CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

RESOLUTION NO. 99-056

ADOPTION OF FINDINGS OF MITIGATION
AND
MITIGATION MONITORING PROGRAM
FOR THE EAGLE MOUNTAIN LANDFILL WASTE DISCHARGE REQUIREMENTS

The California Regional Water Quality Control Board, Colorado River Basin Region (hereinafter Regional Board), finds:

As a Responsible Agency, the Regional Board is required to make findings of mitigation or overriding consideration and adopt a mitigation monitoring program only for those portions of the Project that are being approved by the Responsible Agency and only as to those mitigation measures that are within the Responsible Agency's jurisdiction.

The jurisdiction of the Regional Board is limited to regulating the impacts of water quality and the beneficial uses of water by the discharge of wastes. Findings in Waste Discharge Requirements, Order No. 99-061 are limited to matters within the Regional Board's jurisdiction.

The mitigation, findings, and supportive evidence are contingent upon the project's owners/operators constructing and operating the project to comply with the waste discharge requirements adopted by the Regional Water Quality Control Board. The design measures hereto described are those proposed by the owner/operator to comply with the Regional Water Quality Control Board's requirements.

I. PROJECT BACKGROUND AND DESCRIPTION SUMMARY

The Project background and description are contained in the Waste Discharge Requirements, Order No. 99-061, which are being considered by the Regional Board along with this Resolution.

An initial study for the Project initially proposed by the dischargers, was prepared by the County of Riverside. A Notice of Preparation (NOP) for an Environmental Impact Report was distributed on May 6, 1995 to Federal and State agencies, local responsible and trustee agencies, the State Clearinghouse, organizations, and interested individuals. Distribution of the NOP assisted in the identification and determination of the range and scope of environmental issues of concern on the proposed Project. Relevant environmental issues were included in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS). Comments received during the NOP distribution were addressed in a Draft EIR/EIS. The Draft EIR/EIS was circulated for public review in July 1996. Following public review and comments, the County of Riverside, as the lead agency, certified the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) on September 9, 1997.

The contents of the Draft EIR/EIS, the response to comments and other related attachments including the Mitigation Monitoring Program compose the FEIR/EIS for the Eagle Mountain Landfill. The FEIR/EIS is part of the record used to draft this resolution.

II. THE RECORD

The California Code of Regulations, Title 14, Section 15091(b) requires that the Responsible Agency's findings be supported by substantial evidence in the record. Accordingly, the Responsible Agency's record consists of the following:

A. Documentary and oral evidence, testimony, and staff comments and responses received and reviewed by the Regional Board during it's technical workshop held November 17, 1993, and the public hearing on May 16 and 17, 1994, and on July 28 and 29, 1999 on the Eagle Mountain Landfill as described in Waste Discharge Requirements, Order No. 99-061. The Report of Waste Discharge (ROWD) dated December 17, 1992, and all documents in the Regional Board's files for this facility including, but not limited to those listed below, are also part of the record.

B. Riverside County's Resolution No. 97-236, "Adopting/Approving Comprehensive General Plan Amendment Nos. 402 and 405, Specific Plan Nos. 305 and 306, Change of Zone Case Nos. 6249 and 6253, Development Agreement No. 64, Revised Reclamation Plan Permit No. 158, Tentative Tract Map No. 28217, and the California Environmental Quality Act Findings Made In Connection Therewith.

C. Reports and other written information including the following documents by Geosynthec, Consultants for the Eagle Mountain Landfill:

1. A Report of Waste Discharge (ROWD) in eight (8) volumes, dated December 17, 1992.
2. Conceptual Plan for Unsaturated Zone Gas Monitoring (UZGM), Supplement to the ROWD, dated March 10, 1993.
3. Supplemental Volume 1 (SV1) to the ROWD, dated June 10, 1993.
4. Supplemental Volumes 2A and 2B (SV2) to the ROWD, dated December 1993.
5. Summary of Information on Absence of Holocene Fault Displacement, dated November 4, 1993.
6. Supplemental Volumes 3A and 3B (SV3) to the ROWD, dated December 16, 1997.
7. A response document dated March 25, 1999 concerning:

    - Time-of-Travel for landfill gas, and
    - Rationale for monitoring well screen length and depth.

D. Matters of common knowledge to the Responsible Agency that they consider, such as:

1. The Water Quality Control Plan, Colorado River Basin Region adopted was by the Regional Water Quality Control Board, Colorado River Basin Region on November 17, 1993.
2. The Porter-Cologne Water Quality Control Act, California Water Code Section 13000 et. seq.
3. Title 27, California Code of Regulations, Division 2, Section 20005, et. seq. governing the State Water Resources Control Board/California Integrated Waste Management Board, and the nine Regional Water Quality Control Boards.
4. Criteria for Municipal Solid Waste Landfills, 40 Code of Federal Regulations, Part 258.
5. Municipal Solid Waste Landfill Criteria Subtitle "D" of the Resources Conservation and Recovery Act. 42 United States Code 6901, et. seq. 6941.
6. The State Water Resources Control Board's Resolution No. WQ 93-062, the State Water Resources Control Board's Policy for Regulations of Discharge of Municipal Solid Waste, implementing the Federal Subtitle "D" Regulations in California.
7. The California Environmental Quality Act (CEQA), California Public Resources Code, Section 21000, et. seq., and the State CEQA Guidelines implementing the Act, Title 14, California Code of Regulations, Section 15000 et. seq.
8. Other formally adopted policies and ordinances of the Regional Board and State Board.

E. Documents and other material which constitute this record are located at the office of the California Regional Water Quality Control Board, Colorado River Basin Region, 73-720 Fred Waring, Suite 100, Palm Desert, Ca 92260. The Regional Board's Executive Officer is the custodian of the record.

III. FINDINGS FOR PROJECT IMPACTS

The following section contains the findings required by Section 21081 of the California Public Resources Code. These findings are organized by resources issue area, with impacts that result from the portion of the Project to be mandated in Waste Discharge Requirements Order No. 99-061. The impacts were identified in the January 1997 Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) for the Eagle Mountain Landfill. The following outline follows the FEIR/EIS of January 1997:

Groundwater Quality and Use

Public Health and Safety

Surface Water Drainage/Flooding

Geology and Mineral Resources

Each significant impact of the portion of the Project being mandated by the Waste Discharge Requirements, Order No. 99-061, is set forth below, followed by recommended mitigation measures, a specific finding for the impact, and the supporting evidence.

Groundwater Quality and Use

1. Potential Impact

The Project has the potential for pollution of groundwater due to migration of leachate or Landfill gas.

Mitigation (See Appendix A of this Resolution for the complete wording of the following Prohibitions, Specifications, and provisions):

a. Discharge Prohibitions 1, 3, and 4
b. Discharge Specifications 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 23, 24, 25, 26, 27, 31, 32, 33, 36, 42, 44, 50, 54, 55, and 60
c. Provision 24.

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

Leachate and Gas

As mandated in the Waste Discharge Requirements, Board Order No. 99-061, leachate and gas containment, collection and detection monitoring systems are part of the design criteria required by State and Federal regulations.

Leachate – The possibility of leachate generated due to precipitation at the site is minimal due to the arid climate. The average rainfall is four inches per year and the evaporation rate is about 150 inches per year. A surface water/storm water system is designed to prevent storm water contact with the waste. To reduce leachate generated within the waste, several measures will be taken. These measures include: minimizing the size of the working face to not more than two acres to reduce the area of waste exposed at any one time to precipitation, covering the waste daily to reduce direct waste exposure to precipitation,

recycling the waste (AB 939 requires mandatory 50 percent recycling of residential solid waste by the year 2000), processing the waste at material recovery facilities/transfer stations (MRFs/TSs), and inspecting the waste on site for prohibited materials. Redundant containment and detection monitoring systems are designed to contain and monitor any leachate generated at the Landfill. The entire Landfill including side slopes, benches and ridges, and base are lined with a composite liner that meets State and Federal requirements.

The side slopes and benches and ridges are sloped to direct any leachate generated toward the base of the Landfill. The base of the Landfill is designed to have a primary leachate collection removal system (LCRS), underlain by a primary composite liner. The primary containment composite liner consists of:

a. A 16-oz./yd^2 nonwoven needle punch geotextile.
b. An 80-mil textured (both sides) high density polyethylene (HDPE) geomembrane.
c. A two-foot thick soil liner with low permeability of K $\leq$ 1 x 10^{-9} cm/s.

Leachate directed to the base of the Landfill will be contained in this primary composite liner and directed via gravity (4 percent slope) through a primary porous granular collection system to primary sumps. Leachate collected in the sumps will be pumped (using submersible pumps through riser pipes) into a leachate management system and then transported to an approved wastewater treatment plant.

In addition, a secondary containment and liquid collection system is designed for the base area of the Landfill. This layer consists of an unsaturated zone liquid monitoring layer, also referred to as a secondary LCRS, underlain by a secondary composite liner system. The secondary composite liner consists of:

a. A 16-oz./yd^2 nonwoven needle punch geotextile.
b. An 80-mil textured (both sides) HDPE geomembrane.
c. A geosynthetic clay liner (GCL) with hydraulic conductivity of K $\leq$ 1 x 10^{-9} cm/s.

This secondary containment system and liquid collection system is designed to contain and direct any leachate that passes through the first composite liner system. As in the primary LCRS, leachate will be directed by gravity through a porous granular collection system to secondary sumps. Leachate collected in the secondary sumps will be pumped (using submersible pumps through riser pipes) into the leachate management system and then transported to an approved wastewater treatment plant. The secondary sumps are used to detect the presence of leachate if the primary containment system fails.

To monitor water quality, the groundwater monitoring system designed for the Landfill to detect and monitor the quality of the groundwater underneath the Landfill, consists of 27 downgradient point-of-compliance monitoring wells and nine upgradient background monitoring wells. As mandated under Monitoring and Reporting Program No. 99-061, the groundwater shall be monitored for a specific list of inorganic and organic constituents and all detected releases to the groundwater shall be reported to the Regional Board.

Gas – Landfill gas (LFG) is composed primarily of methane and carbon dioxide, which are the natural products of microbial decomposition of Landfill waste. LFG can also contain forms of volatile organic compounds (VOCs) disposed in the Landfill in small quantities (e.g. small spent containers of home cleaning fluids, solvents, paint and thinners). Recycling, and waste checking at the material recovery facilities, and spot-checking at the Landfill, will reduce the quantities of household waste releasing VOCs. In addition, several design measures will be implemented at the Landfill to address gas generation.

These design measures include:

1. Installation of approximately 1,000 vertical gas extraction wells within the Landfill. This system is designed to extract gas from the Landfill under a small vacuum, convey the gas by gas collection headers and pipelines to flare stations. Gas condensate formed in header pipes will be collected and treated as leachate.

2. Installation of permanent gas monitoring probes around the perimeter of the Landfill as well as monitoring of ambient air, and on-site structures for the presence of Landfill gas. Emissions from the surface of the Landfill will be monitored periodically to ensure that emissions from the Landfill surface are within State and federal guidelines established by the SCAQMD. Detection of potential odors associated with the release of LFG and daily landfilling operations will also be monitored on a regular basis.

3. Installation of an unsaturated zone gas monitoring system (UZGMS) beneath the Landfill. The UZGMS will consist of approximately 200 gas probes installed and spaced every ten acres to locally monitor unsaturated zone gas quality.

   The primary and secondary composite liners, primary and secondary leachate collection and removal system, plus active gas removal systems and gas monitoring systems are designed to reduce any significant impact to the groundwater.

2. Potential Impact

The Project creates potential for water quality degradation from the Landfill after its closure.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications and Provisions):

a. Discharge Specifications 3, 4, 5, 12, 13, 14, 15, 23, 24, 25, 27, 31, 32, 33, 36, 44, 54, 64, and 65
b. Provisions 24 and 38

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

As mandated in Waste Discharge Requirements, Board Order No. 99-061, the Landfill is designed to prevent water quality degradation during and after the closure of the Landfill. The primary and secondary composite liner systems, primary and secondary LCRS, gas extraction and monitoring systems (within the waste, around the perimeter, and underneath the Landfill) plus daily, intermediate and final cover systems will reduce water impacts to a level of insignificance. In addition, Monitoring and Reporting Program No. 99-061 requires post-closure monitoring of all 36 groundwater monitoring wells and all 9 surface water monitoring points for as long as there is a threat to water quality.

Public Health and Safety

3. Potential Impact

The Project has the potential for subsurface fires at the Landfill due to the presence of combustible materials.

Mitigation (See Appendix A of this Resolution for the complete wording of the following Prohibitions and Specifications)

a. Discharge Prohibition 4.
b. Discharge Specifications 3 and 25 (a)(1, 2, and 3)

Findings
Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence
Subsurface Landfill fires can occur if ignitable materials within the Landfill mass are heated to a critical temperature, either through biological decomposition or chemical oxidation. The ignition characteristics and subsequent propagation characteristics of subsurface Landfill fires will depend upon waste composition, moisture content, oxygen availability, and ambient pressure. A continuous source of oxygen would be necessary for the decomposition/oxidation process; oxidation of the refuse materials can generate heat to the point of combustion.

Mitigation measures will be implemented to prevent and/or extinguish Landfill fires due to ignitable materials. All refuse accepted at the Landfill from outside the Chuckwalla Valley will be screened at the MRFs/TSs, and all the combustible materials will be removed prior to shipment to the Landfill. During compaction of waste prior to loading for transport, voids or air spaces capable of supplying oxygen to support combustion would be substantially reduced. There will be a load checking/screening at the Landfill to screen locally delivered waste for prohibited waste, including smoldering waste. Smoldering or burning incoming waste will be isolated and thoroughly extinguished prior to disposal. An active gas extraction system and Landfill gas management system will be implemented to contain, remove and dispose of Landfill gas generated by the decomposition of waste within the Landfill. A fire prevention plan and an emergency response plan will be developed in coordination with the Riverside County Fire Department, and will be implemented as an integral component of the Landfill. This prevention and emergency response plan will detail specific and appropriate actions for preventing fires as well as action to be taken in the event of refuse load fire, including isolating any hot loads before refuse is landfilled.

Surface Water Drainage/Flooding

4. Potential Impact
The Project has the potential for increased leachate and adverse effects on groundwater if storm water infiltrates the Landfill.

Mitigation (See Appendix A of this Resolution for the complete wording of the following Specifications)

a. Discharge Specifications 3, 4, 5, 8, 11(a), 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 27, 29, 30, 32, 33, 34, and 36.

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

The Eagle Mountain Landfill site is located in an area that has an average of four inches or less of rainfall per year, and the rate of evaporation is about 150 inches per year. The main storm water event that would have the possibility of penetrating the waste would be the 100-year, 1-hour, 100-year, 3-hours, and 100-year, 24-hours storm events. Surface water management design for the Eagle Mountain Landfill has taken these severe infrequent storm events into account.

The Eagle Mountain Landfill will be constructed in four contiguous phases, with approximately 13 sequences and 75 subphases. The subphases of the construction operation range from 10 to 40 acres. As the construction of a subphase is completed, landfilling will begin. A subphase surface water management system (temporary system) will be constructed to accommodate storm water events. This system includes temporary drainage ditches, temporary detention basins, erosion and sediment control features will be constructed around the upslope perimeter of each working area of the Landfill to divert storm water flows around and away from the fill area as filling occurs. Each working area will be covered (daily cover) with six inches of compacted soil, or alternative material placed over the waste during or at the end of each working day. As construction and landfilling continues, any area of the Landfill that has waste and that will be inactive for 180 days will be covered (intermediate cover) with a minimum 12-inch compacted soil, or equivalent. Intermediate covers will have side slopes of 3H:1V, or less with sloping benches to divert surface runoff into perimeter drainage ditches north and south of the Landfill.

The Eagle Mountain Landfill will have a composite final cover sloped at no steeper than 3H:1V. The final cover system will be progressively installed as subphase areas reach final grade. Permanent surface water management systems will be constructed to direct storm water away from the Landfill footprint. Nine surface water monitoring points will be constructed to monitor surface water quality. In the event of any storm water infiltration into the waste, the containment systems discussed previously will be able to mitigate such releases. Monitoring and Reporting Program No. 99-061 requires groundwater monitoring and reporting at the Eagle Mountain Landfill. Monitoring and Reporting Program No. 99-061 requires the discharger to immediately telephone the Regional Board if a release is discovered, and submit a written report within seven days that includes a proposal for corrective measures.

5. Potential Impact.

The Project has the potential for contamination of runoff by storm water contact with refuse in Landfill operational areas.

Mitigation (See Appendix A of this Resolution for complete working of the following specifications.

a. Discharge Specifications 3, 27, 29, 30, 31, 32, 33, 34, and 36.

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the

FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence
Two scenarios are considered. The first one is precipitation that falls on portions of the Eagle Mountain Landfill other than the working face, or originates from the drainage basins of Eagle Creek and Bald Eagle Creek after a storm event, and does not come in contact with the waste (noncontact water). This noncontact water will be controlled via surface water management system and three detention basins. The surface water management system and detention basins will divert the flows away from the Landfill and two creeks into the east bowl of the East Pit or into a natural downstream water course.

The second scenario is that precipitation falls on the working face of Eagle Mountain Landfill and comes in contact with waste (contact water). This contact water would be limited to contact with waste only at the working face of the Landfill during working hours and will be treated as leachate. The working face of the Landfill is limited to less than two acres of operation, minimizing exposure of waste. Containment systems, gas extraction, LCRS systems and monitoring systems will prevent or mitigate impact to groundwater, by precipitation onto the working face.

6. Potential Impact
Flooding, erosion and effects on biological resources from discharge of storm waters collected from around the Landfill.

Mitigation (See Appendix A of this Resolution for complete wording of the following specifications)

a. Discharge Specifications 3, 7, 8, 11(a), 27, 29, 30, 31, 32, 33 and 34.

Findings
Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence
The site drainage system has been designed and will be constructed to convey and discharge surface water into natural drainage courses via energy dissipating structures, which will reduce peak flows into the drainages to pre-mining conditions, thus mitigating the potential for erosion impacts or damage to resources. The total watershed area, in terms of size, would be largely unchanged from pre-project to post-landfill conditions, and the total flow generated from a given size storm would remain unchanged. The reclamation of the East Pit by the disposal of solid wastes would establish direct drainage patterns consistent with those that existed prior to mining operations. Runoff currently flows into the East Pit and either percolates into the ground or evaporates. Runoff from the project would flow in a combination of engineered drainage structures and natural drainage courses to the alluvial areas east of the Landfill where it would percolate or evaporate. Potential impacts to surface drainage would be avoided due to the incorporation of the project design features, which include a design plan consistent with the requirements of the Riverside County Flood Control & Water Conservation District and applicable state and federal landfill regulations. All permanent detention basins for the Landfill will be designed to handle a 500-year storm event. After significant rainfall events, all ditches and detention ponds will be inspected and periodically cleaned out. In addition, the final landfill slope will be a minimum of 3 percent.

Geology and Mineral Resources

7. Potential Impact

Potentially expansive soils may occur in the fine tailing storage lagoons and in areas underlain by alluvial material.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications)

a. Discharge Specifications 3, 46(b)(9), 46(e)(3), 46(g)(1)(h) and 47.

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

The dischargers are required under Waste Discharge Requirements Order No. 99-061, to submit detailed "Final Construction Design Plans and Specifications" to the Regional Board prior to construction. The plan requires material used for Landfill construction be evaluated among other things for shear strength and expansion by a California registered engineer or certified engineering geologist. Fine tailing soil used for Landfill construction will be evaluated by a California registered geotechnical engineer and/or a certified engineering geologist, and areas subject to expansive soil will be subject to remedial grading as needed.

As part of the Specifications in Board Order No. 99-061, the discharger is required to maintain safety factors of 1.35 and 1.5 for interim slopes and final slopes, respectively. Also, Specifications in Board Order No. 99-061 require that Construction Quality Control-Construction Quality Assurance (CQC-CQA) plans be implemented during the Eagle Mountain Landfill construction. These plans include:

a. CQC-CQA plans to be implemented by an independent engineering firm that is not owned in whole or in part by the dischargers.

b. CQC-CQA implemented by the contractor or manufacturer. All materials and workmanship shall be tested in accordance with the quality control-quality assurance plan. All tests may be observed by the CQC-CQA firm (independent firm), and all test results shall be submitted to the CQC-CQA firm for review and approval.

c. CQC-CQA plans by the discharger to control all aspects of the Eagle Mountain Landfill construction. The discharger is required to periodically submit all observations and test results to the Regional Board's Executive Officer.

8. Potential Impact

The Project may create instability of manufactured slopes in bedrock and alluvial areas of the East Pit.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications)

a. Discharge Specifications 3, 46(b)(1,2,3 and 4), 46(e), 46(g)(1)(d, e, f, g and h), 46(g)(2) and 47.

Findings

Changes or alterations have been required in, or incorporated into, the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

Extensive slope stability analyses were performed by the discharger for all Landfill slopes conditions. Waste Discharge Requirements, Board Order No. 99-061, requires specific conditions for different phases of construction. Under Board Order No. 99-061, a "Final Construction Design Plans and Specifications" document will be submitted to the Regional Board's Executive Officer for review and approval 120 days prior to initiation of construction of each subphase of the Eagle Mountain Landfill. The document will include Construction Quality Control-Construction Quality Assurance (CQC-CQA) plans. Under these plans, as grading for the Landfill occurs, a California registered geotechnical engineer and/or a certified engineering geologist will determine safe slope angles and maintain slopes within this range with flattening of slopes or construction of fill buttresses as needed. The slope angle design will be part of the final design submitted in final construction design plans and specifications.

All significant changes as specified in Specification 46(g) of Board Order No. 99-061 will be conditional upon the Regional Board's Executive Officer's approval. The California registered geotechnical engineer and/or certified engineering geologist will certify that the liner system is placed at safe slope angles.

9. Potential Impact

The Project has the potential for settlement in waste rock dumps northeast of the East Pit and loose alluvium in the eastern Project area.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications)

a. Discharge Specifications 3 and 47.

Findings

Changes or alterations have been required in, or incorporated into the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and/or in the design of the Project.

Supportive Evidence

The areas that have potential for excessive settlement will be excavated or compacted prior to liner system construction. The compaction will be at least 90 percent relative compaction in accordance with ASTM Standards.

10. Potential Impact

The Project will create potential slope failure and dislodgment of loose materials from existing manufactured slopes in the strong seismic event.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications)

a. Discharge Specifications 3, 19, 20, 46(a), 46(b)(2, 3, 4, and 5), 46(d), 46(e)(3 and 4), and 46(g)(1)(d, f, g, and h).

Findings

Changes or alterations have been required in, or incorporated into the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and or in the design of the Project.

Supportive Evidence

The dischargers have performed slope stability analyses for all slope conditions expected to be encountered on the Eagle Mountain Landfill project. These analyses meet the California Code of Regulations, Title 27, Section 20005, et. seq., (Title 27) and 40 Code of Federal regulations, Part 258 (Subtitle D) regulations. Included in these analyses are both static and seismic analyses for slope stability. Board Order No. 99-061 has specific requirements that shall be met during the construction of the Eagle Mountain Landfill. Under specifications in Board Order No. 99-061, the stability of slopes shall be maintained during construction in accordance with Construction Quality Control-Construction Quality Assurance (CQC-CQA) plans. As part of the construction plan, loose rock and materials will be progressively scaled from benches above the working face of the Landfill. All natural and man-made slope conditions have been analyzed for seismic stability using the Subtitle D design event and conservative interface shear strength values. To ensure that the engineered slopes constructed during facility development achieve the desired factors of safety, minimum interface shear strength values shall be specified in the construction documents. The potential for seismically induced settlement of fill placed during previous mining activities and of loose alluvium will be mitigated through design and construction. Any previous mining fill or loose alluvium that would provide inadequate support for overlying facilities shall be removed and replaced with compacted fill prior to the construction of the facilities.

11. Potential Impact

The Project has the potential to be affected by ground shaking, fault rupture, liquefaction, slope instability, and settlement in a strong seismic event.

Mitigation (See Appendix A of this Resolution for complete wording of the following Specifications)

a. Discharge Specifications 3, 19, and 20, 46(a), 46(b)(2, 3, 4, and 5), 46(d), 46(e)(3 and 4), and 46(g)(1)(d, f, g, and h).

Findings

Changes or alterations have been required in, or incorporated into the Project, which avoid or substantially lessen the significant environmental effects as identified above and in the FEIR/EIS. These are set forth in the mitigation measures above and or in the design of the Project.

Supportive Evidence

California Title 27 and the Federal Subtitle D regulations require that Class III non-hazardous waste management facilities be designed to withstand the maximum probable earthquake (MPE) without damage to the foundation or to the structures which control leachate, surface drainage, or erosion, or gas. The dischargers have submitted seismicity analyses that meets these and other related regulations in Title 27 and Subtitle D. Included in the seismicity study evaluation and analyses (fully explained in the ROWD) are the following:

The potential for seismically-induced strong ground shaking at the site was evaluated using a probablistic seismic hazard assessment. The probabilistic assessment considered the contributions to the site seismicity from all active and potentially active faults. Impacts associated with strong ground shaking will be mitigated by designing the Landfill

containment systems, LCRSs and gas extraction systems, to withstand a magnitude 6.5 event located five miles from the site, generating an acceleration of 0.56g at the site. This event, as required by Subtitle D, is expected to occur at this site once every 2,375 years. There are no known Holocene faults (faults that have had surface displacement within the last 11,000 years) within 200 feet of the Eagle Mountain Landfill as required by Title 27. The liner system is also designed to withstand an 8.0 magnitude earthquake on the San Andreas fault at its closest location to the site (33 miles away).

Depth to groundwater from the base of the Landfill ranges from 100 to 300 feet. Analyses of liquefaction potential indicate that liquefaction will not occur at the Eagle Mountain Landfill due to seismic events.

The potential for seismic slope instability will be mitigated through several design and construction measures. All long-term natural and man-made slope conditions have been analyzed for seismic stability using Subtitle D design event and interface shear strength values. Acceptable factors of safety against failure were achieved. Critical slopes were also evaluated for performance for MPE event. To ensure that the engineered slopes constructed during Landfill development achieve the desired factors of safety, minimum interface shear strength values shall be specified in the construction documents.

The potential for seismically induced settlement of fill placed during previous mining activities and of loose alluvium will be mitigated through design and construction. Any previous mining fill or loose alluvium that would provide inadequate support for overlying facilities will be removed and replaced with compacted fill prior to the construction of the facilities.

Title 27 states that the discharger, in lieu of achieving a factor of safety of 1.5 under seismic conditions, can utilize a more rigorous analytical method that provides a quantified estimate of the magnitude of movements in the design earthquake. Analytical studies that have been done for the Eagle Mountain Landfill indicates a displacement of 6 to 12 inches during the design earthquake. This amount of movement is accommodated in the design of the liner system, LCRS system and gas system without jeopardizing the integrity of these systems.

IV. CEQA GENERAL FINDINGS

A. The Board finds that changes or alterations have been incorporated into the Project to mitigate or avoid significant impacts. These changes or alterations include mitigation measures and Project modifications outlined herein and set forth in more detail in the January 1997 FEIR/EIS.

B. The Board finds that the Project as approved includes an appropriate Mitigation Monitoring Program. This Mitigation Monitoring Program ensures that measures that avoid or lessen the significant Project impacts, as required by CEQA and the State CEQA Guidelines will be implemented as described.

V. MITIGATION MONITORING PROGRAM

Section 21081.6 of the Public Resources Code requires that when a public agency is making the findings required by State CEQA Guidelines Section 15901(a)(1), codified as Section 21081(a) of the Public Resources Code, the public agency shall adopt a reporting or monitoring program for the changes to the proposed Project which it has adopted or made a condition of approval, in order to mitigate or avoid significant effects on the environment.

A. Compliance with approved mitigation measures is to be achieved through two primary methods. Both methods integrate mitigation monitoring into existing processes, as encouraged by CEQA.

- The Regional Board will include the mitigation measures in the Waste Discharge Requirements, Order No. 99-061, and will direct staff to oversee the implementation of mitigation measures at the Eagle Mountain Landfill.

- The Regional Board will direct staff to monitor the effect of mitigation measures through inspections and review of self-monitoring and reporting programs, as indicated in the Self-Monitoring and Reporting Program No. 99-061, and revisions thereto, Eagle Mountain Status Report, and Project oversight.

THEREFORE, BE IT RESOLVED, that the Regional Board hereby adopts findings of mitigation and a mitigation monitoring program, as described herein, for Eagle Mountain Landfill; and be it

FURTHER RESOLVED, that the Regional Board certifies that compliance with the mitigation monitoring program is adequate to ensure the implementation of the mitigation measures described herein.

I, Philip A. Gruenberg, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Colorado River Basin Region on September 16, 1999.

Gary L. Harris
for Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

APPENDIX A
TO
FINDINGS OF MITIGATION
AND
ADOPTION OF MITIGATION MONITORING PROGRAM
FOR
KAISER VENTURES, INC. OWNER
KAISER EAGLE MOUNTAIN, INC., OWNER
MINE RECLAMATION CORPORATION, OPERATOR
EAGLE MOUNTAIN RECLAMATION, INC., OPERATOR
EAGLE MOUNTAIN CLASS III MUNICIPAL WASTE LANDFILL
Eagle Mountain – Riverside County

A. DISCHARGE PROHIBITIONS

1. The discharge of the following wastes as defined in Title 27 is prohibited at the Eagle Mountain Landfill site:

   a. Hazardous waste, except for waste that is hazardous due only to its friable asbestos content,
   b. Liquid waste (moisture content more than 40%)
   c. Items included under the metallic discharge ban, including white goods (i.e., large intact household appliances),
   d. Medical wastes,
   e. Designated wastes,
   f. Incinerator ash,
   g. Radioactive waste.

3. The discharge or deposit of wastes, which can cause erosion or decay, or otherwise reduce or impair the integrity of the containment structures, is prohibited.

4. The discharge or deposit of waste which is mixed or commingled with other wastes in the Landfill which could produce chemical reactions that create heat or pressure, fire or explosion, toxic byproducts, or reactions which, in turn:

   a. Require a higher level of containment than provided by this unit;

   b. Are "restricted hazardous wastes"; or

   c. Impair the integrity of the containment structure

   is prohibited.

B. DISCHARGE SPECIFICATIONS

3. The treatment or disposal of wastes at this waste management facility shall not cause pollution or nuisance as defined in Sections 13050(l) and 13050(m) of Division 7 of the California Water Code.

4. For ground water quality protection, the dischargers shall install the following:

   a. A composite liner over the entire base of the Landfill, meeting the minimum requirements of Subtitle D, 40 CFR, Part 258 and Title 27;

   b. An alternative composite liner on the side slopes meeting the minimum requirements of Subtitle D, 40 CFR, Part 258 and Title 27;

   c. A leachate collection and removal system (LCRS);

   d. LCRS sumps;

   e. An unsaturated zone liquid monitoring system (UZLMS) beneath the base of the Landfill that also functions as a secondary leachate detection, collection and removal system;

   f. An unsaturated zone gas monitoring system (UZGMS) beneath the entire Landfill which functions as a gas detection, collection and removal system;

   g. An active gas extraction system;

   h. A perimeter gas monitoring system;

   i. A daily, interim and final cover system;

   j. A surface water management system; and

   k. An ambient air monitoring system.

5. The dischargers shall construct the following liner systems for base, side slopes, benches and ridges, and final cover for the Eagle Mountain Landfill site:

   a. Base Liner – areas of the Landfill such as bottoms of canyons and pits with a foundation of grade of 3H:1V or less.

      1. The composite primary liner shall consist of:

         a. A 16-oz./yd^2 nonwoven needlepunch geotextile
         b. An 80-mil textured (both sides) HDPE geomembrane; and
         c. A two-foot thick soil liner with low permeability of K≤ 1 x 10^{-9} cm/s.

      2. The secondary composite liner shall consist of:

         a. A 16-oz./yd^2 nonwoven needlepunch geotextile
         b. An 80-mil textured (both sides) HDPE geomembrane; and
         d. A geosynthetic clay liner (GCL) with hydraulic conductivity of K≤ 1 x 10^{-9} cm/s.

b. Side slopes – areas of the Landfill with foundation grade greater than 3H:1V, including benches.

1. The composite liner shall consist of

a. A 16-oz./yd^2 nonwoven needlepunch geotextile
b. An reinforced GCL (K≤ 1 x 10^{-9} cm/s); and
c. An 80-mil HDPE, smooth on top and textured on the bottom.

c. Benches and Ridges - areas of the Landfill on the side slope with slopes of 3H:1V, or less.

1. The composite liner shall consist of

a. A 16-oz./yd^2 nonwoven needlepunch geotextile
b. A reinforced GCL (K≤ 1 x 10^{-9} cm/s); and
d. An 80-mil HDE (textured on both sides).

d. Interim cover shall consist of:

1. Daily cover composed of a minimum of 6 inches of compacted soil, or alternative material placed over the waste during or at the end of each working day; and

2. Intermediate cover composed of a minimum of 12-inch of compacted soil, or equivalent, placed over waste areas which shall be inactive for periods greater than 180 days; existing daily cover may be used as part of the intermediate cover.

e. The final cover for the Eagle Mountain Landfill shall be constructed as follows (in ascending order):

1. Foundation for final cover layer – a 24-inch thick layer low-permeability (upper 18 inches must have K ≤ 1 x 10^{-5} cm/s) soil layer to mitigate the effect of differential waste settlement and subsidence on the overlying low permeability layer, and provide a firm smooth subgrade for placement of lower permeability barrier layer (VLDPE).

2. VLDPE – A 40-mil very low-density polyethylene (VLDPE) (K ≤ 1 x 10^{-10} cm/s) geomembrane.

3. Geotextile – A 12-oz/yd^2 nonwoven needlepunch geotextile cushion.

4. Protection layer – A protection layer type B with K = 1 x 10^{-2} cm/s to protect the VLDPE from damage due to equipment traffic and the overlying erosion layer.

5. Geotextile – an 8-oz/yd^2 nonwoven or woven geotextile.

6. Erosion layer – a 24-inch thick coarse granular material shall be placed on top of the protection layer to control erosion that may be caused by storm water runoff, and to visually blend with the surrounding environment.

7. Slope of the final cover shall be no steeper than 3H:1V on the side and on the top of the Landfill, the slope shall be a minimum of 3 percent.

6. The interim and final covers for the Eagle Mountain Landfill shall:

a. Control odors, vectors and litter;

b. Minimize infiltration into the Landfill;

c. Control erosion and convey runoff to the storm water management system at manageable, non-scouring flow rates; and

d. Control and contain Landfill gas.

7. The dischargers shall cover disposed waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging. Any alternative materials of alternative thickness shall be approved by the Regional Board's Executive Officer prior to use. The dischargers shall demonstrate that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.

8. A compacted layer of at least 12 inches of intermediate cover shall be placed on all surfaces of the fill where no additional refuse will be deposited within 180 days.

11. East subphase shall be on the order of 10 to 40 acres to minimize:

a. The amount of leachate caused by direct precipitation onto the working phase; and

12. The dischargers shall design, install and operate a primary leachate collection and removal system (LCRS) immediately above the primary composite liner in the base, benches and ridges, and side slopes of the Landfill.

13. The LCRS at the Eagle Mountain Landfill shall:

a. Function without clogging through the active life of the waste management unit and during the post-closure maintenance period.

b. Maintain less than one-foot (1 ft.) depth of leachate over any of the Landfill liner.

c. Have a slope of 4% in the base, benches and ridges, and a slope of 1.5 (minimum) H:1V on the side slopes.

d. Remove twice the maximum anticipated daily volume of leachate from the waste management unit.

e. Consist of a permeable subdrain layer that covers the bottom of the waste management unit and extends as far up the side slopes as possible (i.e., blanket-type).

f. Be of sufficient strength and thickness to prevent collapse under the pressures exerted by the overlying waste, waste cover materials, and by any equipment used at the waste management units.

14. The LCRS shall consist of the following:

a. Drainage Layer

1. In the base area of the Landfill, and on benches and ridges, the drainage layer shall be 18 inches thick. The drainage material shall be gravel type A($K > 1$ cm/s, maximum particle size of 1.5 inches and not more than 3% passing a U. S. Standard No. 200 sieve). In the base area, an 18-inch thick protection layer shall overlie the LCRS with an 8-oz/yd^2 nonwoven, needlepunch, geotextile filter between drainage gravel (LCRS gravel) to control the potential for particle migration. In the benches and ridges, gravel Type A

shall be overlain by LCRS gravel Type B ($K \leq 1 \times 10^{02}$ cm/s, maximum particle size 1.5 inches, and fine content $\leq$ 5%) as a protection layer. An 8-oz/yd^2 nonwoven, needlepunch geotextile filter between Type A and Type B gravel shall be used to control the potential for particle migration.

2. In the side slope areas of the Landfill, the LCRS drainage layer shall be in the range of 3 feet to 20 feet in thickness and shall use LCRS gravel Type B as drainage material.

b. Drainage Corridor – Any leachate collected by the LCRS drainage layer shall flow by gravity to LCRS drainage corridors, which in turn shall direct the leachate to LCRS sumps or directly flow to LCRS sumps. Each drainage corridor shall be constructed as follows, so that leachate buildup does not occur:

1. A two-foot thick central core of coarse, granular drainage corridor gravel with hydraulic conductivity of at least 10 cm/s, a particle size of 2.5 inches and not more than 2% fine. The drainage corridor shall be separated from the composite liner by a 16-oz/yd^2 nonwoven, needlepunch geotextile cushion and a 0.5-foot thick layer of LCRS gravel Type A. A 1.5-foot protection layer Type A shall overlie the drainage corridor. The LCRS gravel shall be encapsulated by an 8-oz/yd^2 nonwoven, needlepunch geotextile to prevent any particle migration from surrounding materials.

c. Sumps

1. A total of ten LCRS sumps (two each in Phase 1 and Phase 2, and three each in Phases 3 and 4) shall be constructed, in the base of the Landfill, for collection and removal of any leachate that percolates into the LCRS.

2. The sumps shall be the lowest points in the Landfill to which any leachate flows.

3. The sumps shall be 50 x 40 in plan dimension and up to 6.5 feet in depth.

4. The sumps shall be filled with drainage corridor gravel with hydraulic conductivity of at least 10 cm/s.

5. An 18-inch thick protection layer (Type A) shall be placed above the drainage corridor gravel in the sumps.

6. An 8-oz/yd^2 geotextile shall encapsulate the drainage corridor gravel to control the potential for particle migration.

15. The dischargers shall direct any leachate removed from the LCRS sumps into a leachate management system for temporary onsite above ground storage tanks followed by transport to an approved wastewater treatment plant.

18. The dischargers shall test the LCRS on an annual basis to demonstrate that the system is functioning properly. The dischargers shall submit the test results to the regional board pursuant to Section II of Monitoring and Reporting Program No. 99-061, and revisions thereto.

19. The dischargers shall ensure that the foundation of the Landfill and the structures which control leachate, surface drainage, erosion and gas mitigation for this site, are constructed and maintained to withstand conditions generated during a maximum probable earthquake event.

20. Leachate sumps and interim and final berms shall be designed and constructed to withstand the maximum probable earthquake at the facility.

21. Leachate collection sumps shall be designed and operated to keep leachate levels at the minimum needed to ensure sufficient pump operation. Leachate collected shall be disposed of in accordance with local, state, and federal regulations.

22. The dischargers shall submit a detailed Leachate Management Plan acceptable to the Regional Board's Executive Officer for the Landfill 90 days prior to the disposal of any waste. This Plan shall estimate the quantity of leachate produced, the storage of leachate, and ultimate disposal of the leachate. The report should evaluate the quantity of the leachate produced from each unit and determine the maximum safe operating level for the leachate containment facilities. The plan shall provide a detailed assessment of alternative and disposal methods along with a plan for implementation of preferred alternatives. If recirculation of leachate is to be considered, the dischargers must demonstrate that the quantity of leachate being recirculated will not result in a solid-to-liquid ratio larger than 5:1 by weight in that phase of the Landfill.

23. The dischargers shall install a secondary leachate detection removal system or unsaturated zone liquid monitoring system (UZLMS) immediately underneath the first composite liner system in the base of the Landfill to monitor any leachate that might have penetrated through the primary composite liner.

24. The USLMS shall consist of:

    a. Unsaturated zone liquid monitoring layer

        1. This drainage layer shall be constructed of coarse, granular material with a minimum hydraulic conductivity of 1×10^{-1} cm/s.

        2. This layer shall be at least one-foot thick and have a minimum slope of four percent to promote flow to unsaturated zone monitoring stations.

    b. Liquid barrier:

        1. A liquid barrier shall be constructed immediately beneath the unsaturated zone liquid monitoring layer to provide a physical barrier to downward migration of liquid.

        2. The liquid barrier shall be constructed of an upper component consisting of an 80-mil HDPE (textured on both sides) geomembrane and a lower component, consisting of a geosynthetic clay liner (GCL) with hydraulic conductivity of 1×10^{-6} or less. A 16-oz/yd^2 nonwoven, needlepunch geotextile cushion shall be placed directly on the HDPE for protection.

    c. Unsaturated zone liquid monitoring stations:

        1. Monitoring stations shall be used to perform detection monitoring for liquids in the unsaturated zone immediately below the Landfill.

        2. Each monitoring station shall be located within each sump, and shall be capable of monitoring the area immediately beneath the LCRS sumps.

        3. A total of ten monitoring stations shall be installed at the Eagle Mountain Landfill.

25. An active gas detection, extraction, and monitoring system shall be installed at the Landfill. This system shall be comprised of the following components:

    a. Vertical gas extraction system with:

1. Approximately 1,000 vertical gas extraction wells shall be progressively installed within the Landfill. The perimeter vertical gas extraction wells shall be located approximately 150 feet inside the limits of the containment system on approximately 200-foot centers. Interior wells shall be approximately 300-400 foot centers. This system shall extract gas from the Landfill under a small vacuum. The system shall control gas by promoting Landfill gas flow from the waste toward the gas extraction wells.

2. landfill gas collected and removed by the gas extraction system shall be conveyed by a gas collection header and pipeline system to flare stations for ultimate treatment and disposal by thermal combustion.

3. Enclosed gas flares shall be installed in four areas along the southern portion of the Landfill, as shown on Attachment 29.

4. Condensate formed in the header pipe shall be drained by pumping from the condensate pump stations to dedicated condensate storage tanks equipped with secondary containment systems, or by pumping into the leachate transmission pipeline. Condensate formed in the header system shall not be drained into the gas extraction wells, the Landfill, or the LCRS.

b. Perimeter gas monitoring system: a gas monitoring system shall include the installation of permanent gas monitoring probes around the perimeter of the Landfill as well as monitoring of ambient air, and onsite structures for the presence of Landfill gas. In addition to methane, emissions from the surface of the Landfill shall be monitored periodically to ensure that emissions from the Landfill surface are within state and federal guidelines established by the SCAQMD. Detection of potential odors associated with the release of LFG and daily landfilling operations shall also be monitored on a regular basis.

   Perimeter gas monitoring probes shall be installed as follows:

   1. For waste up to 10 feet deep – A shallow probe 10 feet deep.

   2. For waste depth greater than 10 feet and less then 30 feet – A second probe (intermediate probe) to a minimum depth of 30 feet.

   3. For waste greater than 30 feet – A third probe (deep probe) to the depth of the waste.

   When the Landfill is completed, the site shall be ringed by a network of approximately 63 gas monitoring locations with up to three monitoring probes at each location. Probes shall be located between the limits of waste and the project boundary at a maximum spacing of about 1,000 feet, as shown on Attachment 29.

c. Unsaturated Zone Gas Monitoring System (UZGMS)

   1. Approximately 200 gas probes shall be installed every ten acres beneath the Landfill to locally monitor unsaturated zone gas quality, as shown on Attachment 30A, 30B, and 30C.

   2. Gas monitoring probes shall consist of ten-foot long sections of slotted high-density polyethylene (HDPE) pipes.

   3. HDPE pipes and probes, and associated pipe bending material, shall be designed to function under the load that will be imposed by the Landfill. The gas probe slot size shall be designed to prevent particulate clogging of the probe.

   4. The gas monitoring parameter shall be methane.

5. Monitoring shall be done from a sampling port at the Landfill perimeter by applying suction to the port with a positive-displacement, leak-tight vacuum pump.

6. Methane concentration of the gas shall be measured quarterly.

7. Monitoring shall be conducted by a third party, an independent contractor, and the results shall be submitted by a Civil Engineer or an Engineering Geologist, registered in the State of California.

26. For any material used for all or any portion of the UZGMS, UZLMS, base liner, LCRS, side slope liner, vertical gas collection removal system, daily, intermediate and final cover, the dischargers must demonstrate leachate compatibility, shear strength, under the applicable normal forces, and any other applicable requirements as stated in Specification 46 of this Board Order.

27. The exterior surfaces of the disposal area, including daily cover, and intermediate and final covers shall be graded and maintained to promote lateral runoff of precipitation and to prevent ponding.

29. Drainage features within the Landfill footprint shall be designed to accommodate the 100-year 1-hour, 100-year, 24-hour, and 500-year, 3-hour storm events.

30. A minimum depth of freeboard of two (2) feet shall be maintained for any storm event at all times in any sedimentation pond that received runoff from the Landfill.

31. The dischargers shall install a surface water management system at the Eagle Mountain Landfill. This surface water management system shall be designed to:

    a. Isolate the Landfill by diverting surface water runoff from adjacent areas around the Landfill footprint;

    b. Isolate the daily Landfill cell (i.e., active area with exposed waste) by diverting surface water runoff from Landfill areas with intermediate or final cover away from the active area;

    c. Limit infiltration, inundation, and ponding within the daily Landfill cell.

    d. Limit erosion, slope failure, washout, and overtopping of the surface water conveyance and retention structures; and

    e. Limit erosion of interim and final cover.

32. The following types of surface water management features shall be installed at the site:

    a. Interim drainage, erosion, and sediment control features within the Landfill footprint (on-Landfill), such as temporary detention basins, interim downchutes, interim swales, bench ditches, channels, side slope spillways, berms, silt fences, and hay bales, as shown on Attachments 16, 17, and 18, shall be designed to collect and control surface water flow during landfilling operations. These features may be modified periodically as landfilling operations progress.

    b. Final on-Landfill drainage, erosion, and sediment control features, such as final cover benches, downchutes, swales, final cover access road channels, and energy dissipators, shall be designed to collect and convey surface water flow across portions of the Landfill where the final cover has been constructed, as shown on Attachments 19, 20, 21, and 22.

c. Final off-Landfill drainage control, erosion, and sediment control features outside the Landfill footprint, such as haul road and maintenance road drainage channels, spillways, energy dissipators, and three detention basins, shall be designed to collect and convey surface water flow around the perimeter of the Landfill, as shown on Attachments 19, 20, 21, and 22.

33. The dischargers shall implement the following measures for surface water control at the Eagle Mountain Landfill:

a. Off-Landfill surface water runoff – during the progressive development of the Landfill, the noncontact water (surface water that does not come in contact with the waste) originating primarily from the drainage basins of the Eagle Creek and Bald Eagle Creek shall be controlled in stages by constructing three detention basins. The detention basins shall intercept the flow from these creeks and eventually discharge into the east bowl of the East Pit, or into a natural downstream watercourse.

b. On-Landfill surface water runoff (interim and final):

1. Noncontact surface water runoff within the boundary of the Landfill (i.e., precipitation that falls on the intermediate and final cover) shall be collected by a system of berms, ditches, downchutes, swales and drainage channels, and shall be diverted off the Landfill to the east bowl of the East Pit or to the natural courses offsite.

2. Any precipitation that falls on the working face of the Landfill and comes in contact with waste (contact water) shall be treated as leachate.

3. The working face of the Landfill shall be limited to one day of operation at a time, so as to minimize the amount of contact water.

c. Erosion control measures:

1. Where flow concentrations result in erosive flow velocities, surface protection such as asphalt, concrete asphalt, concrete riprap, or other erosion control material shall be used for protection of drainage conveyance features. Interim bench ditches shall be provided with erosion control material and riprap to control erosion where necessary.

2. Energy dissipators shall be installed to control erosion at locations where relatively high erosive flow velocities are anticipated.

3. Slopes on the Landfill shall be benched to control flow velocities.

4. Where high velocities occur at terminal ends of downchutes or where downchutes cross the final cover access roads, erosion control material shall be applied to exposed soil surfaces.

5. The interim detention basins in Phase 1 and final detention basins located along the north maintenance road shall also function as sediment basins as shown on Attachments 16 and 19.

6. Sediments shall be removed from the detention basins whenever the volume of the basin has been reduced by 25 percent of the basin's design capacity.

7. Silt fences, hay bales, and other measures as shown on Attachment 18 shall be used to control noncontact surface water runoff from Landfill areas where daily, intermediate and final cover have been placed, and from areas where Landfill containment system construction is occurring.

34. The dischargers shall use a network of nine surface water monitoring points (SW-1 to SW-9) to monitor the quality of surface water at the site. Five of the monitoring points (SW-1, SW-2, SW-3, SW-4, and SW-8) shall be used to monitor the quality of surface water runoff to establish background values. The remaining four monitoring points (i.e., SW-5, SW-6, SW-7 and SW-9) shall serve as compliance monitoring points. Surface water quality monitoring points are shown on Attachment 23, appended hereto as part of this Board Order.

36. The dischargers shall install a ground water monitoring system that consists of 27 downgradient point-of-compliance monitoring points (POCs) and nine upgradient background monitoring points (upgradient background wells) as shown on Attachment 23.

42. The dischargers shall, for any additional subphase, install additional ground water, soil-pore liquid, soil-pore gas, or leachate monitoring devices to comply with the Monitoring and Reporting Program of this Board Order, and revisions thereto. The dischargers shall submit to the Regional Board's Executive Officer 120 days prior to construction, the plan for these installations.

44. Methane, carbon dioxide and other Landfill gasses shall be adequately vented, removed from each subphase of the Landfill unit, or otherwise be controlled to prevent the danger of explosion, adverse health effects, nuisance conditions, or the impairment of beneficial uses of water due to the migration of gas through the unsaturated zone.

46. The dischargers shall submit to the Regional Board's Executive Officer, for review and approval, pursuant to Provision C.8.of this Board Order, "Final Construction Design Plans and Specifications" 120 days prior to initiation of construction of each subphase of the Landfill. The plans and specifications shall include the following:

    a. Criteria – the minimum acceptable criteria are as follows:

        1. Interim slopes shall have a safety factor of 1.35.

        2. Final slopes shall have a safety factor of 1.5.

        3. A small increase in shear strength not greater than represented by a dilation angle of 3° may be used to account for the kinematic constraints imposed by side slope benches.

        4. Increases in calculated two-dimensional (2-D) factors of safety to account for three-dimensional (3-D) conditions shall not exceed a factor of 1.05. Any correction factors greater than 1.05 must be supported with specific 3-D analyses for the critical surfaces of the Landfill subphase.

    b. Engineering Designs and Analysis – detail designs and analysis of all portions of the project shall include:

        1. Details of the minimum requirements (e.g., shear strength) associated with each element of the Landfill system required to meet slope stability criteria.

        2. Slope stability analyses shall explicitly model the actual liner slopes, including benches. The actual residual shear strengths corresponding to the actual liner interfaces shall be employed in the analyses.

        3. Seismic and status slope stability calculations for all slopes under the appropriate range of loading conditions.

        4. Evaluation of 3-D geometry effects for both interim and final slope conditions. This evaluation shall include the possibility that 3-D stability within lined canyons may be less

than that calculated for 2-D stability conditions. The potential increases in computed factors of safety for the effect of 3-D effects may be incorporated in the design of the slope. However, these factors must correspond to minimum acceptable criteria set forth in Specification 46.a. of this Board Order.

5. Calculations of the minimum factor of safety for interim and final slopes, pursuant to Specification 46.a.1 and 2.

6. Leachate head calculations.

7. Drainage system flow calculations.

8. Settlement analyses of the foundation, liner system and waste.

9. Analyses indicating the capability of the material used for containment systems such as HDPE, GCL, CT, or any other material to withstand the anticipated overburden pressures plus the weight of any operating equipment used that could cause axial loading on the containment system. It is noted that the maximum overburden pressures shall be approximately 42,000 lb/ft^2.

10. Any other applicable analysis.

c. Construction Drawings and Specifications – detailed sets of construction drawings and specifications with sufficient detail to build the Landfill containment system. The construction plans shall include horizontal coordinates (± 0.1 ft), elevations (± 0.1 ft), and grades (± 0.1%). The plan should show locations of all interim and permanent berms, ditches, downchutes, sumps, benches and ridges, pipe connection details, liner overlaps, liner seaming or welding, and layer minimum thickness.

d. Detailed Fill Plan – the fill plan detailing the limits of acceptable interim geometries for all locations of the Landfill subphase. All phases of construction where waste and/or fill is being placed over the completed liner system shall be considered to be interim waste slopes. Such slopes shall be designed to meet a minimum slope stability factor of safety of 1.35, using appropriate shear strengths of the materials involved, including residual shear strengths, where geosynthetic materials are involved.

e. Construction Quality Control-Quality Assurance – A Construction Quality Control-Quality Assurance (CQC-CQA) plan to be implemented during construction of the containment system by an independent engineering firm that is not owned in whole or in part by the dischargers. This plan shall contain, at a minimum, the following:

1. Quality control/quality assurance procedures for each geosynthetic and fill material to be incorporated within the Landfill liner and cover system.

2. Detailed testing, inspection, and acceptance criteria for each geosynthetic and fill material to be incorporated within the Landfill liner and cover system.

3. Detailed foundation acceptance criteria and acceptable interim waste slopes.

4. A plan for:

a. Performing interface shear strengths, prior to liner installation, using the specific geosynthetic materials specified for different elements of the liners. The test shall be performed for the range of normal stress, moisture conditions, and displacement rates applicable with field conditions: and

b. Determination of shear strength values which must be equal to or greater than the shear strengths employed in the slope stability analyses performed during final design.

f. Contractor Quality Control – each contractor or manufacturer is responsible for implementing their own quality control plan as required by the detailed construction specifications. All materials and workmanship shall be tested in accordance with the quality control-quality assurance plan. All tests may be observed by the CQC-CQA firm, and all test results shall be submitted to the CQC-CQA firm for review and approval.

g. Field Changes

1. Construction drawings and specifications shall be developed to minimize, to the extent feasible, the need for "significant field changes". "Significant field changes" include, but are not limited to:

a. Changes in material specifications,

b. Changes in soil liner compaction criteria,

c. Changes in liner system component thickness,

d. Increase in side slope grades,

e. Decrease in bottom slope grades,

f. Decrease or increase in the height of the slopes,

g. Decrease or increase in the width of benches, and

h. Changes to the Landfill grading plan.

2. A plan outlining the following steps, which should be taken if a "significant field change" is found to be necessary:

a. The contractor shall notify the construction manager or the owner regarding the proposed change.

b. The construction manager or owner shall have the design engineer review the proposed change. The review shall include any engineering analyses that need to be done to ensure that all design criteria are met with the proposed change.

c. The dischargers shall submit the proposed change to the Regional Board's Executive Officer for review and approval. The proposed change shall be accompanied by an explanation for the change, a copy of the engineering analyses, and any changes to the design drawings and specifications.

d. The Regional Board's Executive Officer shall approve the proposed changes before it can be implemented. Such approval shall not be given unless supported by slope stability analyses demonstrating that the field changes do not result in slope stability factors of safety less than the minimum acceptable values.

47. The dischargers shall compact the fill at least 90 percent relative compaction in areas with fine tailings, alluvial soil, or any other soil material used as a part of the liner in accordance with ASTM Standards.

50. A periodic load checking program shall be implemented to ensure that hazardous materials are not discharged at the Landfill. The plan for the program must be acceptable to the Regional Board's Executive Officer and to the Department of Health Services pursuant to Title 27. The plan for the program shall include, but not be limited to:

    a. Number of random loads to be checked per day,

    b. Description of training program for onsite personnel and contract waste haulers,

    c. Record keeping and reporting program,

    d. Program implementation schedule, and

    e. Alternatives for waste found to be not in compliance with this Board Order.

54. Wastes shall not be placed in or allowed to contact ponded water from any source.

55. The dischargers shall remove and relocate any wastes that are discharged at this site in violation of these requirements.

60. Waste material shall not be discharged on any ground surface that is less than five feet above the highest anticipated ground water level.

C. PROVISIONS

24. The dischargers shall submit a detailed post earthquake Inspection and Corrective action Plan to be implemented in the event of any earthquake generating ground shaking of Modified Mercalli Intensity V or greater at or near the Landfill. The Plan shall describe the containment features, ground water monitoring, leachate control facilities, and gas monitoring facilities, potentially impacted by the static and seismic deformations of the Landfill. The Plan shall provide for reporting results of the post earthquake inspection to the Regional Board within 18 hours of the occurrence of the earthquake. Immediately after an earthquake event causing damage to the Landfill structures, the corrective action plan shall be implemented, and this Regional Board shall be notified of any damage.

38. The dischargers shall submit a report every five years that either validates the containment and monitoring systems ongoing viability, or poses and substantiates any needed changes (e.g., a documented increase in the monitoring systems' ability to provide reliable early detection of a release can cause a decrease in the Landfill financial coverage). The report due date is within five years of the date of adoption of this Board Order, and every five years thereafter.