Criteria Sub-criteria Comments
of airborne pathogens, and exposure
to vectors

P55-41

Any septage hauling will cause spores to be air borne See SWRCB fines of the Pacifica Plant.

B. Promoting
sustainability

Project must increase energy efficiency
over conventional designs, reducing
overall use of natural resources

C. Reducing greenhouse
gas emissions

Project must result in reduction of
carbon footprint from conventional
designs Carbon footprint big with gravity construction. Fused pipe under estimated

4. Costs A. Life Cycle Costs Project must involve:

• Efficient use of funds for capital
improvements

• Lowest feasible and practical
Operations and maintenance costs
Necessary to meet WDR discharge
Limits.

Gravity sewers have a long history of violations; Here is a plant designed by MWH the designer of the 3 gravity projects you have listed as project 2,3 and 4.

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Lila Tang of the San Francisco Bay Regional Water Quality Control Board said her agency would investigate the January spills in Pacifica.

"We have taken quite a few enforcement actions against the city (over time), possibly more action than against other cities," Tang said. "We haven't imposed

any corrective actions on them for the January incidents or for these types of wet-weather events in general," she added, noting that the city of Burlingame ended up discharging more than 2 million gallons of fully treated wastewater into the Bay during the same weekend.

Tang said the Pacifica plant could escape a fine if it had no alternative than to dump the wastewater, and demonstrates the ability to cope next time.

January's spill wasn't the only such incident in the plant's history, however. Documents provided to the Times show that another big storm -- lasting from Nov. 29 to Dec. 1, 2001 -- forced 110,000 gallons of partially treated wastewater out into Calera Creek without the benefit of the sand filters or the ultraviolet cleaning system.

Gromm attributes those incidents to growing pains at the plant, which had just come online in September of 2000.

"We had to figure out how to change the plant to respond to these high flows," he said. "Since then, I don't think we've had any problems" -- the most recent incident excepted.

But other violations of a different nature have plagued the wastewater plant since its inception.

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CONT

The Regional Water Quality Control Board fined the Pacifica facility $396,000 for violating its discharge-permit limits 137 times between January 2001 and Nov. 30, 2007.

The list of violations included at least 74 discharges of fecal coliform, 23 discharges of ammonia and two mercury-limit violations, according to documents obtained from the board.

Some of these problems are attributed to the plant's anaerobic digester, which becomes clogged with foam. Plant engineers employed a temporary workaround, and next week, construction crews will begin the process of modifying the machine at a cost of $1 million, according to Gromm.

Other machine malfunctions have also led to fines. In December 2001, a pump station in the neighborhood of Linda Mar discharged over one million gallons of untreated sewage into the ocean, leading to fines of $125,000.

In December 2005, 253,000 gallons of sewage escaped from the Rockaway pump station during a pipe system replacement. Pacifica was fined $190,000 and sued the construction company for negligence.

Reach Julia Scott at 650-348-4340

B. Staffing Requirements Project must minimize number of required management and staff positions.
Ponds, vacuum or LPS would have the lowest staff hours as well as ADS pond treatment.
C. Community Acceptance
Includes consideration of:
• Private property value
A large assessment of $25 to $40 million would be less acceptable than a project of $15 K. Nowhere in California even in areas of high income is there a sewer fee of $250.00 a month…it is outrageous taking of our rights to live under the constitution of the USA.
• Aesthetics
5. Permit ability A. Coastal Permit • Required for any work
• Must be in compliance with the Local Coastal Plan (LCP) Not in this project
B. Endangered Species Habitat Areas (ESHA)
Includes considerations of what is permitted in the ESHA
C. Environmental Includes consideration of the following:
• Endangered Species Protection Act
Many species including homo sapiens will be adversely affected in the endocrine systems as they develop. EDSAP
http://www.cardam.eu/NR/rdonlyres/733613DB-623F-4A8A-B193-B38D28E24103/0/HildaWittersfinal.pdf and
Since 1998 teat are ongoing for all domestic chemicals sold or released into the USA environment http://www.epa.gov/endo/
National Resources Defense Council and other plaintiffs joined and won a decision to force USEPA to go forward with that evaluation.
" In recent years, some scientists have proposed that certain chemicals might be disrupting the endocrine system of humans and wildlife. A variety of chemicals have been found to disrupt the endocrine systems of animals in laboratory studies, and compelling evidence shows that endocrine systems of certain fish and wildlife have been affected by chemical contaminants, resulting in developmental and reproductive problems. Based on this and other evidence, Congress passed the Food Quality Protection Act in 1996, requiring that EPA initiate EDSP to screen pesticide chemicals and environmental contaminants for their potential to affect the endocrine systems of humans and wildlife."
http://www.epa.gov/endo/pubs/edspoverview/index.htm
World wildlife federation
http://wwf.worldwildlife.org/site/PageServer?pagename=can_results_endocrine

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CONT

Dioxin Exposure, from Infancy through Puberty, Produces E http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2199303 endocrine Disruption and Affects Human Semen Quality.
There is ample and overwhelming evidence both from studies and common sense that the products we use daily. Prescription drugs, off of the shelf healthcare and cosmetics have levels of toxins and pollutants and other classes of chemicals that effect human health and development…mutagens and carcinogens that remain in sewer effluent after treatment process that is scheduled to be added to our potable and limited water supply for 15,000 people. Add to this the chemicals on the cleaning aisles of supermarkets, hardware and auto parts stores, local dry cleaners, auto Body and other stores that will be added pollutants…over 200,000 and we have a new source of potable water at Broderson that must meet recharge standards. You have failed to meet CEQA requirements to define impacts, classify impacts and meet mitigation standards. Our hope is a SEIR may do so.

Stably transfected human breast cancer cell line, developed by INSERM (Balaguer et al, 1999) □
Section 7 consultations with US Fish and Wildlife Service
• Archaeology
• Sensitive species/habitat
• State Marine Reserve
D. Land Uses Includes:
• No other feasible alternative for ESHA
• Prime agricultural land
• Siting of public utility facilities
E. Engineering Includes the following elements:
• Health and Safety
• Drainage
• Noise
• Odor
• Traffic Trips
• Operational Dependability

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CONT

5.1AG Exchange is different than reuse as we get potable water for treated effluent.. Using the AG X should be an A priority. ReCip TVA subsurface wetlands vector proof, in Small Flows article and followed by

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page 432 DEIR 7-24 Table 7-5 screening level A,B,C
Disagree with the values in penalizing and minimizing bias

Table 7.7 page 456: Wrong $11.4 Capital cost $355,000 O&M

Construction low:
$18 to $21 million
O&M medium:
About $800,000/year.

Page 464 top Wrong… ponds need dredging 15-20 year

Page 474 Other Effluent Disposal Alternatives
Constructed Wetlands Can't harvest water see Clayton County Georgia

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CONT

Conclusion:

There is evidences of constructive fraud through the process. The values reported in the due diligence, Rough/Fine screening tech memos and the resulting conclusions are based on questionable values. The alternatives were not vetted in some cases leaving out known data from Carollo project that won awards recently…Petaluma Pond/wetland and Carnation WA Vacuum sewer with wetlands.
This plan has a lot of deferred costs and impacts. How ill these be identified in the disposal plans?
Please obtain a copy of Los Osos TAC Report Comments by Tom Ruethr March 30 through April 8, 2007 Dr, Ruehr has 35 years studying this project from the earlier TAC in the 80-90s, was a member of the citizens group that formed the LOCSD "The Solutions Group" and a retired (last year) Soil Scientist at Cal Poly San Luis Obispo. He has information that needs considering in this DEIR…lamellae layered at 2" to 4" depth hold the effluent in the soils and crerate a lateral flow. As I have pointed out earlier. If you do not recognize these problems the CA Coastal Commission or the Courts may. It is after all scientific evidence.
More study needs to be completed and Tom supports my view that Vacuum, Low Pressure and STEP have a superior outcome for collection in these conditions than does gravity. Please invite and evaluate the submissions of LPS, Vacuum and STEP/STEG as well has wetlands and AG exchange.
Thank You AL Barrow Coalition for Low Income Housing and Citizens for Affordable and Safe Environment.

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*Eone puts a valve at the septic tank junction to the grinder pump for power outages,

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CONT

P55
Attachment 1

From: "abarrow" <abarrow@sbcglobal.net>
To: "Tom Ruehr" <truehr@calpoly.edu>
Cc: "al barrow" <abarrow@sbcglobal.net>
Sent: Saturday, September 01, 2007 5:35 PM
Subject: Fw: :Collection Comparisons, 3 years ago and the myth still stands

----- Original Message -----
From: Mike Saunders
To: 'abarrow'
Cc: 'Bill Cagle'
Sent: Friday, August 24, 2007 11:28 AM
Subject: RE: :Collection Comparisons, 3 years ago and the myth still stands

Mr. Barrow, I have addressed the comments presented by Mr. Taylor. My comments have been added in red type so that they can be differentiated from the comments being made. I have included the initial e-mail for reference purposes. The statements and replies are as follows:

Statement 1: First of all, your system. Even though you often refer to it as STEP/STEG, if the collectors are a uniform 3 to 4 feet below the surface and follow the contour of the ground, then the collectors must be pressurized. Water will not flow up hill (to follow the contour of the ground) unless it is pumped. So you are talking about a pure STEP system. There is no part of it that is STEG.

This statement is incorrect, flow can travel over an up gradient provided that the Static Head (Determined by the tank discharge elevation) is higher than the pressure gradient within the pressure main. The proposed treatment location from the Ripley Report has elevations ranging from 30" to 110' above sea level. The service area in Los Osos has elevations in some areas more than 160' above sea level. This elevation variance does create the possibility that STEG could be utilized. Unfortunately, we cannot determine how much STEG may be utilized until design work is initiated.

While it has never been discussed in the fine screening, because the STEP/STEG system is pressurized, treatment can easily be decentralized to multiple locations. Typically this would be considered in areas that may have a large irrigation need. By decentralizing the treatment, it saves on the cost of force mains and purple irrigation piping. For example, if the golf course has a need for 200,000 gallons of irrigation water per day, 200,000 gallon of treatment could be decentralized to the vicinity of the golf course. The low elevation of the golf course could facilitate the ability for more STEG systems to be utilized..

At this time, we have not seen any pricing that assumes the use of STEG systems. Any systems that could become STEG probably would save about $1000.00 in cost per home. Additionally, O&M cost would probably be about 50% lower per household for each one that uses STEG.

Statement 2: I make the distinction, because the 2000 Oswald Report, was a hybrid. Bill Bownes felt that the lowest lying parts of the Community should be STEP. He was planning to use shallow trenching for these. This system would cover 30%. The 70%, in Bownes' design, would be STEG. As you know, STEG systems require a slightly greater minimum fall than a conventional gravity sewer. So STEG collection systems will go slightly deeper into the ground than conventional.

The minimum fall in a gravity sewer pipe is determined by the minimum flow velocity. Typically the minimum flow velocity for gravity sewer is 2 Ft./sec. The minimum flow velocity is necessary for self cleansing of the sewer pipe (to flush solids out of the main). Generally, flow velocity in gravity sewer pipe is determined by Manning's Equation. Variables in Manning's Equation that affect the determination of flow velocity are the interior pipe characteristics (essentially the amount of pipe friction), the hydraulic radius (this is determined by dividing the cross sectional area of the pipe by the wetted perimeter that is contact with the pipe) and the slope of the pipe.

Relatively speaking, as you increase pipe size, the minimum slope necessary to achieve the minimum flow velocity decreases. However, gravity sewers are typically sized at a minimum of 8" diameter pipe despite the fact

that the hydraulic capacity of an 8" pipe is not required. This project, I believe, is proposing 8" pipe at .16% grade. By Manning's equation, assuming a full pipe, the capacity of this typical pipe is in the range of 400 gpm. This is enough capacity for approximately 700 to 750 homes assuming typical flow rates for single family homes. This size pipe is however, utilized on all pipes. Accordingly, a pipe with capacity for 700 homes may only have 1 home. When you don't have enough homes on the main. which is most often the case, the actual flow velocity will never approach the necessary 2 ft/sec for scouring velocity. Accordingly many states mandate minimum slopes of .4%, mandate minimum flow velocities based on actual hydraulic flow (greater fall) or they initiate an intensive maintenance program to flush lines that are prone to sedimentation. If the gravity system was actually designed to assure minimum flow velocities, I believe that the system depth (deeper) and/or the number of lift stations (more) would be significantly different.the cot of the gravity system would therefore, be higher.

Stating that a STEG system requires more fall is incorrect. In a normal STEG application, the pipe still follows the topography of the land as previously mentioned. Static head, and not pipe gradient, is utilized to move the wastewater. Alternative design options can include an on-site tank discharging to a conventional sewer that empties into a traditional pump station or homes can gravity sewer to a common tank that serves multiple homes. If the wastewater flows through a STEP tank before it enters a gravity pipe, the pipe friction will be less and the need for a minimum flow velocity can be reduced from 2 ft/sec to 1 ft/sec since there are significantly less solids in the raw wastewater. In theory, the slope of a gravity sewer receiving flow from only STEG tanks could require as little as half the slope as one receiving conventional wastewater flow only. If the wastewater was gravity flowing to a common tank serving more than one house, the slope would be exactly the same.

Statement 3: So, in your STEP system, the 204,000 linear feet of collectors would cost $3.4 million. There would be about 4800 laterals that would have to be hooked up. Using Tidwell's figure of $3500, this would come to about $16.8 million. The combination would be $20.2 million. I doubt that the figures include a 10% contingency, inflation escalator, etc. but let's go with that.

If we are anticipating 4800 connection, We would generally anticipate the following methodology would be utilized. First, we have to recognize that STEP mains, just like water mains, are constructed in the green area adjacent to the road and not within the black-top area. Also, a service is typically 1" in diameter. Additionally, the main is generally on the opposite side of the road from the water main. Accordingly we should anticipate that 1/2 of the laterals would be what we call long side services (they must cross under the road) and 1/2 would be short side laterals. Therefore approximately 2400 homes require long side laterals. Most often, long side laterals can be combined to serve two homes (just like water services). With this in mind, we can now state that approximately 1200 long side service would be required with construction of the main. A long side service, installed using a mole to cross under the road (rather than cutting the road), will typically cost in the range of $900.00 each. Therefore long side services can be anticipated to cost around $1.1 million total.

The short side services can be installed with the main or they can be installed when the on-lot connection is made. While these services can and will serve two homes when convenient, often individual service can be more cost effective since they can reduce the on-site cost. If the laterals are installed concurrently with the main we would expect the cost per lateral to be in the range of $500/each. If we ran individual services, this cost would be in the rang of $1.2 million. If we combine services to double services, where it make sense to do so, we could probably get this cost down to the $800,000 range. When the on-site work is done, the contractor is already excavating to within 5' of the new main. Deferring the lateral installation until the on-site work is done, could probably push this cost to less than $500,000.

I would speculate that the actual cost of services is more in the range of $2,000,000 - $2,500,000.

It should also be noted that vacant property does not require a lateral when the main is constructed. Laterals can be tapped onto the main, when the property is developed. While we haven't quantified this cost reduction, it may be fairly substantial.

Contingency is not a real cost number, it is money set aside to pay for additional costs that were possibly unforeseen during the design process. During this analysis, the word contingency has been thrown around liberally and has been applied inequitably between STEP (30%) and gravity sewer (10%). The potential for additional cost due to unforeseen impacts is very low for STEP. Since it is pressure main and because it is small diameter pipe, changes can be made to accommodate unknown utilities, rocks, drainage structures, etc. simply by deflecting the pipe (no fittings). Accordingly there is no cost impact. Gravity sewer, being grade dependent, has huge cost implications when unknown construction impacts are encountered. It should be understood that

contingency should be based on construction risk and therefore should be much higher for gravity sewer.

Statement 4: If we go back to MWH's 5/30/03 cost estimates, we find that the collection system itself was figured at $32.8 million. But to compare to a STEP system, we have to include the pump stations as well. These are $3.5 million. The combination, then, is $36.3 million.

The need for pump stations in pressure systems is determined by the ability of the individual on-site pumps being utilized. Orenco utilizes a multi stage wastewater pump specifically designed and constructed for this application. The shut-off head approaches 240'. Additionally, because solids are removed from the wastewater stream, pipes can be liberally oversized to reduce pressure loss within the pipe. We do not anticipate the need for any lift stations in a community of this size as all of the pumps will pump directly to the point of treatment. Accordingly the capital cost and O&M costs are not applicable.

Statement 5: Clearly, there appears to be a tremendous cost saving from STEP. But any such comparison as this has to include the property owner's cost as well.

At no time has any analysis of wastewater for Los Osos considered the varied cost models between STEP and gravity. In fact, every effort has been made to place STEP into the same model as gravity sewer. The inherent problem with gravity sewer is the high up-front cost. That is because the bulk of the cost is in the collection main. Additionally, all of the O&M costs are generally attached to the main and the lift stations. Accordingly, to keep O&M costs down, on a per customer basis, customers must be quickly be connected so that they start sharing the cost. When customers do not connect, existing customers will pay an inequitable share of O&M costs.

There is this misconception that gravity sewers have low O&M costs. People need to understand that gravity sewers have a low *initial* O&M cost. Aging gravity sewer systems are becoming problematic in this Country, and the real costs are becoming more documented. The average age of a gravity system in the Unties States in a little more than 30 years. As the system ages, I&I (inflow & infiltration of extraneous water), expensive R&R (Renewal and Replacement), expensive system failures, SSO's (Sanitary Sewer Overflows), on-site lateral replacement, all have potentially huge cost implications. Growing communities are often able to keep these costs somewhat in-check to their customers by the addition of lower maintenance new gravity systems that help distribute the impact of aging systems to more customers. Small communities, in particular, that have aging gravity systems, without developing areas, are starting to experience significant financial hardships with regards to O&M of gravity sewer systems. Most often these communities are asking for financial assistance from State and Federal Agencies. The gap between the financial needs and financial assistance available to help defray costs is trending towards a larger financial gap.

Despite this, gravity sewer continues to get a free pass in most analysis. What I mean by this is that the Consulting Community continues to preach the benefits of new pipe materials and they get away with quoting costs from new gravity sewer systems. If gravity sewer were to be placed under the scrutiny that emerging systems such as STEP receive, people would be horrified. I've attached an interesting paper for anyone that is interested.

By comparison O&M costs are typically quoted as high end cost. No consideration is given to the fact that these systems have extremely low maintenance cost during the initial 7 to 10 years of operation. Pumps last 20 years, tanks pump-outs are 10 years and the call-out rate is probably in the range of one call-out per 10 years. Does 500 call-outs per year at 30 minutes per call over the initial 7 years sound expensive, complicated or excessive? O&M cost for STEP are normally quoted in terms of average cost and are inclusive of R&R and tank pump-outs. Do you think that $450,000 includes R&R of lift Stations, manholes and gravity sewer mains.

The on-site capital cost for STEP can be a deferred cost. What this means is that while on-site infrastructure can be installed as part of the main project, there are also opportunities to defer the installation until service is required. This deferral of cost and infrastructure, creates opportunities for alternative financing, lower initial financing and more ability to focus cost assistance to those in financial need. For STEP systems, O&M costs are extremely low for the collection mains and are almost entirely associated with the on-site infrastructure. Accordingly, the O&M cost does not become an issue until you have a paying customer. Unlike gravity sewer, this keeps O&M costs in line with revenue being generated. The homeowner does not have any direct on-site O&M costs with the exception of electrical costs estimated to be in the range of $12.00 annually. The system is intended to be publicly owned with the monthly bills being charged just like any other centralized sewer system. In fact, the homeowner has less liability, since they only own a very short lateral to the tank rather than being

responsible for a long lateral extending to the property line. Lateral replacement is costing homeowners in older systems anywhere from $3,000 to $20,000 to replace when they fail.

Statement 6: In the Project Report, MWH estimates homeowners' cost at $9.4 million for the lateral, decommissioning septic tank, etc. This included 20% for contingency and 2% for inspection, etc. For comparison purposes, it would probably be reasonable to figure only about $1000 would be for the lateral itself.

The on-site portion of the lateral is typically a 1" pressure pipe and is generally installed with a walk-behind trencher. We would considered the on-site costs that were stated to be more than inclusive of this small cost. The costs for the lateral extension from the main has already been discussed.

Statement 7: In the STEP system, there would be about $1500 for the pump, chamber, controls, separate electrical service, etc. With the $1000 for the lateral, this is $2500/home or $12 million for the project. This would raise the STEP system to $32.2 million. Total at this point is $45.7 million for the current project.

We've already discussed the methodology for installation of the main. We should add that the main can be installed trenchless or by open-cut. Directional boring is utilized as the trenchless method for installing small diameter pressure pipe and is utilized when logistics or cost impacts such as driveways, roadways, trees, etc make open trenching a more expensive. We provided the County with a bid tab of a STEP project that was entirely directional bored and the cost worked out to slightly less than $40/ft inclusive of laterals (both sides) and all taxes, overhead and profit. The pipe size was larger than we would generally need in Los Osos, so the cost is probably conservative. We have also provided the County with a bid tab of a project that was completely trenched that came in at a cost slightly below $20/ft. 230,000 feet of pipe at $40/ft is less than $6,000,000. While we don't necessarily suggest that this is the number that should be utilized for analysis, we would suggest that the high end costs stated in the fine screening report should be carefully scrutinized. We believe that the Ripley estimates were a good conservative estimate of STEP costs for budgetary consideration. Typically, on-site installations costs are available but have ranged from $3,500 to $7,500 inclusive of all materials, labor, taxes and profit. This work includes connection to the main. Additionally we would consider $500 per home to be a reasonable cost to provide a dedicated 110V circuit from the home. The fine screening uses electrical drops from the public right-of-way with SRF requirements as justification. At $6,000 per home, we would speculate the overall on-site cost, based on typical costs we see, is in the range of $30,000,000. Again this is a typical cost, not a budgetary conservative cost.

Statement 8: But, next comes the part you won't like. MWH figured it would cost about $20 million to replace all of the septic tanks. Dana Ripley agreed. Experts in the field (Bill Bownes, MWH, Dana Ripley, for starters) all will say the septic tanks should be replaced. Bownes has designed over 100 STEP or STEG systems and 100% of the septic tanks were replaced in all but 3 of these projects.

STEP programs have been done where the existing tanks have been utilized. Generally, there are some inherent risks in adopting this methodology because existing septic tanks are generally sized smaller than a STEP tank. Additionally, it is rare to see water-tight septic tanks that are build to the quality that we mandate for our STEP installations. If we were to consider utilization of the existing tank we could probably anticipate a savings in the rang of $1500 per connection. This savings however, would probably translate into higher maintenance costs, less efficient solids digestion in the tanks, higher potential of I&I and more likelihood of tank failures (structural).

We would also recommend that tanks be replaced. We would consider the costs that have been discussed to be inclusive of tank replacement.

Tank replacement is not as cumbersome as the fine screening would lead you to believe. The analysis shows the new tanks being installed in an adjacent location to the existing tank with decommissioning of the existing tank. It also states that all new tanks will be installed in the front yard. We would suggest that this method causes too much disruption to the property and incurs unnecessary costs for additional plumbing ,excavation and sodding. We would suggest that it is more appropriate to remove the existing tank and replace it with a new tank in the same location. Excavated material, being less, is placed on a tarp to avoid impact to the existing sod and plywood be utilized under the equipment tracks to avoid rutting. The existing tanks can be removed and staged at a common location for crushing and possible reclamation as aggregate or structural fill.

We have heard that the impact to make a STEP connection will be more than gravity. We do not see this as a true statement. The STEP connection will require excavation of the existing tank, backfilling and restoration. The

service line can be trenched with a walk-behind trencher with very little impact or restoration required. By comparison a gravity connection requires excavation of the existing tank with removal, or crushing in-place being the most common decommissioning techniques. Plumbing must than be installed from the home to a typical depth of 4" at the property line. This trench is typically at least 12" wide and requires compaction and restoration. Also, a gravity connection will often traverse a property to connect to a common why shared with a neighbor.

Having stated our preference for tank replacement, there will still be opportunities that we would consider appropriate for utilization of the existing tank. Typically, multi-family complexes and commercial buildings have liberally sized septic tanks that are of better structural quality. These installation should be evaluated on a case-by-case basis for consideration of utilizing the existing tank. Also, the fine screening states that rear lot septic tanks will be pumped to the front lot location with a grinder pump. The logic applied, is that these tanks may be inaccessible for the equipment necessary to install a new tank. It is important to note that new excavation equipment is available to get into every tight locations. Also, fiberglass tanks can be utilized to avoid the need for large equipment capable of lifting a heavy tank. After these options are considered, and if it the existing tank is still deemed inaccessible, we would recommend installation of a STEP package into the existing tank. We would never recommend that the O&M cost for the additional grinder pump ($600/yr) be incurred, nor would we recommend that the capital cost ($2500-$5500) be incurred for the grinder pump and alternative tank location. Incidentally, the cost of 200 grinder pumps that were identified in the gravity sewer analysis do not appear to be adequately quantified in terms of cost.

Statement 9: The problem is the limited hydraulic capacity of the STEP collection system. When you change from the 8" conventional collector to a 3" STEP collector, there is a reduction of 86% in hydraulic capacity. This is pretty gross. Particularly since septic tanks are not really made to be watertight to infiltration from above. Water in the soil above from rain will find its way into (and out of) the tank through the lids (particularly if tree roots have entered) and the crack between the sides and the top. In a STEG system, essentially every tank, at about the same time, will put a few quarts of effluent into the collection system. Even though each tank does not add much, the combination of all tanks, at the same time, will overwhelm the system.

This reply has already touched on hydraulic capacity. It is true that an 8" gravity main typically can hold much more capacity than is necessary. One should consider however, that aging gravity sewers have generally eaten up this capacity when I&I overcomes the system. I&I, in many aging systems, can easily be a multitude of time higher than the average daily flow from homes. In fact SSO's (Sanitary Sewer Overflows) are common in gravity mains that have excessive capacity for residential flow.

To state that a gravity main has 86% more capacity than a 3" STEP main is incorrect. One pipe is gravity flow, laid at minimum velocities and one is a pressure pipe. As already stated, the gravity sewer pipe has about 400 gpm capacity when flowing full at 2ft/sec (capacity and flow velocity can be increased with greater fall, but of course capital costs will also increase). By comparison a 3: pressure pipe can handle flows of 5ft/sec on average. Also, higher velocities can be handled on an intermittent basis during periods of higher flow rates. The capacity of a 3" pipe at 5ft/sec is around 100 gpm. Also, intermittent flow up to 150 gpm probably wouldn't cause much concern. The critical point however, is that peak flow during rain events will never approach that of a gravity system. Accordingly, STEP pipes can be designed much closer to actual flows that gravity sewer can ever be. Additionally, with STEP, you can oversize the pipe for additional capacity with little or no detrimental effects. Again, since STEP doesn't have solids to settle out, flow velocities are not as critical, and oversizing can be more easily considered. If an 8" STEP main were utilized, we would generally estimate the capacity to be in the range of 800 gpm, twice that of gravity sewer.

Statement 10: It is virtually impossible to analyze the reaction of a STEP system. The infiltration will go into the pump chamber. Typically, this will store effluent, and when the float switch says it is full, pump out 50 gallons. The infiltration will cause more pumps to “fire” than would normally be the case. And each “firing” will put 50 gallons into the system.

By replacing the on-site septic tank, we are installing an engineered tank and pump, designed to be water-tight. During construction, each installation is tested to show it is water-tight. If for some reason, the tank is compromised and infiltration did occur, it can be detected by checking pump-run times. If you want the system to be absolutely water-tight, telemetry can be added to each on-site system that will notify the operator of extraneous flow into the tank.

It is not impossible to analyze a STEP system. In fact the lower impact from I&I and the fact that it is pressurized

with a common pump from each residence makes modeling a STEP system fairly easy. Water systems are modeled the same way. By comparison, I would venture that gravity sewers can be much more problematic to accurately model because of extraneous factors such as I&I.

Theoretically, in an event that more pumps "fire" than was expected during design, pumps further from the discharge would hit shut-off head. This means that they do not have ample pumping capability to pump against the existing line pressure. If this would ever occur, the pumps closer to the discharge would still pump and would eventually reach the pump-off level. As they shut-off, line pressures would drop and adjacent pumps would be allowed to activate. STEP tanks that were locked against existing line pressures would alarm to tell the operator that they have not pumped. However, each installation has more than a days storage before they would ever reach overflow. Eventually all pumps will discharge.

Statement 11: But, this is not the kind of thing that people like you and I can have a good feel for. That is why experts were born. And, their feeling is probably one based on experience – not theoretical concepts. If the $20 million is added to the STEP system, we end up at $52.2 million for the STEP system and $45.7 million for the current.

Experts have weighed in and largely have been ignored. Everything that has been presented is generally theoretical. I would like to think that Orenco, with 25 years of experience in STEP and more than 150,000 STEP systems in service would qualify as an expert. Additionally, having spent 9 years as the Technical Services Manager for the largest and oldest STEP system in the World, probably validates my statements. In that position I salvaged a failed conventional sewer program ($600,000,000) and managed to satisfy the State with a 5000 property STEP initiative. I also constructed STEP to more than 14,000 properties in an area that had been stalled for 20 years because property owners could not develop without sewer.

Statement 12: It is also important to point out that the relatively small ($1.5-2K/home) homeowner's cost for the regular system would zoom to something like $6.5-7K. And this has to be borrowed at a rate 2-3 times higher than the SRF loan. Any consideration for the cash-strapped homeowner would rule against this increase.

We believe that the on-site cost can be handles in a multitude of ways that can make it affordable to the homeowner. Also it allows for those that are experiencing financial hardship to be identifies with assistance tailored to their ability to pay. The problem is that all typical financing is tailored toward the conventional model. We would state that this is proving to be a highly inefficient way to allocate public assistance such as SRF loans or grants. Orenco has continued to state that an RFP allows teams to show a complete solution with bottom-line costs and with explanation of how a different expenditure model can be leveraged to assist homeowners.

Statement 13: One further word. To take a chance and go against the expert advice might work out. Then again, it might not. If not, the cost of the fix will be astronomical. And no one can be held accountable except the owner (CSD, city or whatever) because they overrode the advice of the engineer.

STEP systems have been in existence for 35 years. Orenco has been installing STEP systems for 25 years. STEP is not a new system as it is so often painted. Orenco has stated that private operations can be included in a proposal if they have concerns such as the ones you have stated.

Statement 14: There are no magical systems, Al. I am truly sorry. But that is a fact.

The message that we have always shared is that septic abatement is not a one-system-fits-all solution. Gravity sewer, despite statistical data that shows that smaller communities are struggling to maintain, gets placed a free pass in virtually every evaluation. The decisions on technology most often are placed in the hands of consultants who's fees are based on capital cost. We firmly believe that an RFP for a design/build/finance project is truly the best method to assure that the best solution is properly aired, evaluated and initiated. While an RFP affords competing technologies to show what they can achieve it in no way diminishes the ability of conventional approaches to show they are the better choice.

Thank you fro the opportunity to address these concerns.

Respectfully,

Michael L. Saunders
National Accounts Leader
Orenco Systems, Inc.

msaunders@orenco.com

Office 1-800-348-9843 (Extension 443)
Cell 941-276-8586
Fax 941-764-6069

Visit our web site at www.orenco.com

From: abarrow [mailto:abarrow@sbcglobal.net]
Sent: Friday, August 24, 2007 1:51 AM
To: mike saunders
Cc: al barrow
Subject: :Collection Comparisons, 3 years ago and the myth still stands

hello Mike;

If you have a few minutes you could print between the lines in red to clear some of this up.

Al Barrow, President, Citizens for Affordable and Safe Environment & Coalition for Low Income Housing

----- Original Message -----
From: Gordon Taylor
To: Al Barrow
Sent: Friday, August 27, 2004 7:12 PM
Subject: Collection Comparisons

Al,

It is interesting to play with the numbers for a collection system. You never can tell where you will end up.

First of all, your system. Even though you often refer to it as STEP/STEG, if the collectors are a uniform 3 to 4 feet below the surface and follow the contour of the ground, then the collectors must be pressurized. Water will not flow up hill (to follow the contour of the ground) unless it is pumped. So you are talking about a pure STEP system. There is no part of it that is STEG.

I make the distinction, because the 2000 Oswald Report, was a hybrid. Bill Bownes felt that the lowest lying parts of the Community should be STEP. He was planning to use shallow trenching for these. This system would cover 30%. The 70%, in Bownes' design, would be STEG. As you know, STEG systems require a slightly greater minimum fall than a conventional gravity sewer. So STEG collection systems will go slightly deeper into the ground than conventional.

So, in your STEP system, the 204,000 linear feet of collectors would cost $3.4 million. There would be about 4800 laterals that would have to be hooked up. Using Tidwell's figure of $3500, this would come to about $16.8 million. The combination would be $20.2 million. I doubt that the figures include a 10% contingency, inflation escalator, etc. but let's go with that.

If we go back to MWH's 5/30/03 cost estimates, we find that the collection system itself was figured at $32.8 million. But to compare to a STEP system, we have to include the pump stations as well. These are $3.5 million. The combination, then, is $36.3 million.

Clearly, there appears to be a tremendous cost saving from STEP. But any such comparison as this has to include the property owner's cost as well.

In the Project Report, MWH estimates homeowners' cost at $9.4 million for the lateral, decommissioning septic tank, etc. This included 20% for contingency and 2% for inspection, etc. For comparison purposes, it would probably be reasonable to figure only about $1000 would be for the lateral itself.

In the STEP system, there would be about $1500 for the pump, chamber, controls, separate electrical service, etc. With the $1000 for the lateral, this is $2500/home or $12 million for the project. This would raise the STEP system to $32.2 million. Total at this point is $45.7 million for the current project.

But, next comes the part you won't like. MWH figured it would cost about $20 million to replace all of the septic tanks. Dana Ripley agreed. Experts in the field (Bill Bownes, MWH, Dana Ripley, for starters) all will say the septic tanks should be replaced. Bownes has designed over 100 STEP or STEG systems and 100% of the septic tanks were replaced in all but 3 of these projects.

The problem is the limited hydraulic capacity of the STEP collection system. When you change from the 8" conventional collector to a 3" STEP collector, there is a reduction of 86% in hydraulic capacity. This is pretty gross. Particularly since septic tanks are not really made to be watertight to infiltration from above. Water in the soil above from rain will find its way into (and out of) the tank through the lids (particularly if tree roots have entered) and the crack between the sides and the top. In a STEG system, essentially every tank, at about the same time, will put a few quarts of effluent into the collection system. Even though each tank does not add much, the combination of all tanks, at the same time, will overwhelm the system.

It is virtually impossible to analyze the reaction of a STEP system. The infiltration will go into the pump chamber. Typically, this will store effluent, and when the float switch says it is full, pump out 50 gallons. The infiltration will cause more pumps to "fire" than would normally be the case. And each "firing" will put 50 gallons into the system.

But, this is not the kind of thing that people like you and I can have a good feel for. That is why experts were born. And, their feeling is probably one based on experience – not theoretical concepts. If the $20 million is added to the STEP system, we end up at $52.2 million for the STEP system and $45.7 million for the current.

It is also important to point out that the relatively small ($1.5-2K/home) homeowner's cost for the regular system would zoom to something like $6.5-7K. And this has to be borrowed at a rate 2-3 times higher than the SRF loan. Any consideration for the cash-strapped homeowner would rule against this increase.

One further word. To take a chance and go against the expert advice might work out. Then again, it might not. If not, the cost of the fix will be astronomical. And no one can be held accountable except the owner (CSD, city or whatever) because they overrode the advice of the engineer.

There are no magical systems, Al. I am truly sorry. But that is a fact.

From: "albarrow" <abarrow@sbcglobal.net>
To: "Gail McPherson" <ronmcpherson@earthlink.net>; "Jim Tkah" <jimtk@charter.net>; "Lisa Schicker" <lisaschicker@charter.net>; <truehr@oboe.aix.calpoly.edu>; "Chuck Cesena" <clcesena@charter.net>; "Steven Senet" <stevensenet@yahoo.com>
Cc: <abarrow@sbcglobal.net>
Sent: Wednesday, March 02, 2005 9:15 AM
Attach: cap_168167.jpg
Subject: $21,900,000

Hello,
Here is a great picture of an RO plant. Because San Jaun has an ocean outfall (assumption) which we won't trucking brine will add 60x $1000.00 gallon brine tankers to Ventura a day that adds up to $21,900,000.00 a year. For our picture gallery this one is easy to understand their is no room on the Tri-W for this.

This is a defferred expense for providing drinking water for buildout.
Thank You,
Al Barrow C.A.S.E.

Downtown San Francisco Groundwater Basin

- Groundwater Basin Number: 2-40
- County: San Francisco
- Surface Area: 7,600 acres (12 square miles)

Boundaries & Hydrology

The Downtown San Francisco groundwater basin is located on the northeastern portion of the San Francisco peninsula, and is one of five basins in the eastern part of San Francisco each separated from the other by bedrock ridges (Phillips et.al. 1993). The groundwater basin is made up of shallow unconsolidated alluvium underlain by less permeable bedrock within the watershed located east and northeast of the Twin Peaks area including Nob and Telegraph Hills to the north and Potrero Point to the east, as well as most of the downtown area. Bedrock outcrops along much of the ridge form the northeastern and southern basin boundaries. In general, groundwater flow is northeast, following the topography. Average precipitation within the basin is approximately 24 inches per year.

Hydrogeologic Information

Water Bearing Formations

The primary water-bearing formations are comprised of unconsolidated sediments and include alluvial fan deposits, beach and dune sands, undifferentiated alluvium and artificial fill. The oldest of these sediments are Pleistocene in age (Knudsen et.al. 2000). Water-bearing formations are thickest beneath the central and northeastern portion of the basin (between Interstate 80 and Chinatown) where bedrock is encountered at less than 300 feet below ground surface. In much of the basin bedrock is encountered at less than 200 feet below ground surface (Phillips et.al. 1993). Bedrock underlying the basin consists of consolidated rocks of the Franciscan Complex (Schlocker 1974).

Groundwater Recharge

Groundwater recharge to the groundwater basin occurs from infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes. Recharge to the Downtown San Francisco groundwater basin was estimated to be 5,900 ac-ft per year. Recharge due to leakage from municipal water and sewer pipes accounted for about half of the total recharge of groundwater in the San Francisco area (Phillips et.al. 1993).

Groundwater Level Trends

No published water level data showing long-term groundwater level trends was found for the basin, however measurements taken from 1988 to 1992 indicate little to no seasonal fluctuations in groundwater levels.

Groundwater Storage

No published groundwater storage information was found for the basin.

Groundwater Budget

A hydrologic routing model was developed by the USGS to estimate groundwater recharge on the San Francisco peninsula. The model was based on land use zones in the region. A detailed discussion of the groundwater budget can be found in the report by Phillips et.al. (1993).

Groundwater Quality

Characterization. No published groundwater quality information was found for the Downtown basin, however limited water quality data for the surrounding basins is available and shows that the general character of groundwater for all basins beneath the entire San Francisco peninsula is similar (Phillips et.al. 1993). Groundwater beneath the San Francisco peninsula is a mixed cation bicarbonate type, and considered generally "hard" ($CaCO_3$ concentrations between 121 and 180 mg/L). Concentrations of most major dissolved constituents are within the guidelines recommended by the U.S. EPA. Total dissolved solids vary from about 200 to over 700 ppm. Elevated concentrations of nitrate and chloride are common, especially at shallower depths (Phillips et.al. 1993).

Impairments. Groundwater within the Downtown basin is subject to high concentrations of nitrates and elevated chloride, boron and total dissolved solids concentrations. High nitrate levels and are attributed to groundwater recharge from sewer pipe leakage and possibly to fertilizer introduced by irrigation return flows. Elevated chloride and TDS levels are most likely due to a combination of leaky sewer pipes, historic and current seawater intrusion, and connate water (Philips et.al. 1993).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: N/A	Average: N/A
	Total depths (ft)	
Domestic	Range: N/A	Average: N/A
Municipal/Irrigation	Range: N/A	Average: N/A

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater Levels	N/A
	Water Quality	N/A

Basin Management

Groundwater management:

Water agencies

Public	San Francisco Water Department
Private	

References Cited

Blake, M.C., Graymer, R.W., and Jones, D.L. 2000. *Geologic Map and Map Database of Parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California*. U.S. Geological Survey Miscellaneous Field Studies MF 2337, Online Version 1.0. (available online at http://geopubs.wr.usgs.gov/map-mf/mf2337/) .

Bonilla, M.G. 1998. Preliminary geologic map of the San Francisco South 7.5' quadrangle and part of the Hunters Point 7.5' quadrangle, San Francisco Bay area, California: A digital database. U.S. Geological Survey Open-File Report 98-354. (available online at http://wrgis.wr.usgs.gov/open-file/of98-354/)

Knudsen, K.L. et.al. 2000. Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database. U.S. Geological Survey Open-File Report 00-444. (available online at http://geopubs.wr.usgs.gov/open-file/of00-444/).

Knudsen, K.L., Noller, J.S., Sowers, J.M., and Lettis, W.R. 1997. *Quaternary Geology and Liquefaction Susceptibility, San Francisco, California 1:100,000 Quadrangle: A digital database.* U.S. Geological Survey Open-File Report 97-715. (available online at http://wrgis.wr.usgs.gov/open-file/of97-715/)

* Phillips, S.P., Hamlin, S.N., and Yates, E.B. 1993. *Geohydrology, Water Quality, and Estimation of Ground-water Recharge in San Francisco, California, 1987-92.* U.S. Geological Survey Water-Resources Investigations Report 93-4019. Prepared in cooperation with the San Francisco Water Department. 69 p.

Schlocker, Julius. 1974. *Geology of the San Francisco north quadrangle, California.* U.S. Geological Survey Professional Paper 782. 109p.

* Denotes that the reference is a key one for the basin

Errata

Changes made to the basin description will be noted here.

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT
STAFF: Michael T. Chee
MEETING DATE: September 15, 2004

ITEM: 8

SUBJECT: **City of Petaluma, Water Pollution Control Plant, Petaluma, Sonoma County –** Hearing to Consider Mandatory Minimum Penalty for Discharge of Partially Treated Wastewater to Waters of the State

CHRONOLOGY: October 2000 -Mandatory Minimum Penalty (MMP)
February 2002 -MMP
August 2003 -MMP

DISCUSSION: The City of Petaluma Water Pollution Control Plant violated of its effluent limits on 35 occasions during the period between January 1, 2000, and April 30, 2004. Twenty-nine of these violations are subject to mandatory penalties for a total penalty of $87,000.

Petaluma has waived its right to a Water Board hearing (Appendix B), and intends to undertake a supplemental environmental project (SEP). The proposed SEP is for the Wetland Habitat Studies Program (WHSP). WHSP will provide students and the general public with opportunities to tour and study upland habitats, ponds, freshwater marshes, tidal wetlands, and mudflats at Shollenberger Park that is located adjacent to the Petaluma Marsh and River. SEP funds will also assist the Casa Grande High School in developing a native plant nursery to provide plants for student planting within the Petaluma watershed. The attached complaint proposes civil liability in the amount of $87,000, of which $51,000 will be suspended to fund the SEP.

RECOMMEN-
DATIONS: *No action required.*

File No.: 2149.4006 (MTC)

Appendix: A. Complaint No. R2-2004-0041
Appendix: B. Signed waiver

From: "abarrow" <abarrow@sbcglobal.net>
To: "piper reilly" <kismetwest@sbcglobal.net>
Cc: "Lois Capps" <greg.haas@mail.house.gov>; "Congresswoman Lois Capps" <ca23ima@mail.house.gov>; <governor@governor.ca.gov>; <jlenthall@co.slo.ca.us>; "jim patterson" <jpatterson@co.slo.ca.us>; "katcho achadjian" <kachadjian@co.slo.ca.us>; "harry ovitt" <hovitt@co.slo.ca.gov>; "'Bruce Gibson'" <bgibson@thegrid.net>; <jwaddell@co.slo.ca.us>; "john diodati" <jgdiodati@co.slo.ca.us>; <pogren@co.slo.ca.us>; "al barrow" <abarrow@sbcglobal.net>; "Tom Ruehr" <truehr@calpoly.edu>; "Dana Ripley" <ripac@comcast.net>; <bcagle@orenco.com>; "mike saunders" <msaunders@orenco.com>; "Phil veneris" <phil.veneris@fire.ca.gov>; <Assemblymember.Blakeslee@assembly.ca.gov>; "Bill" <bill.garfinkel@sbcglobal.net>; <achill29@hotmail.com>
Sent: Monday, November 12, 2007 1:57 PM
Subject: ABAG The Real Dirt on Liquefaction - Pipelines.htm

Hello Piper and all officials;
We are on an earthquake fault. If you put the sewer water on Broderson after treatment a very large water mound will form (purposely) a very large liquifaction zone which, on that slope turns the unlerlain soils to jelly! Slippage of house foundations could happen and gravity sewer pipes will have huge pressure separating the joints. In the December 2003 Loma Prieta earthquake the central coast area did not inspect the sewer mains for leaks.

"In earthquakes, utility pipelines leak and break. The most vulnerable pipelines are typically those carrying sewage because they are made of the most brittle materials and do not have sealed joints. The next most vulnerable are water pipelines. Some pipelines carrying natural gas are also vulnerable, but utilities such as Pacific Gas & Electric are upgrading and replacing vulnerable pipelines as described below."

"ABAG, in examining pipeline breakage statistics from the Loma Prieta earthquake, concluded that the damage to pipelines in areas mapped as highly susceptible to liquefaction experienced significantly greater damage than areas with lower susceptibility, given similar shaking levels."

Not only will gravity sewer lines but water mains and gas lines will be act risk from earthquake liquifaction conditions as the Broderson effluent mound will be 160 deep on a 7% slope overlayong the Los Osos Strand B fault that runs under the fire department (damaged then) without liquefaction conditions from Broderson. Any gravity design needs to budget the repair cost to those infrastructures. This is earth quake country and we are sitting on a very big fault.

AL Barrow

3-1071

What Happens?
Utility Pipelines Leak

Excerpts From "The REAL Dirt on Liquefaction"

What Happens?

In earthquakes, utility pipelines leak and break. The most vulnerable pipelines are typically those carrying sewage because they are made of the most brittle materials and do not have sealed joints. The next most vulnerable are water pipelines. Some pipelines carrying natural gas are also vulnerable, but utilities such as Pacific Gas & Electric are upgrading and replacing vulnerable pipelines as described below.

Why Does This Happen?

Utility pipelines can leak or break due to the passage of earthquake waves through the soil or due to permanent ground displacement (such as faulting, landsliding or liquefaction). Even though areas susceptible to liquefaction are a relatively small percentage of the areas in which pipelines are located, these liquefaction-susceptible areas have contained a disproportionate number of breaks.

What Were the Pipe Damage Statistics in the Loma Prieta Earthquake?

ABAG, in examining pipeline breakage statistics from the Loma Prieta earthquake, concluded that the damage to pipelines in areas mapped as highly susceptible to liquefaction experienced significantly greater damage than areas with lower susceptibility, given similar shaking levels.

First, the number of water pipeline leaks per mile of water pipeline in areas mapped as having high and very high susceptibility to liquefaction was four-to-six times greater than outside of these areas, given equivalent shaking intensities.

Example of main sewage treatment conduit rupture in the 1995 Kobe Earthquake.
Source - Kobe Geotechnical

Second, the number of leaks per mile of natural gas pipelines was three-to-eleven times greater within the areas mapped as having high and very high susceptibility than outside of these areas, given equivalent shaking intensities. The gas pipeline leaks were predominately in cast iron and other older pipelines that are known to be vulnerable to earthquake effects.

Much of the pipeline damage occurred in areas where no surface expression of liquefaction was observed. Thus, these statistics show increased damage in areas mapped as being susceptible to liquefaction; they do not

Collection, Earthquake Engineering Research Center, Univ. of California, Berkeley

indicate that the damage was necessarily due to liquefaction. See Appendix C for more information.

Note that no damage surveys were conducted of sewer lines as a result of the Loma Prieta earthquake, so no data on statistical damage to these facilities are available. However, as stated above, sewer lines probably had more damage than water lines because they are more brittle and do not have sealed joints.

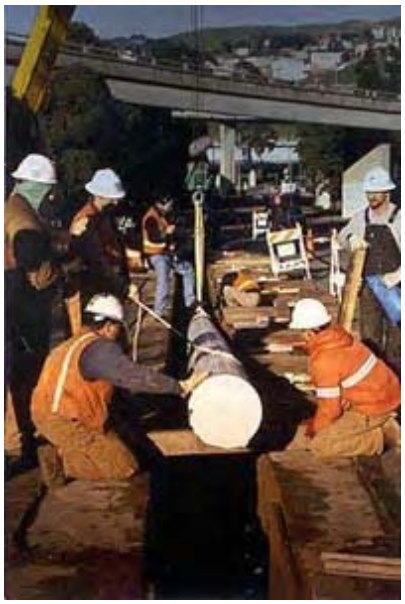
Utilities and the Seismic Hazard Mapping Program of the California Division of Mines and Geology (CDMG)

The following excerpt from CDMG Special Publication 117, Chapter 6 (1997) notes the concern of that organization for pipeline damage in areas subject to liquefaction:

> To date, most liquefaction hazard investigations have focused on assessing the risks to commercial buildings, homes, and other occupied structures. However, liquefaction also poses problems for streets and lifelines- problems that may, in turn, jeopardize lives and property. For example, liquefaction locally caused natural gas pipelines to break and catch fire during the Northridge earthquake, and liquefaction-caused water line breakage greatly hampered firefighters in San Francisco following the 1906 earthquake. Thus, although lifelines are not explicitly mentioned in the Seismic Hazards Mapping Act, cities and counties may wish to require investigation and mitigation of potential liquefaction-caused damage to lifelines.

Pg&E's Gas Pipeline Replacement Program (GPRP)

Beginning in 1985, PG&E undertook a 25-year, $2.5 billion program, known as the Gas Pipeline Replacement Program (GPRP). As a result of the GPRP, many pipeline upgrades were installed both prior to and following the Loma Prieta earthquake. These upgrades are continuing. The newer pipelines are significantly less vulnerable to earthquake effects, including liquefaction, differential settlement, violent shaking, and ground strain, than the older types of pipe installed 50 - 100 years ago.



Gas pipelines being replaced in San Francisco
Source - W. Savage, PG&E

New Guidelines for Pipeline Systems Are Being Developed

In response to the lack of a national code for pipeline systems, the American Lifelines Alliance (ALA) is developing two guideline documents:

1. on the design of water transmission systems to resist earthquake hazards, including liquefaction, and
2. an Appendix to the American Society of Mechanical Engineers (ASME) B-31 Piping Codes for the design of better performing buried pipelines in earthquakes, not just water pipelines.

The projects are being funded by the Federal Emergency Management Agency (FEMA) under a cooperative agreement with the American Society of Civil Engineers (ASCE). Both of these documents should be available in early 2001 and will be able to be obtained from ASCE. Contact Thomas McLane, tmclane@asce.org. For further information on ALA, go to - http://www.americanlifelinesalliance.org/

ABAG, the Association of Bay Area Governments, is the regional planning and services agency for the nine-county San Francisco Bay Area. The liquefaction hazard map information was last updated by ABAG in October 2003.

jbp 10/16/03

3-1074

PROPOSED REVISIONS TO THE COASTAL ZONE LAND USE ORDINANCE TO RUN CONCURRENTLY WITH THE ESTERO AREA PLAN UPDATE
Public Hearing Draft, August 2003

ORDINANCE NO._____

AN ORDINANCE AMENDING TITLE 23 OF THE SAN LUIS OBISPO COUNTY CODE, THE COASTAL ZONE LAND USE ORDINANCE; SECTIONS 23.04.186, 23.05.050, 23.06.100, 23.06.106, 23.06.108 REGARDING WATER QUALITY AND DRAINAGE; SECTION 23.05.110 REGARDING ROADS AND BRIDGES; SECTIONS 23.04.200 AND 23.07.104 REGARDING ARCHAEOLOGICAL RESOURCES; SECTION 23.04.210 REGARDING VISUAL RESOURCES; SECTION 23.04.220 REGARDING ENERGY CONSERVATION; SECTION 23.04.440 REGARDING A COMMUNITY-BASED TDC PROGRAM FOR LOS OSOS; AND SECTIONS 23.01.043 AND 23.11.030 REGARDING APPEALS WITHIN UNMAPPED ENVIRONMENTALLY SENSITIVE HABITATS

The Board of Supervisors of the County of San Luis Obispo ordains as follows:

SECTION 1: Chapter 23.04 of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.04.200** to read as follows:

23.04.200 - Protection of Archaeological Resources Not Within the Archaeologically Sensitive Areas Combining Designation: All development applications that propose development that is not located within the Archaeologically Sensitive Areas combining designation and that meets the following location criteria shall be subject to the standards for the Archaeologically Sensitive Areas combining designation in Chapter 23.07: development that is either within 100 feet of the bank of a coastal stream (as defined in the Coastal Zone Land Use Ordinance), or development that is within 300 feet of such stream where the slope of the site is less than 10 percent.

This amendment treats areas close to streams--that are known to have a higher likelihood of containing archaeological resources--as though they were in the Archaeologically Sensitive combining designation, without actually mapping them. Such areas would be subject to the AS combining designation standards in Chapter 23.07, as revised in the following section. In practice, new development in such areas is typically required to have an archaeological surface survey in connection with environmental review, where required by CEQA.

SECTION 2: Section 23.07.104c [Archaeologically Sensitive Areas: When a mitigation plan is required] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended** to read as follows:

b. When a mitigation plan is required. If the preliminary site survey determines that proposed development may have significant effects on existing, known or suspected archaeological resources, a plan for mitigation shall be prepared by the archaeologist. The purpose of the plan is to protect the resource. The plan may recommend the need for further study, subsurface testing, monitoring during construction activities, project redesign, or other actions to mitigate the impacts on the resource. Highest priority shall be given to avoiding disturbance of sensitive resources. Lower priority mitigation measures may include use of fill to cap the sensitive resources. As a last resort, the review authority may permit excavation and recovery of those resources. The mitigation plan shall be submitted to and approved by the Environmental Coordinator, and considered in the evaluation of the development request by the review authority ~~applicable approval body~~.

This amendment states the priorities for mitigation of impacts to archaeological resources, with highest priority given to avoidance. This amendment codifies what is already current practice that is consistent with the CEQA Guidelines.

SECTION 3: Chapter 23.04 of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.04.210** to read as follows:

23.04.210 - Visual Resources:

The following standards apply within Critical Viewsheds, Scenic Corridors and Sensitive Resource Area (SRA) combining designations that are intended to protect visual resources, as identified in this title, the Official Maps, Part III of the Land Use Element, or the area plans of the Local Coastal Plan.

a. Applicability of standards. The following standards apply to proposed land divisions and residential and residential accessory structures (including water tanks), agricultural and agricultural accessory structures, commercial structures, pipelines and transmission lines, public utility facilities, communications facilities, and access roads that are required by the Coastal Zone Land Use Ordinance to have a land use permit, except that the following are exempt from some or all of these standards:

(1) Agricultural accessory structures that are 600 square feet or less in area.

(2) Project not visible. An exemption from the standards in the following subsections c(1), (2), (4), and (5) may be granted if documentation is provided demonstrating that the proposed structures and access roads will not be visible from any of the roads specified in the applicable area plan planning area standards for Critical Viewsheds, Scenic Corridors or SRA's

that are intended to protect visual resources. Such documentation shall at a minimum provide topographic and building elevations with preliminary grading and building plans. An exemption from the standard in subsection c(6) may be granted if the preceding documentation is provided, and if open space preservation within the Critical Viewshed or SRA is not otherwise needed to protect sensitive habitat or watershed, as identified in the area plans.

b. Permit requirement. Minor Use Permit approval, unless Development Plan approval is otherwise required by this title or planning area standards of the area plans. The land use permit or land division application shall include the following:

(1) A landscaping plan and a visual analysis that is prepared by a licensed architect, a licensed landscape architect or other qualified person acceptable to the Director of Planning and Building. The landscaping plan and visual analysis shall be used to determine compliance with the following standards.

c. Standards for Critical Viewsheds and SRAs for protection of visual resources. The following standards apply within areas identified as Critical Viewsheds or SRAs in the area plans for protection of visual resources.

(1) Location of development. Locate development, including accessory structures, water tanks and access roads, in the least visible portion of the site as viewed from any of the applicable roads or highways described in the applicable planning area standards in the area plans, consistent with protection of other resources. Visible or partially visible development locations shall only be considered if no non-visible development locations are identified, or if such locations would be more environmentally damaging. Visible or partially visible development locations may be approved where visual effects are reduced to an insignificant level, as determined by the review authority. Use topographic features first and vegetation second to screen development from public view.

(2) Building visibility. Minimize building height and mass by using low-profile design where applicable, including partially sinking structures below grade. Minimize the visibility of buildings, including water tanks, by using colors to harmonize with the surrounding environment.

(3) Ridgetop development. Locate structures so that they are not silhouetted against the sky as viewed from the Morro Bay estuary and applicable roads or highways described in the applicable planning area standards in the area plans, unless compliance with this standard is infeasible or results in more environmental damage than an alternative.

(4) Landscaping for hillside and ridgetop development. Provide at least 80 percent screening of structures at plant maturity using native or drought-tolerant vegetation (no invasive species) as seen from applicable roads or highways described in the applicable planning area standards in the area plans, but without obstructing major public views (e.g., screening should occur at the building site rather than along a public road). Maximize use of evergreen trees and large-growing shrubs that have shapes similar to existing native vegetation. Alternatives to such screening may be approved if visual effects are otherwise reduced to an insignificant level through use of topographic features or design of structures. Provisions shall be made to maintain and guarantee the survival of required landscape screening for a period of at least five years.

(5) Residential land divisions - cluster requirement. Residential land divisions and their building sites shall be clustered in accordance with Chapter 23.04 or otherwise concentrated in order to protect the visual resources as identified in the area plans.

(6) Open space preservation. Pursuant to the purpose of the Critical Viewshed or SRA to protect significant visual resources, open space preservation is a compatible measure to support the approval of new development. Approval of an application for any land division, Minor Use Permit or Development Plan (excluding any agricultural accessory building) is contingent upon the applicant executing an agreement with the county to maintain in open space use appropriate portions of the site within the Critical Viewshed or SRA (for visual protection) that are not intended for development. Guarantee of open space preservation may be in the form of public purchase, agreements, easements controls or other appropriate instrument, provided that such guarantee agreements are not to grant public access unless acceptable to the property owner.

d. Standards for scenic corridors. The following standards apply within areas identified as Scenic Corridors in the area plans for protection of visual resources.

(1) Setback. Where possible, residential buildings, residential accessory structures and agricultural accessory structures shall be set back 100 feet from the edge of the right-of-way of the road along which the Scenic Corridor is established in the area plans, or a distance as otherwise specified in the area plan planning area standards. If there is no feasible development area outside of this setback, the project shall be located on the rear half of the property and shall provide a landscaping screen of moderately fast-growing, drought-tolerant plant material to provide 80 percent view coverage at plant maturity at the building site (not along the public road). A landscaping plan in accordance with the requirements of Chapter 23.04 shall be provided at the time of building permit application submittal.

(2) Signs. Locate signs that are required to have a land use permit, especially freestanding signs, so that they do not interfere with vistas from the road along which the Scenic Corridor is established in the area plans.

This amendment establishes a consistent set of standards for projects located within visually sensitive areas, using language taken from existing standards in the area plans. This approach will eliminate the need to establish new, separate visual standards in each area plan and should help eliminate the variations in such standards from one area plan to another.

SECTION 4: Chapter 23.04 of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.04.220** to read as follows:

23.04.220 - Energy Conservation, Including Design for Solar Orientation: The policies and guidelines for designing compact communities and energy efficient projects described in the Energy Element of the County General Plan shall be consulted for new land divisions and development.

This amendment encourages project proponents to consider incorporating into project design the energy conservation measures in the Energy Element; however, the amendment in itself does not require any specific measures.

SECTION 5.: Section 23.04.440 of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **revising and recodifying as subsection a**, and by **adding new subsection b**, to read as follows:

23.04.440 Community-Based Transfer of Development Credits Programs - ~~Cambria~~.

a. Cambria.

The purpose of this subsection is to implement portions of the Cambria/Lodge Hill Community-based Transfer of Development Credits Program (TDC) by providing a procedure to allow simple transfers within the Lodge Hill area of the community of Cambria. Consistent with applicable planning area programs and standards of the Land Use Element, the objective of this subsection is to reduce potential buildout in sensitive areas of Lodge Hill called “Special Project Areas.” Through transfer of development credits, allowable building area (expressed in square footage) for lots within a special project area may be transferred to more suitable sites within Lodge Hill. A lot from which development credits have been transferred is "retired," and loses its building potential through recordation of a permanent conservation easement or other document. A residence on a “receiver” lot may thus be developed with larger dwellings than would otherwise be allowed by planning area standards.

(1) ~~a.~~ Where allowed. Development credit transfers shall occur only on parcels located within the Lodge Hill area (east and west) as defined by Figure 3,

Cambria Urban Area, Part II of the Land Use Element. Lots being retired for purposes of a transfer shall be located within a special project area as shown on Figure 3. In no case shall a development credit be transferred to a building site within a special project area from outside the area. Lots within a special project area may qualify for additional dwelling square footage only by retiring lots(s) within a special project area.

(2) ~~b.~~ **Permit Requirement.** Minor Use Permit for the proposed dwelling and site receiving the additional allowed square footage. No permit requirement for the lot to be retired into open space.

(3) ~~c.~~ **Required findings.** The review authority ~~Planning Director or applicable appeal body~~ shall not approve a Minor Use Permit for a residence to be constructed with additional square footage gained through TDC until the following findings have been made:

i. ~~(1)~~ Adequate instruments have been executed to assure that lot(s) to be retired will remain in permanent open space and that no development will occur; and

ii. ~~(2)~~ The "receiver" site can accommodate the proposed scale and intensity of development without the need for a variance (23.01.045), exception to height limitations (23.04.124b) or modification to parking standards (23.04.162h); and

iii. ~~(3)~~ The circumstances of the transfer are consistent with the purpose and intent of the applicable planning area programs and standards regarding transfer of development credits.

(4) ~~d.~~ **Eligible purchasers of TDC's.** Owners of small lots within Lodge Hill may be allowed to construct a larger residence than would otherwise be allowed by the planning area standards of the Land Use Element through participation in the TDC program. Larger residences may be constructed on a "receiver" lot through purchase of available square footage from a non-profit corporation organized for conservation purposes.

(5) ~~e.~~ **Application contents.** In addition to meeting the application contents of section 22.02.033 (Minor Use Permit), an applicant proposing a TDC shall submit evidence that a preliminary agreement has been reached between the property owners and a non-profit corporation organized for conservation purposes approved by the Planning Director, including the following:

i. ~~(1)~~ The location of the lot(s) to be retired;

ii. ~~(2)~~ The size and approximate slope of both lots to be retired and lot(s) to receive additional square footage;

iii. ~~(3)~~ The method of permanent disposition of fee title of the lot(s) to be retired;

iv. ~~(4)~~ The type of conservation easement, deed restriction or other instrument utilized to guarantee the permanent open space of the lots(s) to be retired.

(6) ~~f.~~ **Participation of a non-profit corporation required.** A TDC shall not be approved unless a non-profit corporation or public agency, organized for conservation purposes and approved by the Planning Director, participates in the TDC process. The role of the non-profit corporation may include public information and TDC program development, a source of available square footage for purchase, recordation of easements, deed restrictions or other documents, and may be responsible for final disposition of lots to be retired.

b. Los Osos.

The purpose of this subsection is to implement portions of the Los Osos Community-based Transfer of Development Credits (TDC) Program by providing a procedure to allow simple transfers between sending sites (TDCS) and receiving sites (TDCR) identified in the Estero Area Plan of the Land Use Element and Local Coastal Plan. Consistent with applicable planning area programs and standards in the Estero Area Plan, the objectives of this subsection are to help establish a greenbelt around Los Osos, clearly define the urban edge of the community, prevent urban sprawl, discourage conversion of agricultural lands, protect unique and sensitive habitat, and protect scenic qualities. Through transfer of development credits, all or a portion of the allowable density on an identified sending site may be transferred to receiving sites that are suitable for higher intensity development. A sending site or portion thereof from which development credits have been transferred is "retired," and loses its building potential through recordation of a permanent conservation easement or other document. A receiving site to which development credits have been transferred may thus be developed at a higher density or intensity than would otherwise be allowable by the Local Coastal Program.

(1) **Where allowed.** Development credits may be transferred only to properties located within identified transfer of development credits receiving sites (TDCR) shown in the maps and/or described in the text of the Estero Area Plan of the Land Use Element and Local Coastal Plan. Properties within identified TDCRs may qualify for additional density or intensity of development only when retiring properties within identified transfer of development credits sending sites (TDCS) as shown in the maps and/or described in the text of the Estero Area Plan.

(2) **Required findings.** The review authority shall not approve a land use permit or tentative map that proposes additional density or intensity of development through use of TDCs until the following findings are made:

i. Adequate instruments have been executed to assure that all property to be retired will permanently remain in open space or in agricultural uses consistent with the Coastal Zone Framework for Planning, Land Use Element and Local Coastal Plan, and that no other development will occur.

ii. The circumstances of the transfer are consistent with the purpose and intent of the applicable planning area programs and standards regarding transfer of development credits.

(3) **Eligible purchasers of TDC's.** Owners of properties within identified TDCRs may be allowed to develop at higher densities or intensities than would otherwise be allowable by the Local Coastal Program through participation in the Los Osos Community-based TDC program. Higher density or intensity development may be developed on a TDCR site by purchasing development credits from an identified TDCS site from a non-profit corporation or public agency organized for conservation purposes and approved by the Planning Director.

(4) **Application contents.** In addition to meeting the application contents of Chapter 23.02 of the Coastal Zone Land Use Ordinance, an applicant proposing TDCs shall submit evidence that a preliminary agreement has been reached between the property owners and a non-profit corporation organized for conservation purposes and approved by the Planning Director, including the following:

i. The location of the property, or portion thereof, to be retired.

ii. The number of development credits that are to be retired, and the number of credits, if any, that will remain on the TDCS site.

iii. The method of permanent disposition of fee title of the property to be retired.

iv. The type of conservation easement, deed restriction or other instrument used to guarantee the permanent open space or agricultural use of the property to be retired.

(5) **Participation of a non-profit corporation required.** A TDC shall not be approved unless a non-profit corporation or public agency, organized for conservation purposes and approved by the Planning Director, participates in the TDC process. The non-profit corporation may provide public information; help develop the TDC program; purchase and sell development credits; record easements, deed restrictions or other documents; and

manage and otherwise be responsible for the final disposition of properties to be retired.

This amendment is needed to enable implementation of the community-based TDC program established as part of the Estero Area Plan update (in Chapters 6 and 7 of the draft Estero Area Plan).

SECTION 6.: Chapter 23.05 of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.05.110** to read as follows:

23.05.110 - Road and Bridge Design, Construction and Maintenance:

Roads and bridges shall be designed, constructed and maintained to protect sensitive resources (such as aquatic habitat and scenic vistas) and prime agricultural soils to the maximum extent feasible; to minimize terrain disturbance, vegetation removal and disturbance of natural drainage courses; to avoid the need for shoreline protective devices; and to provide for bikeways and trails, consistent with the Circulation Element of the County General Plan. In addition, the following measures shall be implemented:

a. Contour slopes to blend in with adjacent natural topography

b. Replant graded areas with native vegetation

c. Include pollution prevention procedures in the operation and maintenance of roads and bridges to reduce pollution of surface waters

d. Apply fertilizers and nutrients at rates that establish and maintain vegetation without causing nutrient runoff to surface waters

e. Give preference to aerial crossings of watercourses

This amendment expands upon a planning area standard in the existing Estero Area Plan by applying the standards to bridges as well as to roads, and by protecting sensitive habitat and prime agricultural soils, as well as visual resources. Additional measures are also included, such as methods to prevent water pollution. This amendment is consistent with another proposed amendment in connection with Periodic Review implementation that would allow for better protection of Environmentally Sensitive Habitat Areas by examining alternatives to locations of permitted roads, bridges and other crossings.

SECTION 7.: Section 23.04.186d(3) [Landscape plan content: Planting plan] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended by adding new subsection (ix)** to read as follows:

(ix) A note that fertilizers and nutrients are to be applied at rates that establish and maintain vegetation without causing nutrient runoff to surface waters.

SECTION 8.: Section 23.05.050b [Drainage Standards: Natural channels and runoff] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended** to read as follows:

b. Natural channels and runoff. Proposed projects are to include design provisions to retain off-site natural drainage patterns and, when required, limit peak runoff to pre-development levels. To the maximum extent feasible, all drainage courses shall be retained in or enhanced to appear in a natural condition, without channelization for flood control.

SECTION 9.: Section 23.05.050 [Drainage Standards] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended by revising subsection a** [design and construction]**, and by adding new subsections g, h and i** to read as follows (new subsections e and f regarding best management practices are proposed to be added through Periodic Review implementation):

a. Design and construction. Drainage systems and facilities subject to drainage plan review and approval that are to be located in existing or future public rights-of-way are to be designed and constructed as set forth in the County Engineering Department Standard Improvement Specifications and Drawings. Other systems and facilities subject to drainage plan review and approval are to be designed in accordance with good engineering practices. The design of drainage facilities in new land divisions and other new development subject to Minor Use Permit or Development Plan approval shall maximize groundwater recharge through on-site or communitywide stormwater infiltration measures. Examples of such measures include constructed wetlands, vegetated swales or filter strips, small percolation ponds, subsurface infiltration basins, infiltration wells, and recharge basins. Where possible, recharge basins shall be designed to be available for recreational use.

g. Sensitive habitat and groundwater protection. Runoff from roads and development shall not adversely affect sensitive habitat, groundwater resources and downstream areas, and shall be treated to remove floatable trash, heavy metals and chemical pollutants as necessary prior to discharge into surface or groundwater.

h. Impervious surfaces. New development shall be designed to minimize the amount of impervious surfaces.

SECTION 10.: Section 23.06.100 [Water Quality] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.06.104** to read as follows:

23.06.104 - Municipal Well-head Protection: Referrals:

The purpose of this section is to protect groundwater resources from contamination by proposed development.

Minor Use Permit and Development Plan applications that propose uses within one mile of a municipal well (locations of municipal wells may be shown in the area plans) that have the potential to release toxic or hazardous materials (e.g. gas stations, businesses that handle hazardous wastes) shall be referred to the County Environmental Health Division for review and appropriate recommended measures that assure protection of water quality. Recommended measures may include, but are not limited to the following:

a. Determining the extent of areas that contribute water to municipal wells, and making further recommendations as appropriate

b. Relocating proposed uses relative to municipal wells, especially where such uses involve the manufacture, storage or handling of hazardous materials

c. Concentrating or clustering development relative to the location of municipal wells

d. Reducing the density or intensity of proposed uses

e. Limiting the amounts of potential contaminants that may be stored or handled

SECTION 11.: Section 23.06.100 [Water Quality] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.06.106** to read as follows:

23.06.106 - Wastewater: On-site Sewage Disposal:

Wastewater from on-site sewage disposal systems shall not adversely affect groundwater resources or sensitive habitat.

SECTION 12.: Section 23.06.100 [Water Quality] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby amended by **adding new section 23.06.108** to read as follows:

23.06.108 - Chemical Control:

Land use permit applications that require discretionary review for projects that have potential to release toxic or hazardous materials (e.g. gas stations, businesses that handle hazardous wastes) shall include measures, and where applicable, Best Management Practices that: a) minimize the amounts of potential contaminants that may be stored or handled; b) assure proper containment and c) prevent release of contaminants into the environment. These measures and practices shall be referred to the County Division of Environmental Health for review and for recommendations that shall be implemented through the land use permit.

In general, preceding Sections 7 through 12 modify existing standards and establish new standards in order to better manage drainage and protect water quality, groundwater recharge and sensitive habitat. These amendments respond to concerns expressed by the Coastal Commission staff about the need to address non-point source pollution from development activities. These standards are in addition to the standards requiring best management practices for residential and non-residential projects that are proposed to be implemented through the Periodic Review process.

SECTION 13.: Section 23.01.043c [Appeals to the Coastal Commission, Appealable Development] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended** to read as follows:

c. Appealable development. As set forth in Public Resources Code Section 30603(a) and this title, an action ~~a decision~~ by the County on a permit application, including any Variance, Exception, or Adjustment granted, for any of the following projects may be appealed to the California Coastal Commission:

(1) Developments approved between the sea ~~ocean~~ and the first public road paralleling ~~to~~ the sea ~~ocean~~, or within 300 feet of the inland extent of any beach ~~(~~or of the mean high tide line of the ocean where there is no beach~~)~~, whichever is the greater distance, as shown on the adopted post-certification appeals maps.

(2) Approved developments not included in subsection c(1) of this section that are proposed to be located on tidelands, submerged lands, public trust lands, within 100 feet of any wetland, estuary, stream, or within 300 feet of the top of the seaward face of any coastal bluff, as shown on the adopted post-certification appeals maps.

(3) Developments approved in areas not ~~identified~~ included in subsections c(1) or c(2) ~~above~~ that are located in a Sensitive Coastal Resource Area, ~~as defined in Chapter 23.11 of this title,~~ which includes:

(i) Special marine and land habitat areas, wetlands, lagoons, and estuaries mapped and designated as Environmentally Sensitive Habitats (ESHA) in the Local Coastal Plan. Does not include resource areas determined by the County to be Unmapped ESHA.

(ii) Areas possessing significant recreational value, including any "V" (Visitor Serving designation) as shown in the Land Use Element and areas in or within 100 feet of any park or recreation area.

(iii) Highly scenic areas which are identified as Sensitive Resource Areas by the Land Use Element.

(iv) Archaeological sites referenced in the California Coastline and Recreation Plan or as designated by the State Historic Preservation Officer.

(v) Special Communities or Small-Scale Neighborhoods which are significant visitor destination areas as defined by Chapter 23.11 of this title.

(vi) Areas that provide existing coastal housing or recreational opportunities for low-and moderate income persons.

(vii) Areas where divisions of land could substantially impair or restrict coastal access.

(4) Any approved development not listed in Coastal Table O, Part I of the Land Use Element as a Principal Permitted (PP) Use.

(5) Any development that constitutes a Major Public Works Project or Major Energy Facility. "Major Public Works Project" or "Major Energy Facility" shall mean any proposed public works project or energy facility exceeding $100,000 in estimated construction cost, pursuant to Section 13012, Title 14 of the California Administrative Code.

The procedures established by Section 23.01.041c. (Rules of Interpretation) shall be used to resolve any questions regarding the location of development within a Sensitive Coastal Resource Area.

SECTION 14.: Section 23.11.030 [Coastal Zone Land Use Ordinance Definitions] of the Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, is hereby **amended** to read as follows:

Environmentally Sensitive Habitat Area (Mapped ESHA). A type of Sensitive Resource Area where plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could easily be disturbed or degraded by human activities and development. They include wetlands, coastal streams and riparian vegetation, terrestrial and marine habitats and are mapped as Land Use

Element combining designations. Is the same as an Environmentally Sensitive Habitat.

Environmentally Sensitive Habitat Area (Unmapped ESHA). A type of Sensitive Resource Area where plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could easily be disturbed or degraded by human activities and development. They include, but are not limited to, known wetlands, coastal streams and riparian vegetation, terrestrial and marine habitats that may not be mapped as Land Use Element combining designations. The existence of Unmapped ESHA is determined by the County at or before the time of application acceptance and shall be based on the best available information. Unmapped ESHA includes but is not limited to:

1. Areas containing features or natural resources when identified by the County or County-approved expert as having equivalent characteristics and natural function as mapped other environmentally sensitive habitat areas;

2. Areas known to contain sensitive resources identified by appropriate resource protection agencies, such as the U.S. Fish and Wildlife Service and the State Department of Fish & Game;

3. Areas previously known to the County from environmental experts, documents or recognized studies as containing ESHA resources;

4. Other areas commonly known as habitat for species determined to be threatened, endangered, or otherwise needing protection.

The purpose of preceding Sections 13 and 14 is twofold. Section 14 adds a second type of ESHA that is usually unmapped or poorly defined on County LCP maps. Early recognition of the existence of ESHA, whether it is mapped or unmapped, is important for both proposed development and protection of the resources. This proposed change will allow for better identification and protection of Environmentally Sensitive Habitat Areas and bring the County's LCP into conformance with the Coastal Act.

Section 13 amends the Appeals section to make it clear that development proposed in an Unmapped ESHA is not appealable only because it is ESHA. However, it may be appealable for other reasons consistent with other LCP requirements.

SECTION 15.: That the Board of Supervisors has considered the initial study prepared and conducted with respect to the matter described above. The Board of Supervisors has, as a result of its consideration, and the evidence presented at the hearings on said matter, determined that the proposed negative declaration as heretofore prepared and filed as a result of the said initial study, is appropriate, and has been prepared and is hereby approved in accordance with the California Environmental Quality Act and the County's regulations implementing said Act. The Board of Supervisors, in adopting this ordinance, has taken into account and reviewed and considered the information contained in the negative declaration approved for this project and all comments that were received during the public hearing process. On the basis of the Initial Study and any comments received, there is no substantial evidence that the adoption of this ordinance will have a significant effect on the environment.

SECTION 16.: If any section, subsection, clause, phrase or portion of this ordinance is for any reason held to be invalid or unconstitutional by the decision of a court of competent jurisdiction, such decision shall not affect the validity or constitutionality of the remaining portion of this ordinance. The Board of Supervisors hereby declares that it would have passed this ordinance and each section, subsection, clause, phrase or portion thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases or portions be declared invalid or unconstitutional.

SECTION 17.: This ordinance shall become operative only upon approval without any modifications by the California Coastal Commission and upon acknowledgment by the San Luis Obispo County Board of Supervisors of receipt of the Commission's resolution of certification.

SECTION 18.: This ordinance shall take effect and be in full force on and after 30 days from the date of its passage hereof. Before the expiration of 15 days after the adoption of this ordinance, it shall be published once in a newspaper of general circulation published in the County of San Luis Obispo, State of California, together with the names of the members of the Board of Supervisors voting for and against the ordinance.

INTRODUCED at a regular meeting of the Board of Supervisors held on the ____ ___ day of _____, 2004, and PASSED AND ADOPTED by the Board of Supervisors of the County of San Luis Obispo, State of California, on the _____ day of _____, 2004, by the following roll call vote, to wit:

AYES:

NOES:

ABSENT:

ABSTAINING:

_____
Chairman of the Board of Supervisors,
County of San Luis Obispo,
State of California

ATTEST:

_____
County Clerk and Ex-Officio Clerk
of the Board of Supervisors
County of San Luis Obispo, State of California

[SEAL]

ORDINANCE CODE PROVISIONS APPROVED
AS TO FORM AND CODIFICATION:

JAMES B. LINDHOLM, JR.
County Counsel

By:_____
Deputy County Counsel

Dated:_____

Drinking Water Source Assessment and Protection Program (DWSAP)

PROGRAM DOCUMENT - January 1999

Section 8.0
Vulnerability of Drinking Water Sources to Contamination

After the initial inventory of Possible Contaminating Activities (PCAs) has been completed (Section 7.0), a vulnerability analysis is conducted to determine the types of PCAs to which the drinking water source is most vulnerable by prioritizing the list of activities identified in the inventory. The analysis factors in the source and/or site characteristics that may affect the vulnerability of the source to contamination from the types of PCAs identified in the inventory.

8.1 Definition

Vulnerability: A determination of the most significant threats to the quality of the water supply that takes into account the physical barrier effectiveness of the drinking water source. The vulnerability determination also considers the type and proximity to the water supply of activities that could release contaminants.

Vulnerability, as defined in the DWSAP Program, is consistent with existing California regulations (see Section 8.4).

8.2 Vulnerability Analysis Procedures

The vulnerability analysis evaluates the types of PCAs identified in the inventory within the context of the characteristics of the source and its site. The first step in the analysis is to determine the Physical Barrier Effectiveness (PBE) for the drinking water source. The PBE can be determined using site-specific information on hydrogeology, hydrology and soils. Additional information is required depending upon whether the source is ground water or surface water.

8.2.1 Drinking Water Source and Site Characteristics

8.2.1.1 Drinking Water Source Information

The information needed to determine the Physical Barrier Effectiveness should be compiled using readily available data and reports. A minimum level of information is necessary to make the initial determination, but additional information may be useful in refining the determination.

For surface water sources, Appendix C shows the minimum water body and watershed information necessary to determine Physical Barrier Effectiveness. Most of this information can be found in the Watershed Sanitary Survey for the source.

For ground water sources, the minimum information necessary to determine Physical Barrier Effectiveness is shown in Appendix J. The information to be collected should be available from well

logs, soil survey maps, some general knowledge of the hydrogeology of the area, and well operation information.

8.2.1.2 Determination of Physical Barrier Effectiveness

The Physical Barrier Effectiveness is essentially an estimate of the ability of the natural geologic materials, hydraulic conditions, and construction features of the well or intake to prevent the movement of contaminants to the drinking water source.

A qualitative rating of low, moderate or high Physical Barrier Effectiveness (PBE), based on the drinking water source and site characteristics, is determined for each source. A simple approach to determining PBE for surface water is shown in Appendix C, and for ground water in Appendix J. In the DWSAP approach, the reviewer collects some basic information on the water body and watershed for surface water, and on the drinking water source and aquifer for ground water. This information is then evaluated with parameters that indicate the relative effectiveness of the source and site in preventing the migration of contaminants to the water supply.

In general, the intent of the Physical Barrier Effectiveness determination is to highlight the sources that have "high" or "low" effectiveness. Most sources will have "moderate" PBE. A more detailed review of the Physical Barrier Effectiveness at a site can be done during the development of a local source water protection program (see Section 11.0).

Surface Water

For surface water, the PBE evaluation considers several parameters including the size of, and detention time in, the reservoir, topography, geology, soils, vegetation, precipitation and ground water recharge. The size of the watershed is also important to consider, in terms of its potential for dilution or retardation of contaminants.

As shown in Appendix C, in order to get a high PBE ranking, all the parameters for a source must have values that indicate an effective barrier. For example, a source with a high PBE would be in flat terrain, with low precipitation and non-erosive soils covered by grassland.

A source is considered to have low PBE (i.e. high potential for contamination), if any of the parameters have values that do not indicate an effective barrier. For example, a source would be considered to have a low PBE if the watershed has steep slopes or if the soils are erodible or have high runoff potential.

For surface water, all sources that do not clearly have a low or high PBE are considered to have a moderate PBE. To be conservative (i.e., health protective), if any of the parameters is unknown, the drinking water source is considered to have low physical barrier effectiveness.

Ground Water

For ground water, the evaluation of Physical Barrier Effectiveness first considers the degree of confinement of the aquifer. An aquifer is classified as confined or unconfined (which includes semi-confined, leaky, and unknown). Detailed review is necessary to determine that an aquifer is confined. Table 6-1 lists indicators to consider in determining the presence or degree of confinement of an aquifer. In general, DHS will assume that an aquifer is unconfined unless detailed hydrogeologic information is available that clearly indicates that the aquifer is confined. Fractured rock aquifers, for purposes of the PBE analysis, are included in the unconfined aquifers, due to the complexity of their flow patterns.

PBE of Confined Aquifers

Confined aquifers generally are considered highly effective in preventing the migration of contaminants. However, the PBE may be diminished if abandoned or improperly destroyed wells are present that corrupt the integrity of the confining layer. The PBE may be improved if the hydraulic head in the confined aquifer is higher than the hydraulic head of aquifers above (i.e., the well exists under artesian conditions). The construction of the well can impact the effectiveness in retarding contaminants, particularly the presence of a properly constructed sanitary seal.

PBE of Unconfined Aquifers

For aquifers that are unconfined, semi-confined or of unknown confinement, the PBE evaluation next considers the soil materials in the aquifer. Wells in fractured rock are always considered to have low PBE due to the high transport velocities that can occur within fractures. Sources in porous media that have a thick continuous layer of clay above the water table have more effective barriers, similar to confined aquifers.

Abandoned or improperly destroyed wells within the protection zones for a source can decrease the effectiveness of the barrier. Because of the prevalence of abandoned and improperly destroyed wells, and the difficulty of locating them, they are considered to decrease the effectiveness of all ground water sources unless their absence can be assured.

In unconfined aquifers, water level conditions of a well can impact the likelihood that contaminants may be drawn to the well. Greater depths to ground water are more effective at preventing contamination. Wells with high production rates, short screened intervals and perforations located close to the top of the water table are more likely to pull contaminants towards the well.

As with unconfined aquifers, the construction of the well in a confined aquifer can impact its effectiveness in retarding contaminants, particularly the presence of a properly constructed sanitary seal.

The procedures for determining PBE for ground water use the checklist in Appendix J. A ground water source is assigned points for each parameter on the Physical Barrier Effectiveness checklist. The points are totaled to arrive at a PBE score for the source, ranging from a low of 0 points to a high of 100 points. The PBE points in themselves are not a quantitative value; rather they are used to determine the overall PBE rating for the source: low, moderate or high.

Physical Barrier Effectiveness

Score Interpretation

Point Total	PBE
0 to 35	Low (includes all sources in fractured rock)
36 to 69	Moderate
70 to 100	High

Notes on Physical Barrier Effectiveness checklist for ground water:

3-1093

- The highest score a source in a confined aquifer can get is 100 (High PBE). The lowest score a source in a confined aquifer can get is 40 (Moderate PBE).

- The highest score a source in an unconfined aquifer can get is 70 (High PBE). Without having a clay layer 25' thick, the highest score for a source in an unconfined aquifer is 60 (Moderate PBE).

- The only sources that can get High PBE are those in confined aquifers, and those in unconfined aquifers with a clay layer, with no abandoned or improperly destroyed wells in the protection zones.

- All sources in fractured rock are considered to have Low PBE.

8.2.2 Modifying the Risk Ranking for a PCA

As described in Section 7.0, the PCA inventory includes a ranking of the potential risk or threat of contamination to a drinking water source for each type of PCA. In the inventory, activities that are considered to have a high potential for pollution of drinking water sources are designated "very high" or 'high" risk. Other activities having lower potential for drinking water pollution are designated "moderate" or "low" risk.

The risk ranking provides a simple approach to comparing the relative risk of types of PCAs. The risk rankings are based on the general nature of the activities and the contaminants associated with them (refer to Table 7-2), not on the density (number of facilities) or facility-specific information, such as management practices.

Comments were received regarding the ability to modify the risk ranking for an individual facility for a type of PCA. The DWSAP program is intended to be a simple, first-cut screening tool. Further detail, such as modifying the risk ranking of types of PCAs (Appendix E or L), is an optional part of the minimum drinking water source assessment. Evaluation of site-specific information may best be performed during the development of a local protection program (see Section 11.0).

8.2.3 Determination of Vulnerability

DHS has developed a simple approach to substitute for a detailed vulnerability determination. The vulnerability analysis uses the PCA inventory and the Physical Barrier Effectiveness determination to prioritize the list of types of PCAs in order to determine to which the drinking water source is most vulnerable.

The vulnerability ranking process is shown in Appendix F for surface water sources and Appendix K for ground water sources. The process involves reviewing each type of PCA identified in the inventory (and those types of PCAs whose presence is unknown) and assigning points based on the risk ranking of the type of PCA, the zone in which it occurs, and the Physical Barrier Effectiveness of the drinking water source. The points are added together, and the types of PCAs are prioritized according to points from highest to lowest, with the highest points representing the types of PCAs to which the source is most vulnerable. Finally, a cutoff point is identified, and the source is not considered vulnerable to types of PCAs with points below the cutoff.

As with the PBE scores, the vulnerability points in and of themselves do not have a quantitative value. Rather, the points are used to relatively rank the types of PCAs for an individual source. The ranking is intended as a preliminary tool to facilitate local source water protection programs that are site-specific.

The steps in the vulnerability ranking are listed below. The points for each element and the process for adding the points and assessing the relative vulnerability can be found following the steps.

1. Determine if any contaminants have been detected in the water supply (the information collected for use in the Consumer Confidence Report may be used for this purpose).

2. Determine, to the extent practical, the types of PCAs associated with detected contaminants.

3. For each type of PCA identified as existing in the protection zone(s), or as unknown, determine the number of points for the associated risk ranking.

4. For each type of PCA, determine the zone in which it occurs and add the points associated with that zone. If that type of PCA exists within more than one zone, repeat the process for each zone.

5. For each drinking water source, determine the Physical Barrier Effectiveness (PBE) and add the points associated with that PBE (these points are for Low, Moderate and High PBE as shown below).

6. Prioritize the types of PCAs by the vulnerability points, from the most points to the least.

7. The drinking water source is vulnerable to all types of PCAs with vulnerability points above the cutoff. Refer to the appropriate Vulnerability Matrix below.

8. The drinking water source is most vulnerable to PCA types with the highest vulnerability points, and to those PCA types associated with a contaminant detected in the water source, regardless of the vulnerability points.

9. The drinking water source is considered vulnerable to types of PCAs whose existence is Unknown, if the vulnerability points are equal to or greater than the cutoff.

Points for Vulnerability Analysis

PCA Risk Ranking Points:

Very High	7
High	5
Moderate	3
Low	1

Zone Points:

Surface Water (Zones defined)		Surface Water (Zones not defined)		Ground Water	
Zone A	= 5	Watershed	= 5	Zone A	= 5
Zone B	= 3	.		Zone B5	= 3

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Remainder of Watershed	= 1	.		Zone B10	= 1
Unknown	= 0	Unknown	= 0	Unknown	= 0

Physical Barrier Effectiveness points:

Low	5
Moderate	3
High	1

Vulnerability Matrix for SURFACE WATER SOURCES

The cutoff point for vulnerability is **11**. The drinking water source is considered Vulnerable to all PCAs with Vulnerability Score greater than or equal to **11** (shaded boxes).

PCA points	**Zone points**		**PCA + Zone points**	**PBE Points**			**Vulnerability Score PCA + Zone + PBE points**		
Risk Ranking	Zones Defined	Zones Not Defined	.	Low	Med	High	PBE Low	PBE Med	PBE High
VH (7)	A (5)	Watershed (5)	12	5	3	1	17	15	13
VH (7)	B (3)	.	10	5	3	1	15	13	11
VH (7)	Watershed (1)	.	8	5	3	1	13	11	9
VH (7)	Unknown (0) *	Unknown (0)*	7	5	3	1	12	10	8
.	.	.	.	.	.	.	.	.	.
H (5)	A (5)	Watershed (5)	10	5	3	1	15	13	11
H (5)	B (3)	.	8	5	3	1	11	9	7
H (5)	Watershed (1)	.	6	5	3	1	11	9	7
H (5)	Unknown (0) *	Unknown (0)*	5	5	3	1	10	8	6
.	.	.	.	.	.	.	.	.	.
M (3)	A (5)	Watershed (5)	8	5	3	1	13	11	9
M (3)	B (3)	.	6	5	3	1	11	9	7
M (3)	Watershed (1)	.	4	5	3	1	9	7	5
M (3)	Unknown (0) *	Unknown (0)*	3	5	3	1	8	6	4
.	.	.	.	.	.	.	.	.	.

L (1)	A (5)	Watershed (5)	6	5	3	1	11	9	7
L (1)	B (3)		4	5	3	1	9	7	5
L (1)	Watershed (1)		2	5	3	1	7	5	1
L (1)	Unknown (0) *	Unknown (0)*	1	5	3	1	6	4	

* Source is considered vulnerable to type of PCAs that are Unknown, if the Vulnerability Score is 11 or higher.

Vulnerability Matrix for GROUND WATER SOURCES

The cutoff point for vulnerability is **8**. The drinking water source is considered Vulnerable to all PCAs with Vulnerability Score greater than or equal to **8** (shaded boxes).

PCA points	**Zone points**	**PCA + Zone points**	**PBE Points**			**Vulnerability Score PCA + Zone + PBE points**		
Risk Ranking	A, B5, B10	.	Low	Med	High	PBE Low	PBE Med	PBE High
VH (7)	A (5)	12	5	3	1	17	15	13
VH (7)	B5 (3)	10	5	3	1	15	13	11
VH (7)	B10 (1)	8	5	3	1	13	11	9
VH (7)	Unknown (0) *	7	5	3	1	12	10	8
.	.	.	.	.	.	.	.	.
H (5)	A (5)	10	5	3	1	15	13	11
H (5)	B5 (3)	8	5	3	1	13	11	9
H (5)	B10 (1)	6	5	3	1	11	9	7
H (5)	Unknown (0) *	5	5	3	1	10	8	6
.	.	.	.	.	.	.	.	.
M (3)	A (5)	8	5	3	1	13	11	9
M (3)	B5 (3)	6	5	3	1	11	9	7
M (3)	B10 (1)	4	5	3	1	9	7	5
M (3)	Unknown (0) *	3	5	3	1	8	6	4
.	.	.	.	.	.	.	.	.
L (1)	A (5)	6	5	3	1	11	9	7
L (1)	B5 (3)	4	5	3	1	9	7	5
L (1)	B10 (1)	2	5	3	1	7	5	1
L (1)	Unknown (0) *	1	5	3	1	6	4	2

* Source is considered vulnerable to type of PCAs that are Unknown, if the Vulnerability Score is 8 or

higher.

8.3 Uses of Vulnerability Analyses

The prioritized list from the vulnerability analysis may be used by a water system in developing protection measures to address activities that are most significant to the water supply.

In addition, the prioritized list will be useful to DHS to determine drinking water sources that may be eligible for chemical monitoring relief.

The prioritized list may also be useful on a statewide basis in determining the types of activities that represent the greatest threats to drinking water supplies, their proximity to drinking water sources, and an estimate of their prevalence.

The PBE determination may be useful for a water system in comparing water sources to each other, and identifying the ones that are at greater risk. The PBE determination may be useful on a state-wide basis in determining areas where sources with high or low effectiveness may be concentrated.

8.4. Vulnerability Assessment Procedures in California Regulations

Existing California regulations detail the vulnerability assessment procedures required to obtain a waiver for monitoring certain organic and inorganic chemicals in drinking water supplies.

California Code of Regulations (CCR), Title 22, Chapter 15, Section 64432(l) addresses vulnerability waivers for cyanide:

> (l) A water system may be eligible for a waiver from the monitoring frequencies for cyanide specified in paragraph (b)(1) of this section without any prior monitoring if it is able to document that it is not vulnerable to cyanide contamination pursuant to the requirements in section 64445(d)(1) or (d)(2). *(See below).*

CCR, Title 22, Chapter 15, Section 64432.2 addresses vulnerability waivers for asbestos for ground water systems:

> The Department will determine the vulnerability of ground water sources on the basis of historical monitoring data and possible influence of serpentine formations.

CCR, Title 22, Chapter 15, Section 64445(d)(1) and (2) addresses waivers for organic chemicals based on use and susceptibility:

> (d) A water system may apply to the Department for a monitoring waiver for one or more of the organic chemicals on Table 64444-A in accordance with the following:
>
> > (1) A source may be eligible for a waiver if it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and therefore, that the source can be designated non-vulnerable.
> >
> > (2) If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated non-vulnerable pursuant to Paragraph (d)(1), it may still be eligible for a waiver

based on a review related to susceptibility to contamination. The application to the Department for a waiver based on susceptibility shall include the following:

(A) Previous monitoring results;
(B) user population characteristics;
(C) proximity to sources of contamination;
(D) surrounding land uses;
(E) degree of protection of the water source;
(F) environmental persistence and transport of the chemical in water, soil and air;
(G) elevated nitrate levels at the water supply source; and
(H) historical system operation and maintenance data including previous Departmental inspection results.

Home

From: "albarrow" <abarrow@sbcglobal.net>
To: "baynews" <news@thebaynews.com>
Cc: <abarrow@sbcglobal.net>
Sent: Tuesday, March 22, 2005 7:47 PM
Attach: CONFORMED FINAL INITIATIVE PETITION.doc
Subject: Initiative petition ballot measure

Hello Niel;
You said today you intend to write an article on the lawsuits, revocation, recal and Initiative. The initiative has yet to announced. Please use our press release.
Press releases are just that. My view is let the releasor release and get published, then you write an article with your spin separately. Otherwise your paper is all opinion and no news. You may see it in a different light. Reality is reality, but we will keep trying for the facts.The longer the community is deprived of the facts the longer the sewer will take. Lets move forward with the facts and put all the cards on ther table.
My 'umble opinion.Attached is the Initiative we are over halfway in two weeks.
Thank You,
Al Barrow C.A.S.E.

LAW OFFICES
BURKE, WILLIAMS & SORENSEN, LLP
611 WEST SIXTH STREET, SUITE 2500
LOS ANGELES, CALIFORNIA 90017-3102
Tel: (213) 236-0600
Fax: (213) 236-2700
www.bwslaw.com

INLAND EMPIRE OFFICE
3403 TENTH STREET, SUITE 300
RIVERSIDE, CALIFORNIA 92501-3629
Tel: (951) 788-0100
Fax: (951) 788-5785

ORANGE COUNTY OFFICE
5 PARK PLAZA, SUITE 1280
IRVINE, CALIFORNIA 92614-2547
Tel: (949) 863-3363
Fax: (949) 863-3350

SAN DIEGO OFFICE
701 "B" STREET, SUITE 1790
SAN DIEGO, CALIFORNIA 92101-8142
Tel: (619) 615-6672
Fax: (619) 615-6673

SAN JOSE OFFICE
96 NORTH THIRD STREET, SUITE 620
SAN JOSE, CALIFORNIA 95112-5572
Tel: (408) 299-0422
Fax: (408) 299-0429

VENTURA COUNTY OFFICE
2310 EAST PONDEROSA DRIVE, SUITE 25
CAMARILLO, CALIFORNIA 93010-4747
Tel: (805) 987-3468
Fax: (805) 482-9834

Writer's Direct Dial:
(213) 236-2719
sporter@bwslaw.com

OUR FILE NO:
4750-0001

March 23, 2005

Steve Monowitz
Permit Supervisor
725 Front Street,
Suite 300
Santa Cruz, CA 95060-4508

Re: Permit Revocation Request For Coastal Development Application No. A-3-SLO-03-113

Dear Mr. Monowitz:

This communication outlines the appropriate legal standards for the California Coastal Commission ("Commission") to utilize when determining whether revoke the permit ("Permit") that was issued on August 11, 2004 on Application No. A-3-SLO-03-113.

This communication does not focus on the factual allegations relating to the Permit and the hearing, as those allegations are fully presented in the "Permit Revocation Request" prepared by the Los Osos Technical Task Force ("Revocation Request"); the February 23, 2005 rebuttal letter to Mr. Peter Douglas from Ms. Jana Zimmer ("Rebuttal Letter"); and additional comment letters that presumably are expected to have been or will be forwarded to your attention. Rather, this communication is intended to refute the legal assertions made in the Rebuttal Letter, and to provide a more accurate summary of applicable law.

When the appropriate legal standards are applied to those facts previously or subsequently submitted, it should establish that the Permit should be revoked.

I. REVOCATION IS REQUIRED IF THREE PRONGS ARE SHOWN.

CCR Title 14 Division 5.5. Article 16, 13105(a) (the "Regulation") provides:

> Grounds for revocation of a permit shall be:
>
> Intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application, where the commission finds that accurate and complete information would have caused the commission to require additional or different conditions on a permit or deny an application.[1]

Stated differently, all that the Commission must find to revoke the Permit is (1) the Commission was presented with incomplete, inaccurate or erroneous information; (2) the inclusion of this information was intentional; and (3) complete or accurate information would have caused the Commission to have issued at least one condition in a different manner, or have denied the application.

A. The Commission Was Presented With Incomplete, Inaccurate or Erroneous Information.

The first prong to establish grounds for revocation is that the Commission was presented with incomplete, inaccurate or erroneous information. Stated differently, this first prong is met if the commission was presented with either incorrect information, or a "half-truth."

1. There Is No Requirement That The Incomplete Or Incorrect Information Be Presented By A Particular Party.

The Regulation does not require that the incorrect information be submitted by any particular party. The only way to create a requirement of disclosure by a particular party would be to add words to the Regulation. Rather, the Regulation is silent as to who must have made the representations. Adding words to a regulation is prohibited. *Burden v. Snowden* (1992) 2 Cal.4th 556, 562 *modified*, 2 Cal.4th 758 ["Where the words of the statute are clear, we may not add to or alter them to accomplish a purpose that does not appear on the face of the statute or from the legislative history"]; *Lesher Communications, Inc. v. City of Walnut Creek* (1990) 52 Cal.3d 531, 543 (1990) [A court "may not add to the statute or rewrite it to conform to an assumed intent that is not apparent in its language."]. Rather, the Regulation was drafted in the passive voice to avoid any requirement of action by a particular party.

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[1] Section 13105(b) provides the alternate ground for revocation of a permit: "Failure to comply with the notice provisions of Section 13054, where the views of the person(s) not notified were not otherwise made known to the commission and could have caused the commission to require additional or different conditions on a permit or deny an application."

And for good reason. Otherwise, individuals that support the issuance of the Permit other than the applicant could make bald faced lies to the Commission and hide behind a rule that says, "unless the factual inaccuracies were presented by the actual applicant, the Commission can do nothing." This cannot be the law, nor is it the law. The Commission must have, and does have, the power to revoke permits if they were issued on incomplete or inaccurate information.

Nevertheless, the Rebuttal Letter asserts that this is the law. The rules of regulatory construction prohibit adding non-existent words and phrases. *Craig v. City of Poway* (1994) 28 Cal.App.4th 319, 337 [The Legislature is presumed to have meant what it said and the plain meaning of the language will govern the interpretation of the statute]. Contrary to this rule of regulatory construction, in an attempt to add a requirement of a particular actor, the Rebuttal Letter states the first prong requires that the "**applicant** or its representative submitted the contested testimony or information" [emphasis in Rebuttal Letter]. The only requirement is that there *were* factual misstatements; it is irrelevant who made the incorrect statements.

2. <u>The Incomplete Or Incorrect Information Need Only Have Related To The Permit Application.</u>

Similarly, the Rebuttal Letter asserts "the allegations merely restate a difference of opinion as to need for and the impacts of the project, not that the information provided the Commission did not accurately reflect the project to be constructed." This statement suggests that the only relevant information is that which relates to the "project to be constructed" – the size, shape, and location of the proposed structure. This may have been an inadvertent suggestion, but is nevertheless an improper conclusion, as the plain wording of the Regulation directly contradicts any such limitation. The Regulation provides that for the information to be considered, it need only have been presented "in connection with a coastal development permit application." Stated differently, if the information was relevant, it is at issue. As such, the Commission may consider any information that is relevant – including paperwork that was filed with the application, the status of approvals, the status of regulatory procedures, etc. The question of whether there are factual inaccuracies is so broad as to include whether the permits were obtained, whether the project complies with the LCP, and anything else related to the Permit.

Simply, the first prong merely requires that sometime during the Permit proceedings the Commission was presented with incomplete[2], inaccurate or erroneous information.

[2] The MacMillan 1980 Legal Thesaurus lists twenty three synonyms to the word to the word "incomplete." The terms are "broken, defective, deficient, devoid, imperfect, inadequate, inchoate, insufficient, non-substantial (not sufficient), outstanding (unresolved), paltry, partial (part), partial (relating to apart), perfunctory, rudimentary, scarce."

B. The Information Must Have Been Intentionally Included.

The second prong is that the information was intentionally included.

1. There Is No Required Showing Of Bad Faith.

The Regulation does *not* state that there is a requirement of bad faith; rather, the Regulation merely requires that the information be included "intentionally." Stated differently, there is no requirement that the Commission determine that whoever presented the information intended the *effect* of the act (i.e. intended to mislead the Commission), rather, the only requirement is that whoever presented the information had to have intended to do the act (i.e. to have intended to state or type the sentence, prepare a chart as it appeared, or have made any other representation in the manner in which it appeared as opposed to a mere oversight or any other accidental inclusion of information).

This interpretation is consistent with Black's Law Dictionary (both the 7th & 8th editions) which provides:

> "An act is intentional when foreseen and desired by the doer, and this foresight and desire resulted in the act through the operation of the will."

Simply, for an act to be "intentional" the law requires only a desire to do the act – there is no need to have a desire to have the actual effects of the act.[3] In legal jargon, the *actus reus*, is different than the *mens rea*; the act is different than the intent.

Had the Regulation been intended to require an improper motive, then the Regulations would have said so. For example, Regulation could have been drafted so as to require revocation where there was "intentional inclusion of inaccurate, erroneous or incomplete information introduced for the purpose of misleading the Commission." The Regulation, however, does not say this or anything similar. Because words cannot be added to regulations, the regulations must be interpreted as drafted. *Burden v. Snowden*, *supra*, 2 Cal.4th 556, 562.

[3] Numerous other authorities support this distinction. For example, Webster's Ninth New Collegiate Dictionary defines intent as "the state of mind with which an act is done: volition." It further provides that a synonym for "intent" is "voluntary." Another example is from the criminal context. There an act is intentional, so long as it was not accidental; there is no duty to show any further intent, unless the statutes specifically so provides. *U.S. v. Fuller* 162 f.3d 256 (4th Cir. 1998). This is confirmed by the legal maxim *In criminalibus, voluntas reputabitur pro facto* (in criminal cases, the intent will be taken for the deed."

Again, there is good reason for this rule. The drafters of the Regulation ("Drafters") were justifiably concerned that if the Commission required a showing of improper purpose, purpose could rarely, if ever be shown. How could the Commission ever know the motive of people who drafted documents, especially when the creator of those documents may never have even appeared at the hearing?[4] The Commission could never with any certainty determine that someone acted with a nefarious purpose. The ultimate concern of the Drafters was to preserve the California Coast. If the Commission was misled – regardless of the reason – the Commission must be allowed to properly regulate the California Coast. As such, the Commission us it trapped by mere technicalities.[5]

Yet that is exactly what the Rebuttal Letter proposes. It provides, "there is no evidence of an intent, let alone a motivation, to include erroneous or incomplete information." This statement improperly implies that the Commission must first determine whether the facts were incorrect, and *also* whether there was an improper motive. This is not the case.

2. <u>The Best Means To Determine Whether Information Was Intentionally Included Is To Determine How Often the Statements Were Made.</u>

The best means for the Commission to determine whether a statement was incomplete and/or factually inaccurate is to determine how many times that improper statement or a similar such statement was made. If the statement was made only one time, and that statement contradicted numerous other statements made by the same speaker, then the first statement was likely an unintended misstatement. If, however, the statement was made on more that one occasion, then the Commission can reasonably infer that the actor intended to make that statement.

Of course, there can be no hard and fast rule as to exactly when it can be known whether a particular statement is correct. In some situations one factual assertion can be known to be intentionally made. This is why the Regulation was drafted how it was – with a slight ambiguity and enough flexibility for the Commission to determine for itself whether a statement was accidental. Had the Drafters wished there to be a "bright line," they would have the exact number of misstatements that was required. The Drafters instead opted for flexibility.

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[4] This is not to suggest that those presenting incomplete information to the Commission did not have a motive for doing so. Numerous motives may exist, including: (1) the desire to avoid any potential fines to be imposed by water quality officials; (2) the desire to quickly complete the project before a replacement board of directors opts to terminate the project; (3) the desire to comply with one's boss who bases job performance based upon whether the project is approved. Rather, this is simply intended to state that there is no need to show any such motivation.

[5] Of course, there must be some finality to Commission decisions. That is why the three prongs were required.

At first blush, the Regulation does not appear to be clear as to exactly what is meant by "intentionally." On further examination, however, when applying general legal principles, it becomes clear that the second prong of the Regulation merely requires a showing that the presenter of the information intended to include the information in the presentation.

C. The Commission Would Have Either Issued Different Conditions Or Denied The Application.

The last prong is that the "accurate and complete information would have caused the Commission to require additional or different conditions on a permit or deny an application." In other words, the Commission must determine that the information would have affected its decision in some manner had the information been complete or accurate.

1. The Commission May Look To Later Events To Determine Whether The Commission Was Presented With Complete And Accurate Information.

The Rebuttal letter suggests that the Commission can never look to actions which took place after the hearing. This is an oversimplification. The only rule is that the Commission must determine whether the information presented at the hearing was incomplete or inaccurate at the time. This does not preclude the Commission from considering latter evidence to determine whether the information was correct or complete at the time.

The Regulation does not preclude the use of latter events to determine whether the past was correct. Again, for good reason. Otherwise, someone could lie to the Commission and the Commission could do nothing about it. If, for example, the Commission was told "tomorrow I will transfer $1 million to the City," and the transfer never occurred, but instead, three weeks thereafter, the individual transferred the money to a Swiss bank account and fled the country, the Commission should be able to determine based on that information alone that at the time that the statement was made, it was inaccurate – there was never any present intent to transfer the money. This rational conclusion is based entirely upon latter determined facts. Yet the Rebuttal Letter suggests that the Commission must ignore this information and conclude that the information it initially received was accurate. Because this legal interpretation of a regulation leads to absurd conclusions, the legal interpretation must be discarded. *Landrum v. Superior Court* (1981) 30 Cal.3d 1, 9 [courts are reluctant to attribute to the drafters of legislation an intent to create "an illogical or confusing scheme"].

Simply, the Commission *must* be permitted to look to future events; otherwise it could not fully determine the truth of the past events. When doing so, the Commission must determine whether it would have ruled differently. If the Commission would have issued, added, removed

or changed any conditions, or if it would have denied the Permit, the Commission must revoke the Permit.

II. ADDITIONAL CORRECTIONS

In addition to those comments mentioned above, there are two additional comments made in the Rebuttal Letter that should be corrected.

A. The Existence of a Court Case In No Way Removes The Commission's Duty to Respond.

First, the Rebuttal Letter argues that because there is an existent lawsuit in which it is alleged that the Commission violated the Coastal Act, that somehow the Commission is therefore absolved from determining the issue in the current instance. This is incorrect. The fact that a court of law will determine a somewhat related issue on a previous matter does not absolve the Commission from its statutory and regulatory duty to now determine whether the Permit should be revoked. This is particularly true because the Court must use different legal standards, and will analyze different issues than those discussed herein. In fact, if the Commission fails to rule as required, it would likely be subject to litigation wherein it would be alleged that the Commission's failure of analysis was contrary to law.

B. Neither Party Has The Burden of Proof.

Second, the Rebuttal Letter asserts that "Complainants have the burden to prove several separate elements." This can clearly be shown to not be the state of the law for various reasons. First, the Rebuttal Letter provides no authority that any party has the burden of proof. Second, 14 CCR 13108(d) provides only that Commission may revoke the permit if the Commission finds "that any of the grounds specified in [the Regulation] exist." 14 CCR 13108(d) does not require that either party meet some unspecified burden of proof. Third, the plain wording of the Regulation, too, does not provide that either party has the burden of proof. Last, pursuant to 14 CCR 13104, the Commission's Executive Director has standing to initiate proceedings. If the assertion was correct that the Complainants have the burden of proof, then 14 CCR 13104, or another similar regulation would state how the burden of proof is different in this situation where neither party requested revocation of the permit.

Simply, there is no authority for such a proposition. If indeed, there was some such requirement there would be at least a *scintilla* of evidence to support this proposition. Presumably, the authors of the Rebuttal Letter assumed that the *court* rules of burdens of proof applied in this *administrative* proceeding; but again, no authority is presented for such conclusion.

III. CONCLUSION

If the Commission finds that (1) the Commission was presented with incomplete, erroneous, or incorrect information; (2) the party intended to present this information to the Commission; and (3) the inclusion of proper information would have caused the Commission to have issued a different decision, then the Commission must revoke the Permit.

Very truly yours,

Scott E. Porter
for BURKE, WILLIAMS & SORENSEN, LLP

From: "albarrow" <abarrow@sbcglobal.net>
To: "Gail McPherson" <ronmcpherson@earthlink.net>; "Jim Tkah" <jimtk@charter.net>; "Lisa Schicker" <lisaschicker@charter.net>; <abarrow@sbcglobal.net>; <mshunter@charter.net>; <truehr@oboe.aix.calpoly.edu>; "Chuck Cesena" <clcesena@charter.net>; "Steven Senet" <stevensenet@yahoo.com>; "Julie Tacker" <windmilljt@sbcglobal.net>
Cc: <abarrow@sbcglobal.net>
Sent: Monday, December 06, 2004 6:29 PM
Attach: pipe slopes 2.doc
Subject: pipe slopes 2

Hello;
Recent articles say the Nipomo wastewater collection system manholes hand to be coated due to hyrogen sulfide deterioration of the concrete manhole system. The cost $750.000.00 was due to shallow slopes of 1/16 inch per foot. We estimate 2/3 of the proposed LOCSD system will have the same problem.
A water sample from a gas line excavation was taken from 4th and Pismo. Water was two feet from grade where LOCSD want a 18 foot deep gravity collection pipe. Three samples will be tested to human coliform bacteria. Next week results will be back from the lab.
A retired public works manager from Fresno and a nieghbor of mine took a look at the Gas company crew's excavation. If the excavation were 15 to 20 foot deep as planned it would be unsafe without a cage for the workers and the pressure could be so great as to make it impossible to hold the sides. He also noted Fresno uses pond treatment and hired a company for $120K to do chemical odor control. They treat for a million residents.
He is willing to meet with the technical task force.
Thank You,
Al Barrow C.A.S.E.

From: "shpaige" <shpaige@sbcglobal.net>
To: "abarrow" <abarrow@sbcglobal.net>
Sent: Thursday, June 14, 2007 8:32 AM
Attach: compiled comments.pdf
Subject: Re: Comment on Fine Screening: for LOWWAC: Al Barrow

Compiled Comments Attached:

----- Original Message -----
From: abarrow
To: Lisa Schicker ; Gail McPherson ; Steven Senet ; jimtk@charter.net ; steve paige ; slogordon@fix.net
Cc: al barrow
Sent: Wednesday, June 13, 2007 10:28 PM
Subject: Comment on Fine Screening: for LOWWAC: Al Barrow

Hello Committee:
Here is my offering on Fine screening to the end of collection chapter. I included the entro letter to the BOS and exec summary as they impact the process.

In general:
The process is flawed in a number of ways and the cost numbers unjustified by data. The order of events makes it impossible for the ratepayer/voter to know what they are commmiting themselves to. The document needs to be divided into to portions of private and public financed elements which each has their own constraints not covered here. There is a lot of speculation as to constraints assumptions on STEP, like separate power service to the property, replacing all tanks etc.
Several FATAL FLAWS are listed in my comments. Some ommissions were addressed for the Counties benefit. It is distressing that they will not meet Orenco's request to have an LOCSD rep at the meetings with Carrollo.We need Orenco's cost values and technical in this fine sreeening. That inflexibility may cost them the 218 vote.
I ask for consensus on the STEP collection as prefferred method. I also would ask that you all support the Pond/Wetland treatment which complements the reuse by removing the human carbon (that will cause carcinogens when mixed with chlorine in water delivery systems) assuming reuse as drinking water. Anyway here is a page plus of comments:

Here are some points on the Fine Screening by Carrollo Engineering.

The first sentence deals with property owners wish to partner with the County as expressed by a 218 favorable vote. Including expensive technology and an unpopular project in that vote puts Tri-w on the table. Seems risky to the 218. They mention options not on the table that could be viable.

Since this is a cost document the assumed values must be justified. STEP industry show cost 1/3 of Corollo's values they need to be included here as BOOT financed privately does not have the engineering and contingency costs added to these costs. $50 million is the project estimate given by Orenco. By owning the treatment project and billing the ratepayers the private investment is secured by the infrastructure. 50% of all public projects do not use SRF loan as the saving in low interest is eaten by the strings and red tape. An example is Golden State who goes to the private sector to finance new infrastructure. They mention Regional Water Solutions, which opens another can of worms that the AB2701 included possibly obligating us to Nacamiento water that has some mercury. They are confident that STEP/STEG will remain on the table.

The range of costs, $134 million to $207 million are totally unaffordable and numbers justified by assumptions other industry analyst have disagreed with. Another FATAL FLAW.I have two contractor estimates that refute these numbers.

Both Daleo and Tidwell have estimated septic tank to Andre with potholing and paving do not exceed $12.5 million local contractors at prevailing wage scale.

Page ES-6 makes some serious assumptions: federal funding is available, no HCP or EIR delays and competitive bidding at present there is no guarantee for these assumptions That isn't going to happen. Another reason for a turnkey approach.

Table 1.1 needs to name the facultative ponds still in after fine screening. Is ADS, AIPS or Nelson in?

1.2.1 Seawater intrusion reversal can be accomplished outside of the project by reducing the lower aquifer draft in lieu of upper aquifer water with nitrate for residential landscape application. These expenses can be paid by new development starting with the schools and park. Purple pipe is encouraged and funded by DWR. See the 2003 white paper on reuse. (Our upper aquifer is replenished by septic effluent and classed as partial wastewater or we would not need a sewer.

1.2.2 Golden State has applied to CAPUC for rate increase to pay for infrastructure and treatment that will utilize the upper aquifer. How many ACY will that reduce the lower draft? This is an omission that needs attention.

1.3 Flow projections will not change constituent treatment requirements, with ponds it is not a big factor as with 24 hour in 24 out treatment train but that will effect disposal numbers.

FATAL FLAW "Properly installed bell-and-spigot…" will leak raw sewage into our drinking water aquifer which will soon be the upper aquifer as the lower aquifer is not recharging.

2.1 KEEP THE WATERS IN THE BASIN unless the water is not needed then it can be sprayed and disposed.

2.1.2 Lower aquifer is intruded and that portion is lost That is not necessarily so.

Upper aquifer water must be harvested to the point it does not leak into the bay.

Recharge must not have Phosphorus, which will clog soil pores. All treatments so far do not address this.] impact on reuse. Calcium treatment that is affordable can be used in combination with wetlands to remove phosphorus this so the treated effluent waters are safe.

2.3.2 Bullet 4 describes the cost per acre of grade II-III farmland as $40, 000.00 I think $10,000.00 is a more responsible number. Giacomozzi was $323,000.00 for 35 acres at one point. More inflated costs!

The case is correctly made that pumping the upper aquifer as landscape water is cheaper than piping effluent back to town and much safer.

Table 2.1 page 33

PERCOLATION PONDS AT BRODERSON: This was a project FATAL FLAW in 1997 SLO County plan

Urban wastewater reuse is a poor concept compared to upper zone nitrogen water for irrigation instead of drinking water. Less piping and much lower health risk on school and community center.

They represent over 40ACF reduction in saltwater intrusion on the school/park sites.

2.1.2 Sea water intrusion is not irreversible. Early-indicator signals of groundwater contamination: the case of seawater encroachment

FCGMA documents reversal of saltwater intrusion in Ventura County.
http://publicworks.countyofventura.org/fcgma/GMA%20Management%20Plan-Final%20051506x%20electronic%20v2.pdf see page 25 for reversal of saltwater intrusion. Grants from 319 USA were used, see page 75 reduction in seawater intrusion.

I recommend a cost benefit analysis for purple pipe in the reuse portion. And a note on septic INI if a tank can be retrofitted

in ground with sprayed epoxy, like manhole restoration it would only cost $700.00 per tank. saving replacement and removal and retirement costs Replacements could take place at the point of resale so as not to have the community dug up at once. Charlotte County did not replace any tanks. For Gordon's benefit they used a Tarriff document to gain access to private property i have a copy if you would like me to send it along. Tank need certification as per RWQCB3 requirements. If a tank is abandone it could be used to capture rain water and recharge through existing leech fields. (No waste)

The STEP collection works well with pond treatment with low biosolids production and lowest energy demand making the combination the most sustainable as the project goals state Many constraints and costs have been added to STEP by this document that are not supported by the STEP Industry data. I have screened out gravity due to the eventual leakage into the drinking water aquifer as they have admitted. One other FATAL FLAW is the seawater intrusion around the Bay where the deepest pipes will be trenched in. When saltwater enters the collection system then the treatment plant will require reverse osmosis and brine trucking to Ventura County will ensue as many as 60 trucks a day. The expense of these impacts was not added to the gravity cost as I recall $60,000.00 a day or an additional . Less hydrostatic pressure in the upper aquifer and less water volume may bring in saltwater into the upper aquifer. Please remember that sea water levels are predicted to rise making STEP low pressure safer.

Consensus:

Pond treatment/STEP collection and wetland reuse spray irrigation on grazing land moving to AG exchange as it is more widely accepted.

From: "Mike Saunders" <msaunders@orenco.com>
To: "'abarrow'" <abarrow@sbcglobal.net>
Cc: "'Bill Cagle'" <bcagle@orenco.com>
Sent: Friday, August 24, 2007 11:41 AM
Attach: Swimming%20in%20Sewage1.pdf
Subject: Sewer Paper

Al,

This is the paper that I referenced that may be of interest. Many interesting statistics.

Michael L. Saunders
National Accounts Leader
Orenco Systems, Inc.

msaunders@orenco.com

Office 1-800-348-9843 (Extension 443)
Cell 941-276-8586
Fax 941-764-6069

Visit our web site at www.orenco.com

EPA/600/R-01/034
December 2000

Exfiltration in Sewer Systems

by

Robert S. Amick, P.E.
Environmental Quality Management, Inc.
Cincinnati, Ohio 45240
and
Edward H. Burgess, P.E.
Camp, Dresser & McKee
Cincinnati, Ohio 45249

Order No. 8C-R551-NASX

Project Officer

Ariamalar Selvakumar, Ph.D., P.E.
National Risk Management Research Laboratory
Edison, New Jersey 08837

National Risk Management Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

Notice

The U.S. Environmental Protection Agency through its Office of Research and Development funded and managed the research described here under contract 8C-R551-NASX to Environmental Quality Management, Inc. It has been subjected to the Agency—s peer and administrative review and has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Foreword

The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation—land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA—s research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory is the Agency—s center for investigation of technological and management approaches for preventing and reducing risks from pollution that threatens human health and the environment. The focus of the Laboratory—s research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL—s research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory—s strategic long-term research plan. It is published and made available by EPA—s Office of Research and Development to assist the user community and to link researchers with their clients.

E. Timothy Oppelt, Director
National Risk Management Research Laboratory

Abstract

This report was submitted in fulfillment of Order No. 8C-R551-NASX by Environmental Quality Management, Inc. and Camp, Dresser & McKee of Cincinnati, Ohio under the sponsorship of the United States Environmental Protection Agency. This report covers the period from September 1998 to February 2000 and work was completed in April 2000.

The study focused on the quantification of leakage of sanitary and industrial sewage from sanitary sewer pipes on a national basis. The method for estimating exfiltration amounts utilized groundwater table information to identify areas of the country where the hydraulic gradients of the sewage are typically positive, i.e., the sewage flow surface (within pipelines) is above the groundwater table. An examination of groundwater table elevations on a national basis reveals that the contiguous United States is comprised of groundwater regions (established by the U.S. Geological Survey) which are markedly different. Much of the northeastern, southeastern, and midwestern United States has relatively high groundwater tables that are higher than the sewage flow surface, resulting in inflow or infiltration. Conversely, a combination of relatively low groundwater tables and shallow sewers creates the potential for widespread exfiltration in communities located in the western United States.

This report presents information on typical sewer systems, identifies and assesses the factors that cause or probably cause exfiltration, presents commonly used and advanced corrective measures and their costs for dealing with exfiltration, identifies technology gaps, and recommends associated research needs and priorities. This report also examines urban exfiltration, including a case study of Albuquerque, New Mexico.

Contents

Figures

Tables

Acknowledgement

The contributions of several individuals are acknowledged and appreciated for the preparation of the project report. Dr. Ariamalar Selvakumar and Mr. Richard Field were the Project Officer and Technical Advisor, respectively for EPA ~~s~~ National Risk Management Research Laboratory (NRMRL), and contributed toward the review and preparation of the project report. Mr. Robert Amick, P.E., was the Project Manager for Environmental Quality Management, Inc. Mr. Edward Burgess, the Technical Manager for Camp, Dresser & McKee, was responsible for the quantification of exfiltration on a national level.

Chapter 1
Introduction

1.1 Background

Many municipalities throughout the United States have sewerage systems (separate and combined) that may experience exfiltration of untreated wastewater from both sanitary and combined sewers. Sanitary sewer systems are designed to collect and transport to wastewater treatment facilities the municipal and industrial wastewaters from residences, commercial buildings, industrial plants, and institutions, together with minor or insignificant quantities of ground water, storm water, and surface waters that inadvertently enter the system. Over the years, many of these systems have experienced major infrastructure deterioration due to inadequate preventive maintenance programs and insufficient planned system rehabilitation and replacement programs. These conditions have resulted in deteriorated pipes, manholes, and pump stations that allow sewage to exit the systems (exfiltration) and contaminate adjacent ground and surface waters, and/or enter storm sewers. Exfiltration is different from sanitary sewer overflows (SSOs). SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to surcharged pipe conditions. SSOs can be in the form of direct overflows to receiving water, street flooding, and basement flooding; whereas exfiltration is not necessarily caused by excess I/I and is merely caused by a leaking sewer from its inside to its surrounding outside.

Untreated sewage from exfiltration often contains high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation—s waterways.

1.2 Objectives

Although it is suspected that significant exfiltration of sewage from wastewater collection systems occurs nationally, there is little published evidence of the problem and no known attempts to quantify or evaluate it on a national basis. Accordingly, the objectives of this

study were to quantify through desk-top estimates the magnitude of the exfiltration problem in wastewater collection systems on a national basis; identify the factors that cause and contribute to the problem; and document the current approaches for correcting the problem, including costs. The resulting information was used to identify information and technology gaps and research priorities.

Chapter 2 identifies and qualitatively assesses the causative factors and health impacts of exfiltration; the methodology employed for quantification of exfiltration on a national scale is presented in Chapter 3; Chapter 4 presents corrective measures applicable to exfiltration; national magnitude of exfiltration and corrective measure costs results are presented in Chapter 5; and Chapter 6 identifies existing information/data gaps and makes recommendations for further research.

Chapter 2
Identification and Assessment of Causative Factors and Health/Environmental Impacts

2.1 Causative Factors

A search for publications regarding exfiltration of sewage from wastewater collection systems did not locate any exfiltration-specific discussion of unique/causative factors because most factors which cause inflow/infiltration are identical to those associated with exfiltration (i.e., they both occur through leaks in pipes, depending on the relative depth of the ground water).

Factors that contribute to exfiltration include:

- š size of sewer lines
- š age of sewer lines
- š materials of construction (sewer pipe, point/fitting material, etc.)
- š type and quality of construction (joints, fittings, bedding, backfill)
- š depth of flow in the sewer

Geological conditions that contribute to exfiltration include:

- š groundwater depth (in relation to sewer line/depth of flow of sewage)
- š type of soil
- š faults

Climate conditions that influence exfiltration include:

- š average frost line in relation to sewer depth
- š average rainfall, which helps determine groundwater depth

In a typical exfiltrating sanitary sewer system, with the groundwater level below the sewage flow surface, exfiltration can occur in several areas. Figure 2-1 schematically represents these exfiltration sources, including defective joints and cracks in the service laterals, local mains, and trunk/interceptor sewers. The level of ground water and the depth of flow in the sewer will influence the extent of exfiltration rates, since the pressure differential

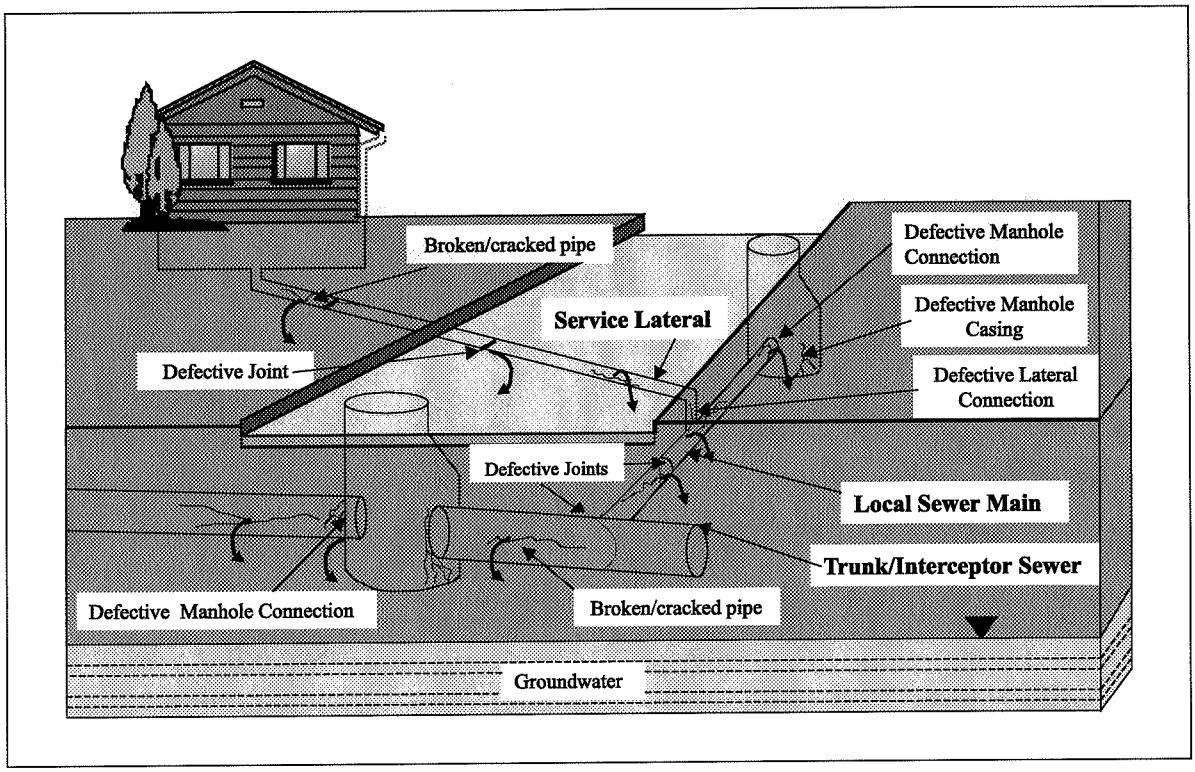

Figure 2-1. Sanitary sewer system components and exfiltration sources.

between the hydraulic head in the sewer and the groundwater hydraulic head will force water out of the sewer apertures into the surrounding soil material.

2.2 Health and Environmental Impacts

This section addresses the potential health impacts of exfiltration on ground water, drinking water distribution systems, and surface water.

2.2.1 Ground Water

Little published data is available on specific incidents of groundwater pollution and associated health/environmental impacts arising from leaking sewers, despite the widespread acknowledgment that these incidents occur. Several studies have indicated widespread pollution of ground water in urban areas arising from the general leakiness of sewers, including bacteria and ammonium reported from Wisconsin and general pollution in the San Joaquin Valley in California.[1]

Transport of the sewage and pollutants leaking into the subsurface/ground water depends on a variety of factors, including but not limited to: the difference in hydraulic head between the sewage surface and the groundwater table level, the substrate physical/chemical/ biological characteristics (which determines attenuation potential), and the sewage pollutants and their concentrations. Fecal bacteria contamination is the most serious health risk associated with domestic sewage exfiltration. Contamination by viruses, protozoa, and other microorganisms is also a concern. Increased concentrations of total organic carbon, nitrate, chloride, and sulfate, however, can also make the water unfit for consumption. Phosphate and boron are good indicators of sewage pollution since they are not naturally occurring in ground water.[2]

The solids present in sewage can plug the porous media beneath the pipe and rapidly decrease the exfiltration rate. In an experiment completed to examine this effect, the leakage was reduced to a steady state within an hour.[3]

As evidence of pollution from sewage, chloride and nitrate have been found to travel together. A California study indicated that ammonium disappeared within 4 feet, probably by adsorption and bacteriological activity. Bicarbonate and nitrate increased several hundred percent and nitrite disappeared.[4]

2.2.2 Water Supply Distribution Systems

Because of minimum separation requirements for potable water supply distribution systems and sanitary sewers and vigilant application of cross-connection control programs, the opportunity for sewer exfiltration to contaminate drinking water supplies is theoretically rather limited. Only one such potential documented case was found in a comprehensive data/information search.[5] Sewage from exfiltration can enter a distribution system through a broken water main or, under reduced pressure conditions, through a hole which leaks drinking water out under normal positive pressure conditions. Situations which could allow infiltration of the sewage through a lowering of water main pressure primarily involve backflow and surges.

Main Breaks

Despite the best efforts of utilities to repair water main breaks using good sanitary procedures, these breaks represent an opportunity for contamination from exfiltration to enter the distribution system. When a main breaks, utilities typically isolate the affected section, superchlorinate, and flush the repaired pipe. Flushing velocities may not always remove all contaminated debris, however, and microbiological testing of the final water quality may not detect contaminating microorganisms. In 1989, Cabool, Missouri[5] experienced a suspected cross-connection between sewage overflow and two major distribution system line breaks (backflow may have occurred during simultaneous repair of numerous water meters) caused by freezing temperatures, resulting in 243 cases of diarrhea, 32 hospitalizations, and four deaths due to *E. coli* O157:H7 strain. This town of

2000 was on an untreated groundwater system and did not superchlorinate during repairs of the water main breaks.

Backflow

Backflow devices to prevent the entry of contaminated water constitute an important distribution system barrier. Because of cost considerations, backflow-prevention devices are primarily installed on commercial service lines at facilities that use potentially hazardous substances. Such facilities include hospitals, mortuaries, dry cleaners, and industrial users. It is uncommon for all service connections to have backflow prevention devices; thus, back siphonage can occur at these unprotected points. Furthermore, installation of backflow devices at all service connections would make routine checking of the devices nearly impossible. Without routine inspection, proper functioning of the units cannot be determined.

Surges

Recent research is focusing on transient pressure waves that can result in hydraulic surges in the distribution system. These waves, having both a positive and negative amplitude, can draw transient negative pressures that last for only seconds and may not be observed by conventional pressure monitoring. Because these waves travel through the distribution system, at any point where water is leaking out of the system, the transient negative pressure wave can momentarily draw water and sewage (if present) back into the pipe.[6]

2.2.3 Surface Water Pollution

No data or narrative information in the literature demonstrate, or even suggest, that sewer exfiltration has directly contaminated surface waters. Several factors that control the occurrence of sewer exfiltration may explain the absence of a linkage between exfiltration and surface water pollution.

The occurrence of exfiltration is limited to those areas where sewer elevations lie above the groundwater table. Since groundwater elevations near surface water bodies are typically near the ground surface, sewers near surface water bodies generally are below the groundwater table, and infiltration (rather than exfiltration) will dominate the mode of sewer leakage in these areas. In areas of steep topographic conditions, where sewers are located near surface waters and at elevations that lie above the surface water, exfiltration impacts may be possible. However, these situations are assumed to be sufficiently rare that exfiltration impacts on surface waters are not observed.

Chapter 3
Methodology for Determining the Magnitude of Exfiltration on a National Scale

The process of estimating the magnitude of the exfiltration problem on a national scale has been performed as a series of two independent steps:

- š Qualitatively assessing the portion of the nation—s sewer systems that are susceptible to exfiltration;

- š Applying assumptions about exfiltration rates (percent of base sewer flow) to the exfiltration susceptible sewer systems to provide an assessment of the extent of sewer exfiltration on a national scale.

3.1 Identification of Exfiltration Susceptible Sewer Systems

The key factor influencing the occurrence of exfiltration is the direction of the hydraulic gradient between the sewer flow surface and the groundwater table (GWT) external to the sewer. Where (and/or when) the direction is toward the sewer, exfiltration will be <0 (i.e., the hydraulic gradient will cause infiltration, rather than exfiltration). This situation is probably best analyzed by evaluating the depth of the sewers (and service laterals) relative to the groundwater table. In much of the northeastern, southeastern, and midwestern United States, relatively high groundwater tables typically result in infiltration conditions. Exceptions include shallow sewers, service laterals, and seasonal variation in GWTs that can significantly change the spatial extent of the sewer system that lies above the GWT (i.e., that can be considered to be ˜exfiltration susceptible™)To a lesser degree, short-term reversals in the gradient that may occur during wet weather (e.g., surcharged sewers which temporarily experience high sewage flow surface above the GWT, and may therefore briefly exfiltrate) may also need to be considered.

Given the importance of first screening out those areas that are not ˜exfiltration susceptible,™the initial desktop analysis task was to perform spatial analysis of sewer depth relative to regional GWT elevations. Existing national-scale groundwater information was examined, such as that provided by the U.S. Geological Survey (e.g., USGS Groundwater Regions of the United States). As the various national groundwater data sources were reviewed, however, it was determined that mapping in support of the purposes of this study was not readily available. For this reason, a national depth-to-groundwater map was prepared under this project from groundwater level data available

in the national databases (U.S. EPA STORET and USGS WATSTORE) and presented in Section 5 of this report.

It is recognized that there may be seasonal variability in the portion of sewer systems susceptible to exfiltration in some areas, as GWTs can vary seasonally. The extent to which seasonal differences must be accounted for was assessed in reviewing the correlations to sewer depth.

National-scale sewer depth data does not exist, but for purposes of the desktop analysis some assumptions about this parameter can be made. For example, typical service lateral depth can be assumed to be 8 feet for buildings with basements, and 2 to 4 feet for houses built on slabs. Typical sewer main depth can be assumed to be 6 to 10 feet; it may be possible for more detailed assessments to develop a typical depth distribution (i.e., x % 4-10 ft deep, y% 11-15 ft deep, z% > 15 ft deep). Regional differences should be considered; for example, sewer depths typically are shallower in the western United States than in other areas of the country. Sewer system density (miles/acre) can be correlated with readily available national population density data to create a GIS coverage of sewer system density.

GIS processing incorporating the general spatial (mapped) relationships between sewer depth and groundwater elevations allowed the development of a characterization of the ˜exfiltration susceptibility™ of various areas.This was attempted at the national level, but the data required to support this analysis are unavailable; thus, a representative area (Albuquerque, New Mexico) for which a recent exfiltration study had been completed, was selected on which to perform the analysis. National exfiltration rate assessments can be extrapolated from this analysis. However, more detailed identification and inventory of exfiltration susceptible areas is required to support a meaningful quantification of national exfiltration rates.

3.2 Estimating National Exfiltration Rates

Estimation of the extent of exfiltration that actually occurs was addressed with the same set of parameters that are applied to characterize and quantify the infiltration problem: sewer condition, joint type, pipe material, age, etc. Similarly, correcting the problem can be assumed to involve the same technologies as are applied to infiltration (various lining approaches, etc.). For purposes of this project, however, it was necessary to make simplifying assumptions about exfiltration rates and corrective actions. More detailed investigations in the future can examine the spatial variability in exfiltration rates that can be correlated to the sewer condition, joint type, pipe material, and sewer age parameters. Corrective action costs can also be refined later with more detailed assessments of required actions.

For purposes of this study, unit rates for exfiltration (gallons/day/inch/mile) available from the 1989 EPA study[7] were used to generate the assessment of the magnitude of the

national exfiltration problem. These unit rates were applied to the ˜exfiltration susceptible™ areas (together with assumptions about the inch-miles of sewers/service laterals in those areas) to generate exfiltration rates in the Albuquerque case study. The unit rates based on gallons/day/inch/mile were compared with estimates based on percent of base sewer flow. Comparisons of the two methods proved useful in developing the final estimates.

Chapter 4
Corrective Measures

The proper selection of corrective or rehabilitation methods and materials depends on a complete understanding of the problems to be corrected, as well as the potential impacts associated with the selection of each rehabilitation method. Pipe rehabilitation methods to reduce exfiltration (and simultaneously infiltration) fall into one of the two following categories:

- External Rehabilitation Methods
- Internal Rehabilitation Methods

Certain conditions of the host pipeline influence the selection of the rehabilitation method. It is therefore necessary to assess these factors to prepare the pipe for rehabilitation. Rehabilitation is proceeded by surface preparation by cleaning the pipe to remove scale, tuberculation, corrosion, and other foreign matters.

4.1 External Sewer Rehabilitation Methods

External rehabilitation methods are performed from the aboveground surface by excavating adjacent to the pipe, or the external region of the pipe is treated from inside the pipe through the wall. Some of the methods used include:

- External Point Repairs

- Chemical Grouting
  - Acrylamide Base Gel
  - Acrylic Base Gel

- Cement Grouting
  - Cement
  - Microfine Cement
  - Compaction

4.2 Internal Sewer Rehabilitation Methods[8, 9, 10]

The basic internal sewer rehabilitation methods include:

š Chemical Grouting - Internal grouting is the most commonly used method for sealing leaking joints in structurally sound sewer pipes. Chemical grouts do not stop leaks by filling cracks; they are forced through cracks and joints, and gel with surrounding soil, forming a waterproof collar around leaking pipes. This method is accomplished by sealing off an area with a ~packer,™air testing the segment, and pressure injecting a chemical grout for all segments which fail the air test. The three major types of chemical grout are:

- Acrylic
- Acrylate
- Urethane

š Sliplining - In this method, pipes are inserted into an existing line by pulling or pushing pipes into a sewer. The space between the existing pipe and liner pipe is grouted. Sliplining can be segmental or continuous. Small pipes including service laterals are usually continuous, with the larger sizes being segmental. Major types of sliplining are:

Continuous Pipe - insertion of a continuous pipe through the existing pipe

- Polyethylene
- Polypropylene

Segmental - Short segments of new pipe are assembled to form a continuous line, and forced into the host pipe. Generally, this method is used on larger sized pipe and forced into the host pipe.

- Polyethylene
- Polyvinyl Chloride
- Reinforced Plastic Mortar
- Fiberglass Reinforced Plastic
- Ductile Iron
- Steel

š Cured-in-Place Pipe (CIPP) - The CIPP process involves the insertion of a flexible lining impregnated with a thermosetting resin into a cleaned host pipe using an inversion process (hot water or steam). The lining is inserted using existing manholes.

Because the liner initially is flexible, the pressurized steam or water also serves to form it in the shape of the existing pipe. The resin hardens with the application of

heat and with the passage of time (generally a few hours) to form a pipe within the existing pipe.

š Closed-fit Pipe - This involves pulling a continuous lining pipe that has been deformed temporarily so that its profile is smaller than the inner diameter of the host pipe. After installation, the new pipe expands to its original size and shape to provide a close fit with the existing pipe. Most lining pipe is deformed in the manufacturing plant.

š Fold and Form Pipe - This is similar to sliplining, except that the liner pipe is deformed in some manner to aid insertion into the existing pipe. Depending on the specific manufacturer, the liner pipe may be made of PVC or HDPE. One method of deforming the liner is to fold it into a ~U™shape before insertion into the existing pipe. The pipe is then returned to its original circular shape using heated air or water, or using a rounded shaping device or mandrel. Ideally, there will be no void between the existing pipe and the liner pipe after expansion of the liner pipe with the shaping device. For the ~U™shape liner, the resulting pipe liner is seamless and jointless.

š Spiral Wound Pipe - This involves winding strips of PVC in a helical pattern to form a continuous liner on the inside of the existing pipe. The liner is then strengthened and supported with grout that is injected into the annular void between the existing pipe and the liner. A modified spiral method is also available that winds the liner pipe into a smaller diameter than the existing pipe, and then by slippage of the seams, the liner expands outward.

š Pipe Bursting - Pipe Bursting is a method of replacing existing sewers by fragmenting the existing pipe and replacing the pipe in the void.

1. Hydraulic Method - In this method a solid rod is inserted into the existing pipe and a bursting head is attached to the rod, which is then attached to a new replacement pipe. Hydraulic power is used to retract the rod and bursting head, and draw in new pipes. Existing sewer pipe is broken into fragments, which are driven into the surrounding soil.

2. Pneumatic Method - This system consists of a pneumatic burster unit that splits the existing pipe while simultaneously installing a new polyethylene pipe of the same size or larger. Over 90 percent of the bursting is done by this method.

3. Static Head - Static heads have no moving parts. The head is simply pulled through the old pipe by a heavy-duty pulling device.

š Spot (Point) Repair - Point repairs are used to correct isolated problems in a pipe. Sometimes they are used as the initial step in the use of other rehabilitation

methods. Point repairs include:

1. Robotic Repair
2. Grouting/Sealing
3. Special Sleeves
4. Point CIPP

4.3 Issues Related to the Limitations of Existing Technologies

The City of Houston, Texas recently completed model simulations and determined that comprehensive rehabilitation was not cost-effective.[11] It was found cheaper to relieve Houston—collection system bottlenecks for the short duration. This study noted that many types of rehabilitation and varying levels of rehabilitation, however, were not tested and could prove to be cost-effective. Soil characteristics and climatology vary from region to region, as do sewer system conditions and available system capacity, and the conclusions found in Houston may not be applicable to other parts of the country.

Thousands of communities have rehabilitated portions of their collection systems; yet very few know whether or not they have been successful. The problem is that no one can forecast how effective the rehabilitation will be. A recent literature search found that only 91 sewer sheds worldwide have post rehabilitation infiltration/inflow (I/I) reduction information available.[12] Average reported reduction is 49 percent of peak I/I rate. No data was found on the amount of exfiltration reduction from rehabilitation.

Pipe bursting may be limited in use where the pipe has sags. This technology—s use is limited to cast or ductile iron pipe or concrete encasement. Pipe bursting may not be applicable where other existing utilities are close to the pipe.

Some sliplining applications require a round host pipe. Clearance should be checked before this method is employed.

Chapter 5
Results

This section describes the results of using various methods to estimate exfiltration from sewers. These methods have been developed and used in several locations in the United States and Europe. Some of these methods have been applied to calculate potential exfiltration in Albuquerque—sewer system, for which one of the most extensive exfiltration studies in the United States to-date has been completed.[12] For this reason, Albuquerque has been selected as a case study, from which the national extent of sewer exfiltration can be assessed.

The results of the 1998 exfiltration study from Albuquerque are extrapolated qualitatively by evaluating the exfiltration susceptibility of sewer systems throughout the United States. Susceptibility is defined by the relative depths of the sewers and groundwater table. In cases where sewer depths are generally shallower than the surrounding ground water, the potential to exfiltrate exists (because the direction of the hydraulic gradient is toward the exterior of the sewer) and these sewers can therefore be considered exfiltration susceptible. A national depth-to-groundwater map has been prepared for use in this assessment of the national extent of exfiltration susceptible sewer systems.

The findings of the Albuquerque case study were combined with the national depth-to-groundwater mapping to present a qualitative assessment of the extent to which sewer exfiltration represents a risk to water quality and human health on a national scale. Much of the information presented in Section 5.1 is taken from the 1998 Albuquerque study.[12]

5.1 National Scale Quantification

Although exfiltration is not a widely studied phenomenon, several exfiltration studies and investigations have been completed throughout the world. These include work completed in the United States for the U.S. EPA and several studies in Europe, the majority of which are focused on Germany. Some of the more applicable previous studies are discussed below.

Three basic approaches have been used to quantify sewer exfiltration rates: 1) direct measurement of flow in isolated sewer segments, 2) theoretical estimates using Darcy—s Law and related hydraulic theory, and 3) water balance between drinking water

produced/delivered and wastewater collected/treated. Each of these approaches has been applied to the Albuquerque case study and is described below.

5.1.1 Estimates Based on Direct Measurements (U.S. EPA Study)

An EPA study entitled ~Evaluation of Groundwater Impacts of Sewer Exfiltration™was completed in the late 1980—s. The work estimated exfiltration in two California city sewer systems to develop a correlation between exfiltration and infiltration. The tests were conducted in areas of vitrified clay pipe (VCP) predominance, where older pipe of known or suspected poor condition existed. Only those pipe segments located above groundwater levels were tested. Water consumption was metered for all sewer service connections corresponding with each measured sewer line to determine the actual quantity of wastewater flow entering the system. It was assumed that all internal household water entered the sewer system. Measurements of sewage flow in the sewer lines were made by continuous flow monitoring and hydrostatic testing. Calculated sewer exfiltration was reported in units of gallons per inch diameter per mile length per day (gpimd). Table 5-1 presents a summary of the exfiltration rates.

Table 5-1. Summary of Exfiltration Rates from Continuous Flow Monitoring and Hydrostatic Testing (Engineering Science, Inc., 1989)

Location	Pipe Information	Exfiltration Rate Cont. Flow Monitoring (gpimd)[a]	Exfiltration Rate Hydrostatic Testing (gpimd)
Berkeley, CA Pardee Street	320 linear feet (lf) of 8-in. - diameter VCP	5,649 (34% of flow)	6,327
Berkeley, CA 7th Street	298 lf of 6-in. - diameter VCP	5,283 (56% of flow)	5,649
Santa Cruz, CA Beach Street	260 lf of 8-in. - diameter VCP	6,557	2,417
Santa Cruz, CA Riverside Parking Lot	124 lf of 6-in. - diameter VCP	77,745	8,324

[a] gallons per inch diameter per mile length per day

This table shows that a large discrepancy exists between the results from the continuous flow monitoring and the hydrostatic testing at one Santa Cruz location. The study concludes that the continuous flow monitoring achieved reliable data and that the hydrostatic test data was influenced by the tidal cycle. A correlation model between exfiltration and infiltration was developed, but not field tested.

A second evaluation was performed using field measurements at another location to verify the correlation model. This evaluation used similar methodologies as the first task.

Exfiltration measurements were made in the Washington Suburban Sanitary Commission (WSSC) sewer system near Washington, D.C., and in Lexington, Kentucky. Table 5-2 presents a summary of the measurement results from the evaluation.

Table 5-2. Summary of Exfiltration Measurements (Engineering Science, Inc., 1989)

Location	Pipe Information	Average Exfiltration Rate (gpimd)[a]	Exfiltration as Percentage flow (%)
WSSC John Hanson Highway	1,400 lf of 8-in. - diameter VCP	16,248	16.6
WSSC University of MD	832 lf of 10-in. - diameter VCP	63,312	49.1
Lexington, KY Lumber Yard	455 lf of 8-in. - diameter VCP	17,103	22.6
Lexington, KY Car Lot	1,029 lf of 8-in. - diameter VCP	9,061	31.3
Lexington, KY Various Shops	586 lf of 10-in. - diameter VCP	5,664	11.9
Lexington, KY Various Shops	586 lf of 10-in. - diameter VCP	15,689	34.5

[a] gallons per inch diameter per mile length per day; lf = linear feet

Several problems with the measurement methodologies were noted, and overall the hydrostatic test method was judged to be not successful. It was resolved that the flow monitoring procedure worked well and should be applied to areas with a minimum of 400-500 linear feet of pipe with little or no service connections.

5.1.2 Estimates Based on Darcy's Law and Related Theory (European Studies)

The study of exfiltration has been of great interest in Germany. This country has a very old, deteriorated infrastructure. The cost to complete the necessary repairs to Germany—s sewer systems is estimated to be nearly $100 billion (U.S.). Therefore, several exfiltration studies have been conducted to prioritize repair work. These studies have both applied theoretical (Darcy—s Law) approaches and direct measurements to estimate sewer exfiltration. Excerpts from some of the studies are summarized below.

š A report from England[13] provided an estimate of 300 x 10^6 m^3/yr (793 x 10^8 gal/yr) or approximately 1 liter/day/m (397 gal/day/mile) for the exfiltration of the 880,000 km (547,000 miles) of sewer lines in Germany, although the basis of the estimate is not clear. This very low sewer leakage rate is actually net exfiltration, which is the difference between exfiltration and infiltration. The study indicates that total exfiltration and infiltration in Germany are nearly equal, but the amounts are not provided.

š To better understand the mechanics of exfiltration, sewage migration from leaking pipes to ground water was correlated in a study using Darcy-s-Law (see Equation 1).[3] The rate of exfiltration is linearly dependent on the area of the pipe exfiltrating and the pressure head:

$$(1) \qquad Q = L\,A\,dh$$

where Q is the exfiltration rate (ft^3/s) through a pipe leak area A (ft^2) at a pressure head of dh (ft), and L is leakage factor (s^{-1}).

The leakage factor is defined in Equation 2:

$$(2) \qquad L = K/dL$$

where K is the permeability of the surrounding soil (ft/s) and dL is the thickness of the settleable soil layer (ft).

This study found that the settleable solids in the wastewater act to reduce the permeability of the bedding material and lower the exfiltration rate rapidly at low flows and velocities. This clogging reduces the rate of exfiltration immediately. In fact, a steady-state rate of exfiltration was reached after one hour, even with large area of joint damage.

š A research project undertaken by the Institute of Environmental Engineering (ISA) at the University of Technology of Aachen, Germany, studied the water pollution hazard of leaking sewers.[14, 15, 16] The ISA developed and used a special exfiltration measuring device at every joint in several sections of sewer pipe on several tests conducted throughout Germany. This study determined that the most significant VCP sewer damages which permit exfiltration are leaking service junctions, leaking sewer joints, pipe cracks, and pipe fractures. At a pressure head below the sewer crown, which is typically the case in gravity flow sewer lines, exfiltration rates were minimal. At a pressure head of one pipe diameter, the exfiltration rate increased dramatically, to more than 26 gal/hour (gph) per joint in some segments. This high leakage rate can, in part, be attributed to the generally poor condition of the old sewer systems. A linear correlation between pressure head and exfiltration rate for several types of sewer defects was noted for pressure heads greater than 500 mm (20 inches). It was also noted that at lower flows and pressure heads, the exfiltration rate decreases exponentially, most likely from self-sealing from sewer film and settleable solids in the sewage. If the flow and pressure head increases, however, this self-sealing property is broken and the exfiltration rate increases rapidly.

5.1.3 Estimates Based on Drinking Water - Wastewater Balance

In this section, exfiltration from Albuquerque~~s~~ sewer system is estimated using a water/sewage balance calculation, backed up by some previous local studies on infiltration. The results are then compared with leakage rates calculated from the other methodologies and unit rates derived from the EPA and European studies presented above.

A direct method for estimating exfiltration is to compare water pumpage and usage with wastewater received at Albuquerque~~s~~ Southside Water Reclamation Plant (SWRP). To make this comparison, it is necessary to identify the base water demand, which is the indoor component of the total household use. Demands during mid-winter (January and February) are assumed to be near base flow because no or very minimal outdoor water usage occurs. Water and wastewater data obtained from the City for January 1998 revealed the following:

- Average daily influent flow at the SWRP: 51.4 mgd
- Average daily water pumpage into transmission/distribution system: 61.2 mgd (this is then considered to be the daily base flow for that month)

Subtracting wastewater flow from the pumpage rate yields a difference of 9.8 mgd, which is the first approximation of sewage leakage. However, several other factors also impact the water balance in the water and wastewater systems. These are:

- Sewer infiltration
- In-house water consumption
- Water distribution system leakage
- Sewer exfiltration

City of Albuquerque staff, using a range of available information (including meter and billing records, pumpage records, and other data), have estimated losses in the water system at about 11 percent of the total amount pumped. A 1997 study[17] found water system losses ranging from 8 percent in Hong Kong, which is considered to have a relatively "tight" and high-quality system, to the 20-25 percent range in England, which has many very old distribution systems. An 11 percent loss in the system would account for a daily average loss of about 6.73 mgd.

In-house consumption is the portion of the water entering the house that does not leave as sewage, but is consumed in cooking, drinking, watering plants, cleaning, etc. National experience indicates that about 3 percent of water entering the home is consumed on an average day in January 1998. With negligible non-domestic consumption, the remaining amount of water, about 1.4 mgd, represents the net difference between the two other factors in the water balance: sewer infiltration and exfiltration. The net amount is positive, indicating that exfiltration exceeds infiltration by 1.4 mgd, which is plausible given that the

great majority of Albuquerque ~~s~~ sewers, and particularly those most susceptible to exfiltration (older VCP), are in exfiltration areas (well above groundwater levels).

In order to estimate the exfiltration volume, previous studies addressing infiltration in the Albuquerque sewer system were reviewed. One of the studies[18] utilized several approaches to gain an approximation of inflow and infiltration in the Albuquerque system, most of which was attributed to infiltration in the valley of the Rio Grande. Some of these methodologies are described below:

- A flow comparison between winter water use and sewage flow. This methodology resulted in an infiltration flow of 3.7 mgd. However, the report stated that ~this estimation is probably within ± 50 (percent) of the actual value†™

- Early morning sewage flow versus water use. This methodology resulted in an infiltration flow of nearly zero.

- Sewage flow versus population. Using a 100-gallons-per-capita-per-day wastewater flow and a population of 300,000, infiltration was estimated at 5 mgd. It was also noted that the average sewage flow for Albuquerque at this time was actually 117 gpcd.

- Influent BOD versus domestic wastewater BOD. The expected BOD concentration in the wastewater was calculated based upon a generally accepted BOD loading of 0.17 lb/cap/day. This BOD concentration was compared with the average influent concentration to calculate an infiltration flow of 5.9 mgd. However, this was thought to be a high estimate based upon the relatively small industrial component and the high institutional contribution.

In addition, the study field-verified the areas subject to infiltration. Based upon the above calculations and results of the field tests, infiltration was thought to be somewhat less than 3 mgd, or 9 percent of the wastewater flow in 1975. Nine percent of today ~~s~~ wastewater flow would be in the 5 mgd range.

Another infiltration analysis was completed as part of the Albuquerque ASAM Model Loading and Verification Task.[19] Interceptor manholes that were within 2 feet of ground water were identified. Flow monitoring was completed in a sewer subbasin, and the resulting flows were compared with the predicted flows to determine infiltration. The infiltration rate for Albuquerque was calculated at 0.925 mgd, but, again, the impact of exfiltration was not included. Therefore, the work revealed a net infiltration rate, indicating that actual infiltration is about 1 mgd greater than total exfiltration.

From the foregoing investigations, it is estimated that the total average infiltration rate for the Albuquerque system is in the vicinity of 3.5 mgd. The 9 percent field-verified rate

reported in the Molzen-Corbin report is probably high, given the repair and replacement of major interceptors in the valley that have occurred since 1975, as well as the use of better quality materials and construction techniques for new pipelines since then. On the other hand, repairs have generally not been made to the sewers most susceptible to exfiltration -- old vitrified clay pipes (VCP).

The total exfiltration rate is obtained by adding the 1.4 mgd remaining in the water balance to the infiltration rate, for a total of 4.9 mgd, or approximately 5 mgd.

5.1.4 Comparison of the Various Methodologies – Albuquerque Case Study

Unit Rates from U.S. EPA Study

The 1989 U.S. EPA exfiltration study is discussed in Section 5.1.1 above, and some of the results are summarized in Tables 5-1 and 5-2. Application of measured exfiltration rates from this study (in gpimd) to the 66.5 miles of Albuquerque VCP sewers (average diameter of 8.57 inches) that are potentially in condition C (major cracks) or D (severe cracks) results in total exfiltration rates ranging from 1.38 mgd to 44.1 mgd (504 Mg/yr to 16,907 Mg/yr). These calculated quantities are listed in Table 5-3. Although there is a very wide range in calculated rates, many of them are in the 3 to 4 mgd range calculated above using a water balance.

Table 5-3. Calculated Exfiltration Rates Using United States EPA Study Results

Location	Measured Unit Rates (gpimd)	Equivalent Albuquerque Quantities[a] (mgd)
Berkeley, CA, Pardee Street	5,649; 6,327	3.2; 3.6
Berkeley, CA, 7th Street	5,283; 5,649	3.0; 3.2
Santa Cruz, CA, Beach Street	6,557; 2,417	3.7; 1.4
Santa Cruz, CA, Riverside Parking Lot	77,745; 8,324	44.3; 4.7
WSSC, John Hanson Highway	16,248	9.3
WSSC, University of MD	63,312	36.1
Lexington, KY, Lumber Yard	17,103	9.8
Lexington, KY, Car Lot	9,061	5.2
Lexington, KY, Various Shops	5,664; 15,689	3.2; 8.9

[a] For 66.5 miles of suspected Class C and D pipe, average diameter 8.57 inches.

European Methods

Section 5.1 discusses the results of several exfiltration studies carried out in Germany. Applying these methods and unit rates to the Albuquerque sewer system yields several estimates as follows:

- The study by Lerner and Halliday[13] presented an estimated net exfiltration rate of 397 gal/day/mile for the whole of Germany. Applying this figure to the entire length of clay and concrete sewers in Albuquerque—s system yields a totalet exfiltration rate (net leakage) of about 0.46 mgd. This is reasonably close to the net exfiltration rate of 1.4 mgd calculated by the water balance in Section 5.1.3. It is expected that, on average, a greater percentage of Germany-s-sewers are in infiltration areas than is the case in Albuquerque. On the other hand, Germany—s sewers arealso older and undoubtedly in overall worse condition, therefore more susceptible to exfiltration. Thus, a near balance in exfiltration and infiltration is possible. Albuquerque has a greater percentage of sewers above groundwater level, but a smaller portion that is likely to heavily exfiltrate.

- The study completed by Rauch and Stegner[3] determined that exfiltration could be correlated by Darcy-s-Law. A leakage factor dependent upon the bedding grain size and permeability affects the exfiltration rate (refer to Equations 1 and 2 in Section 5.1.2). For this study, the leakage factor was back-calculated using Darcy—s Equation with the data presented in Rauch-s-report. This calculated leakage factor was then used in Darcy-s-Equation to calculate the exfiltration rate for 8-inch-diameter pipes flowing half full, with every joint separated one-quarter inch to approximate conditions for Albuquerque. The exfiltration rate was calculated as 7.9 mgd (2,900 Mg/yr). However, not every joint will have a quarter-inch separation. The ISA German studies discussed above[14, 15, 16] summarized the sewer damage noted in the project. About 30 percent of the VCP sewers have leaking sewer joints. The infrastructure in Albuquerque is not as old as that of Germany and therefore is in better condition. If we assume every fourth joint (25 percent) will be separated one-quarter inch, the exfiltration quantity is 2 mgd or 725 Mg/yr.

- The German ISA project determined that at a 4-inch head (equivalent to an 8-inch pipe flowing half full), the exfiltration rate was nearly zero. However, a storm sewer was found to have an exfiltration rate, dependent upon the type of damage, ranging from 4 to 10.5 gallons per hour per joint. This rate yields an exfiltration quantity of 8.2 to 21.9 mgd (3,000 to 8000 Mg/yr) for the Albuquerque sewer system. It is probable, however, that not every joint is leaking even in pipe of condition C or D. Assuming every fourth joint is leaking (25 percent as discussed above) presents an estimate of 2 to 5.5 mgd (769 to 2,000 Mg/yr).

Table 5-4 presents a summary of the estimates of sewer exfiltration for the Albuquerque area based on data from the European studies.

Table 5-4. Estimates of Sewer Exfiltration Quantities for the Albuquerque Sewer System Based on Published European Exfiltration Rates

Source/Study Location	Daily Quantity	Annual Quantity
Munich, Germany measurement of 24,600 gpmd	1.65 mgd	600 Mg/yr
Darcy—s Equation, every joint offset 0.25 inch	7.9 mgd	2,900 Mg/yr
Darcy-s-Equation, every 4th joint offset 0.25 inch	2 mgd	730 Mg/yr
ISA Study › every joint leaking 4 g/hr	8.2 mgd	3,000 Mg/yr
ISA Study › every joint leaking 10.5 g/hr	22 mgd	8,000 Mg/yr
ISA Study › every 4th joint leaking 4 g/hr	2 mgd	730 Mg/yr
ISA Study › every 4th joint leaking 10.5 g/hr	5.5 mgd	2,000 Mg/yr

Based on a review of the above exfiltration rates for Albuquerque as calculated with the various EPA and European unit figures and methodologies, it can be seen that the rate of 5 mgd determined in Section 5.1.3 is very much within the range that would be expected. Although the calculated rates vary widely, the majority are within the 2 to 10 mgd range. Therefore, the rate of 5 mgd, as determined by the water balance described in Section 5.1.3, is presented as the best estimate of the average daily wastewater exfiltration rate from Albuquerque-s sewer system.

It is further concluded that the majority of this leakage will occur in those areas most susceptible to exfiltration, as approximately 15 percent of the sewer system in Albuquerque is estimated to be below the groundwater table and therefore not exfiltration susceptible.

5.2 National Depth to Groundwater Mapping

In order to extrapolate the Albuquerque findings to a national scale, a qualitative assessment of exfiltration susceptibility has been made using depth-to-groundwater information. Since no such mapping at a national scale suitable for this purpose was readily available, an initial mapping effort was undertaken as part of this study.

The development of a nationwide depth-to-groundwater atlas is difficult at best due to the lack of easily obtainable data for most of the country. Data to determine the depth to the shallowest water table may be gathered from local, state, federal, and private sources through well logs, water level measurements, location of wetlands and seeps, characterization of streams and rivers, and locations of lakes and other water bodies. A thorough characterization of the U.S. water table is a long and exacting process.

Within the context of this study, the depth-to-groundwater map presented in Figure 5-1 is a generalized view created using readily available data from the EPA STORET and USGS WATSTORE databases of depth-to-groundwater parameters. The data were downloaded

from CDROM databases resident at the CDM Hydrodata Center in Denver, Colorado. The data were screened to eliminate missing depth-to-water values, missing latitude and longitude, duplicate data, and easily recognized anomalous data. The resultant set contained approximately 93,000 data points in the coterminous United States, Alaska, and Hawaii (only the coterminous U.S. is shown below). Since the data retrieved from STORET and WATSTORE is dependent upon the data owner for accuracy, there is no comprehensive method of quality control. USGS data are continually reviewed, however, and these data may be deemed reasonably accurate. The STORET and WATSTORE databases, while certainly robust, do not contain all data available; therefore, data gaps exist which are labeled (in the data tables) as insufficient data.

Despite the large dataset applied to build the map, many regions of the United States have relatively limited data; these areas are unshaded on the map. Areas with the greatest concentration of valid data points within the deep groudwater range are generally west of the Mississippi River and along the Appalachian Mountains.

The data set was plotted upon a map of the United States using ESRI Arcview 3.1 GIS application with a Spatial Analyst extension. A grid was produced with a cell size of 10000 for the coterminous U.S. and Alaska and 1000 for Hawaii. An inverse distance weighted interpolation method (IDW) was used based on the 12 closest points. The IDW interpolator assumes that each point has a local influence that diminishes with distance.

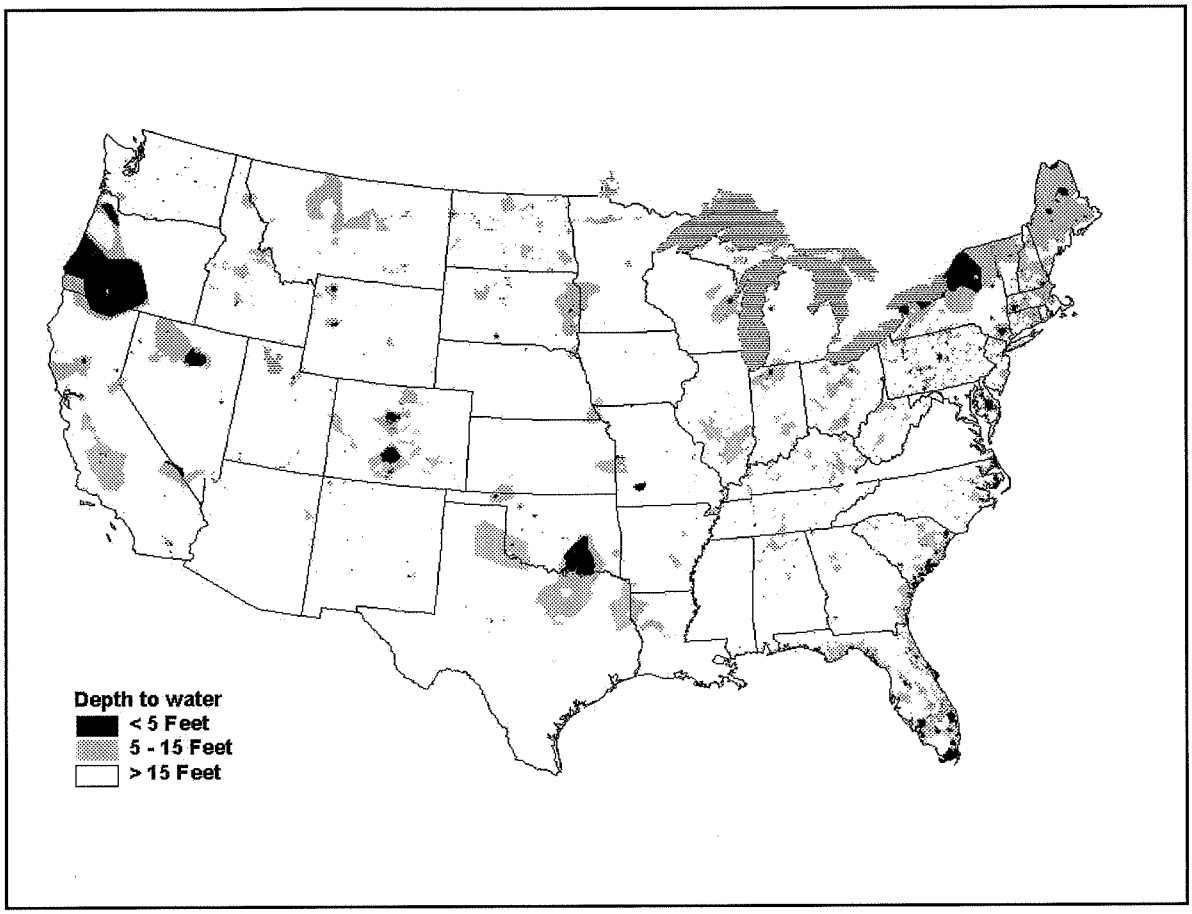

Figure 5-1. National depth-to-groundwater map.

Note: It is important to read Section 5.2 for a detailed explanation of background data basis.

5.3 Conclusions

Most of the urban areas in the northeastern, southeastern, and coastal areas of the U.S. have relatively shallow groundwater tables (<15 feet). In these areas, where a significant portion of the population (and therefore sewer systems) exists, relatively few exfiltration-susceptible sewer systems are expected. One caveat is exfiltration from service laterals. Even in the areas mentioned, many shallow service laterals may exist above groundwater tables. However, the hydraulic head available to drive exfiltration in these service lines is generally very low (typically only one or two inches, and intermittent). Further study in this area may be warranted to assess the extent of service lateral exfiltration.

Based on a review of the depth-to-groundwater map, it is expected that widespread exfiltration is probably limited to a relatively small portion of the total U.S. population, as relatively few large urban areas in the U.S. are located in these deeper groundwater areas. Cities such as Albuquerque, Phoenix, Tucson, and others, are among the larger urban areas where significant exfiltration potential exists. Further study of exfiltration conditions in cities such as these, with relatively large areas with sewers above the groundwater table, may be warranted on a case-by-case basis where evidence of exfiltration (e.g., groundwater contamination) has been observed, or is revealed by more detailed evaluations. Areas with extremely deep groundwater tables probably experience relatively less risk associated with exfiltration due to the long subsurface travel times and distances of the exfiltrated sewage from the sewer to the groundwater table. Areas with significant portions of the system above, but in close proximity to, the groundwater table are probably at greatest risk. There is an increased risk in the relatively few areas with significant exfiltration potential when there is, for example, a thin soil and fractured rock hydrogeologic setting which allows pathogens and other contaminants from the sewage to reach the ground water quickly and with minimal attenuation. However, since public water supplies are treated with chlorination, ozonation, or other systems to kill fecal bacterial contamination, an added measure of protection is provided.

A greater potential problem, albeit isolated, may be exfiltration from sewers carrying industrial wastewater. Organic and inorganic constituents of industrial sewage can be much more persistent than those of domestic sewage, and therefore much more likely to reach the ground water in areas of significant exfiltration potential. The disposition of industrial sewage contaminants which reach ground water used for drinking water supplies may not be the same as that of fecal bacteria from domestic sewage [i.e., the treatment processes (flocculation, filtration, chlorination, activated carbon filtration, etc.) may not eliminate or reduce these contaminants to render them harmless]. Untreated well water in some rural, small community, commercial, and private-owner drinking water systems does not enjoy this added protection. However, these systems are not typically in close proximity to large municipalities and associated sewer systems/exfiltration potential.

The Albuquerque Case Study concluded that the rate of exfiltration from that sewer system, expressed as a percentage of base flow, is on the order of 10% of average daily base wastewater flow - in absolute terms, roughly 5 mgd. This rate, expressed as an average annual rate, is 1,825 Mg/yr. Another relevant conclusion of the Albuquerque study was that there is a greater impact on ground water from septic tank usage than from sewer exfiltration. As the foregoing depth-to-groundwater analysis indicates, however, exfiltration is expected to vary significantly on a regional basis. Further study should expand the initial depth-to-groundwater analysis performed here and identify more precisely the ˜exfiltration susceptible™ sewer systems throughout the U.S. and the extent to which exfiltration impacts ground water in these systems.

In summary, exfiltration appears to be a problem in certain cities in the United States (mainly located west of the Mississippi River and along the Appalachian Mountains) based on an evaluation of: 1) available groundwater table data to nationally assess the extent to

which sewer systems are susceptible to exfiltration, 2) past studies of measured and estimated exfiltration rates, and 3) protective mechanisms, particularly natural soil/hydrogeological setting attenuation and drinking water treatment plants. Exfiltration may be a regional, or more likely, local problem where the GWT lies closely under the sewage flow surface. Situations where the exfiltrate can reach even deep ground water through a thin soil/fractured rock hydrogeologic setting, especially where persistent, potentially toxic contaminants are present (such as those often associated with industrial sewage) also pose a problem.

5.4 Corrective Measure Costs

Given the relatively high rates of exfiltration that potentially discharge from exfiltration-susceptible sewer systems in the U.S., corrective measures may be required to adequately protect groundwater resources, and in some limited instances surface waters, in these areas. The site-specific nature of exfiltration problems, however, requires a more detailed assessment of the larger urban areas in the exfiltration-susceptible western U.S. be completed before a meaningful estimate of corrective costs can be developed.

Corrective actions to address exfiltration in those situations where local-level evaluation calls for such action will generally be accomplished with similar technologies as those used to address infiltration. These technologies are described in Section 4. Although an estimate of national-scale costs to address exfiltration must follow more detailed evaluation of exfiltration-susceptible sewer systems, it is possible to identify corrective action costs on a unit basis (i.e., cost ($) per linear foot of sewer) in this study. The following table provides an example of those costs assuming the use of cured-in-place lining as the method of sewer rehabilitation.[20]

Table 5-5. Example Sewer Rehabilitation Costs for Exfiltration Corrective Action

Sewer Diameter (inches)	Cost ($) per linear foot
8	60
10	71
12	77
15	130
18	160
21	225
24	295
27	310
30	535
36	590

Chapter 6
Recommendations

This study identified the following data/technology gaps associated with exfiltration. Recommendations for research and development to fill these gaps were developed for each data/technology gap identified.

1. Data Gap - comprehensive national depth-to-groundwater maps: Although a large portion of the U.S. has readily available, accurate depth-to-groundwater data, many regions of the United States have relatively limited data.

   Recommendation:

   An effort to refine the initial depth-to-groundwater mapping produced in this study with an expanded and updated database would support a more detailed national estimate of exfiltration and the cost of associated corrective measures.

2. Data Gap - extent of exfiltration in municipalities: There are relatively few large urban areas in the U.S. which have the potential for widespread exfiltration. Western arid U.S. cities such as Albuquerque, Phoenix, and Tucson are among the larger metropolitan areas where significant exfiltration potential exists and little is known about it. Albuquerque ~~s~~ exfiltration has recently been studied extensively.

   Recommendation

   Further study of localized exfiltration conditions in cities with high exfiltration potential may be warranted on a case-by-case basis where evidence of exfiltration has been observed, or is revealed by more detailed groundwater study. This study should be preceded by assessment using the refined depth-to-groundwater mapping recommended above to produce a national inventory of exfiltration susceptible areas. This localized study will be of greater value than an attempt to quantify the problem nationally, due to the localized nature of the problem.

3. Data Gap - exfiltrate fate and transport: No information is available regarding the biological disposition of sewage exfiltrate. Also, it would be useful to determine if a biological crust forms in the bedding below an exfiltrating sewer that would serve to insulate/protect groundwater and/or water supply distribution systems.

Recommendation:

Research to fill the exfiltration disposition data gap could involve the use of existing sewage systems known or determined to be leaking in significant amounts (using carefully excavated examination of the bedding beneath and adjacent to the leaking sewer joints), or by construction of an experimental leaking sewer system (artificially introducing sewage into the sewer systems bedding). An analysis of bedding samples from points at increasing depths and horizontal distances from the leak would help to reveal the extent of exfiltrate transport.

4. Combined/Separate Sewer Considerations for Detailed Urban Study

Recommendation

The sewer systems to be considered in future exfiltration assessments should include both combined and separate sewer areas, since combined sewers are often located in highly urbanized areas where imperviousness is high. The result is a decreased rainfall infiltration into the soil and lowering of the GWTs, making these sewers potentially more susceptible to exfiltration. Additionally, combined sewers are often shallower than separate sewers, older than separate sewers, and constructed with less-watertight pipe joints - all factors that can contribute to higher exfiltration rates. Another special case that must be considered in more detailed studies is force mains. Although they are often constructed with tighter pipe joints and more durable pipe material, they nonetheless operate under pressure and may therefore be more exfiltration susceptible.

5. Inclusion of Service Laterals

Recommendation

It will be important to more detailed exfiltration assessments of urban areas to consider service laterals together with public sewers in identifying and evaluating the exfiltration susceptible sewers. Service laterals are the shallowest portion of the sewer system (largest hydraulic gradient difference with GWT) and typically of the poorest construction.

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Glossary Of Terms[1]

1. Combined Sewer

   A sewer intended to serve as a sanitary sewer and a storm sewer, or as an industrial sewer and a storm sewer.

2. Excessive Infiltration/Inflow

   The quantities of infiltration/inflow which can be economically eliminated from a sewer system by rehabilitation, as determined by cost-effectiveness analysis that compares the costs for correcting the infiltration/inflow conditions with the total costs for transportation and treatment for the infiltration/inflow.

3. Exfiltration

   Exfiltration is the leaking of wastewater from a sanitary or combined sewer into the surrounding soil, and potentially, into the groundwater. Exfiltration occurs when the sewer condition degrades to an extent where pipe defects (cracks, joint separation, etc.) allow wastewater to leak out of the sewer. Exfiltration can cause groundwater pollution if the rate and/or volume of wastewater leakage exceeds the ability of the subsurface soil to filter, absorb or immobilize certain pollutant constituents that may be present in the wastewater. Exfiltration is distinguished from infiltration (see below) by the direction of the hydraulic gradient across the sewer wall boundary. For exfiltration to occur, the hydraulic gradient must drive flow external to the sewer; with infiltration, groundwater depths above the flow line in the sewer drive flow into the sewer.

4. Infiltration

   The water entering a sewer system and service connections from the ground, through such means as, but not limited to, defective pipes, pipe joints, connections or manhole walls. Infiltration does not include, and is distinguished from, inflow.

5. Infiltration/Inflow

   The total quantity of water from both infiltration and inflow without distinguishing the source.

6. Infiltration/Inflow Analysis

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[1] U.S. Environmental Protection Agency, Office of Water Program Operations, Handbook for Sewer System Evaluation and Rehabilitation, December 1975.

An engineering and, if appropriate, an economic analysis demonstrating possibly excessive or nonexcessive infiltration/inflow.

7. Inflow

The water discharged into a sewer system, including service connections, from such sources as, but not limited to, roof leaders, cellar, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross connections from storm sewers and combined sewers, catch basins, storm waters, surface run-off, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

8. Internal Inspection

An activity of the Sewer System Evaluation Survey. This activity involves inspecting sewer lines that have previously been cleaned. Inspection may be accomplished by physical, photographic and/or television methods.

9. Physical Survey

An activity of the Sewer System Evaluation Survey. This activity involves determining specific flow characteristics, groundwater levels and physical conditions of the sewer system that had previously been determined to contain possibly excessive infiltration/inflow.

10. Preparatory Cleaning

An activity of the Sewer System Evaluation Survey. This activity involves adequate cleaning of sewer lines prior to inspection. These sewers were previously identified as potential sections of excessive infiltration/inflow.

11. Rainfall Simulation

An activity of the Sewer System Evaluation Survey. This activity involves determining the impact of rainfall and/or runoff on the sewer system. Rainfall simulation may include dyed water or water flooding the storm sewer sections, ponding areas, stream sections and ditches. In addition, other techniques such as smoke testing and water sprinkling may be utilized.

12. Rehabilitation

Repair work on sewer lines, manholes and other sewer system appurtenances that have been determined to contain excessive infiltration/inflow. The repair work may involve grouting of sewer pipe joints or defects, sewer pipe relining, sewer pipe replacement and various repairs or replacement of other sewer system appurtenances.

13. Sanitary Sewer

A sewer intended to carry only sanitary and industrial wastewaters from residences, commercial buildings, industrial plants and institutions.

14. Sewer System Evaluation Survey

A systematic examination of the tributary sewer systems or subsections of the tributary sewer systems that have demonstrated possibly excessive infiltration/inflow. The examination will determine the location, flow rate and cost of correction for each definable element of the total infiltration/inflow problem.

15. Storm Sewer

A sewer intended to carry only storm waters, surface run-off, street wash waters, and drainage.

SEC. 307. **Coastal Zone Management Act (U.S.)**

(a) In carrying out his functions and responsibilities under this title, the Secretary shall consult with, cooperate with, and, to the maximum extent practicable, coordinate his activities with other interested Federal agencies.
(b) The Secretary shall not approve the management program submitted by a state pursuant to section 306 unless the views of Federal agencies principally affected by such program have been adequately considered.
(c)

(1)
(A) Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. A Federal agency activity shall be subject to this paragraph unless it is subject to paragraph (2) or (3).
(B) After any final judgment, decree, or order of any Federal court that is appealable under section 1291 or 1292 or title 28, United States Code, or under any other applicable provision of Federal law, that a specific Federal agency activity is not in compliance with subparagraph (A), and certification by the Secretary that mediation under subsection (h) is not likely to result in such compliance, the President may, upon written request from the Secretary, exempt from compliance those elements of the Federal agency activity that are found by the Federal court to be inconsistent with an approved State program, if the President determines that the activity is in the paramount interest of the United States. No such exemption shall be granted on the basis of a lack of appropriations unless the President has specifically requested such appropriations as part of the budgetary process, and the Congress has failed to make available the requested appropriations.
(C) Each Federal agency carrying out an activity subject to paragraph (1) shall provide a consistency determination to the relevant State agency designated under section 306(d)(6) at the earliest practicable time, but in no case later than 90 days before final approval of the Federal activity unless both the Federal agency and the State agency agree to a different schedule.

[307 (c)(1) revised by PL 101-508]
(2) Any Federal agency which shall undertake any development project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved state management programs.

[307 (c)(2) amended by PL 101-508]
(3)
(A) After final approval by the Secretary of a state's management program, any applicant for a required Federal license or permit to conduct an activity, in or outside of the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity compiles with the enforceable policies of the state's approved program and that such activity will be conducted in a manner consistent with the program. At the same time, the applicant shall furnish to the state or its designated agency a copy of the certification, with all necessary information and data. Each coastal state shall establish procedures for public notice in the case of all such certifications and, to the extent it deems appropriate, procedures for public hearings in connection there with. At the earliest practicable time, the state or its designated agency shall notify the Federal agency concerned that the state concurs with or objects to the applicant's certification. If the state or its designated agency fails to furnish the required notification within six months after receipt of its copy of the applicant's certification, the state's concurrence with the certification shall be conclusively presumed. No license or permit shall be granted by the Federal agency until the state or its designated agency has concurred with the applicant's certification or until, by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds, after providing a reasonable

opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this title or is otherwise necessary in the interest of national security.

[307(c)(3)(A) amended by PL 101-508]

(B) After the management program of any coastal state has been approved by the Secretary under section 306, any person who submits to the Secretary of the Interior any plan for the exploration or development of, or production from, any area which has been leased under the Outer Continental Shelf Lands Act (43 U.S.C. 1331 et seq.) and regulations under such Act shall, with respect to any exploration, development, or production described in such plan and affecting any land use or water use or natural resource of the coastal zone of such state, attach to such plan a certification that each activity which is described in detail in such plan compiles with the enforceable policies of such state's approved management program and will be carried out in a manner consistent with such program. No Federal official or agency shall grant such person any license or permit for any activity described in detail in such plan until such state or its designated agency receives a copy of such certification and plan, together with any other necessary data and information, and until-

[307(c)(3)(B) introductory text amended by PL 101-508]

(i) such state or its designated agency, in accordance with the procedures required to be established by such state pursuant to subparagraph (A), concurs with such person's certification and notifies the Secretary and the Secretary of the Interior of such concurrence;
(ii) concurrence by such state with such certification is conclusively presumed as provided for in subparagraph (A), except if such state fails to concur with or object to such certification within three months after receipt of its copy of such certification and supporting information, such state shall provide the Secretary, the appropriate federal agency, and such person with a written statement describing the status of review and the basis for further delay in issuing a final decision, and if such statement is not so provided, concurrence by such state with such certification shall be conclusively presumed; or

[(ii) revised by PL 95-372, September 18, 1978]

(iii) the Secretary funds, pursuant to subparagraph
(A), that each activity which is described in detail in such plan is consistent with the objectives of this title or is otherwise necessary in the interest of national security. If a state concurs or is conclusively presumed to concur, or if the Secretary makes such a finding, the provisions of subparagraph (A) are not applicable with respect to such person, such state, and any Federal license or permit which is required to conduct any activity affecting land uses or water uses in the coastal zone of such state which is described in detail in the plan to which such concurrence or findings applies. If such state objects to such certification and if the Secretary fails to make a finding under clause (iii) with respect to such certification, or if such person fails substantially to comply with such plan as submitted, such person shall submit an amendment to such plan, or a new plan, to the Secretary of the Interior. With respect to any amendment or new plan submitted to the Secretary of the Interior pursuant to the preceding sentence, the applicable time period for purposes of concurrence by conclusive presumption under subparagraph (A) is 3 months.

(d) State and local governments submitting applications for Federal assistance under other Federal programs, in or outside of the coastal zone, affecting any land or water use of natural resource of the coastal zone shall indicate the views of the appropriate state or local agency as to the relationship of such activities to the approved management program for the coastal zone. Such applications shall be submitted and coordinated in accordance with the provisions of title IV of the Intergovernmental Coordination Act of 1968 (82 Stat. 1098). Federal agencies shall not approve proposed projects that are inconsistent with the enforceable policies of a coastal state's management program, except upon a finding by the Secretary that such project in consistent with the purposes of this title or necessary in the interest of national security. [307(d) amended by PL 101-508] (e) Nothing in this title shall be construed-

(1) to diminish either Federal or state jurisdiction, responsibility, or rights in the field of planning, development, or rights in the field of planning, development, or control of water resources, submerged lands, or navigable waters; nor to displace, supersede, limit, or modify any interstate compact or the jurisdiction or responsibility of any legally established joint or common agency of two or more states or of two or more states and the Federal Government; nor to limit the authority of Congress to authorize and fund projects;

(2) as superseding, modifying, or repealing existing laws applicable to the various Federal agencies; nor to affect the jurisdiction, powers, or prerogatives of the International Joint Commission, United States and Canada, the Permanent Engineering Board, and the United States operating entity or entities established pursuant to the Columbia River Basin Treaty, signed at Washington, January 17, 1961, or the International Boundary and Water Commission, United States and Mexico.

(f) Notwithstanding any other provision of this title, nothing in this title shall in any way effect any requirement

(1) established by the Federal Water Pollution Control Act, as amended, or the Clean Air Act, as amended, or

(2) established by the Federal Government or by any state or local government pursuant to such Acts. Such requirements shall be incorporated in any program developed pursuant to this title and shall be the water pollution control and air pollution control requirements applicable to such program.

(g) When any state's coastal zone management program, submitted for approval or proposed for modification pursuant to section 306 of this title, includes requirements as to shorelands which also would be subject to any Federally supported national land use program which may be hereafter enacted, the Secretary, prior to approving such program, shall obtain the concurrence of the Secretary of the Interior, or such other Federal official as may be designed to administer the national land use program with respect to that portion of the coastal zone management program affecting such inland areas.

(h) In case of serious disagreement between any Federal agency and a coastal state-

(1) in the development or the initial implementation of a management program under section 305; or (2) in the administration of a management program approved under section 306; the Secretary, with the cooperation of the Executive Office of the President, shall seek to meditate the differences involved in such disagreement. The process of such meditation shall, with respect to any disagreement described in paragraph

(2), include public hearings which shall be conducted in the local area concerned.

(i) With respect to appeals under subsections (c)(3) and (d) which are submitted after the date of the enactment of the Coastal Zone Act Reauthorization Amendments of 1990, the Secretary shall collect an application fee of not less than $200 for minor appeals and not less than $500 for major appeals, unless the Secretary, upon consideration of an applicant's request for a fee waiver, determines that the applicant is unable to pay the fee. The Secretary shall collect such other fees as are necessary to recover the full cost of administering and processing such appeals under subsection (c).

[307 (i) added by PL 101-508]

Al Barrow, January 30, 2009 (Letter P55)

Response to Comment P55-1

This comment is unclear—it suggests another SOP is needed to evaluate new information not provided by the County for OPR. Thank you for your comment.

Response to Comment P55-2

This comment relates information regarding vacuum collection systems. See the responses to comments P50-1 through P50-11.

Response to Comment P55-3

This comment expresses a concern regarding the identification of a gravity system as the preferred system in 3 of 4 projects. Both gravity and STEP collection systems are fully analyzed in the Draft EIR and supporting documents. Although each system has advantages and disadvantages, all County documents conclude that both systems are viable alternatives. These results are consistent with those of the NWRI Peer Review, which concluded that, "The Panel believes that the two collection system options are both viable. Both options have risks and benefits that are unique to themselves and, when viewed as a whole, make them functionally equivalent." Comparisons between gravity and STEP are summarized in Section 7 of the Draft EIR.

Response to Comment P55-4

This comment expresses a concern regarding reverse osmosis at the Broderson site. The proposed projects do not include reverse osmosis and this treatment method is not required in order to meet the effluent discharge requirements described in Section 3 of the Draft EIR.

Response to Comment P55-5

This comment expresses a concern regarding sewer leakage. See Response to Comment P32-3.

Response to Comment P55-6

This comment expresses a concern regarding leakage in gravity collection systems. See Topical Response 10, Infiltration, Inflow, and Exfiltration.

Response to Comment P55-7

This comment expresses a concern regarding liquefaction and seismic impacts. Sections 5.4 and 5.7 along with Appendices F and I of the Draft EIR evaluate the project's geological and public safety impacts. The County of San Luis Obispo has a well developed Emergency Response Plan which is available for review on the County's Office of Emergency Services website at http://www.slocounty.ca.gov/OES.htm.

Response to Comment P55-8

This comment expresses a concern regarding concern regarding leakage of sewer effluent from Broderson or the collection system and the preservation of cultural resources. The main objective of the project is to avoid leaking sewage. Currently the septic systems in the community of Los Osos are not effective and suspected of pollution of the groundwater and eventual leakage into Morro Bay.

The proposed project (any of the projects) are designed to prevent this from happening. The Broderson leachfield is designed to safely dispose of the treated effluent in conjunction with the Tonini sprayfields. Use of the Broderson leachfields will allow for infiltration of the treated effluent and eventually replenish the groundwater in the area.

Your concern about gravity sewers not protecting cultural resources is in error. Response to Comment P36-8 and P36-31 provide information on why cultural resources may not be impacted or will be limited in impact. The difference between a pressure line and gravity line would have little difference in excavated material for the majority of the project area in the community of Los Osos. See also Topical Response 13, Construction Excavation.

Response to Comment P55-9

This comment expresses a desire for clarification regarding the Department of Health and Safety's Drinking Water Source Assessment Program. The California Department of Public Health has been consulted numerous times regarding the proposed use of Broderson for effluent disposal. As noted in their letter (see comment letter A2) "we would recommend to the RWQCB that the Broderson site be considered a disposal project." The proposed projects do not include reverse osmosis and this treatment method is not required in order to meet the effluent discharge requirements described in Section 3 of the Draft EIR.

Response to Comment P55-10

This comment expresses a concern regarding liquefaction and seismic impacts. See Response to Comment P36-22 regarding liquefaction potential at Broderson.

Response to Comment P55-11

This comment expresses a concern with the second assessment. A second 218 assessment would address the costs of solving the current roadblocks to developing on vacant parcels in the prohibition zone (or re-developing under developed parcels). The assessment would have to address wastewater costs, water supply costs, and habitat costs.

Response to Comment P55-12

The comment refers to one of the existing conditions present at the time the proposition 218 vote was passed (2007). It should be noted that the proposition 218 process was widely vetted in the community and then passed.

Response to Comment P55-13

This comment states that the Tri-W has been slated for a lift station according to Measure B. Measure B regarding the location of a wastewater treatment plant in Los Osos was passed by the voters and subsequently found to invalid by the courts. It should be noted that proposition B specifically eliminated elements of the collection system from the measure.

Response to Comment P55-14

This comment restates information from the California Coastal Act regarding revocation of Coastal Development Permits and asserts that the County's consultants have misstated important information. We disagree. It should also be noted that a similar request to revoke the Coastal Development Permit issued to the LOCSD for their wastewater project was denied.

Response to Comment P55-15

This comment expresses a concern regarding pipe slopes. See Response to Comment P36-5 and P36-10.

Response to Comment P55-16

This comment expresses a concern regarding the lack of information regarding energy analysis. See the Response to Comment A8-39 regarding cost analyses.

Response to Comment P55-17

This comment expresses a concern regarding energy consumption due to global warming. The project is based on the general assumption that energy to operate critical public facilities will continue to be available as government agencies and the private sector work to develop and implement alternative energy sources as well as to implement conservation strategies. All of the pump stations are provided with emergency back-up power, in addition to reserve capacity in the pump station itself. Pocket pump stations, which are simply pump stations serving a small group of homes, have reserve capacity in the station. In the event of a prolonged power failure, systems operators would connect mobile auxiliary generators and operate the pocket pump stations in sequence. It should be noted that while each STEP/STEG tank has a certain capacity in the tank to accept wastewater when each of the 4769 pumps is not operating due to a power failure, there is no feasible way to pump all 4769 tanks if the power failure is prolonged, leading to potential overflows at every residence along the bay front. Simply put, the gravity collection system is designed with double back-up in the event of power failures (reserve capacity and auxiliary power) while the STEP/STEG system depends entirely on reserve capacity. Never-the-less, given the infrequency of prolonged power outages and the backup systems designed into both gravity and STEP/STEG, there is clearly a less than significant potential for the project to result in aesthetic impacts.

Response to Comment P55-18

This comment expresses a desire to consider the use of a gray water retrofitting program. See Topical Response 3, Water Resources and the Project Scope; and Topical Response 8, The Broderson Leachfield Although they could be one part of an overall water strategy for the community, grey water systems present their own unique issues. Very few homes have been constructed in a manner that would make grey water systems effective, while even fewer homeowners are likely to accept the responsibilities inherent in operating a grey water system. Widespread use of grey water systems also present salt loading issues which would need to be addressed.

Response to Comment P55-19

This comment expresses a concern regarding the possibility of an energy emergency. The project is a critical element of public infrastructure that should not be deferred because of potential future energy supply issues. See also Response to Comment P55-17.

Response to Comment P55-20

This comment pertains to the Fine Screening Report. The Fine Screening Report was not intended to replace the analysis contained in the Draft EIR. The issues raised in this comment are addressed in various sections of the Draft EIR and in the documents incorporated by reference into it. Regarding pond systems, all iterations of pond systems remain under consideration in the Design/Build process, along with any other alternative technologies. Regarding sweater intrusion, see Topical Response 3, Water Resources and the Project Scope, and Response to Comment A8-57.

Response to Comment P55-21

This comment expresses a concern regarding groundwater contamination and seawater intrusion. Regarding purple pipe, see the Response to Comment A8-57. With respect to the use or retrofit of existing septic tanks, there is no supporting documentation than the tanks can be sealed and retrofitted for less than the cost of a new sealed tank. Regarding the location of STEP tanks, see the Response to Comment P36-37. See Topical Response 10, Infiltration, Inflow, and Exfiltration. Regarding reverse osmosis, see Response to Comment P55-4.

Response to Comment P55-22

This comment expresses a concern regarding the proposed locations. Regarding the revocation of the Coastal Development Permit for the Los Osos CSD wastewater project, see Response to Comment P55-14.

Response to Comment P55-23

This comment expresses a concern regarding the gravity collection design listed on the San Luis Obispo County website. The Los Osos CSD did not cancel the previous permit. Presumably because the permit included construction of the wastewater treatment plant at the Mid-town site the LOSCD did not pursue an extension of the permit after stopping construction. As noted in Response to Comments P55-14 and P55-22, the validity of the permit was upheld by the Coastal Commission. To the extent that the County project contains the same elements as the previous project, the County has stated on numerous occasions that it intends to abide by the conditions of the previous permit.

Response to Comment P55-24

This comment expresses a concern regarding endocrine toxicity. See Topical Response 10, Infiltration, Inflow, and Exfiltration, and Topical Response 12, Sewer System Management Plan.

Response to Comment P55-25

This comment expresses a desire to include Vacuum and LPS technologies. See Topical Response 5, Alternative Collection Systems.

Response to Comment P55-26

The comment states that the impacts to regarding the Williamson Act and prime agricultural lands on the Tonini parcel are not addressed.

In the expanded agricultural resources section, impacts to prime agricultural lands are addressed on pages 5.11-26 through 5.11-38, and table 5.11-8 shows differences in impacts as measured by agriculture revenue lost by the four AG zoned parcels, and by proposed project. Impacts to Williamson Act lands on the Tonini parcel are addressed on pages 5.11-42 and 5.11-43.

Response to Comment P55-27

This comment states that recharge at the Broderson site was not evaluated for the impacts of the Lamellae fine lenses. Comments are so noted. See Topical Response 8, the Broderson Leachfield; /Topical Response 6, Alternative Treatment Systems; and Topical Response 4, Tertiary Treatment.

Response to Comment P55-28

This comment expresses a concern that San Luis Obispo put a penalty on the STEP systems but not on gravity collection. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P55-29

This comment is concerned that there is a potential for ground lurching to impact the Broderson site. Impact 5.4-F in Appendix F-1 acknowledges that the proposed facilities could be significantly impacted by ground lurching. To reduce ground lurching impacts on the proposed facilities, including Broderson, to less than significant, Mitigation Measure 5.4-F1 was included in the Draft EIR. The specific measures to implement will be based on site, location, and structure.

Response to Comment P55-30

This comment expresses the need for a discussion on impacts related to the project being susceptible to fault rupture and landslides. These issues are discussed in Section 5.4 – Geology. The mitigation measures may be found in Section 5.4.6, Mitigation Measures. See Response to Comment A8-116.

Response to Comment P55-31

This comment is concerned with invasion of non-native plants particularly at the Broderson leachfield. Mitigation Measure 5.5-A16 provides for habitat restoration on the Broderson property. While it does not explicitly require restoration of the leachfields as this would be counter-productive, it does call for the removal and eradication of invasives. See Response to Comment A8-188.

Response to Comment P55-32

This comment is concerned with deep trenching of the gravity collection system on cultural resources sites. Response to Comment P36-8 and P36-31 provide information on why cultural resources may not be impacted or will be limited in impact. The difference between a pressure line and gravity line would have little difference in excavated material for the majority of the project area in the community of Los Osos. See also Topical Response 13, Construction Excavation.

Response to Comment P55-33

This comment expresses the concern with truck trips associated with leachfield construction and their impacts on both traffic and road damage. The Draft EIR proposes in Mitigation Measure 5.8-A1 that the construction contractor develop a traffic management plan based on type of roadway, traffic conditions, duration of construction, physical constraints, as well as other factors that would include repairs to existing roads to restore them to pre-construction conditions.

Response to Comment P55-34

This comment expresses the concern that implementation of recent legislation regarding truck retrofits would require a reevaluation of the impacts from trucks. The Draft EIR used the most current adopted legislation as the basis for the analysis and cannot be required to revisit the subject when legislation changes. In addition, since the legislation mentioned is statewide in effect, the changes related to it would not be project specific.

Response to Comment P55-35

This comment expresses a concern that noise created by trucks at Broderson and reoccurring truck from reconstruction activities at Broderson need quantifying. See Response to Comment A8-29 regarding reoccurring truck noise impacts from reconstruction of the Broderson leach field every 5 to 10 year. These reconstruction activities as well as construction activities associated with Broderson include construction equipment that includes trucks.

Response to Comment P55-36

This comment states that the agriculture that is lost at Tonini represents a greater impact than the agriculture lost at Giacomazzi. As discussed in Section 5.11 in the Draft EIR and Appendix M-1, the implementation of Proposed Project 4 which includes a treatment plant facility at Tonini would result in the impact to approximately 180 acres of agricultural crop production that is considered prime farmland. The implementation of Proposed Projects 1 through 3 would result in the loss of 191 to 203 acres of agricultural crop production that is considered prime farmland. The definition of prime farmland that is used within the Draft EIR is based on the definition established by the California Coastal Commission.

Response to Comment P55-37

This comment expresses a concern regarding cost allocations associated with the proposed project and gentrification. See Topical Response 2, Project Costs, regarding the overall project costs.

Response to Comment P55-38

This comment expresses a desire for effluent disposal using constructed wetlands as an alternative. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P55-39

This comment states that the proposed project must contribute to the mitigation of saltwater intrusion and groundwater recharge. See Response to Comment A8-102.

Response to Comment P55-40

This comment states that the proposed project is not consistent with EPA standards for emerging contaminants. All of the project alternatives will meet the discharge requirements established by the Regional Water Quality Control Board shown in Table 3-1 of Section 3 of the Draft EIR.

Response to Comment P55-41

This comment reiterates some information from page 13 in Appendix P-1 of the Draft EIR. The comment states that any septage hauling will cause spores (i.e., airborne pathogens) to be air borne. As stated on page 13 in Appendix P-1 of the Draft EIR, the evaluation criteria for the various alternatives state that the project must demonstrate effectiveness in minimizing release of airborne pathogens. The projects evaluated in the Draft EIR were evaluated and determined that they were effective in minimizing release of airborne pathogens.

Response to Comment P55-42

This comment expresses a desire for effluent disposal using constructed wetlands as an alternative. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P55-43

This comment is unclear but seems to express concern about why agricultural exchange is not considered a "Priority A" since potable water would be returned to the community. The comment also questions costs shown in Table 7.7. Tertiary treatment of the effluent would be required to have an agricultural exchange or an agricultural in-lieu program. Topical Response 4, Tertiary Treatment, discusses the issues with this level of treatment and Topical Response 3, Water Resources and Project Scope, addresses why the LOWWP addresses certain water resource issues, specifically saltwater intrusion to the lower aquifer. Cost figures used throughout the Draft EIR were based on the Fine Screening Report and various Technical Memoranda produced by Carollo Engineers.

Response to Comment P55-44

This comment is a summary conclusion to the writer's comment letter. The comment provides many sweeping generalities and alleges fraud throughout the process. Since these comments do not address specific environmental concerns and because there are no comments, no response is necessary.

January 30, 2009
Via email

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center Room 207
San Luis Obispo, CA 93408

Mark,

The Environmental Impact Report should include an explanation of the process and an estimate of the cost of treating the effluent to a tertiary level. This would be required, according to the Regional Water Quality Control Board, for agricultural exchange and for the use of injection wells to replenish the lower aquifer and reduce saltwater intrusion. Tertiary treatment will eventually be required by the state, so I recommend it be a requirement of the Los Osos treatment plant. P56-1

I recommend injection wells be evaluated as an alternative to spray fields as a means of reclaiming this valuable resource within our water basin. P56-2

Ray Bracken
765 Highland Dr.
Los Osos
528-1044

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Ray Bracken, January 30, 2009 (Letter P56)

Response to Comment 56-1

This comment suggests that the Draft EIR include an explanation of the process and costs associated with tertiary treatment of the wastewater. An explanation of tertiary treatment is included in the Carollo technical reports, Fine Screening Report (incorporated by reference into the Draft EIR), and Section 7.3.5 of the Draft EIR. In essence, tertiary treatment is accomplished after secondary treatment techniques are employed (including de-nitrification) and involves filtering of the effluent and subsequent disinfection for potential reuse opportunities. See also Topical Response 4, Tertiary Treatment.

Response to Comment 56-2

This comment recommends the consideration of injection wells instead of using effluent sprayfields. A thorough discussion of the groundwater characteristics is contained in Section 5.2 and Appendix D of the Draft EIR. In essence, there is little opportunity to inject effluent into the ground at the Tonini site while the effluent placed on the Broderson leachfield will provide direct and indirect benefits to the Los Osos Basin. See also Topical Response 8, The Broderson Leachfield.

January 30, 2009

To: Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Public Works Department

From: Chuck Cesena
591 Ramona Ave.
Los Osos, CA 93402

RE: LOWWP Draft EIR Comments

Section 1.2-4, Page 1-8

There is still an unresolved legal question as to whether the CSD defaulted on the State Revolving Fund loan or if the State Water Resources Control Board improperly terminated the loan during the 90 period that the work was suspended, as allowed by the contract with the State. The CSD actually ordered the contractors to resume work on the project prior to the expiration of the 90 period, pending the resumption of loan payments from the State. Those payments were never reinstated. P57-1

Section 2.2.2, Page 2-5

See previous comment. Also, as a majority of the voters in Los Osos supported Measure B (which prohibited the sitting of a wastewater treatment facility at the TriW site) during the fall of 2005 special election, the suspension of work on the project should not be considered a setback but a legally required action taken by the newly elected CSD Board. It is unfortunate that the attempted compromise brokered by Assemblyman Blakeslee, and accepted by the LOCSD, failed. Perhaps it would have saved the County much effort and the community 6 million dollars as that project looks, except for the environmentally superior choice of facultative ponds for treatment, eerily similar to the project the County now prefers. P57-2

Section 2.4.4, Page 2-12

Here is the first mention of an assumption that is central to the decision to be made regarding the project's collection system as it further assumptions regarding (at the very least) operations and maintenance costs, greenhouse gas emissions, and biosolids processing . Where does the requirement to pump STEP/STEP tanks every five years originate? This "requirement" is mentioned at least twenty times in the DEIR, probably many more. The Regional Water Quality Contol Board's proposed onsite regulations require inspection every five years with pumping on an as-needed basis. At the early hearings on this issue, and at various hearings regarding the Cease & Desist Orders issued to 45 community members, the RWQCB did intend to require pumping every five P57-3

years. Expert testimony demonstrated that this would actually decrease the functioning of septic tanks in many instances and the requirement was changed to reflect the need to inspect tanks every five years. Please cite your authority requiring pumping every five years as personal experience and the expert testimony offered to the RWQCB indicated that pump-out intervals could be at least twice that.

P57-3 CONT

Section 2.4.7, Page 2-15

If the one project selected by the County to pursue for design, permitting and construction is based on the information presented in the DEIR (see how important that one assumption regarding pumping intervals becomes), how does the design-build process fit in? Even the community preference survey could be tainted by misinformation in the DEIR.

P57-4

Section 2.5, Page 2-22

Will construction actually be completed by late 2010 when it will not be started until 2010?

P57-5

What happened to the late 2008 Community Survey? As cost is central to the selection of a community preference, and truly accurate cost estimates will not be known until the Requests for Proposals are returned, the Community Survey should not occur until after the proposals have been submitted.

P57-6

Table 2-9, Page 2-35

Mitigation Measure 5.4-C1

This measure should be applied to the Broderson leachfields as well as the collection and treatment plant sites.

P57-7

Mitigation Measures 5.5-A1 through 5.5-A13 and 5.5-C1 through C3

In general, adhering to required laws and regulations is not considered mitigation; it is compliance with the law. The mitigation is the byproduct of the consultation and it is usually best to approach the consultation with a known set of impacts and proposed mitigation. The purpose of an EIR is to quantify impacts, not to postpone mitigation decisions until a later date. The promise of pre-construction surveys is not adequate mitigation.

P57-8

3.2.2, Page 3-13/14

Be specific about the number of pump stations scattered throughout the community. Yes, they can be counted on the nearby map, but this is the first mention in the text. This is an important issue as there will be noise and odor issues associated with living near the

P57-9

pump stations. They are expensive and messy to maintain, especially in areas along the edge of the bay where they will be located below groundwater levels.

Proposed Project 1, the STEP/STEG option, not only precludes the need for the central pump station at the mid-town site, it does not require any of the other pump stations scattered throughout the community.

P57-9
CONT

Section 3.3.1,Table 3-2, Page 3-20

This table should compare the contribution of I&I to wastewater treatment plant flows from both the proposed PVC pipe collection systems proposed in the DEIR and High Density Polyethylene pipe (HDPE) pipe, which is likely to be proposed by any design-build team proposing a STEP/STEG collection system. STEP/STEG collection systems easily lend themselves to the more water-tight HDPE pipe. Was PVC assumed for the STEP/STEG option just to try and keep the I&I numbers close between the gravity and STEP/STEG options?

P57-10

Aging gravity collection systems are known to have peak wet weather flows up to 10 times the dry weather flows, even the City of San Luis Obispo has experienced this. This system will be new, but even new systems, such as that constructed in the City of Lathrop less than five years ago, have I&I issues during wet weather. Given the saturated sandy soils in much of Los Osos, and the propensity for earthquakes in California, HDPE pipe should be required for either proposed collection system in all areas where groundwater will be within 10 feet of the collection system and sea level rises due to global warming should be factored into this requirement.

Table 3-3, Page 3-20

The septage estimates are greatly influenced by the assumption that STEP/STEG tanks would be pumped every five years. Again, where is your cited authority for this assumption?

P57-11

Section 3.3.2, Page 3-34

What is involved with abandoning the existing septic tanks for a gravity collection system? If the top must be pulled to either fill or clean the tank for future reuse, the on-lot disturbance would be nearly the same as if replacing the tank.

The sizes of the various pump stations should be correlated with the locations, both on this page and on all of the maps showing their locations. Where are the larger duplex stations located and especially where are the two triplex stations with the 30 and 60 horsepower pumps?

P57-12

Page 3-35

Why couldn't some of the tanks be placed at the edge of the County right-of-way if front yard space is tight and the streets have 80 foot wide corridors? Where did Kennedy and Jenks or Crawford, Multari and Clark come up the requirement to pump tanks every five years? No other authorities are mentioned in Appendix B. P57-13

Nor would the STEP/STEG system require the other 19 pump stations scattered throughout the community.

Page 3-40

Biosolids processing estimates are especially vulnerable to miscalculation because of the five year pump out assumption. P57-14

Page 3-44

It is bad enough to use spray fields outside the groundwater basin for disposal, even on a temporary basis. Can't we at least grow a productive crop other than grasses to be disposed of at a landfill? P57-15

Section 3.3.3, Page 3-53

A STEP/STEG system would eliminate the need for all 20 pump stations scattered throughout the community, not just at the Mid-town site.

Here the five year pumping requirement is affecting the proposed maintenance needs and costs of a STEP/STEG project.

Page 3-59

This makes it sound as though the contractor, and not the property owner, will make the decision as to whether the new STEP/STEG tank will go where the existing septic tank is located. Please clarify. P57-16

Page 3-60, Table 3-8a

Was it determined that 2/3 of the STEP/STEG tanks would go in a new location to drive up the excavation totals? P57-17

Page 3-63

Could a modern gravity collection system be constructed be constructed of fuse-welded HDPE pipe so that there are no joints to eventually leak? The sandy soils and earthquakes that will result in sagging pipes will be a test for even the tightest rubber gaskets, which will eventually turn brittle unless replaced. The replacement of gaskets in 12 foot deep P57-18

holes seems like a maintenance nightmare for both water and street crews. How often would the gaskets need to be replaced? For each proposed project, please provide initial construction and life cycle cost I&I and exfiltration estimates for each type of pipe. Lifecycle cost should be defined as the replacement of most, if not all, system parts. Is this paragraph saying that little exfiltration is expected because of the high percolation rates in our sandy soils? What about those sections of the collection system that will be sitting in groundwater? Are we expecting the hydraulic head of the groundwater to keep the wastewater in the pipes? Inflow of groundwater high in salts will be very problematic for the treatment plant operations. Yes, this can be reduced through continual inspection and maintenance, but that will not prevent catastrophic failures. Minimize all possibility of leaks and reduce maintenance needs by requiring HPDE pipe as it has no joints for even tree roots to attack the system. Rubber gaskets will not prevent this from happening either.

P57-18 CONT

Section 3.3.6, Page 3-65

What direct experience does Carollo Engineers have with the design, construction, or operation of a STEP/STEG system? This question is asked because in 2008 the County requested that the National Water Research Institute (NWRI) peer review the Carollo-prepared Technical Memorandums, which comprised the Fine Screening Report upon which the DEIR is based. At the follow up teleconference with County staff and consultants, the NWRI panel member stated that he was having a hard time not using the words gravity-biased when discussing the memorandums. If the engineering work upon which the DEIR is based is biased, how can the DEIR itself not also be? Since the County's analysis has shown very little difference between the environmental impacts associated with the various projects (Paavo Ogren, Los Osos Middle School informational meeting in November 2008), cost is even more likely to be the deciding factor in community preference. It is likely that only through a fair design-build process will the true cost of a STEP/STEG system be known. If the Community Survey will occur prior to the conclusion of the Request for Qualifications/Proposals process, how will it be structured to deal with cost proposals that could be tens of millions below the low end of any estimate contained in the DEIR?

P57-19

Section 5.2.1, Page 5.2-4

It should be noted that the stated groundwater monitoring wells' overall nitrate level of 10mg/l is just at the State drinking water standards and has not been increasing since the moratorium was imposed in 1988.

P57-20

Table 5.4-1, Page 5.4-5, Question number #5 (last collection system question)

This question is asked about septic tanks (with leachfields) in areas where sewers are not available, as opposed to STEP/STEG tanks (without leachfields) which are part of a sewer system. So it is unclear why this question is not given a NI rating for Project 1?

P57-21

Impact 5.4-C, Page 5.4-9

The 5-10 feet of loose sands spread over portions of the collection system have a high potential for liquefaction but the 5-10 feet of loose sands at the Broderson leachfields do not, even at the reduced application rates of 448 AFY? P57-22

Impact 5.4-F, Page 5.4-15

If risk of ground subsidence is greatest where dewatering occurs during construction, how can all projects be considered to have equal threat given that at least half of the STEP/STEG collection system would be installed using a micro-tunneling technology as opposed to the deep trenches and dewatering of the gravity system? This subsidence could result in subtle damage to walls, driveways and homes adjacent to the dewatering, damage so subtle it might not be apparent for months or years. P57-23

Impact 5.4-H, page 5.4-19

Again, this question is asked about septic tanks (with leachfields) in areas where sewers are not available, as opposed to STEP/STEG tanks (without leachfields) which are part of a sewer system. The real question is “after an earthquake, would a collection system of PVC pipe with bell and spigot housings be more or less likely to leak than a STEP/STEG tank? P57-24

Section 5.4.6, Table 5.4.2, Page 5.4-19, Mitigation 5.4-C1 P57-25

This requirement should apply to the disposal areas as well as collection and treatment sites.

Mitigation 5.4-F1

Relying on a future report to reduce a potentially significant impact to a level of insignificance seems risky. What happens if there are no measures identified that could reduce the level of significance or if the measures are determine too expensive to implement? P57-26

Section 5.5.7, Impact 5.5-A, Page 5.5-8

Would micro-tunneling, as opposed to open-cut trenching, reduce the potential for a significant impact to the creek and the endangered wildlife it supports? If so, it should be a required mitigation measure. The same holds true for HDPE pipe, if it has an advantage over the more rigid PVC. Have these measures been included in cost estimates? P57-27

Page 5.5-17 P57-28

Couldn't the impact upon sensitive plant species resulting from the clearing for the pump stations and leach fields have been quantified? Other than for the endangered snail, it is doubtful there is appreciable endangered species habitat/presence in the front yards of Los Osos. P57-28 CONT

Page 5.5-40 Combined Project Effects

How does the phrase "could result in a measurable combined effect on resources protected under local policies and ordinances" sit into a significance determination? This statement appears in the Combined Project Effects discussion for each project over the next few pages. Why weren't they measured so that decisions could be made? P57-29

Impact 5.5-E, Page 5.5-40, CZLUO SEC. 23.07.160-23.07.166 SRA

This paragraph, and the next two, indicates that the STEP/STEG and gravity systems could differ substantially with regard to potential impacts to sensitive natural communities, but never attempts to quantify those differences.

The title refers to Sensitive Resource Areas (SRA) but the paragraph discusses Environmentally Sensitive Habitat (ESHA). This paragraph seems to be saying that SRA (or ESHA) has been designated in front yards. Significant amounts of undisturbed natural habitats in front yards is an unlikely occurrence, and is not likely to be officially mapped as SRA (ESHA). At the pump stations perhaps, as they are more likely to be located at street ends adjacent to undisturbed native habitat. P57-30

CZLUO 23.07.170 ESHA

Same question as above, is ESHA likely to be designated in a front yard? P57-31

CZLUO 23.07.172 Wetlands, Streams, and Riparian

It is even more unlikely that any of these habitat types would be found in front yards. P57-32

Page 5.5-42 Proposed Project 4

What happened to the discussion of treatment and disposal sites? P57-33

Section 5.5.8, Table 5.5.2, Page 5.5-42

How can the consultation process be considered mitigation? It results in mitigation agreements, but the process itself is not mitigation. P57-34

Page 5.5-44 Southern Steelhead

If you are committed to minimizing impacts to the maximum feasible extent, specify micro-tunneling with HDPE pipe under the creeks. P57-35

Section 5.6.6, Impact 5.6-B, Page 5.6-7

This paragraph seems to be saying that the collection system for each project would have an equal potential for impacts to archaeological resources. But how can that be when micro-tunneling (horizontal drilling) associated with the smaller diameter pipe associated with a STEP/STEG system allows the rerouting of the line around resources? A gravity system would use deep trenching. Even if horizontal boring of the larger diameter gravity pipe were attempted, the gradient could not easily be adjusted to miss the resource. It would be more likely to just bore through the resource. P57-36

Page 5.6-8 Proposed Project 1 Collection System

If the STEP/STEG tanks are replaced at the location of existing tanks, the potential for impacts to archaeological resources is minimal. P57-37

Section 5.7.5, Impact 5.7-B, Page 5.7-8 Proposed project 1 Treatment Plant Site

There are benign alternatives to methanol. This was pointed out at the TAC meetings, why has it been ignored? Would allowing the adjacent farmers to use the effluent reduce the need for denitrification? P57-38

Impact 5.7-C, Page 5.7-9

Is there a difference in the shear strength of HDPE pipe versus the likelihood of PVC pipe to separate at the bell and spigot housing? P57-39

Section 5.8.5, Impact 5.8-A, Page 5.8.8

The construction related traffic impact discussion totally avoids discussing the fact that much of a STEP/STEG system would use horizontal drilling and gravity projects deep trenching methods. The impacts of each upon local daily traffic flow could be significant and should be discussed. P57-40

Section 5.10.5, Impact 5.10-B page 5.10-14/15

My condolences to anyone living near a pump station during the construction, operation, or maintenance of those facilities.

Section 7.2.2, Page 7-6

If the primary goal of the project is to satisfy the mandates from the State and Regional Water Quality Control Boards, who receive all of their capability (responsibility?) to help fund the mandated projects from the federal Environmental Protection Agency, why can't P57-41

we insist on a project that meets EPA's affordability criteria, as detailed by Mimi Whitney and others? P57-41 CONT

Section 7.3.3, Table 7.5, Page 7-23

Since much of the "gravity" collection system would actually be under pressure, would ex-filtration actually be less than for a STEP/STEG system? Even given the likelihood that a STEP/STEG system would use HDPE pipe and a gravity system PVE pipe? There are many more connections in a PVC system. That is just more opportunity to leak and more area to maintain. P57-42

How much of the greenhouse gas disadvantage assigned to a STEP/STEG system is attributed to the use of methanol in the calculations versus more benign alternatives? How much is attributed to the extra truck trips from a fictitious five-year pump out interval? Where is the mention of biosolids production? A STEP/STEG system reduces this by about 75%. P57-43

Section 7.3.7, Page 7.60

It is not clear if a seawater mitigation factor of 0.1 for areas of the Los Osos Creek Valley refers to reduced pumping from the east compartment of the groundwater basin or areas further east in the valley? Would the east compartment studies that are due in March or April be likely to change seawater mitigation factors for the agricultural lands in the area? P57-44

In conclusion, there are several assumptions made that seem to taint much of the information presented in the DEIR. One is that the STEP/STEG tanks would need to be pumped every five years. Another is that a STEP/STEG project would use PVC pipe for the collection system. Each of these greatly inflates the potential environmental impacts of this collection system and the second assumption does not allow for the environmental advantages of the HDPE pipe that is likely to be used. From the moment in mid-2006 that the previous County Public Works Director declared to the Board of Supervisors that it would be a gravity system that would be built, this process has seemed pre-determined. The comments from the NWRI panel member during the 2008 teleconference added to that suspicion. This is such a complex project that environmental and engineering evaluations can support just about anything the authors set out to support. The people of Los Osos will be not only footing the bill for the construction and operation of the project, we will also be paying for the fines likely to result from a collection system built in an area with high groundwater and unstable soils. We deserve an honest answer to the most basic of questions: what is the true environmental and economic cost of a STEP/STEG alternative? Please allow the design-build process to be a fair one. P57-45

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Check Cesena, January 31, 2009 (Letter P57)

Response to Comment P57-1

This comment contains an additional perspective on the project background as viewed by a member of the LOCSD Board of Directors, and described in section 1.2-4 of the Draft EIR. The additional information is appreciated.

Response to Comment P57-2

This comment states that a majority of the voters in Los Osos supported Measure B (which prohibited the sitting of a wastewater treatment facility at the TriW site) during the fall of 2005 special election, the suspension of work on the project should not be considered a setback but a legally required action taken by the newly elected CSD Board. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P57-3

This comment expresses a concern regarding the source stating that the STEP/STEG tanks will be pumped every five years. Various texts and operators have expresses varying opinions and recommendations on what the pumping intervals of a STEP tank should be. See Response to Comment P40-27.

Response to Comment P57-4

This comment expresses a concern regarding the incorporation of the design-build process. There are many issues that need to be considered when selecting a preferred project. Information presented in the Draft EIR is important, and every effort has been made to ensure its accuracy. Although we believe the referenced information discussed in comment P57-3 is indeed accurate, the entire process has been conducted in the public forum so that the public can make their own decisions based on the wealth of information provided by the County, other community members, and the private sector.

Response to Comment P57-5

This comment expresses concern regarding the project's construction schedule. Section 3, page 3-57 of the Draft EIR, states that construction of the proposed project is expected to take about 16 to 24 months. It is anticipated that construction of the proposed project will begin in 2010 and be completed in 2012.

Response to Comment P57-6

This comment expresses a concern regarding the cost estimates associated with the proposed project. Depending on various factors, construction may take a longer or shorter period. An initial goal of the project was to be substantially complete by the end of 2010, although external factors may extend that time period. The community survey was released during the week of February 16. Regarding the timing of the community survey and the Design Build Proposals, the Design/Build process requires that project selection be based on criteria established in the Request for Proposals. Changing the criteria based on community survey results received after the issuance of the Request for Proposals is

not allowed by the process; therefore, one process cannot be used to influence the other. Both must be considered by decision makers on their own merits and results.

Response to Comment P57-7

This comment expresses concern that Mitigation Measure 5.4-C1 should be applied to the Broderson leachfields in addition to the collection and treatment plant sites. Section 5.4, pages 5.4-18 through 5.4-21 of the Expanded Analysis includes a discussion of Proposed Project 1, which would include the Broderson leachfields. Therefore, Mitigation Measure 5.4-C1 would apply for the Broderson leachfields.

Response to Comment P57-8

The comment is concerned with mitigation measures and the concern with preconstruction surveys. The mitigation measures were designed to deal with changing conditions. In many instances no sensitive species were encounter or are expected to be encountered, but since the project is not currently being built it is difficult to ascertain if species will be present when construction occurs.

After the selection of the Preferred Project in November 2008, biologists went into the field with specific development plans with locations of pipeline routes and specific plans for the facilities. Surveys were conducted, areas were examined and more definitive answers with regard to both impacts and the potential for sensitive species were assessed. This information is being prepared as a Biological Assessment for formal (or informal) consultation with the U.S. Fish and Wildlife Service. In many instances there is no potential for sensitive species. In other instances sensitive species were identified and the design was modified to avoid impacts to sensitive species. Even with the deferral of surveys, resources were protected and adequate protection to resources was undertaken.

Response to Comment P57-9

The comment is concerned with mitigation measures and the concern with preconstruction surveys. The mitigation measures were designed to deal with changing conditions. In many instances no sensitive species were encounter or are expected to be encountered, but since the project is not currently being built it is difficult to ascertain if species will be present when construction occurs.

After the selection of the Preferred Project in November 2008, biologists went into the field with specific development plans with locations of pipeline routes and specific plans for the facilities. Surveys were conducted, areas were examined and more definitive answers with regard to both impacts and the potential for sensitive species were assessed. This information is being prepared as a Biological Assessment for formal (or informal) consultation with the U.S. Fish and Wildlife Service. In many instances there is no potential for sensitive species (see Response to Comment P32-2). In other instances sensitive species were identified and the design was modified to avoid impacts to sensitive species. Even with the deferral of surveys, resources were protected and adequate protection to resources was undertaken.

Response to Comment P57-10

This comment expresses a concern regarding potential leaks from the gravity collection system. See Topical Response 10, Infiltration, Inflow, and Exfiltration. Figures in Table 3.2 are based on gravity using PVC pipe and STEP using HDPE with fusion welded joints. The majority of inflow and infiltration that occurs in a STEP system is the result of the connection between the house and the tank.

Response to Comment P57-11

This comment expresses a concern regarding the source stating that the STEP/STEG tanks will be pumped every five years. See Response to Comments P47-27 and P57-3.

Response to Comment P57-12

This comment expresses a concern regarding the abandonment of the existing septic tanks. It is not necessary to remove the top of existing septic tanks to either abandon them or reuse the tank for an approved use. Abandonment involves pumping the tank, puncturing the bottom of the tanks so it will drain any future water flows, and filling the tank with non-expansive material (sand). If a tank were reused, the tank pumper could clean the tank at the same time that it is emptied. The layouts of the various pump stations are provided in the descriptions of the Preferred Project in the Appendix Q.

Response to Comment P57-13

This comment expresses a concern regarding the placement of the proposed tanks. Where space permits and there is no interference with existing underground utilities (water, gas, communications), where areas are not already being utilized for drainage, and where areas do not contain cultural or biological resources, existing right of way could be used for STEP tanks if on-lot placement is problematic.

Response to Comment P57-14

This comment expresses a concern regarding miscalculations based on the five year pump out assumption. See the Response to Comment P47-27.

Response to Comment P57-15

This comment expresses a desire for the production of a more productive crop at the sprayfields. See the Response to Comment P36-21.

Response to Comment P57-16

This comment expresses a desire for clarification regarding the location determination for the new STEP/STEG tanks. It is expected that some level of coordination will need to occur between contractors, the County, and the property owner. Criteria on how to determine who has the final decision has not been developed. For instance, if the front yard of a residence has minimal improvements and no impediments to a STEP tank, yet the owner is insistent that it be placed in a more difficult location (i.e., more expensive to construct) who determines the final placement and

who pays the additional cost? While not an environmental issue, this is an important social aspect of the STEP alternative.

Response to Comment P57-17

This comment expresses a concern regarding the placement and excavation total of the STEP/STEG tanks. Placing STEP tanks in locations other than the existing septic tanks is less costly and less destructive to private property.

Response to Comment P57-18

This comment expresses a concern regarding the potential for leaks associated with the gravity collection system. See Topical Response 10, Infiltration, Inflow, and Exfiltration. Gaskets in PVC bell and spigot pipes have an indeterminate life span, that is, although these types of pipe have been in use for decades around the world there is no record of regular failure of the pipe or gasket. In the event a joint does leak, there are numerous systems used to repair the leak from inside the pipe that do not require excavating the pipe. Using fusion welded PVC pipes for a gravity system would add approximately 12 percent to the cost of that system (Flows and Loads Technical Memorandum Appendix).

Response to Comment P57-19

This comment expresses a concern regarding qualifications of Carollo Engineers. Few if any wastewater consultants that possess the capability to perform the work required of Carollo for this project have extensive experience with STEP systems. Consequently, the project team, including Carollo, relied extensively on information on STEP systems prepared by the Ripley Pacific Team for the Los Osos CSD, as well as on existing literature. The analysis may show differences in results for STEP between the County's work product and STEP advocates because the basis of comparison is likely different. That is, the County approached the process with no particular bias, while those organizations with the most STEP experience build only STEP systems. The community survey does include questions about the cost of different systems, using a cost sensitivity approach.

Response to Comment P57-20

This comment states that the groundwater monitoring wells' overall nitrate level has not increased since the moratorium was imposed in 1988. See Topical Response 3, Water Resources and the Project Scope.

Response to Comment P57-21

This comment expresses concern that Impact 5.4-H (wastewater disposal systems) was given a no impact designation under Proposed Project 1. Section 5.4, pages 5.4-30 through 5.4-31 of the Expanded Analysis includes a discussion of wastewater disposal systems under Proposed Project 1.

Response to Comment P57-22

This comment is concerned that the Draft EIR found that loose sands over the collection system may result in significant liquefaction impacts while the loose sands over the Broderson site would result in

less than significant liquefaction impacts. The difference between the two findings is based on the elevation of groundwater at the proposed facilities. There are areas of high groundwater within the proposed collection system while the groundwater elevation at Broderson is greater than 100 feet below the existing ground surface.

Response to Comment P57-23

This commentor asked if Proposed Projects 1 through 4 would result in the same ground subsidence impact since at least half of the STEP/STEG collection system would be installed using a boring technique. As stated in Section 3.3.4 on page 3-60 of the Draft EIR, approximately half of the collection pipeline system is assumed to be installed by boring rather than open trench excavation. As part of the collection system, the STEP tanks would require excavation. Given that the total amount of excavation for the entire collection system is similar between Proposed Project 1 (322,000 cubic yards) and Proposed Projects 2 through 4 (340,000 cubic yards), the potential for subsidence is estimated to be similar.

Response to Comment P57-24

This comment expresses a concern regarding the impact associated with seismic activities on the collection system. See Response to Comment P41-18,

Response to Comment P57-25

This comment asked if Mitigation Measure 5.4-C1 should apply to the disposal facilities. Mitigation Measure 5.4-C1 applies to the proposed collection system and treatment plant facilities. Impact 5.4-C on page 5.4-18 in Appendix F-1 states that the proposed disposal facilities would have little impact on the potential for liquefaction. In addition, the facilities at Broderson would not be impacted by liquefaction due to the current depth of groundwater.

Response to Comment P57-26

This comment raises a concern that feasible mitigation measures may not be available to reduce potential lateral spreading, ground subsidence, and ground lurching to less than significant. The types of mitigations and studies that need to be considered in the project planning are discussed in sufficient detail in the geotechnical reports that have been prepared for the various components of the project that the County can provide adequate contingencies to implement the measures.

Response to Comment P57-27

This comment expresses a concern regarding the use of open-cut trenching and suggests the examination of micro-tunneling to limit the costs. The Coastal Commission and other resource agencies have been opposed to micro-tunneling under waterways and wetlands due to concerns about subsurface impacts to groundwater flow and construction impacts involving spills of drilling muds. To address this issue, the pipeline crossings at Los Osos and Warden Creeks have been revised to be aerial crossings, using the bridges for support (see Appendix Q.3). Creek crossings on the Tonini site will be trenched through those seasonal streams, with impacted areas being restored after construction. Based on recent experience constructing the Turri Road Bridge in an area containing

red-legged frog, we believe that construction can be accomplished without significantly impacting the species.

Response to Comment P57-28

The commentor asks why impacts to sensitive plant species cannot be quantified. An analysis of impacts associated with the preferred project have been prepared and included in Appendix Q. This analysis and quantification of impacts is based on detailed drawings of facilities, and refinements to the project description to reduce or avoid impacts and field visits to all of the facilities.

Response to Comment P57-29

The commentor asks how the phrase "could result in a measurable combined effect on resources protected under local policies and ordinances" be considered in a significance determination. The commentor further asks why they were not measured so that decisions could be made.

The phrase used for 5.5-E of the Draft EIR under combined project effects was necessary because of the potential cumulative nature of the various components covered under County ordinances. With selection of a preferred project these statements can be refined, however, the cumulative effects must still be taken into consideration.

Response to Comment P57-30

The commentor asks why the differences between STEP/STEG and gravity have not been identified and is concerned that the SRA discussion is confused with ESHA discussion. The commentor further asks how SRA or ESHA could be established in front yards.

An analysis of the preferred project has been completed based upon refined information. Quantification has been completed and can address the issues of concern. With regard to the assessment of SRAs and/or ESHAs within front yards in the community of Los Osos. The maps in the Local Coastal Development Plan from the County indicate that both SRAs and ESHAs occur over the entire community. We do agree that there are probably few undisturbed "natural" habitats in front yards but Morro shoulderband snails can (and do) exist within yards.

Response to Comment P57-31

The commentor further asks how ESHAs could be established in front yards. See response to comment P57-30.

Response to Comment P57-32

The commentor further asks how these habitat types would be found in front yards. We agree that it is unlikely that streams and riparian areas could be found in front yards, but small wetland areas could easily exist within a portion a yard according to Coastal Commission definitions.

Response to Comment P57-33

The commentor asked where portions of the Proposed Project 4 discussions are. The commentor is correct that the discussion on the Treatment Plant and Disposal Sites and the Combined Project

Effects were inadvertently omitted from the Draft EIR. The sections are provided below. The material below is quoted from the Draft EIR Appendix G-1, Expanded Biological Resources Analysis:

Treatment Plant Site

Proposed Project 4 would include the development of facultative ponds, storage ponds, and appurtenance facilities in the vicinity of wetlands on the Tonini property, including two unnamed tributaries to Warden Creek (herein referred to as T-1 and T-2).

No direct impacts to any existing jurisdictional areas, including wetland waters of the U.S., will result from the treatment plant site developments for Proposed Project 4. The closest developments to jurisdictional areas within the Tonini property include the proposed facultative ponds and appurtenances. These developments have been sited and designed with adequate setbacks from wetlands and other sensitive resources. The facultative ponds proposed within the Tonini property are located at a minimum of 100 linear feet from jurisdictional areas within T-2, and the appurtenances facilities are located at a minimum of 100 linear feet from jurisdictional areas within T-2. Therefore, developments associated with the treatment plant site for Proposed Project 4 would not result in any direct impacts to wetland waters of the U.S.

As discussed in the impact analysis for Proposed Project 1, there is the potential for leakage in the treatment facility elements for all Proposed Projects that will handle raw waste, releasing untreated sewage into the environment. This potential impact is addressed in Section 5.7 of the Draft EIR, specifically within Impact 5.7-A. Mitigation Measure PS-1 in Section 5.7 would reduce potential impacts resulting from leakage in the treatment facility elements to less than significant.

Disposal Sites

The disposal sites for Proposed Project 4 would be the same as that which is proposed for Proposed Project 1, with the exception of minor changes in the location of the sprayfield area in order to accommodate the treatment plant site facilities. Despite the change in location, impacts associated with the sprayfields would be fundamentally the same as those discussed for disposal sites in Proposed Project 1. Sprayfield influence would remain setback from existing wetlands, streams, and riparian habitat at or greater than the minimum required distance. The placement of the up to 8-acre storage pond would not be within any riparian areas and setbacks would be more than 100 feet from any wetlands on the Tonini site as were discussed for the Treatment Pant Site for Project 4. See impact analysis for disposal sites for Proposed Project 1 above.

Combined Project Effects

Similar to Proposed Projects 1 through 3, the construction and operation of the proposed components for the collection system and treatment plant site for Proposed Project 4 could

result in a measurable combined effect on wetlands. The collection system could result in temporary construction impacts to wetlands through the installation of components within and adjacent to Los Osos Creek, Warden Creek, and tributaries to Warden Creek located along Los Osos Valley Road and within the Tonini property. Potential impacts associated with the collection system would be primarily temporary in nature and would not result in a substantial removal, alteration, or degradation of wetlands areas. Treatment plant components could result in potential indirect impacts to wetlands located downstream and downslope of areas proposed for the filling of waters and development of permanent structures. The combined effects resulting from all components of Proposed Project 4 would be reduced to a less than significant level through the implementation of Mitigation Measures 5.5-1, 5.5-2, 5.5-C3, 5.5-A7, PDF 5.3A-1, PDF 5.3A-2, PDF 5.3A-3, PDF 5.3A-4, PDF 5.3A-5, PDF 5.3A-6, and PS-1. These measures will ensure that appropriate avoidance and minimization actions are employed during project construction, and that all permitting obligations and compensation for potential impacts to wetlands are fulfilled.

Response to Comment P57-34

The commentor asks how consultation can be considered mitigation. Mitigation Measures 5.5-A1 and 5.5-A2 are part of a process requiring consultation on the project. While consultation in itself is not a measure, the requirement to request concurrence from the agencies is a CEQA requirement. The process of discussion has been initiated informally and formal consultation with the US Fish and Wildlife Service will happen through the US Environmental Protection Agency probably through the State Water Resources Board under a CEQA Plus action. See Response to Comment A7-1 and Response to Comment A11-4.

Response to Comment P57-35

This comment expresses concerns regarding the use of micro-tunneling with HDPE pipes under the creeks. See Response to Comment A1-1.

Response to Comment P57-36

The comment questions the assessment of impacts to cultural resources for the entire project with a focus on micro-tunneling potentials.

See Topical Response 13, Construction Excavation. There is an erroneous assumption that micro-tunneling could be used for the entire pressure system and that using such a system would avoid all impacts to cultural resources. See response to P36-8 for more detail.

Response to Comment P57-37

The commentor suggests that STEP/STEG tanks could be placed at the location of the existing septic tanks to avoid impacts to cultural resources. While it may be possible to place STEP/STEG tanks within the footprint of the existing septic tanks, the location the septic tank would have to be in the front yard to provide access for the County. A difficulty with the replacement model is the time between decommissioning the existing septic tank and replacement with the new STEP/STEG. There

could result in serious delays in the change in service that would leave residents without any water service.

Response to Comment P57-38

This comment expresses a concern regarding the use of methanol and suggests the use of alternatives for denitrification. See Response to Comment P36-25.

Response to Comment P57-39

This comment expresses a desire for clarification regarding the differences between the shear strength of HDPE and PVC pipes. Shearing forces are not likely to separate either type of pipe joint; it is more likely that shear forces would crush the pipe section before the joints would fail. HDPE joints are considered stronger in tension (that is, more resistant to being pulled apart) than PVC gasketed joints, however, the both systems are very robust and more than adequate for the intended use.

Response to Comment P57-40

This comment expresses concerns over traffic impacts associated with the installation of the STEP/STEG system and deep trenching methods. The Draft EIR acknowledges potential short-term impacts on local roads during construction of the pipelines and service laterals for each house. The Draft EIR proposes in Mitigation Measure 5.8-A1 that the construction contractor develop a traffic management plan based on type of roadway, traffic conditions, duration of construction, physical constraints, sensitivity for bicycle, pedestrian and driveway access, as well as other factors.

Response to Comment P57-41

This comment expresses a concern regarding the exclusion of the EPA's affordability criteria. EPA's affordability criteria are guidelines, not requirements. However, those guidelines are and continue to be an important tool as the County pursues various funding sources in Sacramento and Washington DC.

Response to Comment P57-42

This comment expresses a concern regarding the amount of exfiltration associated with the gravity collection system. See Topical Response 10, Infiltration, Inflow, and Exfiltration. As designed by MWH, the force main sections of the gravity collection system, that is, those sections that are pressurized use fusion welded HDPE pipe (some of which remains stockpiled at the east Paso Robles lay down site).

Response to Comment P57-43

This comment questions how much of the greenhouse gas disadvantage assigned to the STEP/STEG system is related to methanol; how much from truck trips based on the five-year interval; and how much from biosolids production. Using information provided in Appendix K of the Draft EIR, it is determined that only 0.4 percent of the total GHG emissions from Project 1 are from methanol and of the on-road truck portion of the GHG emissions from Project 1, only 10 percent is related to septage transfer.

Response to Comment P57-44

This comment expresses a concern regarding changes to the seawater mitigation for agricultural lands through the inclusion of the east compartment studies. No, because the mitigation factor considers distance from the shoreline which will not change.

Response to Comment P57-45

This comment expresses a concern regarding the assumptions that were made regarding the STEP/STEG tanks. The decision to pump STEP tanks on five year cycles is valid and not based on the rate of solids accumulation. See Response to Comment P47-27. Also, project assumptions do not include using PVC pipe for a STEP system. See Response to Comment P57-10. The NWRI Panel final report states, "The Panel believes that the two collection system options are both viable. Both options have risks and benefits that are unique to themselves and, when viewed as a whole, make them functionally equivalent." Nowhere does the NWRI report contain the phrase "gravity bias."

January 31, 2009

David Sylvester
5600 Los Osos Valley Road
San Luis Obispo, CA

Re: Los Osos Wastewater Project

Mark Hutchinson,

As a property owner in the very near vicinity to the proposed project at Tonini Ranch, my 55+ acre parcel located at 5600 Los Osos Valley Road (L.O.V.R.), the draft EIR raises significant concerns in many categories in ways that it would affect agricultural and visual aspects of the properties proposed and surrounding. Our ranch has direct views of the Turri Ranch site.

The Turri Road and the scenic byway of L.O.V.R. are a significant part of the aesthetic beauty that attracted us as landowners to the area. The EIR addresses some concerns but does not properly and fully address all aspects of the impact - specifically those related to the scenic and known regular uses of Turri Road by motion pictures and advertising due to its scenic beauty, and as a recognized bicycle corridor. P58-1

In many ways, the report seems boldly contradictory in its assessments of any detrimental effects the placement of the wastewater plant on the Tonini site would have. The EIR downplays any visual impact of an industrial plant built on an historically agricultural property and downplays any visual impact of a fence built to 'prevent public contact' along a road with mainly 3-strand barbed wire grazing fences for miles until you get into city limits.

Most puzzling, the EIR states "the proposed project would not conflict with the local goals and policies protecting agricultural resources". This is a slap in the face to local farmers and landowners who simply want to build a modest residence on the land they own, and completely contrary to their experiences with the process, many whom we know are turned down, have given up completely, or are highlighted in local papers after years of frustration. This does not appear to protect a long-standing prime A-1 agricultural resource, but rather develop it, even more than any residential project might. P58-2

1. Section 5.12-A states, "This project will not have an adverse effect on a scenic vista" and rates it as less than significant. In the EIR, section 3, page 44, paragraph 2 states, "The spray field area would be fenced off to prevent public contact with the water." Any subsequent type of fencing along Turri Road would do irreparable harm to the visual and aesthetic value associated with the area. P58-3

2. Traffic & Circulation - The EIR does not outline the number of truck trips nor P58-4

the use of Turri Road as the primary access point and how it may impact the road, surrounding areas and existing traffic. P58-4 CONT

3. Section 5.12-C1 does not specify the hours of operation of the facility lights and regardless of shielding whether they would be bothersome to adjoining properties at night and on weekends. P58-5

4. Section 5.11-A - The fenced-off area and the use of the public spray fields also represents a totally unmitigated loss of prime Agricultural Land that has remained unchanged for over 75 years. It also does not address the Coastal Commission's assessment as to loss of this prime Ag Land within the area. P58-6

The list is substantially longer but these are the main issues that would directly impact us and other citizens of the county.

I am adamantly opposed to the options for using spray fields outside the city of Los Osos.

Sincerely,
David Sylvester

David Sylvester, January 31, 2009 (Letter P58)

Response to Comment P58-1

The comment states the Draft EIR does not properly address impacts to users of Turri Road. See to Response to Comment P24-20.

Response to Comment P58-2

This comment expresses confusion regarding local goals and policies protecting agricultural resources and protection of long-standing prime agricultural land. Because there are no comments on the contents of the Draft EIR, no further response is required.

Response to Comment P58-3

The comment states that fencing along Turri Road would do irreparable harm to the visual value associated with the area. Impacts to Scenic vistas such as the Morros occur when substantial portions of the view are blocked or altered. The comment does not specify how a fence would substantially alter the view of local scenic vistas.

Response to Comment P58-4

This comment is concerned that the Draft EIR did not outline the number of truck trips or the use of Turri Road as the primary access and how surrounding areas are affected by traffic. Section 5.8 in the Draft EIR, and specifically Impact 5.8-A, identifies and quantifies the number of construction and operational trips. This quantification for construction trips breaks down the number of truck trips and employee trips that are assumed for each of the Proposed Projects. A nominal amount of long-term daily trips are depicted in Impact 5.8-A.

Response to Comment P58-5

The comment states that Section 5.12 C-1 does not specify the hours of operation of the facility lights, and regardless of shielding whether lighting would be bothersome to adjoining properties at night and on weekends. On pages 5.12-36 through 5.12-38 of the expanded Visual Resources section 5.12 it is acknowledged the impacts of lighting will be significant before mitigation for the treatment and disposal facilities. However, following implementation of Mitigation Measure 5.12D-1 (lighting plan) light and glare impacts will be less than significant. See also Response to Comment A11-13 that provides mitigation for lighting with regard to protection of sensitive species and Response to Comment P24-28.

Response to Comment P58-6

The comment states that the use of the Tonini parcel for sprayfields is a totally unmitigated loss of prime Agricultural Land that has remained unchanged for 75 years. The comment further states that the Coastal Commission's assessment of the loss is not addressed.

Regarding the first point, analysis of impacts to prime agricultural lands are addressed on pages 5.11-26 through 5.11-38 in the Expanded Agricultural Resources Section 5.11. On page 5.11-40, impacts to the Tonini parcel are acknowledged as significant and unavoidable, and mitigation 5.11a-1 is

proposed but will not reduce impacts to less than significant. Regarding the second point, the analysis of agricultural resources as stated on page 5.11-25 follows the California Coastal Act Guidelines for analysis of impacts to prime agricultural lands, using the California Coastal Commission's definition for prime agricultural lands.

Highland Ranch
7515 Los Osos Valley Rd.
San Luis Obispo, CA 93405

January 30, 2009

Mark Hutchinson
Public Works Dept.
County Government Center
San Luis Obispo, CA 93408

Dear Mr. Hutchinson:

I wish to express my concern for the impact that sewer disposal fields could have on adjacent vegetable land as a result of the Los Osos Sewer Project . Wind and small animals (pigs, squirrels etc,) could carry strains of E-coli and other bacteria into adjacent fields seriously impacting the land, creating food safety liability issues, and farm viability. Sewer failures and runoff into adjacent drainages could render downstream vegetables unsafe. P59-1

I would also urge you to consider that Turri Rd. is a heavily traveled bicycle route, a very scenic tourist road, and has hosted various sports activities and film shootings. Spray and odors could seriously impact the historical use of the road. P59-2

Please take these concerns into consideration and mitigate for them as well as providing assurances to land owners that their land will be protected.

Sincerely yours,

R. Don Warden

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R. Don Warden, January 30, 2009 (Letter P59)

Response to Comment P59-1

This comment expresses concerns about overspray of effluent onto adjacent parcels of the agricultural lands and the potential for small animals and rodents carrying pathogens or other potential health hazards to adjacent parcels that may be used for agricultural purposes. The comment goes on to express concern about potential sewage spills contaminating adjacent lands. As discussed in Appendix Q, Preferred Project Evaluation, the operation of the spray field has been modified from the operation described in the Draft EIR. The spray field operation would use evapotranspiration. In addition, the spray field would be set back from existing onsite streams by 100 feet to further reduce the potential of spray irrigation being conveyed to the creeks and 30-feet from adjacent roadway shoulders to prevent overspray onto roadways (see also Response to Comment 59-2 below). Furthermore, the concern regarding runoff during the winter would be reduced because the operation of the spray field would be reduced during the winters and the operation of the Broderson leach field would increase. During the summer, the operation of the spray field would increase while the Broderson leach field would decrease. The potential for sewage spills at the plant is remote, however, spill response measures are addressed in the Draft EIR, Section 3.32 in Appendix B contains a discussion of exfiltration issues related wastewater systems. Draft EIR Section 5.7, Public Health and Safety, and Appendix I analyze the environmental effects of exfiltration and conclude that the volume expected from a modern system would not have a significant environmental effect. Refer also to Topical Response 12, Sewer System Management Plan, for measures to be employed in the event of a sewage spill at the site, and elsewhere. The comment addressed concerns about pathogens or other potential health hazards that could be carried by vectors to adjacent agricultural lands. The system to be built will comply with the Waste Discharge Requirements issued by the Regional Water Quality Control Board for the operation of the LOWWP. A key component of the County's approach to the treatment plant is to ensure that the system that is chosen can be easily modified, or added to, to meet potential future requirements, whether they be related to reuse of the effluent or to higher treatment levels. There is general awareness of trace constituents, such as tritium and pharmaceuticals, and they are being reviewed by appropriate regulatory agencies at the federal and State level. If additional treatment is required, it can be added to the treatment train without the need to abandon any of the existing treatment steps that will already be in place. By constructing a treatment plant that can be easily upgraded, Los Osos should be in a position to meet future treatment levels in a very cost effective manner.

Response to Comment P59-2

This comment expresses concern about the potential overspray and odors that may emanate from the sprayfield operation at the Tonini site on users of Turri Road. The proposed sprayfield will locate spray heads pointed in towards the property (away from Turri Road) and have a 30-foot setback from the road right of way (approximately the outer edge of the road shoulder). This setback, coupled with the directional spraying, will minimize the potential for overspray onto Turri Road that could disturb users of the roadway. Care in operation of the sprayfields will be paramount to not spray during

times of high winds that may carry water particles away from the sprayfield. Regarding potential odors, typically treated and disinfected effluent from secondary treatment does not emanate odors.

CHAFFE McCALL
L. L. P.

New Orleans Office

KEITH M. BENIT, PARTNER
Admitted in Louisiana and Mississippi

Direct Dial No: (504) 585-7582
Direct Fax No: (504) 544-6040
E-mail:benit@chaffe.com

December 15, 2008

Certified Mail – Return Receipt Requested
Paavo Ogren, Director
San Luis Obispo County
Public Works Department
1055 Monterey Street
San Luis Obispo. CA 93408

Re: Los Osos Wastewater Project
Our Reference 1250/32959

Dear Mr. Ogren:

As you may recall from our previous correspondence, we represent S.E. Acquisition of Los Osos Mortuary and Memorial Park Inc., d/b/a Los Osos Valley Memorial Park, and the purpose of this letter is to formally support the selection of the "Tonini Property" for the construction of a wastewater treatment plant in this area. Upon our review of the Environmental Impact Report and other materials and discussions with various individuals, we believe that the Tonini Property is the most suitable and logical place for the construction of such facility.

As stated in our earlier correspondence to you, we are still extremely concerned that a portion of Los Osos Cemetery's property is being considered as a suitable site for this sewer plant. The construction of such a plant on the cemetery's property or property in close proximity thereto, would adversely affect the operation of our client's business and, maybe more importantly, impact those families who have selected the cemetery as the final resting place for its family members. The construction of the plant itself, as well as its subsequent operation and potential offensive odors, would ruin the tranquility of the property and impact not only burial services but also those visiting the cemetery in the future. P60-1

In closing, we once again reiterate that we support the selection of the Tonini Property for the location of the sewer plant and oppose any attempt to locate this project on the property of or in close proximity to the cemetery.

New Orleans: 2300 Energy Centre • 1100 Poydras Street • New Orleans, LA 70163-2300 • Tel: (504) 585-7000 • Fax: (504) 585-7075
Baton Rouge: 202 Two United Plaza • 8550 United Plaza Blvd. • Baton Rouge, LA 70809 • Tel: (225) 922-4300 • Fax: (225) 922-4304 3-1199
www.chaffe.com

Should you have any questions, please do not hesitate to contact me.

Very truly yours

CHAFFE McCALL, L.L.P.

Keith M. Benit

KMB/hm
cc: Bruce Gibson, San Luis Obispo County Board of Supervisors
Harry Ovitt, San Luis Obispo County Board of Supervisors
Jerry Lenthall, San Luis Obispo County Board of Supervisors
K. H. Katcho Achadjian, San Luis Obispo County Board of Supervisors
James R. Patterson, San Luis Obispo County Board of Supervisors
Ken Stevens (*via email*)
Mike Miller (*via email*)
Jerry Bagley (*via email*)
Judy Serpa (*via email*)

Keith M. Benit, CHAFFE McCALL LLP, December 15, 2008 (Letter P60)

Response to Comment P60-1

This comment expressed support for the use the Tonini parcel for the site of the wastewater treatment facilities. The comment also repeated the objection to use any portion of the Cemetery Property for the LOWWP. The Draft EIR clearly states that no portion of the existing Cemetery site was to be used for the wastewater facilities for the project, thus supporting the concern expressed by the writer. It is acknowledged that the responder supports the recommendation to use the Tonini site for the wastewater facilities. No further response is needed.

SECTION 4: ERRATA

The following are revisions to the Draft EIR for the Los Osos Wastewater Project and where a specific comment was submitted on a technical study (i.e., Expanded Analysis), if warranted, the specific revision to the technical report is included as well. These revisions are minor modifications and clarifications to the Draft EIR and the technical reports, and the revisions do not change the significance of any of the environmental findings within the Draft EIR. The revisions are listed by page number.

This Erratum is separated into two sections: (1) revisions to the Draft EIR and (2) revisions to Appendices. The new information provided in this Errata does not alter the conclusions contained within the Draft EIR, but provides additional explanations and clarifications of the impacts associated with the Proposed Projects.

Following are revisions to the Draft EIR and Appendices based on comments received during the public review period as well as additional revisions that were determined necessary. All of the revisions are minor modifications and clarifications to the Draft EIR and its associated appendices and do not change the significance of any of the environmental issue findings within the Draft EIR. The revisions are listed by page number. All additions to the text are underlined (<u>underlined</u>) and all deletions from the text are stricken (~~stricken~~).

Draft EIR - Revisions Affecting Multiple Occurrences

The following revisions affect text throughout the Draft EIR.

The spelling of Biolac, Biolac TM, Biolac™, and BioLAC is revised as follows:

Biolac®

The spelling of the term spray field is revised as follows:

sprayfield

The spelling of the term leach field is revised as follows:

leachfield

The number of existing septic tanks that will be abandoned is revised from 4,679 as follows:

4,769

Page ix of the Draft EIR

The following Acronyms and Abbreviations, on page ix of the Draft EIR are revised as follows:

AFY acre-feet per year

AF Acre-feet

~~AFY acre-feet/year~~

Page xi of the Draft EIR

The following Acronyms and Abbreviations, on page xi of the Draft EIR are revised as follows:

NI = No Impact

~~NI = No Impact~~

RWQCB = Regional Water Quality Control Board

~~RWQCB = Regional Water Quality Control Board~~

Page 2-22 of the Draft EIR

The first sentence in the first paragraph in Section 2.5 is revised as follows:

The LOWWP is planned to be a single-phased project spread out over an approximate ~~the next~~ two year~~s~~ period with construction of the wastewater collection, treatment and disposal system beginning ~~completed~~ by late 2010.

Page 2-41 of the Draft EIR

Mitigation Measure 5.6-B5 on page 2-41 of the Draft EIR is revised as follows:

5.6-B5 ~~H~~ Historic-era ranch/farm complexes may contain intact artifact deposits from early periods of occupation (in privies, trash pits, wells, etc.).

Page 2-41 of the Draft EIR

Mitigation Measure 5.6-B6 is revised as follows:

5.6-B6 Preconstruction monitoring shall occur in areas ranked as high in sensitivity for buried deposits. Two such areas have been identified within the proposed project

area: (1) along Los Osos Valley Road from Los Osos Creek east to the Cemetery Parcel; and (2) in the western portion of the Tonini Parcel. Mechanical backhoe trenching shall be conducted within the sensitive areas where any construction impacts will occur and shall be monitored by a qualified geoarchaeologist. Any identified intact deposits will be evaluated, and any deposits determined to be eligible to the California Register and/or National Register shall require project redesign to avoid impacts, or data recovery to mitigate unavoidable impacts.

Page 3-8 of the Draft EIR

The second sentence of the second paragraph in Section 3.1.2, Project Goals and Objectives, is revised as follows:

On March 27, 2007, the County Board of Supervisors certified a "Level of Severity (LOS) III for the community of Los Osos while adopting a Resource Capacity Study of the Los Osos groundwater basin.

Page 2-12 and Page 3-41 of the Draft EIR

Table 2-3 on page 2-12 and Table 3-5 on page 3-41 of the Draft EIR are revised as follows:

Effluent Disposal Method	Available Area (acres)	Estimated Capacity per Acre (AFY1/acre)	Capacity (AFY1)	Proposed Project Capacity (AFY1)			
				Proposed Project #1	Proposed Project #2	Proposed Project #3	Proposed Project #4
Broderson Leachfield	8	64	448[2]	448	448	448	448
Tonini Sprayfields[3]	~~80~~257	~~4.84/3.05~~3.45	~~864~~874	842	842	842	842
Total Effluent Disposal Capacity			~~1,358~~1322	**1,290**	**1,290**	**1,290**	**1,290**
Conservation Measures[6]			160	160	160	160	160

Notes:
1 AFY = acre-feet per year.
2 This is a conservative estimate of the maximum possible estimated effluent discharge capacity that can be sustained reliably without constructing dewatering wells downstream that could pump out groundwater, if necessary, to maintain adequate depth to the groundwater table and avoid saturated soil conditions along the bay. See Section 5.2 and Appendix D for additional detail on groundwater issues.
3 The proposed Tonini sprayfields would include a combination of evapotranspiration (ET) and percolation and ET only. The actual split between land that is suitable for ET and percolation and land that is suitable only for ET will be determined as part of the design process. Other site conditions such as providing buffers along coastal streams will be accommodated in the final design.
4 Capacity for ET and percolation.
5 Capacity for ET only.
6 The 1,290 AFY needed effluent disposal capacity assumes that water conservation measures will be implemented to reduce water consumption and the corresponding wastewater generation by 160 AFY.
Source: Carollo Engineers, April 2008b. Cleath and Associates, 2009.

Pages 3-47 through 3-51 of the Draft EIR

The following under Effluent Disposal Column for each project in Table 3-7 on pages 3-47 through 3-51 is revised as follows.

> Mitigates 187 AFY of seawater intrusion (99 AFY for Broderson and 88 AFY for conservation).

Page 5.5-4 - 5.5-6 of the Draft EIR

Table 5.5-1 on page 5.5-4 - 5.5-6 of the Draft EIR is revised as follows:

> **Table 5.5-1: Biological Resources ~~Proposed Mitigation Measures~~ Significance Determination**

Page 5.5-40 of the Draft EIR

The project discussion under Proposed Project 2 on Page 5.5-40 of the Draft EIR is revised as follows:

> *County of San Luis Obispo Coastal Zone Land Use Ordinance (CZLUO)*
>
> - **CZLUO Sections 23.07.160 - Section 23.07.166: Sensitive Resource Area (SRA).** The collection system for Proposed Projects 2 and 3 would be the similar as that which is proposed for Proposed Project 1 but could differ substantially with potential impacts to sensitive natural communities associated with the ESHA within the community of Los Osos. These differences are focused on the differences in disturbance associated with the ~~lack of~~ excavation and habitat disturbance associated with the STE tank installation. The gravity collection system for Proposed Projects 2 through 4 would have substantially less impacts in the community, as there is no need for the excavations associated with the STE tank installation. The collection system for Proposed Projects 2 through 4 will also have the development of seven pump stations and 12 pocket pump stations within the Mid-town property and parcels within the community of Los Osos.
> - **CZLUO Section 23.07.170: Environmentally Sensitive Habitat Area (ESHA).** The collection system for Proposed Projects 2 and 3 would be the similar as that which is proposed for Proposed Project 1 but could differ substantially with potential impacts to sensitive natural communities associated with the ESHA within the community of Los Osos. These differences are focused on the differences in disturbance associated with the ~~lack of~~ excavation and habitat disturbance associated with the STE tank installation. The gravity collection system for Proposed Projects 2 through 4 would have substantially less impacts in the community, as there is no need for the excavations associated with the STE tank installation. The collection system for Proposed Projects 2 through 4 will also have

the development of seven pump stations and 12 pocket pump stations within the Mid-town property and parcels within the community of Los Osos.

- **CZLUO Section 23.07.172 - Section 23.07.174: Wetlands, Streams, and Riparian Vegetation.** The collection system for Proposed Projects 2 and 3 would be the similar as that which is proposed for Proposed Project 1 but could differ substantially with potential impacts to sensitive natural communities associated with the ESHA within the community of Los Osos. These differences are focused on the differences in disturbance associated with the ~~lack of~~ excavation and habitat disturbance associated with the STE tank installation. The gravity collection system for Proposed Projects 2 through 4 would have substantially less impacts in the community, as there is no need for the excavations associated with the STE tank installation. The collection system for Proposed Projects 2 through 4 will also have the development of seven pump stations and 12 pocket pumps ~~stations within the Mid-town property and parcels~~ throughout the community of Los Osos.All additional pump station developments associated with the collection system of Proposed Projects 2 through 4 will incorporate the minimum required setbacks from all wetland, streams, and riparian vegetation.

Page 5.5-42 - 5.5-43 of the Draft EIR

Mitigation Measure 5.5-A1 has therefore been modified to state the following:

5.5-A1 ~~The proposed project may result in take of federally listed species and their habitat. Prior to project approval, the County shall enter into formal consultation with the USFWS and NMFS. A Biological Opinion (BO) will be prepared by the USFWS and NMFS for any proposed action which may result in potential take of a listed species and its habitat. Pending the determinations made by the USFWS and NMFS in a forthcoming BO, the proposed project will be required to fulfill all mitigation obligations and conservation measures conditioned in the BO regarding federally listed species and the their habitat. This will include preconstruction survey and avoidance measures, and compensatory mitigation for loss of occupied habitat to be incorporated and implemented prior to project development.~~

~~Specific avoidance measures, preconstruction survey requirements, and mitigation measures, if required, will be provided by the USFWS through Section 7 (or possibly Section 10) consultation with regard to federally-listed species.~~

The proposed project may affect federally-listed species (Morro shoulderband snail and California red-legged frog) and as such, the EPA shall initiate formal consultation with USFWS pursuant to Section 7(a)(2) of

the federal ESA. All mandatory terms and conditions, and reasonable and prudent measures pertaining to incidental take prescribed within the Biological Opinion and Nationwide Permit for the project shall be fulfilled and implemented.

Page 5.5-44 of the Draft EIR

Mitigation Measure 5.5-A5 has been revised as follows to clarify that the project proponent will enter into a "no take agreement" or similar effective agreement with CDFG to avoid take and any adverse effects to the state-fully protected Morro Bay kangaroo rat.

5.5-A5 ~~Prior to project construction and pending determinations made by the USFWS, a biologist permitted by the USWFS shall conduct protocol trapping surveys for the Morro Bay kangaroo rat within all suitable habitat that occurs on and in the immediate vicinity of the proposed impact area. Protocol trapping efforts shall be conducted in coordination with the USFWS, CDFG, and the Endangered Species Recovery Program (ESRP), and all trapped specimens shall be retained for consideration of captive breeding by the USFWS, ESRP or other agency responsible for the recovery of extremely endangered species.~~

The County shall provide funding for on-going recovery activities for the Morro Bay kangaroo rat conducted by Cal Poly and the US Fish and Wildlife Service (through recovery permit holder Francis Villablanca) to better understand how to avoid the species during project construction and operation. Recovery activities at the Tonini Ranch shall include survey and trapping on all suitable habitat areas currently considered for sprayfields. If the species is determined to be present, the County shall adjust sprayfield boundaries to avoid the habitat in accordance with a "no take agreement".

Prior to construction, the County shall formalize a "no take agreement" with the California Department of Fish and Game for the Morro Bay kangaroo rat. The "no take agreement" shall detail measures to avoid the species through sprayfield redesign, exclusion fencing, and other measures as necessary dependant upon the results of the protocol surveys conducted at the Tonini Ranch. The "no take agreement' shall also outline a monitoring and contingency plan for the Broderson leachfield, as on-going maintenance of the leachfield may create suitable Morro Bay kangaroo rat habitat.

Page 5.5-44 - 5.5-45 of the Draft EIR

Mitigation Measure 5.5-A6 has been revised to include all measures necessary to minimize potential impacts to steelhead and critical habitat.

5.5-A6 ~~Additional specific avoidance measures, preconstruction survey requirements, and mitigation measures, if required, shall be provided by the NMFS consultation with regard to southern steelhead. Any impacts within Los Osos Creek shall be minimized to the maximum extent feasible. If the project proposes to use open-cut trenching or bridge suspension methods for installation of the conveyance pipeline system, the project shall perform all construction associated with the crossing of Los Osos Creek during the dry months when the creek bed is entirely dry and there is no sign of standing water.~~

~~Project activities shall be required to occur during times when there is the least potential for southern steelhead to occur in Los Osos Creek (July - September).~~

~~If project construction is to occur within any portions of Los Osos Creek or any adjacent upland areas within 100 feet of the Creek, the project shall implement erosion, sediment, material stockpile, and dust control Best Management Practices (BMPs) at all times during construction to minimize the potential for fill or runoff to enter Los Osos Creek. Construction vehicles shall be restricted within Los Osos Creek to the maximum extent feasible required for either open-cut trenching or bridge suspension methods. All construction equipment shall be maintained to prevent leaks of fuel, lubricants, or other fluids into Los Osos Creek.~~

~~Service and re-fueling procedures shall be restricted to disturbed or developed upland areas at least 50 feet from Los Osos Creek to prevent potential spills of hazardous materials. The project shall confine all heavy equipment, vehicles, and construction work to approved roads and work areas around Los Osos Creek. Stream channel work for open-cut trenching or activities associated with pipe suspension shall limit disturbance to Los Osos Creek to what is necessary for construction. If the project proposes to use HDD methods, the project shall implement a frac-out contingency plan to manage the inadvertent release of any drilling muds into Los Osos Creek.~~

~~All project work areas within and around Los Osos Creek shall be restored to pre-existing contours upon completion of work. Any impacts to riparian and~~

~~wetland habitat shall be mitigated for through replacement mitigation at a set ratio as determined through consultation with the regulatory and wildlife agencies. Where the mitigation requirements of separate policy under the CZLUO, or the requirements of the USACE, RWQCB, and CDFG or other agency with jurisdiction over an area are different, the more restrictive regulations shall apply.~~

All construction activities across Los Osos Creek shall be restricted to low-flow periods of June15 through November 1. If the channel is dry, construction can occur as early as June 1. Restricting construction activities to this work window will minimize impacts to migrating adult and smolt steelhead, if present.

Prior to construction, the County shall retain a qualified biological monitor to be on site during all stream crossing activities associate with Los Osos Creek. The biological monitor will be authorized to halt construction if impacts to steelhead are evident.

Prior to construction, a spill prevention plan for potentially hazardous materials shall be prepared and implemented. The plan shall include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms shall be constructed to prevent spilled materials from reaching the creek channel.

Prior to construction, silt fencing shall be installed in all areas where construction occurs within 100 feet of known or potential steelhead habitat. All silt fencing, erosion control and landscaping specifications shall only include natural-fiber, biodegradable products for meshes and coir rolls to minimize impacts to species and the environment during use.

During construction, spoil sites shall be restricted to upland locations so they do not drain directly into Los Osos Creek. If a spoil site drains into a water body, catch basins shall be constructed to intercept sediment before it reaches the channels. If required, spoil sites shall be graded to reduce the potential for erosion.

During construction, equipment and materials shall be stored at least 50 feet from Los Osos Creek. No debris such as trash and spoils shall be deposited within 100 feet of waterways. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be restricted to locations

outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream shall be positioned over drip pans at all times. Any equipment or vehicles driven and/or operated within or adjacent to the stream shall be checked and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles shall be moved away from the stream prior to refueling and lubrication.

During construction, proper and timely maintenance for all vehicles and equipment used shall be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creek. Maintenance and fueling shall be restricted to safe areas away from Los Osos Creek that meet the criteria set forth in the spill prevention plan.

Immediately following construction, all construction work areas shall be restored to pre-construction channel conditions, including streambed composition, compaction, and gradient. If required, channel banks shall be returned to original grade slope and appropriate bank stabilization techniques shall be implemented to reduce the potential for erosion and sedimentation. A plan describing pre-project conditions and restoration methods shall be prepared prior to construction.

Immediately following construction, all appropriate construction work areas will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria shall be prepared prior to construction.

Page 5.5-46 of the Draft EIR

Mitigation Measure 5.5-A8 is revised as follows:

5.5-A8 ~~Additional specific avoidance measures, preconstruction survey requirements, and mitigation measures, if required, will be provided by the USFWS consultation with regard to California red-legged frog.~~

~~Prior to project construction, the County shall retain a qualified biologist to conduct pre-construction surveys for the California red-legged frog according to protocol approved by the USFWS. Surveys shall be conducted within all areas that at are determined to contain suitable breeding habitat for this species and that occur within 100 feet of proposed construction, or at a~~

~~distance determined through USFWS consultation. These areas shall include the following: wetlands within the community of Los Osos; tributaries T-1 and T-2 to Warden Creek on the Tonini property; tributaries W-3, W-4, W-5, W-5a, and W-5b to Warden Creek along the Los Osos Valley Road right-of-way; Warden Creek at the Turri Road crossing; Warden Lake on the Branin property; tributaries W-1 and W-2 to Warden Creek on the Giacomazzi property, and Los Osos Creek at the Los Osos Valley Road crossing.~~

~~All areas that are determined to be occupied by California red-legged frog shall be avoided during all phases of the proposed project unless authorized and permitted by the USFWS. Construction avoidance and minimization measures will be required for all activities within or adjacent to suitable breeding habitat for this species, as determined through USFWS consultation.~~

~~Additional conservation measures may be determined through the USFWS consultation.~~

EPA shall complete FESA Section 7 formal consultation with USFWS prior to initiating construction activities.

Only USFWS-approved biologists shall be permitted to participate in activities associated with the capture, handling, and monitoring of California red-legged frogs. Ground disturbance shall not begin until written approval is received from the USFWS that the biologist is qualified to conduct the work.

Prior to project construction, the County shall retain a qualified biologist to conduct pre-construction surveys for the California red-legged frog according to protocol approved by the USFWS. Surveys shall be conducted within all areas that at are determined to contain suitable breeding habitats for this species and that occur within 100 feet of proposed construction, or at a distance determined through USFWS consultation.

A USFWS-approved biologist shall permanently remove any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes from the project area, to the maximum extent possible. The USFWS-approved biologist shall be responsible for ensuring his or her activities are in compliance with the California Fish and Game Code. To ensure that diseases are not conveyed between work sites by the USFWS-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force shall be followed at all times.

Prior to the commencement of construction activities that will occur within 100 feet of California red-legged frog habitat, a USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished.

A USFWS-approved biologist shall be present at the active work sites until such time that the initial survey for California red-legged frogs, instruction of workers, and (upland) habitat disturbance have been completed. After this time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives appropriate training as to the identification of frogs, potential hazards to this species, inappropriate and allowable work activities, and appropriate contacts for immediate, professional biological support.

During work activities, all trash that may attract predators shall be properly contained, removed from the work site and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.

All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 20 meters (65 feet) from site riparian habitat or water bodies. The permittee shall ensure that contamination of habitat does not occur during such operations. Prior to the onset of work, the EPA shall ensure that the permittee has prepared a plan to allow a prompt and effective response to any accidental spills.

To avoid potential timing conflicts with the California red-legged frog breeding period, work activities at these sites shall be completed between May 1 and October 31.

Nighttime illumination at the treatment plant site shall meet the following requirements of the County's Estero Area Plan: "all lighting fixtures shall be shielded so that neither the lamp nor the related reflector interior surface is visible from adjacent properties. Light hoods shall be dark-colored." No night lighting shall be used unless necessary for active nighttime

maintenance activities at the plant, or under emergency conditions. Lighting shall be shielded from the creeks.

Wet weather storage ponds shall be maintained as to not attract bullfrogs. This will include allowing the ponds to go dry during the summer to disrupt any breeding activity by bullfrogs. The County shall monitor wet weather storage ponds for bullfrog activity.

Page 5.5-46 - 5.5-47 of the Draft EIR

Mitigation Measure 5.5-A10 shall be revised as follows:

5.5-A10 ~~Construction activities on the Broderson and Mid-town properties shall be conducted in conjunction with relocation efforts for the Morro Bay blue butterfly. Prior to construction activities on the Broderson and Mid-town properties, a qualified biologist shall be retained to conduct relocation efforts for the Morro Bay blue butterfly. Relocation efforts shall include multiple capture and transport surveys of adult Morro Bay blue butterflies throughout the adult flight season (April to June), or according to other protocol recommended for similar blue butterfly species.~~ Prior to construction activities on the Broderson and Mid-town properties, a qualified biologist shall be retained to identify and demarcate all host silver lupine shrubs that occur within the proposed impact area. The qualified biologist shall inspect each host lupine for the presence of any Morro Bay blue butterfly eggs or pupae. In an effort to avoid mortality of butterfly eggs or pupae prior to the onset of adult emergence, any host lupine specimens determined to contain eggs or pupae shall be considered for relocation outside of the proposed impact area and within suitable coastal dune scrub habitat on either the Broderson or Mid-town properties.

Any planting and restoration efforts proposed as mitigation for the project shall include silver dune lupine (Lupinus chamissonis) within the plant palette to encourage the species to continue to use the area.

Page 5.5-47 of the Draft EIR

Mitigation Measure 5.5-A11 shall be revised to address construction-related issues.

5.5-A11 If ~~the removal or trimming of any trees or shrubs is~~ any construction activities are proposed during the general bird breeding season (February 1 through August 31), a pre-construction survey shall be conducted by a

qualified biologist within 10 calendar days prior to ~~grading~~ the onset of construction activities ~~within any project impact area~~ to identify ~~all active raptor nests in areas impacted throughout project construction and implementation~~ any active non-raptor bird nests within 250 feet of the proposed impact area. If an active nest is identified during the pre-construction survey, ~~no construction activity shall take place within a minimum of 250 feet of any active nest until the young have fledged (as determined by a qualified biologist) and/or the nest is no longer determined to be active. Construction activity in the vicinity of any active nest shall be conducted at the discretion of a qualified monitoring biologist.~~ a minimum no-disturbance buffer of 250 feet shall be delineated around active nests until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival. For sensitive species, including Allen's hummingbird, yellow warbler, and loggerhead shrike, the distance and placement of the construction avoidance shall be a minimum of 250 feet unless otherwise determined through consultation with the CDFG.

Page 5.5-47 of the Draft EIR

Mitigation Measure 5.5-A12 has been revised to address construction-related issues and to clarify that the project shall avoid take and any adverse effects to the state-fully protected white-tailed kite.

5.5-A12 If ~~the removal or trimming of any trees or shrubs is~~ any construction activities are proposed during the general raptor breeding season ~~(April 1 through July 31)~~ (February 1 through August 31), a pre-construction survey shall be conducted by a qualified biologist within 10 calendar days prior to ~~grading~~ the onset of construction activities ~~within any project impact area~~ to identify ~~all active raptor nests in areas impacted throughout project construction and implementation~~ any active raptor nests within 500 feet of the proposed impact area. If an active raptor nest is identified during the pre-construction survey, ~~no construction activity shall take place within a minimum of 500 feet of any active raptor nest until the young have fledged (as determined by a qualified biologist) and/or the nest is no longer determined to be active. Construction activity in the vicinity of any active nest shall be conducted at the discretion of a qualified monitoring biologist.~~ a minimum no-disturbance buffer of 500 feet shall be delineated around active nests until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival.

Pursuant to Section 2050 of the CFG Code, the CDFG will not permit any impacts to the California state fully protected raptor white-tailed kite. If an active nest or breeding territory is detected during preconstruction surveys for nesting birds, no construction activities shall take place within 500 feet of the location of the active nest. The area shall be completely avoided and fenced to allow for an adequate buffer from construction activities. A qualified biologist shall be retained to monitor the activity of the nest during the breeding season until it is determined that the nest is no longer active (i.e. all young have fledged the nest and ~~are~~ no individual kites are dependent on the nest).

Page 5.5-48 of the Draft EIR

Mitigation Measure 5.5-A13 has been revised as follows:

5.5-A13 Prior to project construction and within all areas on the Broderson ~~and Mid-town properties~~ property that contain suitable habitat for ~~Morro manzanita,~~ Monterey spine flower~~, and Indian knob mountainbalm~~, a qualified biologist ~~approved by the USFWS~~ shall be retained to conduct botanical surveys to identify ~~all sensitive plant species within and in the immediate vicinity of the proposed impact area~~ Monterey spineflower presence. Surveys shall be conducted during the local blooming period~~s~~ for ~~each~~ the species, which typically occurs between April and June, and according to recommendations and guidelines prepared by the CDFG and CNPS. If positively identified, ~~A~~all specimens shall be clearly demarcated with flagging, and avoided to the maximum extent feasible during construction. A qualified monitoring biologist shall be retained to monitor all construction activities in the immediate vicinity (within ~~100~~ 25 feet) of any flagged specimens that will not be removed as a result of construction activities. If specimens are positively identified within the leachfield impact area, the seeds of those specimens shall be collected and sown within suitable habitat located outside of the leachfield impact area and within the Broderson property.

~~Any impacts that are proposed to the Morro manzanita, Monterey spineflower, and Indian knob mountainbalm shall proceed according to stipulations determined through wildlife agency consultation. Mitigation for Morro manzanita shall include replacement at a minimum ratio of 5:1, unless determined otherwise during wildlife agency consultation. Transplantation and relocation of salvaged specimens, if appropriate and feasible, should be considered during wildlife agency consultation. Salvaged specimens should~~

~~be transported to an offsite location that is approved by the USFWS, and should be assessed against survival and reproduction success criteria according to a mitigation monitoring plan.~~

The County shall provide a written report to USFWS within 90 days following the completion of the ~~proposed~~ project. The report ~~must~~shall document the number of ~~Morro manzanita,~~ Monterey spineflower~~, and Indian knob mountainbalm~~ specimens removed ~~and relocated~~ from project areas, the locations of ~~all Morro manzanita,~~ areas seeded with Monterey spineflower seeds~~, and Indian knob mountainbalm relocations~~, and the number of ~~Morro manzanita,~~ Monterey spineflower~~, and Indian knob mountainbalm~~ specimens ~~known~~ found to be dead or damaged as a result of construction activities. The report shall contain a brief discussion of any problems encountered in implementing minimization measures, results of biological surveys, observations, and any other pertinent information such as the acreages affected and restored, or undergoing restoration, of each habitat type.

Page 5.5-48 of the Draft EIR

Mitigation Measure 5.5-A14 has been revised as follows:

5.5-A14 The proposed project shall minimize to the maximum extent feasible any potential impacts to non-listed plant and lichen species designated as sensitive by the CNPS, including Blochman leafy daisy, saint's daisy, San Luis Obispo wallflower, curly-leafed monardella, dune almond, spiraled old man's beard, Los Osos black and white lichen, long-fringed parmotrema, and splitting yarn lichen. A qualified biologist shall conduct botanical surveys within suitable coastal sage scrub habitat on the Broderson and Mid-town properties to identify all sensitive plant and lichen species within and in the immediate vicinity of the proposed impact area.

Surveys shall be conducted during the local blooming periods for each species, where applicable, and according to recommendations and guidelines prepared by the CDFG and CNPS. All specimens shall be clearly demarcated with flagging and avoided to the maximum extent feasible during construction.

Page 5.5-49 - 5.5-50 of the Draft EIR

Mitigation Measure 5.5-A16 has been revised to state the following:

5.5-A16 The existing coastal sage scrub within the Broderson property shall be restored and maintained to promote the land's function and value as suitable habitat for sensitive plants and wildlife that are local or endemic to the area. Restoration activities shall be conducted on the Broderson property by qualified personnel with expertise in restoration ecology and knowledge of sensitive plant and wildlife species in the area. Restoration activities shall be conducted according to a Restoration Plan or similar plan specifically prepared for the effort and approved by USFWS, and CDFG~~, and/or the CNPS~~. Similarly, restorative measures and maintenance shall be implemented according to ~~a Habitat Mitigation and Monitoring Plan~~ the Resource Management Plan prepared for the preservation lands on the Broderson property, or similar implementation plan that shall require a schedule and program for monitoring and reporting the progress of the restoration effort.

The ~~Restoration Plan~~ Resource Management Plan shall include measures for the removal and eradication of invasive exotic plant species known to occur in the local area, including veldt grass and pampas grass. Activities that involve the removal of invasive species should not result in unnecessary trampling or removal of native species, and techniques for invasive removal shall be least damaging to native species. Any disturbed portion of acquired mitigation lands should be appropriate for restoration into coastal sage scrub habitat and have the potential to support the functions and values necessary for the Morro shoulderband snail, the Morro Bay kangaroo rat, and other sensitive species.

The restoration effort shall include the implementation of a seed collection program to gather seeds to be used during restoration from native sources. The seed collection program shall be prepared for approval by the County prior to project construction activities. The seed collection program shall include the use of native plants that will be removed as a result of the project, including but not limited to, mock heather (Ericameria ericoides), silver dune lupine (Lupinus chamissonis), California sagebrush (Artemisia californica), black sage (Salvia mellifera), bush monkey flower (Mimulus aurantiacus), and deerweed (Lotus scoparius). Collection shall take place by qualified personnel with expertise in botanical resources during the appropriate time of year for seed production and harvesting.

The restoration effort shall be monitored against permanence standards for a minimum of five years, after which the maintenance and monitoring of the

restored areas shall be covered within the management directives contained within the Resource Management Plan. The performance standards for year five shall include, at minimum, at least 80 percent native plant species coverage and no greater than 1 percent coverage of invasive non-native plant species (e.g. pampass grass, veldt grass). The restored areas must demonstrate a continued ability to support the functions and values necessary to sustain the Morro shoulderband snail. All monitoring shall be conducted by qualified personnel with expertise in botanical resources and knowledge of sensitive species that occur in the local area, including the Morro shoulderband snail, Morro Bay kangaroo rat, and Morro Bay blue butterfly. Quarterly monitoring shall be conducted for the first two years of the restoration effort, with annual monitoring efforts to follow for the remaining three years.

The County shall provide annual reports to the USFWS documenting the results of all restoration and monitoring activities. Annual reports shall be provided to the USFWS for a minimum of five years or until it is determined by the USFWS that requisite performance criteria have been met. These reports should include any noted changes in the plant community structure or composition or surface hydrology down-slope of the Broderson leachfields, in addition to other requirements as determined through USFWS consultation and stipulated within permit conditions.

Page 5.6-21 of the Draft EIR

Mitigation Measure 5.6-B6 is revised as follows:

5.6-B6 Preconstruction monitoring shall occur in areas ranked as high in sensitivity for buried deposits. Two such areas have been identified within the proposed project area: (1) along Los Osos Valley Road from Los Osos Creek east to the Cemetery Parcel; and (2) in the western portion of the Tonini Parcel. Mechanical backhoe trenching shall be conducted within the sensitive areas where any construction impacts will occur and shall be monitored by a qualified geoarchaeologist. Any identified intact deposits will be evaluated, and any deposits determined to be eligible to the California Register and/or National Register shall require project redesign to avoid impacts, or data recovery to mitigate unavoidable impacts.

Page 5.8-2 of the Draft EIR

The last sentence of the last paragraph on 5.8-2 of the Draft EIR is revised as follows:

Based on a review of the County of San Luis Obispo General Plan, there ~~are~~ is one goal and one policy that address traffic and transportation related issues. These are presented below.

Page 5.9-22 of the Draft EIR

Table 5.9-9: Proposed Project 4 Operational Emissions is corrected below.

Table 5.9-9: Proposed Project 4 Operational Emissions

System	Pounds Per Day			
	ROG	CO	NO_X	PM_{10}
Collection	0.03	1.24	0.28	0.02
Conveyance	0.01	0.39	0.05	0.00
Treatment	~~1.33~~0.74	~~3.51~~1.97	~~14.13~~7.90	~~0.49~~0.27
Disposal	0.00	0.00	0.00	0.00
TOTAL	~~1.38~~0.78	~~5.14~~3.60	~~14.46~~8.23	~~0.51~~0.29
Current Operations	0.12	1.15	5.54	0.15
NET DIFFERENCE	~~1.26~~0.66	~~3.99~~2.46	~~8.92~~2.69	~~0.36~~0.14
District Threshold	10	550	10	10
Exceeds Threshold	No	No	No	No
Source: MBA 2008.				

Page 5.11-3 of the Draft EIR

The third sentence of the last paragraph of Section 5.11.5 is revised as follows:

The complete anal*y*sis and rationale for determining a less than significant or no impact under these thresholds of significance can be found in Appendix M~~N~~-1.

Page 5.11-3 of the Draft EIR

The fifth sentence of the fifth paragraph on page 5 .11-3 of the Draft EIR is revised as follows:

All other thresholds had a potentially significant impact prior to mitigation for at least one of the proposed projects. See Table 5.~~12~~11-1 below.

Page 5.11-7 of the Draft EIR

The sixth sentence in the first paragraph on page 5.11-7 of the Draft EIR, is revised as follows:

However, direct and indirect impacts would be represented by 313 acres. ~~the entire parcel acreage.~~

Page 5.11-7 of the Draft EIR

The tenth sentence in the first paragraph on page 5.11-7 of the Draft EIR, is revised as follows:

> Therefore, the annual potential lost revenue associated with direct and indirect impacts for using the Tonini parcel as a disposal site is $1,031,914 ~~$1,008,398~~ (Table 5.11-8 ~~Table 5.11-9).~~

Page 5.11-7 - 5.11-8 of the Draft EIR

Pages 5.11-7 and 5.11-8 in the Draft EIR, under Proposed Project 1, Disposal Effects, and Combined Project Effects, are revised as follows:

> The highest and best use of the Tonini parcel that can support agricultural production within the boundaries of the spray fields area is assumed to be vegetable crops on 171 acres, and rangeland grazing on the remaining 4 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This loss would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Page 5.11-8 of the Draft EIR

The fourth sentence in the third paragraph on Page 5.11-8 in the Draft EIR is revised as follows:

> Within the boundaries of the spray fields, the highest and best use of the Tonini parcel is assumed to be for vegetable crops on 163 acres, and rangeland grazing on the remaining 12 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Page 5.11-9 of the Draft EIR

The sixth sentence in the third paragraph on page 5.11-9, under Proposed Project 3, Disposal Effects, of the Draft EIR, is revised as follows:

> Therefore, the potential lost revenue associated with the direct and indirect impacts of using the Tonini parcel as a disposal site is $1,031,914 ~~1,008,398~~ per year (Table 5.11-8 ~~5.11-9~~).

Page 5.11-9 - 5.11-10 of the Draft EIR

Pages 5.11-9 and 5.11-10 under Proposed Project 3, Disposal Effects, and Combined Project Effects, of the Draft EIR, are revised as follows:

> Within the boundaries of the spray fields, the highest and best use of the Tonini parcel that can support agricultural production within the boundaries of the sprayfields area is assumed to be vegetable crops on 171 acres, and rangeland grazing on the remaining 4 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Page 5.11-10 of the Draft EIR

The tenth sentence in the second paragraph on page 5.11-10 of the Draft EIR, under Proposed Project 3, Combined Project Effects, is revised as follows:

> The combined effect of potential lost revenue from direct impacts associated with the treatment and disposal facilities would be $1,370,518 ~~1,347,002~~ per year and would result in a significant and unavoidable impact.

Page 5.11-11 of the Draft EIR

The sixth sentence in the first full paragraph on page 5.11-11 of the Draft EIR, under Proposed Project 4, Combined Project Effects, is revised as follows:

> Within the spray field boundaries, the highest and best use of the Tonini parcel is assumed to be for vegetable crops on 163~~0~~ acres and rangeland grazing on 12 acres.

Page 5.11-11 of the Draft EIR

Page 5.11-11 of the Draft EIR, under Proposed Project 4, Disposal Effects, and Combined Project Effects, is revised as follows:

> Within the spray field boundaries, the highest and best use of the Tonini parcel is assumed to be for vegetable crops, on 148 acres, and rangeland grazing on 27 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in an additional loss of $47,110 to the agricultural revenue stated below, but would not change the impact conclusion of significant and unavoidable.

Page 7-23 of the Draft EIR

Table 7-5 on page 7-23 of the Draft EIR is revised as follows:

Table 7-5: Screening of Collection System Alternatives

Baseline Criteria	Gravity1	Combined Septic Tank Effluent Pumping (STEP)/ Septic Tank Effluent Gravity (STEG) System	Low Pressure Collection System (LPCS)1	Vacuum System
Level Designation	**Level A**	**Level A**	**Level C**	**Level C**
Groundwater Quality & RWQCB Waste Discharge Requirements	• Meets RWQCB requirements for elimination of pollution to groundwater • Least ex-filtration • Septic tank effluent that currently recharges aquifer is removed	• Meets RWQCB requirements for elimination of pollution to groundwater • Some exfiltration with pressurized pipelines. • Septic tank effluent that currently recharges aquifer is removed	• Meets RWQCB requirements for elimination of pollution to groundwater • Less exfiltration than STEP; more than gravity system. • Septic tank effluent that currently recharges aquifer is removed	• Meets RWQCB requirements for elimination of pollution to groundwater
Water Resources	• Inflow - As gravity system ages, Inflow can occur at lateral connections, manholes, and mainline joints. Regular maintenance can reduce • Infiltration - Potential where mainlines and manholes are below water table. • Septic tank effluent that currently recharges aquifer is removed.	• Inflow - As STEP/STEG system ages, Inflow can occur at house lateral connections and STEP/STEG tank joints. • Infiltration - Unlikely. • Septic tank effluent that currently recharges aquifer is removed	• Inflow - As LPCS system ages, Inflow can occur at house lateral connections and grinder pump station connections. • Infiltration - Unlikely. • Septic tank effluent that currently recharges aquifer is removed • <u>During power outage, spills can occur because grinder pumps do not have capacity to provide wastewater storage</u>.	Not evaluated.

Page 7-49 of the Draft EIR

The last sentence of the second paragraph on page 7-49 is revised as follows:

> Table 7-6 ~~below~~ provides a summary comparison of the wastewater treatment process alternatives against the project selection criteria.

Page 7-58 of the Draft EIR

The first three paragraphs on page 7-58 of the Draft EIR is revised as follows:

> All four proposed projects assume that water conservation measures will be implemented to reduce water demand and the associated wastewater generation by 160 AFY. This represents about a ~~12~~ 10percent reduction in per capita water demand over 2006 estimated wastewater generation rates of 66 gallons per capita per day. Since the LOWWP wastewater conveyance, treatment and effluent disposal facility capacities have been based on the reduced wastewater generation rates, there will be significant savings in capital construction costs and operations and maintenance. Without implementing the water conservation measures, wastewater generation could continue at the historical rates and the LOWWP facilities would have to be enlarged to treat higher wastewater flows.
>
> In order to reduce wastewater generation, the water conservation measures must focus on plumbing fixtures and residential and commercial water uses other than landscape irrigation, which does not generate wastewater. A ~~12~~ 10percent reduction in non-irrigation water uses is significant, so the Los Osos community will need to make a concerted effort to reach the water conservation goal. Three primary water conservation measures to be implemented could include:
>
> 1. Mandate that property owners, including residents, commercial establishments and schools, retrofit their buildings with all low-flow plumbing fixtures, including low-flow toilets, showerheads and faucets, prior to hooking up their buildings to the sewer.
> 2. Conduct a Public Education campaign to increase awareness of water conservation practices.
> 3. Promote High-Efficiency appliance programs that are sponsored by the gas and electric utility companies. Many of these programs cover appliances such as energy-efficient dishwashers and washers that would reduce both energy and water consumption.
>
> The LOWWP would institute additional water conservation measures as needed to achieve the target ~~12~~10percent per capita water consumption rate reduction and the resulting wastewater generation reduction. Because of water conservation's importance to achieving the LOWWP project goals of sustainability, affordability, and mitigating the project's

impacts on water resources, implementing water conservation measures has been designated a Level A alternative."

Page 7-65 of the Draft EIR

The last sentence of the third paragraph on page 7-65 of the Draft EIR is revised as follows:

All four proposed projects assume a 46-acre <u>foot</u> storage pond.

Page 11-2 of the Draft EIR

The twelfth reference on page 11-2 of the Draft EIR was repeated and is removed as follows:

~~Crawford, Multari, and Clark Assocaites. 2001. Final Environmental Impact Report for the Los Osos Community Services District Wastewater Facilities Project, March 1.~~

Crawford, Multari, and Clark Associates. 2001. Final Environmental Impact Report for the Los Osos Community Services District Wastewater Facilities Project, March 1.

Appendix D-1 Expanded Groundwater Resources Analysis Page 5.2-32

The discussion regarding disposal sites under Proposed Project 4 of Appendix D-1, Expanded Groundwater Resources Analysis, is revised as follows:

Short-term Construction Effects

As with Proposed Project 1, the potential for groundwater quality impacts of the project disposal sites during construction of facilities for Proposed Project 4 would be the same ~~less than significant impact~~ <u>no impact</u> as described above for Proposed Project 1.

Appendix E-1 Expanded Drainage and Surface Water Quality Analysis Page 5.3-72

The discussion regarding project-specific impact analysis for Proposed Projects 1 through 4 of Appendix E-1, Expanded Drainage and Surface Water Quality Analysis is revised as follows:

Proposed Projects 1 through 4

Table 5.3-3 provides a discussion of the project's consistency with the federal Clean Water Act, local Coastal Zone Land Use Ordinances, SLOC Coastal Plan Policies, SLOC Department of Public Works Improvement Standards, and the California Code of Regulations. Based on the consistency analysis in Table 5.3-3, Proposed Projects 1 through 4 would not conflict with federal laws or local goals and policies relating to hydrology and water quality; therefore Proposed Projects 1 through 4 would result in ~~less than significant~~ <u>no</u> impacts.

Appendix E-1 Expanded Drainage and Surface Water Quality Analysis Page 5.3-91

The significance determination regarding project-specific level of significance after mitigation for Proposed Projects 1 through 4 of Appendix E-1, Expanded Drainage and Surface Water Quality Analysis, is revised as follows:

Project-Specific
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix F-1 Expanded Geology Analysis Page 5.4-17

The mitigation measures identified for Proposed Projects 1 through 4 under cumulative of Appendix F-1, Expanded Geology Analysis, is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Implementation of Mitigation Measures 5.4-B1 is required~~ No mitigation measures are required.

Appendix F-1 Expanded Geology Analysis Page 5.4-18

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix F-1, Expanded Geology Analysis, is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix F-1 Expanded Geology Analysis Page 5.4-29

Mitigation Measure 53.4-G1is revised as follows:

5.4-G1 Prior to approval of improvement and building plans for the proposed collection system facilities~~, and~~ facilities at the treatment plant site, and facilities at Broderson, a design-level geotechnical report shall be prepared that addresses and reduces potential expansive soil impacts to less than significant. The expansive soil data shall be used with the requirements of the California Building Code (2007), as adopted by the County of San Luis Obispo.

Appendix I-1 Expanded Public Health and Safety Analysis Page 5.7-15

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix I-1, Expanded Public Health and Safety Analysis, is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix I-1 Public Health and Safety Analysis Page 5.7-22

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix I-1, Expanded Public Health and Safety Analysis, is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix I-1 Expanded Public Health and Safety Analysis Page 5.7-23

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix I-1, Expanded Public Health and Safety Analysis, of the Draft EIR is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix I-1 Expanded Public Health and Safety Analysis Page 5.7-24

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix I-1, Expanded Public Health and Safety Analysis, is revised as follows:

Cumulative
Proposed Projects 1 through 4
~~Less than Significant~~ No Impact.

Appendix I-1 Expanded Public Health and Safety Analysis Page 5.7-26

The significance determination regarding cumulative level of significance after mitigation for Proposed Projects 1 through 4 of Appendix I-1, Expanded Public Health and Safety Analysis, of the Draft EIR is revised as follows:

Cumulative

Proposed Projects 1 through 4

~~Less than Significant~~ No Impact.

Appendix K-1 Expanded Air Quality Page 5.9-23 - 5.9-24 of

The discussion regarding attainment status under Appendix K-1, Expanded Air Quality Analysis, of the Draft EIR is revised as follows:

Attainment Status

There are three terms generically used to describe if an air basin is exceeding or meeting federal and State standards: Attainment, nonattainment, and unclassified or unclassifiable. Air basins are assessed for each applicable standard and receive a designation for each standard based on that assessment. If an ambient air quality standard is exceeded, the air basin is designated as "nonattainment" for that standard. An air basin is designated as **"**attainment**"** for standards that are met. If there is inadequate or inconclusive data to make a definitive attainment designation for an air quality standard, the air basin is considered "unclassified." With some federal standards, only two divisions are used. Either the area is not in attainment for the standard or is classified unclassifiable/attainment. It should be noted that for State standards, designations are only made on a pollutant-by-pollutant basis, therefore, an area must achieve attainment for each averaging time for it to achieve attainment for that pollutant. The current attainment designations for the project area are shown in Table 5.9-6 below.

The County has been designated as a nonattainment area for the State PM_{10} standard. The County achieved State 1-hour ozone attainment status in January 2004. SLOAPCD was one of three air districts in California in 2004 to be re-designated from nonattainment to attainment for the State 1-hour ozone standard. San Luis Obispo County was first designated nonattainment for the State 1-hour ozone standard in 1989 after adoption of the CCAA. The law required each nonattainment area to develop a plan to attain the standards expeditiously.

However, there are two State standards for ozone: a 1-hour standard and an 8-hour standard. An area must attain both standards to be designated attainment. If either the 1-hour or 8-hour standard is violated, the area is nonattainment or nonattainment-transitional. The State 1-hour standard has been in place for a number of years, but in April 2005 the CARB approved a new 8-hour standard of 0.070 ppm. This longer averaging time standard was designed to

protect against the more chronic health impacts of longer-term ozone exposure. The State 8-hour ozone standard became effective May 17, 2006. In the CARB's 2006 Area Designations (CARB 2006), analysis demonstrated that the County did not qualify as attainment for the State 8-hour standard, thus was re-designated to nonattainment.

Appendix K-1 Expanded Air Quality Analysis Page 5.9-34

The discussion regarding cumulative impact analysis for Proposed Projects 1 through 4 of Appendix K-1, Expanded Air Quality Analysis, is revised as follows:

Proposed Projects 1 through 4

Related projects within the greater cumulative project area are detailed in Section 4.2 and Exhibit 4.2-1 in the Draft EIR. Three of the nine related projects (Los Osos CSD Waterline Replacement, Los Osos Valley Road Palisades Storm Drain, and AT&T Cable) physically overlap with the study area for the proposed project but are either completed or expected to be completed by the time construction of the proposed project is anticipated to begin (2010). Six of the nine related projects (State Park Marina Renovation, Morro Bay Wastewater Treatment Plant, Dredging of Morro Bay, CMC Wastewater Treatment Plant, Phase II Steam Generator Replacement at Diablo, and Spent Fuel Storage Facility at Diablo) have no physical overlap with the proposed project; however, they could contribute to the same air basin impacts. Since the Proposed Projects 1 through 4 would not exceed the District's concentration standards, ~~the projects wound not contribute to potential cumulative impacts related to the exceedance of the District's concentration standards~~ the projects' contribution to potential cumulative air quality impacts related to the District's concentration standards is less than cumulatively considerable.

Appendix K-1 Expanded Air Quality Analysis Page 5.9-34

The significance determination regarding the level of significance after mitigation under cumulative of Appendix K-1, Expanded Air Quality Analysis, of the Draft EIR is revised as follows:

Cumulative

~~No Impact~~ Less than significant**.**

Appendix K-1 Expanded Air Quality Analysis Page 5.9-63 - 5.9-64

Based on a review of the Greenhouse Gas (GHG) analysis contained in Section 5.9 of the Draft EIR and Appendix K-1, Expanded Air Quality Analysis, there was an error in the calculation related to on-road vehicular GHG emissions. Table 5.9-14 in Appendix K-1 is revised as follows:

Table 5.9-14: Construction GHG Emissions

System/Source	Metric Tons CO2e per year			
	Project 1	Project 2	Project 3	Project 4
Collection				
On road vehicular	2,482,290	2,138,906	2,138,906	1,682,659
Off road equipment	408	382	382	382
Construction materials off site	804	1,243	1,243	960
Collection Total	2,483,503	2,140,531	2,140,531	1,684,001
Conveyance				
On road vehicular	361,361	380,836	380,836	393,944
Off road equipment	63	63	63	83
Conveyance Total	361,424	380,899	380,899	394,027
Treatment				
On road vehicular	490,602	505,688	505,688	490,478
Off road equipment	519	446	446	519
Construction materials off site	2,115	3,043	3,043	3,095
Treatment Total	493,236	509,176	509,176	494,092
Disposal				
On road vehicular	981,492	981,809	981,809	981,928
Off road equipment	838	838	838	838
Disposal Total	**982,330**	**982,647**	**982,647**	**982,766**
GRAND TOTAL	**4,320,493**	**4,013,254**	**4,013,254**	**3,554,886**
Source: MBA 2008.				

Table 5.9-14: Construction GHG Emissions

System/Source	Metric Tons CO_2e per year			
	Project 1	Project 2	Project 3	Project 4
Collection/Conveyance				
On road vehicular	1,422	1,116	1,116	1,142
Off road equipment	440	414	414	424
Construction materials off-site	804	1,243	1,243	960
Collection/Conveyance Total	2,666	2,773	2,773	2,526
Treatment				
On road vehicular	245	205	246	245
Off road equipment	519	446	489	519
Construction materials off-site	2,115	3,043	3,043	3,095
Treatment Total	2,879	3,693	3,778	3,859
Disposal				
On road vehicular	491	670	491	491
Off road equipment	838	924	838	838
Disposal Total	**1,328**	**1,594**	**1,328**	**1,329**
GRAND TOTAL	**6,874**	**8,060**	**7,879**	**7,713**
Source: MBA 2008.				

Appendix K-1 Expanded Air Quality Analysis Page 5.9-65

Based on a review of the Greenhouse Gas (GHG) analysis contained in Section 5.9 of the Draft EIR and Appendix K-1, Expanded Air Quality Analysis, there was an error in the calculation related to on-road vehicular GHG emissions. Table 5.9-15 of Appendix K-1, Expanded Air Quality Analysis, is revised as follows:

~~**Table 5.9-15: Operational GHG Emissions**~~

~~System/Source~~	~~Metric Tons CO2e per year~~			
	~~Project 1~~	~~Project 2~~	~~Project 3~~	~~Project 4~~
~~Collection~~				
~~On road vehicular~~	~~98,564~~	~~69,668~~	~~69,668~~	~~69,668~~
~~Energy usage~~	~~169~~	~~199~~	~~199~~	~~199~~
~~Septic tanks~~	~~624~~	~~0~~	~~0~~	~~0~~
~~Collection Total~~	~~99,357~~	~~69,867~~	~~69,867~~	~~69,867~~

~~**Table 5.9-15 (Cont.): Operational GHG Emissions**~~

~~System/Source~~	~~Metric Tons CO2e per year~~			
	~~Project 1~~	~~Project 2~~	~~Project 3~~	~~Project 4~~
~~Conveyance~~				
~~On road vehicular~~	~~20,945~~	~~20,945~~	~~20,945~~	~~20,945~~
~~Conveyance Total~~	~~20,945~~	~~20,945~~	~~20,945~~	~~20,945~~
~~Treatment~~				
~~On road vehicular~~	~~53,148~~	~~80,605~~	~~80,605~~	~~52,500~~
~~Energy Usage~~	~~425~~	~~541~~	~~541~~	~~493~~
~~Chemical Production off-site~~	~~356~~	~~14~~	~~14~~	~~356~~
~~Treatment Total~~	~~53,929~~	~~81,159~~	~~81,159~~	~~53,349~~
~~Disposal~~				
~~On road vehicular~~	~~0~~	~~0~~	~~0~~	~~0~~
~~Disposal Total~~	~~0~~	~~0~~	~~0~~	~~0~~
~~GRAND TOTAL~~	~~174,231~~	~~171,971~~	~~171,971~~	~~144,161~~
~~Current Operations~~	~~201,045~~	~~201,045~~	~~201,045~~	~~201,045~~
~~NET DIFFERENCE~~	~~-27,654~~	~~-29,914~~	~~-29,914~~	~~-57,724~~
~~Percent Reduction~~	~~15.9%~~	~~17.4%~~	~~17.4%~~	~~40.0%~~
~~Source: MBA 2008.~~				

Table 5.9-15: Operational GHG Emissions

System/Source	Metric Tons CO2e per year			
	Project 1	Project 2	Project 3	Project 4
Collection/Conveyance				
On road vehicular	60	45	45	45
Energy usage	169	199	199	199
Septic tanks	624	0	0	0
Collection Total	853	244	244	244
Treatment				
On road vehicular	27	40	40	26
Energy Usage	425	541	541	493
Chemical Production off-site	356	14	14	356
Treatment Total	808	595	595	865
Disposal				
On road vehicular	0	0	0	0

Table 5.9-15 (Cont.): Operational GHG Emissions

System/Source	Metric Tons CO2e per year			
	Project 1	Project 2	Project 3	Project 4
Disposal Total	0	0	0	0
GRAND TOTAL	1,660	839	839	1,109
Current Operations	941	941	941	941
NET DIFFERENCE	720	-102	-102	169
Percent Reduction	43.4%	-12.1%	-12.1%	15.2%
Source: MBA 2008.				

Appendix K-1 Expanded Air Quality Analysis Page 5.9-75

The discussion regarding cumulative impact analysis for Proposed Projects 1 through 4 of Appendix K-1, Expanded Air Quality Analysis, is revised as follows:

Cumulative Impact Analysis

Related projects within the greater cumulative project area are detailed in Section 4.2 and Exhibit 4.2-1 in the Draft EIR. Three of the nine related projects (Los Osos CSD Waterline Replacement, Los Osos Valley Road Palisades Storm Drain, and AT&T Cable) physically overlap with the study area for the proposed project but are either completed or expected to be completed by the time construction of the proposed project is anticipated to begin (2010). Six of the nine related projects (State Park Marina Renovation, Morro Bay Wastewater Treatment Plant, Dredging of Morro Bay, CMC Wastewater Treatment Plant, Phase II Steam Generator Replacement at Diablo, and Spent Fuel Storage Facility at Diablo) have no physical overlap with the proposed project; however, they could contribute to GHG impacts. Since Proposed Projects 1 through 4 ~~could reduce GHG emissions compared to the existing wastewater system, implementation of any of the proposed projects would not contribute to an adverse cumulative impact related to GHG emissions~~ would increase GHG emissions during construction activities and could reduce long-term GHG emissions compared to the existing wastewater system. Proposed Projects 1 through 4's contribution to GHG emissions is considered less than cumulatively considerable, and thus result in a less than significant impact.

Appendix L-1 Expanded Noise Analysis Page 5.10-62

The discussion regarding cumulative impact analysis for Proposed Projects 2 of Appendix L-1, Expanded Noise Analysis, of the Draft EIR is revised as follows:

Combined Project Effects

The combined project construction-related vibration impacts for Proposed Project 2 would be similar as those described for Proposed Project 1, except the combined construction activities would create only 69 truck round trips per day versus the 102 truck round trips per day for Proposed Project 1. The analysis above for Proposed Project 1 found that the combined project construction vibration impacts associated with pile driving for the in-town collection system would ~~not create a significant impact~~ be significant. Therefore, the combined project vibration impacts during construction of Proposed Project 2 would be ~~less than~~ significant.

Appendix L-1 Expanded Noise Analysis Page 5.10-63

The discussion regarding combined project-effects for Proposed Projects 3 of Appendix L-1 Expanded Noise Analysis, is revised as follows:

Combined Project Effects

The combined project construction-related vibration impacts for Proposed Project 3 would be similar as those described for Proposed Project 1, except the combined construction activities would create only 70 truck round trips per day versus the 102 truck round trips per day for Proposed Project 1. The analysis above for Proposed Project 1 found that the combined project construction vibration impacts associated with pile driving for the in-town collection system would ~~not create a significant impact~~ be significant. Therefore, the combined project vibration impacts during construction of Proposed Project 3 would be ~~less than~~ significant.

Appendix L-1 Expanded Noise Analysis Page 5.10-64

The discussion regarding combined project-effects for Proposed Projects 4 of Appendix L-1, Expanded Noise Analysis, of the Draft EIR is revised as follows:

Combined Project Effects

The combined project construction-related vibration impacts for Proposed Project 4 would be similar as those described for Proposed Project 1, except the combined construction activities would create only 71 truck round trips per day versus the 102 truck round trips per day for Proposed Project 1. The analysis above for Proposed Project 1 found that the combined project construction vibration impacts associated with pile driving for the in-town collection system would ~~not create a significant impact~~ be significant. Therefore, the combined project vibration impacts during construction of Proposed Project 4 would be ~~less than~~ significant.

Appendix L-1 Expanded Noise Analysis Page 5.10-66

The significance determination regarding the level of significance after mitigation under cumulative of Appendix L-1, Expanded Noise Analysis, is revised as follows:

Cumulative
~~Less than significant~~ No impact**.**

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-29

The sixth sentence in the second paragraph on page 5.11-29, under Proposed Project 1, Disposal Effects in Appendix M-1, Expanded Agriculture Resources Analysis is revised as follows:

> However, direct and indirect impacts would be represented by 313 acres. ~~the entire parcel acreage.~~

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-29

The tenth sentence in the second paragraph on page 5.11-29, under Proposed Project 1, Disposal Effects in Appendix M-1, Expanded Agriculture Resources Analysis, revised as follows:

> Therefore, the annual potential lost revenue associated with direct and indirect impacts for using the Tonini parcel as a disposal site is $1,031,914 ~~$1,008,398~~ (Table 5.11-8 ~~Table 5.11-9).~~

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-29 - 5.11-30

Pages 5.11-29 and 30 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 1, Disposal Effects, and Combined Project Effects are revised as follows:

> The highest and best use of the Tonini parcel that can support agricultural production within the boundaries of the spray fields area is assumed to be vegetable crops on 171 acres, and rangeland grazing on the remaining 4 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This loss would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-30

The ninth sentence in the first paragraph on page 5.11-30, in the Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 1, Combined Project Effects, is revised as follows:

> In terms of lost potential revenue, the combined direct effect of removing 32 acres (Cemetery, Giacomazzi, and Branin parcels) from agricultural production for the treatment facility and 175 acres for disposal facilities (Tonini parcel), and indirect impacts that would

occur to all lands on the Cemetery, Giacomazzi, and Branin parcels capable of agricultural production, would result in a potential loss of $1,538,053~~1,514,537~~ per year.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-32

Table 5.11-8 on page 5.11-32 in the Appendix M-1, Expanded Agriculture Resources Analysis, is revised as follows:

Table 5.11-8: Potential Annual Agriculture Revenue Lost from Direct and Indirect Impacts

Parcel	Proposed Project 1	Proposed Project 2	Proposed Project 3	Proposed Project 4
Cemetery	$167,535			
Giacomazzi	$223,891	$223,891	$223,891	
Branin	$114,713		$114,713	
Tonini - treatment facilities		$47,110		$135,531
Treatment sub-totals	$506,139	$271,001	$338,604	
Tonini - disposal only	$1,031,914~~1,008,398~~	$961,288	$1,031,914~~1,008,398~~	$872,866
Project Totals[1]	$1,538,053~~1,514,537~~	$1,232,289	$1,370,518~~1,347,002~~	$1,008,397
Total Proposed Project Percentage of County vegetable crop revenue[2]	0.64%	0.52%	0.57%	0.43%

Notes:
Potential revenue lost for the Cemetery, Giacomazzi, and Branin parcels is based on total agricultural land use acreages reported in Table 5.11-8. For the Tonini parcel, potential revenue lost is based on both crop producing and the non-grazing lands reported in Table 5.11-8.
1 Totals may not sum due to rounding.
2 Total vegetable crop revenue is the highest potential use on the subject parcels and was taken from the 2007 Crop Report for San Luis Obispo County.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-33

Page 5.11-33 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 2, Disposal Effects is revised as follows:

Within the boundaries of the spray fields, the highest and best use of the Tonini parcel is assumed to be for vegetable crops on 163 acres, and rangeland grazing on the remaining 12 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-34 - 5.11-35

Pages 5.11-34 and 35 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 3, Disposal Effects, are revised as follows:

> The highest and best use of the Tonini parcel that can support agricultural production within the boundaries of the sprayfields area is assumed to be vegetable crops on 171 acres, and rangeland grazing on the remaining 4 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in a loss of $47,110 in addition to agricultural revenue lost stated below, but would not change the impact conclusion of significant and unavoidable.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-35

The first sentence on page 5.11-35, under Proposed Project 3, Disposal Effects, in Appendix M-1 Expanded Agriculture Resources Analysis, is revised as follows:

> Therefore, the potential lost revenue associated with the direct and indirect impacts of using the Tonini parcel as a disposal site is $1,031,914 ~~1,008,398~~ per year (Table 5.11-8 ~~5.11-9~~).

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-35

The tenth sentence in the third paragraph on page 5.11-35 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 3, Combined Project Effects, is revised as follows:

> The combined effect of potential lost revenue from direct impacts associated with the treatment and disposal facilities would be $1,370,518~~1,347,002~~ per year and would result in a significant and unavoidable impact.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-36 - 5.11-37

On pages 5.11-36 and 37 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 4, Disposal Effects, and Combined Project Effects, is revised as follows:

> Within the spray field boundaries, the highest and best use of the Tonini parcel is assumed to be for vegetable crops, on 148 acres, and rangeland grazing on 27 acres. However, an additional 8 acres of prime agricultural land would also be lost to setbacks on creeks that bisect the Tonini parcel. This would result in an additional loss of $47,110 to the agricultural revenue stated below, but would not change the impact conclusion of significant and unavoidable.

Appendix M-1 Expanded Agriculture Resources Analysis Page 5.11-37

The sixth sentence in the first paragraph on page 5.11-37 of Appendix M-1, Expanded Agriculture Resources Analysis, under Proposed Project 4, Combined Project Effects, is revised as follows:

> Within the spray field boundaries, the highest and best use of the Tonini parcel is assumed to be for vegetable crops on 163~~0~~ acres and rangeland grazing on 12 acres.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-22

The seventh sentence of the last paragraph on page 5.12-22 will be revised as follows:

> Proposed Project 1 will include the incorporation of approximately 51,688 linear feet of 6-, 8-, and 10-inch PVC force mains, 263,165 linear feet of pressure sewer collector, 630 isolation valves and air release valves, 240 flushing ports, and 1,000 linear feet of creek crossings. Most of this infrastructure would be located below grade, including a submersible pump station. ~~There would be a power generating station above grade that would be approximately 25 feet by 14 feet, with an approximate height of 17 feet.~~

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-22

The first sentence of the fourth paragraph on page 5.12-24 will be revised as follows:

> The proposed collection system for this project would be a combination of gravity with facilities for pipelines, pump stations, blow-offs and clean-outs located entirely within roadway dedicated right-of-way and within the urban village reserve area. <u>The collection system would include a standby power station above grade that would be approximately 25 feet by 14 feet, with an approximate height of 17 feet.</u>

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-22 - 5.12-23

The ninth sentence of the third paragraph on page 5.12-22 - 5.12-23 under Proposed Project 1 is revised as follows:

> Short-term construction impacts would temporarily change the appearance of the residences where old septic tanks would be removed. Construction activities would create dust, expose soil from grading, create soil piles from trenching and excavation, <u>and may temporarily require Baker tanks for dewatering of trenches.</u> However, these activities would not block views of scenic vistas. Therefore, short-term construction impacts associated with Proposed Project 1 would not have a significant impact on a scenic vista.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-35

The discussion regarding cumulative impact analysis for Proposed Projects 1 through 4 of Appendix N-1, Expanded Visual Resources Analysis, is revised as follows:

Proposed Projects 1 through 4

Development of Proposed Projects 1 through 4 would not substantially degrade the existing visual character or quality of the site and its surroundings. There are other related projects which have been or are being constructed within the greater cumulative project area, as detailed in Section 4.2 and Exhibit 4.2-1 in the Draft EIR. Based on a review of these projects, ~~however,~~ Proposed Projects 1 through 4 ~~will not~~ could result in a significant effect, however, no other projects were identified that will contribute to a cumulative impact to the existing visual character or quality of the site and its surroundings ~~because a cumulative impact to the existing visual character or quality of the site and its surroundings will not occur~~. Therefore, cumulative impacts to the existing visual character or quality of the site and its surroundings will not occur.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-45

Mitigation Measure 5.12-F-3 is revised as follows:

5.12-F-3 Aesthetic Policy AES 4 (Revegetation Plan) from the Estero Area Plan shall apply to any facilities associated with treatment and disposal (Tonini parcel). A revegetation plan shall be prepared to the satisfaction of the US Fish and Wildlife Service, California Department of Fish and Game and San Luis Obispo County for the portion of the Broderson site that will be disturbed by the installation of the disposal leachfields. The plan shall be prepared by a qualified landscape architect and/or botanist and shall, to the extent feasible, restore the site to its condition prior to disturbance.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-46

The discussion regarding the project-specific impact analysis for Proposed Projects 1 through 4 of Appendix N-1, Expanded Visual Resources Analysis, is revised as follows:

Proposed Projects 1 through 4

Table 5.3-3 provides a discussion of the project's consistency with local goals, policies and ordinances relating to visual resources. Based on the consistency analysis in Table 5.12-2, Proposed Projects 1 through 4 would not conflict with local goals, policies and ordinances relating to visual resources; therefore Proposed Projects 1 through 4 would result in ~~less than significant~~ no impacts.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-48

The first sentence of the second paragraph of Table 5.12-2: Consistency of the Proposed Projects with Goals, Policies, and Ordinances Regarding Visual Resources on page 5.12-48 in Appendix N-1, Expanded Visual Resources Analysis, has been revised as follows:

> Project elements would primarily consist of ground level elements such as storage ponds, which would minimize visibility. Visual impacts associated with other project elements such as outbuildings, fences, and lighting would be mitigated to less than significant levels.

Appendix N-1 Expanded Visual Resources Analysis Page 5.12-55

The significance determination regarding the level of significance after mitigation under project-specific of Appendix N-1, Expanded Visual Resources Analysis of the Draft EIR is revised as follows:

> *Proposed Projects 1 through 4*
> ~~Less than significant~~ No impact.

Appendix O-1 Expanded Environmental Justice Analysis Page 5.16-13

The first paragraph on page 5.16-13 of Appendix O-1, Expanded Environmental Justice Analysis, is revised as follows:

> ~~Pumps associated with the collection system, including grinder pumps and pump stations, will be constructed with a design/build alternative. These facilities will be placed in underground vaults, ranging from 10 to 12 feet in diameter and buried at depths of 10 to 20 feet below the existing ground surface. Depending upon location, some of these could have the potential to impact historic architectural resources. The impacts would be less than significant.~~

Appendix K-2 Air Quality and Climate Change Calculations Pages GHG-1 and GHG-2

The Operational and Construction GHG emission tables are revised and replaced as shown in the San Luis Obispo County Department of Public Works, Notice dated December 19, 2008: Information Update for the Los Osos Wastewater Project Draft Environmental Impact Report. The notice is reprinted on the following pages.

SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS
Paavo Ogren, Director
County Government Center, Room 207 • San Luis Obispo CA 93408 • (805) 781-5252
Fax (805) 781-1229 email address: pwd@co.slo.ca.us

Notice

Information Update for the Los Osos Wastewater Project
Draft Environmental Impact Report
December 19, 2008

Further review of the Greenhouse Gas (GHG) analysis contained in section 5.9 and Appendix K of the Draft Environmental Impact Report (DEIR) shows an error in the calculations related to on-road vehicular GHG emissions. Factors for pounds per mile were used instead of grams per mile. As a result, the amount of GHG emissions attributed to on-road vehicular use is overstated. Substituting the correct factors results in a change in tables 5.9-14 and 5.9-15 in Appendix K, and various tables in appendix K-2. Because GHG emissions is one of several factors used to identify the environmentally superior alternative (see page 7.68 in the DEIR) the corrected calculations may result in a change in the designation of the environmental superior alternatives; that is, substitution of extended aeration treatment systems (Oxidation Ditch or Biolac) in place of facultative ponds.

Revised Table 5.9-15: Operational GHG Emissions
(Appendix K-2)

System/Source	Metric Tons CO_2e/yr			
	Project 1	Project 2	Project 3	Project 4
Collection				
On road vehicular	60	45	45	45
Energy Usage	169	199	199	199
Septic Tanks	624	0	0	0
Total Collection	***853***	***244***	***244***	***244***
Treatment				
On road vehicular	27	40	40	26
Energy Usage	425	541	541	493
Chemical Production off-site	356	14	14	346
Total Treatment	***808***	***595***	***595***	***865***
Disposal				
On road vehicular	0	0	0	0
Total Disposal	***0***	***0***	***0***	***0***
GRAND TOTAL	***1,660***	***839***	***839***	***1,109***
Existing operations	941	941	941	941
NET CHANGE	***720***	***-102***	***-102***	***169***
Percent Difference	43.4%	-12.1%	-12.1%	15.2%

Existing Septic Tanks = *840.0 Metric Tons CO_2e/yr*
Existing Septage Transport = *100.5 Metric Tons CO_2e/yr*
Total GHG ***940.5*** *Metric Tons CO_2e/yr*

Revised Table 5.9-14: Construction GHG Emissions
(Appendix K-2)

System/Source	Metric Tons CO_2e/yr			
	Project 1	Project 2	Project 3	Project 4
Collection/Conveyance				
On road vehicular	1,422	1,116	1,116	1,142
Off road equipment	440	414	414	424
Construction materials off-site	804	1,243	1,243	960
Total Collection/Conveyance	***2,666***	***2,773***	***2,773***	***2,526***
Treatment				
On road vehicular	245	205	246	245
Off road equipment	519	446	489	519
Construction materials off-site	2,115	3,043	3,043	3,095
Total Treatment	***2,879***	***3,693***	***3,778***	***3,859***
Disposal				
On road vehicular	491	670	491	491
Off road equipment	838	924	838	838
Total Disposal	***1,328***	***1,594***	***1,328***	***1,329***
GRAND TOTAL	***6,874***	***8,060***	***7,879***	***7,713***

If you questions regarding this information update, please feel free to contact:

Mark Hutchinson
Environmental Programs Manager
San Luis Obispo County Department of Public Works
County Government Center Room 207
San Luis Obispo, CA 93408