**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**
**LAHONTAN REGION**

**BOARD ORDER NO. R6V-2019-0247**
**WDID NO. 6B360304003**

# NEW CORRECTIVE ACTION PROGRAM AND REVISED POST-CLOSURE WASTE DISCHARGE REQUIREMENTS

**FOR**

# SAN BERNARDINO COUNTY SOLID WASTE MANAGEMENT DIVISION APPLE VALLEY CLASS III LANDFILL

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Water Board) finds:

1. Discharger

The County of San Bernardino, Solid Waste Management Division submitted a complete Final Engineering Feasibility Study (EFS) and proposed Corrective Action Program (CAP) for the Apple Valley Class III Landfill in October 2009. For the purposes of this Water Board Order (Order), the San Bernardino County Solid Waste Management Division is referred to as the "Discharger."

2. Facility Location

The Facility is located near Yucca Loma Road at the eastern edge of the Town of Apple Valley, San Bernardino County. The Facility is within Section 29 of Township 5 North, Range 2 West, San Bernardino Baseline and Meridian, as shown on Attachment A.

3. Facility

The Apple Valley Class III Landfill is a closed Class III municipal solid waste (MSW) landfill (Facility) owned by the County of San Bernardino and operated by the Discharger since 1964. The Facility stopped receiving waste in July 1997. For purposes of this Order, the Waste Management Unit (WMU) is referred to as the "Landfill," and consists of a 40-acre existing WMU that is unlined with no leachate collection and recovery system (LCRS), a burn dump area, a 1-acre septage waste disposal area in the northwest corner of the Landfill, and a 5-acre septage waste disposal area in the southeast corner of the Landfill. Discharge of septage waste to the septage ponds ceased in April 1990, and the ponds were cleaned-closed in March 1993. A map of the Facility is included as Attachment B, which is made part of this Order.

4. Reason for Action

The Facility began receiving waste in 1964. The Facility stopped receiving waste in July 1997, and the Landfill was closed in May 2007 in accordance with an approved

Final Closure and Post-Closure Maintenance Plan (FCPCMP), dated November 10, 2004. The EFS describes the proposed CAP to remediate the known release to groundwater. The FCPCMP describes the proposed maintenance of the Facility during the post-closure period. The Water Board is rescinding Board Order No. R6V-2006-0037 and issuing these new Corrective Action Program and Revised Post-Closure Waste Discharge Requirements (WDR) and updating the Monitoring and Reporting Program (MRP) to: (1) establish a CAP to address the effects of a known release to groundwater; (2) establish the post-closure maintenance and monitoring requirements for the Facility; and (3) provide general updates to the WDRs and MRP based on current site conditions, in compliance with the California Code of Regulations (CCR), title 27.

5. Order History

a. WDR was established for the Facility under Board Order No. 6-72-93, which was adopted on October 26, 1972.

b. Board Order No. 6-81-45 was adopted on June 18, 1981, which eliminated the provision prohibiting disposal of septage waste to the Landfill.

c. Board Order No. 6-85-126 was adopted on October 10, 1985, which revised the WDR for the Landfill; and Board Order No. 6-85-133 was later adopted on November 14, 1985, which revised the WDR to specify average volume of waste received by the Facility.

d. The Executive Officer issued Cleanup and Abatement Order (CAO) No. 6-89-182 to the Discharger on August 14, 1989, to require the cleanup and abatement of the condition of groundwater pollution beneath the Landfill.

e. Board Order No. 6-90-07 was adopted on January 11, 1990, which incorporated findings of the Solid Waste Assessment Test (SWAT) investigation conducted at the Landfill and to require clean-closure of the septage ponds.

f. The Executive Officer issued CAO No. 6-91-931 on October 24, 1991, to establish a revised time schedule for the cleanup and abatement of the groundwater pollution beneath the Landfill. CAO No. 6-91-931 superseded CAO No. 6-89-182.

g. Board Order No. 6-93-100-35 was adopted on September 9, 1993, and amended the WDR to incorporate the requirements of Code of Federal Regulations, Title 40 (40 CFR), Parts 257 and 258 (Subtitle D). State Water Resources Control Board (State Water Board) Resolution No. 93-62 requires the Regional Board's to implement in requirements for MSW landfills Subtitle D regulations that are necessary to protect water quality and to include those provisions in Subtitle D that are either more stringent than or that do not exist in CCR, title 27.

h. Board Order No. 6-95-66 was adopted on June 8, 1995 and revised the requirements to require the Discharger to incorporate requirements of previously adopted Board Order No. 6-93-100-35, document a new time schedule for compliance with State and Federal regulations, and to rescinded CAO Nos. 6-89-182 and 6-91-931.

i. Board Order No. R6V-2006-0037 was adopted September 14, 2006, and revised the requirements to require the Discharger to achieve compliance with the requirements of CCR, title 27, sections 20385, 20415, 20420, 20950 (general closure and post-closure maintenance standards), 21090 (closure and post-closure maintenance requirements for solid waste landfills), and 20390 (Water Quality Protection Standards [WQPS]).

6. Detected Release to Groundwater

In 1988, the SWAT investigation confirmed a release of volatile organic compounds (VOCs) to groundwater beneath the Facility. The most commonly detected VOCs in groundwater beneath the Landfill are tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride. The SWAT investigation also identified several inorganic constituents (chloride, iron, manganese, sulfate, and total dissolved solids [TDS]) with concentrations above drinking water limits, but no determination was made as to whether any of these inorganic compounds were associated with the release from the Landfill. Upgradient (background) groundwater monitoring well AVSL-9 was later installed in 1993. Statistical analyses and comparison to background water quality established in groundwater monitoring well AVSL-9 indicate elevated concentrations of several inorganic constituents in groundwater, including chloride, nitrate (as nitrogen [N]), sulfate, and TDS, which are indicative of a leachate release from the Landfill.

Since the release was verified, the Discharger has implemented an Evaluation Monitoring Program (EMP) and has shown that the sources of the release are a combination of leachate, landfill gas (LFG) migration, and septage pond leakage. The EMP and source of the release is more specifically described in Finding No. 26. The Discharger has been implementing interim corrective action measures, including a groundwater extraction and treatment system, since 1995.

The Discharger proposes a CAP that includes LFG source controls with Monitored Natural Attenuation (MNA) and drainage controls. The proposed CAP is more specifically described in Finding No. 27.

7. Waste Management Unit Classification and Authorized Disposal Sites

Pursuant to CCR, title 27, section 20260, the Landfill is classified as a Class III WMU and is the only authorized waste disposal site within the Facility boundary. The Landfill is defined as an MSW landfill in Subtitle D.

8. Waste Classification

The waste that was discharged to the Landfill is defined in CCR, title 27, sections 20220 and 20230, as non-hazardous and inert solid waste, respectively. The septage waste discharged to septage ponds is classified as designated waste in accordance with CCR, title 27, section 20210.

9. Subtitle D Submittal Status

Subtitle D requirements became effective for this Landfill on April 9, 1994. Board Order Nos. 6-93-100-35, 6-95-66, and R6V-2006-0037 required the submittal of several items in order to comply with Subtitle D for the Landfill. The Discharger submitted complete information regarding the acceptance of liquids, the existing waste footprint, the distance from the Landfill to the nearest drinking water source, whether the Landfill is in a 100-year floodplain or a wetland, and a revised WQPS. These items fulfilled the submittal requirements of Subtitle D, as implemented by State Water Board Resolution No. 93-62.

10. Final Closure and Post-Closure Maintenance Plan

Board Order No. R6V-2006-0037 approved the FCPCMP (dated November 10, 2004) and the proposed engineered alternative final cover system. The FCPCMP describes the manner of closure and the proposed maintenance of the Facility during the post-closure period. In 2007, an engineered alternative final cover was constructed over the Landfill, specifically an evapotranspirative (ET) soil cover. The constructed ET cover is a 3-foot thick engineered cover composed of a minimum of a 2-foot thick layer of select soil materials underlain by a 1-foot thick foundation layer over the entire Landfill surface. The cover surface has been vegetated with native species from the surrounding area. An onsite borrow area (north of the Landfill) was the source of the cover materials. The main concept of this type of landfill cover is to store moisture between the soil particles during the rainy season and release that moisture during the dry season through plant uptake and evaporation. The Discharger performs maintenance on an as-needed basis to maintain, as designed, the final ET cover of the Landfill throughout the post-closure maintenance period of the Facility. This Order requires the Discharger to review the FCPCMP annually to determine if significant changes in the Landfill or maintenance operations warrant an update to the plan.

11. Post-Closure Period

This Order requires a minimum post-closure maintenance and monitoring period of 30 years after the completion of closure of the entire landfill in accordance with 40 CFR Part 258.61. The Landfill final closure construction activities were completed in May 2007; therefore, the post-closure period is expected to end in 2037. However, the Discharger will not be released from post-closure maintenance requirements until it is demonstrated

to and approved by the Water Board that the Landfill no longer poses a threat to water quality in accordance with CCR, title 27, section 20950(a)(1).

12. Land Uses

The land uses surrounding the Facility consist of rural residential and open desert. There are no structures within 1,000 feet of the Facility boundary. The nearest residential parcel to the south is approximately 3,520 feet southeast of the Facility. The nearest residential parcel to the north is approximately 4,050 feet east-northeast of the Facility. The water supply for these residential properties is provided by individual private wells.

13. Site Topography

The Facility is in the eastern portion of the Victor Valley and is situated on a topographic saddle on the western flank of the Granite Mountains. The saddle demarcates a "northern" and a "southern" portion of the Landfill and acts as a groundwater divide. The northern portion of the Landfill slopes gently to the north, whereas the southern portion of the Landfill slopes to the south. Surface elevation of the Landfill ranges from a high of approximately 3,255 feet above mean sea level (msl) along the saddle to approximately 3,160 feet above msl in the northern portion of the site to approximately 3,144 feet above msl in the southern portion of the site.

14. Climate

The Facility is in an area that can be characterized as arid with infrequent rain, low relative humidity, and hot, dry conditions during the summer months. The mean annual temperature is 62 degrees (°) Fahrenheit (F) and ranges from a high of 98° F in the summer to a low of 30° F in the winter. The mean annual rainfall in the area is approximately 3.6 inches occurring mostly during November through April. The annual average evaporation rate is approximately 110 inches per year. Predominant wind direction is from the south and southwest.

15. Site Geology

The Facility is located within the eastern portion of Victor Valley. The area is tectonically active. There are no known active (Holocene-age) faults beneath the Facility; however, a series of northwest-southeast trending parallel bedrock fractures exist in the bedrock beneath the Landfill and may represent a shear zone associated with faulting. The Facility is located approximately 5 miles north of the active North Frontal fault system located along the northern limit of the San Bernardino Mountains and 5 miles south of the active Helendale fault, which is located on the floor of the Mojave Desert. The active San Andreas and San Jacinto fault zones are 24 and 28 miles southwest of the Facility, respectively.

The Facility overlies Quaternary alluvial fan deposits that are composed of poorly sorted, coarse-grained sand and gravel with some silt. The alluvial deposits range in thickness from 5 feet to 13 feet beneath the Facility and thicken distally to the north and south to a depth of about 147 feet below ground surface (bgs). The Facility is situated within a topographic saddle on the west side of the Granite Mountains which are composed of Triassic monzonite immediately east of the site and Jurassic and Cretaceous granite and quartz monzonite west of the site. Bedrock beneath the Facility ranges from 5 to 20 feet bgs.

16. Site Hydrogeology and Groundwater Quality

The Facility overlies the Upper Mojave River Valley Groundwater Basin. Groundwater exists beneath the Facility at depths ranging from 54 to 240 feet bgs. Shallower groundwater is located near the topographic saddle and is in fractured bedrock. Deeper groundwater is in the alluvium and becomes increasingly deeper with distance from the Landfill. The crest of the topographic saddle acts as a groundwater divide beneath the Facility, with groundwater flowing in a northerly direction north of the saddle ("northerly flow regime") and groundwater flowing in a southerly direction south of the saddle ("southerly flow regime"). Groundwater flow is further complicated by the presence of northwest-southeast trending bedrock fracture zones beneath the Facility. Groundwater flow enters the alluvium both north and south of the Landfill where the alluvium-bedrock contact intersects the water table. Groundwater north of the groundwater divide flows at an average hydraulic gradient of 0.11 feet per foot, and south of the divide groundwater flows south-southeast at an average hydraulic gradient of 0.08 feet per foot. Average groundwater flow velocities range from 0.12 feet per day to 17 feet per day.

The Discharger has been monitoring groundwater quality beneath the Landfill since 1988. In general, the inorganic and dissolved metal water chemistry in groundwater beneath the Landfill is consistent with the available water quality data for public supply wells within the vicinity of the Landfill. Copper, selenium, vanadium, and zinc show little spatial variation in water quality across the site; whereas, arsenic, barium, chloride, sulfate, and TDS do show some spatial variation in water quality across the site. Over the last ten years, TDS concentrations have ranged from 330 milligrams per liter (mg/L) to 2,200 mg/L, and arsenic concentrations have ranged from 0.66 micrograms per liter (µg/L) to 8.5 µg/L. The primary maximum contaminant levels (MCL), based on drinking water standards, for arsenic and barium are 10 micrograms per liter (µg/L) and 1,000 µg/L, respectively. Chloride, sulfate, and TDS do not have primary MCLs; however, the secondary MCLs established for these constituents are 250, 250, and 500 mg/L, respectively. Background TDS exceeds the secondary MCL in groundwater near the Landfill.

Groundwater beneath the Landfill has been impacted with chloride, nitrate, sulfate, TDS, and VOCs. The Discharger has shown that a combination of LFG migration, leachate, and septage pond leakage are the sources of the release. The release was initially detected when groundwater monitoring at the Facility began in 1988, and VOCs

continue to be detected in groundwater at concentrations that exceed the background value of non-detect. The effected groundwater is being remediated with a CAP, and VOC and inorganic concentrations are showing a general decreasing trend over time. Historical and current COC concentrations in groundwater are more specifically described in Finding No. 27.

17. Site Surface Hydrology

The Facility is within the Upper Mojave Hydrologic Area of the Mojave Hydrologic Unit. The Victor Valley, in which the Facility is located, is within the larger Mojave River Valley. All surface water that enters the region either infiltrates into the groundwater basin, evaporates, or flows overland toward the Mojave River. There is no perennial surface water flow at the site. The Landfill is situated overtop a topographic saddle that forms a drainage divide as well as a groundwater divide. All rainfall that falls on the southern half of the Landfill flows to the south, all rainfall that falls on the northern half of the Landfills flows to the north.

18. Site Storm Water Management

The Discharger has developed and is implementing a site-specific Storm Water Pollution Prevention Plan (SWPPP), dated October 2012, for the Facility. Storm water protection at the Facility is primarily accomplished through drainage control based on the following objectives: protection from run-on; minimize infiltration of precipitation into the waste; minimize exposure of pollutants to precipitation; manage run-off to minimize erosion and sedimentation; and minimize offsite migration of storm water. To achieve these objectives, the Discharger implements structural and non-structural Best Management Practices (BMPs), as described in the SWPPP, to mitigate potential pollution of storm water discharges and performs site compliance inspections to evaluate the effectiveness of the BMPs. The Discharger will continue to implement BMPs and perform inspections throughout the post-closure compliance period of the Facility.

This Order requires prohibitions, limitations, and provisions for storm water and non-storm water discharges at the Facility to protect both groundwater and surface water quality.

19. Basin Plan

The Water Board adopted a *Water Quality Control Plan for the Lahontan Region* (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan, as amended.

20. Receiving Waters

The receiving waters are the groundwaters of the Upper Mojave River Valley Groundwater Basin (Department of Water Resources, Groundwater Basin No. 6-42;

Basin Plan, Plate 2B) and minor surface waters of the Upper Mojave Hydrologic Area of the Mojave Hydrologic Unit (Hydrologic Unit No. 628.20; Basin Plan, Plate 1B).

21. Beneficial Uses

The present and probable beneficial uses of the groundwaters of the Upper Mojave River Valley Groundwater Basin No. 6-42, as set forth and defined in the Basin Plan are:

a. Municipal and Domestic Supply (MUN);
b. Agricultural Supply (AGR);
c. Industrial Service Supply (IND);
d. Freshwater Replenishment (FRSH); and
e. Aquaculture (AQUA).

The present and probable beneficial uses of minor surface waters of the Upper Mojave Hydrologic Area No. 628.20, as set forth and defined in the Basin Plan are:

a. Municipal and Domestic Supply (MUN);
b. Agricultural supply (AGR);
c. Ground Water Recharge (GWR);
d. Hydropower Generation (POW);
e. Water Contact Recreation (REC-1);
f. Non-contact Water Recreation (REC-2);
g. Warm Freshwater Habitat (WARM);
h. Cold Freshwater Habitat (COLD); and
i. Wildlife Habitat (WILD).

22. Water Quality Protection Standard

The WQPS consists of constituents of concern (COCs), concentrations limits, monitoring points, and the point of compliance. The COCs, monitoring points, and point of compliance for groundwater and unsaturated zone monitoring are described in MRP No. R6V-2019-0247, which is made part of this Order. The WQPS applies over the active life of the landfill, closure and post-closure maintenance period, and the compliance period of the Facility in accordance with CCR, title 27, section 20410(a).

23. Compliance Period

For MSW landfills, the compliance period is the number of years equal to the active life of the WMU plus a minimum of 30 years during the post-closure period in accordance with 40 CFR, Part 258.61. The compliance period is the minimum period during which the Discharger must conduct a water quality monitoring program subsequent to a release from the Landfill. The compliance period must begin anew each time the Discharger initiates an EMP. The Landfill closed May 2007; therefore, the compliance period is expected to end in 2037, but may be extended if the Facility is not in

compliance with its WQPS. If the discharger is engaged in a CAP at the scheduled end of the compliance period, the compliance period shall be extended until the Discharger can demonstrate that the WMU has been in continuous compliance with its WQPS for a period of three consecutive years as specified in CCR, title 27, section 20410(c).

24. Statistical and Non-Statistical Methods

Statistical and non-statistical analyses of monitoring data are necessary for the earliest possible detection of measurably significant evidence of a release of waste from the Landfill. CCR, title 27, section 20415, subdivision (e)(7), requires statistical data analyses to determine when there is "measurably significant" evidence of a release from the WMU. CCR, title 27, section 20415, subdivision (e)(8) allows non-statistical data analysis methods that can achieve the goal of the monitoring program at least as well as the most appropriate statistical method. The monitoring parameters listed in MRP No. R6V-2019-0247 are believed to be the best indicators of a release from the Facility.

25. Detection Monitoring Program

Four groundwater monitoring wells (AVSL-1 through AVSL-4A) were installed between 1987 and 1988 as part of the original Detection Monitoring Program (DMP). A release of VOCs to the groundwater beneath the Facility was confirmed in 1988. Additional groundwater monitoring wells (AVSL-6 through AVSL-11, AVSL13, AVSL-14, and AVSL-17) were installed between 1990 and 1999. Statistical analyses and comparison to background water quality established in groundwater monitoring well AVSL-9 indicate elevated concentrations of several inorganic constituents in groundwater, including chloride, nitrate, sulfate, and TDS, and are also indicative of a release from the Landfill.

Pursuant to CCR, title 27, sections 20385 and 20420, the Discharger is implementing a DMP for the Landfill. The DMP successfully detected significant evidence of a release from the Landfill. The Discharger conducted an EMP to evaluate the extent of the impacts to water quality and designed a CAP. The Discharger is currently implementing the CAP and will continue to implement the DMP in order to monitor for significant evidence of any new releases from the Landfill, as specified in MRP No. R6V-2019-0247.

26. Evaluation Monitoring Program

Since the release was identified in 1988, a series of EMP studies have been conducted to evaluate the nature and extent of inorganic and VOC impacts to water quality. The Discharger has shown that the low-level concentrations of VOCs and elevated concentrations of inorganic constituents detected in groundwater beneath the Facility are contributable to a combination of LFG migration, leachate, and septage pond leakage from the unlined WMUs as the primary sources of the release. Chloride, nitrate, sulfate, TDS, and VOC concentrations in groundwater are generally stable and/or show a decreasing trend over the past ten years. The Discharger submitted a Final EFS in

October 2009, which documented the downgradient extent and nature of the release from the Landfill and included a CAP to remediate the effects of the release to groundwater. Limited data is provided for lateral and vertical extent of the impacts to groundwater. This Order requires additional investigation to better define the lateral and vertical extent of inorganic and VOC impacts, as further described in Finding No. 27.

An EMP may be required, pursuant to CCR, title 27, sections 20385 and 20420(k)(6), whenever there is "measurably significant" evidence of a release from the Landfill during a DMP or whenever there is significant physical evidence of a release from the Landfill. The Discharger must delineate the nature and extent of the release and develop a suite of proposed corrective action measures within 90 days of establishing an EMP, unless the Discharger proposes and substantiates a longer time period for implementing the EMP. If the EMP confirms measurably significant evidence of a release, then the Discharger must submit an Engineering Feasibility Study for corrective action pursuant to CCR, title 27, section 20425, subdivision (b), and MRP No. R6V-2019-0247.

27. Corrective Action Program

VOCs were initially detected in groundwater beneath the Facility in 1988 and continue to be detected in groundwater beneath the Facility at concentrations that exceed the background value of non-detect. Since the installation of the background groundwater monitoring well AVSL-9 in 1993, statistical analyses and comparison to background water quality data indicate that elevated concentrations of the inorganic constituents chloride, nitrate, sulfate, and TDS that have been detected in groundwater beneath the Facility are further evidence of a release. The Discharger has shown that a combination of LFG migration, leachate, and septage pond leakage are the sources of this release. The Discharger has been implementing interim corrective action measures, including a pilot-scale groundwater extraction and treatment system, since 1995 until the formal CAP is approved.

Soil-pore gas monitoring probes AVG-1A through AVG-1C were installed in 1992 and soil-pore gas monitoring probes AVG-2 and AVG-3 were installed in 1994. Unsaturated zone monitoring indicates that a significant amount of LFG has been generated by the Landfill with the highest VOC concentrations detected in soil-pore gas monitoring probes AVG-2 and AVG-3. Unsaturated zone monitoring has indicated that low levels of methane generation is occurring within the Landfill. Over time, LFG generation in the Landfill appears to be decreasing with lower levels of methane being detected and an overall decrease in VOC concentrations in soil-pore gas monitoring probes AVG-2 and AVG-3.

More than a dozen VOCs are regularly detected in the groundwater beneath the Landfill. The most commonly detected VOCs beneath the Landfill are PCE, TCE, cis-1,2-DCE, 1,1-DCA, and vinyl chloride and have been detected in groundwater at concentrations that exceed their respective MCL. Nitrate has also been detected in groundwater in

excess of its MCL of 10 µg/L. Historically, benzene, 1,4-dichlorobenzene, 1,2-dichloroethane, and methylene chloride were detected above their respective MCLs, but such detections have been limited in occurrence and location. The historical maximum concentrations detected at the Landfill for each of these constituents listed above, the well and year in which each maximum concentration occurred, and their respective MCLs, are provided in the table below.

| HISTORICAL MAXIMUM CONCENTRATIONS IN GROUNDWATER | | | | |
|---|---|---|---|---|
| **Constituent** | **MCL[1]** | **Maximum[1]** | **Well** | **Year** |
| Nitrate (as N) | 10 | 68.8[2] | AVSL-8 | 1994 |
| Benzene | 1 | 4.6 | AVSL-1 | 1999 |
| Cis-1,2-dichloroethene | 6 | 43 | AVSL-1 | 2000, 2001 |
| 1,4-Dichlorobenzene | 5 | 7.62 | AVSL-1 | 1991 |
| 1,1-Dichloroethane | 5 | 27 | AVSL-1 | 2001 |
| 1,2-Dichloroethane | 0.5 | 1.08 | AVSL-1 | 1994 |
| Methylene chloride | 0.5 | 52 | AVSL-1 | 1991 |
| PCE | 5 | 31 | AVSL-3 | 1993 |
| TCE | 5 | 5.8 | AVSL-3 | 1993 |
| Vinyl chloride | 0.5 | 2 | AVSL-1 | 1996, 1997 |

[1] micrograms per liter, unless stated otherwise
[2] milligrams per liter

To evaluate the potential for a pump and treat groundwater remediation system, the Discharger operated a pilot-scale system in the northern flow regime from 1995 through 2005. Due to the geologic complexity beneath the Facility and limited recovery of VOCs in groundwater, the Discharger discontinued the pump and treat system and has been monitoring the rebound response in groundwater since. As of December 21, 2006, it was determined that the pilot-scale pump and treat system had removed a cumulative total of approximately 0.83 pound of VOCs from about 6.32 million gallons of groundwater, which has proved to be an infeasible method for remediating groundwater at the site.

The Discharger submitted a *Preliminary Engineering Feasibility Study* report in April 2007, followed by a *Final Engineering Feasibility Study* report in October 2009. Based on the results of the Final EFS, the Discharger proposes enhanced LFG venting (passive) and source control with MNA as the CAP. LFG source control and VOC reductions within the Landfill are critical to appreciably reduce VOC concentrations in the groundwater at this Facility. MNA allows natural processes to degrade contaminants in the unsaturated zone and groundwater, which include biological degradation (biodegradation) of these contaminants by naturally occurring microorganisms and by chemical transformation of inorganic constituents through chemical reactions with naturally occurring constituents found in subsurface soils. During construction of the ET cover in 2007, drainage controls were also constructed to prevent storm water infiltration and minimize ponding to reduce the potential for leachate generation. The CAP includes contingency remedies should LFG source controls and MNA fail to perform as necessary.

Implementation of the selected remedies, LFG source controls with MNA, pose no threat to human health or the environment. Currently, VOC concentrations are highest in the three point of compliance wells (AVSL-1, AVSL-3, AVSL-4A) and decrease to non-detect levels in the most downgradient groundwater monitoring wells (AVSL-10, AVSL-12, AVSL-13 and AVSL-17). Nitrate concentrations are highest in the point of compliance well AVSL-2 and three downgradient groundwater monitoring wells (AVSL-6, AVSL-11, and AVSL-13). In the southern flow regime, nitrate concentrations are below the MCL in the most downgradient groundwater monitoring well (AVSL-17). The nearest public supply wells are greater than one mile southwest from the Facility. The nearest private supply wells are installed at residential parcels located approximately 3,520 feet southeast of the southern boundary of the Facility and approximately 4,050 feet east of the northern boundary of the Facility. This Order includes a time schedule for the Discharger to install an additional groundwater monitoring well downgradient of well AVSL-13 to delineate the northwestern extent of the groundwater plume in the northern flow regime.

With implementation of the proposed CAP, it is expected to take approximately 20 years for LFG to reduce sufficiently to no longer threaten water quality and for all COCs in groundwater to be reduced to levels below their respective concentration limits. The Discharger has shown that enhanced LFG venting and source control with MNA is the most technically and economically feasible corrective action to remediate the release from the Landfill.

Water Board staff has evaluated the proposed enhanced LFG venting and source control with MNA as the corrective action to remediate the known release from the Landfill and has determined that: 1) the CAP meets the requirements of CCR, title 27, section 20430; 2) LFG source controls have been and will continue to be an effective remedial option to reduce the potential for LFG migration to groundwater; 3) MNA will likely be an effective remedial option to reduce VOC concentrations in groundwater; 4) existing drainage controls have been and will likely continue to be an effective remedial technique to prevent storm water infiltration and minimize the potential for leachate production; 5) remedial goals will likely be achieved within a reasonable timeframe; and 6) that the selected remedies, MNA combined with LFG source controls and drainage controls, are consistent with the guidance outlined in the "Final Report on Monitoring Natural Attenuation, Evaluation and Application in the Lahontan Region," dated March 2016. The following site-specific factors were considered in the evaluation.

a. Favorable MNA conditions exist beneath the Landfill based on evidence provided by the Discharger's water quality monitoring program.

b. The Landfill will continue to generate LFG until all waste in the WMU has fully decomposed. Generally, the more chemicals that have been disposed of in a Landfill, the more likely VOCs will be produced in the decomposition process. To reduce the potential for LFG to migrate from the Landfill, the Discharger will implement an enhanced LFG venting system.

c. The Landfill will continue to generate leachate until all waste in the WMU has fully decomposed. To reduce the potential for leachate to migrate from the Landfill, the Discharger will maintain the existing drainage controls to prevent storm water infiltration and minimize leachate production.

d. The plume appears to be stable over time. In the northern and southern flow regimes, chloride, nitrate, sulfate, TDS, and VOC concentrations in groundwater are generally stable and/or show a decreasing trend over the past ten years with exception of well AVSL-7 in the southern flow regime, where nitrate concentrations are increasing but remain below the MCL. VOC concentrations are decreasing to non-detect in the most downgradient wells (AVSL-17, AVSL-10, AVSL-12, and AVSL-13). The remaining COCs continue to decrease to background levels in the most downgradient wells with exception of well AVSL-13 where an additional downgradient well is needed to delineate the northwestern extent of the plume (further discussed in this Order, Section V.A.1).

e. Implementation of enhanced LFG venting and source control with MNA poses no additional threat to human health or the environment. The nearest public supply well is greater than one mile away and the nearest private well supply is over ½-mile away (approximately 3,520 feet southeast) from the Facility.

f. The Discharger has shown that with implementation of the proposed enhanced LFG venting and source control with MNA as the corrective action, remedial goals will likely be achieved within a reasonable timeframe of 20 years with an additional 3 to 5 years of verification monitoring.

This Order approves the CAP, enhanced LFG venting and source control with MNA, as proposed by the Discharger. This Order includes a time schedule for the Discharger to develop and implement a plan for the installation of the LFG venting system. This Order also includes a time schedule for the Discharger to install two sentry groundwater monitoring wells, one in the northern flow regime and one in the southern flow regime, and to conduct a field investigation to better define the lateral and vertical extent of the plume as part of the CAP. The purpose of the sentry wells is to monitor groundwater quality downgradient of the leading edge of the plume and upgradient of the nearest private supply wells. The CAP may be terminated when the Discharger demonstrates to the satisfaction of the Water Board that the concentrations of all VOCs and other constituents attributable to the release are reduced to levels below their respective concentration limits throughout the entire zone affected by the release.

28. <u>Unsaturated Zone Monitoring</u>

LFG is created by the bacterial decomposition of organic refuse within a landfill and consists primarily of methane and carbon dioxide with lesser amounts of nitrogen, oxygen, hydrogen sulfide, and other gases. In general, the more organic waste and moisture present in the landfill, the more LFG produced by bacteria during

decomposition. Similarly, the more chemicals disposed of in the landfill, the more likely VOCs and other gases will also be produced. In landfills that have average moisture content, the decomposition process occurs at a relatively rapid rate initially and approaches zero asymptotically approximately 20 years after waste placement occurs, with approximately 50 percent of the decomposition occurring after 5 years and 90 percent of the decomposition occurring after 10 years. However, actual decomposition rates vary as a result of site-specific environmental influences and the chemical composition of discrete zones within the landfill. Of these environmental influences, the moisture content of the waste is one of the primary factors in LFG production. The decomposition of waste in the Apple Valley Class III Landfill, and subsequent generation of LFG, is expected to continue at a slow rate for an extended period of time given the low annual rainfall in the region and relatively low moisture content of the waste compared to similar landfills in less arid regions.

The unsaturated zone monitoring program consists of three, co-located, multi-level, soil-pore gas monitoring probes (AVG-1A, AVG-1B, AVG-1C) and two single-depth soil-pore gas monitoring probes (AVG-2 and AVG-3) located around the perimeter of the landfill. The multi-level soil-pore gas monitoring probes, AVG-1A through AVG-1C (originally referred to as "AVPG-1 through AVPG-3" in earlier documents), were installed in 1992, and are each completed with isolated probes at the following depth intervals: of 5.5- to 12.5-feet bgs; 18.5- to 25.5-feet bgs; and 31.5- to 39.5-feet bgs. The single-depth soil-pore gas monitoring probes, AVG-2 and AVG-3, were later installed in 1994. Soil-pore gas monitoring probe AVG-2 is completed with a single isolated probe at a depth interval of 28- to 36-feet bgs, and soil-pore gas monitoring probe AVG-3 is completed with a single isolated probe at a depth interval of 11- to 19-feet bgs.

29. Discharge of Monitoring Well Purge Water

As part of the regularly scheduled groundwater sampling events, groundwater monitoring wells are purged until parameters of electrical conductivity, pH, and temperature are sufficiently stabilized to assure collection of a representative sample. Because VOCs pollute the aquifer beneath the Landfill, the purge water may also contain these constituents at concentrations greater than background. The best practicable treatment technology can remove VOCs from water to non-detectable concentrations. This Order prohibits the discharge to the ground of purge water containing concentrations of VOCs which exceed the WQPS.

30. Financial Assurance

The Discharger is required to obtain and maintain Financial Assurance Instruments to conduct post-closure maintenance activities and for corrective action of all known and reasonably foreseeable releases as required under CCR, title 27, sections 22207, 22212, and 22222 et seq.

The Discharger has provided documentation that a financial assurance fund has been developed for post-closure maintenance and for corrective action of all known and reasonably foreseeable releases. This Order requires the Discharger to report the amount of money available in the fund as part of the annual self-monitoring report. This Order also requires the Discharger to demonstrate, in the annual report, that the amount of financial assurance is adequate or to increase the amount of financial assurance, as appropriate, for inflation.

31. California Water Code, Section 13241 Considerations

Pursuant to CWC, section 13241, the requirements of this Order take into consideration:

a. *Past, present, and probable future beneficial uses of water.* This Order identifies existing groundwater quality and past, present, and probable future beneficial uses of water, as described in Finding Nos. 16 and 21, respectively. The proposed discharge will not adversely affect present or probable future beneficial uses of water including municipal and domestic supply, agricultural supply, industrial service supply, and freshwater replenishment, because the discharge was authorized only to the Landfill and monitoring is required to assess water quality.

b. *Environmental characteristics of the hydrographic unit under consideration including the quality of water available thereto*. Finding No. 16 describes the environmental characteristics and quality of water available.

c. *Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area*. Compliance with the requirements of this Order will not affect surface and groundwater quality. The Water Board will use its existing authority and these WDRs to ensure protection of water quality from these discharges.

d. *Economic considerations*. Water Quality Objectives established in the Basin Plan for the Upper Mojave River Valley Groundwater Basin and the Upper Mojave Hydrologic Area do not subject the Discharger to economic disadvantage as compared to other similar discharges in the Region. This Order will require the Discharger to submit proposals compliant with the requirements of CCR, title 27, and is reasonable.

e. *The need for developing housing within the region*. The Discharger is not responsible for developing housing within the region. This Order provides for continued monitoring a closed municipal solid waste Landfill and, therefore, will not result in any increase in work force or a need to development additional housing.

f. *The need to develop and use recycled water*. The Discharger does not propose the use of recycled water at this Landfill.

32. Human Right to Safe, Clean, Affordable, and Accessible Water

Water Code section 106.3 establishes a state policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes and directs state agencies to consider this policy when adopting regulations pertinent to those uses of water. This Order promotes that policy by requiring storm water and drainage controls, monitoring to assess water quality, and corrective action to address impacts to water quality.

33. California Environmental Quality Act

These revised WDRs govern an existing Facility and is, therefore, exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resources Code, Section 21000 et seq., in accordance with CCR, title 14, section 15301, Existing Facility (CEQA Exemptions).

34. Antidegradation Analysis

State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintenance of High Quality Waters in California") requires that whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality must be maintained. Any change in the existing high quality is allowed by that policy only if it has been demonstrated to the Regional Water Board that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. The policy further requires that Dischargers meet the WDR which will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

There is a detected release to groundwater as a result of waste discharges to the Landfill. This WDR requires the Discharger to implement a CAP to restore water quality and to continue to implement a DMP in order to monitor for significant evidence of any new releases from the Landfill. The CAP is designed to address the effects of a known release to groundwater and this WDR is expected to lead to an improvement of water quality with a robust monitoring and maintenance program to ensure that wastes remain contained at the Facility. As a result, degradation is not expected.

Any limited degradation that may occur till the CAP is completed is consistent with the maximum benefit to the people of the State as it will result in a remedy that ensures water quality is protected. The WDRs also reflect best practicable treatment or control of

wastes, and the discharger has demonstrated that enhanced LFG venting and source control with MNA is the most technically and economically feasible corrective action to remediate the release from the Landfill. This best practical treatment or control is expected to assure that pollution or nuisance will not occur and that the highest water quality consistent with the maximum benefit to the people of the state will be maintained. The CAP will not unreasonably affect present and anticipated beneficial uses of such water because it will lead to an improvement of water quality.

35. Technical and Monitoring Reports

The Discharger must submit technical and monitoring reports in compliance with this Order and as described in MRP No. R6V-2019-0247.

California Water Code, section 13267(b) provides that: "In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of having discharge or discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of having discharged or discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."

The technical reports required by this Order and MRP No. R6V-2019-0247 are necessary to assure compliance with this WDR. Therefore, the burden, including costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained from the reports.

36. Right to Petition

Any person aggrieved by this action of the Water Board may petition the State Water Board to review the action in accordance with California Water Code, section 13320, and CCR, title 23, sections 2050 et. seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality, or will be provided in hard copy or electronic format upon request.

37. Notification of Interested Parties

The Water Board notified the Discharger and interested agencies and persons of its intent to prescribe a WDR for corrective action and post-closure maintenance and has provided them with an opportunity to submit their written views and recommendations.

38. Consideration of Interested Parties

The Water Board, in a public meeting held on June 12, 2019, heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED**, pursuant to California Water Code sections 13263 and 13267, that the Discharger must comply with the following:

I. RECEIVING WATER LIMITATIONS

The discharge must not cause the existing water quality to be degraded nor shall the discharge cause a violation of any applicable water quality standard for receiving water adopted by the Water Board or the State Water Board as required by California Water Code and regulations adopted hereunder.

A. Under no circumstances shall the discharge cause the presence of the following substances or conditions in groundwaters of the Upper Mojave River Valley Groundwater Basin.

1. Bacteria – Groundwaters designated as MUN, the median concentration of coliform organisms, over any seven-day period, must be less than 1.1 Most Probable Number per 100 milliliters (MPN/100 mL).

2. Chemical Constituents – Groundwaters designated as MUN must not contain concentrations of chemical constituents in excess of the Primary MCL or Secondary MCL based upon drinking water standards specified in the following provisions of CCR, title 22: Table 64431-A of section 64431 (Inorganic Chemicals), Table 64444-A of section 64444 (Organic Chemicals), Table 64449-A of section 64449 (Secondary MCLs – Consumer Acceptance Contaminant Levels), and Table 64449-B of section 64449 (Secondary MCLs – Consumer Acceptance Contaminant Level Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

   Groundwaters must not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.

3. Radioactivity – Radionuclides must not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food chain to an extent that it presents a hazard to human, plant, animal, or aquatic life. Groundwater designated MUN must not contain concentrations of radionuclides in excess of limits specified in CCR, title 22, section 64442, Table 64442, and section 64443, Table 64443, including future changes as the changes take effect.

4. Taste and Odors – Groundwaters must not contain taste or odor-producing substances in concentrations that cause a nuisance or that adversely affect beneficial uses. For groundwaters designated as MUN, at a minimum, concentrations must not exceed adopted Secondary MCLs as specified in CCR, title 22, section 64449, Table 64449-A (Secondary MCLs – Consumer Acceptance Contaminant Level) and Table 64449-B (Secondary MCLs – Consumer Acceptance Contaminant Levels Ranges) including future changes as the changes take effect.

5. Toxic Substances – Any presence of toxic substances in concentrations that individually, collectively, or cumulatively cause a detrimental physiological response in humans, plants, animals, or aquatic life is prohibited.

B. Under no circumstances shall the discharge cause the presence of the following substances or conditions in surface waters of the Upper Mojave Hydrologic Area.

1. Ammonia – The neutral, un-ionized ammonia species ($NH_3$) is highly toxic to freshwater fish. The fraction of toxic $NH_3$ to total ammonia species ($NH_4^+$ + $NH_3$) is a function of temperature and pH. Tables 3-1 to 3-4 from the Basin Plan were derived from Unites States Environmental Protection Agency (USEPA) ammonia criteria for freshwater. Ammonia concentrations must not exceed the values listed for the corresponding conditions in these tables. For temperature and pH values not explicitly in these tables, the most conservative value neighboring the actual value may be used or criteria can be calculated from numerical formulas available on page 3-4 of the Basin Plan.

2. Bacteria – Waters must not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes. The fecal coliform concentration during any 30-day period must not exceed a log mean of 20/100 mL, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 mL. The USEPA recommends that the log mean should ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration

exceeding 20/100 mL for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

3. Biostimulatory Substances – Waters must not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

4. Chemical Constituents – Waters designated as MUN must not contain concentrations of chemical constituents in excess of the MCL or secondary MCL based upon drinking water standards specified in CCR, title 22, chapter 15, article 1, section 64400 et. seq. Waters designated as AGR must not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Waters must not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

5. Chlorine, Total Residual – For the protection of aquatic life, total chlorine residual must not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L. Median values must be based on daily measurements taken within any six-month period.

6. Color – Waters must be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

7. Dissolved Oxygen – The dissolved oxygen concentration, as percent saturation, must not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation. The minimum dissolved oxygen concentration must not be less than 4.0 mg/L as a daily minimum, 5.0 mg/L as a 7-day mean, and 6.5 mg/L as a 30-day mean.

8. Floating Materials – Waters must not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high quality waters, the concentrations of floating material must not be altered to the extent that such alterations are discernible at the 10 percent significance level.

9. Oil and Grease – Waters must not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses. For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances must not be altered.

10. Nondegradation of Aquatic Communities and Populations – All waters must be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or which lead to the presence of undesirable or nuisance aquatic life. All waters must be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes.

11. pH – Changes in normal ambient pH levels must not exceed 0.5 pH units. The pH must not be depressed below 6.5 nor raised above 8.5. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

12. Radioactivity – Radionuclides must not be present in concentrations which are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life. Waters designated as MUN must not contain concentrations of radionuclides in excess of the limits specified in CCR, title 22.

13. Sediment – The suspended sediment load and suspended sediment discharge rate of surface waters must not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

14. Settleable Materials – Waters must not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high-quality waters, the concentration of settleable materials must not be raised by more than 0.1 milliliter per liter.

15. Suspended Materials – Waters must not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials must not be altered to the extent that such alterations are discernible at the 10 percent significance level.

16. Taste and Odor – Waters must not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high quality waters, the taste and odor must not be altered.

17. Temperature – The natural receiving water temperature of all waters must not be altered unless it can be demonstrated to the satisfaction of the Water Board that such an alteration in temperature does not adversely

affect the water for beneficial uses. For waters designated WARM, water temperature must not be altered by more than five degrees Fahrenheit (5° F) above or below the natural temperature. For waters designated COLD, the temperature must not be altered.

18. Toxicity – All waters must be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration and/or other appropriate methods as specified by the Water Board [or the Executive Officer or his/her designee]. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, must not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, et al. 1998).

19. Turbidity – Waters must be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity must not exceed natural levels by more than 10 percent.

## II. REQUIREMENTS AND PROHIBITIONS

### A. General

1. The discharge must not cause or threaten to cause a condition of pollution or nuisance as defined in California Water Code, section 13050.

2. The discharge of waste, as defined in California Water Code, section 13050, subdivision (d), must not cause an exceedance of any narrative Water Quality Objective (WQO) contained in the Basin Plan.

3. Where any numeric or narrative WQO contained in the Basin Plan is already being exceeded, any discharge which causes further degradation or pollution is prohibited.

4. The discharge of pesticides to surface waters or groundwater is prohibited.

5. Water used for dust control must be limited to a minimal amount. A "minimal amount" is defined as that amount which will not result in run-off.

6. All purge water discharged to the ground at the Landfill and water used for dust control must not contain concentrations of VOCs in excess of the WQPS.

7. The discharge of waste that contains liquid in excess of the moisture-holding capacity of the Landfill, or which contains liquid in excess of the moisture-holding capacity as a result of waste management operations, compaction, or settlement, is prohibited.

8. The discharge of solid or liquid waste, leachate, or any other deleterious material to surface waters or groundwater is prohibited.

9. Surface drainage from offsite areas and internal site drainage from surface or subsurface sources, must not contact or percolate through solid wastes discharged at the Landfill.

10. The Discharger must maintain in good working order any control system or monitoring device installed to achieve compliance with these WDRs.

11. The Landfill, closed in accordance with the FCPCMP accepted by the Water Board, must be maintained in a closed condition, per the FCPCMP and these WDRs.

12. The Discharger must remove and relocate any waste, which is or has been discharged at the closed Landfill in violation of these requirements.

13. The closed Landfill must be protected from inundation, washout, or erosion of wastes and erosion of covering materials resulting from a 24-hour, 100-year storm or a flood having a 100-year return period.

14. The exterior surfaces of the closed Landfill must be graded to promote lateral run-off of precipitation and to prevent ponding.

15. The Discharger must notify the Water Board within one business day of any flooding, slope failure or other change in site conditions that could impair the integrity of the Landfill or of precipitation and drainage control structures. The Discharger must correct any failure that threatens the integrity of the Landfill, after approval of the method, in accordance with a schedule established by the Water Board as specified in CCR, title 27, section 21710, subdivision (c)(2).

16. The Discharger must at all times maintain adequate and viable financial assurances acceptable to the Water Board Executive Officer for costs associated with post-closure maintenance and monitoring and for corrective action for all known or reasonably foreseeable releases.

17. Pursuant to CCR, title 27, section 21090, subdivision (a)(4)(C), the Discharger must repair, in a timely manner, any breach or other cover problem discovered during the periodic inspection of the Landfill cover. Repairs to the soil cover material must follow a Construction Quality Assurance (CQA) plan, as required in CCR, title 27, sections 20323 and 20324, and the FCPCMP.

B. Storm Water Discharges

The Discharger must implement the site-specific SWPPP prepared for the site throughout the post-closure maintenance period for the Facility. The Discharger must update the SWPPP, as site conditions warrant, and submit the updated plan to the Water Board within 30 days of plan update. The SWPPP must be implemented such that waste in discharges of storm water are reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices.

C. Electronic Submittal of Information

Pursuant to CCR, title 23, section 3890, the Discharger must submit all reports, including soil, soil vapor, and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of title 27 electronically over the internet to the State Water Board's Geotracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement.

## III. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

A. Detection Monitoring Program

The Discharger must maintain a DMP as required in CCR, title 27, section 20420. In conjunction with a CAP, the Discharger must continue to conduct a DMP, as necessary, to provide the best assurance of the detection of subsequent releases from the Landfill.

B. Evaluation Monitoring Program

The Discharger must re-establish a revised EMP whenever there is measurably significant evidence and/or significant physical evidence of a new release from the Landfill pursuant to CCR, title 27, section 20425. Within 90 days of initiating an EMP, the Discharger must delineate the nature and extent of the release, as well as develop, propose, and support corrective action measures to be implemented in a CAP.

C. Corrective Action Program

The Discharger is implementing a CAP as required pursuant to CCR, title 27, section 20385 and 20430(c). The Discharger must continue implementing the CAP until it can be demonstrated to the satisfaction of the Water Board that the concentrations of all COCs are reduced to levels below their respective concentration limits throughout the entire zone affected by the release. Any modifications to the CAP must be submitted to the Water Board for review prior to implementation.

D. Water Quality Protection Standard

1. The WQPS consists of COCs, concentration limits, monitoring points, and the point of compliance. The COCs, concentration limits, monitoring points, and point of compliance for groundwater and unsaturated zone monitoring are described in MRP No. R6V-2019-0247.

2. At any given time, the concentration limit for each COC must be equal to the background data set of that constituent unless a concentration limit greater than background has been established.

3. If the Discharger or Water Board Executive Officer determines that concentration limits were or are exceeded, the Discharger may immediately institute verification procedures upon such determination as specified below or, within 90 days of such determination, submit a technical report pursuant California Water Code, section 13267, subdivision (b), proposing an EMP meeting the provisions of CCR, title 27. In the event of a new release, the Discharger will only have 90 days, once the Water Board authorizes the establishment of the EMP to complete the delineation, develop a suite of proposed corrective action measures, and submit a revised Report of Waste Discharge with a proposed CAP for adoption by the Water Board.

4. Monitoring of the groundwater and unsaturated zone must be conducted to evaluate the effectiveness of the CAP and to provide the best assurance of the early detection of any new releases from the Landfill.

E. Data Analysis

Within 45 days after completion of sampling, the Discharger must determine at each Monitoring Point whether there is measurably significant evidence and/or significant physical evidence of a new release from the Landfill. The analysis must consider all monitoring parameters and COCs. The Executive Officer may also make an independent finding that there is measurably significant evidence and/or significant physical evidence of a new release.

1. To determine whether there is "measurably significant" (as defined in CCR, title 27, section 20164) evidence of a new release from the Landfill, the Discharger must use approved statistical data analysis methods to evaluate point of compliance groundwater data, as required by CCR, title 27, section 20415, subdivision (e).

2. To determine whether there is significant physical evidence of a new release from the Landfill, the Discharger must also use non-statistical methods. Significant physical evidence may include, but is not limited to, unexplained volumetric changes in the Landfill, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, unexplained water table mounding beneath or adjacent to the Landfill, and/or any other change in the environment that could be reasonably be expected to be the result of a new release from the Landfill. Other non-statistical evidence of a release may include trends of increasing concentrations of one or more constituents over time.

3. If there is measurably significant evidence and/or significant physical evidence of a new release, the Discharger must immediately notify the Water Board by telephone as to the monitoring points and constituent(s) or parameters involved followed by written notification sent certified mail within seven days (see "Unscheduled Reports to be Filed With the Water Board," MRP No. R6V-2019-0247). The Discharger must initiate the verification procedures, as specified in this Order, Section III.F.

F. Verification Procedures

Whenever there is a determination by the Discharger or Executive Officer that there is measurably significant evidence or significant physical evidence of a new release, the Discharger must initiate verification procedures as specified below.

1. The Discharger must either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or must conduct a discrete retest in which only data obtained from the resampling event must be analyzed to verify evidence of a release. Alternatively, the Discharger may perform a pass 1-of-3 retesting approach using quarterly samples, as an engineered alternative.

2. The verification procedure need only be performed for the constituent(s) that has shown a measurably significant evidence of a release and must be performed for those monitoring points at which a release is indicated.

3. Within seven days of receiving the results of the last laboratory analyses for the retest, the Discharger must report to the Water Board, by certified

mail, the results of the verification procedure, as well as all data collected for use in the retest.

4. If the Discharger or Executive Officer verifies that there is or was evidence of a release, the Discharger is required to submit a technical report to the Water Board within 90 days of such a determination, pursuant to California Water Code, section 13267, subdivision (b). The report must propose an EMP (see Section III.B above) or make a demonstration to the Water Board that there is a source other than the Landfill that caused evidence of a release (see "Unscheduled Reports to be Filed With the Water Board," MRP No. R6V-2019-0247).

5. If the Discharger declines to conduct verification procedures, the Discharger must submit a technical report, as specified in this Order, Section III.G.

G. Technical Report Without Verification Procedures

If the Discharger chooses not to initiate verification procedures after there has been a determination made for evidence of a release, a technical report must be submitted pursuant to California Water Code, section 13267(b). The report must propose an EMP or attempt to demonstrate that the release did not originate from the Landfill.

H. Monitoring and Reporting

1. Pursuant to California Water Code, section 13267, subdivision (b), the Discharger must comply with the monitoring and reporting requirements as established in the attached MRP No. R6V-2019-0247 and as specified by the Executive Officer. The MRP may be modified by the Water Board Executive Officer.

2. The Discharger must comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of MRP No. R6V-2019-0247.

## IV. PROVISIONS

A. Rescission of Waste Discharge Requirements

Board Order No. R6V-2006-0037 and MRP No. R6V-2006-0037 are hereby rescinded.

B. Standard Provisions

The Discharger must comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment C, which is attached to and made part of this Order.

C. Final Closure and Post-Closure Maintenance Plan

The FCPCMP, dated December 2000 and revised November 2004, describes the manner of closure and the proposed post-closure maintenance of the Facility during the post-closure period, and was approved by the Water Board in 2006 under Board Order No. R6V-2006-0037. The Discharger must submit a report to the Water Board on or before **March 30, 2020**, and by **March 30** every year thereafter, indicating that the FCPCMP is in conformance with existing Facility maintenance and operations. The FCPCMP and cost estimates for post-closure maintenance and corrective action of all reasonably known and foreseeable releases must be updated if/when there is a significant change in the activities or costs for maintenance and/or monitoring of the Facility, and to reflect changes in inflation rates (see Section IV.D below).

D. Financial Assurance

The Discharger must submit to the Water Board a financial assurance report on or before **March 30, 2020**, and by **March 30** every year thereafter, providing evidence that adequate financial assurances has been provided for post-closure maintenance and for corrective action of all known and reasonably foreseeable releases. Evidence must include the total amount of money available in the fund developed by the Discharger. In addition, the Discharger must either provide evidence that the amount of financial assurance is still adequate or increase the amount of financial assurance by an appropriate amount. An increase may be necessary due to inflation, change(s) in regulatory requirements, change(s) in the approved closure plan, or other unforeseen events.

V. TIME SCHEDULE

A. Additional Corrective Action Measures to be Implemented

1. The Discharger is required to install one additional groundwater monitoring well in a location downgradient of groundwater monitoring well AVSL-13; this additional groundwater monitoring well is necessary to delineate the furthest extent of the groundwater plume in the northern flow regime. No later than **November 30, 2019**, the Discharger must submit to the Water Board a report detailing the activities performed for the installation of at least one groundwater monitoring well as described herein. The report must be certified by a California-licensed professional

geologist or civil engineer and must contain sufficient information to verify that the work was performed in accordance with State and County standards. A workplan must be submitted to the Water Board for acceptance **a minimum of 30 days** prior to initiating well installation activities. This additional groundwater monitoring well will be incorporated into the CAP monitoring program described in MRP No. R6V-2019-0247.

2. The Discharger is required to conduct a field investigation to better define the lateral and vertical extent of the groundwater impacts in the northern and southern flow regimes, as part of the CAP. This field investigation is necessary to better delineate the lateral and vertical limits of the release from the Landfill in areas where data has historically been limited. No later than **October 30, 2019**, the Discharger must submit to the Water Board a workplan detailing the proposed activities for the field investigation as required herein. The workplan must include a time schedule for field activities and final report submittal. The workplan and final report must both be certified by a California-licensed professional geologist or civil engineer and must contain sufficient information to verify that the field investigation was proposed and performed in accordance with State and County standards.

3. The Discharger is required to install two sentry groundwater monitoring wells, one in the northern flow regime and one sentry well in the southern flow regime, as part of the CAP. These groundwater monitoring wells are necessary to monitor groundwater quality downgradient of the leading edge of the plume and upgradient of the nearest private supply well. No later than **November 30, 2019**, the Discharger must submit to the Water Board a report detailing the activities performed for the installation of at least two sentry groundwater monitoring wells as described herein. The report must be certified by a California-licensed professional geologist or civil engineer and must contain sufficient information to verify that the work was performed in accordance with State and County standards. A workplan must be submitted to the Water Board for acceptance **a minimum of 30 days** prior to initiating well installation activities. These sentry groundwater monitoring wells will be incorporated into the CAP monitoring program described in MRP No. R6V-2019-0247.

4. The Discharger is required to design and install an enhanced LFG venting system as described in the Final EFS dated October 2009, as part the CAP approved herein. This LFG venting system is necessary to provide additional LFG source control to remediate the effects of the known release to groundwater. No later than **December 15, 2019**, the Discharger must submit to the Water Board a Construction Quality Assurance (CQA) Plan that includes all the pertinent design plans and proposed schedule,

including quality assurance and quality control, for the installation of the LFG venting network for the Landfill. The CQA Plan must be certified by a California-licensed professional geologist or civil engineer and must contain sufficient information to verify conformance with CCR, title 27. **No later than 60 days** following completion of installation activities for the LFG venting network, the Discharger must submit to the Water Board a CQA Report documenting implementation of the CQA Plan. The CQA Report must be certified by a California-licensed professional geologist or civil engineer and must contain sufficient information to verify conformance with CCR, title 27.

I, Patty Z. Kouyoumdjian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by California Regional Water Quality Control Board, Lahontan Region, on June 12, 2019.

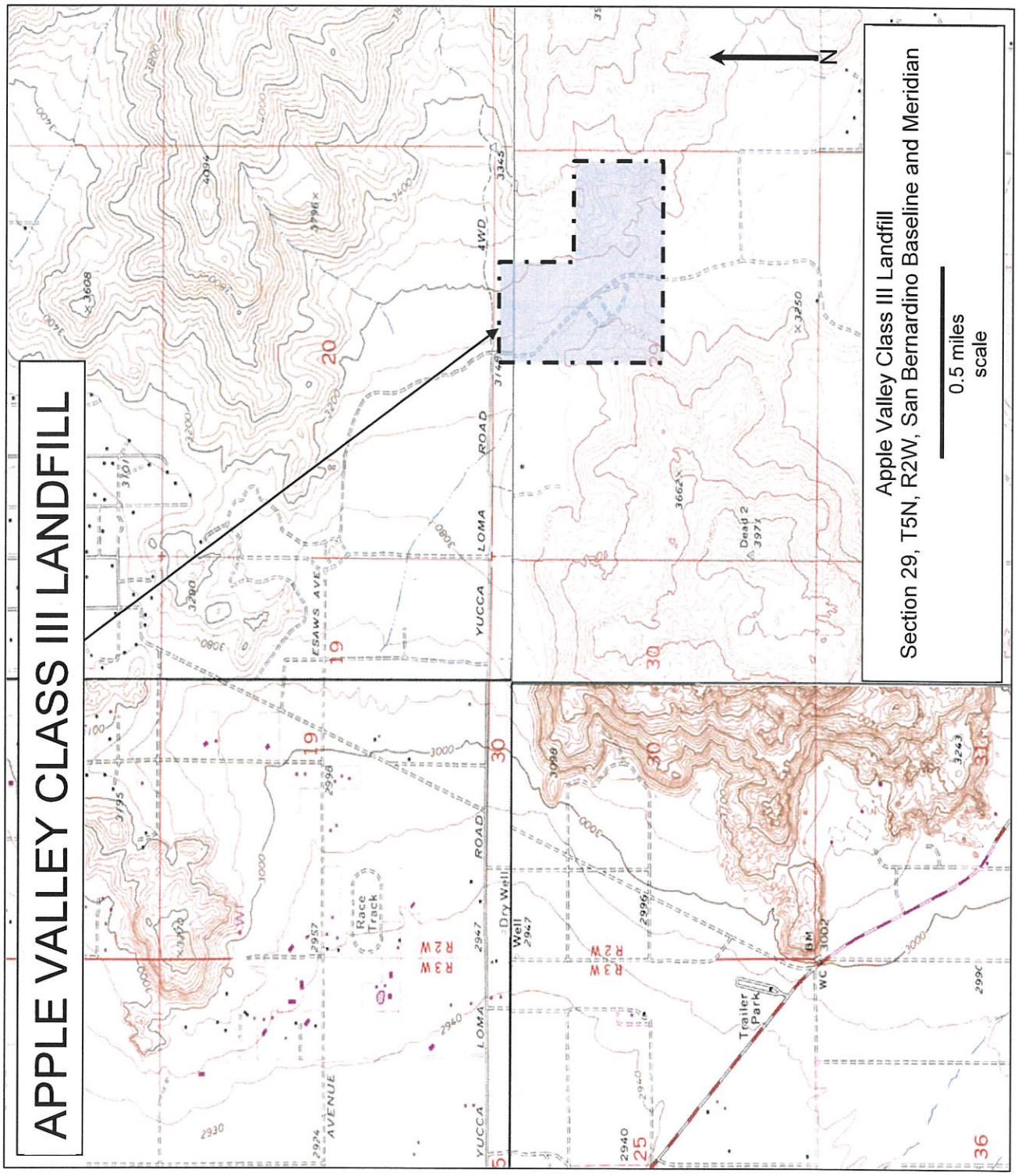
Patty Z. Kouyoumdjian

PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

Attachments:

A. Apple Valley Class III Landfill Location Map and Site Topography
B. Apple Valley Class III Landfill Waste Footprint
C. Standard Provisions for Waste Discharge Requirements

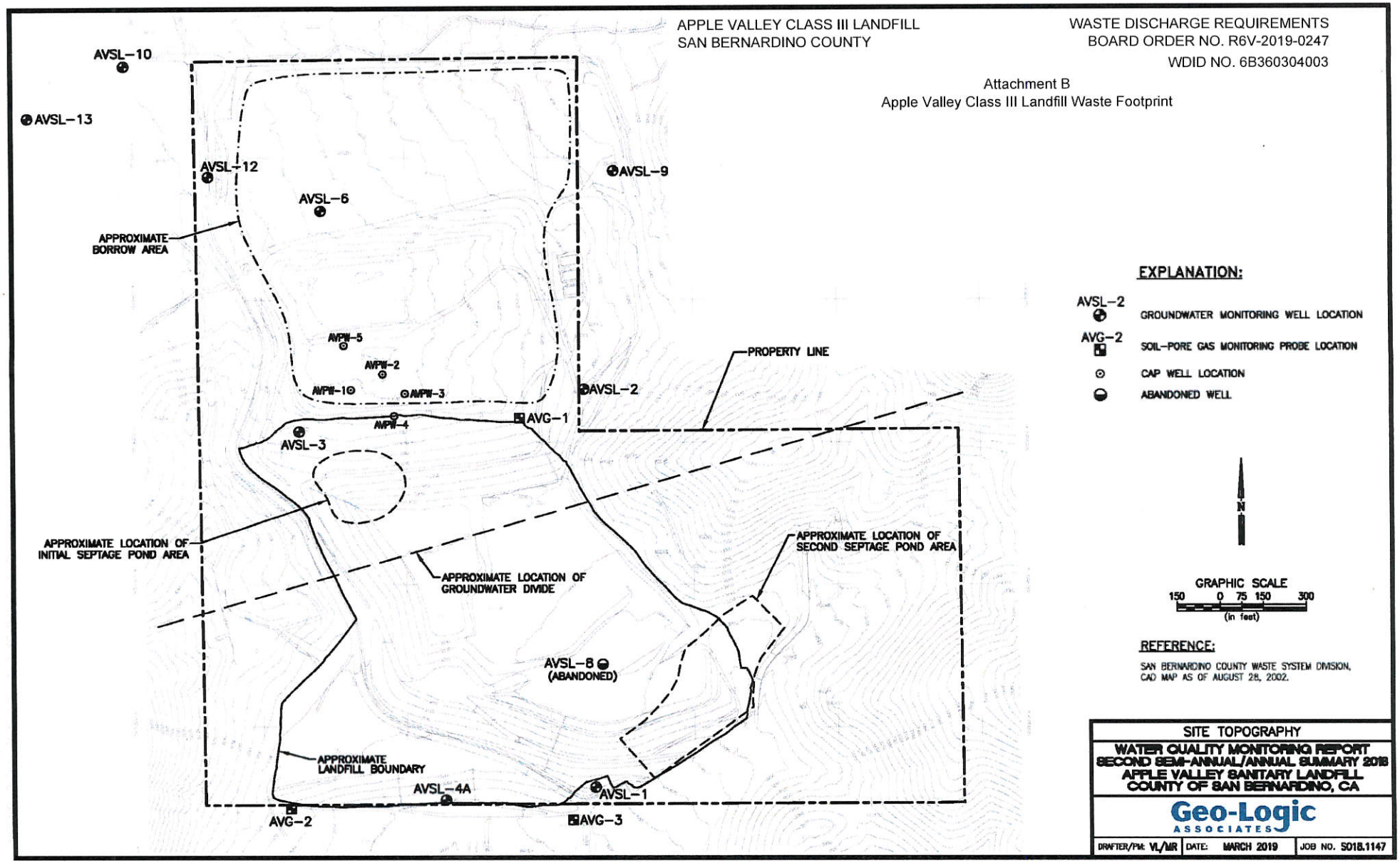
Attachment A
Apple Valley Class III Landfill Location Map and Site Topography



APPLE VALLEY CLASS III LANDFILL
SAN BERNARDINO COUNTY

WASTE DISCHARGE REQUIREMENTS
BOARD ORDER NO. R6V-2019-0247
WDID NO. 6B360304003

Attachment B
Apple Valley Class III Landfill Waste Footprint




SITE TOPOGRAPHY

WATER QUALITY MONITORING REPORT
SECOND SEMI-ANNUAL/ANNUAL SUMMARY 2018
APPLE VALLEY SANITARY LANDFILL
COUNTY OF SAN BERNARDINO, CA

Geo-Logic ASSOCIATES

| DRAFTER/PM: VL/MR | DATE: MARCH 2019 | JOB NO. S018.1147 |
|---|---|---|

**Attachment C**

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

**STANDARD PROVISIONS**
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

a. to enter upon premises in which an effluent source is located or in which any required records are kept;

b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements (WDRs);

c. to inspect monitoring equipment or records; and

d. to sample any discharge.

2. Reporting Requirements

a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.

b. Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.

c. The Owners/Discharger of property subject to WDRs shall be considered to have a continuing responsibility for ensuring compliance with applicable WDRs in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the WDRs shall be reported to the Regional Board. Notification of applicable WDRs shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.

d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing, and correct that information.

e. Reports required by the WDRs, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation.

f. If the Discharger becomes aware that their WDRs (or permit) are no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their WDRs (or permit) be rescinded.

3. Right to Revise WDRs

The Regional Board reserves the privilege of changing all or any portion of the WDRs upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the WDRs may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and re-issuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the WDRs which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the WDRs. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs.

7. Waste Discharge Requirement Actions

The WDRs may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and re-issuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the WDRs conditions.

8. Property Rights

The WDRs do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the WDRs including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the WDRs shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the WDRs are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from treatment and disposal facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operation. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.

b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**
**LAHONTAN REGION**

**MONITORING AND REPORTING PROGRAM**
**NO. R6V-2019-0247**
**WDID NO. 6B360304003**

**FOR**

**SAN BERNARDINO COUNTY SOLID WASTE MANAGEMENT DIVISION**
**APPLE VALLEY CLASS III LANDFILL**

San Bernardino County

This Monitoring and Reporting Program (MRP) No. R6V-2019-0247 is issued to San Bernardino County Public Works Department, Solid Waste Management Division (Discharger) pursuant to California Water Code, section 13267 and incorporates requirements for groundwater and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations (CCR), title 27, section 20005, et seq. The technical reports required by Order No. R6V-2019-0247 and MRP No. R6V-2019-0247 are necessary to assure compliance with the Waste Discharge Requirements. Therefore, the burden, including costs, of these reports bears a reasonable relationship to the need for the report and the benefits to be obtained from the reports.

## I. WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard (WQPS) is required by CCR, title 27, section 20390 through 20410, to assure the earliest possible detection of a release from a waste management unit to the underlying soil and/or groundwater. The WQPS consists of all constituents of concern (COCs), the concentration limits for each COC, the point of compliance, and all water quality monitoring points. The Executive Officer shall review and approve the WQPS, or any modification thereto, for each monitored medium.

The Discharger submitted an updated WQPS report for the Apple Valley Class III Landfill (Landfill) in November 2006. The updated WQPS is hereby approved by the Executive Officer as part of this MRP except for the proposed concentration limits for volatile organic compounds (VOCs). VOCs have been detected in groundwater beneath the Landfill. VOCs are man-made constituents; therefore, background concentrations of these constituents in groundwater are non-detect as more specifically described in this MRP, Section I.C.1.b. The Discharger is currently implementing a Corrective Action Program (CAP) to remediate a release from the Landfill. A WQPS is necessary to evaluate the effectiveness of the CAP and to determine if a new release occurs as part of the Detection Monitoring Program (DMP).

### A. Constituents of Concern

The COCs include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from

waste contained in a waste management unit. The COCs for each monitored medium at the Landfill are listed in Attachment A, which is made part of this MRP. The Discharger must monitor all COCs at the sampling frequency and reporting frequency listed in Attachment A.

B. Monitoring Parameters

Monitoring parameters are those COCs that provide a reliable indication of a release from the Facility. The monitoring parameters for each monitored medium at the Landfill are listed in this MRP, Attachment A. The Discharger must monitor all monitoring parameters at the sampling frequency and reporting frequency listed in Attachment A.

C. Concentration Limits

Concentration limits are established for each COC and are intended to reflect background ambient conditions of surface and subsurface media that are unaffected by a release from the waste management unit. At any given time, the concentration limit for each COC must be equal to the background data set of that constituent unless a concentration limit greater than background (CLGB) has been established. CCR, title 27, section 20415 allows for various options to determine concentration limits including statistical interwell and intrawell methods and non-statistical methods.

1. The Discharger is using the following methodologies to determine concentration limits for the groundwater monitoring program.

   a. Intrawell Comparisons – The Discharger is using historical water quality data from individual groundwater monitoring wells to develop well-specific concentration limits for inorganic constituents. Intrawell comparisons for these COCs are appropriate because these COCs show spatial variation in water quality across the site and a release has already been detected in groundwater.

   b. Non-Statistical Comparisons – For inorganic COCs either not detected in the background well or only detected at trace concentrations and for man-made organic COCs, the concentration limit is set at either the respective practical quantitation limit (PQL) or the method detection limit (MDL) for the analytical method used. For the CAP, the PQL is selected as the concentration limit because this is the lowest concentration (or value) that can be reliably achieved and used to determine a statistically significant or measurable increase. For the DMP, the MDL is selected as the concentration limit, as this will allow for early detection of any future or new release from the Landfill.

2. The Discharger is not required to have concentration limits for soil-pore gas methane, carbon dioxide, nitrogen, and oxygen COCs. These COCs exist naturally in soil with a high degree of variability such that development of background concentrations would be technically infeasible. While VOCs are not naturally occurring in the soil, establishing concentration limits for VOCs in the unsaturated zone is technically infeasible at this time because few studies have evaluated the relationship between soil-pore gas VOC concentrations and the potential threat to water quality. The Discharger will collect soil-pore gas data in the unsaturated zone and use that data to characterize the relationship, if any, between landfill gas (LFG) migration, soil-pore gas VOC concentrations, and the potential threat to water quality at the soil-groundwater interface.

If subsequent sampling of the background monitoring point indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the Facility, the Discharger may request modification of the WQPS concentration limits to provide season-specific concentration limits (background data sets) for each COC at each monitoring point.

CLGBs for corrective action may be proposed by the Discharger in accordance with CCR, title 27, section 20430, after proposed corrective action measures reveal that it is technically and economically infeasible to achieve background water quality levels. The Discharger has not proposed CLGBs for this Landfill.

D. Point of Compliance and Monitoring Points

The points of compliance and monitoring points for each monitored medium at the Landfill are shown on Attachment B of this MRP. Additional monitoring points may be added, as needed, to comply with the DMP and CAP monitoring program requirements contained in this MRP.

The point of compliance is a vertical surface located at the hydraulically downgradient limit of the Landfill that extends through the uppermost aquifer underlying the Landfill. Because there is a groundwater divide that bisects the Landfill into a northern portion and a southern portion, there are two points of compliance, one in the north (northern flow regime) and one in the south (southern flow regime). The northern point of compliance is monitored by groundwater monitoring wells AVSL-2 and AVSL-3, and the southern point of compliance is monitored by groundwater monitoring wells AVSL-1 and AVSL-4A. Additional monitoring points include upgradient (background) groundwater monitoring well AVSL-9, downgradient CAP groundwater monitoring wells AVSL-6, AVSL-10, AVSL-12, and AVSL-13 in the northern flow regime, and downgradient CAP groundwater monitoring wells AVSL-7, AVSL-11, AVSL-14, and AVSL-17 in the southern flow regime.

The soil-pore gas in the unsaturated zone is monitored for LFG concentrations with a series of five LFG monitoring wells located around the perimeter of the Landfill (AVG-1A, AVG-1B, AVG-1C, AVG-2, and AVG-3). LFG monitoring wells AVG-1A through AVG-1C are co-located, multi-level, soil-pore gas monitoring probes, each completed with isolated probes at the following depth intervals below ground surface (bgs): 5.5- to 12.5-feet bgs; 18.5- to 25.5-feet bgs; and 31.5- to 39.5-feet bgs. LFG monitoring well AVG-2 is a single-depth, soil-pore gas monitoring probe completed with an isolated probe at a depth interval of 28- to 36-feet bgs. LFG monitoring well AVG-3 is also a single-depth soil-pore gas monitoring probe and completed with an isolated probe at a depth interval of 11- to 19-feet bgs.

E. Compliance Period

The compliance period is the number of years equal to the active life of the Landfill plus a minimum of 30 years during the post-closure period. The compliance period is the minimum period during which the Discharger must conduct a water quality monitoring program subsequent to a release. The compliance period must begin anew each time the Discharger initiates an Evaluation Monitoring Program (EMP). The compliance period may be extended if the facility is not in compliance with its WQPS.

## II. MONITORING

The Discharger must comply with the monitoring requirements outlined below. All monitoring and inspection activities must be documented, and all sampling must be conducted in accordance with an approved Sampling and Analysis Plan (SAP) that includes quality assurance and quality control standards and procedures, as described in the General Provisions for Monitoring and Reporting (Attachment C of this MRP).

A. Detection Monitoring and Corrective Action Program

The Discharger must operate and maintain a detection and corrective action monitoring system that complies with the DMP and CAP monitoring provisions contained in CCR, title 27, section 20380 through 20435. Monitoring of the groundwater and unsaturated zone must be conducted to evaluate the effectiveness of the CAP and to provide the best assurance of the early detection of any new releases from the Landfill. Changes to the existing monitoring system must be designed and certified by a California-licensed professional geologist or civil engineer as meeting the requirements of CCR, title 27, section 20415(e)(1). The Discharger must collect, preserve, and transport samples in accordance with the SAP.

1. Groundwater Monitoring

The groundwater monitoring program monitors the quality of groundwater that passes through the point of compliance as well as monitors the quality of groundwater upgradient, cross-gradient, and downgradient of the Landfill through the collection of groundwater samples for laboratory analysis and field measurement of water quality parameters.

a. Monitoring Points

The northern point of compliance is monitored by existing groundwater monitoring wells AVSL-2 and AVSL-3 in the northern flow regime; the southern point of compliance is monitored by groundwater monitoring wells AVSL-1 and AVSL-4A in the southern flow regime. Additional monitoring points include upgradient (background) groundwater monitoring well AVSL-9, downgradient CAP groundwater monitoring wells AVSL-6, AVSL-10, AVSL-12, and AVSL-13 in the northern flow regime, and downgradient CAP groundwater monitoring wells AVSL-7, AVSL-11, AVSL-14, and AVSL-17 in the southern flow regime. Groundwater monitoring points are shown on MRP, Attachment B.

b. Depth to Groundwater

Prior to purging and sampling, the Discharger must measure and record the depth below the ground surface of the static groundwater elevation (feet bgs) in all groundwater monitoring wells. The measurements must be accurate to the nearest 0.01 foot.

c. Groundwater Purging and Sampling

Prior to sampling, all groundwater monitoring wells must be purged using either standard or low-flow techniques until temperature, electrical conductivity, and pH of extracted well water have stabilized. These parameters will be considered stable when three consecutive readings have pH values within +/- 0.3 pH units and temperature and electrical conductivity values within +/- three (3) percent.

All groundwater samples, with the exception of field parameters, are to be analyzed by a California state-certified laboratory using the United States Environmental Protection Agency (USEPA) analytical methods listed in Attachment A or the most recently approved SW-846 USEPA method or other

equivalent USEPA method. An alternate method may be proposed and used if acceptable to the Executive Officer.

d. Constituents of Concern and Monitoring Parameters

The Discharger must monitor, at each groundwater monitoring well, all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A. Should any non-monitoring parameter COC exceed their respective concentration limit by a measurably significant amount at any given monitoring point, that non-monitoring parameter COC will become a monitoring parameter at that monitoring point.

e. Field Parameters and Supplemental Parameters

The Discharger must monitor, at each groundwater monitoring well, all field parameters and supplemental parameters in accordance with the frequencies listed in Attachment A.

The field parameters alkalinity, carbon dioxide, dissolved oxygen, ferrous iron, manganese, and oxidation reduction potential are included to evaluate Monitored Natural Attenuation (MNA) conditions for the CAP.

The supplemental parameters total alkalinity and non-volatile organic carbons are included to evaluate MNA conditions for the CAP.

f. Aquifer Characteristics

The Discharger must calculate, and illustrate on a site plan and/or aerial photograph, the following aquifer characteristics: the static water level (feet above mean sea level) in each groundwater monitoring well; the groundwater gradient (feet/feet); the direction of the groundwater gradient beneath and around the Facility (degrees); the velocity of groundwater flow (feet/year); and the current groundwater isocontours for that monitoring period.

g. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of the field monitoring equipment.

2. Unsaturated Zone Monitoring

The unsaturated (vadose) zone monitoring program monitors the composition of soil-pore gases near the Landfill through the collection soil-pore gas samples for laboratory analyses and field measurements. Monitoring of the unsaturated zone must coincide with the groundwater monitoring period.

a. Monitoring Points

The unsaturated zone is monitored for soil-pore gas using a series of five LFG monitoring wells located around the perimeter of the landfill (AVG-1A, AVG-1B, AVG-1C, AVG-2, and AVG-3), as described in this MRP, Section I.D. LFG monitoring point locations are shown on MRP, Attachment B.

b. Field Calibration

Prior to beginning gas collection at the Facility, the instrument(s) will be calibrated using laboratory-grade calibration gases and procedures according to manufacturer recommendations and the approved SAP. This will be done each day the instrument is used and whenever an instrument has been transported from one facility to another to ensure that the field calibration is performed at the same atmospheric pressure at which the soil-gas samples are collected.

c. Soil-Pore Gas Purging and Sampling

Prior to sampling, each LFG probe must be purged of the gas that has been standing inside the casing until methane, oxygen, and carbon dioxide concentrations have stabilized. These parameters will be considered stable when continuous readings have stopped fluctuating. Atmospheric pressure will also be recorded during the purging process.

All soil-gas samples, with the exception of field parameters, are to be collected in accordance with the approved SAP and analyzed by a California state-certified laboratory using the USEPA analytical methods listed in Attachment A or the most recently approved SW-846 USEPA method or other equivalent USEPA method. An alternate method may be proposed and used if acceptable to the Executive Officer.

d. Constituents of Concern and Monitoring Parameters

The Discharger must monitor all probes in each LFG monitoring well for all COCs and monitoring parameters in accordance with the frequencies listed in Attachment A.

e. Field Parameters

The Discharger must monitor all probes in each LFG monitoring well for all field parameters in accordance with the frequencies listed in Attachment A. If methane gas is detected during field monitoring at or above a threshold concentration of 5 percent of methane gas volume in air, then soil-pore gas samples must be taken from that LFG monitoring probe (during that monitoring event) and analyzed for the soil-pore gas COCs listed in Attachment A.

f. Calibration Documentation

Annually, the Discharger must submit documentation of instrument calibration and performance checks to verify proper operation of all field monitoring equipment.

B. Facility Inspections

The following elements must be monitored annually and reported to the Water Board in accordance with the schedule specified in this MRP, Section IV.A.2. Maintenance and repairs must be performed in a timely manner following discovery of the problem in accordance with the procedures outlined in the approved FCPCMP.

1. Annual Inspection

Annually, prior to the anticipated rainy season, but no later than **September 30**, the Discharger must conduct an inspection of the Facility. The inspection must assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and must include adequate observations to assess the Landfill condition. Any necessary construction, maintenance, or repairs must be completed by **October 31** of the same year. The Discharger must document the inspection and the repair measures implemented, including photographs of the problem and of the repairs.

2. Storm Events

The Discharger must inspect all precipitation, diversion, and drainage facilities for damage **within 10 days** following major storm events.

Necessary repairs must be completed **within 30 days** of the inspection. The Discharger must document the inspection(s) and the repair measures implemented, including photographs of the problem and of the repairs.

C. Final Cover Integrity Monitoring and Maintenance Program

The Discharger has installed an engineered alternative final cover over the Landfill, specifically an evapotranspiration (ET) cover. The constructed ET cover is a 3-foot thick engineered cover composed of a minimum of a 2-foot thick layer of select soil materials underlain by a 1-foot thick foundation layer over the entire Landfill surface. The cover has been graded to prevent leachate formation due to storm water infiltration, to promote lateral runoff, and to prevent ponding. Pursuant to CCR, title 27, section 21090, the Discharger must monitor the condition of the cover system as outlined in the Final Closure and Post-Closure Maintenance Plan (FCPCMP). The purpose of this monitoring is to ensure the integrity of the cover and to evaluate the cover's capability to promote runoff and prevent ponding.

The following elements must be monitored annually and reported to the Water Board in accordance with the schedule specified in this MRP, Section IV.A.3. Maintenance and repairs to the cover must be performed in a timely manner following discovery of the problem in accordance with the procedures outlined in the approved FCPCMP.

1. An evaluation of the condition of the ET cover surface, including areas requiring replanting/reseeding, if needed.

2. Eroded portions of the cover surface requiring regrading, repair, or (for areas where the problem persistently reoccurs) installation of additional erosion control measures.

3. An evaluation of the ability of the cover to promote runoff and prevent ponding.

4. Areas where there is evidence of ponding or lacking free drainage.

5. An evaluation of the cover thickness, including areas requiring regrading and additional soil cover, to maintain the as-built final cover over the entire surface of the Landfill.

6. Areas of the cover surface damaged by equipment operation.

7. Localized areas identified in the five-year iso-settlement survey as having sustained repeated or severe differential settlement.

8. Prior to conducting periodic grading repairs and maintenance of the cover surface, the Discharger must note on a map of the Landfill the approximate location and outline of any areas where differential settlement is visually obvious. Map notations and delineations made pursuant to this paragraph need not be surveyed, so long as all areas where differential settlement was visually identifiable prior to regrading can be relocated. Such notation and delineation must be made by, or under the supervision of, a California-licensed professional geologist or civil engineer.

## III. DATA ANALYSES

All groundwater data must be analyzed using statistical and non-statistical methods that meet the requirements of CCR, title 27, sections 20415, subdivisions (e)(8) and (9).

### A. Site-Specific Statistical Analysis Method

In order to determine whether there is "measurably significant" evidence of any new releases from the Facility, evaluation of data will be conducted using statistical methods. For detection monitoring, the Discharger shall use statistical methods to analyze COCs and monitoring parameters that exhibit concentrations that equal or exceed their respective concentration limit. The Discharger may propose and use any data analyses that meets the requirements of CCR, title 27, section 20415, subdivision (e)(7). *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA, 2009) or subsequent versions may also be used to select the statistical test to use for comparing detection monitoring data to background monitoring data.

The Discharger has established concentration limits for detection and for evaluation of compliance with the CAP. The limits may be revised every two years.

### B. Non-Statistical Analysis Methods

In order to determine if any new releases have occurred from the Facility, evaluation of data will also be conducted using non-statistical methods. Non-statistical analyses shall be as follows.

1. Physical Evidence

Physical evidence can include, but is not limited to, unexplained stress in biological communities such as vegetation loss, soil discoloration, or groundwater mounding. Each annual DMP/CAP report must comment on such physical elements.

2. Time-Series Plots

Non-statistical evidence of a release may include trends of increasing concentrations of one or more constituents over time, as depicted in time-series plots. Each annual DMP/CAP report must include these time-series plots. Time-series plots are not required for parameters that have never been detected above their MDL (as specified by the applicable USEPA method).

## IV. REPORTING REQUIREMENTS

The Discharger must comply with the following reporting requirements.

### A. Scheduled Reports to be Filed with the Water Board

The following periodic reports, including all water and soil vapor monitoring data collected during the corresponding reporting period, must be submitted electronically to the Water Board by uploading to the State Water Board's GeoTracker system, per the following schedule.

| REPORTING SCHEDULE | | |
|---|---|---|
| **Report Name** | **Sampling and Reporting Period** | **Report Due Date** |
| First Semi-Annual DMP/CAP Monitoring Report | January 1 – June 30 | August 15 |
| Second Semi-Annual DMP/CAP Monitoring Report | July 1 – December 31 | February 15 |
| Annual DMP/CAP Monitoring Report[1] | January 1 – December 31 | March 30 |
| Annual Cover Performance Report[1] | January 1 – December 31 | March 30 |
| Five-Year Iso-Settlement Map[2] | January 1 – December 31 | March 30 |
| Five-Year Constituent of Concern Monitoring Report[3] | January 1 – June 30<br>July 1 – December 31 | August 15<br>February 15 |
| Five-Year Corrective Action Evaluation Report[4] | January 1 – December 31 | August 15 |

[1] Reports may be combined.
[2] The next five-year iso-settlement map is scheduled to be submitted to the Water Board no later than March 30, 2020.
[3] Sampling and reporting period will alternate between January 1 through June 30 for one five-year sampling event and July 1 through December 31 for the next five-year sampling event. The August 15 report due date corresponds to the January 1 through June 30 sampling and reporting period; the February 15 report due date corresponds to the July 1 through December 31 sampling and reporting period. The next five-year constituent of concern report is due February 15, 2021.
[4] Sampling and reporting period is the most recent five calendar years prior to the report due date. The first 5-year corrective action evaluation report is due August 15, 2024.

1. Semi-Annual DMP/CAP Monitoring Reports

Each semi-annual DMP/CAP report must include, but not be limited to, the following information.

a. All data collected during the reporting period in accordance with the approved SAP for the Landfill's groundwater and unsaturated zone monitoring systems, as outlined in MRP Section II.A.

b. Tabulated results of sampling and laboratory analyses for each groundwater monitoring point, including historical (last ten years at minimum) and current reporting period data, as well as the concentration limit for each monitoring parameter and an identification of each sample that exceeds its respective concentration limit by a measurably significant amount at any given monitoring point.

c. Tabulated results of sampling and laboratory analyses for each unsaturated zone monitoring point, including historical (last ten years at minimum) and current reporting period data.

d. A map and/or aerial photograph showing the Landfill perimeter and ancillary facilities as well as locations of all monitoring points, observation stations, and the surface trace of the point of compliance.

e. Calculate and illustrate on a map and/or aerial photograph the static groundwater surface elevation (feet above mean sea level) in each groundwater monitoring well, the groundwater gradient (feet/feet) and the direction of the groundwater gradient beneath and around the Facility, the velocity of groundwater flow (feet/year), and the current groundwater isocontours for that monitoring period.

f. Copies of all field monitoring and well sampling data sheets.

g. Time-series plots of the analytical results from the groundwater and unsaturated zone monitoring at each monitoring point for each COC detected during the monitoring period as well as available historical data (minimum of last ten years of data). Time-series plots must include, as horizontal lines, the COCs concentration limit as derived in accordance with the WQPS for the respective COC/monitoring point pair, as well as the PQL and MDL for the analytical method used.

h. An evaluation of the effectiveness of the CAP. The evaluation of corrective action activities should also include a map showing the current extent of impacted groundwater (plume maps) and/or cross sections.

i. A letter transmitting the essential points of each report, including a discussion of any violations found since the last

report was submitted and describing actions taken or planned for correcting those violations.

i. If the Discharger has previously submitted a detailed time schedule for correcting violations, a reference to the correspondence transmitting this schedule will suffice.

ii. If no violations have occurred since the last submittal, this must be stated in the letter of transmittal.

2. Annual DMP/CAP Monitoring Reports

Annual DMP/CAP monitoring reports must be submitted to the Water Board no later than **March 30** of each year and may be combined with the second semi-annual DMP/CAP monitoring report for the same reporting year. The report must include the items described in the General Provisions for Monitoring and Reporting (Attachment C to this MRP), the information required under MRP Section IV.A.1, and the following information.

a. All data collected in accordance with this MRP, Section II.B.

b. A list of all monitoring point/monitoring parameter pairs (pairs), by medium, which have exhibited a verified measurably significant increase, together with the respective date (for each) when that increase occurred. Any pairs that have shown an increase within that (prior) year shall be bold-underlined. In addition, by medium, list any non-monitoring parameter COCs that, during testing that year (tested every five years), have exceeded their respective concentration limit by a measurably significant amount and, as a result, have become monitoring parameters, together with the date when the transition occurred.

c. Two maps, one for each semi-annual monitoring period of the last reporting year, showing the groundwater isocontours determined for that monitoring period, the Landfill and all ancillary facilities, all groundwater and unsaturated zone

monitoring points, and the surface trace of the point of compliance.

d. Calibration methods and any discrepancies of any meters used for field parameter evaluations after calibration is performed.

e. An evaluation of the effectiveness of both the groundwater and unsaturated zone monitoring programs and any proposed modifications necessary to improve the DMP and/or CAP. The evaluation of corrective action activities should also include a map showing the current extent of impacted groundwater (plume maps) and/or cross sections.

f. A brief chronological summary of dates of any operational problems and maintenance activities that may impact water quality at the site.

g. The compliance record and the corrective actions taken or planned, which may be needed to bring the Facility into full compliance with the discharge requirements.

h. Evidence that adequate financial assurance for post-closure maintenance and corrective action is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.

i. Evidence that the financial assurance amount is adequate or increase the amount of financial assurance by an appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events.

j. The Discharger must review the FCPCMP annually to determine if significant changes in the operation of the Facility warrant an update to the plan. Proposed changes to the plan must be outlined in the annual report.

3. Final Cover Performance Reports

a. Annual Cover Performance Reports

Annual final cover performance reports must be submitted to the Water Board no later than **March 30** of each year and may be combined with the annual DMP/CAP monitoring report. Annual final cover reports must include, but not be limited to, the following information.

i. All data collected in accordance with this MRP, Section II.C.

ii. A description of the condition of the final cover materials and a discussion regarding any settlement or soil cover erosion, which have occurred, and the capability of the cover to promote runoff and prevent ponding.

iii. Where settlement, erosion, or other damage to the cover is noted, the report must indicate the actions taken to repair the cover material, the date(s) those actions were taken, and what actions are being taken to prevent reoccurrence.

b. Five-Year Iso-Settlement Map

Pursuant to CCR, title 27, 21090(2)(2), at least once every five years, the Discharger must prepare and submit to the Water Board an iso-settlement map accurately depicting the estimated total change in elevation of the final cover surface. The five-year iso-settlement map must be submitted to the Water Board no later than **March 30** of the year in which it is due and should be included with the annual final cover performance report due that same reporting year. The next five-year iso-settlement map is scheduled to be submitted to the Water Board no later than **March 30, 2020**. The map must include, at minimum, the following information.

i. The total lowering of the surface elevation of the final cover, relative to the baseline topographic map prepared at the time of closure (as-built condition).

ii. Indicate all areas where repeated and severe differential settlement has occurred since closure.

iii. The map shall be drawn to the same scale and contour interval as the baseline as-built topographic map but show the current topography of the final cover and include overprinted isopleths indicating the total settlement to-date.

4. Five-Year Constituent of Concern Monitoring and Reporting Program

Pursuant to CCR, title 27, section 20420, subdivision (g), every five years the Discharger must sample for COCs. Groundwater samples must be collected and submitted for laboratory analyses at all monitoring points once every five years for all monitoring parameters

and COCs listed in Appendix I and Appendix II of Title 40, Code of Federal Regulations (40 CFR), Part 258 (Attachment A). Successive monitoring efforts must be carried out alternately during January 1 through June 30 of one five-year sampling event and July 1 through December 31 of the next five-year sampling event, and every fifth year, thereafter. The five-year COC sampling event must be reported no later than 45 days following the monitoring period. The last five-year sampling event occurred in May 2015 and was reported in 2016; therefore, the next five-year sampling event is scheduled to occur in second half of 2020 and reported to the Water Board no later than **February 15, 2021**.

5. Five-Year Corrective Action Program Evaluation Report

During the life of the CAP, the Discharger shall submit to the Water Board every five years a Five-Year Corrective Action Program Evaluation Report. This report will be submitted to the Water Board by **August 15** of the year in which it is due. The first Five-Year Corrective Action Program Evaluation Report is scheduled to be submitted to the Water Board no later than **August 15, 2024**. The report must include, at minimum, the following information.

a. A detailed evaluation of the CAP and recommendations to continue, modify or discontinue the CAP, including recommendations for other remedial alternatives.

b. Status information regarding CAP progress with supporting evidence collected as part of the groundwater and unsaturated zone monitoring programs.

c. Review of the WQPS for the Landfill and recommendations regarding any updates to the WQPS including concentration limits.

d. A chronological summary of any contingency remedies and/or triggers that were identified and the additional corrective actions taken or planned during the previous five years of implementing the CAP.

B. Unscheduled Reports to be Filed with the Water Board

The following reports must be submitted to the Water Board as specified below.

1. Notice of Tentative Release from the Landfill

Should the statistical or non-statistical data analyses indicate, for a given COC, that a new release is tentatively identified, the Discharger must follow these requirements.

a. Physical or Measurably Significant Evidence of a Release from the Landfill

The Discharger must immediately notify the Water Board verbally whenever a determination is made that there is significant physical or "measurably significant" evidence of a release from the Landfill. This verbal notification must be followed by written notification via certified mail within seven days of such determination. Upon such notification, the Discharger may initiate verification procedures or demonstrate that another source other than the Landfill caused evidence of a release in accordance with MRP, Section IV.B.1.b.

The notification must include the following information:

i. The potential source of the release;

ii. General information including the date, time, location, and cause of the release;

iii. An estimate of the flow rate and volume of waste involved;

iv. A procedure for collecting samples and description of laboratory tests to be conducted;

v. Identification of any water body or water-bearing media affected or threatened;

vi. A summary of proposed actions; and

vii. For a physical evidence of a release – the physical factors that indicate evidence of a release; or

viii. For a measurably significant evidence of a release – the monitoring parameters and/or COCs that are involved in the measurably significant evidence of a release from the Landfill.

b. Other Source That May Cause Evidence of a Release from the Landfill

The Discharger may make a demonstration that a source other than the Landfill caused evidence of a release. For this case, the Discharger must notify the Water Board of the intention to make this demonstration. The notification must be sent to the

Water Board by certified mail within seven days of determining physical or measurably significant evidence of a release.

2. Evaluation Monitoring

The Discharger is implementing a CAP for an existing known release to groundwater. The Discharger must, within 90 days of verifying a new release, submit a technical report pursuant to California Water Code section 13267, subdivision (b), proposing an EMP meeting the provisions of CCR, title 27, section 20420, subdivision (k)(5). If the Discharger decides not to conduct verification procedures, or decides not to make a demonstration that a source other than the Landfill is responsible for the release, the release will be considered verified. The EMP must include the following information:

a. COC Concentrations – the maximum concentration of each COC at each monitoring point as determined during the most recent COC sampling event (i.e., under CCR, title 27, section 20420, subdivision (g) or (k)[1]). Any COC that exceeds its concentration limit is to be retested at that monitoring point. Should the results of the retest verify that the COC is above the concentration limit, then that COC will become a monitoring parameter at that monitoring point;

b. Proposed Monitoring System Changes – any proposed changes to the groundwater and unsaturated zone monitoring systems necessary to meet the provisions of CCR, title 27, section 20425;

c. Proposed Monitoring Changes – any proposed additions or changes to the monitoring frequency, sampling and analytical procedures or methods, or statistical methods used at the Facility necessary to meet the provisions of CCR, title 27, section 20425; and

d. Proposed Delineation Approach – a detailed description of the measures to be taken by the Discharger to assess the nature and extent of the release from the Landfill.

3. Engineering Feasibility Study Report

The Discharger is implementing a CAP for a known release to groundwater. Within 180 days of verifying the existence of any new release, the Discharger must submit a revised Engineering Feasibility Study report meeting CCR, title 27, section 20420, subdivision (k)(6), proposing corrective action measures that could be taken to achieve background concentrations for all COCs involved in the release. This report will be the basis for a later expanded Engineering Feasibility Study submitted under the EMP, per CCR, title 27, section 20425, subdivision (b).

4. Monitoring Well Logs

Pursuant to CCR, title 27, section 20415, subdivision (e)(2) all monitoring wells (including groundwater and unsaturated zone monitoring wells) and all other borings installed to satisfy the requirements of this MRP must be drilled by a licensed drilling contractor and must be logged during drilling under the direct supervision of either a California-licensed professional geologist or civil engineer with expertise in stratigraphic well logging. Such logs must be submitted to the Water Board within 90 days following completion of fieldwork.

5. Significant Earthquake Event

After a significant[1] or greater earthquake event at or near the Facility, the Discharger shall notify the Water Board within 48 hours, and within 45 days submit to the Water Board a detailed written post-earthquake report describing any physical damages to the containment features or groundwater and/or unsaturated zone monitoring systems. The Discharger shall closely examine the Landfill cover, vegetative cover, slope conditions, drainage control system, and surface grading for signs of cracking or depressed/settled areas, following the earthquake event. If cracking or depressed areas of the cover is identified, the Discharger shall make repairs to those areas within 30 days from the date of the earthquake event. Repairs must be made in accordance with approved procedures in the FCPCMP.

[1] A significant earthquake is a seismic event classified according to the United States Geological Survey (USGS) Earthquake Hazard Program as a moderate earthquake measuring between 5 and 5.9 on the Richter scale, or higher. The Discharger may use the Modified Mercalli Intensity Scale VI or higher for equivalent ground shaking generated by a significant earthquake of Richter magnitude 5.0 or higher as contained with the USGS Earthquake Hazard Program Magnitude/Intensity Comparison chart found at https://earthquakes.usgs.gov.

C. General Provisions

The Discharger must comply with Attachment C, "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this MRP.

D. Violations

If monitoring data indicate violation of this Corrective Action and Post-Closure WDR, the Discharger must report the violation in the scheduled report for the corresponding reporting period and provide information indicating the cause of violation(s) and the action taken or planned to bring the discharge into compliance.

E. Electronic Reporting Requirements

Pursuant to CCR, title 23, section 3890, the Discharger must submit reports, including soil, vapor, and water data, prepared for the purpose of subsurface investigation or remediation of a discharge of waste to land subject to Division 2 of CCR, title 27, electronically over the internet to the State Water Resources Control Board's GeoTracker system. This requirement is in addition to, and not superseded by, any other applicable reporting requirement. The Discharger must provide the monitoring report to the Water Board, as specified in this MRP, and upload the full monitoring report into GeoTracker, as stipulated by CCR, title 23.

For all other types of documents and correspondence, please send to the Water Board's email address at Lahontan@waterboards.ca.gov and include the WDID No. and Facility name in the subject line.

Ordered by: Patty Z. Kouyoumdjian Dated: June 12, 2019
PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

Attachments: A. Water Quality Monitoring Program
B. Apple Valley Class III Landfill Location of Monitoring Points
C. General Provisions for Monitoring and Reporting

## ATTACHMENT A – WATER QUALITY MONITORING PROGRAM

| GROUNDWATER MONITORING | | | | | |
|---|---|---|---|---|---|
| Parameter | | Units | USEPA Method[1] | Sampling Frequency | Reporting Frequency |
| **Field Parameters** | | | | | |
| Depth to Groundwater | | feet below ground surface | -- | semi-annual | semi-annual |
| Dissolved Oxygen | | milligrams/liter | -- | semi-annual | semi-annual |
| pH | | pH Units | -- | semi-annual | semi-annual |
| Specific Conductance | | siemens/meter | -- | semi-annual | semi-annual |
| Temperature | | degrees Farenheit or Celsius | -- | semi-annual | semi-annual |
| Turbidity | | NTUs | -- | semi-annual | semi-annual |
| Alkalinity[2] | | milligrams/liter | -- | annually | annually |
| Carbon Dioxide[2] | | milligrams/liter | -- | annually | annually |
| Ferrous Iron[2] | | milligrams/liter | -- | annually | annually |
| Manganese[2] | | milligrams/liter | -- | annually | annually |
| Oxidation Reduction Potential[2] | | milliVolts | -- | annually | annually |
| **Constituents of Concern** | | | | | |
| **Monitoring Parameters** | Chloride | milligrams/liter | 300 | semi-annual | semi-annual |
| | Nitrate as Nitrogen | milligrams/liter | 300 | semi-annual | semi-annual |
| | Sulfate | milligrams/liter | 300 | semi-annual | semi-annual |
| | Total Dissolved Solids | milligrams/liter | E160.1 | semi-annual | semi-annual |
| | Volatile Organic Compounds[3] | micrograms/liter | 8260 | semi-annual | semi-annual |
| Antimony | | micrograms/liter | 7062 | 5 year | 5 year |
| Arsenic | | micrograms/liter | 7062 | 5 year | 5 year |
| Barium | | micrograms/liter | 6010 | 5 year | 5 year |
| Beryllium | | micrograms/liter | 6010 | 5 year | 5 year |
| Cadmium | | micrograms/liter | 7131 | 5 year | 5 year |
| Chromium | | micrograms/liter | 6010 | 5 year | 5 year |
| Cobalt | | micrograms/liter | 6010 | 5 year | 5 year |
| Copper | | micrograms/liter | 6010 | 5 year | 5 year |
| Lead | | micrograms/liter | 7421 | 5 year | 5 year |
| Mercury | | micrograms/liter | 7471 | 5 year | 5 year |
| Nickel | | micrograms/liter | 7521 | 5 year | 5 year |
| Selenium | | micrograms/liter | 7742 | 5 year | 5 year |
| Silver | | micrograms/liter | 6010 | 5 year | 5 year |
| Thallium | | micrograms/liter | 7841 | 5 year | 5 year |
| Tin | | micrograms/liter | 6010 | 5 year | 5 year |
| Vanadium | | micrograms/liter | 6010 | 5 year | 5 year |

| | | | | |
|---|---|---|---|---|
| **Constituents of Concern (cont.)** | | | | |
| Zinc | micrograms/liter | 6010 | 5 year | 5 year |
| Total Cyanide | micrograms/liter | 9010 | 5 year | 5 year |
| Volatile Organic Compounds[3] | micrograms/liter | 8260 | 5 year | 5 year |
| Semi-volatile Organic Compounds[4] | micrograms/liter | 8270 | 5 year | 5 year |
| Polychlorinated Biphenyls and Pesticides[4] | micrograms/liter | 8141 | 5 year | 5 year |
| Chlorinated Herbicides[4] | micrograms/liter | 8151 | 5 year | 5 year |
| Organophosphorus Pesticides[4] | micrograms/liter | 8141 | 5 year | 5 year |
| **Supplemental Parameters** | | | | |
| Non-volatile Organic Carbon[2] | milligrams/liter | 415.1 | annually | annually |
| Total Alkalinity[2] | milligrams/liter | 310.1 | annually | annually |

| **UNSATURATED ZONE SOIL-PORE GAS MONITORING** | | | | |
|---|---|---|---|---|
| **Parameter** | **Units** | **Method[1]** | **Sampling Frequency** | **Reporting Frequency** |
| **Field Parameters** | | | | |
| Atmospheric Pressure | inches of mercury | -- | semi-annual | semi-annual |
| Methane | parts per million or percent by volume | -- | semi-annual | semi-annual |
| Carbon Dioxide | parts per million or percent by volume | | semi-annual | semi-annual |
| Nitrogen | parts per million or percent by volume | | semi-annual | semi-annual |
| Oxygen | parts per million or percent by volume | | semi-annual | semi-annual |

| Constituents of Concern | | | | | |
|---|---|---|---|---|---|
| Monitoring Parameters | Carbon dioxide | parts per million or percent by volume | ASTM-D1946 | Based on results of soil-pore gas field parameter monitoring[5] | semi-annual |
| | Methane | parts per million or percent by volume | | | semi-annual |
| | Nitrogen | parts per million or percent by volume | | | semi-annual |
| | Oxygen | parts per million or percent by volume | | | semi-annual |
| | Volatile Organic Compounds | parts per billion or percent by volume | TO-15 | | semi-annual |
| Volatile Organic Compounds | | parts per billion or percent by volume | TO-15 | annually | annually |

1 - The Discharger shall analyze for all constituents, with the exception of field parameters, using the United States Environmental Protection Agency (USEPA) analytical methods indicated or the most recently approved SW-846 USEPA method or other equivalent USEPA method. An alternate method may be proposed and used if acceptable to the Water Board Executive Officer.

2 - Parameters to evaluate Monitored Natural Attenuation are monitored annually. Monitoring of these parameters will alternate between sampling events such that for odd numbered years monitoring will occur during the first semester and for even numbered years monitoring will occur during the second semester.

3 - As defined in Appendix I, 40 Code of Federal Regulations (CFR), part 258.

4 - As defined in Appendix II, 40 CFR, part 258.

5 - If methane gas is detected during field monitoring at or above a threshold concentration of 5 percent of methane gas volume in air, then soil-pore gas samples must be taken from that LFG monitoring probe (during that monitoring event) and analyzed for the soil-pore gas monitoring parameters listed.

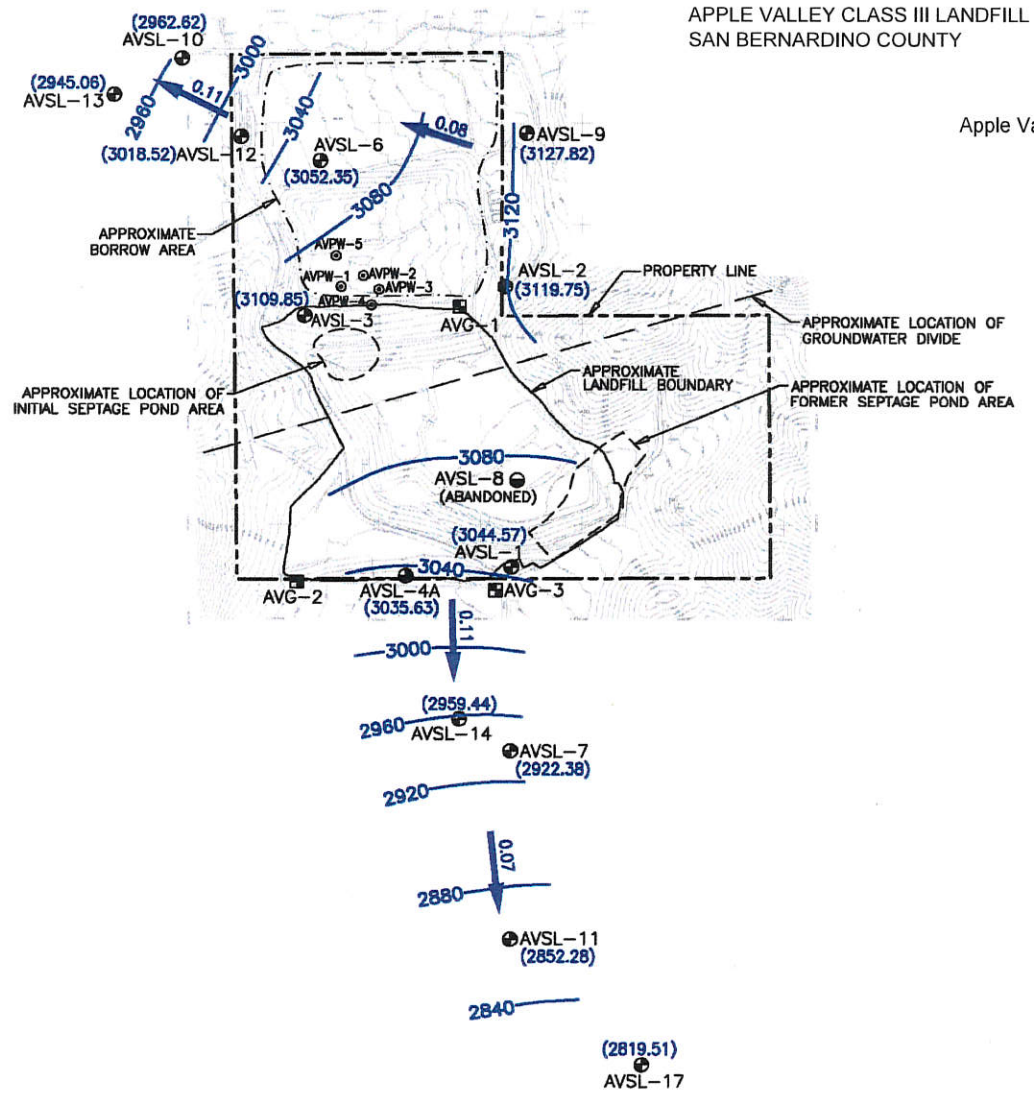
ASTM - American Society for Testing and Methods

NTU - Nephelometric Turbidity Units

APPLE VALLEY CLASS III LANDFILL
SAN BERNARDINO COUNTY

MONITORING AND REPORTING PROGRAM
NO. R6V-2019-0247
WDID NO. 6B360304003

Attachment B
Apple Valley Class III Landfill Location of Monitoring Points




## EXPLANATION:

| | |
|---|---|
| AVSL-2 (3119.75) | GROUNDWATER MONITORING WELL LOCATION (GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL) |
| AVG-2 | SOIL-PORE GAS MONITORING PROBE LOCATION |
| | CAP WELL LOCATION |
| | ABANDONED WELL |
| 3000 | CONTOUR LINE SHOWING GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (CONTOUR INTERVAL = 40 FEET) |
| 0.11 | DIRECTION AND GRADIENT (FT/FT) OF GROUNDWATER FLOW |

N

GRAPHIC SCALE
300 0 150 300 600
(in feet)

## REFERENCES:

1. SAN BERNARDINO COUNTY WASTE SYSTEM DIVISION, CAD MAP AS OF AUGUST 28, 2002.
2. 2018 SECOND SEMI-ANNUAL REPORT AND ANNUAL SUMMARY, WATER QUALITY MONITORING PROGRAM, APPLE VALLEY SANITARY LANDFILL, GEOSYNTEC, FEBRUARY 2019.

OCTOBER 2018 GROUNDWATER EQUIPOTENTIAL CONTOURS

WATER QUALITY MONITORING REPORT
SECOND SEMI-ANNUAL/ANNUAL SUMMARY 2018
APPLE VALLEY SANITARY LANDFILL
COUNTY OF SAN BERNARDINO, CA

Geo-Logic ASSOCIATES

| DRAFTER/PM: VL/MR | DATE: MARCH 2019 | JOB NO. S018.1147 |
|---|---|---|

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

**GENERAL PROVISIONS**
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

i. Standard Methods for the Examination of Water and Wastewater

ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board Executive Officer. Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.

d. The Discharger shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. Pursuant to California Water Code Section 13267(b), all sampling and analytical results shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship,by the proprietor; or

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the following:

i. Name and telephone number of individual who can answer questions about the report.

ii. The Monitoring and Reporting Program Number.

iii. WDID Number.

f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation under Section 13268 of the Water Code.

x:PROVISONS WDRS

file: general pro mrp