

March 13, 2023
File No. 01204123.25, Task 10

Baitong Chen, Air Quality Engineer, bchen@aqmd.gov
Nathaniel Dickel, Senior Air Quality Engineer, ndickel@aqmd.gov
Gerardo Vergara, Air Quality Inspector, gvergara@aqmd.gov
South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, CA 91765-4182

Subject: Weekly Report (March 4 through March 10) for Ex Parte Emergency and Interim Variance (Case No. 6177-3), Chiquita Canyon Landfill (Facility ID 119219), Castaic, California

To Whom It May Concern:

SCS Engineers (SCS), on behalf of Chiquita Canyon Landfill (CCL), hereby provides the South Coast Air Quality Management District (SCAQMD) with a weekly report per the Ex Parte Emergency and Interim Variance (Case No. 6177-3) for the CCL in Castaic, California. The emergency variance was approved on February 8, 2023; the interim variance was approved on February 15, 2023.

This weekly report is covering the period from Saturday, March 4 through Friday, March 10, 2023. These weekly reports will cover a period from Saturday through Friday and be submitted on the following Monday.

BACKGROUND

A lab analysis of landfill gas (LFG) samples from CCL, reported on February 1, 2023, showed total sulfur levels of 143 parts per million by volume (ppmv) with dimethyl sulfide contributing 117 ppmv. A breakdown report was called in to the SCAQMD that afternoon as required, and there was further communication between SCS and the SCAQMD clarifying the reason for the breakdown report, and the written breakdown was submitted on February 9, 2023 within the required 14-day period (500-N Form). The Ex Parte Emergency, Interim, and Regular Variance Application from the following rules/conditions was submitted to the SCAQMD Hearing Board on February 4, 2023:

- Title V permit, Facility Wide Conditions, Condition No. 3; (Rule 431.1);
- CCL's Rule 431.1 Alternative Monitoring Plan (Application No. 352929);
- Permit to Operate (PTO) G23473 (A/N 491442) Condition Nos. 16 and 17; (Rule 1303(a)(1) – BACT; Rule 1303(b)(1) and (b)(2) – Modeling and Offset; Rule 1401); and
- PTO G55163 (A/N 603249) Condition No. 11; (Rule 431.1)



The Ex Parte Emergency Variance was approved on February 8, 2023, subject to conditions. The hearing for an Interim Variance request was conducted on February 15, 2023 and was approved, subject to revised conditions, which were issued in final on March 7, 2023.

Condition No. 5 requires weekly reports to be submitted via email to Baitong Chen, Nathaniel Dickel, and Gerardo Vergara of the SCAQMD, which includes the following information:

- A. *Initial weekly report shall provide information on the LFG sulfur compounds measurements and laboratory analysis conducted in the last 6 months pursuant to Rule 431.1 Alternative Monitoring Plan (AMP).*
- B. *The LFG sulfur compounds measurements and laboratory analysis identified in Condition No. 3.*
- C. *The LFG records and calculations identified in Condition No. 4.*
- D. *Estimated schedule for any replacement or refurbishment of granular activated carbon media in the Landfill Gas Treatment System (under Permit G55163, A/N 603249) identified in Condition No. 1.*
- E. *Description of any problems or delays, if any, encountered or projected to occur pertinent to the execution of contracts, as well as the delivery, replacement, startup, and testing of any operation necessary to replenish and/or replace spent granular activated carbon media in the Landfill Gas Treatment System (under Permit G55163, A/N 603249).*
- F. *Specifications of the equipment and materials used for the daily colorimetric tests (include in initial weekly report (due Monday February 13, 2023), and in the subsequent weekly report(s) only if there is a change in the specifications of the colorimetric instrumentation or method used).*
- G. *All wellhead temperature readings from the past 12 months in a Microsoft Excel spreadsheet format (include in the February 27, 2023 status update report).*

While not required as part of the weekly report pursuant to Condition No. 5, the following conditions of the variance are required to be reported on the weekly reports:

- H. *Petitioner shall perform a root cause analysis to investigate and determine the underlying cause of total sulfur concentration exceedances and submit a preliminary written report to South Coast AQMD staff via email to Baitong Chen, Air Quality Engineer, (bchen@aqmd.gov), Nathaniel Dickel, Senior Air Quality Engineer, (ndickel@aqmd.gov), and Gerardo Vergara, Air Quality Inspector, (gvergara@aqmd.gov) by February 22, 2023. Any updates to this analysis shall be included in the weekly report submitted pursuant to Condition No. 5, until it reaches a final written report.*
- I. *Petitioner shall investigate the availability, viability, and utilization, including pilot testing if needed, of an alternative sulfur compound treatment system that controls, treats, or removes dimethyl sulfide and other sulfur compounds and shall report and submit status updates on this investigation in the weekly report per Condition No. 5 starting in the weekly report that is due February 27, 2023 by 5:00pm.*
- J. *Petitioner shall investigate the availability, viability and utilization of valid and active South Coast AQMD permitted Various Location sulfur compound treatment system that controls, treats, or removes dimethyl sulfide and other sulfur compounds and shall report and submit status updates on this investigation in the weekly report per Condition No. 5 starting in the weekly report that is due February 27, 2023 by 5:00 pm.*
- K. *Whenever South Coast AQMD permitted Various Location equipment is brought or operated on site to process, treat, or control the landfill gas, Petitioner shall:*

- A. *Notify South Coast AQMD in writing of the date and time that the equipment is brought to the facility in the corresponding weekly report per Condition No. 5 and include a copy of the various locations permit(s) in the corresponding weekly report per Condition No. 5.*
- B. *Maintain a daily log including the following information for each permit unit: permit number, application number, equipment location, and start and end time of equipment operation (as applicable). Petitioner shall submit the daily log in the corresponding weekly report per Condition No. 5*
- C. *Notify South Coast AQMD in writing of the date and time that the equipment is removed from the facility in the corresponding weekly report per Condition No. 5.*

An application for a regular variance was submitted with the Ex Parte Emergency Variance on February 4, 2023 and a regular variance hearing is scheduled for May 3, 2023.

WEEKLY REPORT

Section A - LFG Sulfur Compound Measurements in the last 6 Months

Initial Weekly report shall provide information on the LFG sulfur compounds measurements and laboratory analysis conducted in the last 6 months pursuant to Rule 431.1 Alternative Monitoring Plan (AMP).

A summary of the last six months of laboratory analyses and draeger tube readings for landfill gas (LFG) sulfur analyses was provided on February 13, 2023 in the initial weekly report and will not be reported on in subsequent reports.

Section B – LFG Sulfur Compound Measurements during Reporting Period

The LFG sulfur compounds measurements and laboratory analysis identified in Condition No. 3.

Condition No. 3: Petitioner shall sample, analyze, and record the landfill gas sulfur compounds combusted in each flare (under Permit G23473, A/N 491442) at least once each shift using colorimetric tests for hydrogen sulfide (H₂S) and at least once each day sample for analysis for total sulfur compounds as H₂S using South Coast AQMD Method 307-91. Petitioner shall record South Coast AQMD Method 307-91 analysis upon receipt of laboratory analysis report. Each recorded measurement or result shall be documented with the time and date of the measurement or sample collection was conducted, and initialed by the personnel that conducted the measurement or sample collection. Sulfur compound readings and analysis shall be reported to South Coast AQMD pursuant to Condition No. 5.

The lab analyses performed and report received during the reporting period are presented in **Attachment A**. This report includes analytical data received on or after March 4 through March 10. Tedlar bag samples were collected and analyzed by SCAQMD Method 307.91 for hydrogen sulfide and reduced sulfur compounds. These include the following SCAQMD Method 307.91 samples:

- Sample collected on March 4, 2023, and laboratory report received on March 4, 2023.
- Sample collected on March 5, 2023, and laboratory report received on March 6, 2023.

- Sample collected on March 6, 2023, and laboratory report received on March 6, 2023.
- Sample collected on March 7, 2023, and laboratory report received on March 8, 2023.
- Sample collected on March 8, 2023, and laboratory report received on March 8, 2023.
- Sample collected on March 9, 2023, and laboratory report received on March 10, 2023.
- Sample collected on March 10, 2023, and laboratory report received on March 10, 2023.

Daily colorimetric tests (draeger tube) were started on February 9, 2023, after Emergency Variance was approved on February 8, 2022. These include the following colorimetric test samples:

- Sample collected and reported on March 4, 2023
- Sample collected and reported on March 5, 2023
- Sample collected and reported on March 6, 2023
- Sample collected and reported on March 7, 2023
- Sample collected and reported on March 8, 2023
- Sample collected and reported on March 9, 2023
- Sample collected and reported on March 10, 2023

A summary of the colorimetric tests and laboratory analyses for landfill gas (LFG) sulfur analyses is provided in the table below, covering the period March 4, 2023 through March 10, 2023:

Date of Sample	Draeger Tube H ₂ S (ppm)	SCAQMD Method 307.91 (Concentration in ppmv as H ₂ S)		
		H ₂ S	DMS	TRS
3/4/23	10	9.34	109	145.4
3/5/23	10	9.24	111	151.3
3/6/23	7	6.81	177	216.7
3/7/23	7	7.65	142	200.2
3/8/23	7	7.87	134	173.6
3/9/23	7	8.76	139	197.9
3/10/23	10	10.6	135	182.1

*Above summarized Lab analysis are included in **Attachment A**.

Section C – LFG Records and Calculations

The LFG records and calculations identified in Condition No. 4.

Condition No. 4: Petitioner shall maintain a record of the following information, and provide such records to the South Coast AQMD pursuant to Condition No. 5:

A. The hourly and daily flow of landfill gas combusted, in standard cubic feet, in each flare (No. 1 & No. 2 under Permit G23473, A/N 491442) and the total amount of landfill gas combusted at the facility;

B. The daily flow of landfill gas not flared, in standard cubic feet, if applicable;

C. The results of the sulfur readings, sampling, and analyses, calculated as hydrogen sulfide (H₂S);

D. Daily excess emissions in pounds (lbs) of sulfur oxides (SOx) per day for each flare (No. 1 and No. 2 under Permit G23473, A/N 491442), including any assumptions, equations, supporting information, and basis for the calculations used in the excess emissions calculations.

The above-mentioned lab analyses are included in **Attachment A** and calculations are available in **Attachment B**.

In accordance with Condition No 4, Section A, the flow rates for each flare as standard cubic feet per minute (scfm), scf per hour, and scf per day are provided in the calculation tables available in **Attachment B**.

In accordance with Condition No 4, Section B, the daily flow of LFG not flared is available in **Attachment B**. Ameresco applied for variance to operate the LFG turbine plant under a variance order, and their variance was approved on February 15th. Ameresco restarted operations on February 16th, returning LFG collection and control system at CCL to full capacity. Therefore, the daily flow of LFG not flared per Section B ended on February 17th as there are no longer excess emissions related to this item. Please note however, Ameresco was offline from March 6 through March 10 to complete scheduled maintenance. The excess emissions from March 6th through March 10th are included in **Attachment B**.

A summary of the total daily flow for Ameresco is provided in the table below. As noted above, except from March 6th through March 10th, the actual Ameresco LFG flow rate after restarting operations are greater than the calculated unflared amount while Ameresco was off-line as demonstrated in the calculations in **Attachment B**. Therefore, there was no unflared gas from March 4th and March 5th:

Date	Ameresco VOC Flare (scf)	Ameresco Turbine 1 (scf)	Ameresco Turbine 2 (scf)	Ameresco Total (scf)
3/4/23	504,015	2,749,388	2,730,617	5,984,020
3/5/23	503,991	2,776,482	2,740,034	6,020,507
3/6/23	323,378	851,220	837,953	2,012,551
3/7/23	0	0	0	0
3/8/23	0	0	0	0
3/9/23	0	0	0	0
3/10/23	330,033	879,351	26,864	1,236,249

The excess emissions in pounds of sulfur oxides (SOx) per day for each flare are calculated using the following assumptions and calculations, in accordance with AP-42 *Compilation of Air Emissions Factors* Section 2.4:

$$\text{Calculated Actual Emissions (lbs/day)} = (64.066 \text{ g/mol}) / (34.08 \text{ g/mol}) * (\text{TRS as H}_2\text{S ppmv}) * (\text{scfm}) * (1,440 \text{ min/day}) * (34.08 \text{ g/mol}) * (28.32 \text{ L/cf}) / (1,000,000 \text{ BTU}) * (453.6 \text{ g/lb}) * (24.04 \text{ L @ STP})$$

Inputs and units:

- SO₂ molecular weight: 64.066 grams/moles (g/mol)

- H₂S molecular weight: 34.08 g/mol
- TRS as H₂S concentration from daily laboratory analysis: ppmv
- Flare flow rate from chart recorder data: scfm (daily flow to each flare)
- Per day conversion: 1440 min/day
- Cubic feet (cf) conversion: 28.32 Liter per cf (L/cf)
- Million British Thermal Unit (MMBTU) conversion: 1,000,000 BTU
- Pound (lb) conversion: 453.6 g/lb
- Mole conversion: 24.04 L @ STP

The excess emissions are determined by the difference between the daily permitted allowed SO_x emissions and the daily actual SO_x emissions as calculated above from site-specific data and can be found in **Attachment B**.

Section D – Schedule for Replacement or Refurbishment of Granular Activated Carbon Media

Estimated schedule for any replacement or refurbishment of granular activated carbon media in the Landfill Gas Treatment System (under Permit G55163, A/N 603249) identified in Condition No. 1.

Condition No. 1: Petitioner shall expedite, to the maximum extent feasible, replacement of granular activated carbon media in the Landfill Gas Treatment System (under Permit G55163, A/N 603249), including the execution of contracts, as well as the delivery, replacement, startup, and testing of any operation necessary to replenish and/or replace spent granular activated carbon media in the Landfill Gas Treatment System. Petitioner shall ensure adequate stock of all odor control products and supplies are maintained on site.

The Landfill Gas Treatment System (LFGTS) currently consists of four carbon adsorber vessels. Only three of the four vessels are online during normal operations with one vessel offline awaiting servicing to replace spent media or on standby with fresh granular activated carbon media. A vessel is typically serviced every 4 to 8 weeks. Colorimetric tests are performed on the outlet of the operating vessels approximately weekly to determine if a vessel may require an adjustment to the flow or schedule service to replace the media.

H₂S vessels will be changed out at a lower concentration. As of February 24, 2023, Vessels ST-1, ST-2 and ST-4 are online processing the landfill gas. Vessel ST-3 was serviced on March 8 and 9, 2023, and is on standby with fresh media. The next service has been scheduled with the vendors and is set for March 27 and 28, 2023.

SCS is currently investigating the use of a different granular activated carbon media than what is currently used in the treatment vessels to see if it is more effective in reducing dimethyl sulfide. Subsequent weekly reports will include information on the use of any different granular activated carbon.

Section E – Description of Problems or Delays

Description of any problems or delays, if any, encountered or projected to occur pertinent to the execution of contracts, as well as the delivery, replacement, startup, and testing of any

operation necessary to replenish and/or replace spent granular activated carbon media in the Landfill Gas Treatment System (under Permit G55163, A/N 603249).

There have been no problems or delays with any operation necessary to replenish and/or replace spent granular activated carbon media in the LFGTS.

Section F – Specifications of Equipment and Materials for Daily Colorimetric Tests

Specifications of the equipment and materials used for the daily colorimetric tests weekly report(s) only if there is a change in the specifications of the colorimetric instrumentation or method used).

The daily colorimetric tests are completed with the Draeger Accuro 64000 bellows hand pump with either Draeger hydrogen sulfide colorimetric tubes Model 6728821 (2 to 20 ppm) or Model CH29801 (5 to 60 ppm). The specifications of the equipment and materials used for the daily colorimetric test was included in the initial weekly report provided on February 13, 2023. There has been no change in the specifications since the previous weekly report.

Section G – Wellhead Temperature Readings

All wellhead temperature readings from the past 12 months in a Microsoft Excel spreadsheet format (include in the February 27, 2023 status update report).

The wellhead temperature readings from the past 12 months were included in Attachment C of the February 27, 2023 status update report with additional readings provided in subsequent status update reports. Wellhead temperature readings for March 1, 2023 through March 9, 2023 are included in **Attachment C**. Well monitoring was not collected on March 10th due to a storm causing poor field conditions.

Section H – Status of Root Cause Analysis

Status updates pursuant to Condition No. 6 (beginning February 22, 2023).

Petitioner shall perform a root cause analysis to investigate and determine the underlying cause of total sulfur concentration exceedances and submit a preliminary written report to South Coast AQMD staff via email to Baitong Chen, Air Quality Engineer, (bchen@aqmd.gov), Nathaniel Dickel, Senior Air Quality Engineer, (ndickel@aqmd.gov), and Gerardo Vergara, Air Quality Inspector, (gvergara@aqmd.gov) by February 22, 2023. Any updates to this analysis shall be included in the weekly report submitted pursuant to Condition No. 5, until it reaches a final written report.

The preliminary analysis under Condition No. 6 was submitted to the SCAQMD personnel on February 22, 2023. There has been no update to this analysis as of the end of the current reporting period.

Section I – Status of Investigation for Alternate Sulfur Compound Treatment Systems

Petitioner shall investigate the availability, viability, and utilization, including pilot testing if needed, of an alternative sulfur compound treatment system that controls, treats, or removes

dimethyl sulfide and other sulfur compounds and shall report and submit status updates on this investigation in the weekly report per Condition No. 5 starting in the weekly report that is due February 27, 2023 by 5:00pm.

SCS investigated the availability and viability of alternative sulfur compound treatment systems that control, treat or remove dimethyl sulfide and other sulfur compounds. A preliminary list of alternative treatment systems is included below:

- Oxidation by Hypochlorite
- Oxidation by Peroxide
- Oxidation by Potassium Permanganate
- Bentonite or Zeolite Media Impregnated with Metal
- Reaction with Iron
- Reaction with Copper
- Biotreatment with Sulfur-Reducing Bacteria (SRBs)

A preliminary assessment of these treatment technologies was included in Attachment D of the February 27, 2023 status update report. These technologies will be further investigated and updates will be included in subsequent weekly reports. In addition to the preliminary list of alternative treatment systems, SCS is investigating the use of a hydrogen re-former catalyst to convert all sulfur compounds to H₂S.

Section J – Status of Investigation for Various Location Sulfur Compound Treatment System

Petitioner shall investigate the availability, viability and utilization of valid and active South Coast AQMD permitted Various Location sulfur compound treatment system that controls, treats, or removes dimethyl sulfide and other sulfur compounds and shall report and submit status updates on this investigation in the weekly report per Condition No. 5 starting in the weekly report that is due February 27, 2023 by 5:00 pm.

SCS investigated the availability of valid and active SCAQMD Various Location Permits using the SCAQMD's online permit database, Facility Information Detail (FIND). However, the database is very limited and does not provide the ability to query and search for various locations, gas treatment, sulfur treatment, or any other related parameters. Without knowing the exact and specific permit number or permit holder names for Various Location Permits, it is not possible to do a search on the FIND database. SCS reached out to SCAQMD directly for assistance and feedback for searching for Various Location Permits within the SCAQMD. SCAQMD was not able to assist in identifying Various Locations Permits.

After additional internet searches, SCS found information on a limited number of companies in SCAQMD with potential Various Location Permits. A detailed search was conducted via the FIND database based on the Facility names, and the following SCAQMD Various Location Permits were found, all under the Envent Corporation. Additional searches were conducted for GEO Environmental Remediation Company, Innovative Construction Solutions, and National Response Corporation. There were no Various Location Permits available for GEO Environmental Remediation Company and no facility matched National Response Corporation. Two Various Location Permits were found for Innovative Construction Solutions, but they were not applicable. Please note, there were numerous similar Various Location Permits for an equipment type, so only one Permit for each equipment type

was submitted in Attachment E of the February 27, 2023 status update report. Each individual Various Location Permit is listed below. SCS hereby submits these Various Location Permits for consideration:

Similar Equipment consisting of Wet Scrubbers and/or Carbon Adsorbers and/or Activated Carbon:

- Permit No. G71100 (submitted)
- Permit No. G71101
- Permit No. G71103
- Permit No. G25683
- Permit No. G30226
- Permit No. G30774
- Permit No. G30775
- Permit No. D90501
- Permit No. R-F33293
- Permit No. R-G6416
- Permit No. R-G6417
- Permit No. G49310
- Permit No. G67228
- Permit No. G67229
- Permit No. F33240
- Permit No. F39465
- Permit No. F41280
- Permit No. F47167
- Permit No. F96276
- Permit No. F96696
- Permit No. F96698
- Permit No. F96699
- Permit No. F96700
- Permit No. F96701
- Permit No. F96702
- Permit No. F96703
- Permit No. F96704
- Permit No. F96705
- Permit No. F96706
- Permit No. F96707
- Permit No. F96708
- Permit No. F96709
- Permit No. G35420
- Permit No. G35421
- Permit No. G35422
- Permit No. G36076
- Permit No. G36077
- Permit No. G36078

These Various Location Permits are for wet scrubbers and carbon adsorber vessels for pilot test(s) of sulfur and DMS control.

Equipment consisting of Spent Adsorption Media:

- Permit No. G52829 (submitted)

Similar Equipment consisting of Thermal Oxidizers:

- Permit No. G27420 (submitted)
- Permit No. G30442
- Permit No. R-G45029
- Permit No. D90501
- Permit No. F16747
- Permit No. F16750
- Permit No. F19760
- Permit No. F20152
- Permit No. F21532
- Permit No. F21533
- Permit No. F33577
- Permit No. F47126
- Permit No. F47339
- Permit No. F50020
- Permit No. F51474
- Permit No. F52001
- Permit No. F52643
- Permit No. F63896
- Permit No. F67536
- Permit No. R-G51686
- Permit No. F31361
- Permit No. F34742
- Permit No. F39976
- Permit No. F46563
- Permit No. F50022
- Permit No. F54790
- Permit No. F55011
- Permit No. F57097
- Permit No. F63164
- Permit No. F78900
- Permit No. F78989
- Permit No. F78991
- Permit No. F78992
- Permit No. F78993
- Permit No. G16088
- Permit No. G31617
- Permit No. R-F31361
- Permit No. R-F39976

These Various Location Permits are for Thermal Oxidizers for supplemental gas control. These permits will not be needed as long as both Flare No. 1, Flare No. 2, and Ameresco are online.

A request to the SCAQMD for review of the identified Various Location Permits was included in the February 27, 2023 status update report. There are no updates to this request as of the end of the reporting period, and we await SCAQMD's guidance as to whether any of these Various Location Permits are viable for use in pilot testing of sulfur treatment options.

Section K – Status of Permitted Various Location Equipment

Whenever South Coast AQMD permitted Various Location equipment is brought or operated on site to process, treat, or control the landfill gas, Petitioner shall:

A. Notify South Coast AQMD in writing of the date and time that the equipment is brought to the facility in the corresponding weekly report per Condition No. 5 and include a copy of the various locations permit(s) in the corresponding weekly report per Condition No. 5.

B. Maintain a daily log including the following information for each permit unit: permit number, application number, equipment location, and start and end time of equipment operation (as applicable). Petitioner shall submit the daily log in the corresponding weekly report per Condition No. 5

C. Notify South Coast AQMD in writing of the date and time that the equipment is removed from the facility in the corresponding weekly report per Condition No. 5.

A various location equipment has not been brought or operated on site; therefore, this condition is not yet applicable.

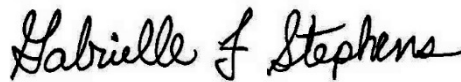
CLOSING

If you have any questions or need any additional information, please contact Cornelius Fong of SCS Field Services at (562) 743-7895 or either of the undersigned at (800) 326-9544.

Sincerely,



James J. Kim
Senior Project Professional
SCS Engineers



Gabrielle F. Stephens
Senior Project Manager
SCS Engineers

JJK/GFS/PSS

cc: Cornelius Fong, SCS Engineers;
Steve Cassulo, Chiquita Canyon Landfill

Enclosures

Attachment A

Lab Analyses from the Reporting Period

Attachment B
Calculations

Attachment C

Wellhead Temperature Data