

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

STAFF REPORT FOR REGULAR MEETING OF FEBRUARY 5, 2009

ITEM NUMBER: 15

SUBJECT: Revised Waste Discharge Requirements Chicago Grade Class III Landfill, San Luis Obispo County – Order No. R3-2009-0001

KEY INFORMATION

Location: Four miles northeast of the City of Atascadero
Owner/Operator: The Chicago Grade Landfill and Recycling, LLC owns the Chicago Grade Class III Landfill ("Landfill"); Chicago Grade Landfill, Inc. operates the Landfill.
Type of Waste: Non-hazardous municipal solid wastes.
Design Capacity: 10.6 million cubic yards of waste
Remaining Capacity: 8.8 million cubic yards; estimated closure date of 2042
Disposal: Land, based on area fill module method
Liner System: Lined (Modules 2, 3, and proposed Modules 4, 6, and 7) and unlined (Module 1).
Existing Orders: Waste Discharge Requirements, Order No. R3-2004-0002.
THIS ACTION: Adopt Waste Discharge Requirements Order No. R3-2009-0001

SUMMARY

Proposed Waste Discharge Requirements Order No. R3-2009-0001 ("Order" or "Order No. R3-2009-0001"), and proposed Monitoring and Reporting Program No. R3-2009-0001 ("MRP") for the Chicago Grade Class III Landfill (Landfill) specify landfill design and operation modifications to protect water quality. The revisions proposed in Order No. R3-2009-0001 (Attachment 1) and the Monitoring and Reporting Program (MRP) (Attachment 2) update the groundwater monitoring network and regulatory and operational status of the Landfill. The proposed Order includes:

- 1) Provision that requires the Discharger to address groundwater monitoring data gaps.
- 2) Provisions for expansion of landfill facility and permitted area to allow for proposed lined Modules 6 and 7.
- 3) Compliance review of the 188-acre landfill facility.
- 4) Updated environmental monitoring information.
- 5) Specification for constructing and operating the Landfill in compliance with California Code of Regulations (CCR) Title 27 (Title 27) and Code of Federal Regulations (CFR) Title 40 Part 258 (40 CFR 258).
- 6) Specifications that new Landfill liner designs must meet regulatory Prescriptive Designs or have engineered alternative designs that meet or exceed the performance of the Prescriptive Design with concurrence from the Central Coast Regional Water Quality Control Board (Water Board) Executive Officer.
- 7) Specifications for disposal of treated wood waste

The proposed Order benefits and protects groundwater and surface water through required engineering controls and monitoring. For instance, the proposed Order requires the Discharger to evaluate background groundwater quality and provide a plan to install a new monitoring well to aid in that evaluation. Groundwater monitoring is an important control mechanism to ensure that landfill containment systems (e.g., bottom liners, leachate collection and removal systems, and landfill gas recovery systems) are operating as designed to eliminate waste constituent migration to waters of the state.

DISCUSSION

The proposed Order updates and replaces Waste Discharge Requirements Order No. R3-2004-0002, adopted by the Water Board in May 2004. The proposed Order covers the current landfill operations and provides guidance and requirements for planned changes at the Landfill. For the lined portion of the facility, design and construction specifications within the proposed Order meet or exceed requirements in both the California Code of Regulations (CCR) Title 27, and Title 40 Code of Federal Regulations, Parts 257 and 258, both of which pertain to design of solid waste management facilities.

Since 2004, the Landfill has undergone operational changes and environmental control improvements that include:

- Enhancement of landfill gas recovery system via installation of new landfill gas recovery wells and a larger flare, allowing for better control of the migration of methane and volatile organic carbon compounds (VOCs).
- Installation and waste disposal over composite-lined Module 3.
- Improved stormwater run-on controls east of the waste recycling facilities to reduce commingling of stormwater with waste.

FACILITY DESCRIPTION: The Landfill is located in San Luis Obispo County, at 2290 Homestead Road, approximately four miles northeast of the City of Atascadero (Order Figures 1 and 2). The Landfill is located approximately one and one-half miles east of the Salinas River. Chicago Grade Landfill and Recycling, LLC owns and Chicago Grade Landfill, Inc. operates the Landfill, which serves the City of Atascadero and communities of Templeton, Santa Margarita, unincorporated areas of San Luis Obispo County, northern portions of Santa Barbara County, and occasionally Monterey County.

The Landfill's property boundary encompasses approximately 188 acres. The current waste footprint occupies about 34 acres. The Landfill consists of unlined and lined disposal areas. Existing waste modules (Modules 1, 2, and 3) and proposed future waste modules (Modules 4, 6, and 7 [Module 5 will not be developed]) will cover approximately 76.4-acres, as indicated on Proposed Order Figure 2. A recycling area covers approximately five acres in the northeast corner of the Landfill property.

As of April 2008, approximately 1.8 million cubic yards of waste have been discharged at the Landfill (Modules 1, 2, and 3). At present waste disposal rates, the Landfill will reach capacity in 2042.

Land use within a one-quarter mile radius of the Landfill consists primarily of low-density rural residential usage, agricultural use (cattle grazing) and unimproved watershed areas. Several single-family residences, including associated domestic supply wells, are located along Homestead Road west of the Landfill, the closest residence being approximately 1,500 feet from

the Landfill. East of the Rinconada Fault (described below) and in the vicinity of the Landfill, approximately 20 domestic water supply wells are completed in the Monterey Formation. West of the Rinconada Fault and in the vicinity of the Landfill numerous domestic wells are completed in the older alluvial deposits to depths of 300 to 400 feet (elevation 700 to 600 feet above mean sea level).

GEOLOGY: The Landfill is located in hills east of the Salinas River. The Landfill is situated on the east side of a small north-south trending canyon, which merges immediately north of the Landfill with a larger east-west trending unnamed canyon.

A thick sequence of sedimentary rocks of the Monterey Formation and the Paso Robles Formation overlies a granitic basement rock from the Franciscan complex beneath the site. The Paso Robles Formation is exposed at the surface and is approximately 300 feet thick at the eastern margin of the Landfill facility but is absent locally in the western portion of the Landfill where the underlying Monterey Formation is exposed. The Monterey Formation consists primarily of fractured and folded siliceous mudstone and shale of marine origin. Alluvium, comprised of sediments from the Paso Robles and Monterey Formations, chiefly occurs in the drainage courses at the Landfill.

The Landfill generally overlies a clay to clayey gravel unit of the Paso Robles Formation. This unit has a maximum thickness of approximately 35 feet and is underlain by a conglomerate/gravel unit of the Paso Robles Formation. Geologic cross sections indicate that the clay unit pinches out beneath the northwest corner of the Landfill, where the landfill overlies the conglomerate and gravel unit. The conglomerate and gravel unit is locally discontinuous and has a maximum thickness of approximately 50 feet. The bedding in the Paso Robles Formation generally dips slightly to the east and strikes north-northwest.

SEISMOLOGY: The Landfill is located 1 mile east of the Rinconada fault. There are two small north-south trending inactive faults located through Modules 3 and 4. No known active (Holocene) faults are located within 200 feet of the Landfill.

SURFACE AND GROUNDWATER: The Landfill is located within the Salinas Hydrologic Unit east of, and approximately 400 feet above the Salinas River floodplain. Surface water runoff in the general vicinity of the Landfill flows predominantly toward the west to southwest. Drainage from the Landfill enters an unnamed ephemeral creek located immediately north of the Landfill, which flows west toward the Salinas River.

The Landfill is designed to divert runoff from above the Landfill away from waste. Stormwater runoff from the active landfill area is directed to a sedimentation basin located immediately west of Module 2 (Proposed Order Figure 2). The overflow from the sedimentation basin flows to the unnamed ephemeral creek described above. The basins are designed to have a volume capable of holding stormwater runoff from a 1/2-inch rain event.

The main groundwater producing formations in the vicinity of the Landfill are the alluvium and the Paso Robles Formation. Beneath the Landfill, the alluvium and the Paso Robles Formation are unsaturated but the Monterey Formation, which underlies the Paso Robles Formation, is sufficiently fractured to be water bearing. The western end of the Landfill overlies a groundwater divide, with groundwater flow directions to the east or west in this area, depending on the location and season. First encountered groundwater occurs at depths ranging from 40 to greater than 200 feet beneath the Landfill facility.

GROUNDWATER QUALITY: To date, monitoring in accordance with the MRP indicates this Landfill has had a minor release of a common landfill waste constituent related to the dissolution of landfill gas in groundwater as indicated by low-level concentrations of dichlorodifluoromethane (Freon [which has no Maximum Contaminant Level]) detected in one monitoring well. The Discharger is addressing this issue via enhanced landfill gas recovery in the area. Total dissolved solid (TDS) concentrations in groundwater from Landfill detection monitoring wells ranges between 760 and 4,000 milligrams per liter (mg/L), with the lowest concentrations found in monitoring wells located more distant to the Landfill. The secondary Maximum Contaminant Level (MCL) for TDS is 500 mg/L. Based on Water Board staff's familiarity with other facilities in the region, groundwater quality from the Monterey Formation is generally poor because of its marine origin (and associated salt content), and highly variable because of its fractured condition. Constituent of concern (COC) monitoring data indicates elevated levels of metals (arsenic, cadmium, and nickel), selenium, and perchlorate occur sporadically in some of the detection monitoring wells. Elevated concentrations of manganese and iron (secondary MCLs of 0.05 mg/L and 0.3 mg/L, respectively) are detected in background monitoring well MW-6.

Because of the limited data set and substantial variability of the Monterey Formation's geochemistry, it is difficult to determine whether the Landfill is contributing to the metal and other trace constituent concentrations in groundwater. Inorganic constituent concentrations in samples collected from lysimeters (soil-moisture probes) are generally lower than those from groundwater samples. However, this does not preclude the possibility that the landfill contributes to the inorganics detected in groundwater. As an example, current groundwater data cannot discern whether perchlorate originates from the landfill or from a fertilizer source. The proposed WDR requires the Discharger to submit a plan to evaluate background concentrations and/or potential sources for the inorganics. The plan shall include scoping for proposed Modules 6 and 7's new detection monitoring well. The new well will be installed a minimum of one year before construction of Modules 6 and 7 and will provide additional background monitoring data for the Landfill.

FUTURE LANDFILL EXPANSION LINER DESIGN: The Discharger plans to construct three expansion cells, Modules 4, 6, and 7. The proposed Order requires the Discharger to construct all new waste management units with a Title 27 and 40 CFR 258 compliant prescriptive liner system (a.k.a. composite liner - plastic liner over a two-foot thick clay liner), but provides for an engineered alternative design (a liner with the same or better waste containment capability).

In October 2004, Central Coast Water Board staff concurred with the Discharger's Composite Liner Construction Plan for Modules 3, 4, and 5. However, for future Module 4, the Discharger may not incorporate all of the specifications included in the 2004 Composite Liner Construction Plan. During the course of constructing Module 3, the Discharger implemented several approved field design changes (August 2005 Module 3, 4, & 5 Liner Project Field Design Changes No. 1, 2, 3, 4, & 5 report). Prior to Module 4 liner placement (scheduled for late 2009), the Discharger proposed revisions to the previously approved liner design. Central Coast Water Board staff will review these proposed changes, contained in the April 21, 2008 Revised Technical Specifications and Construction Quality Assurance Manual, before the Discharger installs the Module 4 liner.

COMPLIANCE HISTORY: The Landfill is out of compliance with the existing Order because of the low-level concentrations of Freon detected in groundwater from one detection monitoring well (as discussed above). No other violations are noted at the Landfill during the last five years and the Discharger has met all reporting deadlines.

MONITORING AND REPORTING PROGRAM: The Landfill's current monitoring system includes:

- Five detection groundwater monitoring points completed in the Monterey Formation and sampled semiannually (wells MW-4, -7, -9b¹, and -10, and the Office Well²).
- Three lysimeters (L-5, -6 and -8 [unsaturated zone probes]).
- Stormwater monitoring at three sedimentation basin outfall locations.
- Three landfill soil-gas monitoring probes.

Central Coast Water Board staff updated the Landfill's MRP; these changes are reflected in the proposed MRP (Attachment 2) and summarized below:

- Monitoring of the Office Well every five years for the Constituents of Concern (COC) monitoring event.
- Discontinuation of monitoring of the lysimeters because 1) to date, the extensive historical data from these lysimeters do not indicate a release has occurred, and 2) soil-gas probes MW-1, -2, and -11 serve to monitor the unsaturated zone for indications of a release (Attachment 2, Figure A-1), based on VOC concentration data.
- Addition of Module 3 underdrain as a detection monitoring point.
- Scoping for a new detection monitoring well for proposed Modules 6 and 7 to obtain representative background groundwater monitoring data for the Landfill. The Landfill currently uses an "intra-well" statistical method, whereby trends in each detection monitoring well are used rather than comparing downgradient monitoring well data to a background data set to check for evidence of a release. The Discharger uses intra-well methods because the existing background monitoring wells appear to have different native groundwater chemistry than the detection monitoring wells.
- Addition of yearly collection of samples from the LCRS in order to 1) verify that the leachate is nonhazardous (and can be returned to the lined Modules), and 2) evaluate constituents that might be present in a landfill release, and 3) be consistent with requirements at other landfills.
- Modification of the stormwater sampling parameters to be consistent with the General Stormwater Permit for Industrial Activities for landfills and to also monitor runoff from the application of biosolids at the landfill. The proposed MRP includes the stormwater parameters defined for landfill operations (per Standard Industrial Code [SIC]), including pH, total suspended solids, specific conductance, total organic carbon, and iron. In addition, the proposed MRP retains nitrate for purposes of monitoring biosolids application.
- Revisions to Table 1 "Monitoring Table" of the proposed MRP include removing or adding the following parameters:
 - Deleted barium, lead, and zinc - historical data indicates that these metal concentrations are relatively low; in addition, these parameters are not good indicators of a landfill release because their concentrations are typically not sufficiently elevated in landfill leachate. However, these metals are retained in the COC analyses (monitored every five years).
 - Added cadmium and selenium to confirm or refute limited historic elevated concentrations.

¹ Well 9b is used as a background well and supply well

² The Office Well is a backup supply well

- Added total alkalinity because landfill gas and leachate can cause significant increases in concentrations of alkalinity in groundwater.
- Added organophosphorous pesticides and chlorinated herbicides - these parameters were added to the COC list (monitored every five years) because of their potential to be present in landfill wastes.

ENVIRONMENTAL SUMMARY

This Order contains prohibitions, discharge specifications, water quality protection standards, and provisions intended to protect the environment by mitigating or avoiding impacts of the project on water quality. The Order addresses both an existing facility and a proposed lateral and vertical expansion.

COMMENTS ON ORDER NO. R3-2009-0001

Central Coast Water Board staff distributed the draft Order No. R3-2009-0001 and MRP No. R3-2009-0001 to interested parties and agencies involved with the Landfill. Comments received on the draft Order and MRP are included as Attachment 3. All submitted comments were considered and nearly all are either included herein or had previously been addressed in the original draft versions.

Comments from Mr. Michael Hoover, Chicago Grade Landfill:

Comment 1) The staff report discusses the design capacities of the stormwater retention basins and maintenance of their capacities. In addition, Specification 11 of the WDR requires that storage facilities associated with stormwater conveyance systems be emptied immediately after every storm. This is essentially a zero discharge requirement, if it means that liquid capacity must be maintained. Hopefully you are referring to removing the silt in between storms.

Water Board staff's response: Specification 11 is not a zero-discharge requirement. In response to this comment, staff clarified the language in Specification 11 of the Order. The Discharger must implement best management practices (BMPs) to reduce pollution/sediment in stormwater pursuant to the General Stormwater Permit for Industrial Activities and to maintain adequate capacity in the retention basins. The purpose of stormwater storage facilities (retention basins) is to provide residence time for stormwater before it discharges to waters of the state. Retention basins are required by Title 27 landfill regulations and as a BMP in the General Stormwater Permit for Industrial Activities. As such, the Discharger must effectively use BMPs to minimize stormwater pollutants based on a best available technology standard, not the maximum extent practicable standard that applies to municipal stormwater permits. BMPs may include, but are not limited to, one or more of the following: redistributing the water in the basins; using the collected stormwater as dust control and irrigation; clearing out accumulated sediment; and minimizing soil erosion throughout the landfill with appropriate engineering controls (i.e., placing filter material over outlet pipes).

Comments 2) Page 5 of the [draft] staff report indicates that approval of construction plans and specifications for modules 3, 4, and 5 have been rescinded. Chicago Grade Landfill, Inc. (Chicago Grade) knows of no such correspondence that draws that conclusion. Chicago Grade has proposed some design modifications for module 4 (Module 3 is already complete, Module 5 is no longer proposed) using geocomposite clay liner and a few other changes. However, Chicago Grade already has approval from the Executive Officer to construct Module 4 per the 2004 design report.

Water Board staff's response: Staff concurs that the original design submitted in 2004 for Module 4 is still an approved design. However, Chicago Grade has changed/improved some aspects of the design for future Module 4 that will require concurrence from the Executive Officer prior to construction. Staff modified the Staff Report language so that it does not imply that the original design is obsolete and no longer approved.

Comment 3) Sampling for perchlorate in the groundwater detection monitoring program should be discontinued because the Landfill does not appear to be the source for perchlorate. Perchlorate was not detected in leachate samples collected from lined areas of the landfill, and it was detected in a stormwater sample collected from a location upgradient of the land disposal area, indicating that it is from background sources such as agriculture.

Water Board staff's response: Perchlorate concentrations have periodically exceeded the California MCL in one detection monitoring well, MW-10, and have been non-detect or below the MCL in the other monitoring wells. The upgradient sample referred to above is located downgradient of the recycling facility. Therefore, the upgradient sample does not completely preclude the landfill facility as being a potential contributor of perchlorate (e.g., the stormwater sample was collected downgradient of the recycle facility at a concentration lower than MW-10's and leachate from unlined areas might have perchlorate). Central Coast Water Board staff discontinued the requirement to monitor for perchlorate in wells that have not had a perchlorate detection over three consecutive monitoring rounds, although the MRP requires monitoring for perchlorate once every five years in all wells. The Discharger will still be required to monitor for perchlorate in MW-10.

Comment 4) Please explain the groundwater "point of compliance" in geographical terms, as it is not clear from the description in Water Quality Protection Standard D.2 of the proposed Order.

Water Board staff's response: The Water Quality Protection Standard D.2 portion of the draft Order combined definitions from both federal and state regulations. In this area, Title 27 (California Code of Regulations [CCR]) is more protective than federal landfill regulations. Title 27, Section 20405 defines the "point of compliance" as the "vertical surface located at the hydraulically downgradient limit of the [waste management] Unit that extends through the uppermost aquifer underlying the [waste management] Unit." Title 27, Section 20164 defines a waste management unit as "an area of land, or a portion of a waste management facility, at which waste is discharged. The term includes containment features and ancillary features for precipitation and drainage control and for monitoring." For the Landfill, the waste management unit includes the disposal area, stormwater conveyance ditches and culverts, and sediment retention basins. To reflect this, staff clarified the Water Quality Protection Standard D.2 language to align with Title 27 regulations, and changed the waste management unit boundary on Figure 2 of the proposed Order to reflect the regulatory definition stated above.

Comment 5) Stormwater samples collected for iron should be field-filtered before sending to the laboratory, in order to analyze for dissolved rather than total iron. Chicago Grade landfill believes that the iron is from natural minerals in the sediment and not landfill operations.

Water Board staff's response: The iron benchmark concentration of 1.0 mg/L included in the stormwater sampling requirements of the MRP was derived by EPA (EPA Red Book, 1976) for protection of aquatic life (levels higher than this can be toxic to sensitive invertebrates). Dissolved ferrous iron is bioavailable and more toxic than iron carried in suspended solids.

However, particulate iron can be toxic as a flocculent on the stream bottom, and therefore the iron criterion is applied as a total concentration.

At some locations, the iron benchmark value might be difficult to meet given naturally elevated iron concentrations in mobilized soil³. This is likely the case at the Chicago Grade Landfill. The Red Book indicates that the total iron requirement comes from aquatic toxicity resulting from both dissolved iron and flocculants (precipitates) of iron (iron oxides and hydroxides). The Red Book does not mention that toxicity results from iron entrained in clay or other soil minerals found in suspended solids. Therefore, Central Coast Water Board staff concurs that the Discharger should analyze stormwater samples for dissolved iron, but the Discharger shall retain total iron in order to evaluate the sources of iron. Staff changed the MRP to reflect this recommendation. Staff also recommends that Chicago Grade analyze background stormwater samples for concentrations of both suspended solids and iron.

CONCLUSION

To date, monitoring in accordance with the approved monitoring program indicates this Landfill has not caused a release to groundwater.

The proposed Order benefits and protects groundwater and surface water through required engineering controls, corrective action, preventative inspections, and monitoring.

RECOMMENDATION

Adopt Waste Discharge Requirements Order No. R3-2009-0001.

ATTACHMENTS

1. Proposed Waste Discharge Requirements Order No. R3-2009-0001
2. Proposed Monitoring and Reporting Program No. R3-2009-0001
3. Comment letters from the Discharger.

³ For example, according to USGS professional paper 1270, the geometric mean iron concentration in US soil is 1.8%. A stormwater sample with 100 mg/L suspended solids [stormwater permit benchmark value] of such a soil would have a total iron concentration of 1.8 mg/L)