**STATE OF CALIFORNIA**
**REGIONAL WATER QUALITY CONTROL BOARD**
**CENTRAL COAST REGION**

**STAFF REPORT FOR REGULAR MEETING OF MAY 10-11, 2007**

**ITEM NUMBER** **18**

**SUBJECT** **Revised Waste Discharge Requirements Order No. R3-2007-0022, For Jolon Road Closed Class III Landfill, Monterey County**

**KEY INFORMATION**

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|---|---|
| Location: | West of Jolon Road, approximately 3.5 miles southwest of King City off of U.S. Highway 101 in Section 30, Township 20 South, Range 8 East, as shown on Figures 1 and 2 of Waste Discharge Requirements Order No. R3-2007-0022. |
| Discharger: | Salinas Valley Solid Waste Authority (Discharger) owns the closed Jolon Road Landfill (landfill) |
| Type of Waste: | Non-hazardous municipal solid waste |
| Waste In Place: | 432,000 cubic yards of air space |
| Current Capacity: | 568,000 cubic yards of air space |
| Disposal: | Canyon cut and area-fill method |
| Liner System: | 15.7 acres are unlined; 1.3 acres are lined |
| Groundwater Contamination: | Low-level volatile organic compounds (VOCs) in groundwater and surface water |
| Existing Orders: | Waste Discharge Requirements Order No. 01-032, and State Water Resources Control Board Water Quality Order No. 97-03 DWQ (General Industrial Storm Water Permit) |
| **This Action:** | **Adopt Waste Discharge Requirements Order No. R3-2007-0022.** |

**SUMMARY**


The proposed Waste Discharge Requirements Order No. R3-2007-0022 (hereafter "Order" or "Order No. R3-2007-0022") specifies minimum landfill design and operation modifications to protect water quality.

Updates to the proposed Order include:

a. Updated groundwater impact information and schedule for the corrective action plan submittal;
b. Specifications for landfill cover design and schedule for closure construction; and
c. Updated geological and hydrogeological information.

The proposed Order updates and replaces Waste Discharge Requirements Order No. 01-032, adopted by the Regional Board on May 18, 2001. This updated Order benefits water quality by specifying minimum requirements for the cover design and groundwater remedial action.

Proposed Order No. R3-2007-0022 and Monitoring and Reporting Program No. R3-2007-0022 are included as Attachment 1.

Design and construction specifications within the proposed Order meet or exceed requirements in both CCR Title 27 and 40 CFR 257 and 258, both of which pertain to siting, design, construction and post-closure care of solid waste management facilities.

## DISCUSSION

### Landfill Description and History

Figure 3 of the proposed Order shows the current landfill configuration. The landfill site consists of two parcels totaling 496 acres encompassing the 57-acre landfill boundary permitted for Class III refuse disposal. The closed landfill has 17 acres of in-place waste, with a 1.3-acre lined cell (Module 4A) constructed with a geocomposite clay bottom liner system that meets Federal Subtitle D requirements (Figure 3). The remaining 15.7 acres of the landfill (Modules 1, 2, and 3) were constructed before the Federal Subtitle D requirements, and therefore do not have a bottom liner.

The landfill was constructed as a typical "canyon fill" whereby areas of the canyon walls and bottom were excavated to provide cover soil as the canyon was filled with waste. The landfill began sanitary landfill operations in 1977 and operated until March 1997, when the landfill was closed and an interim transfer station opened at the site. Waste received at the transfer station is shipped to the Johnson Canyon Landfill in Gonzales.

Septage waste was placed in a land treatment area at the west end of the landfill until 1997, when the practice was discontinued and the septage material transferred to the landfill interim cover.

Land use within 1,000 feet of the landfill is permanent grazing and farming. The nearest residential structure is located approximately 2,500 feet west of the landfill. The nearest domestic well is located approximately 2,000 feet southeast of the landfill.

The landfill was owned and operated by USA Waste of California (Waste Management) from 1977 until closure in 1997, when the Salinas Valley Solid Waste Authority (Discharger) leased the property and assumed operations. In turn, Waste Management assumed operation of the landfill in June 2004, when the Discharger's lease of the property expired. In May, 2006, the Discharger purchased the property from Waste Management. The Discharger continues to manage the transfer station and the closed landfill.

### Compliance History

Since Order No. 01-032 was adopted in 2001, the Discharger has had a continued violation for a release of volatile organic compounds to groundwater (discussed below). In 2005, the Discharger did not submit monitoring reports as landfill ownership was changing. However, since the ownership change, the Discharger has conducted various landfill maintenance tasks to protect groundwater and surface water resources. These include:

a. Improvements to erosion and sediment controls in interim cover area
b. Diligent maintenance of vegetation and cover soil to stabilize slopes and control rodent bioturbation of the interim cover
c. Removal of blockage in the leachate collection and recovery system
d. Diversion, collection, and handling of spring discharge water naturally elevated in total dissolved solids and containing trace concentrations of volatile organic compounds

Between 2000 and 2006, the Discharger has conducted several phases of field investigation associated with an evaluation monitoring program to characterize the nature and extent of groundwater impacts at the toe of the closed landfill. In an August 2006 letter, Water Board staff concurred with the Discharger that the evaluation monitoring program was complete, provided that some additional aquifer permeability data was obtained for the engineering feasibility study. The results of the evaluation monitoring

program serve as the basis for a revised engineering feasibility study (March, 2006). The feasibility study proposes to remediate the limited groundwater impact and spring discharge using phytoremediation and natural attenuation. In a letter dated March 16, 2007, the Executive Officer approved the proposed corrective action, to be implemented by April 2008.

In addition to the evaluation monitoring program, the Discharger has conducted a geologic site characterization, involving several phases of field work and independent third party review, to evaluate whether or not the Jolon landfill site is suitable for a large regional landfill. The March 2002 Geologic Site Characterization report concluded that the landfill site is suitable, based on the absence of recent (Holocene) faulting and naturally poor groundwater quality below the site. However, the Discharger is not pursuing expansion of the landfill at this time.

In a January 28, 2005 letter to the Discharger, the Water Board required that the Discharger submit a Final Closure and Post-Closure Maintenance and Monitoring Plan, including a time schedule for final closure of the landfill, by May 2005. At the time, the landfill closure and post-closure responsibility was under dispute between the current Discharger and Waste Management. However, the current Discharger did submit a Closure Plan, but with a proposed final closure date of October 2010. Since taking over ownership of the landfill, the current Discharger agreed to complete the final closure construction by December 31, 2007. The Discharger proposes an evapotranspirative cover as an alternative cover design.

## Proposed Order Changes

This proposed Order updates chemical, geological, and hydrogeological information obtained during groundwater investigations, establishes a closure construction date, and specifies closure and post-closure criteria. In addition, the proposed Order outlines the groundwater corrective action.

The Monitoring and Reporting Program was last modified by the Executive Officer on May 22, 2001. Staff proposes making minor revisions at this time to adjust the wells sampled in the monitoring well program, and the analytical requirements. In addition, the proposed Monitoring and Reporting Program includes five-year post-closure field monitoring and reporting requirements necessary to evaluate the performance of the alternative cover (in terms of percolation of rainfall through the cover).

## Geology

The landfill canyon and immediately adjacent upland areas are underlain by sedimentary bedrock of the Miocene age Monterey Formation. Alluvial, colluvial, and local landslide deposits, eroded from the adjacent upland areas, overlie the Monterey Formation in the landfill canyon. The maximum thickness of alluvial/colluvial deposits is approximately 50 feet; however, beneath the waste footprint, most of the alluvium/colluvium was removed to make room for waste and for use as daily cover.

The Monterey Formation in the landfill area consists mainly of diatomaceous siltstone, with minor interbeds of claystone, dolomitic siltstone, and chert. The Monterey Formation is thin to massively bedded with chert and siltstone beds fractured into randomly oriented blocks one to six inches across. Fractures are locally filled with calcium carbonate, gypsum, or fine grained pyrite. The upper 50 to 230 feet of the Monterey Formation is moderately weathered. The Quaternary age alluvium consists of locally derived loose to medium dense clayey sand to sandy silt.

Findings 19 through 21 in the proposed Order provide a detailed description of the landfill geology, including stratigraphy and faulting.

## Hydrogeology

Groundwater occurs as deep as approximately 70 feet below ground surface in the canyon uplands and surfaces directly east of the landfill, where it discharges to the spring and creates a seep in the sediment retention basin. Groundwater occurs in two units beneath the landfill: the bedrock of the Monterey Formation, and the overlying alluvial/colluvial deposits. Groundwater in the bedrock moves principally through fractures, because the primary permeability of the siltstone and shale is very low. The bedrock at the landfill is sufficiently fractured such that it transmits groundwater similar to a porous medium.

Regionally, the groundwater in the bedrock has a variable flow direction, but in the landfill canyon hydraulic heads suggest groundwater parallels topographical gradient. Groundwater occurs sporadically in the alluvial deposits because of the variable elevation of the top of bedrock and thickness of the alluvium. The alluvium is absent in some areas beneath and around the landfill because of excavation activities. The alluvium has a saturated thickness of approximately 14 feet at the toe of the landfill near monitoring well JR-J2. As groundwater moves down canyon, groundwater intersects the waste at one or more locations.

Native groundwater quality beneath the site is poor (brackish), with a concentration of total dissolved solids of approximately 4,700 mg/L, sulfate of 2,400 mg/L, and chloride of 430 mg/L according to samples collected from background monitoring wells (JR-J1 and JR-J10). In addition, cadmium, selenium, molybdenum, and arsenic are detected in groundwater at the landfill.

Based on aquifer tests, estimates of hydraulic conductivity for the alluvium and bedrock are similar. Groundwater velocities are likely highly variable, but average approximately 10 feet per year at the landfill, based on a measured potentiometric gradient of 0.04, mean calculated hydraulic conductivity of 1.5 x $10^{-5}$ centimeter per second, and effective porosity of 0.06.

Findings 22 and 23 in the proposed Order provide detailed hydrogeologic information.

## Groundwater Monitoring

Groundwater sampling has been conducted at the landfill since 1977, when landfill operations began. Currently, groundwater samples are collected and analyzed for select inorganic parameters and VOCs on a semiannual basis, and for a comprehensive analyte list every five years.

Groundwater monitoring wells are screened in both the alluvium and underlying bedrock. The locations of groundwater monitoring wells are shown on Order Figure 3. As part of the detection monitoring program, 11 monitoring wells are sampled on a semiannual basis.

Monitoring and Reporting Program No. R3-2007-0022 (Attachment 1) provides comprehensive details regarding the monitoring program along with its associated organic and inorganic water quality monitoring parameters.

## Leachate Management System

Landfill leachate is collected by gravity drainage from the 1.3-acre lined portion of the landfill and temporarily stored before it is applied over lined portions of the landfill as dust control. During spring 2006, the daily average volume of leachate collected was approximately 400 gallons. After completion of closure construction, an alternative disposal

method will be required for the landfill leachate.

## Landfill Gas Monitoring

Four landfill soil-gas monitoring probes are located around the perimeter of the landfill (Figure 3). Because of the landfill's small size, and lack of consistent elevated detections of landfill gas (methane), a landfill gas control system has not been installed. The soil-gas probes are not used as sentinel monitoring devices for potential releases to groundwater because of the shallow or non-existent vadose zone at the landfill.

## Groundwater Degradation

Limited groundwater degradation occurs at the downgradient edge of the landfill. The evaluation monitoring program concludes that the VOC contamination results from groundwater coming in contact with waste at the base of the landfill, or from the infiltration of leachate, rather than from the dissolution of landfill gas. The VOC impact is isolated in the area between the edge of waste, the sediment basin and the spring discharge (Figure 3). Impacted groundwater occurs within both the alluvial and bedrock units to a depth of approximately 25 feet below ground surface. Detected VOC constituents include perchloroethene (PCE), and associated breakdown byproducts trichloroethene (TCE), and cis-1,2-dichlorethene at concentrations ranging from trace to above practical quantitation limits. VOC concentration trends appear stable in well JR-J2 but are increasing in the spring discharge.

## Groundwater Remediation

The Discharger proposes to remediate the low-level VOCs (PCE and breakdown products) in groundwater using a combination of phytoremediation (plant uptake) and natural attenuation. This is a feasible approach given that the PCE is naturally degrading, and that the flux of groundwater at the toe of the landfill is very low. A secondary benefit of the phytoremediation is that the plant transpiration will lower the water table beneath the toe of the landfill.

## Surface/Storm Water

The landfill is covered under the State Water Resources Control Board's General Permit for Storm Water Discharges Associated with Industrial Activities. Storm water is sampled twice yearly, including the first storm that produces a discharge during regular business hours. Surface water monitoring consists of sampling the spring discharge for detection monitoring parameters on a semiannual basis.

# PROPOSED ORDER CONTENTS

## General Information

The section includes discussions of the site's description and history, waste type and classification, geology and hydrogeology, groundwater, storm water and surface water, water quality, control systems and monitoring programs, beneficial uses of the water, and surrounding land use.

## Compliance with other Regulations, Orders and Standard Provisions

This section directs the Discharger to:

a. Comply with all applicable requirements contained in CCR Title 27 and 40 CFR 257 and 258.

b. Comply with State Water Resources Control Board Water Quality Order No. 97-03-DWQ, which addresses storm water associated with industrial activities, commonly referred to as "General Industrial Storm Water Permit."

**Prohibitions**

The discharge prohibitions outlined in the Order are applicable to Class III waste disposal.

**Specifications**

These are specifications that the Discharger must meet and/or implement to comply with site specific aspects of CCR Title 27 and 40 CFR 257 and 258 pertaining to solid waste disposal practices. These specifications include requirements for the final cover, including engineered alternatives; requirements for capacities of drainage facilities; and Discharger obligations over the 30-year post-closure compliance period.

**Water Quality Protection Standards**

These standards outline constituents of concern, monitoring parameters, concentration limits, monitoring points, points of compliance, and compliance period.

**Provisions**

This section addresses the Discharger's responsibilities regarding landfill-related impacts to water quality and provides: Water Board access to the landfill and related reports, Order severability, discharge conditions, reporting and implementation provisions, a termination clause, financial assurance mechanisms, wet weather operations provisions, and dates for completion of closure construction, implementation of the corrective action, and submittal of the deed restriction.

**MONITORING AND REPORTING PROGRAM (MRP) CONTENTS**

**Part I - Monitoring and Observation Schedule**

This section contains the following requirements: periodic routine landfill inspections, intake monitoring, drainage system inspections, rainfall data collection, pollution control system(s), landfill monitoring (groundwater, surface water, leachate and gas), analytical monitoring of groundwater and gas monitoring parameters, and constituents of concern, and quarterly determination of groundwater flow rate and direction.

**Part II - Sample Collection and Analysis**

This section establishes criteria for sample collection and analysis, methods to determine concentration limits, and specifies how these records shall be maintained. This section also establishes acceptable statistical and non-statistical methods the Discharger must use to perform data analysis, and outlines acceptable re-test procedures.

**Part III – Statistical and Non-statistical Analysis of Data**

This section outlines the methods that will be used to analyze monitored constituents for evidence of a release.

**Part IV - Reporting**

This section establishes formats and requirements that the Discharger must follow when submitting analytical data, semiannual reports, and other written summaries to the Water Board. It includes notification requirements, contingency responses and reporting requirements.

This section also outlines the requirements of monitoring and determining the performance of the alternative cover.

**Part V - Definition of Terms**

This section defines a number of terms used in the MRP.

## ENVIRONMENTAL SUMMARY

This current project involves an update of Waste Discharge Requirements initiated by the Discharger. These Waste Discharge Requirements are for an existing facility and as such are exempt from provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Title 14, California Code of Regulations, Chapter 3, Section 15301.

## COMMENTS

The Staff Report, draft Order, and MRP No. R3-2007-0022 were distributed to a list of interested parties and agencies that have been historically involved with the landfill. Written comments received on the draft Order and MRP No. R3-2007-0022 are included in Attachment 2. All submitted comments were considered and addressed upon receipt or had previously been covered in the original draft version. Interested parties only commented on the MRP. These were provided by the Discharger's consultant, Geomatrix, as part of the Engineering Feasibility Study. Geomatrix' key comments, followed by Water Board staff's responses, are as follows:

1) Based on the extensive period of monitoring (30 years), date of landfill closure (1997), and history of chemical detections in leachate and downgradient groundwater, Geomatrix argued that analysis should be restricted to a subset (including historically detected) of analytes and not the full Subtitle D, Appendix II to 40 CFR, Part 258 analytical suite for Constituents of Concern (monitored every five years). Similarly, for semiannual monitoring parameters dictated by the current MRP, Geomatrix argued that the VOC analyte list in USEPA Method 8260B should be abbreviated to known detections, and not the full 8260B suite consisting of 57 analytes. The primary reason for the proposal to abbreviate the analyte list is to reduce the occurrence of false positives.

*Staff's Response: We understand the concern for the potential resource expenditure resulting from false positives. However, we do not agree with the argument that a potential future release will be limited to analytes found in the historical record. In addition, COC samples are collected only once every five years, thus excessive confirmation sampling that may result from a false positive event is unlikely. Staff is familiar with common laboratory contaminants and disinfection byproducts such that confirmation sampling will not be triggered by sporadic trace concentrations of these contaminants/byproducts. Therefore, we have not modified the analytical suite for each COC and monitoring parameter, within the MRP.*

2) Given the poor inorganic quality of the groundwater at the site, and firm understanding of the natural spatial variability of the inorganic constituents based on many years of monitoring, and the fact that these constituents are less concentrated in leachate than in groundwater, Geomatrix argued that inorganic constituents should not be used as detection monitoring parameters for indication of a release to groundwater. Likewise, physical parameters monitored in the field (pH, electrical conductivity, and temperature) are not good indicators of a release because of associated imprecision with field measurements. Rather, VOCs are the best indicator of a release, because VOCs have already impacted groundwater at one downgradient location.

*Staff's Response: We concur with the request to remove field parameters and inorganic*

*parameters from the monitoring parameter list. However, we have retained these parameters as required analyses in order to continue tracking inorganic water quality during and after placement of the landfill final cover and implementation of phytoremediation. Graphical presentation of these parameters shall continue but development of associated Concentration Limits is not necessary.*

Copies of the proposed Order were sent to the downgradient property owner, Delicato Vineyards. No formal written comments were received. During a March 26, 2007 phone conversation between staff and Mr. Clyde Hoover of Delicato, Mr. Hoover stated that Delicato's main interest is that the landfill is not expanded and that the Discharger continue to monitor groundwater. Mr. Hoover stated that he is pleased that the landfill will receive a final cover later this year.

During review of the Order that was distributed for public comment, Senior staff noticed a couple of provisions that were missing from the Order. First, the Order was missing a provision for the corrective action, including corrective action details and schedule. Second, the Order did not include sufficient details (schedule, required materials) for filing of the deed restriction for the landfill property. These two provisions were subsequently added to the proposed Order.

## RECOMMENDATION

Adopt proposed Waste Discharge Requirements Order No. R3-2007-0022.

## ATTACHMENTS

1. Proposed Waste Discharge Requirements Order No. R3-2007-0022.
2. Comments on Draft WDR and MRP No. R3-2007-0022

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