



[Issue](#) | [Background](#) | [Findings](#) | [Conclusions](#) | [Recommendations](#) | [Responses](#) | [Attachments](#)

Planning Issues Relative To Leachate Disposal

Issue

Will projected improvements to the Sewer Authority Mid-Coastside (SAM) sanitary sewer plant require planning changes for the treatment and disposal of the seepage (leachate) from the Ox Mountain Landfill?

Background

San Mateo County, with a population of more than 722,000, generates large amounts of waste that is usually picked up by franchised garbage collectors. Recyclables are taken to transfer stations and separated into various categories, but a major portion of this solid waste material still ends up in landfills. A major landfill in San Mateo County is the Ox Mountain facility located east of the City of Half Moon Bay (HMB) on Highway 92. Disposition of this waste material is regulated by local, state and federal agencies that are responsible for safely disposing of unwanted waste. Currently, Ox Mountain Landfill is permitted to receive 3,598 tons of waste per day.

Proper maintenance of a landfill (Ox Mountain Landfill in this case) is critical to the waste management process. Unfortunately, natural processes prevent the landfill from being a truly final resting place for everything deposited there. Liquid waste, precipitation and ground water will seep from the landfill. This seepage is referred to as leachate. It is a liquid byproduct of decay, decomposition, and the uptake of soluble materials in the liquids that enter the site, mostly precipitation and liquid waste. Materials are leached from the waste as the liquids percolate downward. Leachate can contain both dissolved and suspended material. The leachate can contain a wide range of toxic organic and inorganic compounds, microbes, gasses, (e.g. methane, carbon dioxide) and heavy metal salts.

A very important function at Ox Mountain is the management of leachate. The landfill has a liner of high density polyethylene (HDPE) geomembrane to contain the leachate at the bottom of the landfill and isolate it from the surrounding environment. Also located at the base of the landfill is a large network of perforated HDPE drainpipes that collects the leachate and delivers it to collection tanks. The generation of leachate is a process that will continue indefinitely, even after the landfill is closed to further dumping.

Currently, a significant volume of this leachate is transported via tanker truck to sewer plants for treatment and disposal. One of these plants is operated in the HMB by the Sewer Authority Mid-Coastside (SAM).

SAM is a Joint Powers Authority (JPA) comprised of the Montara Water and Sanitary District (MWSD), the Granada Sanitary District (GSD), and the HMB. The governing board is composed of two MWSD directors with one vote each, two GSD directors with one vote each, and two HMB City Council members with two votes each. SAM operates one treatment facility located in HMB that is connected through a pipeline that connects the member districts.

The SAM treatment facility currently operates to a “secondary” level of treatment (removal of most solids and contaminants). This qualifies the facility to discharge its output into the ocean via an offshore outfall under the countywide National Pollution Discharge Elimination System (NPDES) permit as administered by the City/County Association of Governments (C/CAG).

At their November 23, 1998 meeting, the SAM Board of Directors voted unanimously “...to authorize the Manager to negotiate an agreement with BFI to include a monitoring process, for acceptance and treatment of Leachate from the Ox Mountain Landfill...” although that acceptance and treatment did not commence until 2006.

In early 2005, the SAM board conducted several exploratory hearings as to technology, cost, and financing options relating to the prospective adoption of “tertiary” level treatment (removal of nearly all solids and contaminants), which treatment would produce an effluent suitable for landscaping irrigation and for floriculture. The SAM board concluded the exploration by unanimously resolving to pursue studies, grants, and permits for the upgrading. The board particularly identified the golf course complex and nursery operations in Half Moon Bay – the largest employers on the Coastside – as being in need of such recycled water. There is a need for water in order to remain competitive when the projected Hetch Hetchy Aqueduct Retrofit is anticipated to sharply increase the cost of potable water in the near future. The probability of entering a new drought cycle was also a motivation.

In November of 2005, the voters of the City of Half Moon Bay passed an advisory measure, Measure “P”, by a margin of 86% to 14%, instructing the HMB City Council to use its membership in SAM to pursue the conversion of the treatment plant to tertiary level.

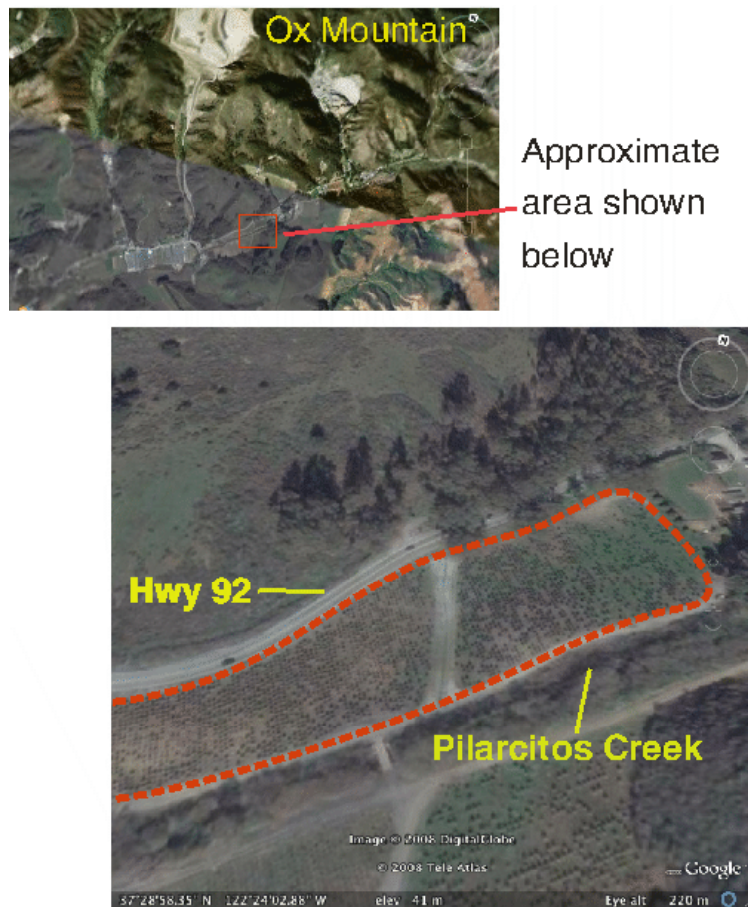
Investigation

The 2007-2008 San Mateo County Civil Grand Jury (Grand Jury) visited the Ox Mountain Landfill site and interviewed operating staff at the site. Representatives of SAM, the County Public Works Department and the South Bayside Waste Management Authority (SBWMA) were interviewed. Members of the Grand Jury reviewed the Ox Mountain Landfill permits in the Environmental Health Department. The California Integrated Waste Management Board (CIWMB), San Mateo County and Association of Bay Area Governments (ABAG) web sites and documents were also consulted (see Appendix).

Findings

Highway 92 west of Crystal Springs Reservoir is a winding, steep, and busy two-lane road with curves that increase the likelihood of an accident (see Attachment). In fact, there have been several truck overturns through the years – some of them involving fatalities – and one non-fatality which spilled enough contaminating material (not leachate) to flow across farmland and into Pilarcitos Creek. Evidence of considerable mitigation efforts can still be seen as shown by the red-dashed outline in Figure 1 (from Google Earth).

Leachate is transferred to 6,000-gallon trucks from the collection tanks at the Ox Mountain Landfill. Table 1 shows the deliveries for two recent months and the average since June 2006. Table 1 also shows that SAM receives about one or two thousand dollars per month for processing the leachate from Ox Mountain (the processing fees are currently undergoing a significant upward adjustment). It can be seen that about four trucks are actually driven three miles from the Ox Mountain Landfill to the SAM wastewater treatment plant, five days a week. As shown in Figure 2 (from Google Earth), most of that travel takes place on Highways 1 and 92. After processing, the final effluent is discharged into the ocean via the outfall.

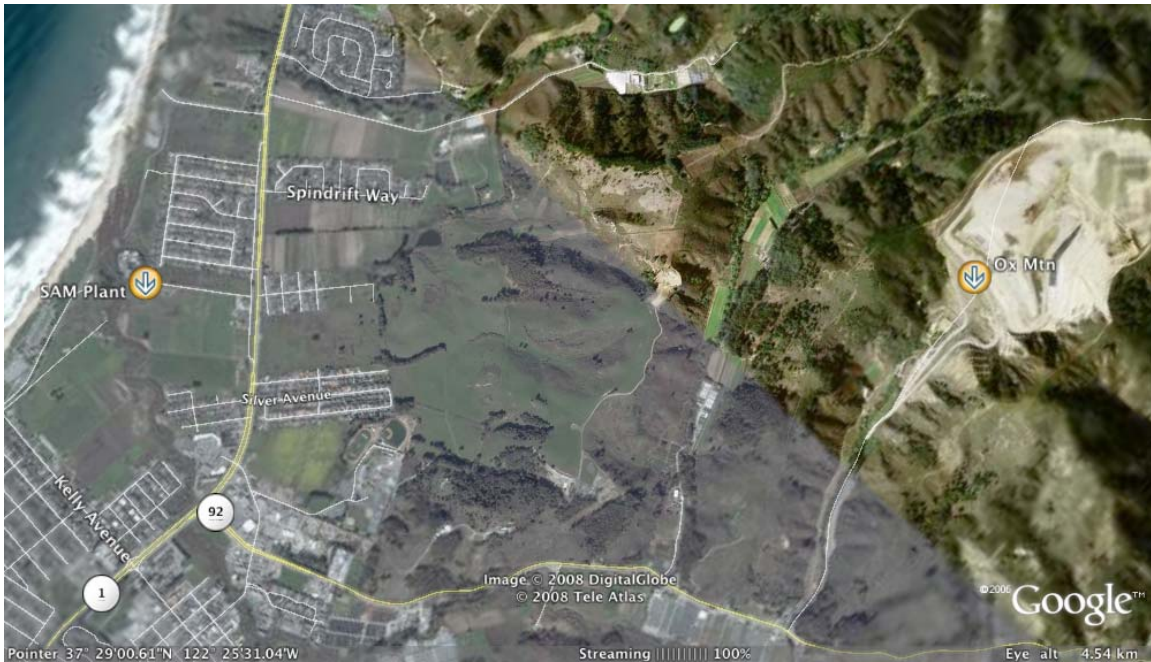


source: Google Earth

Figure 1: Location of a past accidental spill (area marked by dashed red border) between Highway 92 and Pilarcitos Creek

Table 1: Recent deliveries of leachate from Ox Mountain to the SAM treatment plant

| Month | Trucked waste | | Leachate | | Revenue |
|--|---------------|---------------------|------------|---------------------|-------------|
| | deliveries | gallons (thousands) | deliveries | gallons (thousands) | |
| November 2007 | 12 | 2.6 | 64 | 384 | \$885 |
| January 2008 | 18 | 5.7 | 91 | 548 | \$1467 |
| Monthly average: June 2006- Jan. 2008 | – | – | 82.5 | 495 | \$1250 est. |



source: Google Earth

Figure 2: Locations of Ox Mountain, the SAM treatment plant and major roads

The County Office of Emergency Services (OES) has responsibility for dealing with toxic spills in San Mateo County. Their responders are part of the Hazardous Materials Response Team that consists of the South County Fire Hazmat Team, the Environmental Health Division of the County Health Services Agency and Sheriff's Office of Emergency Services. These three agencies respond to hazardous materials emergencies anywhere in San Mateo County.

The Ox Mountain Landfill operator is requesting to be allowed to deliver up to twelve trucks of leachate per day (rather than the current maximum of six trucks) for processing at the SAM wastewater treatment plant.

SAM is planning to upgrade their treatment facilities to levels that qualify as tertiary treatment. However, improvement to this level will preclude treatment of leachate because the tertiary process will not be able to remove the dissolved salts in the leachate. These

dissolved salts could make the water unsuitable for irrigation. The Ox Mountain Landfill operator will, therefore, need to make other arrangements for disposal of the leachate. It is not clear to the Grand Jury what arrangements might be made. On-site processing using methane from the landfill as an energy source is possible. Alternative disposal sites would involve more travel, including a likely crossing of the main water supply for the Peninsula at Crystal Springs. The problem might be mitigated, if not resolved, by shifting significant portions of the annual processing requirement to the wet season during which SAM might be inclined to revert to secondary processing.

Conclusions

The Grand Jury has concluded that:

1. Sewer Authority Mid-Coastside wastewater treatment facility is likely to upgrade its operation and become a tertiary water treatment plant that could provide water of high enough quality and quantity that it could be used to meet important irrigation needs in surrounding areas.
2. An accident while transporting Ox Mountain Landfill leachate in either direction on Highway 92 has the potential to do considerable environmental damage.
3. The need for leachate disposal will persist for decades beyond the closure of the Ox Mountain Landfill. It is unclear to the Grand Jury which entity or entities will be responsible for processing future leachate generation.

Recommendations

The Grand Jury recommends that the Board of Supervisors direct the County Manager to:

1. Engage with the Ox Mountain Landfill operator to assess the feasibility for on-site leachate treatment that would also establish responsibility for continuing treatment once the landfill has been closed, and
2. In the alternative, assess the feasibility of expanding leachate storage capability at the landfill so that treatment could be deferred to the winter months if the Sewer Authority Mid-Coast indicates a willingness to revert to secondary treatment during these months.

The Grand Jury further recommends that the Directors of the Sewer Authority Mid-Coastside:

1. Reaffirm and prioritize its policy goal to upgrade the capabilities of the Sewer Authority Mid-Coastside facility, which is now a secondary water treatment plant, to an advanced tertiary water treatment plant so that the recycled water can be safely used for economically important irrigation needs locally.

2. Provide direction to staff that leachate processing is subordinate to the imperative to upgrade the treatment plant.
3. Direct staff to explore the possibility of offering alternative operational services to the Ox Mountain Landfill, such as processing leachate to secondary standards during the winter months when there would be significantly reduced irrigation demand for tertiary water and significant dilution of effluent due to higher flows.

Appendix: Primary Sources of Information

Reports and other documents

Alpha Analytical Laboratories Inc.
Chemical Examination Report

Ox Mountain Landfill Permit

California Regional Water Quality Control Board
San Francisco Bay Region
Ox Mountain Sanitary Landfill
Order R2-2006-0040

California Integrated Waste Management Board
2006 Landfill Tonnage Data

County of San Mateo
Planning and Building Division
File Numbers: USE 81-34, CDP 81-74, GRD91-0015
(BFI/Ox Mountain Landfill)

Sewer Authority Mid-Coastside, February 25, 2007: Staff Report – Leachate and NE.doc and (NDWSCP) Permit # HS009

Sewer Authority Mid-Coastside, November 2007: Manager's Report

Sewer Authority Mid-Coastside, January 2008: Manager's Report

Internet sources

<http://sciencelinks.jp/j-east/article/200109/000020010901A0196468.php>

<http://toxics.usgs.gov/regional/emc/>

<http://www.abag.org/planning/subregional/cspp/cspp4.html>

<http://www.hmbfire.org/lafco.pdf>

<http://www.pall.com/variants/print/8146.asp>

<http://www.samcleanswater.org/agendas/2008/080128/0801285B.pdf>

<http://www.samcleanswater.org/minutes/2008/SAMMinutes012808.pdf>

<http://www.vsep.com/>

www.dot.ca.gov/dist4/envirodocs/92eenvirodoc/92slowvlandoc.doc

http://www.smcta.com/streets/streets_92_climbing_lanes.asp

Attachment

Excerpt from Caltrans Environmental Document re Route 92 Climbing Lane Project.

1.4 Traffic Analysis

Based on accident data collected state-wide and region-wide by the California Highway Patrol, average accident rates are established for various types of highways, intersections, and interchanges. These average rates provide a basis for comparison and evaluation of actual accident occurrences in a given period for a highway segment or interchange.

Table 1-1 shows accident rates on the eastbound and westbound section of Route 92 within the project area during the period from January 1997 through December 1999.

Table 1-1 **Summary of Accidents for Route 92 Project Area**
(Three year period ending December 31, 1999)

| Year | Number of Accidents | Actual Rate¹ Fatal + Injury | Average Rate¹ Fatal + Injury |
|-------------|----------------------------|---|--|
| 1997 | 68 | 1.15 | 0.89 |
| 1998 | 58 | 0.95 | 0.89 |
| 1999 | 37 | 0.45 | 0.89 |

Accident Rate¹: Accidents/million vehicle miles traveled

Existing and Projected Traffic Volumes

On a typical weekday during the peak two-hour period, Route 92 within the project study limits, operates at Level of Service (LOS) "E." The LOS is probably "E" or better on weekdays, and "F" on weekends during the high tourist season. Level of Service is a qualitative measure of the performance of a highway during some peak period (usually one hour). It is based on the effect of a number of factors, including speed, travel time, travel interruptions, freedom to maneuver, safety, driving comfort, convenience and operating costs. LOS is expressed in a range of levels designated A through F, with A representing free flowing traffic and F representing very congested conditions approaching gridlock.

Future traffic demand was projected for the year 2020. The projections were estimated by Caltrans using the regional growth factor. The San Mateo County Congestion Management Plan (1999) describes the region's two primary roads, Highway 1 and Route 92 as operating at

LOS “E.” By 2010 or sooner, segments of Highways 1 and 92 are projected to be at LOS “F” during peak commute periods.

A recent Highway Congestion Monitoring Report prepared by the California Department of Transportation indicates that between 1995 and 1996 San Mateo County experienced a 125% increase in congestion, a rate more than double any other county in the Bay Area.

Table 1-2 Traffic Projections for Route 92

| Year | Annual Average Daily Traffic | Peak-Hour |
|-------------|-------------------------------------|------------------|
| 1998 | 24,400 | 2,050 |
| 2020 | 39,300 | 3,300 |

Source: 1998 Traffic Volumes on California State Highways.

The area between Pilarcitos Creek and Crystal Springs Reservoir traverses mountainous terrain with steep grades of up to 7%, and includes several sharp curves. The estimated capacity of a single uphill lane in areas with grades of approximately 6% is 1200 vehicles per hour (vph) under ideal circumstances. When trucks and other slow moving vehicles comprise over 3% of the traffic mix, this capacity could decline to 900-1000 vph. Projections for peak hourly volumes in the year 2020 for Route 92 of 3,300 vehicles per hour would result in inadequate capacity and congestion for a two lane conventional highway.

Safety

Facility improvements to two lane highways such as slow-vehicle lanes, median barriers and turning lanes have been shown to reduce the likelihood of both rear-end and head on accidents. Drivers are less likely to become impatient and pass slow moving vehicles if they can anticipate additional lanes within the roadway.

Other factors contributing to increased accident rates include unexpected slow moving vehicles in both the uphill and downhill sections of the roadway, a high proportion of truck traffic, and physical constraints of the roadway such as sharp curves, blind corners, and excessive grades.

Table 1-3 shows accident data for the project area. Of all accidents within the 3-year survey period (1997-1999), 13% were categorized as head-on. Rear-end collisions accounted for 25% of all accidents during this same period.

Table 1-3 Head-On/Rear-End Accidents for Route 92 Project Area
 (Three year period ending December 31, 1999)

| Total Head-On Accidents | Total Rear-End Accidents | Total Accidents |
|--------------------------------|---------------------------------|------------------------|
| 21 | 39 | 156 |
| 13% | 25% | 100% |

Source: Caltrans TASAS Selective Accident Rate Calculation: 092-SM PM 5.20 thru 7.29
 Caltrans TASAS Accident Records 97-01-01 thru 99-12-31

September 30, 2008

Hon. Joseph C. Scott
Judge of the Superior Court
Hall of Justice
400 County Center, 2nd Floor
Redwood City, CA 94063-1655

Dear Honorable Judge Scott:

The Sewer Authority Mid-Coastside (SAM) is in receipt of the Grand Jury Report (Report) dated July 10, 2008, on Planning Issues Relative to Leachate, which contains findings and recommendations pertaining to the treatment and disposal of leachate from the Ox Mountain Landfill, located in San Mateo County, by SAM. This letter contains SAM's comments on the Report's findings, conclusions, and recommendations. The Report's text are presented in boldface; SAM's comments are presented in italics.

In the Report, the Grand Jury makes three recommendations pertaining to SAM. The recommendations and SAM's responses follow.

I. Conclusion 1, Page 5 of Report

The Grand Jury has concluded that:

1. Sewer Authority Mid-Coastside wastewater treatment facility is likely to upgrade its operation and become a tertiary water treatment plant that could provide water of high enough quality and quantity that it could be used to meet important irrigation needs in surrounding areas.

SAM agrees with this conclusion and would like to point out that SAM could provide water of high enough quality and quantity that, in addition to irrigation needs, it could meet other important needs in surrounding areas.

II. Recommendation 1, Page 5 of Report

The Grand Jury recommends that the Directors of SAM:

“1. Reaffirm and prioritize its policy goal to upgrade the capabilities of the Sewer Authority Mid-Coastside facility, which is now a secondary water treatment plant, to an advanced tertiary water treatment plant so that the recycled water can be safely used for economically important irrigation needs locally.”

SAM agrees with this recommendation, and has re-prioritized its goal; Prior to November 2007, SAM considered the Recycled Water Project a priority item. In November 2007, the SAM Board stated that its highest priority projects, of equal priority, were Recycled Water and Wet Weather Flow Management. As such, this recommendation has been implemented.

III. Recommendation 2, Page 6 of Report

**The Grand Jury recommends that the Directors of SAM:
“Provide direction to staff that leachate processing is subordinate to the imperative upgrade of the treatment plant.”**

SAM agrees with this recommendation. The potential negative impact of leachate processing on SAM’s recycled water project was foreseen and addressed by the SAM Board several times in the past. Evidence is as follows:

- A. *In 1976, when SAM was created, it was determined that each member agency would adopt uniform discharge standards and regulations; an excerpt from the “An Agreement Creating Sewer Authority Mid-Coastside” is as follows:*

“Each member agency hereby agrees to adopt wastewater treatment standards and regulations consistent with wastewater treatment standards and regulations adopted by the Authority.”

- B. *In 1994, SAM and each member agency revised those standards and regulations; two excerpts from those standards “Resolution 2-94” are as follows:*

“The purpose of these regulations is to: (c) Improve opportunities to recycle and reclaim treated effluent and wastewater sludge;”(Section 1.0, Purpose); and

“No person shall, and it shall be unlawful to, discharge wastes into the sanitary sewer system which cause, threaten to cause, or are capable of causing, either alone or by interaction with other substances:

- (g) Interference with any wastewater reclamation process which does or may operate in conjunction with the sanitary sewer system, or overloading or a breakdown of such process, or excessive reclamation costs, or any product of the treatment process which renders such reclamation process impracticable or not feasible under normal operating conditions.” (Section 2.0 General Prohibitions)*

C. SAM's Non-Domestic Waste Source Control Program (NDWSCP) permit for not only the Ox Mountain Landfill, but for every SAM discharger, includes the sentence:

"This Permit is subject to revision at any time for the purpose of the Authority's compliance with regulations on sludge, biosolids, wastewater treatment plant effluent, recycled water, and air emissions."

As such, this recommendation has been implemented.

IV. Recommendation 3, Page 6 of Report

The Grand Jury recommends that the Directors of SAM:

"Direct staff to explore the possibility of offering alternative operational services to the Ox Mountain Landfill, such as processing leachate to secondary standards during the winter months when there would be significantly reduced irrigation demand for tertiary water and significant dilution of effluent due to higher flows."

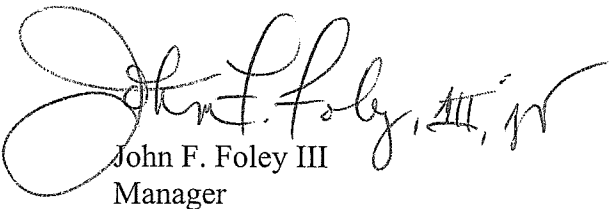
SAM agrees with this recommendation and the SAM Board will be provided the opportunity to direct its staff to explore the possibility of offering alternative operational services to the Ox Mountain Landfill.

This recommendation is in process of being implemented.

If you require any additional information, please do not hesitate to contact me at 650-726-0124.

Sincerely,

SEWER AUTHORITY MID-COASTSIDE


John F. Foley III
Manager

Cc: Board of Directors



COUNTY OF SAN MATEO
Inter-Departmental Correspondence

County Manager's Office

DATE: August 28, 2008
BOARD MEETING DATE: October 7, 2008
SPECIAL NOTICE: None
VOTE REQUIRED: None

TO: Honorable Board of Supervisors
FROM: John L. Maltbie, County Manager
SUBJECT: 2007-08 Grand Jury Response

RECOMMENDATION

Approve this report containing the County's responses to the following 2007-08 Grand Jury report: Planning Issues Related to Leachate Disposal.

VISION ALIGNMENT:

Commitment: Responsive, effective and collaborative government.

Goal 20: Government decisions are based on careful consideration of future impact, rather than temporary relief or immediate gain.

This activity contributes to the goal by ensuring that all Grand Jury findings and recommendations are thoroughly reviewed by the appropriate County departments and that, when appropriate, process improvements are made to improve the quality and efficiency of services provided to the public and other agencies.

DISCUSSION

The County is mandated to respond to the Grand Jury within 90 days from the date that reports are filed with the County Clerk and Elected Officials are mandated to respond within 60 days. To meet those requirements, attached is the County's response to the Grand Jury report on Planning Issues Related To Leachate Disposal, issued on July 14, 2008.

Planning Issues Related to Leachate Disposal

Findings:

Staff is in general agreement with the Grand Jury's findings.

Recommendations:

The Grand Jury Recommends that the Board of Supervisors direct the County Manager to:

- 1. Engage with the Ox Mountain Landfill operator to assess the feasibility for on-site leachate treatment that would also establish responsibility for continuing treatment once the landfill has been closed.**

Response: Concur. The current land use permit agreement between the County and the site owner/operator expires on December 31, 2009. As part of the agreement renewal discussions, the County will certainly discuss and encourage the landfill operator to assess the feasibility for on-site leachate treatment that would also establish responsibility for continuing treatment once the landfill has been closed.

- 2. In the alternative, assess the feasibility of expanding leachate storage capability at the landfill so that treatment could be deferred to the winter months if the Sewer Authority Mid-Coast indicates a willingness to revert to secondary treatment during these months.**

Response: Concur. As part of the agreement renewal discussions, the County will certainly discuss and encourage the landfill operator to assess the feasibility of expanding leachate storage capability at the landfill so that treatment could be deferred to the winter months if the Sewer Authority Mid-Coast indicates a willingness to revert to secondary treatment during these months.