California Regional Water Quality Control Board

Los Angeles Region

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Linda S. Adams
Agency Secretary

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Arnold Schwarzenegger
Governor

June 11, 2007

Interested Parties

FINANCIAL ASSURANCE FOR KNOWN OR REASONABLY FORESEEABLE RELEASES - SUNSHINE CANYON COUNTY EXTENSION LANDFILL, SYLMAR, CALIFORNIA (File No. 58-76)

Attached please find the copy of a proposal that was submitted to this Regional Water Quality Control Board (Regional Board) by the Browning Ferris Industries, Inc. (BFI), which owns and operates the Sunshine Canyon Landfill Facility in Sylmar, California. Submittal of the proposal is required in waste discharge requirements (WDRs) adopted by this Regional Board on April 5, 2007 (Order No. R4-2007-0023) for the Sunshine Canyon County Extension Landifll. The relevant requirement is in Provision L.12. of the WDRs, which states, in part, that "*Within 30 days of the adoption of this Order, the Discharger shall submit a proposal to the Regional Board, in accordance with 27 CCR section 22222, for assurance of financial responsibility in an amount appropriate for initiating and completing corrective action for all known or reasonably foreseeable releases from the Landfill. Upon approval by the Regional Board, the Executive Officer shall forward the proposal to the CIWMB.*" (CIWMB is the abbreviation of California Integrated Waste Management Board.)

We are currently evaluating BFI's proposal and would like to hear from you if you have any comments on this matter. The Regional Board is expected to consider BFI's proposal at a public hearing on August 9, 2007. To allow Board staff adequate time to process, your comments should be received at the Regional Board office by July 11, 2007, at the following address:

Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013
Attention: Rodney Nelson

If you have any questions or need additional information, please contact me at (213) 620-6119 or Dr. Wen Yang at (213) 620-2253.

Sincerely,

/Signed by/

Rodney H. Nelson, Senior Engineering Geologist
Groundwater Permitting and Landfills Unit

Enclosures

Mailing List

Firms and Agencies

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Individuals

Marlene Bane
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Louise Lewis
Sylvia Libis
Scott and Sharon Manate
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Robin Navickas
Bob Ogg
Dora Prihar
Florence and Dorri Raskin
Robert Ricketts
Charles and Kay Stelzried
Irene Tomlinson
Phil and Bobbie Wenger
Chris Ward
Anthony Zero

May 4, 2007

Rodney H. Nelson
Senior Engineering Geologist
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Subject: Sunshine Canyon County Extension Landfill
Financial Assurance for Known and Reasonably Foreseeable Releases

Dear Mr. Nelson:

Browning Ferris Industries of California, Inc. (BFI) is pleased to submit the enclosed report, "Sunshine Canyon Landfill, Corrective Action Cost Estimate for Known and Reasonably Foreseeable Releases" dated May 2, 2007. The report was prepared by A-Mehr, Inc., and is submitted in conformance with Condition L.12 of the Waste Discharge Requirements for Sunshine Canyon County Extension Landfill, RWQCB Order No. R4-2007-0023, approved April 5, 2007, which requires BFI to "submit a proposal to the Regional Board, in accordance with 27 CCR section 22222, for assurance of financial responsibility . . . . for all known and reasonably foreseeable releases from the Landfill."

The report addresses the requirements of 27 CCR 22222 for both the County Extension Landfill and City Landfill. As required by the applicable provisions of Title 27, it considers known and reasonably foreseeable releases from the landfill that could impact groundwater, with the following general conclusions:

County Extension Landfill

The known release to subdrain waters, due to impacts of landfill gas, is being remedied under RWQCB Corrective Action Order R4-2004-0080. A reasonably foreseeable release would be a reoccurrence of a similar event. A-Mehr, Inc. concluded that there is not a significant potential for a release directly impacting groundwater other than the subdrain liquids, due to an upward gradient of groundwater flow in Sunshine Canyon, and to the existing composite liner system, and requirement for future installation of a double composite liner system in all new disposal areas of the County Landfill. The cost of constructing the double composite liner is estimated to be over $11,000,000 for the 42 acres of the County Landfill area where it is required.

Surface water is not a potential source of a reasonably foreseeable release that would impact groundwater, and is not considered in the analysis.

Sunshine Canyon Landfill • 14747 San Fernando Road • Sylmar, California 91342
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The estimated cost of completing the existing corrective action program for the known release at the County Extension Landfill is $399,495. The estimated cost of correcting a reasonably foreseeable release is $350,354. The total for both estimates is $749,849. We will work with the RWQCB and CIWMB to agree on a financial assurance instrument, to provide this amount of financial assurance for the County Extension Landfill.

City Landfill

The report identifies two known releases, both associated with the closed City Landfill Unit 1, which are presently being corrected pursuant to Corrective Action Order No. R4-2004-0132. City seep water is collected and discharged to sanitary sewer, and groundwater at the toe of Sunshine Canyon is being collected and treated by the cutoff wall, extraction wells and treatment system constructed in 2004.

A-Mehr, Inc. concludes there is no reasonably foreseeable release from City Landfill Unit 2, due to the required installation of a double composite liner system in all disposal areas of Unit 2. The cost of constructing the double composite liner system in City Landfill Unit 2 is estimated to be over $25,000,000. As with the County Landfill, surface water is not addressed since it is not a threat to the groundwater of the State.

The estimated costs of operating the existing corrective action program for City Landfill Unit 2 is $138,256 per year. The program is expected to be maintained for a period of 15 years from the present. Accordingly, the financial assurance amount for the known release is $2,073,841.

Conclusion

Based on A-Mehr, Inc.'s findings, BFI proposes that the financial assurance amount for known and reasonably foreseeable releases at the County Extension Landfill be established at $749,849. We will work with the RWQCB and CIWMB to establish an appropriate financial assurance instrument to provide this amount of financial assurance for the County Extension Landfill.

Sincerely,

Dave Hauser
General Manager

Cc: Wendy Phillips, California Regional Water Quality Control Board
Dr. Wen Yang, California Regional Water Quality Control Board
Greg Loughnane, Allied/BFI
Tony Pelletier, Allied/BFI

SUNSHINE CANYON LANDFILL
CORRECTIVE ACTION COST ESTIMATE
FOR
KNOWN AND
REASONABLY FORESEEABLE RELEASES

Prepared by

A-Mehr, Inc.
23016 Mill Creek Drive
Laguna Hills, California

Prepared for

Browning Ferris Industries of California, Inc
Sunshine Canyon Landfill
14747 San Fernando Road
Sylmar, CA 92653

May 3, 2007

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1. INTRODUCTION

27 CCR 22222 requires operators of municipal solid waste landfills to provide financial assurance for corrective action "to address a known or reasonably foreseeable release" from the disposal unit. Title 27 does not define or otherwise describe what constitutes a "known or reasonably foreseeable release". The purpose of this report is to define the term, describe what constitutes known or reasonably foreseeable releases from the Sunshine Canyon Landfill, and provide a third-party estimate of costs for corrective action for the identified known and reasonably foreseeable releases.

2. INTENT OF THE REGULATION

27 CCR 22222 was originally adopted as CCR Chapter 15, sections 2550.0(b) and 2580(f). At the time, and at present, its intent was to protect groundwater from contamination by releases from solid waste landfills. The regulation, adopted at a time when many active landfills in California were unlined and likely to have releases, was designed to protect the public from impact and cost of cleaning up releases of pollutants to groundwater. The financial assurance coverage was required "to address the higher of either (1) the cost of any current cleanup, or (2) the likely cleanup cost of largest release that could occur in the future prior to being **reliably** detected by the monitoring system."(SWRCB 1993[1])

Technical guidance issued by the State Water Resources Control Board (SWRCB 1993) described the intent of the "known or reasonably foreseeable release" wording as being to provide an incentive for permit-holders to implement monitoring systems that could detect a release early and reliably in order to minimize the potential cost of corrective action:

> *The function of this requirement is to cause the Discharger to face a risk-based, present-day cost related to the reliability of the Unit's monitoring system, the earlier and more reliably the monitoring system can detect a release, the lower the level of coverage needed to assure the Regional Water Board that cleanup will be completed without burdening the State.*
>
> *This is a market-based approach, in that it involves the balancing of two opposing present-day costs: (1) that of updating the monitoring system to increase its reliability, versus (2) that of the coverage needed to offset the uncertainty of an detecting a release*

[1] "Chapter 15 Technical Note 8: Corrective Action Coverage Known or Reasonably Foreseeable, Whichever is Greater". State Water Resources Control Board, December 2, 1993.

early-on. The Discharger should naturally gravitate to a balance point where present-day costs are minimized. In most cases, this should involve a thorough review and augmentation of the monitoring system.

It is clear from the plain language of the regulation, as well as from the guidance supplied by the SWRCB, that the intent of the regulation is to provide the means for financing corrective action with the following characteristics:

- The release is one that impacts groundwater, as opposed to other media such as air quality or surface water (other than as it may impact groundwater);
- The release is one that may be existing, or one that would be detected in the future by a groundwater monitoring system;
- The corrective action would be implemented by a third party; and
- The corrective action would be continued for as long as the release poses a potential threat to groundwater.

The level of financial assurance required is to be based on site specific circumstances including:

- The presence or absence of a known release;
- The type and quality of the site's monitoring system and its ability to detect a release early and reliably; and
- The potential size and character of a potential release, given the nature of the site's monitoring system

The language of the regulation makes no reference to releases due to extraordinary or catastrophic circumstances, such as from earthquakes, floods or other events outside the design criteria specified in Title 27 for solid waste landfills. The wording links "known and "reasonably foreseeable" together as likely occurrences,[2] and the technical guidance document provides examples illustrating relationships between appropriate financial assurance amounts, the presence of known releases and the quality of a site's monitoring system. In an example with some similarity to the current conditions at Sunshine Canyon Landfill the document describes a landfill with a significant known release that is being cleaned up, and an upgraded monitoring system capable of early detection of a further release. The site's appropriate financial assurance amount, as stated by the guidance document, "*must show financial ability to address the larger cost of the known release until cleanup has been completed, but can thereafter be downsized to address the smaller size of release that the revised monitoring system is designed to reliably detect (i.e., the coverage is reduced to match a smaller foreseeable release*)" (SWRCB, 1993).

Based on these interpretations of the regulation by the responsible agency, it is clear that the establishment of financial assurance for corrective action of a known or reasonably foreseeable release at Sunshine Canyon Landfill must take into account the nature of existing known releases and the monitoring system designed to detect any future releases. The following sections

[2] Dictionary definitions of "foreseeable" include: "being such as may be reasonably anticipated;: and "capable of being anticipated".

describes these site conditions in relation to the hydrogeologic environment controlling the path of potential releases.

3. HYDROGEOLOGY OF SUNSHINE CANYON

Sunshine Canyon Landfill is located entirely within a single canyon area oriented generally in a north-south direction. The landfill is bounded on the east and west sides by bedrock ridges which pinch together at the southerly end of the site to form a narrow canyon mouth, at the site entrance from San Fernando Road. Groundwater within the canyon generally flows according the near-universal pattern of following the contours of surface topography. Accordingly all groundwater originating within Sunshine Canyon, including that flowing below the landfill waste footprint, is naturally channeled toward the canyon mouth and exits the canyon in the rock and soil strata underlying the site entrance on San Fernando Road.

Groundwater recharge occurs primarily in the canyon areas above the landfill, and moves within the fractured bedrock down slopes toward the mouth of Sunshine Canyon. Based on hydrogeologic studies at the site, groundwater flow gradients are primarily horizontal, except in the upper canyon areas where downward gradients are expected and in the lower portion, where an upward component of groundwater flow is evident. (Sunshine Canyon JTD, 2006)[3]

4. KNOWN RELEASES AT SUNSHINE CANYON LANDFILL

4.1 County Extension Landfill

Existing areas of the County Extension Landfill (Phases I-IV) are constructed with a composite liner and leachate collection and removal system. Future areas (Phases V, VI and VII) will be constructed with a double composite liner system. These systems, installed pursuant to Waste Discharge Requirements of the RWQCB, minimize the potential for a release of leachate to the underlying subgrade.

Routine monitoring in September 2000 detected measurable concentrations of volatile organic compounds (VOCs) in liquid collected in the subdrain system constructed below the liner system to manage shallow groundwater in areas excavated for landfill construction. After extensive investigation pursuant to RWQCB requirements, the source of the VOCs was determined to be landfill gas coming in contact with the subdrain liquids. The most likely path of landfill migration was identified as soil stockpiles beyond the edge of lined areas. It is believed that landfill gas originating in the refuse fill migrates through the soil beyond the liner system to reach shallow groundwater. The County Extension Landfill currently is implementing a corrective action program for contamination of the subdrain liquids by VOCs, which are low in concentration and have not impacted groundwater resources downgradient of the County Extension Landfill. The corrective action is being conducted under CRWQCB Cleanup and Abatement Order (CAO) R4-2004-0080, adopted in August 2004. The Order required three major remedial actions:

[3] Joint Technical Document, Sunshine Canyon County Extension Landfill. A-Mehr, Inc. November 2006

- Collection of impacted subdrain water and treatment in the site's leachate treatment plant prior to use on site or discharge to the sanitary sewer;
- Improved management of landfill gas to reduce or eliminate the potential for contact between landfill gas and subdrain liquids; and
- Upgrade of the groundwater monitoring network.

The improvements to the groundwater monitoring system have been completed, and treatment of the impacted subdrain liquids is ongoing. During calendar year 2006, BFI collected and managed approximately 2.4 million cubic feet of subdrain liquids from the County Extension Landfill. (A-Mehr, Inc. 2007)[4] The landfill gas system continues to be improved and maintained with the remaining potential pathway for gas to contact the subdrains being in the vicinity of future Phase VII of the landfill, where soil fill was placed above the temporary liner edge of Phase I and Phase III for construction of landfill equipment maintenance facilities, and to facilitate surface water drainage. This pathway, which potentially allows gas to migrate into the subgrade below the stockpile, will remain until future development of Phases VI and VII. In the interim, landfill gas monitoring and extraction wells are being operated in the soil fill area to minimize the potential for gas migration. After the soil fill is removed, it is expected that no additional landfill gas will contact the subdrain liquids, and concentrations of VOCs will decline and be eliminated.

It should be noted that extensive studies prior to issuance of CAO R4-2004-0080 determined that the contamination of the subdrain liquids was not consistent with leachate impacts. Accordingly, the RWQCB concluded there is no evidence of any release of leachate due to damage or flaws in the composite liner system of the County Extension Landfill. As noted above, future Phases V, VI and VII of the landfill will be constructed with a double composite liner system, which will further minimize the potential of releases due to damage or flaws in the containment system.

4.2 City Landfill

Sunshine Canyon City Landfill Unit 1, which received waste from 1958 through 1991, like most landfills of that period, was constructed without liners and leachate collection systems. Groundwater contaminated by leachate and landfill gas is presently being managed in two locations. Seep collectors in the central area of the landfill collected approximately 1.2 million cubic feet of water during 2006. The seep liquids are tested, treated if necessary in the on-site wastewater treatment facility, and discharged to the City sanitary sewer. During 2006 all seep water was discharged to the sewer without the need for pretreatment.

Impacted groundwater not removed by the seep collector system is managed by a corrective action program being implemented pursuant to CAO No. R4-2004-0132, issued by the RWQCB on October 17, 2003. As required by the CAO, BFI constructed a groundwater barrier ("cutoff wall") across the mouth of the canyon. The cutoff wall consists of an impermeable vertical wall constructed of clay and a geomembrane, extending from bedrock to the surface, across the

[4] Combined Groundwater and Waste Disposal Monitoring Report for the Second Annual and Annual Monitoring Period of 2006, Sunshine Canyon City and County Landfills, Sylmar, California. A-Mehr, Inc., February 15, 2007.

groundwater flow area between the canyon walls at the narrow mouth of the canyon near San Fernando Road. A network of extraction wells pumps groundwater from the upgradient side of the cutoff wall and delivers it to a treatment system, where it is treated to remove VOCs prior to use on site for irrigation or dust control.

Construction of the cutoff wall and associated groundwater extraction wells was completed in August 2004. Pumping from the extraction wells began shortly thereafter and continues to the present time. During 2006, BFI extracted, treated and used approximately 1.1 million cubic feet of groundwater from behind the cutoff wall. (A-Mehr, Inc. 2007) Operation of this system is expected to continue until the existing waste mass in the closed City Landfill Unit 1, which was placed between 1958 and 1991, stops generating leachate and landfill gas as a result of completed decomposition processes and elimination of additional liquid due to the closure cap.

One constituent, 1,4-dioxane, has been detected since early 2004 in small quantities in monitoring wells MW-5 and MW-13, which are located down-gradient of the cutoff wall. BFI is continuing to monitor these wells in conjunction with water levels in observation wells upgradient and down-gradient of the cutoff wall to determine whether the concentrations of 1,4-dioxane currently being measured below the cutoff wall are due to groundwater that was present before construction of the barrier, or whether they are due to groundwater that has bypassed the cutoff wall since its construction. A-Mehr, Inc. has recommended that monitoring results for this constituent in the affected wells be tracked for a period of several years to determine whether the concentrations are stable or are declining. Significantly, no other constituents, including those present in groundwater being pumped and treated from behind the cutoff wall, are present in the downgradient wells. Based on this and other data, A-Mehr, Inc. believes the existing detection of 1,4-dioxane in monitoring wells MW-5 and MW-13 is associated with groundwater present prior to installation of the cutoff wall at the mouth of the canyon, and that it will decline and be eliminated in time as the extraction system prevents the discharge of impacted groundwater downgradient from the cutoff wall.

There is no known release from City Landfill Unit 2, which began operation in August 2005. Unit 2 is equipped with a double composite liner system constructed under exacting construction quality control procedures, from which releases are highly unlikely and are not foreseen.

5. MONITORING SYSTEMS

The Sunshine Canyon County Extension and City Landfills have independent but coordinated monitoring systems for groundwater and landfill gas. All are designed to provide reliable early detection of releases, and have proven to be effective in detecting the known releases presently being addressed by the corrective action programs described above. Figure 1 illustrates the existing monitoring network, including groundwater monitoring wells (generally designated by MW or CM prefixes) and landfill gas monitoring wells (P-203, etc). All elements of the system are monitored at least semi-annually, with designated wells being monitored on a quarterly basis as provided in the site's Monitoring and Reporting Programs (CI-2034 for the City Landfill and CI-7059 for the County Extension Landfill). The location and design of the network, combined with the frequency of monitoring, make early detection of any future release from either landfill a virtual certainty.

6. KNOWN OR REASONABLY FORESEEABLE RELEASE DETERMINATION

6.1 County Extension Landfill

As described above, the known release from the County Extension Landfill is the VOC contamination of subdrain waters by contact with landfill gas. The corrective action for this release will continue until sample results indicate the subdrain liquids are no longer contaminated, indicating the contact with landfill gas has been eliminated. Based on current understanding and site development plans, the remaining potential path for landfill gas to reach groundwater is expected to be eliminated by the development of the Phase VI and Phase VII areas along the southwest corner of the landfill, which is projected to occur in approximately five to six years from present. (JTD, 2006) It is expected that the subdrains will be free of impacts within 6 months to a year after the source of landfill gas is eliminated. At that time the current corrective action program would be completed and subdrain waters could be used on-site or released to surface water without treatment. Thus, the anticipated maximum duration of the existing corrective action at the County Extension Landfill is approximately 7 years from present, or until mid-2014.

Once the corrective action program has cleaned up the known release, financial assurance would be required for a reasonably foreseen release. Such release would most likely consist of continuing impact to subdrain waters from landfill gas, and would be corrected by the same measures as the current known release and corrective action program. As noted in Section 4 above, the RWQCB concluded with respect to the existing condition that there is no evidence of any release of leachate due to damage or flaws in the composite liner system of the County Extension Landfill. Future Phases V, VI and VII of the landfill will be constructed with a double composite liner system, which will further minimize the potential of releases due to damage or flaws in the containment system. Additionally, a release directly impacting groundwater is highly unlikely, given the presence of a documented upward vertical gradient of groundwater flow, which would cause any leachate release from the liner system to be detected, and treated, in the subdrain system.

A foreseeable release impacting subdrain waters of the County Extension Landfill would be detected within months of occurrence, due to the quarterly monitoring conducted for subdrain waters. Once detected, technical analysis and reviews would be conducted pursuant to an Evaluation Monitoring Program (EMP), and an Engineering Feasibility Study (EFS) and Amended Report of Waste Discharge (AROWD) would be prepared and submitted to the RWQCB. After review by of the EFS/AROWD by the RWQCB, a Corrective Action Program would be prepared, submitted to the RWQCB, in after public hearing incorporated into a new CAO. Although it would be expected that interim measures would be taken by BFI prior to issuance of the CAO, it can be assumed that approximately 2 to 5 years would be required to complete required actions to stop the release and eliminate contaminants in the subdrain liquids.

6.2 City Landfill

A-Mehr, Inc. does not believe there is a reasonably foreseeable release from the City Landfill Unit 2. City Landfill Unit 2 is being constructed with a double composite liner system, from which a release to groundwater is highly unlikely.

The existing release to groundwater from the closed City Landfill Unit 1 has been extensively studied and is presently being managed by the seep collector system and by the cutoff wall, extraction wells and treatment system installed pursuant to CAO No. R4-2004-0132 in 2004. The combined total of liquids being managed in these systems during 2006 was approximately 2.3 million cubic feet.

The seep collector and cutoff wall systems must remain in place as long as the waste mass in the closed City Landfill continues to produce leachate or landfill gas with potential to impact groundwater quality. The volume of liquid impacted by leachate from the closed landfill may decline due to the presence of the cover cap, but will not be eliminated due to the continuing contact between groundwater and the base of the refuse mass, driven by the vertical upward gradient of groundwater flow in the lower canyon.

With the landfill having been active between 1958 and 1991, the age of the refuse in City Landfill Unit 1 is between 49 and 16 years. Based on this age, we estimate the remaining period of potential impact from decomposition processes in Unit 1 to be approximately 15 years. We believe this is a reasonable period on which to base an estimate of the financial assurance for corrective action for the known release from the City Landfill.

7. COST ESTIMATES

This section provides estimates for corrective action to manage the known and foreseeable releases from the Sunshine Canyon County Extension Landfill and the City Landfill. Estimates are based on third-party assumption of operation of the existing treatment systems at the site.

7.1 Costs - County Extension Landfill

Liquids from County Landfill Subdrains A,B,C and J are presently collected and managed as part of the County Landfill's ongoing corrective action program. During 2006 these subdrains produced a total of approximately 2.4 million cubic feet of liquid that was treated in the on-site wastewater treatment facility and used on-site for dust control or irrigation, or was discharged to City sewer. BFI estimates the cost of collecting and treating subdrain liquids is estimated to cost $.015 per cubic foot of water treated. At this rate, the annual cost of managing subdrain waters is estimated at $37,071 per year. Details of the data supplied by BFI are given in Table 2.

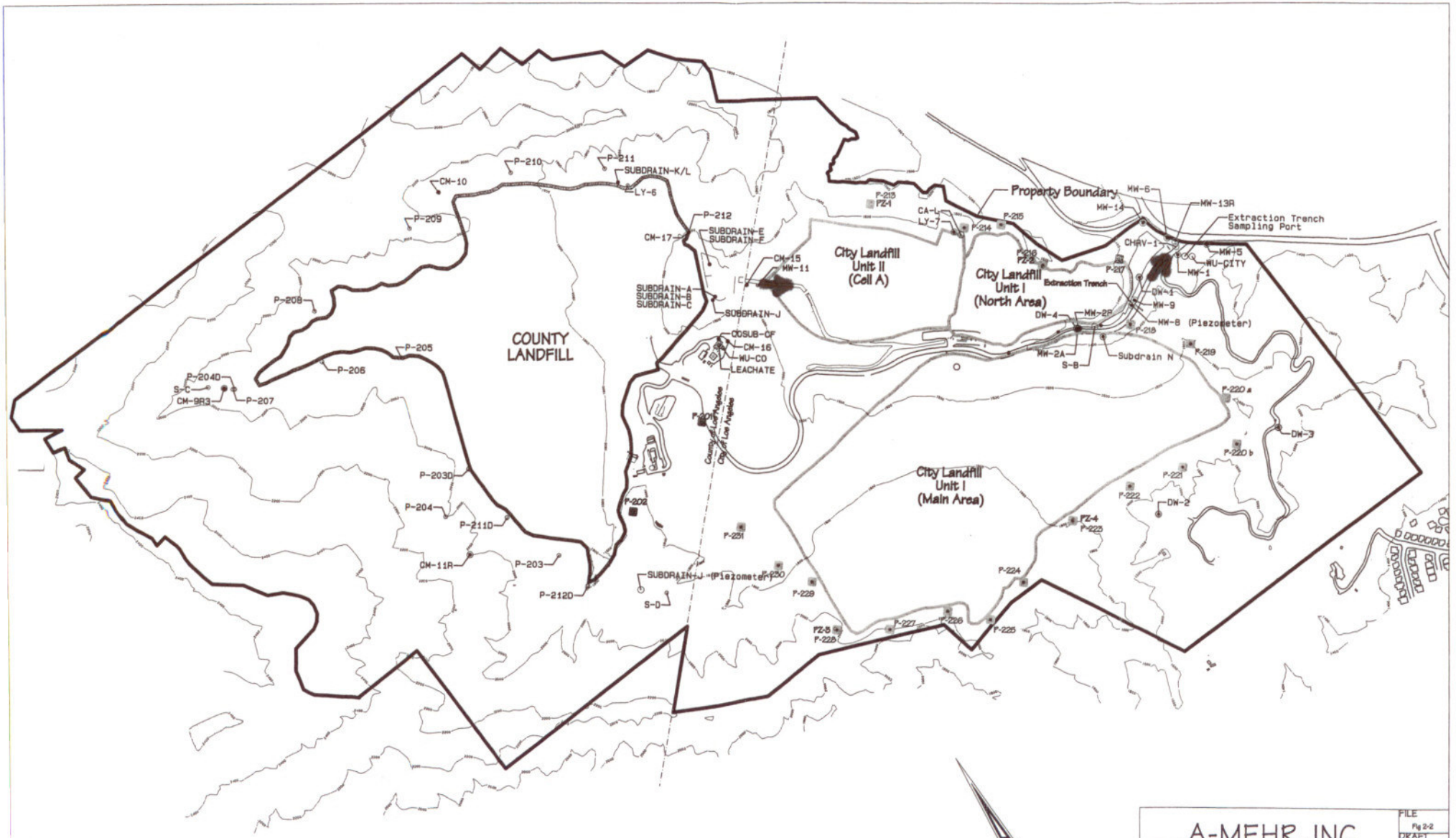
As described above, the existing known release to subdrain waters is expected to be corrected within approximately 7 years from present, after development of Phases VI and VII of the landfill. As shown in Table 1, the total estimated cost for correction of the existing known release, including sampling and testing costs, is $399,495.

The reasonably foreseeable release, following correction of the known release, is postulated as an additional release to subdrain waters requiring collection and treatment. With an estimated treatment period of five years, the cost of correcting the foreseeable release is estimated at $350,849 including the cost of preparing study documents preparatory to implementing the corrective action, and conducting the necessary monitoring during the correction period.

The total estimated cost for corrective action to remedy known and reasonably foreseeable releases from the County Extension Landfill is therefore $749,849, as shown in Table 1.

7.2 Costs - City Landfill

Existing corrective action at the City Landfill involve the collection and discharge of seep waters from the central area of the landfill, and collection, treatment and on-site use of groundwater from behind the cutoff wall. Both these activities are expected to be required for a period of 15 years, the estimated period during which the refuse in City Landfill Unit 1 is expected to continue producing landfill gas and leachate. Although liquid volumes may decline in the future, the existing volumes of liquids provide a conservative basis for estimating financial assurance requirements. As stated previously, the total volume of seep liquid and cutoff wall water managed in 2006 was approximately 2.3 million cubic feet. Based on the cost data presented in Tables 1, 3 and 4, the annual cost of liquids management from the City Landfill is $138,256. The total cost for a 15-year period is estimated to be $2,073,841, including costs for sampling and testing.



A-MEHR, INC
23016 Mill Creek Drive, Laguna Hills, CA 92653
(949) 206-0157 (949) 206-9157 FAX

Sunshine Canyon Landfill

Monitoring Point Locations

FILE	Fig 2-2
DRAFT	RM
CHECK	
DATE	6/29/06
FIGURE	1

TABLE 1
SUNSHINE CANYON LANDFILL
COST ESTIMATE FOR CORRECTIVE ACTION
KNOWN AND REASONABLY FORESEEABLE RELEASES

COUNTY EXTENSION LANDFILL

KNOWN RELEASE: TREATMENT OF SUBDRAIN WATERS IMPACTED BY LANDFILL GAS (2007through 2014)						
ITEM	QUANTITY	UNITS	UNIT COST	EXTENDED COST		
				Annual*	No. of Years	Total
Collect Subdrain Liquids	2,400,000	cu. ft./year	$0.0013	$3,030	7	$21,210
Treat Subdrain Liquids	2,400,000	cu. ft./year	$0.0092	$22,041	7	$154,285
Discharge Subdrain Liquids	2,400,000	cu. ft./year	$0.0050	$12,000	7	$84,000
Sampling and Testing	4	events/year	$5,000	$20,000	7	$140,000
TOTAL COST - KNOWN RELEASE				**$57,071**		**$399,495**
REASONABLY FORESEEABLE RELEASE - FUTURE SUBDRAIN IMPACT BY LANDFILL GAS (After 2014)						
ITEM	QUANTITY	UNITS	UNIT COST	EXTENDED COST		
				Annual*	No. of Years	Total
Evaluation Monitoring Program	1	Consultant Study	$25,000	$25,000	1	$25,000
EFS / AROWD**	1	Consultant Study	$25,000	$25,000	1	$25,000
Corrective Action Program	1	Report	$15,000	$15,000	1	$15,000
Collect Subdrain Liquids	2,400,000	cu. ft./year	$0.0013	$3,030	5	$15,150
Treat Subdrain Liquids	2,400,000	cu. ft./year	$0.0092	$22,041	5	$110,204
Discharge Subdrain Liquids	2,400,000	cu. ft./year	$0.0050	$12,000	5	$60,000
Sampling and Testing	4	events/year	$5,000	$20,000	5	$100,000
TOTAL COST - FORESEEABLE RELEASE						**$350,354**
TOTAL COST - KNOWN AND REASONABLY FORESEEABLE RELEASES						**$749,849**

CITY LANDFILL

KNOWN RELEASE: TREATMENT OF GROUNDWATER IMPACTED BY LEACHATE AND LANDFILL GAS (CLOSED UNIT 1)						
ITEM	QUANTITY	UNITS	UNIT COST	EXTENDED COST		
				Annual***	No. of Years	Total
Collect City seep water	1,200,000	cu. ft./year	$0.020	$24,166	15	$362,489
Discharge City seep water to sewer	1,200,000	cu. ft./year	$0.005	$6,000	15	$90,000
Annual sewer inspection for seep water	1	events/year	$1,200	$1,200	15	$18,000
Operate cutoff wall extraction system	1,100,000	cu. ft./year	$0.074	$81,390	15	$1,220,852
Pump and treat cutoff wall water	1,100,000	cu. ft./year	$0.005	$5,500	15	$82,500
Sampling and Testing	4	events/year	$5,000	$20,000	15	$300,000
TOTAL COST - KNOWN RELEASE				**$138,256**	**15**	**$2,073,841**

Notes

* See Table 2 - Sub Drain for unit cost breakdown

** Engineering Feasibility Study and Amended Report of Waste Discharge

*** See Table 3 - Seep Water and Table 4 - Cut-off Wall for unit cost breakdown

Table 2
Sub Drain Liquids Collection and Treatment
Sunshine Canyon County Extension Landfill
Estimated Annual Costs - Data Supplied by BFI

				Annual Costs	Subtotals
Collection Wells and Monitoring Points					
Level Indicating Transducers	4				
Transducer		$ 705.00	one annual	$ 705	
Third party labor		$ 375.00	per change out	$ 375	
Replace Extraction Pumps (includes crane and labor)					
pump costs		750	one per annual	$ 750	
labor costs					
third party labor		$ 375.00	per change out	$ 375	
Electric motor costs		450	one per annual	$ 450	
labor costs					
third party labor		$ 375.00	per change out	$ 375	
			Subtotal		**$ 3,030**
Process Area					
Flow Meter Maintenance					
Clean paddlewheels					
Labor 1 Hr/meter	2hr/wk	$ 35.00	$ 70.00	$ 3,640	
Tank Level Control					
Purchase and install transducers					
Transducer	$400/each	1 changeout/year		$ 400	
Misc Electrical Maintenance					
Outside third party costs		$ 250.00	Quarterly	$ 1,000	
Misc Mechanical Maintenance					
Transfer pump		$ 1,000.00	1 changeout/year	$ 1,000	
Discharge pump		$ 2,500.00	1 changeout/year	$ 2,500	
Electrical Power (DWP)		$ 1,125.06	per month	$ 13,501	
			Subtotal		**$ 22,041**
Sewer Discharge Fees	2,400,000	cu. ft.	$ 0.005 per cu. ft.		**$ 12,000**
TOTAL ANNUAL COSTS - MANAGE SUBDRAIN LIQUIDS					**$ 37,071**

UNIT COST SUMMARY - PER CUBIC FOOT OF LIQUID	
Collection Wells & Monitoring Points	**$ 0.0013**
Process Area	**$ 0.0092**
Discharge Fees	**$ 0.0050**

Table 3
Seep Water Collection and Discharge
Sunshine Canyon City Landfill Unit 1
Estimated Annual Costs - Data Supplied by BFI

					Annual Costs
Flow Meter Maintenance					
Clean paddlewheels					
Labor 1 Hr/meter	2hr/wk	$ 35.00	$ 70.00	$	3,640
Tank Level Control					
Purchase and install transducers					
Transducer	$400/each	1 changeout/year		$	400
Misc Electrical Maintenance					
Outside third party costs	$ 250.00	Quarterly		$	1,000
Misc Mechanical Maintenance					
Transfer pump	$ 750.00	1 changeout/year		$	750
Discharge pump	$ 1,500.00	1 changeout/year		$	1,500
Electrical Power (DWP)	$ 1,406.33	per month		$	16,876
Sewer Discharge Fees	1,200,000 cu. ft.	$ 0.005	per cu. ft.	$	6,000
Total Annual Costs - Manage City Seep Water				**$**	**30,166**

UNIT COST SUMMARY - PER CUBIC FOOT OF LIQUID	
Collection System	**$ 0.0201**
Discharge Fees	**$ 0.0050**

Table 4
Cut-off Wall Liquids Extraction, Treatment and Discharge
Sunshine Canyon City Landfill Landfill
Estimated Costs - Data Supplied by BFI

					Annual Cost	Subtotal
Extraction Wells and Monitoring Points						
Level Indicating Transducers (11 total)						
Transducer			$ 705.00	one semi-annual	$ 1,500	
third party labor			$ 375.00	per change out	$ 1,500	
Replace Extraction Pumps (includes crane and labor)						
pump costs			750	one per annual	$ 750	
labor costs						
third party labor			$ 250.00	per change out	$ 250	
Electric motor costs			450	one per annual	$ 450	
labor costs						
third party labor			$ 250.00	per change out	$ 250	
Misc Electrical Maintenance						
Outside third party costs			$ 250.00	Quarterly	$ 1,000	
Misc Mechanical Maintenance						
Outside third party costs			$ 250.00	Quarterly	$ 1,000	
Electrical Power (DWP)			$ 843.80	per month	$ 10,126	
Subtotal - Operate and Maintain Cutoff Wall Extraction System						**$ 16,826**
Process Area						
Carbon Cannister Changeouts						
One in Feb				$ 5,500.00	$ 5,500	
One in Aug				$ 5,500.00	$ 5,500	
Filters						
Four filter bags/ canister				Weekly		
Filter costs	8/week		$7.00/each	$ 56.00	$ 2,912	
Labor	1 Hr/canister	2hr/wk	$ 35.00	$ 70.00	$ 3,640	
Flow Meter Maintenance						
Clean paddlewheels						
Labor	1 Hr/meter	2hr/wk	$ 35.00	$ 70.00	$ 3,640	
Backflushing Carbon						
backflush sediment out of carbon						
Labor	1 Hr/flush	3hr/wk		$ 105.00		
Clean containment		per flush				
Pump		3hr/flush	$ 50.00	$ 50.00	$ 2,600	
Labor		6hr/flush	$ 71.00	$ 426.00	$ 22,152	
Equipment		1hr/flush	$ 47.50	$ 47.50	$ 2,470	
Tank Level Control						
Purchase and install transducers						
Transducer		$400/each	1 changeout/year		$ 400	
Misc Electrical Maintenance						
Outside third party costs			250	Quarterly	$ 1,000	
Misc Mechanical Maintenance						
Transfer pump		$ 1,000.00	1 changeout/year		$ 1,000	
Discharge pump		$ 2,500.00	1 changeout/year		$ 2,500	
Electrical Power (DWP)			$ 937.55	per month	$ 11,251	
Subtotal - Operate and Maintain Treatment System						**$ 64,565**
Sewer Discharge Fees	1,100,000 cu. ft.		$ 0.005	per cu. ft.		**$ 5,500**
TOTAL ANNUAL COST - MANAGEMENT OF CUTOFF WALL LIQUIDS						**$ 86,890**

UNIT COST SUMMARY - PER CUBIC FOOT OF LIQUID	
Collection Wells & Monitoring Points	**$ 0.0153**
Treatment System	**$ 0.0587**
Discharge Fees	**$ 0.0050**