

OPERATING AGREEMENT

BETWEEN

**WESTERN PLACER WASTE MANAGEMENT
AUTHORITY**

AND

**FCC ENVIRONMENTAL SERVICES, LLC
FOR OPERATION OF THE WESTERN REGIONAL
SANITARY LANDFILL**

OPERATING AGREEMENT EFFECTIVE AS OF JULY 1, 2022

TABLE OF CONTENTS

	Page
ARTICLE 1. DEFINITIONS.....	1
ARTICLE 2. REPRESENTATIONS & WARRANTIES OF CONTRACTOR.....	7
2.1 Legal Status.....	7
2.2 Authorization and Binding Obligation.....	7
2.3 Legal Authority.....	7
2.4 No Conflicts or Litigation.....	7
2.5 Contractor's Investigation.....	8
2.6 Information Supplied by the Contractor	8
2.7 Financial Resources; Expertise and Capability.....	8
2.8 Representatives of the Parties	8
ARTICLE 3. CONDITIONS TO EFFECTIVENESS OF AGREEMENT	8
3.1 Transition Plan.....	8
3.2 Conditions to Effectiveness of Agreement	9
ARTICLE 4. Term of agreement.....	10
4.1 Term.....	10
4.2 Extension of Term.....	10
ARTICLE 5. Landfill operations.....	10
5.1 General.....	10
5.2 Days and Hours of Operation	11
5.3 Priority	11
5.4 Hazardous Waste Exclusion Program.....	11
5.5 Liquidated Damages	12
5.6 Landfill Signage.....	15
5.7 Avoidance of Undisturbed Land.....	15
5.8 Waste Disposal Fill Plans	15
5.9 Surveying and Staking.....	16
5.10 Soil Operations Layer	16
5.11 Waste Acceptance and Load Checking.....	16
5.12 Waste Placement and Compaction Performance Standards	18
5.13 Landfill Cover and Related Operations	18

TABLE OF CONTENTS
(continued)

	Page
5.14 Landfill Maintenance	20
5.15 Landfill Drainage	23
5.16 Litter Control	24
5.17 Odor Control	25
5.18 Vector Control	25
5.19 Dust Control.....	25
5.20 Fire Safety	26
5.21 Equipment.....	26
5.22 Labor	27
5.23 Contractor Cooperation with WPWMA Construction Projects.....	31
5.24 Additional Work Directed by the WPWMA	31
5.25 Operation of Other Business	32
5.26 Contractor's Construction of Landfill Gas Window Wells	32
5.27 Stormwater Monitoring and Reporting.....	32
ARTICLE 6. OTHER CONTRACTOR REQUIREMENTS	33
6.1 Contractor's Facilities	33
6.2 Public Access to The Contractor.....	34
6.3 Complaints and Response	35
6.4 Change in Operations or Administration	35
ARTICLE 7. CONTRACTOR COMPENSATION	35
7.1 General.....	35
7.2 Compensation for Contractor Operating the Landfill.....	36
7.3 Annual Inflation Adjustment	37
7.4 Billing and Payment.....	38
7.5 Change in Circumstances.....	39
7.6 Miscellaneous	39
ARTICLE 8. OTHER RECORD KEEPING AND REPORTING REQUIREMENTS	40
8.1 Record Keeping, Posting, Report Submittal	40
8.2 Right to Inspect Records.....	40
8.3 Monthly Reporting.....	40

TABLE OF CONTENTS

(continued)

	Page
8.4 Quarterly Reporting	41
8.5 Financial Records and Reporting.....	41
8.6 Additional Reporting	42
8.7 Other Related Requirements	43
8.8 Inspection by the WPWMA or Regulators	43
ARTICLE 9. INDEMNITY, INSURANCE, BOND.....	43
9.1 Contractor Indemnification	Error! Bookmark not defined.
9.2 Hazardous Substances Indemnification	44
9.3 Insurance Scope and Limits	44
9.4 Faithful Performance Bond.....	48
9.5 Waiver of Consequential Damages.....	48
ARTICLE 10. BREACH, DEFAULT AND REMEDIES	48
10.1 Events of Breach	48
10.2 Events of Default	48
10.3 Right to Terminate Upon Contractor Default	50
10.4 Right to Terminate Upon WPWMA Default.....	50
10.5 Possession of Property Upon Termination	51
10.6 The WPWMA's Remedies Cumulative.....	51
10.7 Excuse from Performance.....	51
10.8 Right to Demand Assurances of Performance	52
10.9 The WPWMA's Right to Perform	53
ARTICLE 11. OTHER AGREEMENTS OF THE PARTIES	54
11.1 Relationship of Parties	54
11.2 Compliance with Applicable Law	54
11.3 Governing Law	54
11.4 Contractor Assignment	54
11.5 Subcontracting	56
11.6 Binding on Successors	56
11.7 Transition to the Next Contractor	56
11.8 Parties in Interest.....	56

TABLE OF CONTENTS
(continued)

	Page
11.9 Waiver.....	56
11.10 Condemnation.....	56
11.11 Notice.....	56
ARTICLE 12. MISCELLANEOUS AGREEMENTS	57
12.1 Entire Agreement.....	57
12.2 Article and Section Headings.....	57
12.3 References to Laws	57
12.4 Reference to Days	57
12.5 Interpretation.....	57
12.6 Integration and Amendment	57
12.7 Severability	57
12.8 Counterparts.....	58
12.9 Miscellaneous	58
EXHIBIT A TRANSITION PLAN	60
EXHIBIT B INSURANCE CERTIFICATES AND ENDORSEMENTS.....	61
EXHIBIT C PERFORMANCE BOND	62
EXHIBIT D CONTINGENCY PLAN	63
EXHIBIT E SITE MAP	64
EXHIBIT F PRIMARY SERVICE AREA MAP.....	65
EXHIBIT G SPECIAL SERVICES HOURLY RATES	66
EXHIBIT H MASTER FILL SEQUENCING PLAN.....	67
EXHIBIT I LANDFILL GAS WINDOW WELL PLAN AND SPECIFICATIONS	68
EXHIBIT J SITE WIDE ODOR PLAN	69
EXHIBIT K DISPUTE RESOLUTION	70

THIS OPERATING AGREEMENT (“Agreement”) effective as of July 1, 2022 (“Effective Date”), between the Western Placer Waste Management Authority (hereinafter “WPWMA”) and FCC Environmental Services, LLC (hereinafter “Contractor”). Unless otherwise specified in this Agreement any action authorized or required to be taken by the WPWMA may be taken by the Board or by an official or agent designated by the Board.

RECITALS

WHEREAS, the Legislature of the State of California, by enactment of the Act, has declared that it is within the public interest to authorize and require local agencies to make adequate provisions for solid waste handling within their jurisdictions; and

WHEREAS, the WPWMA was created on October 3, 1978 to assume responsibility for the Waste Disposal needs of the cities of Rocklin, Roseville and Lincoln, and the western unincorporated areas of Placer County; and WHEREAS, the WPWMA owns the Landfill located at 3195 Athens Avenue, Lincoln, California; and WHEREAS, pursuant to California Public Resources Code Section 40059(a)(2), the Board has determined that the public health, safety and well-being require that a contract be awarded to a qualified firm for operations of the Landfill; and WHEREAS, the WPWMA proposes to enter into this Agreement with Contractor for the operation of the Landfill, and:

WHEREAS, the Contractor represents it is qualified and willing to operate the Landfill pursuant to this Agreement,

NOW, THEREFORE, intending to be legally bound, the Parties agree as follows:

ARTICLE 1. DEFINITIONS

For purposes of this Agreement the following words or phrases shall have the following meanings.

1. **Act** “Act” means the California Integrated Waste Management Act of 1989, as amended, Public Resources Code Sections 40000, et seq.
2. **Affiliate** “Affiliate” means any corporation, partnership, joint venture or other entity directly or indirectly controlling the Contractor, or directly or indirectly owned or controlled by the Contractor.
3. **Active Face** “Active Face” means the working surface of the Landfill upon which Wastes are deposited during landfill operations prior to the placement by Contractor of daily cover material.
4. **Agreement** “Agreement” means this Operating Agreement between the WPWMA and the Contractor for operation of the Landfill including all exhibits and attachments and any future amendments hereto.

5. **Airspace Conservation Adjustment** “Airspace Conservation Adjustment” means: (1) the credit payment due to Contractor for saving additional landfill capacity by exceeding an average Effective Density Target, or (2) the payment due by Contractor to WPWMA for loss of landfill capacity for Waste Disposed at the Landfill not meeting an average Effective Density Target.
6. **Alternative Daily Cover** “Alternative Daily Cover” means an alternative material or manufactured product, including MRF ADC, that is not soil and that is authorized by the WPWMA and permitted by regulatory agencies for use. Approved Alternative Daily Cover is to be used as daily cover material, meaning to cover the landfill for 24 hours or less, by placing or applying over Waste Disposed of in the Landfill.
7. **Applicable Law** “Applicable Law” means all laws, regulations, rules, orders, judgments, decrees, permits, approvals, or other requirement of any governmental agency having jurisdiction over the handling, processing, and disposition of Waste and other materials to be handled by Contractor under this Agreement, and that are in force on the Effective Date and as they may be enacted, issued or amended during the Term. Applicable Law includes all requirements contained in any permits and approvals pertaining to the Landfill, including but not limited to any applicable land use permits, Waste Discharge Requirements, Title V Air Permits and Solid Waste Facility Permits.
8. **Base Facility Fee** “Base Facility Fee” means the fee paid in twelve equal monthly increments to Contractor for providing the Base Services, and such fee shall not fall below a minimum payment of \$2,511,231.00 annually pursuant to Section 7.2.
9. **Base Services** “Base Services” means all of the duties and obligations of the Contractor hereunder, but does not include Special Services.
10. **Board** “Board” means the Board of Directors of the WPWMA.
11. **CERCLA** “CERCLA” means the Comprehensive Environmental Responsibility Compensation and Liability Act, 42 U.S.C.A. §9601 et seq. (West 1983 & Supp. 1989) and similar State laws, as amended or superseded, and the regulations promulgated thereunder.
12. **CalRecycle** “CalRecycle” means the California Department of Resources Recycling and Recovery and any successor agency.
13. **Claims** “Claims” means any and all loss, liability, penalty, fine, forfeiture, demand, action, proceeding or suit, of any and every kind and description, whether judicial, quasi-judicial or administrative in nature including, but not limited to, injury to and death of any person and damage to property or for contribution or indemnity claimed by third parties, as referenced in Sections 9.1 and 9.2.
14. **Construction Quality Assurance** “Construction Quality Assurance,” or CQA, is a set of planned and systematic activities which are typically laid out before a construction project starts with the aim of giving confidence that quality requirements will be fulfilled.

CQA is not to be confused with quality control, the latter being concerned with only the final outcome of a project.

15. **Contractor** “Contractor” means FCC Environmental Services, LLC, and its WPWMA-approved subcontractors, successors or assigns.
16. **Contractor Service Fees** “Contractor Service Fees” means the compensation provided to Contractor by the WPWMA for services performed and as described in Section 7.2.
17. **Cover** “Cover,” used in conjunction with landfill activities herein, means to extend a material (ADC, soil, etc.) completely over the Waste. The depth of cover is the thickness of the material extending above the highest point of the Waste.
18. **Customer** “Customer” means any individual, commercial business, franchised waste hauler, or other entity, including the operator and employees of the Materials Recovery Facility, that pays a fee or is otherwise entitled by the WPWMA to use the Landfill.
19. **Designated Hauler** “Designated Hauler” means the company or companies which from time to time are granted the exclusive right or franchise to collect Waste within the Primary Service Area.
20. **Direct Hauled Waste** “Direct Hauled Waste” means Waste delivered directly to the Active Face of the Landfill for Disposal by a customer other than the operator of the Materials Recovery Facility. Direct Hauled Waste does not include residual Wastes generated at the Materials Recovery Facility.
21. **Disposal** “Disposal”, “Dispose” or “Disposed” means the final disposition by burial of Waste received at the Landfill.
22. **Effective Date** “Effective Date” means July 1, 2022.
23. **Effective Density Target** “Effective Density Target” means the ratio of Tonnage of Waste Disposed in the Landfill to the volume of airspace consumed for a given measurement period and area, expressed in pounds per cubic yard as agreed upon by the Parties.
24. **Executive Director** “Executive Director” means the Executive Director or designee of the WPWMA.
25. **Facility Rates** “Facility Rates” means those rates, fees, or charges, whether expressed as per-ton tipping fees or other charges, set by the WPWMA and charged to users of the Materials Recovery Facility and/or Landfill. The WPWMA shall determine and set the amount of Facility Rates and may modify such Facility Rates at its sole discretion.
26. **Hazardous Waste** “Hazardous Waste” shall have the meaning set forth in California Code of Regulations, Title 14, Division 7, Chapter 3, Article 4, §17225.32 and Health and Safety Code §25117, or successor laws and regulations as may be amended from time to time.

27. **Holiday** “Holiday” means a day which is one of the following legal holidays recognized for purposes of this Agreement: January 1, Memorial Day, July 4, Labor Day, the Fourth Thursday of November, and December 25. No other legal holidays are considered a “Holiday” for purposes of this Agreement.
28. **Household Hazardous Waste** “Household Hazardous Waste” shall have the meaning set forth in California Code of Regulations, Title 14, Division 7, Chapter 7, Article 1.1, §18502, or successor laws and regulations as may be amended from time to time.
29. **Landfill** “Landfill” means the Western Regional Sanitary Landfill, consisting of approximately 281 acres and as shown in Exhibit E hereto.
30. **Maintenance or Maintain** “Maintenance” or “Maintain” means those activities warranted to keep infrastructure in the same functionality and state of repair that existed when the WPWMA or Contractor constructed the infrastructure or, if constructed prior to the Agreement, the state of repair that existed at the Signature Date of the Agreement; to preserve from failure or decline.
31. **Materials Recovery Facility** “Materials Recovery Facility” or “MRF” means the WPWMA’s Materials Recovery Facility and related structures and areas where Wastes are processed to recover recyclable materials.
32. **Medical and Infectious Waste** “Medical and Infectious Waste” means biomedical waste generated at hospitals, public or private medical clinics, dental offices, research laboratories, pharmaceutical industries, blood banks, mortuaries, veterinary facilities and other similar establishments.
33. **Member Agencies** “Member Agencies” means the County of Placer and the cities of Lincoln, Rocklin and Roseville.
34. **MRF ADC** “MRF ADC” means a Waste-derived Alternative Daily Cover generated at the Materials Recovery Facility the same day it is proposed for use at the Landfill, and that meets the standards of 27 CCR 20690 (a) for fire prevention, odor control, blowing litter, vectors and scavenging that poses no threat to human health or the environment which is also screened to a half-inch minus size as previously approved for use by the Placer County Local Enforcement Agency.
35. **Operational Material** “Operational Material” means any material, other than Waste and Alternative Daily Cover, that is used by Contractor and that occupies space in the Landfill, including but not limited to soil or any other Alternative Daily Cover materials not previously approved by the WPWMA used for daily or intermediate cover, and materials used to construct working pads or access roads.
36. **Operating Year** “Operating Year” means each successive period of twelve (12) months during the Term commencing on July 1 and ending on June 30. The initial Operating Year under this Agreement begins on July 1, 2022, and ends on June 30, 2023.

37. **Participating Agencies** “Participating Agencies” means the Member Agencies and the cities of Auburn and Colfax and the Town of Loomis.
38. **Party** “Party” means the WPWMA or the Contractor singularly, “Parties” means the WPWMA and Contractor jointly.
39. **Primary Service Area** “Primary Service Area” means the geographical area of Placer County, but excluding any areas occupied by recognized Native American tribal reservations and lands, including Native American casinos unless such tribes elected to bring materials to the Landfill.
40. **Reasonable or Reasonably** “Reasonable” or “Reasonably” means the objective determination a reasonably prudent person would enforce or observe under a given set of circumstances in order to protect him/herself and/or the WPWMA from liability for negligence, or that may be ordinary or usual in the circumstances.
41. **Signature Date** “Signature Date” means the date of execution of this Agreement by the Parties.
42. **Specially Handled Waste** “Specially Handled Waste” includes, but is not limited to, discarded materials which may require special handling by the Contractor in order to be properly Disposed in the Landfill. Specially Handled Waste are those materials which fall into the following general categories:
- a. Bulky items, including recreational vehicles, film plastic, box springs, mattresses, appliances, wood stumps over 2 foot in diameter, tree limbs or poles over 8 feet in length, and other similar bulky items intended for Disposal.
 - b. Loads which require special burial due to the content or odor producing potential of the materials delivered.
43. **Special Services** “Special Services” are those services that are in addition to the Base Services provided by Contractor under this Agreement. Special Services shall be available upon request of the WPWMA, based on the availability of Contractor’s personnel and equipment to perform such services.
44. **Special Services Hourly Rates** “Special Services Hourly Rates” means the compensation to be paid to Contractor by WPWMA for the provision of Special Services and shall be based on (1) Contractor’s actual and reasonable costs consisting of: (a) the actual labor and personnel costs incurred by Contractor in performing such services as provided by the actual external personnel charges experienced by Contractor or, in the case of self-performance, the Contractor’s burdened rates included in Exhibit G, and (b) compensation for the usage of equipment while actually engaged in performing such services, as provided by actual equipment rental rates experienced by Contractor or, in the case of owned equipment, the rates included in Exhibit G, and (2) A ten percent (10%) administrative, overhead and profit in addition to the foregoing Contractor costs. The Special Service Hourly Rates shall include a four (4) hour minimum for equipment and a two (2) hour minimum for labor brought on-site solely to perform Special Services.

Equipment and labor already on-site or subsequently used for other purposes will not be subject to these minimums. Contractor shall bill all labor and equipment in increments of no less than one-half (1/2) of an hour.

45. **State** “State” means the State of California.
46. **Substantial Completion** “Substantial Completion” means the stage when the work identified in the scope of work is complete and in accordance with the Contract Documents (as determined by, and in the sole reasonable discretion of, the WPWMA) except only for completion of minor items which do not impair the WPWMA’s ability to fully utilize the related improvements for their intended purpose.
47. **Term** “Term” means the duration of this Agreement, as specified in Article 4.1.
48. **Timely** “Timely” means within the time set by regulation, regulatory response requirement, statute or rules of the court. Where such provides no definitive timeframe and none is provided otherwise in this Agreement, timely shall be interpreted as within sufficient time for the would-be timely action to be fully beneficial or meaningful.
49. **Ton or Tonnage** “Ton” or “Tonnage” means a “Short ton” of 2,000 pounds avoirdupois.
50. **Treated Wood Waste** “Treated Wood Waste” or “TWW” means wood waste that has been infused with a chemical preservative and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. § 136 et seq.) and meets the requirements of 22 CCR 67386.2(a).
51. **Uncontrollable Circumstances** “Uncontrollable Circumstances” means any “act of God” or event which is caused by the effect of nature or natural causes and without any direct interference by humans including landslides, lighting, fires, wildfires, storms, floods, pestilence, freezing, earthquakes or other catastrophic events; b) epidemics or pandemics; c) explosions, sabotage, civil disturbances, acts of terrorism or a public enemy, wars, blockades, riots, strikes or lockouts by individuals who are not employed by or directed at Contractor or other industrial disturbances; d) eminent domain, condemnation or other taking or e) other events of a similar nature, not caused or maintained by the WPWMA or Contractor, which events are not reasonably within the control of the Party claiming the excuse from its obligations due to such event, to the extent such event has a demonstrable material adverse effect on the ability of a Party to perform its obligations thereunder and which occurs at the Facility or within the Primary Service Area. Events which could have been reasonably foreseen and predicted or otherwise prevented by reasonable precautions, including compliance with agreements and Applicable Law and changes in Applicable Law, shall be not be considered an Uncontrollable Circumstance. Labor unrest, including but not limited to strike, work stoppage or slowdown, sickout, picketing, or other concerted job action conducted by the Contractor’s employees or directed at the Contractor, or a subcontractor, are not considered Uncontrollable Circumstances.
52. **Waste** “Waste” means solid waste as defined in California Public Resources Code, Division 30, Part 1, Chapter 2, §40191 and regulations promulgated thereunder. Excluded

from the definition of Waste are Hazardous Waste and Medical and Infectious Waste. Notwithstanding any provision to the contrary, Waste may include de minimis volumes or concentrations of Hazardous Waste of a type and amount normally found in residential solid waste after implementation of programs for the safe collection, recycling, treatment and disposal of Household Hazardous Waste in compliance with Section 41500 and 41802 of the California Public Resources Code.

- 53. **WPWMA** “WPWMA” means the Western Placer Waste Management Authority, a public agency created under the Joint Exercise of Powers Act.
- 54. **WPWMA Indemnified Parties** “WPWMA Indemnified Parties” means the WPWMA, its Board members, Member Agencies, officers, officials, employees, contractors, agents and assigns and any successor or successors to the WPWMA’s interest.

ARTICLE 2. REPRESENTATIONS & WARRANTIES OF CONTRACTOR

Contractor, by acceptance of this Agreement, hereby makes the following representations and warranties for the benefit of the WPWMA as of the Signature Date.

- 2.1 **Legal Status.** Contractor is duly organized, validly existing and in good standing in the State of California, and is authorized to do business in California with the lawful power to own its properties and to enter into and perform its obligations under this Agreement.
- 2.2 **Authorization and Binding Obligation.** Contractor has the authority to enter into and perform its obligations under this Agreement. Contractor, or its authorized representative, has taken all actions required by law and its governing documents to authorize the execution of this Agreement. The persons signing this Agreement on behalf of Contractor warrant and represent that they have authority to do so. This Agreement constitutes the legal, valid and binding obligation of Contractor to comply with each of the provisions of this Agreement.
- 2.3 **Legal Authority.** Contractor has the legal authority to enter into and perform its obligations under this Agreement. To the best of Contractor’s knowledge, after reasonable investigation, there is no Applicable Law in effect as of the Signature Date of this Agreement that would prohibit the performance by Contractor of its obligations under this Agreement and the transactions contemplated hereby.
- 2.4 **No Conflicts or Litigation.** Neither the execution nor the delivery by Contractor of this Agreement nor the performance by Contractor of its obligations hereunder (1) conflicts with, violates or results in a breach of Applicable Law or any other law or governmental regulation applicable to Contractor; (2) conflicts with, violates or results in a breach of any term or condition of any judgment, decree, agreement (including, without limitation, the certificate of incorporation of Contractor) or instrument to which Contractor is a party or by which Contractor or any of its properties or assets are bound, or constitutes a default under any such judgment, decree, agreement or instrument, or (3) will result in the creation or imposition of any encumbrance of any nature whatsoever upon any of the properties or assets of Contractor. To the best of Contractor’s knowledge, after

reasonable investigation, there is no action, suit, proceeding or investigation as of the Signature Date, at law or in equity, before or by any court or governmental authority, commission, board, agency or instrumentality decided, pending or threatened against Contractor wherein an unfavorable decision, ruling or finding, in any single case or in the aggregate, would materially adversely affect the performance by Contractor of its obligations hereunder or which, in any way, would adversely affect the validity or enforceability of this Agreement or any such agreement or instrument entered into by Contractor in connection with the transactions contemplated hereby, or which would have a material adverse effect on the financial condition of Contractor, or any surety or entity guaranteeing Contractor's performance under this Agreement.

- 2.5 Contractor's Investigation.** Contractor has made an independent investigation (satisfactory to it) of the conditions and circumstances surrounding the Agreement and the work to be performed hereunder and has taken these matters into consideration in its agreement to provide these services in exchange for the compensation provided for under the terms of this Agreement. Contractor has relied solely on its own investigation of the WPWMA, the Landfill, and the WPWMA's service needs in preparing its proposal and entering into this Agreement.
- 2.6 Information Supplied by the Contractor.** The information and warranties supplied by Contractor in all proposals and submittals made in connection with negotiation and execution of this Agreement are true, accurate, correct and complete in all material respects on and as of the Signature Date. Contractor acknowledges that if the WPWMA at any time discovers a material inaccuracy in the information in Contractor's proposals, such inaccuracy may be grounds for termination or suspension of this Agreement, as provided in Section 10.2.B.
- 2.7 Financial Resources; Expertise and Capability.** Contractor possesses the business, professional, and technical expertise, and the financial, equipment, and employee resources required to perform the services specified in this Agreement.
- 2.8 Representatives of the Parties.** Contractor has designated and submitted to the WPWMA, in writing, the name, title and contact information of a responsible officer who shall serve as the representative of Contractor and who shall have authority in all daily operational matters related to the Agreement. The WPWMA may rely upon action taken by such designated representative as action of Contractor unless for actions not taken within the scope of the Agreement.

ARTICLE 3. CONDITIONS TO EFFECTIVENESS OF AGREEMENT

- 3.1 Transition Plan.** The Parties recognize that substantial planning is required in order to ensure orderly provision of Base Services on the Effective Date. The Contractor shall submit to the WPWMA a preliminary transition plan which specifies the Contractor's schedule for acquiring all necessary equipment, hiring personnel, and otherwise arranging for the Base Services to be provided in this Agreement. This preliminary transition plan shall be submitted for WPWMA approval no later than one week following the Signature

Date. The final transition plan shall be included as Exhibit A to this Agreement. Following the Signature Date, the Contractor shall, no later than May 16, 2022, submit the final transition plan to the WPWMA for approval. Substantive failure on the part of the Contractor to adhere to the transition plan will constitute a breach of this Agreement and, if incurred, an event of default under Article 10.

3.2 Conditions to Effectiveness of Agreement. This Agreement shall not become effective and the WPWMA shall not be obligated to permit this Agreement to become effective and to perform the undertakings provided for in this Agreement unless each and all of the conditions set out below are satisfied or waived, in written form, in whole or in part by the WPWMA. Waiver of any of the following as a condition to the effectiveness of this Agreement will not preclude the WPWMA from pursuing any claim for breach of this Agreement.

- A. Accuracy of Representations.** The representations and warranties made by the Contractor in Article 2 of this Agreement and in its proposal are true and correct on and as of the Signature Date.
- B. Absence of Litigation.** There is no litigation pending on the Signature Date in any court challenging the award or execution of this Agreement or seeking to restrain or enjoin its performance. Contractor shall notify WPWMA, and WPWMA shall notify Contractor, in writing within thirty (30) days of any litigation which may in any way affect each Parties respective performance of Base Services under this Agreement.
- C. Effectiveness of WPWMA Action.** A WPWMA Resolution approving this Agreement, shall have become effective pursuant to Applicable Law on or prior to the Signature Date.
- D. Verification of Insurance Coverage and Faithful Performance Bond.** Contractor shall submit, to the reasonable satisfaction of the WPWMA, endorsements or certificates of insurance coverage pursuant to Article 9.3 and a faithful performance bond pursuant to Article 9.4 of this Agreement and provided as Exhibits B and C.
- E. Contingency Plan.** Contractor shall submit to the WPWMA six (6) weeks prior to the Effective Date of this Agreement a written “Contingency Plan” demonstrating the Contractor’s specific arrangements to provide vehicles and personnel and to maintain uninterrupted service during mechanical breakdowns, and in case of natural disaster, strikes or other emergency, including events described in Article 10.7. The Contingency Plan submitted by Contractor shall be subject to the WPWMA’s reasonable approval and shall be attached as Exhibit D to this Agreement. In the event some condition arises to necessitate implementation of the plan, Contractor shall follow the plan. The WPWMA’s approval or disapproval shall be given within three (3) weeks of the date the Contractor’s Contingency Plan is delivered to the WPWMA.

- 3.3 **Fire Recovery Period.** Prior to the Effective Date of this Agreement, the MRF incurred substantial damages due to causes outside of Contractor's control. As a result, the MRF will not be at full operating efficiency as of the Effective Date, as was represented during the procurement phase of the project. Consequently, the Parties agreed that certain provisions of this Agreement shall be suspended or modified until such time as set forth in Addendum 1 to the Agreement, incorporated by this reference.

ARTICLE 4. TERM OF AGREEMENT

- 4.1 **Term.** The Term of this Agreement shall commence on the Effective Date and shall end as of midnight on June 30, 2032, unless extended by the WPWMA as provided in the following section. If this Agreement is extended by the WPWMA, the Term of this Agreement shall include any such extension periods.
- 4.2 **Extension of Term.** The WPWMA may, in its sole discretion, extend this Agreement for a period of one (1) year by delivering written notice of its exercise of that option to the Contractor no later than February 28, 2032, but only to the extent WPWMA simultaneously extends the operating agreement between the Parties for the operation of the MRF for the same period of time.

If the WPWMA elects to exercise the extension option, the Contractor shall be bound to perform all Contractor obligations for the additional extension period described in the WPWMA's notice extending the Term. In addition and without limiting the above, the WPWMA and Contractor may by mutual agreement extend the Term of this Agreement for two (2) additional five (5) year terms.

ARTICLE 5. LANDFILL OPERATIONS

- 5.1 **General.** Contractor shall provide all labor, supervision, equipment, materials, supplies, and all other items necessary to perform the services required under this Agreement.

Contractor shall provide the required services in a thorough and professional manner so that the Landfill is provided with efficient, reliable, courteous and high-quality operations at all times.

Contractor's operations shall comply with Applicable Law, and any other applicable regulations and ordinances, as now existing or as they may be later adopted, modified or amended, and shall further comply with all approved closure and post-closure plans for the Landfill. In addition, Contractor shall comply with the provisions, conditions and requirements of all future permit applications, operating plans and other documents for the Landfill hereafter approved by the WPWMA or other regulatory or governmental agency.

It is acknowledged by the Parties that this Agreement does not obligate the Contractor to fund or conduct design or construction activities directly related to the closure of the Landfill. Nonetheless, Contractor shall be required to perform post-closure maintenance

activities under this Agreement as identified in this Article 5 and any and all post-closure maintenance plans developed by the WPWMA and approved by CalRecycle and/or the Central Valley Regional Water Quality Control Board or any other governmental agency with jurisdiction over the Landfill.

5.2 Days and Hours of Operation. Contractor shall operate the Landfill for receipt of Waste every day of the year during the following hours:

Monday through Friday	7:00a.m. - 5:00p.m.
Saturday and Sunday	8:00a.m. - 5:00p.m.

Contractor shall perform all work necessary to prepare the Landfill to receive Waste prior to the above start times. Contractor may begin work necessary to close the Landfill prior to the closing hours noted above but must be able to accept Landfill-bound materials up to 5:00 PM daily.

5.3 Priority. The primary purpose of the Landfill is to Dispose of Waste delivered by the operator of the Materials Recovery Facility and the Participating Agencies and/or their Designated Haulers, who shall have first priority in use of the Landfill. A secondary purpose is to Dispose of Waste delivered by residents and/or businesses of the Participating Agencies, who shall have second priority in use of the Landfill. If the WPWMA allows, pursuant to Section 5.11, Waste generated outside the Primary Service Area to be Disposed of at the Landfill shall be assigned third priority.

Contractor shall operate the Landfill in order to give effect to the above stated priorities.

Disposal of Waste from outside the Primary Service Area shall, if allowed by the WPWMA, never be permitted to interfere with Disposal of Waste delivered by the operator of the Materials Recovery Facility, the Participating Agencies or their Designated Haulers. The Primary Service Area is shown in Exhibit F.

5.4 Hazardous Waste Exclusion Program. Contractor shall develop, implement, update (at least annually by July 1) and submit to the WPWMA a Hazardous Waste Exclusion Plan which is acceptable to the WPWMA and which meets the requirements of CalRecycle, the Placer County Local Enforcement Agency, the Central Valley Regional Water Quality Control Board, and all other public regulatory agencies, boards and bodies with proper jurisdiction and satisfies all applicable local, state and federal laws. The Hazardous Waste Exclusion Plan shall provide for Contractor's ability and responsibility to inspect, monitor and reject loads which are discovered to contain Hazardous Waste or Household Hazardous Waste or to safely and appropriately accept and store the Household Hazardous Waste prior to Contractor transporting the Household Hazardous Waste to the Materials Recovery Facility for subsequent processing. Contractor shall implement the approved Hazardous Waste Exclusion Plan in a diligent, reasonable and non-discriminatory manner.

Contractor shall provide suitable, covered temporary storage at the Landfill for Hazardous Wastes and Household Hazardous Wastes which are discovered through the Hazardous Waste Exclusion Plan (or otherwise) in conjunction with Contractor's

operation of the Landfill. Contractor shall be responsible for the transportation of such Hazardous Waste and Household Hazardous Waste from the Landfill to the Materials Recovery Facility Household Hazardous Waste Facility and shall be fully responsible for any spills or releases of Hazardous Waste or Household Hazardous Waste during such transport by Contractor. Contractor shall transport such materials on a daily basis or more frequently as necessary. Ownership or title to such Hazardous Waste or Household Hazardous Waste shall not be deemed to have passed to Contractor at any time and Contractor shall not be responsible for any subsequent disposal costs associated with Hazardous Waste or Household Hazardous Waste identified at the Landfill.

The Parties recognize that the operator of the Materials Recovery Facility is required to conduct its own independent Hazardous Waste exclusion program. If Contractor identifies and subsequently rejects any material delivered by the operator of the Materials Recovery Facility because it may not legally be disposed of at the Landfill, Contractor shall notify the operator of the Materials Recovery Facility and request that said operator immediately remove and dispose the rejected materials in a safe and lawful manner. Any dispute between Contractor and the operator of the Materials Recovery Facility as to whether materials may legally be Disposed of at the Landfill shall be between Contractor and such operator, and the WPWMA shall have no responsibility to Contractor as a result of any such dispute. The WPWMA may, but need not, decide any question which may arise as to the suitability for Disposal of materials at the Landfill and, if it does, any such decision of the WPWMA must be final and therefore shall be binding on Contractor and the operator of the Materials Recovery Facility.

5.5 Liquidated Damages

5.5.1 Turnaround Time of Waste Delivery Vehicles. Contractor shall operate the Landfill so that: 1) all vehicles of Participating Agencies and/or their Designated Haulers and the Materials Recovery Facility operator are able to unload, depart from the Landfill, and return to the scales in no more than thirty (30) minutes after their receipt of a ticket or similar approval to leave and 2) all other vehicles are able to unload, depart from the Landfill, and return to the scales in no more than forty (40) minutes after their receipt of a ticket or similar approval to leave scales.

The Parties acknowledge that consistent, efficient operation of the Landfill is of utmost importance, that delays in operations which increase the costs of the Participating Agencies and/or their Designated Haulers may affect the payments that Participating Agencies must make to the Designated Haulers, and that the WPWMA has considered and relied on Contractor's representations as to its quality of service commitment in entering into this Agreement.

The Parties further recognize that quantified standards of performance are necessary and appropriate to ensure consistent and reliable service. The Parties further recognize that if Contractor fails to achieve the performance standards, the WPWMA, the Participating Agencies and their residents will suffer damages and

that it is and will be impracticable and extremely difficult to ascertain and determine the exact amount of damages that they will suffer.

Therefore, the Parties agree that the following liquidated damage amounts represent a reasonable estimate of the amount of such damages considering all of the circumstances existing on the Effective Date, including the relationship of the sums to the range of harm to the WPWMA and Participating Agencies that reasonably could be anticipated and in anticipation that proof of actual damages would be costly or impractical.

In placing their initials at the places provided, each Party specifically confirms the accuracy of the statements made above and the fact that each Party had ample opportunity to consult with legal counsel and obtain an explanation of this liquidated damage provision at the time that this Agreement was made.

Contractor

WPWMA

Initial Here: _____

Initial Here: _____

Contractor agrees to pay (as liquidated damages and not as a penalty) the amount set forth below and further agrees that this amount may be deducted by the WPWMA from payments to Contractor by the WPWMA:

For each vehicle owned or operated on behalf of the Participating Agencies and/or their Designated Haulers which is unable to unload and return to the scales within thirty (30) minutes after its departure from the scales as defined above: \$500

For any other vehicle which is unable to unload and return to the scales within forty (40) minutes after its departure from the scales as defined above: \$200

The liquidated damages provided for herein are the WPWMA's sole monetary remedy for the delays for which they are assessed.

The above amounts are effective July 1, 2022 and may only be adjusted by written agreement between both WPWMA and Contractor.

Neither the time limits nor the liquidated damages set forth in this section shall apply to vehicles selected for load check procedures pursuant to the Hazardous Waste Exclusion Plan or which are otherwise delayed because of Contractor's investigation of their contents for Hazardous Waste or Household Hazardous Waste, or to vehicles delayed by mechanical breakdown or by driver negligence.

5.5.2 Regulatory Compliance Performance Standards. Contractor agrees that the regulatory compliance and public perception of the Landfill is of extreme importance to the WPWMA and agrees to perform all operations in such a way as to minimize the amount of regulatory compliance issues with all Applicable Law so that: 1) there are no more than three (3) consecutive months for which the

Landfill receives an Area of Concern (AOC) from a regulatory agency as a result of the Contractor's actions or inactions related to the operational responsibilities as outlined in this Agreement, and 2) there are zero (0) months for which the Landfill receives a Notice of Violation (NOV) from any regulatory agency as a result of the Contractor's actions or inactions related to the operational responsibilities as outlined in this Agreement.

The Parties acknowledge that consistent, compliant operation of the Landfill is of utmost importance, that poor regulatory performance may adversely affect the WPWMA, and that the WPWMA has considered and relied on Contractor's representations as to its quality of compliance commitment in entering into this Agreement.

The Parties further recognize that quantified standards of performance are necessary and appropriate to ensure consistent and reliable service. The Parties further recognize that if Contractor fails to achieve the regulatory compliance performance standards, the WPWMA, the Participating Agencies and their residents will suffer damages and that it is and will be impracticable and extremely difficult to ascertain and determine the exact amount of damages that they will suffer.

Therefore, the Parties agree that the following liquidated damage amounts represent a reasonable estimate of the amount of such damages considering all of the circumstances existing on the Effective Date, including the relationship of the sums to the range of harm to the WPWMA and Participating Agencies that reasonably could be anticipated and in anticipation that proof of actual damages would be costly or impractical.

In placing their initials at the places provided, each Party specifically confirms the accuracy of the statements made above and the fact that each Party had ample opportunity to consult with legal counsel and obtain an explanation of this liquidated damage provision at the time that this Agreement was made

Contractor	WPWMA
Initial Here: _____	Initial Here: _____

Contractor agrees to pay (as liquidated damages and not as a penalty) the amount set forth below and further agrees that this amount may be deducted by the WPWMA from payments to Contractor by the WPWMA:

For each weekday where WPWMA staff or technological resources used by WPWMA staff during a focused or routine general inspection, finds or continues to find the Contractor in violation of any regulatory standard of which Contractor has been previously notified: \$500

For each Area of Concern and for each month the Landfill receives related to Contractor responsibilities as it pertains to operation of the Landfill as outlined in this Agreement that occurs in three (3) or more consecutive months: \$5,000

For each Notice of Violation and for each month the Landfill receives related to Contractor responsibilities as it pertains to operation of the Landfill as outlined in this Agreement: \$5,000

The liquidated damages provided for herein are the WPWMA's sole monetary remedy for the AOCs and NOV's for which they are assessed.

The above amount is effective July 1, 2022 and may only be adjusted by written agreement between both WPWMA and Contractor.

The liquidated damages set forth in this section shall not apply to such matters caused by a third party, except for matters caused by Contractor's subcontractors, that are outside of the control of the Contractor. Notwithstanding the above liquidated damages, Contractor shall still be responsible to pay any actual fine amounts associated with NOV's related to the Contractor responsibilities inasmuch as the issue was within the Contractor's control.

5.6 Landfill Signage. The WPWMA will provide signage identifying the Landfill, hours the Landfill is open for the receipt of Waste, and signs at the scalehouses listing the appropriate Facility Rates, prohibited materials, and other information as deemed necessary by the WPWMA. Contractor shall be responsible for providing and maintaining all other on-site signage necessary to safely and efficiently direct traffic from the WPWMA scalehouses and WPWMA MRF to the material unloading areas of the Landfill.

5.7 Avoidance of Undisturbed Land. Contractor shall not encroach on any previously undisturbed land, areas determined by the WPWMA to be biologically sensitive, or areas of the Landfill designated by the WPWMA as restricted from use by Contractor while performing the services required by this Agreement without the prior written approval of the Executive Director.

Contractor is expressly prohibited from storing or processing materials on the closed landfill.

5.8 Waste Disposal Fill Plans. The WPWMA shall develop and provide Contractor with incremental Waste Disposal Fill Plans which will consist of a series of grading plans based on predicted representative incoming tonnages and covering periods of 6, 12 and 24 months. These plans will dictate the progression of Disposal, soil excavation/borrow areas, roadway development, winter pad construction and deconstruction, revegetation, interim and final cover deployment, and storm water controls. The 6-month plan will be broken into approximately one-month long time increments and indicate where intermediate cover will be required per Section 5.13 C. The 12-month plan will provide a single grading and grading footprint for landfill gas, stormwater management, roadway

construction requirements. The 24-month plan will outline the areas Contractor is obligated to establish a thickened interim cover per Section 5.13 C and revegetation.

Contractor and WPWMA shall meet at least monthly to discuss the implementation of the Waste Disposal Fill Plans, anticipated daily and weekly quantities of Alternative Daily Cover, including MRF ADC, required to meet the daily cover requirements identified in Section 5.13 A, Disposal sequencing and direction of Disposal operations. Contractor Disposal operations shall at all times comply with the Waste Disposal Fill Plans. The WPWMA shall provide Waste Disposal Fill Plans to Contractor at least two months ahead of the time such plan would be effective.

- 5.9 Surveying and Staking.** Engineering drawings depicting excavation base grades and final fill elevations will be provided by the WPWMA. Contractor shall perform all surveying and staking necessary for Waste placement and Disposal, miscellaneous drainage work and related Landfill support activities. Contractor shall provide the WPWMA a continuous connection to a cloud storage system containing live and daily stored, georeferenced waste and soil placement survey data based on accurate Trimble, Topcon, RDO or equivalent machine control systems. The cost of the data collection and cloud storage/access shall be borne by Contractor for the WPWMA and itself. WPWMA reserves the right to determine the adequacy of any equipment utilized and resultant data provided by Contractor.
- 5.10 Soil Operations Layer.** Contractor shall verify, construct and maintain as necessary a soil operations layer on any and all lined areas in conformance with the applicable Landfill module liner or cover system design, including any required side slope liner system, and as approved by the WPWMA prior to the Disposal of Wastes in any given Landfill module. Contractor shall place a two (2) foot thick soil operations layer on any exposed liner prior to establishing an Active Face within one hundred (100) yards of any exposed liner. Contractor acknowledges its obligation to cover liner systems that separate Waste from the ground as well as liner systems designed to separate Class II wastes from Class III wastes. Contractor acknowledges that Class II/Class III separation liner will extend from the base of each module to the ultimate fill height of the Landfill between Modules 5 and 13 and all modules to the north thereof (Modules 6 and 12, Modules 7 to 11, etc.), and that Contractor shall cover that separation liner with the soil operations layer as noted herein.
- 5.11 Waste Acceptance and Load Checking.** Contractor shall accept all Wastes, including Specially Handled Waste, for Disposal, in accordance with this Agreement and to the extent that Contractor is legally able to do so; provided, however, that Contractor may redirect, subject to the WPWMA's approval and at Contractor's sole expense, loads or portions of loads identified by Contractor as being loads of materials that should be Processed for Recycling of Recoverable Materials at the MRF. Loads redirected from the Landfill to the scalehouse shall be deducted from the tonnage received at the Landfill and added to the tonnage delivered to the final processing unit to which they were sent and accepted.

Contractor shall at all times comply with the Hazardous Waste Exclusion Plan as detailed in Section 5.4. Contractor shall at all times provide the necessary number of HAZWOPER and MOLO trained and certified employees to verify that the contents of the materials unloaded from each vehicle are suitable for acceptance and Disposal at the Landfill and are being unloaded at the appropriate area on the Landfill. If Contractor determines that the Customer is unloading prohibited materials or unloaded materials at an area not designated for those materials, Contractor shall direct the Customer to the WPWMA's scalehouses or to the designated unloading area, as appropriate. If there is a discrepancy about the proper classification of the materials in a vehicle, Contractor's employee shall promptly notify the WPWMA.

Contractor shall develop and maintain adequately sized unloading areas for Waste, including Specially Handled Waste so as to provide a safe and efficient environment for Landfill Customers to unload their vehicles. Unloading areas shall be of sufficient design to provide for safe distances between unloading vehicles, accommodate the turning radius of a tractor-trailer vehicle, enable the queuing of vehicles during peak usage periods and ensure that Customers do not have to come into contact with Wastes, including sludge, leachate or other potentially harmful materials in order to unload their vehicles. The sufficiency of all unloading areas, including their width, slope, materials, and location shall be at the sole discretion of the WPWMA.

- A. **Materials Salvaging Prohibited.** Contractor shall take all steps reasonably necessary to prevent its employees, Customers, and any other users of the Landfill from engaging in any materials salvaging activities unless otherwise specifically allowed as part of the Agreement.
- B. **Tires.** Whole tires encountered during Disposal operations shall be removed by Contractor and stockpiled in a designated area adjacent to the Active Face. Contractor shall transport all collected tires to the Material Recovery Facility at the end of each day. Tires that are quartered or shredded may be Disposed of or transported by Contractor to the Material Recovery Facility for recycling.
- C. **Treated Wood Waste.** Subject to State approval, TWW may be discharged to certain modules of the Landfill. Contractor shall accept incoming loads of TWW at a predetermined location identified by Contractor and approved by WPWMA. Contractor shall integrate treated wood waste into the Active Face in a manner that capitalizes on the unique physical properties of the treated wood and promotes efficient use of airspace capacity while minimizing the chance of air intrusion or leachate generation/migration.
- D. **Sludge.** Wastewater treatment sludge is accepted in certain modules of the Landfill. Contractor shall accept incoming loads of sludge at a predetermined location adjacent to the Active Face identified by Contractor and approved by WPWMA. Contractor shall integrate sludge into the Active Face in a manner that capitalizes on the unique physical properties of the sludge and promotes efficient use of airspace capacity. Contractor shall make all reasonable efforts to confine the push path and minimize the surface area impacted during the handling of

sludge. Contractor shall also make all reasonable efforts while handling sludge to minimize its odor impacts and the potential for customer or any other user of the Landfill to have direct or indirect contact with the sludge.

- 5.12 Waste Placement and Compaction Performance Standards.** Contractor shall conduct Waste Disposal operations in accordance with the Annual Waste Disposal fill plan, pursuant to Section 5.8. Contractor shall keep the Active Face of the Landfill as confined as is practical and its overall size, slope ratios and waste placement and compaction methods shall all be subject to WPWMA approval.

Contractor agrees that the efficient use of landfill airspace capacity is of extreme importance to the WPWMA and agrees to perform all operations in such a way as to maximize the amount of Waste Disposed within the available airspace. To this end, and during the first year following the Effective Date (subject to Section 3.3 herein) Contractor shall achieve an Effective Density Target between 1,100 and 1,200 pounds per cubic yard for all Waste Disposed at the Landfill, and in the following years the WPWMA and Contractor shall mutually agree to the Effective Density Target. The Effective Density Target achieved by Contractor shall be mutually calculated by the WPWMA and Contractor every quarter of each Operating Year and shall be computed as the ratio of the weight of Waste Disposed in the Landfill to the volume of airspace consumed during each quarter.

The preceding performance standards shall be verified by the WPWMA on a quarterly basis using data from the WPWMA's scalehouse records and aerial surveys conducted by the WPWMA. The volume of airspace consumed shall only include areas of the Landfill that received Waste fill and were directly impacted by Waste fill operations during the subject quarter. The WPWMA and Contractor may agree to review and modify the areas included in the airspace volume calculation and make the final determination of the volume of airspace consumed each quarter. For the purposes of these performance standards and calculations, the weight of Waste Disposed shall be the same weight that the WPWMA reports to the Board of Equalization for the purposes of remitting quarterly CalRecycle fees.

5.13 Landfill Cover and Related Operations

- A. Reclaimed Cover.** Prior to the start of daily Disposal operations, Contractor shall remove and reclaim all previously placed cover soil from areas upon which Waste is to be placed that day. Contractor shall also remove and reclaim, any previously placed Alternative Daily Cover that is impermeable and will potentially contribute to leachate seeps. Notwithstanding the foregoing, Contractor shall not be obligated to remove MRF ADC used by Contractor as daily cover unless otherwise directed by the WPWMA or a regulatory agency.
- B. Daily Cover and Alternative Daily Cover.** Prior to the end of Disposal operations each day, Contractor shall cover all exposed Waste with a minimum of six (6) inches of Waste-free, uncompacted soil, an approved Alternative Daily Cover, reclaimed material or a WPWMA- approved combination of these

materials. Prior to placement of any daily cover material, including Alternative Daily Cover, Contractor shall prepare the exposed Waste surface to minimize any variations in the compacted Waste surface so as to maximize cover usage efficiency and effectiveness.

Contractor may, at its sole expense, utilize other forms of Alternative Daily Cover including films and tarps subject to the conditions contained in the prior written approval from the WPWMA.

- C. **Intermediate Cover.** Contractor shall place and compact intermediate cover consisting of at least an additional twelve (12) inches of compacted soil on top of the daily soil cover on areas of the Landfill where no additional Waste will be Disposed of within 180 calendar days. Contractor shall place an additional twelve (12) inches of compacted soil, for a total of twenty-four (24) inches of compacted intermediate cover soil, over areas where no additional Waste will be Disposed of within two (2) years. Where Contractor has placed intermediate cover on side slopes of the Landfill, Contractor shall compact, track walk and hydroseed the intermediate cover to prevent rills and erosion channels. Intermediate cover shall be compacted to at least eighty percent (80%) of the maximum achievable compaction for the subject soils. Contractor shall be obligated to verify and validate its achievement of the applicable soil compaction standard and provide WPWMA with all supporting documents and calculations upon request.

The Master Fill Sequencing Plan indicates the final grade of the final cover for the Landfill reaches a maximum elevation of 295 feet above mean sea level in the permitted shape and slope shown in Exhibit H. Contractor shall be responsible for ensuring that the subgrade (i.e. the top of the Waste) and intermediate cover grades conform to the shapes and slopes of the Master Fill Sequencing Plan. For the purposes of grading control, Contractor shall subtract the following depths from the depicted final grade to determine the top of Waste:

Cover Element, from Top to Bottom	Total Final Cover Thickness in Geocomposite-lined Modules
Vegetative Cover Soil	1 foot
Geocomposite Drainage Layer, 60 mil LLDPE Geomembrane, GCL	Negligible (zero)
Cover System Foundation Layer	1 foot
Daily + Intermediate Soil Cover	2-1/2 feet
Total	4-1/2 feet

Contractor shall remove and regrade any locations where the top of Waste is more than one (1) foot above the subgrade elevation (prior to settlement). Final cover tolerance shall be no lower than final grade design (prior to settlement) and no

higher than 0.5 foot above final grade design, and no greater than 0.5 percent variance in the given slope. In the event Contractor does not meet the tolerances noted above, Contractor shall submit a Corrective Action Plan to the WPWMA outlining activities and timeframe for removing and relocating the Waste or otherwise correcting the intermediate cover thickness errors to meet the tolerances.

- D. Soil Excavation and Stockpiling.** Contractor shall excavate unimpacted, native soil for daily and intermediate cover as indicated in the Waste Disposal Fill Plan or as directed by the WPWMA. If the WPWMA directs Contractor to excavate soils from the location of any future Waste module, Contractor shall limit their excavation in these areas to a level which is no deeper than and no more than one (1) foot above the subgrade elevation for the module (i.e. the design subgrade for the floor of the liner). Grading plans showing subgrade elevations at fifty (50) foot intervals will be provided by the WPWMA. Final leveling, and subgrade compaction is considered part of the liner installation work and is not subject to this Agreement. Contractor shall immediately notify WPWMA if Contractor over-excavates the module floor. Repair of over excavation by Contractor shall be the sole financial responsibility of Contractor. Contractor shall reimburse the WPWMA for the WPWMA staff time incurred to administer CQA services for the earthfill and compaction efforts typical to the earthwork specifications for the WPWMA liner construction project. Contractor shall further engage such consultants for CQA services for the earthfill and compaction efforts typical to the earthwork specifications for the WPWMA liner construction project as requested by WPWMA. Contractor shall obtain WPWMA's approval of the consultant and scope of work for such services.

5.14 Landfill Maintenance

- A. Liner.** Contractor shall take all reasonable measures consistent with recognized landfill operations practices to ensure the Landfill liner is not damaged or destroyed as a result of Contractor's operation of the Landfill or any Customer's use of the Landfill. If any portion of the liner system, including exposed liners or other temporary covers along slopes, is damaged during the course of operations, Contractor shall immediately cease operations in and immediately adjacent to the damaged area. Contractor shall promptly notify the WPWMA of such damage to the Landfill liner. Contractor shall be liable to the WPWMA for all material and labor costs incurred associated with the investigation and repair of any and all damage to the liner system whether or not such damage was a direct result of Contractor's actions or by any other Customer delivering Waste to the Landfill.
- B. Cover.** Contractor shall take all reasonable measures consistent with recognized landfill best management practices to ensure that Wastes or other foreign objects do not protrude from the Landfill cover. Contractor shall be responsible for augmenting Landfill surface areas on unclosed portions of the Landfill where landfill gas emissions have been detected by Contractor, the WPWMA or

WPWMA's consultants, regulatory agencies or as otherwise directed by WPWMA.

- C. **Surfaces and Slopes.** Contractor shall be responsible for minimizing surface erosion at the Landfill, including but not limited to the Landfill, soil borrow, and stockpile areas.

Contractor shall within seven (7) calendar days repair any and all cracks, depressions and erosions of the surface and side slopes, both interim and final, without regard to whether such surfaces or slopes were constructed by past operators of the Landfill or Contractor. Contractor shall implement mitigation efforts, including but not limited to the repair of cracks, depressions and erosions of the Landfill surface and slopes, in response to any surface landfill gas emissions and leachate seeps detected by Contractor, the WPWMA, WPWMA's consultants, or regulatory agencies on the Landfill cover or elsewhere on the Landfill property. Contractor shall not be responsible for major construction or reconstruction of failed or defective landfill slopes to the degree that any such failure was not the direct result of Contractor's operations.

- D. **Control of Leachate Seeps.** Contractor shall utilize recognized landfill best management practices and implement mitigation measures as necessary to prevent leachate seeps and to prevent leachate from contacting surface water. Contractor shall layer Waste in the landfill at a slope angled back into the Landfill at least a four percent (4%) grade when Disposing Waste near the edges of the Landfill. Furthermore, Contractor shall make all reasonable efforts to prevent Customers and their vehicles from coming into contact with leachate. Contractor shall inspect exposed surfaces of the Landfill for the presence of seeps on a weekly basis and shall immediately contain and repair any leachate seeps encountered by Contractor, or otherwise brought to Contractor's attention by the WPWMA or any regulatory agency. WPWMA shall determine the adequacy of these repairs. Contractor shall contain and pump all contaminated liquids into an approved sanitary sewer connection. Contractor is responsible for arranging the temporary sewer connection, including all related costs for connection to the sewer and disposal of the leachate, and reporting to the sewer provider any information needed for the discharge permit, billing information, or other information required by the sewer provider.

- E. **Borrow Areas.** Contractor shall be responsible for maintenance of soil borrow areas and for excavating soil from the borrow areas as indicated in the annual Waste Disposal Fill Plan or as directed by the WPWMA. Contractor shall be responsible for providing proper drainage along borrow area access roads and at the borrow areas. Contractor shall be responsible for pumping any storm water which accumulates in the borrow areas to storm water drainage ditches.

- F. **Perimeter Fences.** Regular maintenance of all existing fences, any additional fences installed by Contractor, and all gates shall be the sole responsibility of Contractor. Fence maintenance includes, but is not limited to, wire strand and slat

replacements, vertical and horizontal post replacements, post cap replacements and other repairs necessary to maintain the security of the site and structural integrity of the fencing system. Contractor shall inspect and repair perimeter fencing on an annual or more frequent basis to ensure overall fencing integrity for site security. In the case of damage to perimeter fencing, Contractor shall make emergency repairs to the damaged section within twenty-four (24) hours of the time Contractor first becomes aware of the damaged section regardless of whether or not the damage was a result of Contractor's operations.

- G. On-Site Roads.** Contractor shall maintain all internal Landfill access roads that serve soil excavation areas, active areas of Landfill, materials stockpiling areas, the landfill gas blower/flare station and adjoining privately-owned gas-to-energy facility, landfill gas and groundwater monitoring probes, inclinometers, wells and other environmental monitoring devices, and other areas necessary for the performance of Base Services under this Agreement. Between May 15th and June 30th of each Operating Year, and prior to the annual application of dust palliatives, Contractor shall resurface the gravel or soil access roads, cutting down ruts, backfilling with compacted road base or other WPWMA approved materials, and resetting any affected infrastructure to accommodate that maintenance work.

The access road to the Active Face shall be a sufficient thickness of road material above Waste to prevent damage to vehicle tires or equipment, have sufficient width to permit turning and passage of two-way traffic, and not exceed maximum grades and/or minimum curve radii as approved by the WPWMA. Contractor shall construct and maintain a parking pad to enable Customers to safely maneuver vehicles to the unloading area. The sufficiency of the design of the roads, including the width, slope, materials, and location shall be at the sole discretion of the WPWMA.

- H. Landscaping.** Contractor shall maintain the landscaped areas along the west (south of the Recovery Facilities parking lot) and south Landfill property lines. Contractor shall clear and mow weeds and maintain clean areas surrounding all environmental monitoring devices and environmental control equipment (e.g.: survey markers, wells, probes, lysimeters, access pipes, etc.) Contractor shall clear and mow weeds along the perimeter berms, the areas between the perimeter fencing and fire breaks constructed by Contractor in accordance with Section 5.19.8, and along the interior access roads throughout the Landfill property. Contractor shall clear and mow weeds as necessary to maintain a weed height in the referenced areas of approximately two (2) inches or less.

Contractor shall maintain the irrigation systems such that all emitters are functioning properly, properly sized to adequately water each tree or landscape plant, and that the system is free of leaks. Contractor shall immediately remove and replace any dead or dying trees and shrubs at Contractor's sole expense and following WPWMA and PG&E (for trees near power lines) guidelines.

- I. Winterization Plan.** Contractor shall submit to the WPWMA on or before September 1st of each Operating Year a winterization plan for the Landfill. Contractor's winterization plan shall be subject to the WPWMA's approval which will not be unreasonably withheld. Contractor shall implement such approved plan prior to October 15th of each Operating Year.

At a minimum, Contractor's winterization plan shall specify the Contractor's plan to operate in inclement weather while maintaining customer satisfaction and mitigating environmental risk, including but not limited to: constructing and maintaining: 1) all-weather roads to the Active Face and all other stockpile or material unloading areas; 2) all weather tipping areas; 3) all-weather access roads to monitoring wells, 4) vegetation of interim and final cover slopes, 5) maintenance of silt basins and installation of silt fencing, 6) windblown litter control, 7) seep prevention and management, 8) stormwater pollution prevention plan, 9) litter and odor control plans, and 10) any other winterization efforts needed to ensure safe and proper operation of the Landfill during the wet season.

Contractor shall hydroseed to minimize soil suspension in the stormwater. Contractor shall continue to hydroseed every two months until the areas of the Landfill not planned for operations in the upcoming 12-months have achieved at least 70% regrowth. Contractor shall be solely responsible for any and all costs associated with developing and implementing the winterization plan.

- J. Repair of Damaged Property.** With the exception of the repair or replacement of perimeter fencing as identified in Subsection G above, Contractor shall have fifteen (15) calendar days to repair or replace any WPWMA equipment, infrastructure, or building structures, located within the boundaries of the Landfill, damaged by Contractor's operations or required to be maintained by Contractor under this Agreement, upon receipts of written notice from the Executive Director. If, after said fifteen (15) days, or after 24 hours in the case of perimeter fencing damage as identified in Subsection G above, Contractor fails to reasonably repair or replace such damaged property, the WPWMA may use private or WPWMA personnel to repair or replace said WPWMA property and the WPWMA may deduct all reasonable costs borne by WPWMA associated with such repair or replacement from the Contractor's monthly payment(s), except to the extent any such repair would reasonably require more than fifteen (15) calendar days to repair. In such a case, the Parties shall mutually agree upon a satisfactory and reasonable period of time for Contractor to complete such repairs.

- 5.15 Landfill Drainage.** Contractor shall at all times make the necessary provisions and take the necessary actions, subject to the WPWMA's approval, to: 1) maintain positive drainage of all surface water, storm water, contact water and leachate, 2) minimize erosion of all areas of the Landfill, 3) remove and properly dispose to the sanitary sewer any ponded contact water, and 4) take all other actions necessary to minimize the infiltration of liquids into the Waste that have the potential to result in the production of leachate. Contractor must immediately drain any ponds or depressions on the Landfill.

Contractor shall provide, place and/or relocate and maintain any and all drainage control devices; construct drainage ditches and berms; and provide all materials and methods as necessary to maintain positive drainage.

Contractor shall maintain a minimum slope of four (4) percent on all surface areas, with the exception that Contractor shall maintain a minimum slope of three (3) percent on all closed slopes per the Landfill closure plan. At a minimum, Contractor shall annually inspect the surface of the Landfill and fill in depressions as necessary to prevent ponding and promote positive drainage of surface water and address any such deficiencies via the Winterization Plan and prior to October 15, annually.

Contractor is responsible for diverting surface water from active Disposal areas, exposed liner areas and WPWMA contractor (e.g. liner construction contractor) work areas at all times. Contractor is responsible for maintaining all sedimentation basins, including removal of accumulated sediments on an annual basis or more frequently as necessary or as directed by the WPWMA. Each WPWMA project will indicate the acceptable stormwater entrance and exit points from the WPWMA contractor's work area. The WPWMA construction contractor(s) will be expected to collect, convey and control stormwater within its work area during construction to the extent Contractor prevents runoff from entering the work area.

During periods of wet weather operations, Contractor shall construct and maintain earthen berms as close as practical to the Active Face for the purpose of minimizing and controlling contact water. Under no circumstances shall Contractor allow contact water to come in contact with storm water runoff from the site.

The adequacy of these measures shall be determined by the WPWMA. The WPWMA will promptly notify the Contractor of any condition which it believes is not in conformance with this Section.

5.16 Litter Control. Contractor shall be responsible for both on-site and off-site litter control as follows:

- A. On-Site Litter Control.** Contractor shall use reasonable conventional efforts to maintain and keep the Landfill free of litter including constructing and operating litter fences, creating wind blocks, reducing disposal activities, and/or adding additional employees to collect litter. Said efforts shall be consistent with industry standards and the requirements of responsible regulatory agencies including CalRecycle, the Central Valley Regional Water Quality Control Board, and the Placer County Local Enforcement Agency. Litter consists of any Waste outside of the Active Face or any other unloading or stockpiling areas. Contractor shall be solely responsible for maintaining the Landfill in a clean and sanitary condition and shall be responsible for any public nuisance created as a result of its operations. Contractor shall use wind screens and/or litter fences during windy conditions to contain blowing Waste. Contractor shall provide adequate personnel to collect and properly dispose of litter from the Landfill, as needed, and to keep the wind screens and/or litter fences clear of Waste.

- B. Off-Site Litter Control.** Contractor shall be responsible for the daily removal of litter blown off-site of the Landfill to surrounding properties, including the Materials Recovery Facility. Prior to entering off-site properties to pick-up litter, Contractor shall contact the landowner(s) for permission to enter. If any landowner refuses entry by Contractor, Contractor shall document such refusal and shall not enter the refusing landowner's property unless and until the landowner subsequently gives permission to either WPWMA or Contractor to enter the subject property. Contractor shall establish blanket rights-of-entry annually inasmuch as possible and submit such with the Winterization Plan.
- 5.17 Odor Control.** Contractor shall fully comply with the WPWMA's Site Wide Odor Plan (SWOP) in Exhibit J, including any future amendments as deemed necessary and appropriate by the WPWMA as it relates to the Contractor's operations, including but not limited to the implementation of Best Management Practices related to the landfilling operation as specified in the SWOP. Contractor shall also take any and all other necessary actions, as agreed to with the WPWMA, to minimize off-site odor issues associated with the Contractor's landfilling operations.
- 5.18 Vector Control.** Contractor shall use reasonable landfill operating practices and techniques to control birds, rodents, insects and other disease carrying or breeding organisms, subject to Applicable Law. Contractor shall provide any chemical sprays, traps and similar measures approved by local or State agencies to control these pests, whenever necessary. Contractor shall employ the services of a falconer if the number of birds at the staying at the Landfill exceeds 100 birds. Contractor shall summarize its vector control plan and efforts in each monthly report.
- 5.19 Dust Control.** Contractor shall provide sufficient equipment and manpower to apply water for the alleviation and prevention of dust that may occur during Contractor's daily operations at the Landfill. Contractor shall suspend all non-essential excavating and grading operations when sustained winds exceed twenty five (25) miles per hour based on WPWMA's on-site meteorological monitoring system. Contractor shall post, adhere to and make all reasonable attempts to have Customers and its employees adhere to traffic speeds on all on-site unpaved roads of fifteen (15) miles per hour or less.

Contractor shall also implement the following measures to control dust:

- A. Soil Stockpiles.** Exposed soil stockpiles shall be enclosed, covered, watered twice daily, or treated with approved soil binders according to manufacturer's specifications. Contractor may suspend watering of said stockpiles if visual inspection indicates a soil crust has formed on the soil pile, such that dust generation has ceased.
- B. On-Site Roadways.** Contractor shall maintain all access roads on the perimeter of the landfill. The contractor shall also maintain a maximum of 1500 linear feet of access road per module. Maintenance of undeveloped gravel roads includes but is not limited to: annual resurfacing to mitigate depressions and build-up,

moisture conditioning/dust control (explained below), access road construction, track-out mitigation measures, etc.

Contractor shall water active on-site roadways and graded areas at least twice daily between the months of April to October or during any other period where there has been three (3) consecutive days or more without 0.01 inches or more of recordable precipitation. Contractor shall provide a single application of dust palliatives annually on both lanes of the landfill perimeter and haul roads between May 15th and June 30th after performing the annual road maintenance. Dust palliatives shall be approved by the WPWMA prior to use and shall be used in strict accordance with the manufacturer's instructions. The adequacy of Contractor's dust control measures shall be determined by the WPWMA.

5.20 Fire Safety

- A. Fire Control.** Should any fires occur, it shall be the responsibility of Contractor to notify the fire department, to use all available methods to control and extinguish such fires, and to notify the WPWMA of the event within 2 hours of Contractor's first knowledge of the event.
- B. Construction of Fire Breaks.** Contractor shall construct a twenty (20) foot wide fire break along the Landfill property line between May 15th and June 30th of each Operating Year and shall maintain such fire breaks throughout the dry season, or as otherwise directed by the Fire Marshall or Executive Director. For the purposes of this section, existing on-site roadways may be utilized as part of the fire break measures employed by Contractor. Contractor shall notify the WPWMA prior to constructing any fire breaks so that the WPWMA may ensure that all biological concerns for the area of construction have been addressed.
- C. Smoking.** Smoking shall only be permitted in areas specifically designated and approved by the WPWMA for that purpose. At no time shall smoking be allowed on any active or closed modules of the Landfill including the Active Face whether or not the person smoking, whether an employee of Contractor or any other Customer, is inside or outside of a protected structure or vehicle. Contractor shall be responsible for enforcing these restrictions.
- D. Burning.** No burning shall be permitted and Contractor shall use all reasonable means to prevent burning of any kind at the Landfill.

- 5.21 Equipment.** Contractor shall supply all equipment necessary to handle, push, cover and transfer Waste, maintain on-site roads, provide dust control, perform both on and off- site litter clean-up services, excavate and transport soils, Alternative Daily Cover and/or other Operational Materials, and otherwise perform the requirements of this Agreement. Equipment shall be of sufficient size and quantity to safely and efficiently operate the Landfill, meet the Effective Density Target requirements identified in Section 5.12 and shall comply with Applicable Law and any and all Local, State and Federal vehicle

emissions standards and applicable safety regulations. The WPWMA reserves the right to determine the adequacy of any equipment utilized by Contractor.

Contractor is responsible for providing and maintaining equipment which will operate with a minimum of down time. Should any individual piece of equipment necessary for the daily Disposal or covering of Wastes become non-operational for a period of more than four (4) hours, or if it is unavailable to perform necessary work at the end of the working day, Contractor shall: (1) notify the WPWMA immediately, and (2) immediately provide substitute equipment, unless the WPWMA determines that the piece of equipment is not necessary to properly complete the day's work. In the event that a piece of equipment breaks down for any extended period of time and has material impact on the operations, Contractor shall take necessary remedies to ensure operations are not impacted.

Contractor shall promptly remove all equipment and other property not used in, or necessary for proper Landfill operations. Contractor shall furnish or have available at all times sufficient backup equipment or provide substitute equipment to prevent material delay in the Disposal or covering of Wastes as a result of breakdowns or peak loading conditions. The suitability of such backup equipment shall be subject to the prior approval of the WPWMA.

5.22 Labor

- A. **Sufficient Number of Employees.** Contractor shall employ and have on duty, during all hours that the Landfill is required to be open, a sufficient number of competent, trained employees to perform efficient operations on the Landfill. Contractor's employees shall cooperate with the WPWMA's scalehouse attendants, control public and commercial dumping at all locations that Wastes are unloaded, including but not limited to the Active Face, control and clean up litter, inspect Waste loads for prohibited materials in accordance with Contractor's Hazardous Waste Exclusion Plan, and perform other duties as may be required to operate the Landfill, including operation of Contractor's equipment to ensure that all of Contractor's operations are performed in accordance with this Agreement and Applicable Law.

Contractor shall provide to the WPWMA, within ten (10) working days after requested, a copy of Contractor's payroll records of all on-site employees for any month in which Contractor performed work for the WPWMA under this Agreement.

Contractor's senior on-site manager (who shall be the same individual identified by Contractor in accordance with Section 2.8) shall sign a written certification that such records are complete, true and accurate and comply with the applicable California prevailing wage requirements.

Contractor shall have additional labor forces available within 24 hours of severe wind events to provide on-site and off-site litter control as defined in Section

5.16. The WPWMA reserves the right to: 1) determine the adequacy of Contractor's staffing levels and 2) require Contractor provide additional personnel as the WPWMA deems necessary for litter control or other purposes at no additional cost to the WPWMA.

- B. Contractor Obligation to Pay Prevailing Wage.** Contractor is aware of the requirements of California Labor Code Section 1720 et seq., and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq., ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on "public works" and "maintenance" projects. Since the Agreement is being performed as part of an applicable "public works" or "maintenance" project, as defined by the Prevailing Wage Laws, and since the total compensation is \$1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. WPWMA shall provide Contractor with a copy of the prevailing rates of per diem wages in effect at the commencement of this Agreement. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to execute the Agreement available to interested parties upon request, and shall post copies at Contractor's principal place of business and at the project site. Contractor and any subcontractor shall forfeit a penalty of up to \$200 per calendar day or portion thereof for each worker paid less than the prevailing wage rates.

When Contractor employs workmen in an apprenticeable craft or trade, Contractor shall comply with the provisions of Section 1777.5 of the California Labor Code with respect to the employment of properly registered apprentices upon public works. The primary responsibility for compliance with said section for all apprenticeable occupations shall be with Contractor. The Contractor or any subcontractor that is determined by the Labor Commissioner to have knowingly violated Section 1777.5 shall forfeit as a civil penalty an amount not exceeding \$100 for each full calendar day of noncompliance, or such greater amount as provided by law.

Contractor is advised that eight (8) hours labor constitutes a legal day's work. Pursuant to Section 1813 of the California Labor Code, Contractor shall forfeit a penalty of \$25.00 per worker for each day that each worker is permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week, except when payment for overtime is made at not less than one and one half (1 1/2) times the basic rate for that worker.

Contractor and each subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. The payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor in the manner provided in Labor Code section 1776. In the event of noncompliance with the requirements of this section, Contractor shall have 10

days in which to comply subsequent to receipt of written notice specifying in what respects such Contractor must comply with this section. Should noncompliance still be evident after such 10-day period, Contractor shall, as a penalty to WPWMA forfeit not more than \$100.00 for each calendar day or portion thereof, for each worker, until strict compliance is effectuated. The amount of the forfeiture is to be determined by the Labor Commissioner. A contractor who is found to have violated the provisions of law regarding wages on public works with the intent to defraud shall be ineligible to bid on Public Works contracts for a period of one to three years as determined by the Labor Commissioner. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from progress payments then due. The responsibility for compliance with this section is on Contractor. The requirement to submit certified payroll records directly to the Labor Commissioner under Labor Code section 1771.4 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Section 1771.4.

Pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. No bid will be accepted, nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work. Contractor is directed to review, fill out and execute the Public Works Contractor Registration Certification in a form acceptable to WPWMA prior to contract execution. Notwithstanding the foregoing, the contractor registration requirements mandated by Labor Code Sections 1725.5 and 1771.1 shall not apply to work performed on a public works project that is exempt pursuant to the small project exemption specified in Labor Code Sections 1725.5 and 1771.1.

This Agreement is subject to compliance monitoring and enforcement by the Department of Industrial Relations. It shall be the Contractor's sole responsibility to evaluate and pay the cost of complying with all labor compliance requirements under this Agreement and applicable law. Any stop orders issued by the Department of Industrial Relations against Contractor or any subcontractor that affect Contractor's performance of the Agreement, including any delay, shall be Contractor's sole responsibility. Any delay arising out of or resulting from such stop orders shall be considered Contractor caused delay subject to any applicable liquidated damages and shall not be compensable by the LRSWMA.

- C. **On-Site Contractor Representative.** At least one of Contractor's employees shall be designated as a representative of the Contractor to interact with the WPWMA and Customers, shall be at the Landfill during all hours of operation and shall be reachable by phone. The designated employee(s) shall be able to speak, read and write English, shall be trained in First Aid and CPR, shall have a 40-hour HAZWOPER certificate in hazardous material safety and maintain an 8-hour annual HAZWOPER refresher course, shall be

a trained Manager of Landfill Operations (MOLO) according to the Solid Waste Association of North America (SWANA) and any other similar training approved by the WPWMA and recommended by SWANA. A copy of the course certificate(s) shall be submitted to the WPWMA within two weeks of on-site employment and immediately thereafter following any and all such refresher courses. The on-site Contractor's representative shall meet with WPWMA staff weekly in a routinely scheduled operations meeting.

- D. On-site Supervision.** It is expressly understood and agreed that the WPWMA has entered into this Agreement in reliance upon the Contractor's personal and continuous supervision and responsibility for such enterprise, and at no time shall the WPWMA be required to rely upon supervision or performance by any other party, including but not confined to the surety of the Contractor or successor, or assign or heir of the Contractor, whether by operation of law or otherwise.

The Contractor shall designate an employee to be responsible for supervising the operations at the Landfill. This supervisor shall have current MOLO certification or equivalent throughout the Term of this Agreement. Contractor's equipment operators employed at the Landfill shall be MOLO certified or have received an equivalent certification within 12 months of on-site employment. The on-site Contractor representative and the on-site supervisor can be the same individual.

- E. Replacement of Non-Complying Employees.** In the event that any Contractor employee neglects to properly serve any Customer or WPWMA personnel in a courteous and efficient manner, or fails to conduct operations at the Landfill in compliance with this Agreement, or permits or causes any other violation of this Agreement, the WPWMA shall provide written notice to Contractor with information regarding such behavior, upon which Contractor shall take appropriate measures to remedy the matter which shall be discussed with WPWMA prior to implementation.

- F. Employee Clothing.** Contractor employees shall wear orange shirts and/or vests at all times so that they are easily identified by and visible to the WPWMA and Customers. All employees shall have their name and firm's name on the shirt and/or vest they are wearing. Employees clothing shall be subject to the approval of the WPWMA. Contractor's shall ensure that its employees have the appropriate personal safety equipment, including, but not limited to, hard hats, rain gear, steel-toed boots, back supports, hearing protection, and other appropriate equipment. Contractor is responsible at all times to enforce use of all such safety equipment by its employees.

- G. Safety Program and Monthly Safety Meetings.** Contractor shall develop and maintain a complete safety program. Contractor shall provide documentation to the WPWMA upon request that the safety program is being adhered to by Contractor and Contractor's employees. Contractor shall

conduct operations, safety, and Hazardous Waste recognition training meetings at least monthly, and copies of the meeting records shall be delivered to the WPWMA in conformance with Cal OSHA regulations and Title 14 of the Health and Safety Code.

- H. Hazardous/Unacceptable Material Training.** Contractor shall not allow Disposal of material other than Waste at the Landfill. It is recognized that some non-approved materials, including Hazardous Wastes, Household Hazardous Waste or Medical and Infectious Waste may occasionally be unloaded at the Landfill by a Customer. Contractor shall train all on-site employees to recognize such unacceptable materials and shall submit copies of Hazardous Material Health and Safety certification or equivalent training documentation for each employee to the WPWMA within two (2) weeks of an employee's on-site employment.

- 5.23 Contractor Cooperation with WPWMA Construction Projects.** Contractor shall cooperate with the WPWMA and WPWMA's contractors and engineering and operations consultants during any Landfill-related construction projects and/or ongoing operations which may be undertaken during the Term of this Agreement, including but not limited to expansion of the landfill gas control system and other environmental controls, module or waste excavation and liner construction, roadway construction, soil stockpiling and excavation, odor studies, water collection and treatment, and any other project related to waste collection, processing, treatment or supporting activities. The WPWMA will provide advance notification to Contractor of any construction projects to be implemented, and supply an electronic copy of the plans and specifications at bidding. Contractor shall participate in the pre-bid, pre-construction, and punchlist/substantial completion meetings for each project, and the progress meetings by WPWMA invitation.

The WPWMA will take reasonable measures to ensure that Contractor's operations are not unduly impacted by third party contractors or consultants. The WPWMA construction contractor will have control and be responsible for the work area denoted in the construction contract from the date of the Notice to Proceed through Substantial Completion. The WPWMA construction contractor will be responsible for its own environmental controls (including but not limited to dust control and stormwater control) within its work area. Contractor shall resume operation and responsibility of the WPWMA construction contractor's work area at Substantial Completion.

- 5.24 Additional Work Directed by the WPWMA.** WPWMA may from time to time during the Term request that Contractor perform additional services related to the operation of the Landfill not specifically identified in this Agreement.

Upon WPWMA's request, Contractor shall provide a written estimate of Contractor's cost for performing the requested services, with a detailed breakdown of the components of Contractor's projected costs and pricing proposal costs and documentation which reasonably supports Contractor's projected costs.

Upon receipt of Contractor's proposal, the Executive Director may, in his sole discretion, deliver a written acceptance to Contractor of its proposal to perform the additional

services and the Contractor shall perform such additional services in accordance with Contractor's proposal. The WPWMA shall compensate Contractor for these services on a time and materials, or some other agreed-upon, measurable and incremental basis in accordance with Contractor's proposal and the Special Services Hourly Rates.

- 5.25 Operation of Other Business.** Except for the operations specifically permitted under this Agreement, Contractor shall not engage in any private business, including the storage, display or sale of any salvaged materials, vehicles or other property of Contractor or its employees, or the storage of unrelated or unnecessary equipment, on the Landfill property without the WPWMA prior written consent.
- 5.26 Contractor's Construction of Landfill Gas Window Wells.** At the request of the WPWMA, Contractor shall construct and install Landfill Gas Window Wells as shown in, and substantially in accordance with, the plans and specifications attached hereto and incorporated herein by reference as Exhibit I. In the event that WPWMA determines, at its sole discretion, that additional Landfill Gas Window Wells are necessary, WPWMA shall promptly notify Contractor in accordance with Section 5.23, requesting Contractor to provide an updated or revised cost proposal in relation to the additional work, taking into account the future plans and specifications provided by WPWMA for construction of additional Landfill Gas Window Wells.
- 5.27 Stormwater Monitoring and Reporting.** Contractor shall be responsible for constructing all improvements, performing all Maintenance, monitoring, sampling, analysis and report preparation associated with the stormwater/surface water provisions included in the Facility Industrial Stormwater Permit and the Waste Discharge Requirements as may be adopted by the Water Board. The WPWMA may, at any time, conduct its own monitoring to verify Contractor performance. Contractor shall correct any deficiencies noted by the WPWMA in a Timely manner regardless of weather or working conditions. Any additional costs or efforts associated with stormwater related activities by virtue of the Landfill, or any portion of it, moving from a less stringent to a more stringent reporting tier, whether or not the reclassification was associated directly or indirectly with Contractor's operation of the Facility, or from any enhanced monitoring of a requirement or regulation in place on the Effective Date of the Agreement, shall be the sole responsibility of Contractor and shall not be deemed a Change in Circumstances pursuant to Section 6.4.

WPWMA will include, in agreements with other contractors, requirements to comply with the then-effective Stormwater Pollution Prevention Plan. To the extent that Contractor and the WPWMA can determine a WPWMA contractor was solely responsible for increased stormwater related costs, the WPWMA will reimburse Contractor any remuneration received from said contractor.

Contractor shall submit such reports to the WPWMA as complete, draft documents no later than fourteen (14) days prior to the report due date for WPWMA review and comment. Contractor shall make any and all changes to such reports as requested by WPWMA. WPWMA shall be responsible for filing the reports with the applicable regulatory agencies; Contractor shall not communicate with the regulatory agencies on

behalf of the WPWMA. Permitting of the stormwater system will remain the WPWMA responsibility. Contractor shall submit any requested changes to permitting documents to the WPWMA for review at least thirty (30) days prior to the date Contractor wishes the permit application be filed.

ARTICLE 6. OTHER CONTRACTOR REQUIREMENTS

6.1 Contractor's Facilities

- A. Contractor Provided Buildings and Facilities.** Contractor shall have the right and privilege to construct buildings and/or install portable structures suitable for maintenance of equipment, storage of supplies, employee facilities and office functions on the Landfill. Contractor shall be responsible for maintenance of such facilities for the full Term of the Agreement. The area(s) for placement of such structures shall be subject to WPWMA's approval which will not be unreasonably withheld. Contractor has the right and privilege to lease portable structures for Contractor's use in lieu of constructing facilities.

All costs and charges for constructing and/or installing or leasing buildings and facilities on the Landfill and all costs and charges of any public utility service furnished to any such building or facility shall be the sole and separate obligation of Contractor. Contractor shall at its own expense have the responsibility of obtaining all necessary building and use permits and approvals, including any and all necessary environmental review, for any building or facility provided by Contractor.

The title to any such building or facility shall at all times remain in the name of Contractor; provided that, in the event this Agreement is terminated or completed or if the Landfill operation is terminated, Contractor shall offer for sale to the WPWMA at Contractor's depreciated book value (as shown on Contractor's most recent federal income tax return) any such buildings or facilities the WPWMA may wish to acquire. In the event the WPWMA does not wish to acquire Contractor's buildings or facilities, Contractor shall remove the buildings and facilities from the premises, clear any part and/or foundation of the same, leave the premises in substantially the same condition as first encountered by Contractor, and shall clear away and remove any furnishings or other personal property. If Contractor fails to comply with the requirements of this section within fifteen (15) days after such termination or relocation of the Landfill operations, Contractor shall be deemed to have abandoned the same. The WPWMA shall then have the option of taking possession of the remaining buildings, facilities, or personal property; selling the same or any part thereof; retaining the proceeds of its expenses in the matter; or of demolishing the building or facility and any such foundation, furnishings or personal property and disposing thereof. In any case, the WPWMA shall be entitled to recover from Contractor the WPWMA's

reasonable expenses incurred in demolishing the building or facilities, foundation, furnishings or personal property and/or disposing of the same.

Contractor is expressly advised that nothing contained herein shall be construed as authorizing, nor interpreted as a representation that the WPWMA will authorize, the construction, installation or use of any building or facility contrary to the applicable provisions of the zoning ordinance, building code, fire code or other applicable ordinances of the County of Placer, or statutes or regulations of the State, nor as a representation that the County of Placer shall grant any exception or variance from any such ordinance for such purposes.

- B. **Electrical Connections.** Contractor may, at its own expense, provide electrical connections and lines, in addition to any such electrical connections existing at the Landfill as of the Effective Date. Installation and maintenance of such additional electrical connections and lines shall be the sole responsibility of Contractor. Contractor shall be solely responsible for payment of any utility bills for buildings or facilities provided and/or used by Contractor during the Term of this Agreement.
- C. **Telephone.** Contractor shall maintain a telephone at the Landfill at all times. All charges for telephone service installed and/or used by Contractor shall be the sole responsibility of Contractor. In the event a phone line is unavailable, Contractor shall provide a two-way radio or cellular phone at the Landfill.
- D. **Sanitary Facilities and Drinking Water for Employees.** Contractor shall provide sanitary facilities for its employees at the Landfill. A well maintained chemical toilet and hand wash facility are the minimum requirements. In addition, Contractor shall provide on-site drinking water for all employees.
- E. **Other Provisions.** Contractor shall provide all other necessary facilities including, but not limited to: eye wash stations, personal protective equipment, and other items that may be required to comply with California OSHA and Department of Transportation standards, Applicable Law or other regulations as applicable.

6.2 **Public Access to The Contractor**

- A. **Office Facility.** Contractor shall establish and maintain at all times during the Term an office within 30 miles of the Landfill, preferably at the Landfill.
- B. **Office Hours.** Contractor's office hours shall be, at a minimum, from 8:00a.m. to 5:00p.m. daily, except Saturdays, Sundays and Holidays.
- C. **Availability of Representatives.** A responsible and qualified representative of Contractor shall be available at the Contractor's office during office hours for communication with the WPWMA, Customers or the public.

D. Telephone. Contractor shall maintain a telephone system in operation at its office during office hours. Contractor shall have available a service representative to handle calls by phone from the WPWMA, Customers or the public during office hours. Contractor shall maintain an after-hours telephone number for use during other than normal business hours. Contractor shall have a representative, answering service or voicemail system available at said after- hours telephone number during all hours other than normal office hours. Contractor shall provide an after-hours recorded message in English and Spanish listing office and Landfill hours of operation and an emergency alternative phone number. Contractor shall provide the WPWMA the means to contact Contractor directly by telephone on a 24-hour basis in the event of an emergency.

E. Receipt, Unloading and Storage of Goods. A responsible, qualified and informed representative of Contractor shall be available at the Contractor's office during any hours Contractor intends to receive shipments and shall provide for its own loading/unloading and storage of such materials.

6.3 Complaints and Response. Contractor shall notify the WPWMA by email to reports@wpwma.ca.gov within 24- hours of receipt of any oral and written complaints, including nuisance complaints, registered with Contractor from the public and/or any Customers. As used herein, the word "nuisance" shall refer to a situation where litter, debris, dust or odors from Landfill operations are allowed to travel beyond the Landfill property line boundaries, thereby occasioning complaints from the public. A condition of "nuisance" shall also be deemed to occur where dumping of Waste occurs along any public roadways within a two (2) mile radius of the Landfill. The Contractor shall be responsible for the prompt and courteous attention to, and prompt and reasonable resolution of, all complaints. Complaints that cannot be reasonably resolved may be appealed to the WPWMA for final resolution. Contractor shall record in the complaint log all written and oral complaints, noting the name and address of complainant, date and time of complaint, nature of complaint, and nature and date of resolution. Such log shall be kept so that it may conveniently be inspected by representatives of the WPWMA upon request. The Contractor shall deliver, along with monthly reports specified in Article 8 or otherwise upon request of the WPWMA, a summary of nuisance complaints by number and type, and a legible copy of the log reflecting Contractor's actions taken to resolve the complaints.

6.4 Change in Operations or Administration. Contractor shall notify the WPWMA in writing of any material changes in, or to the operation to provide Basic Services (e.g. equipment type or number, management and employees), at the time such material change is implemented. Any changes to the operations shall meet the service requirements, performance standards and other terms of this Agreement.

ARTICLE 7. CONTRACTOR COMPENSATION

7.1 General. The payments provided for in this Article 7 are the full, entire and complete compensation due to Contractor from the WPWMA for furnishing all labor, equipment,

materials and supplies and all other things necessary to perform all of the services required by this Agreement in the manner and at the time prescribed, and for fulfilling all of its obligations under this Agreement, including but not limited to the operation of the Landfill and any required reporting and environmental compliance activities. Unless otherwise provided specifically to the contrary elsewhere in this Agreement, such payments shall include all costs for the items mentioned above and also for all taxes, insurance, bonds, overhead, profit and all other costs necessary or appropriate for Contractor to perform its required services in accordance with this Agreement, as well as adequate compensation for all risks that are being taken by Contractor by reason of its execution and delivery of this Agreement. Possessory interest taxes, if any, levied pursuant to Revenue and Taxation Code Section 107 on Contractor are included in the payments provided for in this Article 7 and no separate reimbursement of such taxes, if any, will be made by the WPWMA.

7.2 Compensation for Contractor Operating the Landfill. Contractor shall be paid the amounts described in this Section 7.2 for performing all work required by this Agreement, subject to any offsetting quarterly airspace conservation adjustments by the WPWMA or liquidated damages pursuant to Section 5.5. The minimum landfill annual amount that the Authority shall pay the Contractor shall be \$2,511,231.00. At the end of each operating year, the Authority will compare the tipping fees paid to the Contractor and if these payments fall below the minimum landfill annual amount, then the Authority shall pay the difference to the Contractor.¹ Notwithstanding the foregoing, the minimum landfill annual amount shall be modified annually at the end of each operating year to reflect current consumer prices in accordance with the Consumer Price Index (CPI).

A. Tonnage Based Base Facility Fee. Effective July 1, 2022 Contractor shall be paid a monthly Base Facility Fee of Thirty Dollars, Eighty Two Cents (\$30.82) per Ton of Direct Hauled Waste Disposed.

B. Airspace Conservation Adjustment. Based on the quarterly Effective Density Target achieved by Contractor, in accordance with Section 5.12, one of the following conditions shall apply:

- i) Contractor meets the Effective Density Target performance standard.** If Contractor achieves an Effective Density that is within the range of the agreed Effective Density Target for a given quarter of an Operating Year, Contractor will be deemed to have met the necessary performance standard and no additional compensation to Contractor by WPWMA will be due.
- ii) Contractor exceeds the Effective Density Target performance standard.** If Contractor achieves an Effective Density greater than the agreed Effective Density Target for a given quarter of an Operating Year, WPWMA will pay Contractor Eight Dollars and No Cents (\$8.00) per

¹As an example: If 70,000 tons were delivered directly to the landfill with a tipping fee of \$30.82, the initial payment would equal \$2,157,400. In such event, \$353,831 shall be owed to the Contractor because the minimum landfill annual amount has not been met.

cubic yard for each cubic yard of airspace conserved as computed using the following formula:

$$\text{Airspace conserved} = (2,000 * W) * [(1/ED_T) - (1/ED_A)]$$

Where:

W = Weight of Waste Disposed, in Tons, during a given quarter of an Operating Year

ED_A = Effective Density achieved by Contractor during a given quarter of an Operating Year

ED_T = Effective Density Target for a given quarter of an Operating Year

- iii) **Contractor fails to achieve the Effective Density Target performance standard.** If Contractor fails to achieve an Effective Density within the range of the agreed Effective Density Target for a given quarter of an Operating Year, WPWMA will deduct from fees otherwise due to Contractor an amount equal to Eleven Dollars and no Cents (\$11.00) per cubic yard for each cubic yard of airspace Contractor failed to conserve as computed using the following formula:

$$\text{Airspace wasted} = (2,000 * W) * [(1/ED_A) - (1/ED_T)]$$

Where:

W = Weight of Waste Disposed, in Tons, during a given quarter of an Operating Year

ED_A = Effective Density achieved by Contractor during a given quarter of an Operating Year

ED_T = Effective Density Target for a given quarter of an Operating Year

The fees identified in this subsection became effective July 1, 2022 and may only be adjusted from year to year by mutual agreement between the Parties, subject to good faith negotiations following the transition period.

- 7.3 **Annual Inflation Adjustment.** Contractor's fees subject to an annual inflation adjustment, where expressly indicated in this Agreement, shall be adjusted to be effective on July 1st of each year during the Term for the succeeding Operating Year, commencing July 1, 2023, based on the following formula:

Where:

$$\text{COLA} = 0.20 + 0.30 \times (ECI_i/ECI_0) + 0.40 \times (PPI_i/PPI_0) + 0.10 \times (PPIF_i/PPIF_0)$$

$ECI_i =$ Employment Cost Index, Total Compensation, Private Industry, West (Series ID: CIU202S000400000I); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the first quarter of the prior Operating Year to the year the adjustment is to be made (e.g., adjustment for Operating Year 2023/24 will utilize statistics from the first quarter of 2023).

$ECI_0 =$ Employment Cost Index, Total Compensation, Private Industry, West (Series ID: CIU202S000400000I); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the first quarter of 2022.

$PPI_i =$ Producer Price Index, Industrial Commodities Less Fuels (Series ID: WPU03T15M05); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the month of March of the prior Operating Year to the year the adjustment is to be made (e.g., adjustment for Operating Year 2023/24 will utilize statistics from March 2023).

$PPI_0 =$ Producer Price Index, Industrial Commodities Less Fuels (Series ID: WPU03T15M05); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the month of March 2022.

$PPIF_i =$ Producer Price Index, Fuels and Related Products and Power - Petroleum Products, Refined (Series ID: WPU057); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the month of March of the prior Operating Year to the year the adjustment is to be made (e.g., adjustment for Operating Year 2023/24 will utilize statistics from March 2023).

$PPIF_0 =$ Producer Price Index, Fuels and Related Products and Power - Petroleum Products, Refined (Series ID: WPU057); Not Seasonally Adjusted as published by the United States Department of Labor, Bureau of Labor Statistics for the month of March 2022.

On or before June 1st of each year, Contractor shall prepare and submit to the WPWMA for review Contractor's proposed adjustments to its applicable fees as denoted above, including the appropriate calculations used by Contractor to support the proposed adjustments.

If the indices used to compute the annual inflationary adjustment are discontinued or revised by the United States Bureau of Labor Statistics during the Term of this Agreement, such other government index or computation with which it is replaced shall be used in order to obtain substantially the same result as would be obtained if the indices had not been discontinued or revised. The WPWMA shall approve any replacement indices at its sole discretion.

- 7.4 Billing and Payment.** On or before the fifteenth (15th) day of each month Contractor shall submit to the WPWMA an application for payment of the Contractor Service Fees in a format and level of detail required by the WPWMA and consistent with this Agreement.

WPWMA shall pay Contractor the amount due within thirty (30) days after the WPWMA has received and approved the application for payment. If the WPWMA disputes a portion of an Application for Payment, it shall pay the undisputed portion within thirty (30) days and notify Contractor, in writing, within five (5) days' receipt of Contractor's application for payment, of the reason(s) for nonpayment of the disputed amount.

The WPWMA may request clarification and/or additional information about an Application for Payment and/or report. Such a request shall be in writing and shall describe the information requested with adequate specificity. Contractor shall furnish the clarification and/or additional information requested promptly and in any event within thirty (30) days from the date of the request.

- 7.5 Change in Circumstances.** Contractor shall always maintain awareness of the Standard of Care for its profession and industry. Contractor warrants that it is fully aware of and has based its commitment to fulfilling all provisions of this Agreement in accordance with Federal, State and local laws and regulations as they are adopted or drafted and published for public review at the time of the Effective Date.

The WPWMA recognizes that, during the Term of this Agreement, there may be changes in Federal, State or local laws or regulations, the Landfill's permits, or in the method the WPWMA chooses or is allowed to manage a portion of the Wastes that would otherwise be Disposed at the Landfill (such as implementation of an alternative technology such as pyrolysis). In the event that such an unanticipated event occurs and Contractor believes the change could unavoidably, directly and materially increase Contractor's cost of performing services under this Agreement, Contractor shall submit a Notice of Change of Circumstances to the WPWMA following the notification protocol in Section 11.11. The WPWMA may likewise notify Contractor if it believes changed circumstances could directly and materially decrease the Contractor's cost of performing services.

Contractor may apply to the Board for an adjustment in compensation to reflect such change, or in such event the Board itself may initiate proceedings to adjust the Contractor compensation. If Contractor applies for an adjustment to the Board, the WPWMA may in its reasonable discretion, but is not obligated to, grant Contractor an equitable adjustment in the Contractor compensation under this Agreement to compensate Contractor for all or a part of Contractor's increased costs due to the unanticipated event, and such equitable adjustment shall not be unreasonably withheld. The WPWMA will not grant a claim for a Change in Circumstances based on circumstances that were publicly available, adopted or drafted and released for review on or before the Effective Date.

Similarly, the WPWMA may only retroactively apply the Change in Circumstances adjustment a maximum of ninety days (90-days) prior to the date the Contractor notified the WPWMA of the Change in Circumstances.

- 7.6 Miscellaneous.** The making of any payment to Contractor does not imply acceptance of work, nor lessen Contractor's responsibility to correct unsatisfactory work whether or not the unsatisfactory character of such work was apparent or detected at the time such payment was made.

ARTICLE 8.
OTHER RECORD KEEPING AND REPORTING REQUIREMENTS

- 8.1 Record Keeping, Posting, Report Submittal.** Contractor shall maintain, in its office, records of the quantities of materials received, stockpiled, marketed and Disposed and Certified Payroll Reports. Said records shall be subject to the inspection provisions as provided in Section 8.2. Contractor shall post and maintain any jobsite notices required by prevailing wage or other laws for its employers near its employee break room. The adequacy of reports, records and posted information is subject the WPWMA review and approval. Except as otherwise noted, Contractor shall submit all reports electronically in legible, size-reduced, compiled Portable Document Format (PDF) format on or before the due date to reports@wpwma.ca.gov. Contractor shall provide reports in the source files (e.g. .docx, .xlsx, .dwg, etcetera) upon WPWMA request.
- 8.2 Right to Inspect Records.** The WPWMA and its authorized officers, agents or employees, shall at any reasonable time have the right to review and inspect Contractor's records and enter Contractor's premises for the purposes of such review. The WPWMA shall have the right, at its sole discretion and at any time during the Term of this Agreement, to inspect or audit Contractor's payroll records to determine Contractor compliance with the prevailing wage requirement, and shall provide seven (7) days advance notice to Contractor when the WPWMA is to conduct such an inspection or audit at WPWMA's sole expense. The WPWMA's right to review and inspect Contractor's records in this Article shall survive termination of this Agreement.
- 8.3 Monthly Reporting.** Contractor shall prepare and submit operational summary reports to the WPWMA on a monthly basis and no later than the 15th of the month immediately following the reported month, but only to the extent WPWMA has provided Contractor with timely and accurate data, including but not limited to data concerning total tonnage of waste disposed. To the extent such accurate information is provided to Contractor, Contractor's monthly report shall include discussions of the following elements:
1. Tonnage of Waste Disposed;
 2. Tonnage and material description of any Waste materials recovered and subsequently processed or marketed;
 3. Tonnage of Operational Material utilized including load counts and conversion calculations as appropriate;
 4. Locations, conditions and preparation of the Active Face and any deviations from the Waste Disposal Fill Plan;
 5. Site work conducted during the month including litter collection efforts, storm water and erosion control measures, grading and excavation operations, and repairs.
 6. A collection and summary of Daily Field Reports documenting the time and materials used performing any extra work requested by the WPWMA;

7. Load checking and screening reports in accordance with the Hazardous Waste Exclusion Plan and the Landfill's Solid Waste Facility Permit;
8. Equipment usage and downtime by day;
9. Special occurrences;
10. LEA or any other regulatory inspection results and a summary of subsequent actions taken by Contractor;
11. Complaints received by Contractor and all follow-up actions or communications related to the complaint;
12. Safety and training meeting summaries including meeting minutes and a list of attendees; and
13. Certified payroll records, proof that such has been electronically submitted to the California Department of Industrial Relations Labor Commissioner, and proof Contractor has paid into any apprenticeship funds required by law.

8.4 Quarterly Reporting. Contractor shall prepare and submit operational summary reports to the WPWMA on a quarterly basis and no later than the 15th of the month immediately following the reported quarter. Quarterly reports shall summarize the information provided in Contractor's monthly reports, as submitted to the WPWMA in accordance with Section 8.3. Contractor shall also present the quarterly report to the Board when included in the Board agenda at its regular meetings. The WPWMA will provide Contractor at least 72-hours advanced notice of the report being included in the Board agenda.

8.5 Financial Records and Reporting. Contractor shall maintain a proper set of books and records on an accrual basis, and an annual financial statement, audited by Contractor's certified public accountant, in accordance with Generally Accepted Accounting Principles, accurately reflecting the business done by it under this Agreement. Contractor shall submit to WPWMA each year a copy of its audited annual financial statement as soon as it is received by Contractor, but in all events no later than four (4) months following the close of Contractor's fiscal year. The information required herein shall pertain only to Contractor's operations covered and regulated by this Agreement.

Contractor shall maintain all records relating to the services provided hereunder for a period of five (5) years from the date of the generation of each such record. WPWMA or its Agents shall have the right, upon ten (10) business days advance notice, to inspect Contractor's books and records and other like materials of the Contractor which reasonably relate to Contractor's compliance with the provisions of the Agreement.

Such records shall be made available to WPWMA or its Agents at Contractor's regular place of business, but in no event outside of Placer County. WPWMA shall treat all information required by this paragraph and provided by Contractor as confidential information to the maximum extent permitted by Applicable Law and shall not be used or

disclosed except as expressly authorized hereby. While WPWMA will use its best efforts to keep such documents confidential as indicated above, WPWMA makes no representation that these documents will not be treated by the courts as public records subject to disclosure to any persons requesting copies of such documents. Contractor shall be required to indemnify and defend the WPWMA, in accordance with Section 9.1, in the event a member of the public or other Person requests the disclosure of documents marked by Contractor as “Confidential”.

WPWMA’s Agents shall be entitled to examine the books, records and financial statements of Contractor and its Affiliates pertaining to operations not regulated under this Agreement for the sole purpose of gathering information necessary to allow the Agents to ascertain whether income, expenses, assets and liabilities are reasonably and consistently allocated among operations regulated under this Agreement and those not regulated under this Agreement and to assess the reasonableness of any transactions between Contractor and any of its Affiliates. A transaction shall be deemed reasonable if, in the judgment of WPWMA’s Agent, the price for any goods or services provided by an Affiliate to Contractor represent an established market price for such goods or services.

Information gained from examination of records pertaining to operations not regulated under this Agreement shall be treated by WPWMA and its Agents as confidential information to the maximum extent permitted by Applicable Law and shall not be used or disclosed except as expressly authorized hereby. WPWMA’s Agents shall prepare a confidential report regarding the results of their examination of Contractor’s non-regulated operations and transactions with Affiliates. WPWMA’s Agent shall issue its report on Contractor’s non-regulated operations and Contractor’s transactions with Affiliates to WPWMA’s legal counsel, and said report shall remain confidential, except that the dollar amount and general description of any costs that WPWMA’s Agent recommends be disallowed shall be disclosed to the Board. If Contractor appeals the conclusions of said report to the Board, Contractor shall decide what portions, if any, of said report shall be disclosed to the Board. The Board shall then consider Contractor’s appeal, but may, in its discretion, deny said appeal if inadequate information has been disclosed to the Board to make an informed decision on the appeal.

For review of books and other financial records necessary to verify the Contractor’s income, expenses, assets and liabilities, “Agent” shall mean an independent certified public accountant or public accountancy firm designated by WPWMA.

- 8.6 Additional Reporting.** Anytime Contractor determines it has operated outside the tolerances of section 5 or any other Agreement provision or Applicable Law, Contractor shall notify the WPWMA within one (1) calendar day of detection to avoid the WPWMA’s perfunctory enforcement of liquidated damages. While this notification may serve to shield the Contractor from liquidated damages, it does not shield Contractor from the liquidated damages that are based on LEA enforcement actions. The notification shall be followed by a written Corrective Action Plan delivered to the WPWMA within two (2) working days from the notification. Contractor’s failure to provide a timely, written Corrective Action Plan may expose Contractor to enforcement of liquidated damages by the WPWMA.

Contractor shall prepare and maintain, at its offices, and shall furnish to the WPWMA, whenever requested by the WPWMA, all records required to be prepared and maintained of a landfill operator in accordance with Applicable Law, including but not limited to records of: (1) excavations which may affect the safe and proper operation of the Landfill or cause damage to adjoining properties; (2) a daily log book or file of the following information: fires, leachate seeps, landslides, earthquake damage, soil settlement or movement, injury and property damage accidents, explosions, receipt or rejection of unpermitted wastes, flooding and other unusual circumstances; (3) records of all personnel training; (4) copies of written notification to the Placer County Local Enforcement Agency, local health agency, and fire authority of names, address and telephone numbers of the operator or responsible party of the site as required by 27 CCR Section 20615; (5) records of approvals, determinations and other requirements the Placer County Local Enforcement Agency is authorized to make under CalRecycle regulations; (6) complaint logs; (7) safety meeting documentation; and (8) load checking records. Contractor shall also furnish the WPWMA with any additional reports as may reasonably be required by the WPWMA.

8.7 Other Related Requirements. Contractor shall cooperate with and assist the WPWMA in the performance, if and as needed, of periodic waste characterization studies. The WPWMA will reimburse Contractor for its reasonable costs and expenses associated with the preparation of any such studies at the Special Service Hourly Rates.

8.8 Inspection by the WPWMA or Regulators. Any and all WPWMA staff or regulatory personnel, acting safely and outfitted with required safety gear, shall have the right to observe and review Contractor's operations and equipment, and to enter the WPWMA or Contractor's premises for the purposes of such observations and review at any time without prior notification.

ARTICLE 9. INDEMNITY, INSURANCE, BOND

9.1 Contractor Indemnification. Contractor shall indemnify, defend and hold harmless the WPWMA Indemnified Parties, from and against any and all Claims, arising out of or occasioned in any way by, directly or indirectly, (1) the negligence or willful misconduct of Contractor, its officers, managers, employees, agents and/or subcontractors in performing services under this Agreement; (2) the failure of Contractor, its officers, employees, agents and/or subcontractors to comply in all respects with the provisions of this Agreement, Applicable Laws (including, without limitation, the Environmental Laws) and regulations, and/or applicable permits and licenses. The foregoing indemnity shall apply regardless of whether such loss, liability, penalty, forfeiture, claim, demand, action, proceeding, suit, injury, death or damage is also caused in part by the negligence of others, including that of any of the WPWMA Indemnified Parties; provided, however, that this indemnity does not extend to Claims to the extent that they are caused by the active negligence of any of the WPWMA Indemnified Parties, or are caused by the intentional misconduct of or breach of contract by any of the WPWMA Indemnified Parties, or where strict liability is imposed by law upon the WPWMA in the absence of any material fault of Contractor. Upon the occurrence of any Claim, Contractor, at

Contractor's sole cost and expense, shall defend each and all of the WPWMA Indemnified Parties, provided, however, that in the event the named parties to any such Claim (including any impleaded parties) include both the Contractor and the WPWMA, and if the WPWMA Indemnified Parties shall have one or more legal defenses available to any of them which are in direct conflict with the best interests of Contractor and which therefor preclude the same counsel from representing the WPWMA Indemnified Parties and Contractor jointly after taking into account the obligations of Contractor herein for the benefit of the WPWMA, then the WPWMA Indemnified Parties shall have the right to select separate counsel, with the consent of Contractor which will not be withheld unreasonably, at the sole cost and expense of Contractor to pursue such legal defenses and to otherwise participate in the defense of such action on behalf of the WPWMA Indemnified Parties to the extent that joint representation of the WPWMA Indemnified Parties and Contractor is not permissible because of conflicts of interest between the WPWMA Indemnified Parties and Contractor. Contractor's duty to indemnify and defend shall survive the expiration or earlier termination of this Agreement, so long as the event upon which such Claim is predicated occurred prior to such expiration or termination.

- 9.2 Hazardous Substances Indemnification.** Contractor shall indemnify, defend with counsel acceptable to the WPWMA, protect and hold harmless each of the WPWMA Indemnified Parties from and against all Claims, damages injuries, response mediation and removal costs, losses, demands, debts, liens, liabilities, causes of action, suits, legal or administrative proceedings, interest, fines, charges, penalties, reasonable attorneys' fees for the adverse party and expenses (including but not limited to reasonable attorneys' and expert witness fees and costs incurred in connection with defending against any of the forgoing or in enforcing this indemnity) of any kind whatsoever paid, incurred or suffered by, or asserted against, each of the WPWMA Indemnified Parties arising from or attributable to the negligent acts or omissions of Contractor, its agents, employees, contractors and/or subcontractors. The foregoing indemnity is intended to operate as an agreement pursuant to Section 107(e) of CERCLA, 42 U.S.C. Section 9607(c) and California Health and Safety Code Section 25364, to defend, insure, protect, hold harmless and indemnify the WPWMA from liability. The foregoing indemnity shall not apply to the extent such loss, liability, penalty, forfeiture, Claim, demand, action, proceeding, suit, injury, death or damage is also caused by any of the WPWMA Indemnified Parties' active negligence or willful misconduct. Contractor's obligations in this Article shall survive termination of this Agreement.

Notwithstanding the foregoing, Contractor shall not be obligated to indemnify the WPWMA for acts or omissions of prior Landfill operations contractors (other than the Contractor) or for pre-existing environmental conditions that are not contributed to or aggravated by Contractor's negligent acts or omissions.

- 9.3 Insurance Scope and Limits.** Contractor, at Contractor's sole cost and expense, shall procure from an insurance company or companies admitted to do business in the State of California and subject to the regulation of the California Insurance Commissioner and shall maintain in force at all times during the Term the following types and amounts of insurance against Claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its

agents, representatives, employees or subcontractors. The maintenance of Claims made against any insurance required of Contractor shall not be considered a waiver by WPWMA of any Claim or liabilities it may have against Contractor.

At the sole discretion of the WPWMA's Risk Manager, the following requirements may be modified if requested by Contractor and when the Contractor can provide the WPWMA's Risk Manager with proof of acceptable alternative methods of insuring the WPWMA's risks to be covered by the following insurance requirements.

Contractor shall promptly notify the WPWMA of any Claims covered or potentially covered by any of the following policies. This report shall include the name and address of all claimants, the nature of the Claim, the date the Claim arose, the amount of the Claim (if known), and the identity of the insurance carriers that Contractor has notified of the claim.

A. Worker's Compensation and Employers Liability Insurance.

Contractor shall provide Worker's Compensation Insurance as required by any applicable law or regulation. Employer's liability insurance shall be provided in amounts not less than Five Million Dollars (\$5,000,000) each accident for bodily injury by accident, Five Million Dollars (\$5,000,000) policy limit for bodily injury by disease, and Five Million Dollars (\$5,000,000) each employee for bodily injury by disease (limits may be arranged through any combination of underlying and excess or umbrella policies).

B. General Liability Insurance. Contractor shall maintain comprehensive Commercial General Liability insurance with a combined single limit of not less than Ten Million Dollars (\$10,000,000) per occurrence and Ten Million Dollars (\$10,000,000) aggregate covering all claims and all legal liability for personal injury, bodily injury, death, and property damage, including the loss of use thereof, arising out of, or occasioned in any way by, directly or indirectly, Contractor's performance of, or its failure to perform, services under this Agreement (limits may be arranged through any combination of underlying and excess or umbrella policies).

The insurance required by this subsection shall include:

- a. Premises Operations (including X, C and U coverages);
 - b. Independent Contractor's Protective;
 - c. Personal Injury Liability with Employment Exclusion deleted;
 - d. Broad Form Blanket Contractual, with no exclusions for bodily injury, personal injury or property damage; and
 - e. Broad Form Property Damage, including Completed Operations.
- Contractor shall maintain the required General Liability coverage for a

minimum of five (5) years after termination or completion of this Agreement.

- C. **Automobile Liability.** Contractor shall maintain Automobile Liability Insurance for each of Contractor's vehicles used in the performance of this Agreement, including owned, non-owned, leased or hired vehicles, in the minimum amount of Three Million Dollars (\$3,000,000) combined single limit per occurrence (limits may be arranged through any combination of underlying and excess or umbrella policies).
- D. **Pollution Liability.** Contractor shall purchase and thereafter maintain, so long as such insurance is available on a commercially reasonable basis, Pollution Liability insurance in the amount of Four Million Dollars (\$4,000,000) covering liability arising from the sudden and accidental release of pollution at the Landfill (limits may be arranged through any combination of underlying and excess or umbrella policies).
- E. **Physical Damage.** Contractor shall maintain comprehensive (fire, theft and collision) Physical Damage insurance covering the vehicles and the machinery and equipment that is owned by Contractor and used in providing service to the WPWMA under this Agreement.
- F. **Deductible and Self-Insured Retentions.** Any deductibles or self-insured retentions must be declared to and approved by the WPWMA. At the option of the WPWMA, either the Insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the WPWMA Indemnified Parties; or Contractor shall provide evidence satisfactory to the WPWMA guaranteeing payment of losses and related investigations, claim administration and defense expenses. Notwithstanding the foregoing, the WPWMA may elect not to accept any deductibles or self-insured retentions offered by Contractor.
- G. **Required Endorsements.** The policies are to contain, or be endorsed to contain, the following provisions:
1. The WPWMA Indemnified Parties are to be covered as insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of Contractor; and with respect to liability arising out of work or operations performed by or on behalf of Contractor including materials, parts or equipment furnished in connection with such work or operations.
 2. Contractor's insurance coverage shall be primary insurance as respects the WPWMA Indemnified Parties. Any insurance or self-insurance maintained by WPWMA shall be excess of Contractor's insurance and shall not contribute with it.
 3. Each insurance policy required by this clause shall be occurrence-based, or an alternate form as approved by the WPWMA and shall contain an endorsement

stating that thirty (30) days prior written notice shall be given to the WPWMA in the event of cancellation, reduction in coverage, or non-renewal of the policy.

4. Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

The Worker's Compensation and Employers Liability coverage shall be endorsed so that the insurer agree to waive all rights of subrogation against the WPWMA Indemnified Parties for losses arising from work performed by the Contractor for the WPWMA.

Each insurance policy required by this section shall be written on an "occurrence" (not an "accident"), rather than a "claims made" basis if such coverage is readily obtainable for a commercially reasonable premium.

- H. **Acceptability of Insurers.** Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII if admitted.
- I. **Verification of Coverage.** As provided in Article 3.4, Contractor shall furnish the WPWMA with endorsements or certificates effecting coverage required by this clause. The endorsements or certificates are to be signed by a person authorized by that Insurer to bind coverage on its behalf. All endorsements and certificates are to be received no less than three weeks prior to Effective Date for WPWMA review and approved by the WPWMA before work commences.
- J. **Other Provisions.** In the event any services are delegated to a subcontractor, Contractor shall require all such subcontractors to provide statutory workers' compensation insurance and employer's liability insurance for all of the subcontractor's employees engaged in the work. The liability insurance required by Subsection 9.3.B shall cover Contractor's liability for acts of its subcontractors or each subcontractor must furnish evidence of insurance provided by it meeting all of the requirements of this Section 9.3.

Contractor shall comply with all requirements of the insurers issuing policies and shall require its subcontractors to do so. The carrying of insurance shall not relieve Contractor from any obligation under this Agreement, including those imposed by Section 9.1 and 9.2. If any Claim is made by any third person against Contractor or any subcontractor on account of any occurrence related to this Agreement, Contractor, shall promptly report the facts in writing to the insurance carrier and to the WPWMA. If Contractor fails to procure and maintain any insurance required by this Agreement, the WPWMA may take out and maintain, at Contractor's expense, such insurance as it may deem proper and deduct the cost thereof from any monies due Contractor.

- 9.4 **Faithful Performance Bond.** Following the execution of this Agreement and before the Effective Date, Contractor shall file with the WPWMA a bond, payable to the WPWMA, in a form acceptable to the WPWMA, securing the Contractor's faithful performance of each and every one of its obligations under this Agreement. The performance bond shall become Exhibit C to this Agreement. The initial principal sum of the bond shall be \$3,000,000 and shall be adjusted annually in accordance with Section 7.3. The bond shall be executed as surety by a corporation authorized to issue surety bonds in the State of California, with a financial condition and record of service satisfactory to the WPWMA. Alternatively, the Contractor may deposit a letter of credit or open a certificate of deposit in the name of the WPWMA to be held to secure this faithful performance. An annually renewable performance bond shall be furnished and such bond shall be in force for the duration of this Agreement. The premium for the bond shall be paid by Contractor.
- 9.5 **Waiver of Consequential Damages.** NOTWITHSTANDING ANY OTHER PROVISIONS OF THIS AGREEMENT TO THE CONTRARY, NEITHER WPWMA NOR CONTRACTOR SHALL BE LIABLE UNDER THIS AGREEMENT OR UNDER ANY CAUSE OF ACTION RELATED TO THE SUBJECT MATTER OF THIS AGREEMENT, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, PRODUCTS LIABILITY, INDEMNITY, CONTRIBUTION, OR ANY OTHER CAUSE OF ACTION FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES, INCLUDING LOSS OF PROFITS, USE, OPPORTUNITY, REVENUES, FINANCING, BONDING CAPACITY, OR BUSINESS INTERRUPTIONS, OR DAMAGES.

ARTICLE 10. BREACH, DEFAULT AND REMEDIES

- 10.1 **Events of Breach.** The Parties acknowledge that provision of consistent, reliable Base Services is of utmost importance to the WPWMA and that the WPWMA has considered and relied on Contractor's representations as to Contractor's ability and commitment to quality of service in entering this Agreement. Any material failure by Contractor to perform any term, covenant or to satisfy any condition of this Agreement or of any requirement imposed on Contractor by the WPWMA pursuant to this Agreement shall be deemed a material breach of this Agreement.
- 10.2 **Events of Default.** Each of the following shall constitute an event of default hereunder:
- A. **Failure to Correct Breach.** Failure to correct any breach, except to the extent caused by an Uncontrollable Circumstance, (i) within seventy-two (72) hours of written notice from the WPWMA, provided that if the nature of the breach is such that it can be cured but will reasonably require more than seventy-two (72) hours to cure, Contractor shall not be in default so long as Contractor promptly commences to cure such breach and diligently proceeds to complete same; or (ii) promptly, if the breach is such that the health, welfare, or safety of the public or any Customer is endangered as determined by the W Executive Director. For example, and without limiting the generality of the foregoing, failure by Contractor to receive waste for a period of two (2) hours at the Landfill during

normal operating hours would constitute a breach requiring immediate correction by the Contractor, except to the extent any such delay was a result of an Uncontrollable Circumstance.

- B. **Misrepresentation.** Any representation or disclosure made to the WPWMA by Contractor in connection with or as an inducement to entering into this Agreement or any future amendment to this Agreement which proves to be false or misleading in any material respect as of the time the representation or disclosure is made, whether or not any such representation or disclosure appears as part of this Agreement.
- C. **Seizure or Attachment of Equipment.** There is a seizure or attachment (other than a prejudgment attachment) of, or levy affecting possession on, the operating equipment of Contractor, including without limit its vehicles, maintenance or office facilities, or any part thereof of such proportion as to impair Contractor's ability to perform under this Agreement and which cannot be released, bonded, or otherwise lifted within forty-eight (48) hours excluding weekends and Holidays.
- D. **Contractor Bankruptcy.** Contractor files a voluntary petition for debt relief under any applicable bankruptcy, insolvency, debtor relief, or other similar law now or hereafter in effect, or consents to the appointment of or taking of possession by a receiver, liquidator, assignee (other than as a part of a transfer of equipment no longer useful to Contractor or necessary for this Agreement), trustee (other than as security for an obligation under a deed of trust), custodian, sequestrator (or similar official) of Contractor for a part of Contractor's operating assets or any substantial part of Contractor's property, or shall make any general assignment for the benefit of Contractor's creditors, or shall fail generally to pay Contractor's debts as they become due.
- E. **Court Order or Decree.** Any court having jurisdiction shall enter a decree or order for relief in respect of Contractor, in any involuntary case brought under any bankruptcy, insolvency, debtor relief, or similar law now or hereafter in effect, or Contractor shall consent to or shall fail to oppose any such proceeding, or any such court shall enter a decree or order appointing a receiver, liquidator, assignee, custodian, trustee, sequestrator (or similar official) of Contractor or for any part of Contractor's operating equipment or assets, or order the winding up or liquidation of the affairs of Contractor.
- F. **Intentionally Omitted**
- G. **Failure to Provide Performance Assurances.** Contractor fails to provide reasonable assurances of performance as required under Article 10.7 or fails to maintain the Faithful Performance Bond as specified in Article 9.4.
- H. **Failure to Notify WPWMA.** Contractor fails to notify the WPWMA in a timely manner not exceeding three (3) business day of any receipt of notice of violation

or official communication from those regulatory agencies regulating Waste transportation, handling, processing, or Disposal activities.

- I. **Lapse of Financial Requirement.** Lapse of any insurance or bond required under this Agreement.
 - J. **Regulatory Violation.** Contractor materially (as determined by the WPWMA in its sole but reasonable discretion) violates any Applicable Law, regulatory agency orders or written directives applicable to the Landfill, or causes repetitive minor violations to occur, or fails to timely cure any violation.
 - K. **Cessation of Services.** Contractor ceases to provide Waste Disposal services as required under this Agreement for a period of two (2) consecutive days or more, for any reason within the reasonable control of Contractor, including labor disputes.
 - L. **Failure to Meet Payment or Reporting Requirements.** Contractor fails to make any payment required under this Agreement and/or fails to provide WPWMA with required information, report(s), and/or records in a timely manner as provided for in the Agreement.
 - M. **Unremedied Acts or Omissions.** Any other act or omission by Contractor which materially violates the terms, conditions, or requirements of this Agreement and which Contractor does not cure or commence to cure within fourteen (14) days' of written notice from WPWMA or, if Contractor cannot reasonably cure or commence to cure the breach within fourteen (14) days', if Contractor should fail to commence to correct or remedy such violation within a reasonable period of time.
- 10.3 **Right to Terminate Upon Contractor Default.** Upon a Default by Contractor, the WPWMA shall provide Contractor with written notice and an opportunity to cure within a reasonable period of time. After the cure period has ended, the WPWMA shall have the immediate right to terminate this Agreement without need for any hearing, suit or legal action. Contractor's performance bond, in accordance with the terms of the bond, shall be drawn on by the WPWMA to reimburse the WPWMA for its full damages caused by Contractor's Default.
- 10.4 **Right to Terminate Upon WPWMA Default.** Contractor shall have the right to terminate this Agreement by giving notice of termination, either by mail or personal service, to the WPWMA not less than ninety (90) days prior to the date upon which the termination is to become effective, in the event of any material breach of this Agreement by the WPWMA as set forth below:
- 1. The WPWMA's failure to make any payment required under this Agreement or refusal to provide Contractor with required information, reports, test results, as to any material matter, as provided by the Agreement; or

2. Any act or omission by WPWMA which materially violates the terms, conditions or requirements of this Agreement.

Notwithstanding the foregoing, Contractor shall not be permitted to terminate this Agreement if the WPWMA cures said default within ninety (90) days after receiving Contractor's notice of termination.

10.5 Possession of Property Upon Termination. In the event of termination for Contractor default, the WPWMA shall have the right to take possession of any and all of Contractor's equipment, records, customer lists and other property used or useful in the provision of Base Services under this Agreement, and to use such property. The WPWMA shall pay reasonable compensation, at the Special Services Hourly Rates, to Contractor for the temporary use of such equipment and other property. In no event shall compensation exceed twenty five percent (25%) of the Contractor's "daily payment" (for purposes of this Article the term "daily payment" is defined as 1/30th of the Base Facility Fee for the subject month) for use of Contractor's equipment and other property. The WPWMA shall have the right to retain the possession of such property until other suitable arrangements can be made for the provision of services which may include the award of an agreement to another landfill operations company, but in no event longer than one hundred eighty (180) days from the date of termination.

10.6 The WPWMA's Remedies Cumulative. The WPWMA's right to terminate the Agreement under Article 10.3 and to take possession of Contractor's properties under Article 10.5 are not exclusive, and the WPWMA's termination of the Agreement shall not constitute an election of remedies. Instead, all remedies provided for in this Agreement shall be in addition to any and all other legal and equitable rights and remedies which the WPWMA may have under law or as otherwise provided in this Agreement.

By virtue of the nature of this Agreement, the urgency of timely, continuous and high quality service, and the lead time required to effect alternative service, the Parties recognize that the remedy of damages for a breach hereof by Contractor may be inadequate and the WPWMA on a proper showing to a court of equity may be entitled to injunctive relief.

10.7 Excuse from Performance

- A. **Excuse from Performance.** The Parties shall be excused from performing their respective obligations hereunder in the event they are prevented from so performing by Uncontrollable Circumstances beyond the reasonable control of and not the fault of the Party claiming excuse from performance hereunder.
- B. **Inexcuse from Performance.** Labor unrest, including but not limited to strike, work stoppage or slowdown, sick- out, picketing, or other concerted job action conducted by Contractor's employees or directed at Contractor, or a subcontractor, is not an excuse from performance and Contractor shall be

obligated to continue to provide service notwithstanding the occurrence of any or all of such events.

In addition, none of the following are to be considered an excuse from performance: (a) general economic conditions, interest or inflation rates, or currency fluctuation or changes in the cost or availability of fuel, commodities, supplies or equipment; (b) changes in the financial condition of the Contractor or any of its subcontractors affecting their ability to perform their obligations; (c) the consequences of errors, neglect or omissions by the Contractor, or any subcontractor; (d) any failure of any subcontractor or supplier to furnish labor, materials, service or equipment for any reason; or (e) equipment failure.

- C. **Notice.** The Party claiming excuse from performance shall, within two (2) days after such Party has notice of such cause, give the other Party notice of the facts constituting such cause and asserting its claim to excuse under this Section.
- D. **Waiver of Damages.** In the event that either Party validly exercises its rights under this Section, the Parties hereby waive any claim against each other for any damages sustained thereby.
- E. **Interruption or Discontinuance of Service.** The partial or complete interruption or discontinuance of the Contractor's services caused by one or more of the events of Uncontrollable Circumstances and constituting an excuse from performance shall not constitute an event of default by Contractor under this Agreement. Notwithstanding the foregoing, however, if Contractor is excused from performing its obligations hereunder for any of the causes listed in this Section for a period of thirty (30) days or more, the WPWMA shall nevertheless have the right, in its sole discretion, to terminate this Agreement by giving ten (10) days' notice in which case the provisions of Article shall apply. In the event the WPWMA exercises its right to terminate this Agreement under this subsection, Contractor shall not be obligated to the WPWMA under its performance bond.

10.8 Right to Demand Assurances of Performance. If Contractor is: (i) the subject of any labor unrest including work stoppage or slowdown, sick-out, picketing or other concerted job action; (ii) appears in the reasonable judgment of the WPWMA to be unable to regularly pay its bills as they become due; (iii) repeatedly does not meet any term of the Agreement, (iv) receives an administrative deficiency notice such as an Area of Concern or Notice of Violation and, in the estimation of WPWMA staff, does not appear to be adequately responding to or prepared to respond to the deficiency in a timely manner, or (v) is the subject of a civil or criminal investigation, charge, or judgment or order entered by a federal, State, regional or local agency for violation of a law relating to performance under this Agreement, and the WPWMA believes in good faith that Contractor's ability to perform under the Agreement has thereby been placed in substantial jeopardy, the WPWMA may, at its option and in addition to all other remedies it may have, demand from Contractor reasonable assurances of timely and proper performance of this Agreement, in such form and substance as the WPWMA believes in good faith is

reasonably necessary in the circumstances to evidence continued ability to perform under the Agreement. If Contractor fails or refuses to provide satisfactory assurances of timely and proper performance in the form and by the date required by the WPWMA, such failure or refusal shall be an event of default.

10.9 The WPWMA's Right to Perform

- A. WPWMA's Right to Perform.** In addition to any and all other legal or equitable remedies, in the event that Contractor, for any reason whatsoever, fails, refuses or is unable to perform any Base Services at the time and in the manner provided in this Agreement for a period of more than seventy-two (72) hours, and if, as a result thereof, should Waste accumulate within the boundaries of the WPWMA's Primary Service Area to such an extent, in such a manner, or for such a time that the Executive Director should find that such accumulation endangers or menaces the environment, public health, safety or welfare, then the WPWMA shall have the right, but not the obligation, without payment to Contractor, upon twenty-four (24) hours prior notice to Contractor during the period of such emergency as determined by the Executive Director, to do either one or both of the following: (i) cause to be performed such Base Services with other personnel without liability to Contractor; (ii) to take possession of any or all of Contractor's equipment and other property used or useful in providing one or more of the Base Services and to provide one or more of the Base Services.
- B. Notice.** Notice of Contractor's failure, refusal or neglect to perform one or more Base Services may be given orally by telephone to Contractor at its principal office and shall be effective immediately. Written confirmation of such oral notification shall be sent to Contractor within twenty-four (24) hours of the oral notification.
- C. Contractor's Cooperation.** Contractor further agrees that in such event:
1. It shall fully cooperate with the WPWMA to affect the transfer of possession of property to the WPWMA for the WPWMA's use.
 2. It shall, if the WPWMA so requests and to the extent feasible, keep in good repair and condition all of such property, provide all motor vehicles with fuel, oil and other service, and provide such other service as may be necessary to maintain said property in operational condition.
- D. Not a Taking by the WPWMA.** The WPWMA's exercise of its contractual rights under this Article 10: (i) does not constitute a taking of private property for which compensation must be paid; (ii) shall not create any liability on the part of the WPWMA to Contractor; and does not exempt Contractor from the indemnity provisions of Sections 9.1 and 9.2, which are meant to extend to circumstances arising under this Article, provided that Contractor is not required to indemnify the WPWMA against Claims and damages to the extent they are caused by the

active negligence or willful misconduct of WPWMA officers, employees, or agents acting under this Article.

- E. **Temporary Possession of Contractor's Property.** The WPWMA's right to retain temporary possession of Contractor's property, and to provide one or more Base Services shall continue until Contractor can demonstrate to the WPWMA's reasonable satisfaction that it is ready, willing and able to resume such services. The WPWMA has no obligation to maintain possession of Contractor's property or continue its use in performing one or more Base Services for any period of time and may, at any time, in its sole discretion, relinquish possession to Contractor.

ARTICLE 11. OTHER AGREEMENTS OF THE PARTIES

- 11.1 **Relationship of Parties.** The Parties intend that Contractor shall perform the services required by this Agreement as an independent contractor engaged by the WPWMA and not as an officer or employee of the WPWMA nor as a partner of or joint venturer with the WPWMA. No employee or agent of Contractor shall be or shall be deemed to be an employee or agent of the WPWMA. Except as expressly provided herein, Contractor shall have the exclusive control over the manner and means of conducting the services performed under this Agreement, and all persons performing such services. Contractor shall be solely responsible for the acts and omissions of its officers, employees, subcontractors and agents. Neither Contractor nor its officers, employees, subcontractors and agents shall obtain any rights to retirement benefits, workers' compensation benefits, or any other benefits which accrue to the WPWMA employees by virtue of their employment with the WPWMA.
- 11.2 **Compliance with Applicable Law.** In providing the services required under this Agreement, Contractor shall at all times, at its sole cost, comply with all Applicable Laws. In particular, Contractor's operations at the Landfill shall comply with all Applicable Laws, regulations and ordinances, as now existing or as they may be later adopted, modified or amended, and shall further comply with all approved closure and post-closure plans and applicable regulatory permits, including but not limited to any applicable land use permits, Waste Discharge Requirements, air permits and Solid Waste Facility permits. In addition, Contractor shall comply with the provisions, conditions and requirements of all operating plans, permit applications, and all other future permit applications, operating plans and other documents for the Landfill hereafter approved by the WPWMA.
- 11.3 **Governing Law.** This Agreement shall be governed by, and construed and enforced in accordance with, the laws of the State of California
- 11.4 **Contractor Assignment**
- A. **Definition.** For purposes of this Article, "assignment" shall include, but not be limited to (i) a sale, exchange or other transfer of substantially all of Contractor's

assets dedicated to service under this Agreement to a third party; (ii) a sale, exchange or other transfer to a third party of substantially all of Contractor's assets dedicated to service under this Agreement; (ii) the issuance of new stock or membership interests to or the sale, exchange or other transfer of more than thirty-three percent (33%) of the then outstanding stock or membership interests to a third party, other than to the existing shareholders, members and/or affiliates of existing shareholders/members of Contractor who own shares/membership interests on the Effective Date. Notwithstanding the foregoing, Contractor may assign this Agreement to a limited liability company or corporation formed to conduct business in California and wholly owned by Contractor, provided that Contractor executes a guaranty of its obligations under this Agreement in such form as reasonable required by WPWMA.

B. WPWMA Consent. Contractor acknowledges that this Agreement involves rendering a vital service to the WPWMA, and that the WPWMA has relied upon Contractor's representation of its experience and financial resources in qualifying Contractor to perform the services under this Agreement. Except as provided in this Article, Contractor shall neither assign its rights nor delegate, subcontract, or otherwise transfer its obligations under this Agreement to any other person or entity without the prior written consent of the WPWMA. Any such assignment without the consent of the WPWMA shall be void and the attempted assignment shall constitute a material breach of this Agreement. Under no circumstances shall the WPWMA be required to consider any proposed assignment if Contractor is in breach or default at any time during the period of consideration.

C. Requirements of Contractor. If Contractor requests the WPWMA's consideration of and consent to an assignment, the WPWMA may deny or approve such request in its complete discretion. No request by Contractor for consent to an assignment need be considered by the WPWMA unless and until Contractor has met the following requirements:

- a. Contractor shall undertake to pay the WPWMA its reasonable expenses for attorneys' fees and investigation costs necessary to investigate the suitability of any proposed assignee, and to review and finalize any documentation required as a condition for approving any such assignment;
- b. Contractor shall furnish the WPWMA with audited financial statements of the proposed assignee's operations for the immediately preceding three (3) fiscal years of such proposed assignee;
- c. Contractor shall furnish the WPWMA with satisfactory proof: (i) that the proposed assignee has at least two (2) years of landfill operations experience on a scale equal to or exceeding the scale of operations conducted by Contractor; (ii) that in the last five (5) years, the proposed assignee has not suffered any citations or other censure from any federal, state or local agency having jurisdiction over its landfill operations due to any significant failure to comply with state, federal or local waste

management laws and that the assignee has provided the WPWMA with a complete list of such citations and censures; (iii) that the proposed assignee has at all times conducted its operations in an environmentally safe and conscientious fashion; (iv) that the proposed assignee conducts its landfill operations practices in accordance with landfill operations practices in full compliance with all federal, state and local laws regulating the collection and disposal of waste.

11.5 Subcontracting. Contractor shall not engage any subcontractors for services provided under this Agreement without the prior written consent of the WPWMA.

11.6 Binding on Successors. The provisions of this Agreement shall inure to the benefit to and be binding on the successors and permitted assigns of the Parties.

11.7 Transition to the Next Contractor. Two (2) years prior to the conclusion of the Term, and in order to assist with the competitive bid process to award a new agreement at the conclusion of the Term, Contractor shall provide the WPWMA with such information as may reasonably be requested and shall cooperate with the WPWMA by providing full access to the Landfill to other potential operators so that they may observe Contractor's operations during such final two (2) Operating Years. Failure to provide full cooperation may at the WPWMA's sole discretion preclude Contractor from participating in subsequent competitive bid processes. The WPWMA shall consider in good faith any reasonable requests by Contractor to maintain, as confidential, any proprietary or trade secret information of Contractor which the WPWMA may request.

Upon the WPWMA's selection of a new operator for the landfill at the end of the Contractor's term, Contractor shall fully cooperate with the WPWMA and its new operator in supporting a smooth and effective transition, including but not limited to providing the new contractor with access to the site to observe operations, review records, and otherwise familiarize itself with the Landfill and its operations.

11.8 Parties in Interest. Nothing in this Agreement, whether express or implied, is intended to confer any rights on any persons other than the Parties to it and their representatives, successors and permitted assigns.

11.9 Waiver. The waiver by either Party of any breach or violation of any provisions of this Agreement shall not be deemed to be a waiver of any breach or violation of any other provision nor of any subsequent breach or violation of the same or any other provision. The subsequent acceptance by either Party of any monies which become due hereunder shall not be deemed to be a waiver of any preexisting or concurrent breach or violation by the other Party of any provision of this Agreement.

11.10 Condemnation. In addition to its rights under Articles 10.5 and 10.9, the WPWMA fully reserves the right to acquire Contractor's property utilized in the performance of this Agreement, by purchase or through the exercise of its power of eminent domain.

11.11 Notice. All notices, demands, requests, proposals, approvals, consents and other communications which this Agreement requires, authorizes or contemplates are, except

as otherwise specifically provided, to be in writing and shall be effective when personally delivered to a representative of the Parties at the address below or deposited in the United States mail, first class postage prepaid, addressed as follows:

If to the WPWMA: Western Placer Waste Management Authority c/o,
Executive Director
3013 Fiddymont Road
Roseville, CA 95747

If to the Contractor: FCC Environmental Services
c/o Dan Brazil, VP of Operations
10077 Grogans Mill Rd, Ste 466
The Woodlands, TX 77380

The address to which communications may be delivered may be changed from time to time by a notice given in accordance with this Section.

ARTICLE 12. MISCELLANEOUS AGREEMENTS

- 12.1 Entire Agreement.** This Agreement, including the Exhibits, represents the full and entire Agreement between the Parties with respect to the matters covered herein.
- 12.2 Article and Section Headings.** The article headings and sections headings in this Agreement are for convenience of reference only and are not intended to be used in the construction of this Agreement not to alter or affect any of its provisions.
- 12.3 References to Laws.** All references in this Agreement to laws shall be understood to include such laws as they may be subsequently amended or recodified, unless otherwise specifically provided.
- 12.4 Reference to Days.** All references to days herein are to calendar days, including Saturdays, Sundays and Holidays, except as otherwise specifically provided. Business days shall refer to weekdays, not including weekends or WPWMA holidays.
- 12.5 Interpretation.** This Agreement shall be interpreted and construed reasonably and neither for nor against either Party, regardless of the degree to which either Party participated in its drafting.
- 12.6 Integration and Amendment.** This Agreement represents the entire integrated agreement between WPWMA and Contractor and supersedes all prior negotiations, representations, understandings, or agreements between the Parties either written or oral. No prior oral or written understanding shall be of any force or affect with respect to those matters contained herein. This Agreement may not be modified or altered except by amendment in writing signed by both Parties.
- 12.7 Severability.** If any non-material provision of this Agreement is for any reason deemed to be invalid and unenforceable, the invalidity or unenforceability of such provision shall

not affect any of the remaining provisions of this Agreement which shall be enforced as if such invalid or unenforceable provision had not been contained herein.

12.8 Counterparts. This Agreement may be executed in counterparts each of which shall be considered an original.

12.9 Miscellaneous

- A. Mediation/Arbitration.** The Parties agree to cooperate with each other in an attempt to resolve any dispute. If the parties are not able to resolve the dispute, then the parties agree to submit the dispute to mediation to be conducted before a mutually agreeable mediator and pursuant to mutually-agreeable rules within sixty (60) days of the written request for mediation by either party. Each party shall pay its own costs plus an equal share of the cost of the mediator and mediation facilities. If the parties are unable to resolve the dispute pursuant to the terms herein above, the Parties may, in their discretion, but need not, submit disputes which arise under any sections of this Agreement to arbitration in accordance with the procedure set out in Exhibit K and may at that time agree as to whether such arbitration shall be binding or non-binding.
- B. Advice.** Each of the Parties has received the advice of legal counsel prior to signing this Agreement. Each Party acknowledges no other party or agent or attorney has made a promise, representation, or warranty whatsoever, express or implied, not contained herein concerning the subject matter herein to induce the other Party to execute this Agreement. The Parties agree no provision may be subject to any rules of construction based upon either Party being considered the party “drafting” this Agreement.
- C. Attorneys’ Fees.** The prevailing Party in any action brought to enforce the terms of this Agreement or arising out of this Agreement may recover its reasonable costs and attorneys’ fees expended in connection with such an action from the other Party.

IN WITNESS WHEREOF, WPWMA and Contractor have executed this Agreement as of the day and year first above written.

WESTERN PLACER WASTE
MANAGEMENT AUTHORITY, a joint powers
authority organized under California law

CONTRACTOR

By: _____
Chair

By: _____
President

APPROVED AS TO FORM

By: _____
WPWMA Counsel

EXHIBIT A
TRANSITION PLAN

TO BE SUPPLIED BY CONTRACTOR

EXHIBIT B
INSURANCE CERTIFICATES AND ENDORSEMENTS

TO BE SUPPLIED BY CONTRACTOR

EXHIBIT C
PERFORMANCE BOND

TO BE SUPPLIED BY CONTRACTOR

EXHIBIT D
CONTINGENCY PLAN

TO BE SUPPLIED BY CONTRACTOR

EXHIBIT E
SITE MAP

EXHIBIT F
PRIMARY SERVICE AREA

EXHIBIT H
SPECIAL SERVICE HOURLY RATES

TO BE SUPPLIED BY CONTRACTOR

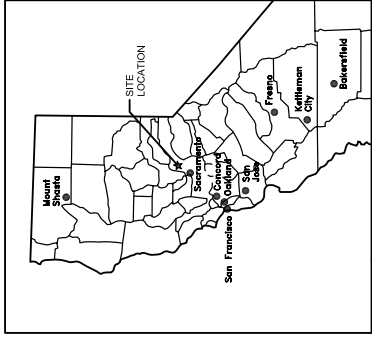
EXHIBIT H
MASTER FILL SEQUENCING PLAN

WASTE FILL SEQUENCING

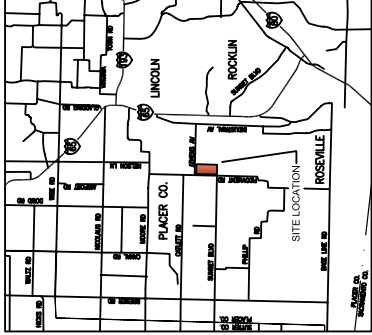
WESTERN REGIONAL SANITARY LANDFILL
PLACER COUNTY, CALIFORNIA

WESTERN PLACER WASTE MANAGEMENT AUTHORITY

LOCATION MAP
N.T.S.

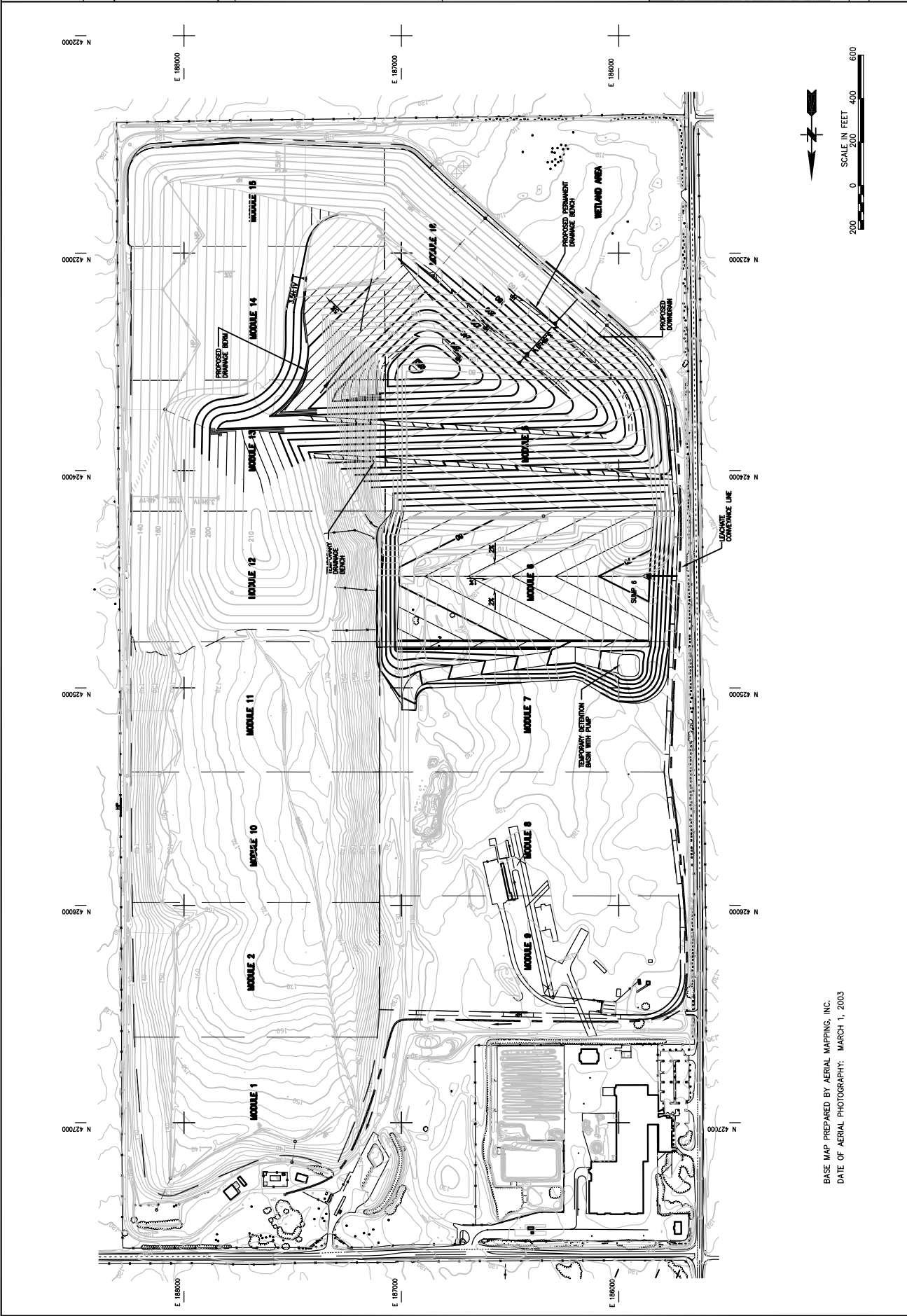


VICINITY MAP
N.T.S.

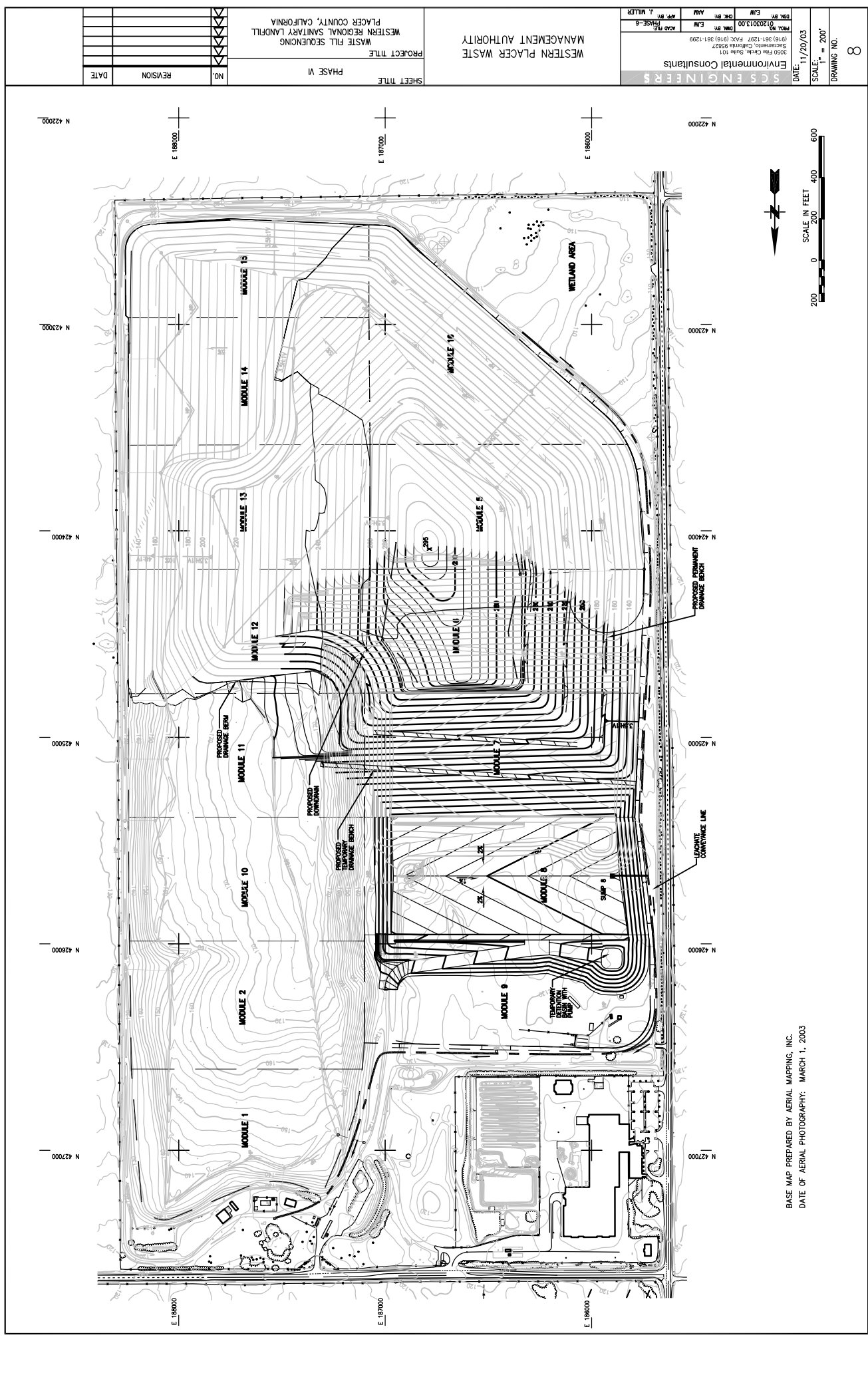


DRAWING No.	DESCRIPTION
1	TITLE SHEET
2	EXISTING SITE PLAN
3	PHASE I
4	PHASE II
5	PHASE III
6	PHASE IV
7	PHASE V
8	PHASE VI
9	PHASE VII
10	PHASE VIII - FINAL GRADING PLAN

SHEET TITLE WESTERN PLACER WASTE MANAGEMENT AUTHORITY		PROJECT TITLE WASTE FILL SEQUENCING PLACER COUNTY, CALIFORNIA		NO.		DATE	
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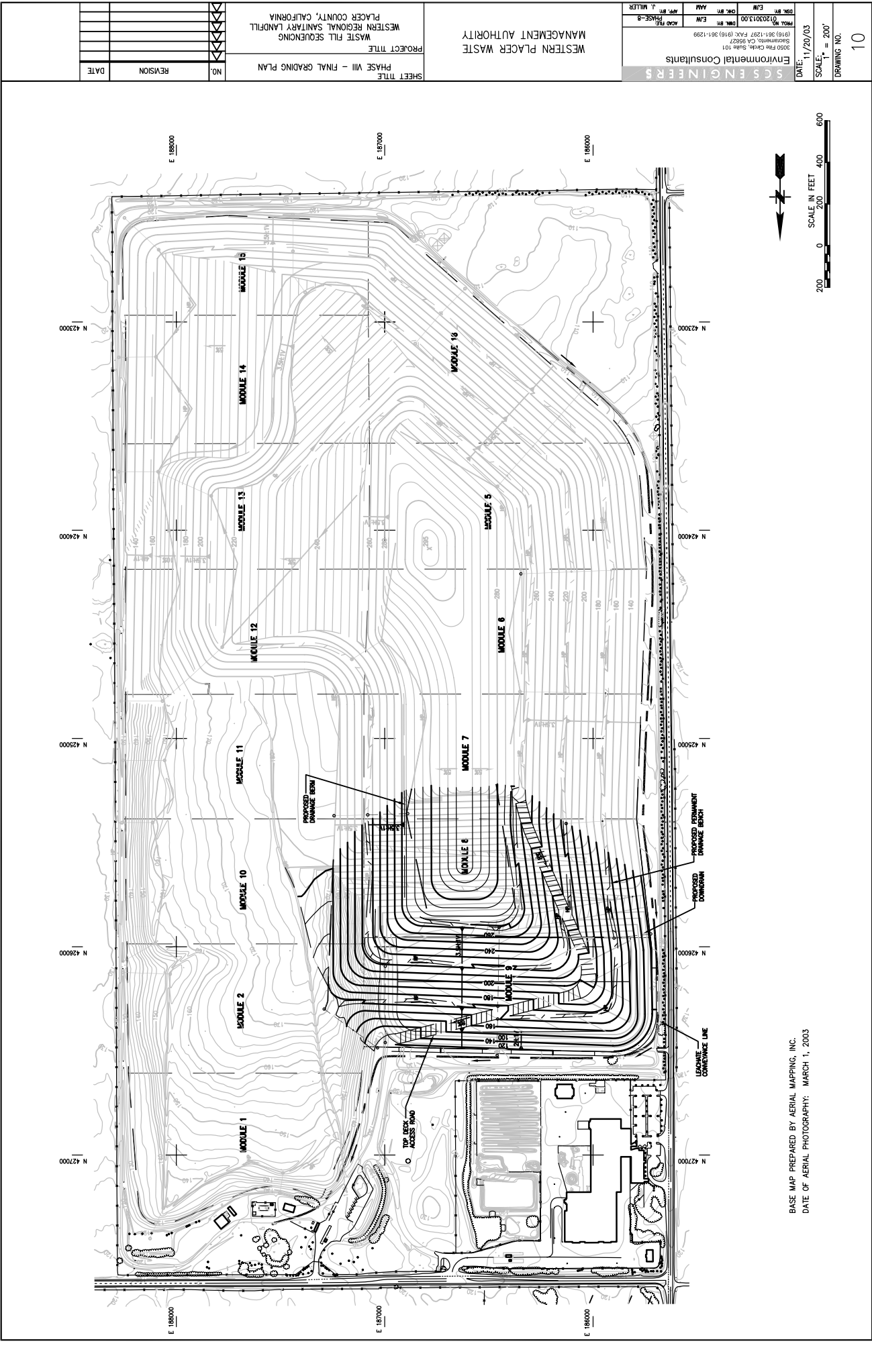
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 DATE OF AERIAL PHOTOGRAPHY: MARCH 1, 2003



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DATE OF AERIAL PHOTOGRAPHY: MARCH 1, 2003

SCS ENGINEERS Environmental Consultants			
PROJECT NO.	0120013.00	DATE	11/20/03
CLIENT	WESTERN PLACER WASTE MANAGEMENT AUTHORITY	DRAWN BY	J. MILLER
PROJECT LOCATION	3050 FIVE CREEK, SUITE 101 SACRAMENTO, CALIFORNIA 95827	CHECKED BY	
PROJECT DESCRIPTION	WASTE FILL SEQUENCING WESTERN REGIONAL SANITARY LANDFILL PLACER COUNTY, CALIFORNIA	APPROVED BY	

SHEET TITLE		PROJECT TITLE	
WESTERN PLACER WASTE MANAGEMENT AUTHORITY		WASTE FILL SEQUENCING WESTERN REGIONAL SANITARY LANDFILL PLACER COUNTY, CALIFORNIA	
PHASE VI		NO.	
		REVISION	
		DATE	



BASE MAP PREPARED BY AERIAL MAPPING, INC.
DATE OF AERIAL PHOTOGRAPHY: MARCH 1, 2003

SCS ENGINEERS Environmental Consultants			
PROJECT NO.	0720013.00	DATE	11/20/03
CLIENT	WESTERN PLACER WASTE MANAGEMENT AUTHORITY	PROJECT	WASTE FILL SEQUENCING
LOCATION	WESTERN REGIONAL SANITARY LANDFILL	PROJECT	WASTE FILL SEQUENCING
ADDRESS	3050 FIVE CREEK, SUITE 101 SACRAMENTO, CA 95827	PROJECT	WASTE FILL SEQUENCING
PHONE	(916) 361-1297	PROJECT	WASTE FILL SEQUENCING
FAX	(916) 361-1299	PROJECT	WASTE FILL SEQUENCING
APP. BY	J. MILLER	PROJECT	WASTE FILL SEQUENCING

WESTERN PLACER WASTE
MANAGEMENT AUTHORITY
PROJECT TITLE
WASTE FILL SEQUENCING
WESTERN REGIONAL SANITARY LANDFILL
PLACER COUNTY, CALIFORNIA

SHEET TITLE	PHASE VIII - FINAL GRADING PLAN
NO.	
REVISION	
DATE	

DATE: 11/20/03
SCALE: 1" = 200'
DRAWING NO. 10

EXHIBIT I
LANDFILL GAS WINDOW WELL PLANS AND SPECIFICATIONS

**EXHIBIT A
SCOPE OF SERVICES**

MODULE 5 GRAVEL WINDOW/LFG WELL INSTALLATION

PURPOSE/BACKGROUND:

The purpose of this scope of work is to construct a new feature at the Western Regional Sanitary Landfill aimed at collecting landfill gas (LFG) more efficiently and cost effectively, and conveying landfill leachate to the recovery sump as quickly as possible.

The Authority endeavors to install LFG collection wells as soon as possible to maximize gas recovery rates and maintain compliance. In the Authority's experience, waste placement activities at the surface of the landfill have made constructing and operating LFG wells increasingly challenging and expensive. Construction of conventional LFG wells (those drilled down vertically into the waste from the top of the waste) has typically required the Authority to finish waste filling operations in one area before expanding the well network into the new area. The Authority, contracting with Nortech Landfill, constructed and commissioned gas wells that were constructed horizontally in the waste as waste placement progressed, thereby reducing the impact to landfill operations and allowing LFG wells to be constructed and commissioned almost immediately. The horizontal wells had decreased ability to handle liquid inundation from surrounding waste due to their flat slope, however, and several horizontal wells quickly became ineffective. Vertical wells in new waste experienced similar liquid inundation, substantially reducing the effectiveness of the vertical wells.

The proposed LFG window wells were designed to address the limitations of prior well designs for new landfill modules. They include a gravel column extending up from the liner system, thereby allowing liquid to fully drain to the leachate recovery system included in the liner system. They are uniformly spaced and installed as waste is placed to maximize LFG recovery rates and ensure compliance. In addition, the LFG window wells increase the effectiveness of the leachate recovery system and address comments received from the Regional Water Quality Control Board during the design of the Module 5 liner system.

SPECIFICATIONS:

Nortech Landfill Inc. (NLI) shall furnish and install all materials, supplies, equipment and labor necessary to provide gravel windows, landfill gas system lateral piping, and vertical well construction. NLI may subcontract parts of the effort with the Authority's written approval. The construction requirements include, but are not limited to, the following:

- Immediately prior to filling waste over the location, remove a 10 foot by 10 foot area of the ~15" thick soil operations layer, leaving the 8 oz/SY filter fabric intact and in place, and replace the soil with clean, 1" to 3" diameter rounded to sub-rounded drain rock at the locations shown in the drawings.
- Immediately prior to placing each lift of refuse, backfill the waste from the 10 foot by 10 foot area above the gravel window and replace the waste with 1" to 3" diameter rounded to sub-rounded drain rock at the locations shown in the drawings to make a continuous rock column that extends to the LCRS. Each gravel window shall eventually extend approximately 30 feet vertically from the top of the liner system operational soil.
- Provide interim cover(s) for each LFG window well as necessary to prevent LFG or odor migration during the various fill stages in the waste placement plan. If LFG is not being produced then detail 7/C2 can be followed. If detail 7/C2 is insufficient to retain generated gas, or if the Authority requires the well to be under vacuum, then NLI should construct detail 5/C2.
- In accordance to Section 5.13A (Landfill Cover and Related Operations – Daily Cover) of the Agreement, and in an effort to remain sensitive to ongoing odor issues, as well as

safety concerns, gravel windows must be excavated and backfilled in the same working day.

- Conform construction to the plans, details and specifications included in the attached drawings.

AUTHORITY RESPONSIBILITIES:

The Authority shall participate in meetings with NLI, review submittals as they are submitted, conduct inspections within two (2) business hours of notification, and immediately notify NLI of any issues associated with the submittals or construction. Authority may test the window/well system when elements of it are constructed to determine the system is meeting the design intent.

INSPECTION SCHEDULE

The Authority has assumed that the Contractor will notify the Authority two days in advance of the need for inspection, and again (given that the construction window is often subject to change) two hours prior to the inspection time.

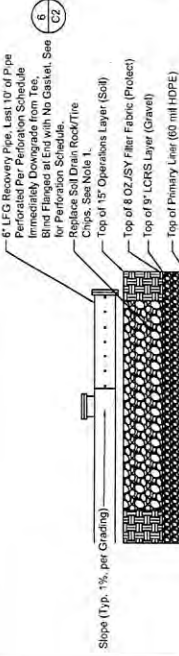
Inspection is required at these points prior to proceeding:

1. After excavation of soil operations layer and prior to placement of first lift of drain rock,
2. After waste has been excavated and prior to placing the drain rock,
3. After installment of any temporary cover system(s) prior to it being covered with soil or waste.

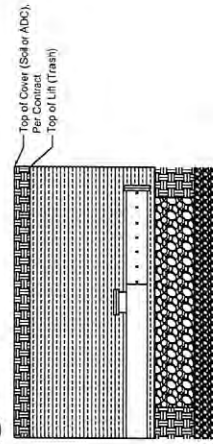
MEASUREMENT AND PAYMENT:

In accordance with sections 5.23 and 7.4 of the Agreement, Contractor shall submit monthly invoices showing materials/equipment and time used to complete the work during the invoice period. The Authority shall compensate Contractor according to the following fixed fees:

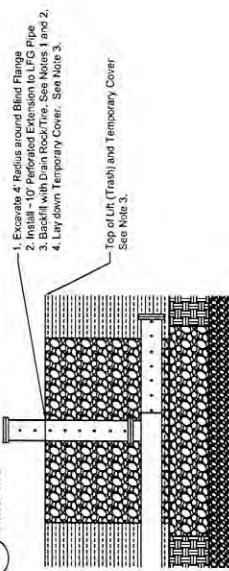
Item Description	Unit	Quantity	Unit Cost	Subtotal
1. Base Gravel Window Construction (Removal of Operations Layer)	Each	16		
2. Extension of Gravel Window and LFG Well, including rock, perforated pipe, flanges, etc.	Lineal Foot	500		
3. LFG Lateral Extensions	Lineal Foot	3,500		
4. Gravel window temporary cover system including plastic cover, installation, grading, etc	Each	16		
5. Profit (per Agreement)			5%	
Total				



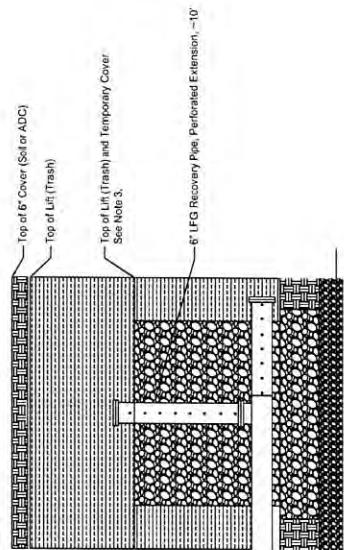
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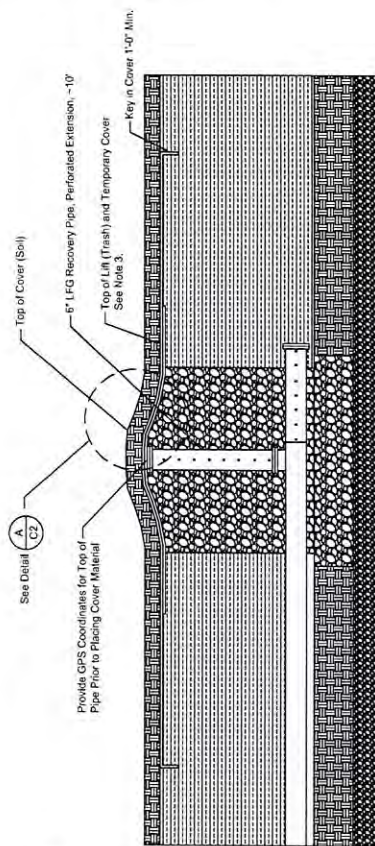
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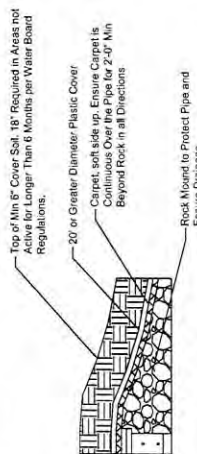
3 JUST BEFORE SECOND LIFT
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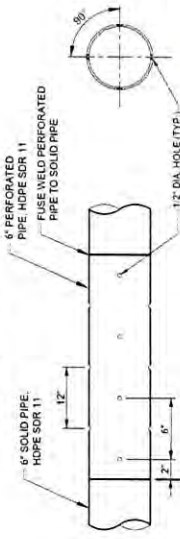
4 AFTER SECOND LIFT
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5 TEMPORARY COVER - GAS PRODUCTION/RECOVERY
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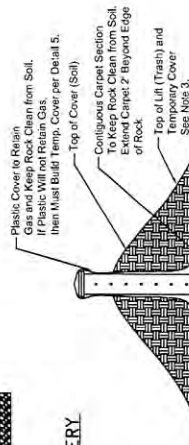
A C2 TEMPORARY COVER DETAIL
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7 TEMPORARY COVER - W/ NO GAS EMISSIONS
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NOTES

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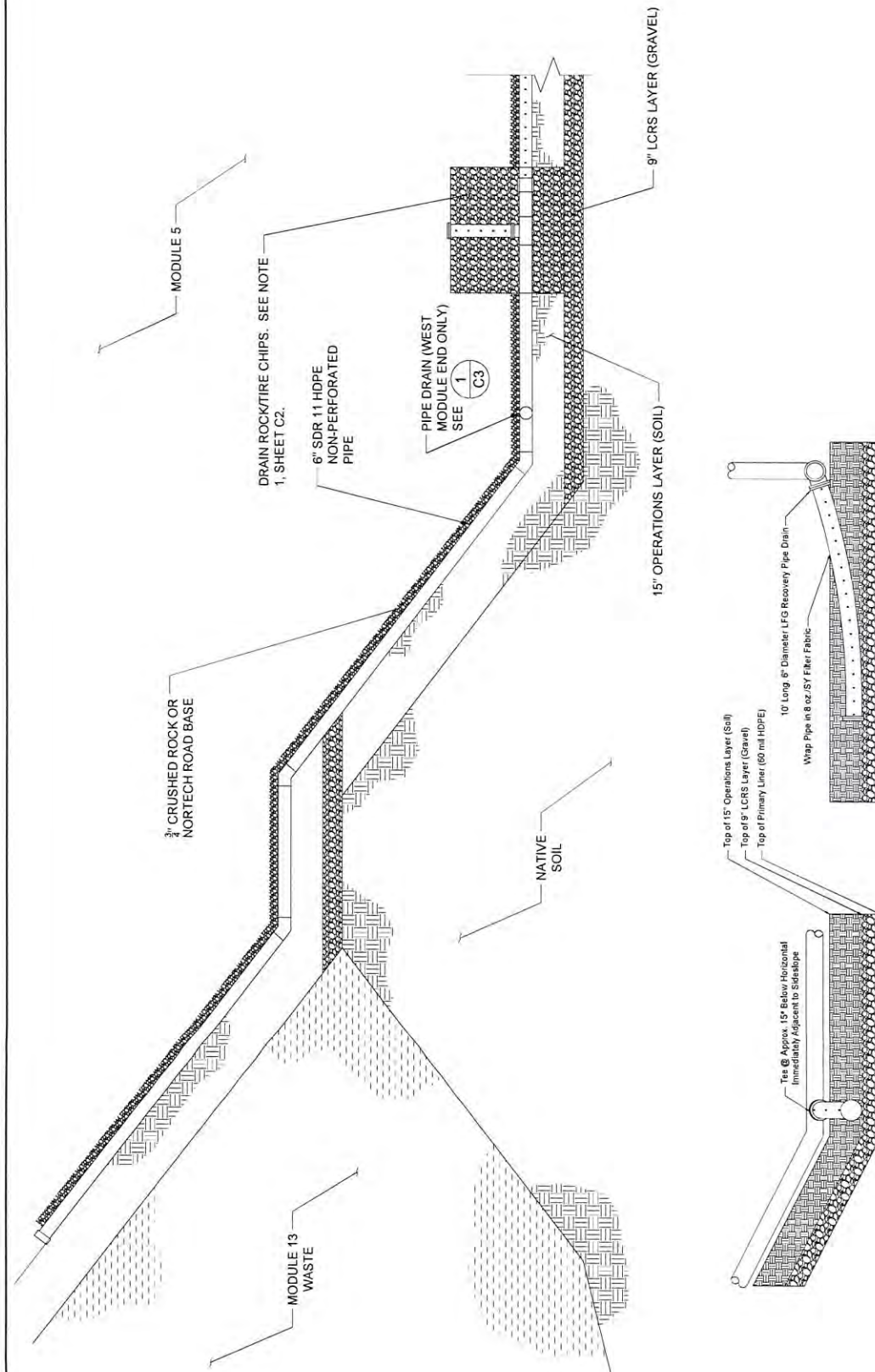
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Checked by:	GS
Original date:	
Date of last revision:	
Revision:	
Revised by:	



WESTERN PLACER
WASTE MANAGEMENT AUTHORITY
7700 3534 Highway Blvd., Sacramento, California 95827
Mail: 11176 E. Avenue - Auburn, California 95603
(916) 843-8500 www.wapa.com

CONSTRUCTION STANDARDS
LFG GRAVEL WINDOWS - DETAILS

Sheet No. C2



1 C3 6" LFG RECOVERY PIPE DRAIN (WESTERN EDGE OF MODULE ONLY)

 WESTERN PLACER WASTE MANAGEMENT	WESTERN PLACER WASTE MANAGEMENT AUTHORITY 3033 Redwood Road - Berkeley, California 94707 Phone: (916) 544-3960 www.wplama.com	Project No. _____
	CONSTRUCTION STANDARDS	Sheet No. C3



Drawn by: MCB
 Checked by: KUS
 Approval date: _____
 Due to job: _____
 Due to cost: _____
 REVISIONS: _____



EXHIBIT J
SITE WIDE ODOR PLAN



SITE WIDE ODOR PLAN

FOR THE

WESTERN PLACER WASTE MANAGEMENT AUTHORITY'S SOLID WASTE PROCESSING AND DISPOSAL FACILITY



Prepared by:
Western Placer Waste Management Authority

October 2020

Version 1.2

Western Placer Waste Management Authority
Site Wide Odor Plan

Table of Contents

1.	Acronyms and Defined Terms	1
A.	Acronyms.....	1
B.	Defined Terms	1
2.	Scope and Intent of the Site Wide Odor Plan	3
3.	Overview of the WPWMA.....	4
4.	WPWMA Facility Purpose	6
5.	WPWMA Funding Sources.....	6
6.	Agency/Stakeholder Roles & Responsibilities	7
A.	Western Placer Waste Management Authority	7
B.	MRF Operator.....	7
C.	Landfill Operator	8
D.	Waste Generators and Haulers	8
E.	Energy Developer.....	9
F.	WPWMA Consultants	9
G.	Placer County Air Pollution Control District.....	9
H.	Placer County Local Enforcement Agency	9
I.	Public.....	9
7.	Regional Odor Sources	10
A.	WPWMA Odor Sources	10
B.	Non-WPWMA Odor Sources	10
8.	On-site Odor Sources, Operational Planning and BMPs.....	13
A.	Overview of On-Site Odor Sources	14
B.	MRF.....	14
C.	Composting Facility	17
D.	Landfill	22
E.	Landfill Gas.....	25
F.	Planning and Scheduling Operational Activities	27
9.	Weather & Topography	27
10.	Odor Monitoring and Investigations	29
A.	Odor Monitoring and Dispersion Modeling System.....	29
B.	Predicative Odor Risk Modeling	30
C.	Routine On- and Off-site Odor Monitoring by WPWMA Staff.....	31
D.	Odor Notification System	33
E.	Odor Notification Investigation Protocol.....	33
F.	Odor Notification Investigation Report Procedures	37

Western Placer Waste Management Authority
Site Wide Odor Plan

Table of Contents
(continued)

G.	Operational Review, Analysis and Adjustment	37
11.	Public Education & Outreach.....	38
A.	Annual Meetings.....	38
B.	Website.....	39
C.	National Night Out Event	39
12.	Review of Odor Control Technologies.....	40
13.	Reporting and Recordkeeping.....	40
14.	WPWMA Board Approval Process and Availability of Funding.....	40

REFERENCES

FIGURE 3-1 SITE LOCATION

FIGURE 7-1 POTENTIAL REGIONAL ODOR SOURCES

FIGURE 8-1 OVERALL CONTRIBUTION TO SITE ODOR BY PROCESS

FIGURE 8-2 WPWMA FACILITY SITE LAYOUT

FIGURE 8-3 COMPOST EMISSION CURVE

FIGURE 10-1 HIGH ODOR RISK WIND DIRECTION ZONE

FIGURE 10-2 ROUTINE OFF-SITE MONITORING LOCATIONS

FIGURE 10-3 ODOR NOTIFICATION INVESTIGATION ZONE

APPENDIX A: BMP CHECKLIST

APPENDIX B: 2015 ODOR STUDY

APPENDIX C: COMPOST ODOR IMPACT MINIMIZATION PLAN

APPENDIX D: ODOR RISK FORECASTING TOOL

APPENDIX E: ODOR INVESTIGATION SUMMARY REPORT TEMPLATE

APPENDIX F: LFG AND LEACHATE MANAGEMENT SOP

1. ACRONYMS AND DEFINED TERMS

The following is a listing of select acronyms and defined terms used throughout this document.

A. Acronyms

ADC	Alternative Daily Cover
ASP	Aerated Static Pile
BMP	Best Management Practice
C&D	Construction and Demolition
GCCS	Landfill Gas Collection and Control System
HHW	Household Hazardous Waste
LCRS	Leachate Collection and Removal System
LEA	Local Enforcement Agency
LFG	Landfill Gas
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NOX	Oxides of Nitrogen
OIMP	Odor Impact Minimization Plan
PCAPCD	Placer County Air Pollution Control District
ROG	Reactive Organic Gasses
SVAB	Sacramento Valley Air Basin
SWOP	Site Wide Odor Plan
VOC	Volatile Organic Compound
WPWMA	Western Placer Waste Management Authority
WRSL	Western Regional Sanitary Landfill
WWTP	Wastewater Treatment Plant

B. Defined Terms

Gate Hours	The hours the WPWMA's facility is open for the receipt of wastes. Currently 7 am to 5 pm on weekdays and 8 am to 5 pm on weekends
Member Agencies	The cities of Lincoln, Rocklin, Roseville and the County of Placer
Observed Holidays	Observed Holidays include: January 1 st , Martin

	Luther King Jr. Day, Lincoln's Birthday, Presidents' Day, Memorial Day, July 4 th , Labor Day, Columbus Day, Veterans Day, Thanksgiving and the day after Thanksgiving, and Christmas Day. Where any of these noted holidays falls on a Saturday, the preceding Friday will be considered the "Observed Holiday". Where any of these noted holidays fall on a Sunday, the following Monday will be considered the "Observed Holiday".
Participating Agencies	Includes the Member Agencies and the cities of Auburn, Colfax and the Town of Loomis
Residue or Residual Waste	Non-recovered materials which are landfilled following processing at the MRF to recover recyclable commodities.

2. SCOPE AND INTENT OF THE SITE WIDE ODOR PLAN

The Site Wide Odor Plan (SWOP) provides an overview of the Western Placer Waste Management Authority (WPWMA), its facilities and services, and potential operational odor sources and associated mitigation measures implemented, contemplated and evaluated via pilot-scale testing at the facility.

Acknowledging that odors are a natural and unavoidable byproduct of the decomposition of organic materials, the WPWMA established the SWOP to provide clear, concise information about individual facility odor sources, operational and meteorological conditions that have the potential to exacerbate the perception of odors, and the measures the WPWMA takes to reduce the potential for facility odors to be perceived by nearby receptors.

The SWOP is intended to be used as a tool by the WPWMA and its facility operators, contractors, and consultants to consistently and proactively take the appropriate steps to reduce the potential for off-site odors while continuing to ensure that WPWMA and its facility operators, contractors, and consultants meet all applicable regulatory and contractual obligations for safely and efficiently managing the solid wastes received, processed or landfilled. Compliance with current and future regulations, particularly those regulations that address enhanced management of organic wastes, have the potential to exacerbate odors from the WPWMA's facility.

The SWOP establishes best management practices (BMPs) utilized by the WPWMA to mitigate the release of odors from WPWMA facilities -- including the material recovery facility, landfill, landfill gas collection and control system (GCCS), and composting operations. The SWOP includes measures to prevent, monitor, and address odors. The BMPs contained in the SWOP are intended to: (1) be fully protective to the health, safety and well-being of the WPWMA employees, its facility operators, contractors, consultants, and facility users; and (2) ensure that WPWMA acts as a good neighbor by reducing its odor-emitting potential. The BMPs identified in this SWOP reflect current operating and regulatory conditions. Changes to operations that result from changes in regulations or programs operated by the Participating Agencies may necessitate the revision of this document.

The SWOP is intended to be considered by the Placer County Air Pollution Control District (PCAPCD) (and any other applicable regulatory bodies that oversees the WPWMA's operation) when evaluating community complaints and non-compliance issues relating to odor. Compliance with the SWOP is an indicator that the WPWMA has implemented measures to mitigate odor impacts consistent with best practices and installed equipment. When determining whether or not to issue a Notice of Violation for nuisance and determining the appropriate settlement terms when a violation is issued, including a potential deterrent monetary penalty, PCAPCD will fully consider WPWMA's adherence to, and degree of compliance with, the procedures identified in the SWOP.

Finally, the SWOP provides insight to current and future nearby receptors of odors from the WPWMA's facility and reasons facility odors may be periodically

noticeable. The SWOP provides details on how the neighboring community can report odor complaints to the WPWMA and PCAPCD, how the WPWMA investigates and responds to the odor notifications/complaints, how the WPWMA cooperates on odor complaints received by the PCAPCD, and the measures implemented by the WPWMA to adjust its operations (where practical) to reduce the potential for odors.

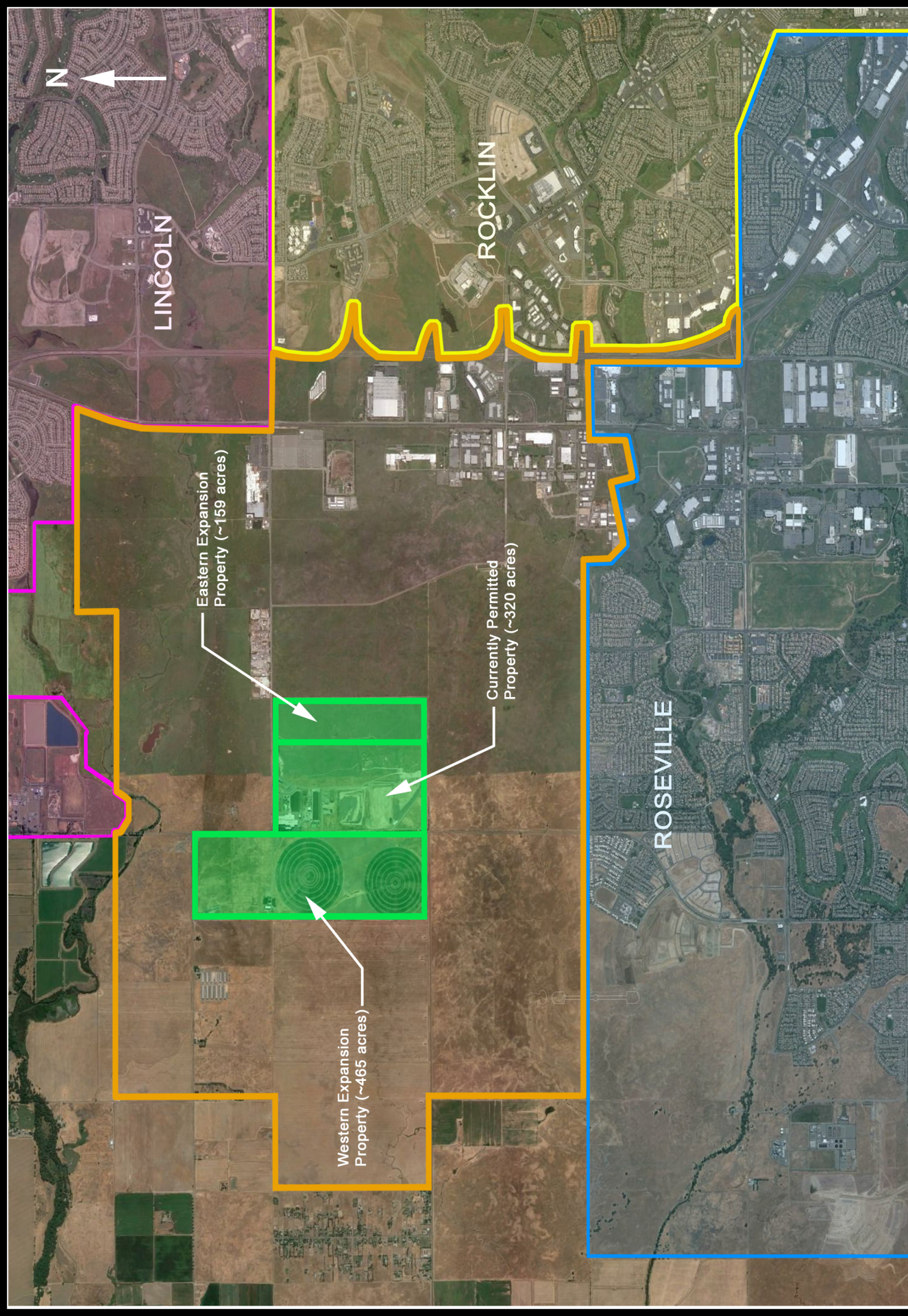
3. OVERVIEW OF THE WPWMA

The WPWMA was created pursuant to a Joint Exercise of Powers Agreement originally dated October 3, 1978, by the County of Placer, City of Roseville, City of Rocklin, and City of Lincoln. These four entities are collectively referred to as the “Member Agencies”. The City of Auburn, City of Colfax, and Town of Loomis utilize the WPWMA’s facilities; these entities and the Member Agencies are collectively referred to as the “Participating Agencies”. The WPWMA is governed by a Board of Directors made up of elected officials from each of the Member Agencies.

The WPWMA was established for the purpose of acquiring, owning, operating, and maintaining a sanitary landfill site and all related improvements. In 1978, after evaluating an area between 350 and 400 square miles in western Placer County for suitable locations to site a sanitary landfill, the present location of the Western Regional Sanitary Landfill (WRSL) was selected. Considerations when selecting the WRSL site included technical aspects such as geology and soil conditions as well as compatibility with surrounding land uses and aesthetic factors such as odors.¹

The WRSL is located on approximately 320 acres in the Sunset Area (formerly known as the Sunset Industrial Area) in unincorporated Placer County north of the City of Roseville, south of the City of Lincoln and west of the City of Rocklin. The permitted area of the WRSL is approximately 291 acres, with approximately 231 acres for disposal activities. The WRSL began disposal operations in 1978 and is currently operated under a contract with a private Landfill Operator. The WPWMA also owns approximately 465 acres west and 158 acres immediately east of the active WRSL to support future expansion of its operations as necessary. As of 2019, the western and eastern properties are not permitted for solid waste-related uses; however, the WPWMA initiated environmental review in January 2019 to utilize the western and eastern properties for solid waste-related operations in the future. The WPWMA’s properties are shown in Figure 3-1.

In response to California Assembly Bill 939, the WPWMA constructed the Materials Recovery Facility (MRF) to assist the Participating Agencies in complying with the regulation’s waste diversion mandates. The MRF began operations in 1995 and has been operated continuously under a contract with a private MRF Operator. Non-recovered wastes (“Residue” or “Residual Waste”) generated at the MRF are transported by the MRF Operator to the WRSL for final disposal. Current MRF operations include: 1) mixed waste receiving and processing areas for recovery of recyclable and marketable materials, 2) an organics composting area where greenwaste, foodwaste, and paper waste are



WPWMA Site-Wide Odor Plan Site Location

composted¹, 3) a woodwaste processing area where wood materials are processed to produce biofuels and landscaping products, 4) two household hazardous waste (HHW) facilities where HHW and universal wastes received from the public or recovered from the MRF are consolidated prior to shipment offsite for recycling or disposal, and 5) a commercial and residential recyclable buyback and drop-off center (Buyback) where clean, source-separated recyclable materials are received and blended with recyclable materials recovered from the MRF for shipment to recyclable commodity end users.

Placer County provides staffing to the WPWMA, including financial management scalehouse operations, general and engineering oversight of all facility operations, and implementation of public education and outreach programs. WPWMA staff also provide recommendations regarding solid waste policies and operations to the WPWMA Board of Directors.

The WPWMA has established long-term contracts with private entities for the operation and maintenance of the MRF and WRSL. The WPWMA also retains the services of professional engineering and other firms related to the ongoing facility operation, including solid waste systems design, water quality, GCCS design and operation, and odor monitoring and air dispersion modeling.

4. WPWMA FACILITY PURPOSE

The WPWMA's facilities receive and process solid wastes from within Placer County for the purposes of: 1) recovering marketable, recyclable materials that can be reintroduced into the local, national or global economy, 2) composting select organic materials to produce a marketable soil amendment, 3) safely recovering household hazardous wastes, universal wastes, and electronic wastes for off-site recycling or destruction, and 4) disposing of non-marketable solid wastes within a sanitary landfill in accordance with applicable regulatory and legal requirements.

5. WPWMA FUNDING SOURCES

The WPWMA's primary funding source is tipping fees charged to customers to drop off their wastes at the WPWMA's facility. Additional sources of funding include, but are not necessarily limited to: royalty payments from the Energy Developer, rent payments associated with real property leases, grant monies received from the state (typically related to oil recycling) and interest earned on the WPWMA's reserve balances.

The WPWMA does not receive revenue from direct parcel assessments, the General Funds of any of its Participating Agencies, or from local, state or federal taxes.

¹ The WPWMA is fully permitted by CalRecycle to compost greenwaste. Approval of a pilot project to co-compost foodwaste and/or soiled paper with greenwaste was granted by the LEA (acting on behalf of CalRecycle) on September 13, 2016.

The WPWMA Board periodically reviews and adjusts its tipping fee structure to ensure sufficient funding is available for current and future operational needs.

6. AGENCY/STAKEHOLDER ROLES & RESPONSIBILITIES

Several primary stakeholders share an interest in regional odors, including those generated and emitted from the WPWMA's facility, and have roles and responsibilities related to the management, control and reporting of these odors.

A. Western Placer Waste Management Authority

The WPWMA is the owner and legal operator of the MRF, WRSL, composting, HHW and Buyback facilities. The WPWMA holds all operating permits for the facility and is directly responsible for complying with the permits and working with the appropriate regulatory agencies on permit-related matters.

The WPWMA Board of Directors has the ability and responsibility to establish policy related to use of the facility by generators and transporters of waste materials, how the facility is operated and maintained by contracted entities, and what, if any, specific policy provisions exist related to control of odors from the WPWMA's facility.

The WPWMA contracts with multiple third-party entities to operate and maintain specific elements of the WPWMA's facilities. As such, the WPWMA has the ability to integrate odor monitoring, mitigation and reporting requirements into these various contracts as it deems appropriate and in the best interest of the WPWMA and its customers.

B. MRF Operator

The MRF, composting, HHW and Buyback facilities (collectively referred to as the MRF) are operated under a single contract with a private firm.

The MRF Operator is directly responsible, as outlined in their contract with the WPWMA, for the operation and maintenance of these facilities. As such, once waste is received at the facility, the MRF Operator controls the flow and management of these materials, including when recyclable commodities are shipped off-site to end-users and when Residual Wastes are transported to the WRSL for final disposal.

The MRF Operator is contractually obligated to inspect waste loads directed by WPWMA staff to the MRF to determine if the materials are suitable for processing. If the MRF Operator judges a load to have too little recyclable or marketable value or that it contains materials that may damage MRF processing equipment, the MRF Operator may elect to redirect the materials to the WRSL for disposal. This provides the MRF Operator the ability to also judge whether a particular load has an excessive level of odor and whether or not it would be best (from a facility odor perspective) to process the materials at the MRF, direct them to the Composting Facility, or divert them to the WRSL for immediate disposal.

The MRF Operator has some ability to adjust MRF operations to reduce the potential for heightened perception of off-site odors. Specifically, depending on other operational factors, the MRF Operator can adjust how and when certain materials are processed based on the time of day and day of the week, actual and predicted weather conditions, and potential for odors from the materials processed.

The MRF Operator is also responsible for maintaining the MRF, including regular and periodic cleaning and other “housekeeping” efforts.

The MRF Operator does not have direct control over the method in which materials are generated and hauled to the MRF for disposal. As such, odors associated with waste materials during transport to the MRF are outside of the MRF Operator’s control.

C. Landfill Operator

The WRS� is operated under a separate contract than the MRF.

The Landfill Operator is directly responsible, as outlined in their contract with the WPWMA, for operation and maintenance of the WRS� as it relates to the receipt, burial, and covering of the waste. The Landfill Operator is not responsible for the design, installation, operation or maintenance of the GCCS.

The Landfill Operator has some ability to adjust operations to reduce the potential for heightened perception of off-site odors. Specifically, depending on other operational factors, the Landfill Operator can adjust where and how to fill sections, within the WPWMA-approved site fill sequence plan, of the WRS� and how wastes are blended with other wastes and covered during the burial process to reduce the potential for odors.

The Landfill Operator does not have direct control over the method in which materials are generated and hauled to the WRS� for disposal. As such, odors associated with waste materials during transport to the WRS� are outside of the Landfill Operator’s control.

D. Waste Generators and Haulers

Neither the WPWMA nor its contractors and consultants are responsible for the transport and delivery of waste materials to the WPWMA’s facility. Some materials delivered to the WPWMA’s facility have a high potential for noticeable odors because of the type of material (e.g. wastewater treatment plant sludge and foodwaste, etc.) or the conditions in which the material was collected and stored prior to transport (e.g. residential greenwaste that begins to decompose and generate odors prior to collection by the hauler, etc.).

The responsibility for the individual generators and haulers to mitigate odors is outside the purview of the SWOP. However, the WPWMA and its

contractors and consultants endeavor to manage these types of materials in a manner aimed at reducing their noticeable off-site odor potential.

E. Energy Developer

The WPWMA currently leases land to a private energy developer who owns and operates a landfill gas-to-energy facility located at the northern edge of the WRSL. The Energy Developer receives LFG provided by the WPWMA for the purposes of generating and selling electricity produced by running internal combustion engines fueled by LFG.

The majority of LFG generated at the WRSL is conveyed by the WPWMA to the Energy Developer, thus the Energy Developer's facility serves as the primary control element for the destruction of LFG.

F. WPWMA Consultants

The WPWMA currently contracts with an engineering firm to operate, manage and maintain the WPWMA's GCCS. Their primary role is to operate the GCCS to maintain regulatory compliance and minimize emissions of landfill gas to the atmosphere which also serves to reduce LFG-related odors.

G. Placer County Air Pollution Control District

The PCAPCD is responsible for the regulation and enforcement of air quality regulations within Placer County consistent with federal, state and local statutes.

The PCAPCD provides regulatory oversight and asserts enforcement of the WPWMA's air-related operating permits.

H. Placer County Local Enforcement Agency

The LEA has been delegated authority by CalRecycle to enforce state law as it relates to the operation and closure of solid waste landfills, MRFs and composting facilities.

The LEA provides regulatory oversight and enforcement of the WPWMA's non-air and non-water-related operating permits.

I. Public

The public, particularly those who live and work proximate to the WPWMA's facility, can serve as real-time field monitors for the presence of odors. The WPWMA's website (www.WPWMA.ca.gov) provides an easy and convenient method for the public to provide feedback regarding when and where they experience odors, how long the odors are noticeable, and a description of the odor.

Information provided by the public provides useful data to the WPWMA that can serve to augment data collected from its odor monitoring and air dispersion system for evaluating the migration of odor from the site. To be

of greatest use, it is important that odors are reported to the WPWMA as timely and accurately as possible, as described in Section 10.D.

7. Regional Odor Sources

The WPWMA is one of several known odor sources located in or adjacent to Placer County's Sunset Area. The following provides an overview of potential odor sources at or proximate to the WPWMA's facility; Figure 7-1 shows the location of these potential odor sources.

A. WPWMA Odor Sources

In its 2007 and 2009 studies conducted for the WPWMA, SCS Engineers identified the following primary sources of odor at the WPWMA's facility: 1) MRF, 2) composting facility, 3) landfill active face, and 4) landfill gas. These odor sources are discussed in greater detail in Section 8 of this report.

B. Non-WPWMA Odor Sources

i. Non-Ag (not exempt from PCAPCD nuisance regulations)

a. Rio Bravo

The Rio Bravo biomass facility is located approximately 1.5 miles east of the WPWMA's facility and directly south of the Thunder Valley Casino Resort.

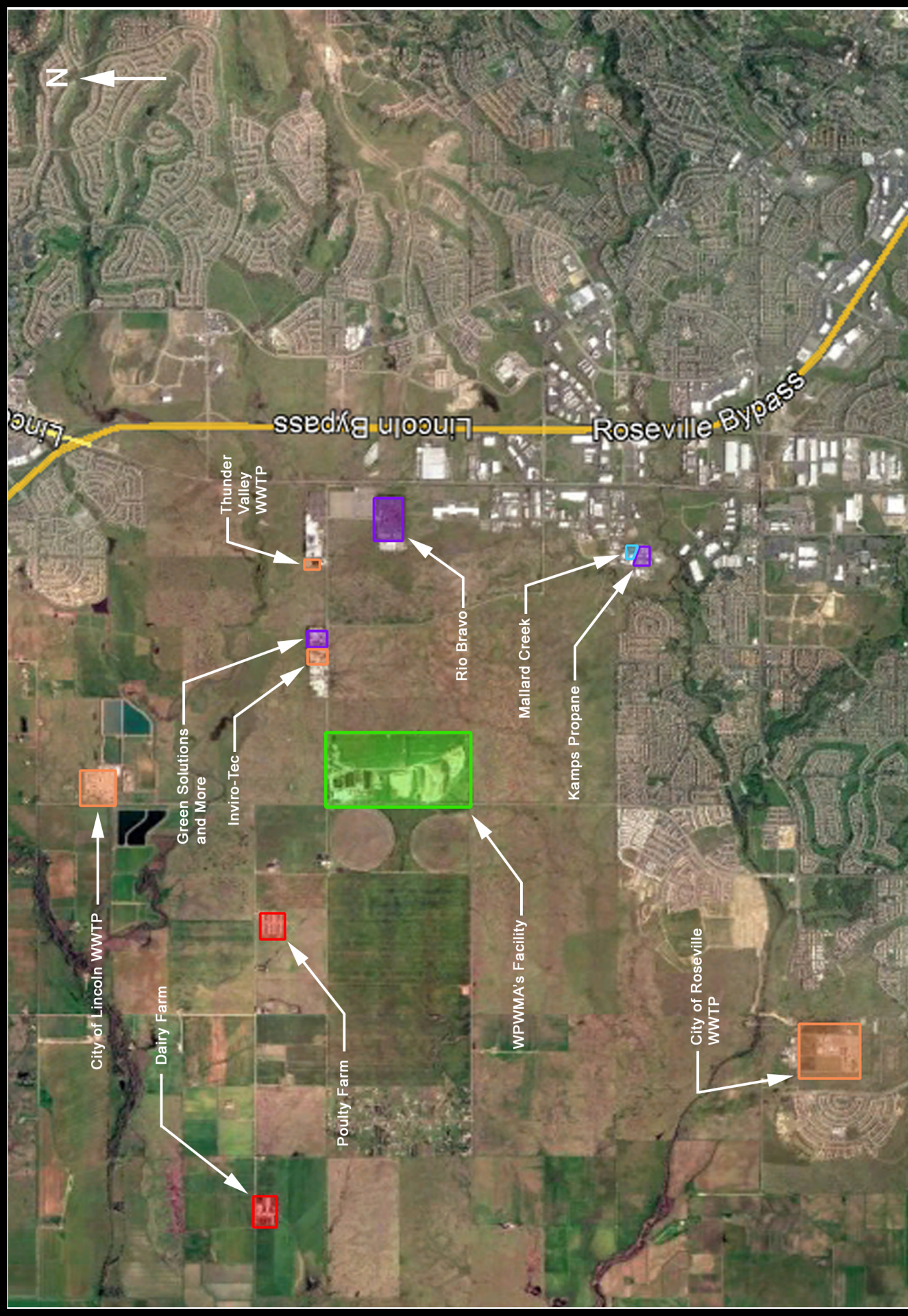
The Rio Bravo facility receives and processes woody materials for the purposes of generating electricity. As part of its operation, Rio Bravo maintains stockpiles of ground wood fuel. In some cases, these stockpiles of wood fuel can begin to decompose and generate odors similar to the WPWMA's composting operations.

b. Mallard Creek

The Mallard Creek facility is located approximately 2.2 miles southeast of the WPWMA's facility. Mallard Creek produces and markets equine and poultry bedding materials, landscaping products, pelletized fuel products and industrial fibers. These products are produced predominately from woody material received and processed at Mallard Creek's facility. Much like the Rio Bravo facility, ground and stockpiled materials have the potential to generate odors similar to that of the WPWMA's composting operations.

c. Green Solutions and More

The Green Solutions and More facility is located approximately $\frac{3}{4}$ mile east of the WPWMA's facility and sits adjacent to the Inviro-Tec Facility. Green Solutions and More accepts greenwaste and woodwaste which is ground



on-site to produce mulch, wood chips and compost. The facility also accepts soil and concrete for recycling. The green and wood materials have the potential to generate odors similar to that of the WPWMA's composting operations

d. Kamps Propane – Rocklin

Kamps Propane is a propane distributor located approximately 2.5 miles southeast of the WPWMA's facility and less than ½ mile due east of Blue Oaks neighborhood. The odorant added to propane can be similar to landfill gas or other landfill-related odors.

e. Inviro-Tec

The Inviro-Tec facility is located approximately ¾ mile east of the WPWMA's facility and site adjacent to the Green Solutions and More facility. Inviro-Tec owns and operates a facility that accepts and processes septic tank pumpings to separate the liquids from the solids. Liquids are pumped to the sanitary sewer while the solids are transported for disposal at the WRSL. Odors from Inviro-Tec's facility can be similar to that of a wastewater treatment plant or the landfill working face when sludges are received and managed.

f. Thunder Valley WWTP

The United Auburn Indian Community owns and operates a wastewater treatment plant at their Thunder Valley Casino. The 700,000 gallon per day facility located approximately 1.5 miles east of the WPWMA's facility serves the Thunder Valley Casino Resort exclusively. Sludge from the Thunder Valley WWTP is hauled by Recology to the WRSL or other sanitary landfill for disposal. Odors from the Thunder Valley WWTP can be similar to that of the landfill working face when sludges are received and managed.

g. City of Lincoln WWTP

The City of Lincoln owns and operates a regional wastewater treatment facility located approximately 1.5 miles north of the WPWMA's facility. The 5.9 million gallon per day facility serves areas between Lincoln and North Auburn. Sludge from Lincoln's WWTP is currently disposed at either the WRSL or the Ostrom Road Landfill in Yuba County. Odors from Lincoln's WWTP can be similar to that of the landfill working face when sludges are received and managed.

h. City of Roseville WWTP

The City of Roseville owns and operates two wastewater treatment facilities.

The Dry Creek facility is located approximately 6.5 miles south southeast of the WPWMA's facility. Materials generated at the Dry Creek facility are currently suitable for land application and are not delivered to the WPWMA's facility.

The Pleasant Grove facility is located approximately 3.5 miles southwest of the WPWMA's facility. Materials from the Pleasant Grove facility are hauled by the City of Roseville to the WRS� for disposal and have the potential for odor generation during transport. To reduce the odors associated with transport of the materials from the WWTP to the WPWMA's facility, the City of Roseville began using covered hauling containers in 2013. This practice substantially reduced the odors associated with sludge transport.

Odors from the Roseville WWTPs can be similar to that of the landfill working face when sludges are received and managed.

ii. Ag (exempt from PCAPCD nuisance regulations)

a. Poultry Farm

A privately-owned poultry farm consisting of twelve (12) enclosed barn structures is located approximately 1-mile northwest of the WPWMA's facility. Odors from the facility tend to have a musty odor mixed with ammonia and can be similar to composting and landfill related odors.

b. Dairy Farm

An approximately 20-acre, privately-owned dairy farm that includes eight (8) open-sided barns/structures and associated feed lots is located approximately 3 miles northwest of the WPWMA's facility. Odors from the facility tend to have a manure odor mixed with ammonia and can be similar to landfill and landfill gas-related odors.

8. ON-SITE ODOR SOURCES, OPERATIONAL PLANNING AND BMPS

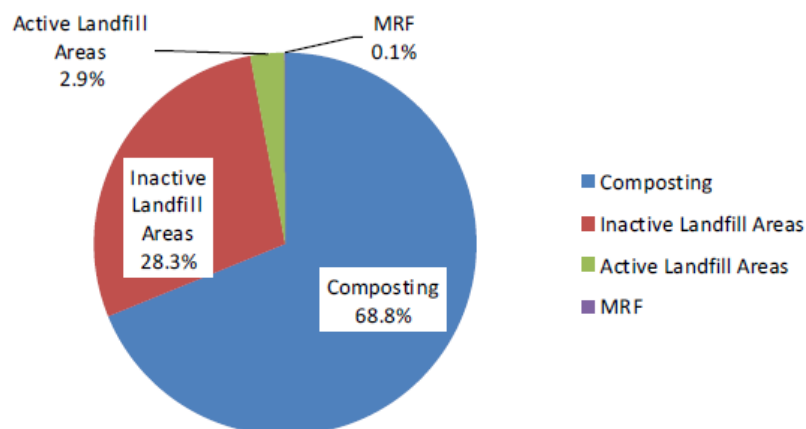
The following provides an overview of the primary odor-generating operations at the WPWMA's facility (MRF, compost, landfill, and LFG) and the BMPs implemented by the WPWMA to reduce the potential for odors to be noticeable off-site including the advance planning and scheduling of operational activities. A checklist template is included in Appendix A that the WPWMA will utilize to document implementation and adherence to the observable BMPs. While this list

may not represent all the potential odor producing operations at the WPWMA's facility, based on previous site-specific studies conducted by the WPWMA, the following represents the operations with the greatest potential to produce odors.

A. Overview of On-Site Odor Sources

A November 2015 odor study commissioned by the WPWMA and produced by Environmental Management Consulting and Charles E. Schmidt, PhD (Appendix B) suggests the following relationship (see Figure 8-1) in terms of the relative odor potential of the primary facility odor sources.

Figure 8.1: Overall Contribution to Site Odor by Process



B. MRF

As used herein, the MRF represents the portion of the WPWMA's facility that receives and processes mixed municipal solid wastes for the purposes of recovering and marketing recyclable materials (Figure 8-2). Residual Wastes are transported to the WRSL for disposal.

Given the location of the MSW processing building relative to the WPWMA's overall facility, the potential for off-site odors associated with the MSW receiving and processing area is greatest along the sections of Athens Avenue and Fiddymont Road noted on Figure 8-2.

The materials processed at the MRF include organic materials and other putrescible wastes that have the potential to emit odors as they begin to decompose. Additionally, fines that are entrained within the mixed waste stream (including, but not limited to, dirt and grit, concrete and drywall dust, grass clippings, and small pieces of paper, wood, glass and plastic) are collected and used at the WRSL as an alternative daily cover (ADC) material. As a result, the following BMPs focus on timely and consistent processing of the materials and regular housekeeping and cleaning of facility to avoid the accumulation of potentially odiferous materials.

Athens Avenue



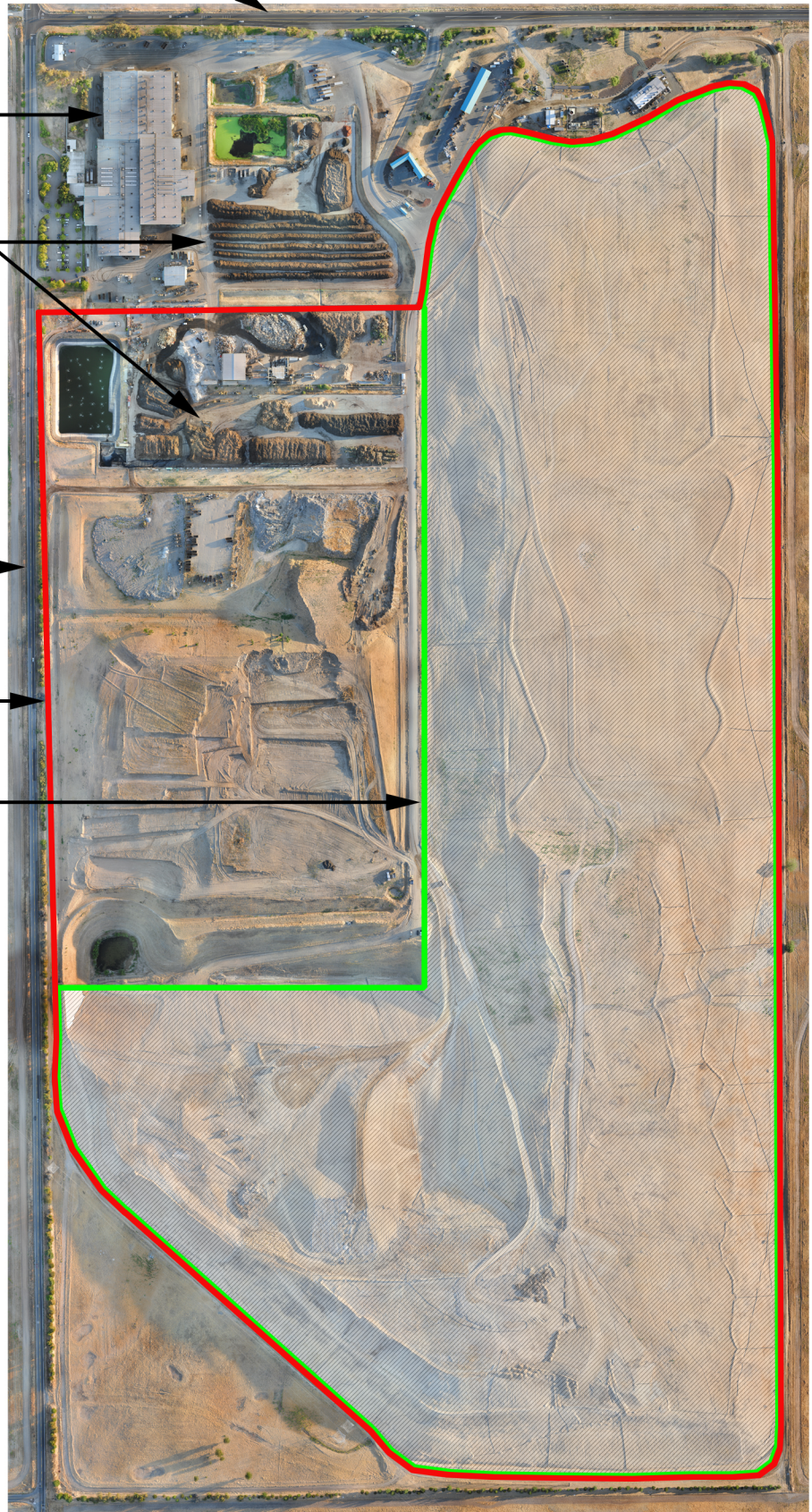
MRF

Composting
Facility

Fiddymment Road

Permitted waste
boundary

Area with waste
currently in-place



WPWMA Site-Wide Odor Plan
WPWMA Facility Site Layout

FIGURE
8-2

i. Best Management Practices

The following represents the odor minimization BMPs related to the MRF operation.

- Process waste materials within forty-eight (48) hours of receipt of the material. For the purposes of this BMP, “process” means to sort the materials to recover marketable commodities and transport the residue to the landfill for burial.
- ADC generated from MRF fines is screened to a ½-inch minus size thereby reducing the potential for larger pieces of foodwaste to be present in the fines. The MRF Operator is responsible for regularly inspecting and properly maintaining the ADC screening system to ensure this material sizing standard.
- Transport all ADC to the landfill the same day it is produced at the MRF. No overnight storage of ADC at the MRF is allowed.
- Transport residual wastes to the landfill the same day they are produced. Limit overnight storage or residue in trailers to situations in which the MRF is operated outside of the landfill waste acceptance hours.
- Continuously operate the stormwater pond aeration system to the degree: 1) the aerators are fully submerged and 2) the dissolved oxygen level in the pond is less than 1 milligram per liter.
- At the end of daily waste processing operations, remove all unprocessed waste material from the processing lines and equipment. No waste material shall remain on the processing lines and equipment overnight. This provision shall not apply to any processing lines that have experienced a mechanical or electrical failure that precludes the MRF Operator from running the line. In these cases, the MRF Operator shall clear the line(s) of material upon repair of the line(s).
- Remove waste materials from the floors and other surfaces underneath MRF processing equipment following the completion of daily processing operations and return the collected materials to the receiving floor for reprocessing.
- Remove waste materials from the baling areas and recovered product storage floor and return the collected waste materials to the receiving floor following the completion of daily baling operations. Recovered recyclables which have not yet been baled are exempted from this cleaning and removal requirement.

- Remove loose waste and debris around the residue and ADC load-out conveyors at the end of daily operations.
- Close at least two (2) of the three (3) MRF receiving floor roll-up doors each night. The MRF Operator may elect to keep one door open to facilitate ease of inspection of the receiving floor for the purposes of maintaining site security and safety.
- Using a street sweeper or equivalent piece of equipment, sweep the asphalt covered areas surrounding the MRF building daily.
- To minimize system downtime, provide equipment maintenance and repair staff whenever the MRF is processing wastes to respond to and repair system faults and equipment breakdowns.
- Conduct daily preventative maintenance activities to minimize system downtime.
- On a quarterly basis, perform routine maintenance and inspection of the MRF air handling system components to ensure proper and uninterrupted operation.

C. Composting Facility

As used herein, the Composting Facility represents the portion of the WPWMA's facility that receives and processes organic materials for the purposes of producing a marketable soil amendment (Figure 8-2). The following provides additional information related to the operation of the Composting Facility as it relates to odors.

A majority of the materials received and processed at the Composting Facility consist of greenwaste (e.g.: grass, leaves, plants, sticks and small branches). With passage of recent regulations by the State of California (i.e. AB 32, AB 1826, SB 1383), foodwaste and other organic materials such as paper waste will need to be co-composted with greenwaste.

Greenwaste and foodwaste are received directly at the Composting Facility. Other organic materials that may be composted will generally be received as part of the MSW stream at the MRF recovered by the MRF Operator, and subsequently transported to the Composting Facility.

As received, greenwaste generally has a relatively low odor potential as sufficient oxygen is available to prevent significant anaerobic conditions. However, during certain parts of the year (typically early Spring) when there may be alternating cycles of warm weather followed by rain, the amount of grass clippings generated within the county and subsequently received at the WPWMA's facility can increase dramatically. In some cases, the greenwaste can already enter a semi-anaerobic phase (and begin producing odors) before being collected and transported to the WPWMA facility. In these cases, extra care must be taken to process

these materials as soon as practical and introduce them to the composting process to reestablish aerobic conditions.

Foodwaste will most often exhibit a high odor potential upon receipt at the Composting Facility. As such, prompt processing and blending of these materials (as noted in the BMP section below) with processed, shredded greenwaste will help to minimize the odor potential of the foodwaste materials.

The WPWMA utilizes a windrow composting method to process a majority of the greenwaste materials received at the Composting Facility. Windrow composting methods are not approved for use at the WPWMA's site for composting foodwaste, paper waste or any other non-greenwaste materials. The windrow composting method consists of placing ground (shredded) greenwaste in long rows. After placement, the windrows are periodically watered and mechanically turned to ensure sufficient oxygen is available to maintain aerobic conditions within the pile. The act of turning the compost has the potential to release compost-related odors, however failure to turn the compost would lead to anaerobic conditions and have a greater potential for the release of offensive odors.

In response to the regulatory changes noted above, the WPWMA is utilizing aerated static pile (ASP) composting methods (on a pilot test scale²) to compost a blend of green and non-green (e.g. food, paper, etc.) organic materials. ASP composting methods involve blending shredded greenwaste with non-green materials and placing the blended material into piles situated above a series of perforated pipes. The pipes are connected to one or more blowers (mechanical air moving systems) that allow air to be drawn from the atmosphere and pushed through the material pile to maintain aerobic conditions. A layer of finished compost is placed on top of the piles to act as a biofilter; this biofilter layer serves to absorb and biologically degrade odorous compounds. Unlike the windrowing method, the materials in the ASP system are not turned or otherwise moved after initial placement and are left in a "static" state until the composting process is effectively completed.

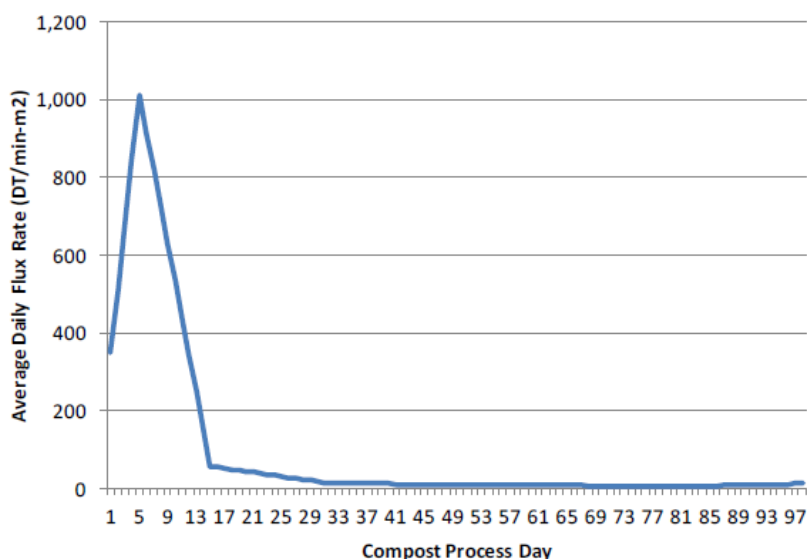
All liquids that contact the compostable materials are directed to one of two on-site composting ponds. Unlike other stormwater ponds located on-site that are designed to collect rainwater and other on-site water that has not come into contact with waste materials and allow any solids to settle before the water is released off-site, compost ponds are designed to preclude any off-site release of liquids that have come into contact with compostable materials. The water collected in the compost ponds can be reapplied to the compost piles to maintain appropriate moisture levels or evaporate to the atmosphere.

² The WPWMA anticipates submitting an application to the LEA to fully permit the ASP composting process by July 2020.

The November 2015 odor study commissioned by the WPWMA suggests that the composting operation has the greatest potential for odors and represents nearly 69% of the total site wide odor potential. At the time the study was performed, the WPWMA had not begun its ASP composting pilot testing. In addition to the operational benefits associated with ASP composting methods, the use of ASP has been demonstrated to reduce odor emissions by at least 80% compared to conventional windrow methods.^{2,3}

After materials have completed the active composting phase⁴, the compost is moved to a separate area to cure before it is ready to be screened and then marketed. During the movement from active composting to curing, the material has some potential to release odors. However, as shown on Figure 8.3 below (source: Figure 5.1 in Appendix B), the odor potential associated with composting operations decreases rapidly and remains relatively low after the first few weeks of the active composting process (windrowing or ASP).

Figure 8.3: Compost Emission Curve



Once cured, the compost is screened to remove contaminants and is then ready for market. Similar to the when the compost is moved from the active to the curing phase, screening of the compost has the potential to release a minor amount of odor

California Code of Regulations Title 14 Section 17863.4 requires that all compostable material handling operations and facilities prepare and maintain a site-specific Odor Impact Minimization Plan (OIMP). The WPWMA's OIMP (Appendix C) provides detailed information regarding design and operating procedures to minimize composting-related odors.

i. Best Management Practices

The following represents the odor minimization BMPs related to the composting operation. As noted above, the highest potential for odors exist during receipt and initial processing of the materials and during the first few weeks of the active composting process. As such, the following BMPs primarily focus on management practices during these initial periods as well as general housekeeping practices.

It is acknowledged that the use of ASP composting methods is still in a pilot testing phase and that any or all of the following provisions are subject to change in the future.

- Comply with all provisions of the approved OIMP in Appendix C.
- Plan and perform material grinding, turning, screening or blending of non-greenwaste materials with ground greenwaste materials consistent with the provisions of Section 8F.
- Perform initial processing (grinding) of green materials within seven (7) calendar days of receipt.
- Grind highly odiferous loads of greenwaste within forty-eight (48) hours of receipt.
- Introduce ground greenwaste into the windrowing or ASP piles within fourteen (14) calendar days of the grinding of the materials.
- Cover foodwaste, paper and/or other compostable materials with ground greenwaste so that no non-greenwaste materials are exposed within two (2) hours of receipt of the foodwaste, paper and/or other compostable materials.
- Move the blended materials to ASP and begin introducing air (as noted below) within seven (7) calendar days of the initial receipt of the foodwaste, paper and/or other compostable materials.
- Limit windrow composting methods to the composting of greenwaste only unless otherwise approved, in writing, by the LEA. All other materials shall be composted using ASP methods.
- Construct and maintain a minimum 12-inch thick biofilter layer comprised of finished, unscreened compost over the entire surface of the ASP compost piles. Biofilter material shall be placed within twenty-four (24) hours of any section of the ASP reaching its maximum height. Based on current material flowrates, it can take between 1 to 3 operational days to fully

construct a new section of ASP with placement of the biofilter layer to follow.

- Introduce ambient air, via a mechanical air supply system, as necessary to generally maintain pile temperatures within the range of 131°F to 168°F. Blowers will be operated on a continuous intermittent schedule (e.g. 5 minutes on, 10 minutes off, etc.) to maintain the appropriate temperature range of the compost piles as noted herein. Blowers shall be used to push ambient air through the piles (positive aeration).
- Maintain materials in the composting windrows for at least eight (8) weeks or in the ASP piles for at least forty-five (45) days as applicable.
- Following the active composting timeframes noted above, maintain the composted materials in a curing pile for at least fifty (50) days prior to final screening of the material.
- Wash down and remove any accumulated liquids, solids and semi-solids that may have leached from the active ASP piles at least once per day.
- Continuously operate the compost pond aeration system to the degree: 1) the aerators are fully submerged and 2) the dissolved oxygen level in the pond is less than 1 milligram per liter.
- Utilize a dedicated continuous dissolved oxygen meter to monitor oxygen levels in the compost ponds.
- On a quarterly basis, sample the compost leachate for the following parameters: pH, dissolved oxygen, total dissolved solids, fixed dissolved solids, total nitrogen and specific conductance.
- Clean and remove sediments from the south composting pond forebay and the north compost pad drainage channel at least quarterly with the first scheduled cleaning to occur by December 31, 2020. Collected sediments shall be promptly mixed with ground greenwaste and reintroduced to the active composting system or immediately transported to the WRSL for disposal and managed in the same method as wastewater treatment plant sludges. In no event shall the collected sediments be allowed to stored overnight without first being mixed or covered with ground greenwaste.
- Clean and remove accumulated compost or other debris on and adjacent to the composting pads semi-annually.

- Drain and clean all membrane-lined composting ponds at least once every four (4) years with the first scheduled cleaning to occur by December 31, 2022.

D. Landfill

As used herein, the “Landfill represents the portion of the WPWMA’s facility referred to as the Western Regional Sanitary Landfill (WRSL). The WRSL is approximately 291 acres with approximately 231 acres permitted for disposal activities (Figure 8-2). As of June 2019, approximately 158 acres have received waste for disposal with the remainder identified as future landfill. Based on the currently permitted capacity of the WRSL and current and projected future filling rates, the WPWMA estimates the WRSL has sufficient capacity to operate until at least 2058.

It is the WPWMA’s intent to recover and market for recycling or reuse as much material as is technically and economically practical and that is environmentally safe to do so. Wastes received at the WPWMA’s facility that cannot be reasonably recovered for recycling or reuse are disposed of at the WRSL.

When the WRSL is not in operation (i.e. not actively receiving waste materials for burial), all in-place wastes are covered by soil or approved alternative daily cover (ADC). This cover serves to reduce the potential for windblown litter, vectors and odors. At the start of daily filling operations, the Landfill Operator establishes one or more daily active working faces where wastes will be disposed. The daily active working face represents the only area(s) at the WRSL where wastes are exposed. On an average day the size of the active working face is generally limited to less than one (1) acre to minimize issues associated with the exposed waste including the potential for odors. At the conclusion of each operating day, the Landfill Operator places a layer of daily cover materials (soil or ADC) over the active working face to completely cover all wastes.

The two primary sources of odor associated with the landfill are: 1) the receipt and burial of wastes and 2) landfill gas related odors. The following section addresses BMPs for minimizing odors related to the receipt and burial of materials; landfill gas related BMPs are addressed separately in Section 8E.

i. Best Management Practices

The following represents the odor minimization BMPs related to the landfilling operation.

- Discuss at the weekly landfill operations meeting, the planned location of each day’s filling operations and when areas of

previously buried waste that have been in place for a week or longer will need to be exposed for the purposes of establishing the daily active working face. The planned efforts will be consistent with the provisions of Section 8F.

- Provide at least twenty-four (24) hours' notice (or as soon as practical in the event of an unforeseen circumstance that would result in less than 24 hours' notice) to the WPWMA Program Manager or Senior Civil Engineer of the need to operate the WRSL on weekends, Observed Holidays or outside WPWMA facility Gate Hours.
- Minimize the size of the working face to that necessary to maintain operator and customer safety. A working face between $\frac{1}{4}$ and $\frac{1}{2}$ acre is considered the minimum safe size with the maximum size of the working face generally limited to one (1) acre.
- Minimize the open-air exposure time of wastes by placing newer wastes over older wastes throughout the operating day. A study commissioned by the WPWMA suggests that odors associated with exposed waste increase over the course of the operating day.⁵
- Bury wastewater treatment plant sludges and other highly odiferous loads immediately upon receipt by covering the materials as quickly as possible with less odiferous wastes.
- When exposing areas of previously buried waste that have been in place for a week or longer, limit the time between removal of the last six (6) inches of soil cover and first placement of additional wastes to no more than one (1) hour.
- Begin placing daily cover materials immediately following receipt of the last load of waste and consistent with the requirements of Title 27, Sections 20680 and 20690 of the California Code of Regulations. Complete daily cover placement within four (4) hours of receipt of the last load of waste.
- Utilize soil or "fines" recovered from the MRF or C&D operation as an ADC as follows:
 - A six-inch minimum layer of on-site, native soil; OR
 - A six-inch layer of MRF fines covered by a six-inch layer of on-site, native soil; OR
 - A six-inch layer of MRF fines covered by a six-inch layer of C&D fines.
 - Restrict use of ADC fines to areas that will receive additional fill within twenty-four (24) hours. Exposure of alternative

daily cover fines in excess of twenty-four (24) hours is prohibited.

- Daily cover shall be compacted to minimize odor transmission. The minimum level of compaction may be achieved via track-walking the materials with a Caterpillar D-6 low ground pressure dozer or equivalent.
- Daily cover soil may be removed at the start of the operational filling day to minimize overall soil disposal rates; MRF fines and dried sewage sludge used as ADC shall not be removed and shall remain in-place once applied by the Landfill Operator.
- Submit a fill plan to the WPWMA for review and approval each month detailing the following information:
 - Subsequent forty-five (45) days of fill operations.
 - Subsequent one hundred eighty (180)-day fill area.
 - Landfill cover plan indicating areas containing intermediate cover and areas that will have intermediate cover within the subsequent one hundred eighty 180-day period.
 - Areas where surface LFG conveyance piping is currently located that the Landfill Operator believes will need to be relocated to accommodate the filling operations noted above.

Provide five (5) days written notice to the WPWMA prior to deviating from the fill plan except in the case where the Landfill Operator believes surface LFG conveyance piping needs to be disconnected or relocated. Provide thirty (30) days written notice to the WPWMA regarding any need to relocate or disconnect LFG piping. WPWMA will provide to the PCAPCD within three (3) business days of receipt, a copy of any such thirty (30) day written notice regarding the need to relocate or disconnect LFG piping.

- WPWMA will maintain reasonably accurate as-built drawings, in AutoCAD format, of all surface and sub-surface GCCS infrastructure and will provide such information to the Landfill Operator.
- Place and compact a minimum of twelve (12) inches of intermediate soil cover over areas where landfilling operations will not occur for one hundred eighty (180) days or more consistent with the regulatory requirements identified in Title 27, Section 20700 of the California Code of Regulations. The depth of any previously placed soil daily cover shall apply towards the intermediate soil depth requirement. The minimum level of

compaction may be achieved via track-walking the intermediate cover soils materials with a Caterpillar D-8 dozer or equivalent.

E. Landfill Gas

Landfill gas (LFG) is the byproduct of the anaerobic decomposition of wastes. As such, the composition of the waste being landfilled can have a direct impact on the generation rate and chemical constituency of the landfill gas.

Only the organic fraction of the landfilled waste will decompose and produce LFG. The generation rate of LFG generally increases over time with development of the landfill and usually peaks shortly after the landfill has reached final capacity. However, as a result of the state's mandate to reduce the amount of organic materials landfilled over time, it is reasonable to conclude that the quantity of LFG per unit volume of disposed waste may decline also over time.

LFG is composed predominately of equal parts methane and carbon dioxide; both odorless gases. LFG also includes trace amounts of volatile organic compounds (VOCs), sulfur-based compounds and ammonia. It is generally the sulfur-based compounds and ammonia that result in LFG related odors.

Federal and state law require that landfills that have the potential to produce a certain amount of LFG install a GCCS. The WRSL meets these criteria; in 1996 the WPWMA installed LFG collection wells and a flare system to destroy the LFG via combustion. Overtime as the WRSL has continued to develop, the WPWMA has expanded, modified and upgraded its GCCS. The current GCCS includes a series of collection wells that remove the LFG from the waste mass (via an applied vacuum) and conveys the LFG in an enclosed piping system to a central location (blower/flare station) where the LFG is either directed to the on-site Energy Developer to produce electricity or to an enclosed ground flare where it is destroyed through high-temperature combustion.

The design and operation of LFG systems is prescribed in both federal and state law. The U.S. EPA established New Source Performance Standards/Emission Guidelines⁶ for municipal solid waste landfills intended to reduce uncontrolled emissions of LFG and regulate release to the atmosphere of non-methane organic compounds entrained in LFG (40 CFR Part 60 Subpart WWW). The California Air Resources Board also approved a regulation intended to reduce emissions of methane gas from landfills.⁷ While both regulations are intended to reduce methane emissions to the atmosphere, compliance with the regulations also serves to reduce the potential for LFG-related odors.

The WPWMA's GCCS operations and maintenance consultant developed and follows standard operating procedures to ensure the LFG system is

operated in compliance with the applicable regulations. These standard operating procedures are included in Appendix F.

i. Best Management Practices

The following represents the odor minimization BMPs related to operation of the LFG collection and control system. For the purposes of this section, these BMPs shall apply to all facility operators, contractors and consultants that have the potential to impact the operation of the LFG system. This includes, but is not limited to, the 1) the WPWMA's operations and maintenance consultant, 2) any third-party construction contractors that are hired to work on any part of the LFG system or the WRSL that would require a shutdown of the LFG system for any reason, 3) the Landfill Operator to the degree their operations require a shutdown of the LFG system for any reason, and 4) the Energy Developer. While not every BMP identified below will apply to every entity that has the potential to impact the operation of the LFG system, all entities should adhere to the appropriate BMPs to limit the potential for a disruption to the operation of the LFG system.

- Comply with all provisions of the approved standard operating procedures in Appendix F.
- Comply with the provisions of 40 CFR Part 60 Subpart WWW and Title 17, CCR Section 95460, et seq.
- Maximize the recovery of LFG from the WRSL while minimizing the potential for subsurface combustion events and oxygen levels in excess of three percent (3%) by volume in the extracted LFG stream.
- Plan and perform all operations that have the potential to disrupt operations of the LFG collection and control system consistent with the provisions of Section 8F.
- Avoid operations that have the potential to disrupt LFG collection and control system operations on weekends, Observed Holidays, and outside of the WPWMA's Gate Hours.
- Where landfill operations require the temporary disconnection of landfill gas collection or conveyance equipment, coordinate with the WPWMA and Landfill Operator to minimize the potential for fugitive LFG emissions by:
 - Minimizing the number of LFG wells that must be temporarily taken off-line
 - Adjusting adjacent LFG wells in an attempt to capture LFG that would otherwise be captured by the wells that are to be disconnected

- Coordinate schedules with the Landfill Operator to reconnect the LFG as soon as it is safe and practical to do so.
- Although not required, the WPWMA will consider placing additional soil cover in excess of regulatory requirements identified in Title 27, Section 20700 of the California Code of Regulations or the use of cover membranes or other non- or low-permeable cover systems when odors associated with LFG surface emissions cannot be reasonably controlled through consistent implementation of the BMPs noted herein.

F. Planning and Scheduling Operational Activities

Each facility operator, contractor and consultant shall utilize the daily odor risk forecasting tool described in Section 10B to plan their respective operations. Where possible, operations that may result in noticeable off-site odors should be avoided during:

- Any continuous three (3) hour period where each hourly risk potential is noted as “HIGH”; or
- Any continuous six (6) hour period where each hourly risk potential is noted as “MODERATE” or “HIGH”.

Appendix D provides an example of these odor risk avoidance periods.

If a facility operator, contractor or consultant identifies that a specific operation or activity must occur to comply with operational needs or compliance with permits and that the timing of the identified activity will not comply with the aforementioned standards, the facility operator, contractor or consultant shall submit notification to the WPWMA, via reports@WPWMA.ca.gov, which includes the following information:

- Description of the activity or operation.
- Date(s) and time period(s) of the activity or operation.
- Reason why the activity or operation could not reasonably be delayed or rescheduled.
- Specific measures taken to reduce the potential for odors.

Any such notice must be submitted to the WPWMA within twenty-four (24) hours of initially conducting the activity or operation.

9. WEATHER & TOPOGRAPHY

The WPWMA’s facilities are located within the Sunset Area and immediately north of the Placer Ranch Specific Plan area. The following is an excerpt from the Draft Environmental Impact Report for the Sunset Area Plan/Placer Ranch Specific Plan⁸.

[U]nincorporated land in west Placer County is part of the Sacramento Valley Air Basin (SVAB). The SVAB comprises the western portion of Placer County, the eastern portion of Solano County, and all of Shasta, Tehama, Glenn, Butte, Colusa, Sutter, Yuba, Yolo, and Sacramento Counties.

Ambient concentrations of air pollutants are determined by the amount of pollutants emitted and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the SVAB are determined by such natural factors as climate, meteorology, and topography, in addition to the level of emissions released by existing air pollutant sources. These factors are discussed separately below.

The SVAB is a relatively flat area bordered by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta (Delta) from the San Francisco Bay Area.

The Mediterranean climate in the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50 degrees Fahrenheit (°F) to more than 100°F. The average winter temperature is a moderate 49°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature. Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest, during the winter months. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. The highest frequency of poor-quality air movement occurs in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods, combined with the reduced vertical flow caused by a decline in surface heating, reduces the influx of air and leads to the concentration of air pollutants under stable metrological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or with temperature inversions, which hinder dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

Elevated levels of ozone typically occur May through October in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the Delta breeze from the southwest in the afternoons. In addition, longer daylight hours provide ample sunlight to fuel photochemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NOX), which

form ozone. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind to shift southward and blow air pollutants back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to the area violating the ambient-air quality standards.

The local meteorology of the project area and surrounding area is represented by measurements recorded at the Lincoln Regional Airport (Karl Harder Field) station. The National Oceanic and Atmospheric Administration's National Centers for Environmental Information has records for that station dating back to 2009. According to these data, the average annual precipitation in the project area is approximately 20 inches, January temperatures range from a normal minimum of 36°F to a normal maximum of 56°F, and July temperatures range from a normal minimum of 61°F to a normal maximum of 96°F. The predominant wind direction is from the southeast (NOAA 2018).

While the PCAPCD does not classify odors as air pollutants, the meteorological and topographical conditions that affect the concentration and dispersion of air pollutants generally apply to the localized concentration and dispersion of odors as well. As noted above, the area surrounding the WPWMA's facilities generally experiences moderate wind patterns and minimal air movement or temperature inversion conditions the majority of the year. These factors can result in poor dispersion of odors and result in a greater potential for WPWMA facility-related and other regional odors to be perceptible by nearby receptors regardless of facility operations or time of day.

10. ODOR MONITORING AND INVESTIGATIONS

The following provides an overview of the WPWMA's effort to estimate potential off-site dispersion of odors generated from its facility, solicit feedback from nearby receptors related to when they experience odors they believe are from the WPWMA's facility, and to investigate and monitor on-site and off-site odors. WPWMA staff responsible for conducting odor monitoring, investigations, operational evaluations and responses to the public, PCAPCD, LEA or other applicable agencies include the WPWMA's a) Program Manager, b) Senior Civil Engineer, c) Associate or Assistant Engineers, d) Environmental Resource Specialist(s) and e) Engineering Technician(s).

A. Odor Monitoring and Dispersion Modeling System

The WPWMA employs a site-wide continuous odor monitoring and dispersion modeling system and meteorological station. Data collected by onsite sensors along with static estimates of odor flux from select sources at the WPWMA's facility are combined with atmospheric data to produce air (odor) dispersion models using the CALPUFF⁹ modeling system. Values for the static odor flux emissions were developed using a U.S.

EPA-approved flux chamber testing methodology as part of the WPWMA's 2015 Odor Study (Appendix B).

The odor monitoring and dispersion modeling system is utilized to provide objective, quantifiable, visual representations of the probable off-site odor concentrations over time associated with the WPWMA's operations.

B. Predictive Odor Risk Modeling

The WPWMA's odor monitoring and dispersion system includes a feature that uses weather forecast data to prepare a 3-day odor risk forecast that identifies periods of time (on an hourly basis) where there could be an increased potential for odors to be experienced off-site.

The odor risk forecast is updated daily and made available to the facility operators, contractors and consultants to help them better plan their operations and minimize the potential for off-site odors. Use of this forecasting tool is included as a BMP in Section 8. An example of the odor risk forecast is included in Appendix D.

The following criteria are used when determining the hourly odor risk assessment:

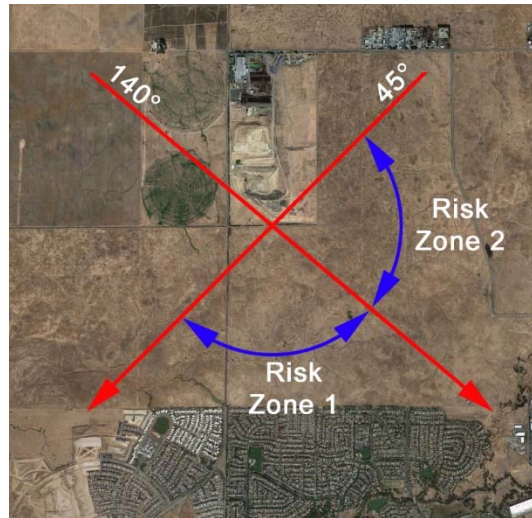
Risk Zone 1:

- If the forecast wind speed is lower than 1 meter per second (2.2 miles per hour), the risk is set to "HIGH"
- If the forecast wind speed is between 1 and 3 meters per second (2.2 to 6.7 miles per hour), the risk is set to "MODERATE"
- If the forecast wind speed is greater than 3 meters per second (6.7 miles per hour), the risk is set to "LOW"

Risk Zone 2:

- If the forecast wind speed is lower than 1 meter per second (2.2 miles per hour), the risk is set to "MODERATE"
- If the forecast wind speed is greater than 1 meter per second (6.7 miles per hour), the risk is set to "LOW"

Figure 10-1: High Odor Risk Wind Direction Zone



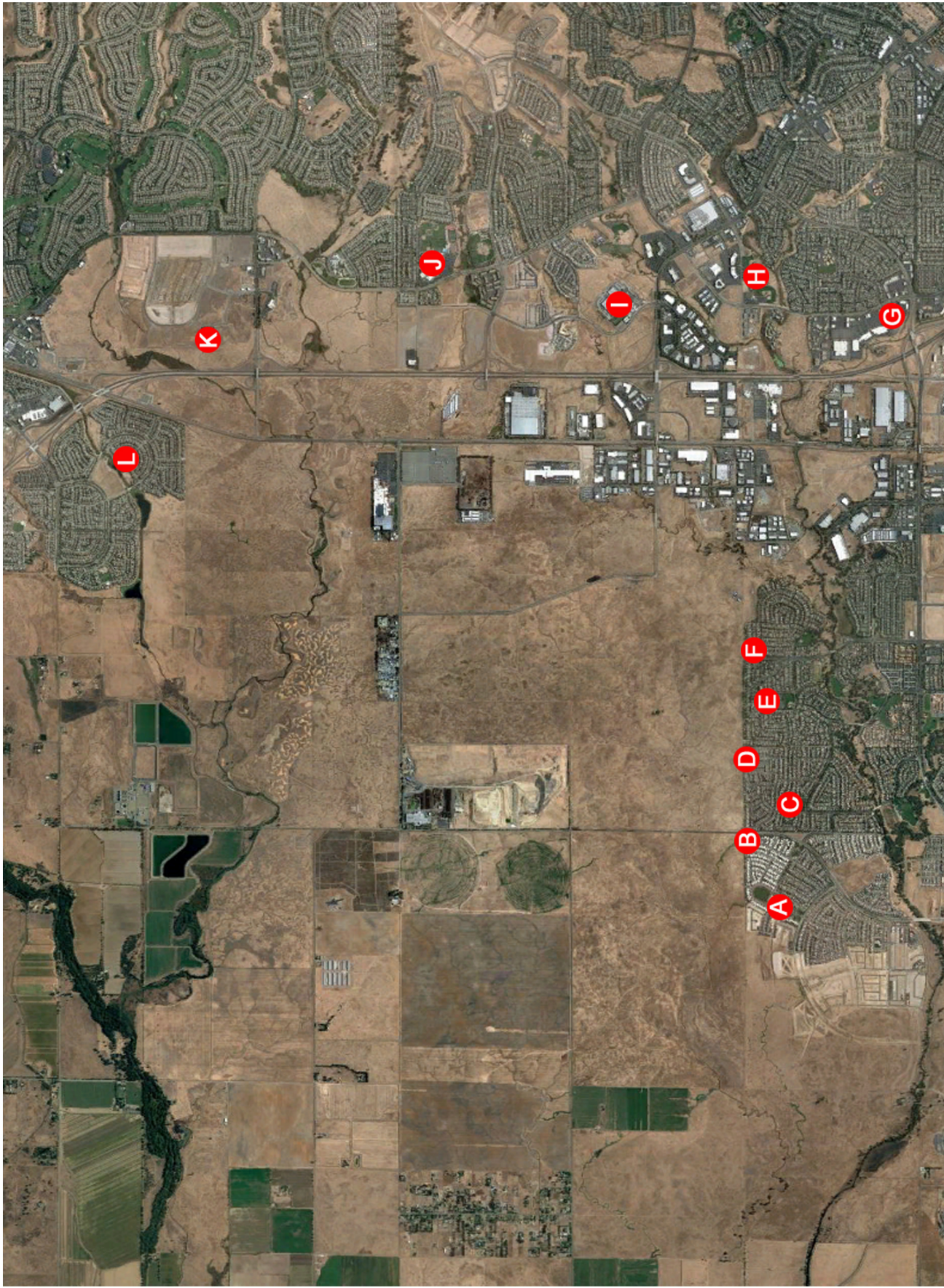
The WPWMA intends to use on- and off-site odor monitoring results to calibrate and verify the accuracy and efficacy of this odor risk tool and will adjust the aforementioned criteria, as necessary, to provide reasonable and realistic odor risk predictions for use by the WPWMA, its facility operators, contractors and consultants.

C. Routine On- and Off-site Odor Monitoring by WPWMA Staff

In addition to the odor investigation efforts by WPWMA staff as noted in Section 10E below, the WPWMA conducts periodic on- and off-site odor monitoring to record the type and intensity of odors that have the potential to be experienced by nearby receptors. Figure 10-2 identifies the off-site odor monitoring locations.

On- and off-site monitoring is performed weekly and at times when odors are expected to be the most noticeable. Based on historical odor notification records received by the WPWMA, odors are most commonly reported as being experienced between the hours of 6 am and 9 am and between 5 pm and 8 pm. As a result, routine on- and off-site monitoring will most commonly be performed during the 6 am to 9 am time window. At each observation location, WPWMA staff record: 1) time, 2) noticeable odors and their description and intensity (on a scale of 1 to 5 with 5 being the most intense), and 3) specific observations about on-site facility operating conditions or off-site conditions (e.g. if it is trash collection day in the area, construction activities, surrounding land use conditions, etc.) that could be contributing to perceived odors. A template for the inspection report is included in Appendix E.

Upon return to the office, WPWMA staff will review and make a qualitative assessment of odor dispersion estimates from the WPWMA's dispersion modeling system corresponding to the recorded time of field observations, and a brief statement of how well these conditions matched with observed field conditions.



WPWMA Site-Wide Odor Plan
Routine Off-Site Odor Monitoring Locations

In the event that specific areas of the WPWMA's operations are noted as emitting higher than average odors, WPWMA staff meet and confer with its applicable facility operators, contractors or consultants to identify and document immediate mitigation measures that can be implemented by the applicable entity to reduce the potential for off-site odors.

D. Odor Notification System

The WPWMA utilizes an online odor notification system (using SurveyMonkey.com as the platform) that allows individuals who experience an odor to report it directly to the WPWMA. A link to the online notification system is prominently displayed on the WPWMA's website (www.WPWMA.ca.gov).

The online notification system provides users the ability to report the following information to the WPWMA:

1. Date and time the odor was first experienced
2. Duration of the odor
3. A description and relative intensity of the odor
4. The location where the odor was experienced
5. Individual's contact information (optional)
6. Any other comments pertinent to the notification (optional)

When an person files an odor notification with the WPWMA, an email summarizing the data noted above is automatically generated (using www.Zapier.com) and emailed to WPWMA and PCAPCD personnel. Additionally, select WPWMA staff (Program Manager, Environmental Resources Specialist and Engineering Technician) receive a text message (also generated by www.Zapier.com) that summarize the notification. Zapier's algorithm monitors the Survey Monkey website and sends the email and text alerts within fifteen (15) minutes of the notification being filed.

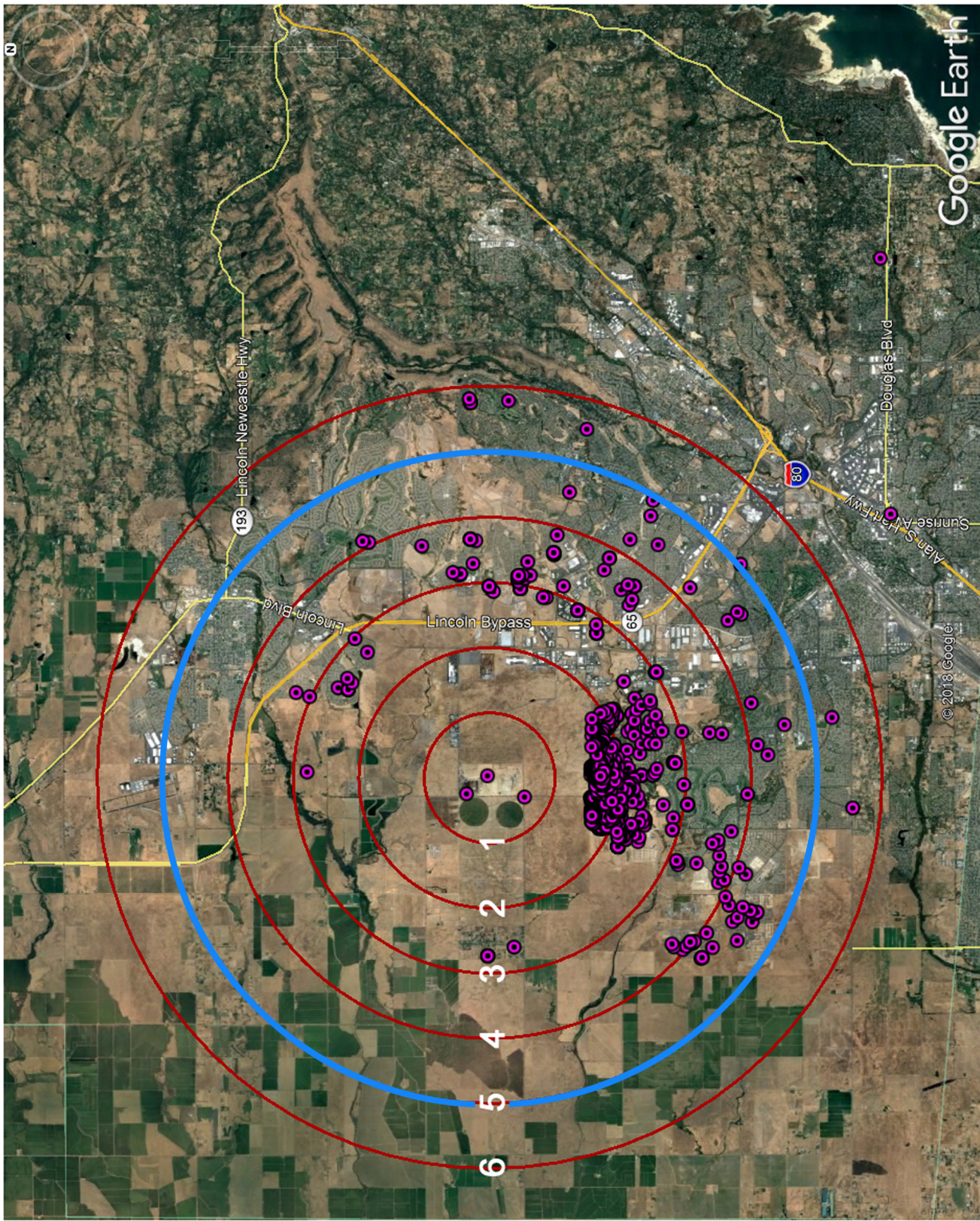
E. Odor Notification Investigation Protocol

It is the goal of the WPWMA to conduct a field investigation in the reported area for as many of odor notifications as the WPWMA deems practical.

When the WPWMA receives an odor notification via its website or from the PCAPCD, the following criteria will be used to determine if a field investigation will be conducted:

1. Was the odor notification filed in a timely manner and is it reasonable to conclude the reported odor conditions are still applicable? Unless the notification would suggest otherwise, field investigations will only be performed when odors are reported within two (2) hours of being experienced.

2. Is the identified location of the odor proximate enough to the WPWMA's facilities to suggest the WPWMA's operations could be a contributing source of the reported odors? Based on historical data, the WPWMA considers any notifications outside of a five (5) mile radius measured from the center of its facility to not be sufficiently proximate to warrant a field investigation. Figure 10-3 represents the area in which field odor investigations will generally be conducted.
3. A field investigation will not be conducted for notifications received outside of normal business hours (8 am to 5 pm, Monday through Friday) or on WPWMA Observed Holidays unless specifically directed by the WPWMA Board of Directors or WPWMA Executive Management or as noted below.
 - If five (5) or more independent notifications are received within a one (1) hour period and when:
 - the notifications are clustered within a ¼-mile radius of one another
 - the odors are reported within one (1) hour of being experienced
 - the reported odor intensities are equal to or greater than 4
 - the notifications include the individual's name, phone number and email contact information
4. A field investigation will not be conducted if conditions could put WPWMA staff in physical danger (e.g. during thunderstorms, heavy rains, extreme heat, etc.) or would necessitate WPWMA staff to trespass on private property or other clearly marked non-accessible areas.
5. A field investigation will not be conducted if insufficient staff is available to conduct the investigation or other business needs of the WPWMA are determined by WPWMA's management (Program Manager or above) to be of greater immediate importance to facility operations, the environment, or public health than performing the investigation.



WPWMA Site-Wide Odor Plan
Location of Odor Notifications and 5-Mile Investigation Zone

If, based on the above criteria, a field odor investigation is warranted, one or more WPWMA staff will perform the investigation in accordance with the following protocol:

1. Identify where the reported location is relative to the WPWMA's facility.
2. Check the WPWMA's facility weather station and observe the surrounding environment to ascertain general wind speed and direction and any other relevant atmospheric conditions.
3. If leaving from the WPWMA offices, wear a safety vest with WPWMA logo, Placer County-issued or other form of photo identification, and WPWMA business cards. If possible and practical, use a WPWMA vehicle. Proceed to the reported address noting any presence of odors between the WPWMA's facility and the subject address. Note the exact time of arrival at the subject location.
4. If safe, walk around the vicinity of the reported address and record any noticeable odors. To the degree possible, document a description of the odor(s) and rank the intensity on a scale of 1 to 5 with 5 being the most intense. If no odors were detected, record as "No odor detected".
5. If members of the public are noted outdoors in the vicinity of the subject address (e.g. at a park, gas station, outside their residence, etc.), inquire if they smell (or smelled) anything recently that would corroborate the notification. Identify and explain who you are and what you are doing. Ask open ended, non-leading questions to not inadvertently bias responses.
6. Prior to leaving the area, note the exact time of departure. If returning the WPWMA's facility, attempt to follow a route that is directly downwind of the facility (and upwind of the reported location) noting any change in odor and intensity.
7. If any of the odors noted during the field investigation are reasonably identifiable as potentially emanating from the WPWMA's facility, conduct a brief facility inspection of the suspect operations to identify any factors that may have resulted in an increased release of odors (e.g. compost turning and grinding operations, recent receipt of highly odiferous loads, GCCS shutdown, etc.)
8. To the degree possible, document the findings within 24 hours using the Investigation Summary Report form included as Appendix E.

F. Odor Notification Investigation Report Procedures

The following summarizes the procedures the WPWMA follows for preparing and issuing an odor notification investigation report:

1. Prepare and download a video clip from the WPWMA's odor monitoring and dispersion modeling system that displays the estimated odor dispersion plume relative to the location identified in the odor notification. Depending on conditions and other proximate (time and location) odor notifications, prepare the video clip to begin approximately 30 minutes to 1 hour prior to the earliest time the odor was reported as first being experienced and approximately 1 hour after the latest time the odors were experienced.
2. Download the relevant information from the Odor Notification System and the Odor Monitoring and Dispersion Modeling System for incorporation into the investigation report template shown in Exhibit D.
3. Identify and select the nearest upwind, pre-defined modeling location for the purposes of identifying and recording site and time-specific odor intensity estimates for inclusion in the report template.
4. Add a summary of the onsite investigation (if any) to the report template.
5. Email the completed report template and video clip to the individual who reported the odor (if an email was provided) and to the PCAPCD.

G. Operational Review, Analysis and Adjustment

If, as a result of on-site or off-site odor monitoring (including odor notification field investigations), WPWMA staff are able to reasonably identify one or more of its facility operations as being a contributor to the documented odors, WPWMA staff will meet and confer with its applicable facility operator(s), contractors or consultants to identify factors that may have resulted in an increased release of odors.

As part of this discussion, WPWMA staff and the applicable facility operator(s), contractors, or consultants will work to determine if any of the identified BMPs were not met which, if implemented, may have reduced the potential for the odor to noticeable off-site.

If it is determined that an identified BMP was not followed, the WPWMA will submit a Non-Compliance Event Form to the PCAPCD and WPWMA staff or the applicable facility operator(s), contractors or consultants will provide the necessary follow-up and training of operational staff to ensure the BMPs are adhered to.

If it is determined that the identified BMPs were followed but were insufficient on ten (10) or more occasions within a one-year period,

changes to the applicable facility operation(s) may be implemented (to the degree they are technically and economically feasible and fully comply with all applicable laws and operating permit conditions) which could include, but not necessarily be limited to, the following:

1. Identify additional BMPs, including investigation or identification of emerging technologies or innovative practices, and update the SWOP as appropriate;
2. Reduce the frequency of the operational practice to the degree practical while continuing to maintain regulatory compliance with all other material throughput requirements and to maintain customer and facility operator safety;
3. Provide information to neighbors (via the WPWMA's website) regarding operational practices or facility construction activities that have the potential for increased odors and an estimate of the possible duration of the applicable operational practice or construction project.

H. Odor Monitoring and Investigation Document Retention Policy

All information collected or produced under this section, including but not limited to, routine on- and off-site odor investigation findings and reports, odor notification information received by the WPWMA via its online odor notification system, odor notification investigation reports and findings related to any necessary operational review and adjustment will be kept in electronic format for at least three (3) years and will be available for review upon request.

11. PUBLIC EDUCATION & OUTREACH

The WPWMA continues to engage with local residents to help educate and inform them about the critical function the WPWMA plays in managing solid wastes generated in Placer County in an environmentally secure and financially stable manner while meeting federal and state regulations related to solid waste management.

At the appropriate time and venue, the WPWMA is also able to provide information about facility and non-WPWMA odors sources, efforts by the WPWMA to reduce odors at its facility, mechanisms for the public to report odors they experience directly to the WPWMA, and the procedures the WPWMA uses to investigate and follow-up on reported odors.

Opportunities to engage the public regarding odors include, but are not necessarily limited to, the following:

A. Annual Meetings

Beginning in 2011, the WPWMA has conducted an annual public meeting at its facility designed to specifically engage nearby residents who have the potential to experience odors associated with operation of the WPWMA's facility. These meetings have typically focused on the

WPWMA providing information about its operations, why odors from these operations may be experienced by nearby residents and specific efforts the WPWMA has taken to monitor, measure and reduce odors associated with its operation. The meetings also serve to provide an open forum for residents to engage directly with WPWMA staff.

Subject to the limitations noted in Section 14 of this SWOP, the WPWMA intends to continue conducting these meetings in the future to the degree the public finds them helpful and informative.

B. Website

The WPWMA will post and maintain an up to date version of this SWOP on its website. Information from the annual meetings noted above will also be posted and maintained on the WPWMA website.

To provide timely, useful information to the public and the PCAPCD regarding potential odor events, the WPWMA will investigate developing an area on its website devoted to identifying current operational factors (e.g.: anticipated GCCS downtime for maintenance or construction, after hours or weekend operation of the WRSL, significant short-term variations in the waste received that could result in excessive odors, etc.) that could lead to the increased perception of off-site odors.

C. National Night Out Event

When possible, and when invited by the sponsoring neighborhoods, WPWMA staff will attend National Night Out events at proximate neighborhoods to provide information about the WPWMA's facility and answer questions about odors and how they can be reported to the WPWMA and the PCAPCD.

D. Coordination with Neighborhood and Homeowner Associations

The WPWMA will contact each of the neighborhood or homeowner associations in Lincoln, Rocklin and Roseville that are located within five (5) miles of the WPWMA's facility for the purposes of establishing a consistent method of communicating with these communities regarding facility odor issues. The WPWMA will suggest that each interested association appoint a representative that will serve as the primary contact for communications with the WPWMA. The emphasis of these communications will be to inform the public about the critical public service the WPWMA provides, how and why odors from the operation may be experienced, how to report odors to the WPWMA, and any known operations or projects by the WPWMA that may result in increases to notable odors.

As a part of these (and other appropriate outreach venues), WPWMA will provide information on how to report odors to the WPWMA via its on-line odor notification system.

12. REVIEW OF ODOR CONTROL TECHNOLOGIES

WPWMA staff will regularly monitor the solid waste industry, including active participation in the Solid Waste Association of North America trade group, to identify, evaluate and consider implementation of new odor control technologies or operating methodologies and will report and/or recommend implementation of the identified technologies or methodologies to its Board of Directors at a regularly scheduled meeting.

13. REPORTING AND RECORDKEEPING

All records and reports prepared or received in accordance with the provisions of this SWOP will be maintained by the WPWMA for a period of three (3) years and will be made available for review by the public in accordance with applicable law.

14. WPWMA BOARD APPROVAL PROCESS AND AVAILABILITY OF FUNDING

Any and all actions noted in this SWOP are subject to the approval by the Western Placer Waste Management Authority Board of Directors, including but not limited to the annual allocation of financial resources to cover the cost of all equipment and labor necessary to perform these actions and the need to comply with all current and future regulatory mandates.

REFERENCES

- ¹ Placer County Department of Public Works. (1977). *Southwestern Placer County Regional Sanitary Landfill Environmental Impact Report*, (State Clearinghouse #77121995). Page 6
- ² Environmental Management Consulting/C.E. Schmidt, PhD, *WPWMA Odor Assessment* (2015)
- ³ T.R. Card and C.E. Schmidt (2012, March 14) *Air Emissions Control for Composting Operations*. Retrieved from <https://www.biocycle.net>
- ⁴ As defined in California Code of Regulations Title 14, Division 7, Chapter 3.1
- ⁵ Environmental Management Consulting/C.E. Schmidt, PhD, *Landfill Active Face Odor Management Handbook* (2019)
- ⁶ <http://www.epa.gov/stationary-sources-air-pollution/municipal-solid-waste-landfills-new-source-performance-standards>
- ⁷ <https://ww3.arb.ca.gov/regact/2009/landfills09/landfillfinalfro.pdf>
- ⁸ Placer County Community Development Resources Agency, Planning Services Division. (2018). *Draft Environmental Impact Report: Sunset Area Plan/Placer Ranch Specific Plan* (State Clearinghouse #2016112012) Page 4.3-2
- ⁹ <https://en.wikipedia.org/wiki/CALPUFF>

APPENDIX A:
BMP CHECKLIST

Site-Wide Odor Plan- Operational Best Management Practices Checklist

Date		Prepared by:	
------	--	--------------	--

MRF

1	Process MSW within 48 hours of receipt	YES	NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear materials have been processed within the required timeframe?				
2	ADC screened to remove oversized materials	YES	NO	
If NO, document observation.				
3	No overnight storage of ADC	YES	NO	
If NO, document observation.				
4	No overnight storage of residue	YES	NO	
If NO, document observation.				
5	Stormwater pond aeration system operating	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Insufficient water volume <input type="checkbox"/> DO reading \geq 1 mg/l <u>reading</u>				
6	No overnight storage of residue	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> MRF operated outside of Landfill waste acceptance hours.				
7	Waste removed from processing lines at end of shift	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Mechanical or electrical issue limiting operability.				
8	Waste removed from floors and other surfaces underneath processing equipment	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				
9	Waste removed from floors and other surfaces underneath processing equipment	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				
10	Waste removed from floors and other surfaces underneath processing equipment	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				
11	Waste removed around baling areas	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				
12	Waste removed around ADC load-out area	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				
13	Close at least 2 of the 3 MRF receiving floor doors at the end of the day	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Confirmed via CCTV cameras.				
14	Sweep asphalt areas around the MRF	YES	NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Cleaning in process.				

Site-Wide Odor Plan- Operational Best Management Practices Checklist

Compost Facility

1	Plan and perform operations consistent with weather predictions and SWOP Section 8F	YES		NO	
NOTE: Based on reasonable observations does it appear operations were planned consistent with the daily odor risk forecast? If NO, document observation.					
2	Perform initial grinding of greenwaste within 7 days of receipt	YES		NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear materials have been processed within the required timeframe? If NO, document observation.					
3	Perform initial grinding of highly odiferous load of greenwaste within 48 hours of receipt	YES		NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear materials have been processed within the required timeframe?					
4	Introduce ground greenwaste to windrows or ASP within 14 days of grinding	YES		NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear materials have been introduced to windrows or ASP within the required timeframe? If NO, document observation.					
5	Cover foodwaste and other compostable materials with ground greenwaste within 2 hrs	YES		NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear materials have been covered within the required timeframe?					
6	Move applicable materials to ASP and begin introducing air within 7 days	YES		NO	
NOTE: May not be able to be measured. Based on reasonable observations does it appear air was introduced within the required timeframe? If NO, document observation.					
7	Only windrow compost greenwaste	YES		NO	
If NO, document observation.					
8	Biofilter placed over ASP within 24 hours of a section reaching maximum height	YES		NO	
If NO, document observation.					
9	ASP air system connected and operational	YES		NO	
If NO, document observation.					
10	Maintain materials in windrows or ASP for minimum prescribed timeframes	YES		NO	
Will require documentation from MRF Operator.					
11	Maintain materials in curing piles for minimum prescribed timeframes	YES		NO	
Will require documentation from MRF Operator.					
12	Wash down ASP surface areas daily	YES		NO	
If NO, document observation.					
13	North compost pond aeration system operating	YES		NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Insufficient water volume <input type="checkbox"/> DO reading \geq 1 mg/l <u>reading</u>					
14	South compost pond aeration system operating	YES		NO	
If NO, document observation or check appropriate box. <input type="checkbox"/> Insufficient water volume <input type="checkbox"/> DO reading \geq 1 mg/l <u>reading</u>					

Site-Wide Odor Plan- Operational Best Management Practices Checklist

Landfill

1	Minimize size of working face necessary to maintain safety	YES		NO	
NOTE: Based on reasonable observations does it appear the working face is as small as practical and safe? If NO, document observation.					
2	Minimize open air exposure time of wastes	YES		NO	
NOTE: Are newer wastes being placed over older wastes on a consistent basis? If NO, document observation.					
3	Bury sludge and other highly odiferous loads immediately upon receipt	YES		NO	
If NO, document observation.					
4	Begin placing daily cover immediately following last load of waste	YES		NO	
If NO, document observation.					
5	Utilize soil, MRF and C&D fines as specified in SWOP	YES		NO	
If NO, document observation.					

If NO,
document
observation.

**APPENDIX B:
2015 ODOR STUDY**

Western Placer Waste Management Authority
Roseville, CA

Odor Assessment



Report

Revision 4

November 2015

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Table of Contents

1. INTRODUCTION	1
SITE LOCATION	1
OBJECTIVES.....	1
SCOPE.....	2
2. SUMMARY	3
3. ODOR SAMPLING RESULTS	6
PROCESS DESCRIPTION	7
LANDFILL INACTIVE SURFACES.....	8
LANDFILL ACTIVE WORKING FACE.....	11
MATERIALS RECOVERY FACILITY (MRF).....	12
GREENWASTE COMPOSTING FACILITY.....	13
4. DATA ANALYSIS	15
INACTIVE LANDFILL SURFACES.....	15
LANDFILL ACTIVE WORKING FACE.....	15
MATERIALS RECOVERY FACILITY (MRF).....	16
GREENWASTE COMPOSTING FACILITY.....	16

Figures

Figure 1.1 WPWMA Location Map.

Figure 2.1 Overall Contribution to Site Odor by Process (Emission Units in DT/Min)

Figure 4.1 WPWMA Process Locations.

Figure 4.2 Sampled Grid Cells.

Figure 5.1 Interpolated Windrow Compost Emission Curve.

Tables

Table 1.1 Summary of Flux Chamber Testing at the WPWMA Facility (Active LF working face, Inactive LF working face, MRF, and Windrow compost facility).

Table 4.1 Summary of Landfill Gas Survey Data Since 2012 (Sampled Cells Highlighted).

Table 4.2 Portion of each Grid Cell Sampled Represented by the Methane Instantaneous Screening Ranges (internal spatial representation of grid cells tested).

Table 4.3 Sampling Results for Grid Cells (Odor Flux, DT/min-m²).

Table 4.4 Measured Odor Flux Values from the Active Working Face.

Table 4.5 Sampling Results for the MRF Odor Sources.

Table 4.6 Summary of Compost Facility Sampling Results.

Table 5.1 Calculated total emissions (DT/min) for each measured cell.

Table 5.2 Calculated total Emissions from Landfill Inactive Surfaces.

Table 5.3 Summary of Landfill Active Working Face Odor Emissions.

Table 5.4 Summary of MRF Odor Emissions.

Table 5.5. Summary of Compost Emissions.

Attachments

1. Data Validation Technical Memorandum
 - a. Field Data Sheets
 - b. Chain of Custody Sheets
 - c. Laboratory Reports
2. Sampling Plan

1. Introduction

Site Location

The test site, Western Placer Waste Management Authority (WPWMA) facility is located in Roseville, California. The site includes a municipal solid waste (MSW) landfill, a Materials Recovery Facility (MRF), and a green waste composting facility.

Figure 1.1 –WPWMA Location Map.



Objectives

The project objective of the Odor Assessment was to quantify surface odor emissions from the active landfill face, inactive landfill surface, the MRF, and the green waste compost facility. These sources are considered all major odor emission sources from this facility and the report for these sources is intended to be comprehensive. The primary specific objectives included:

- 1) Perform an odor source assessment/evaluation of key odor emitting sources on site,
- 2) Generate odor emission factors for odor sources,

- 3) Provide data that can be used to enhance the existing Odowatch® monitoring system for the purpose of providing more representative and accurate predictions (real-time) of off-site odor impacts to the surrounding areas, and
- 4) Coordinate with Odotech to integrate the resulting data into the WPWMA's Odowatch® monitoring system.

Scope

The project assessment includes four tasks:

1. quantifying the odor emissions from the landfill active face, including recently covered refuse;
2. quantifying the odor emissions from the landfill inactive surface;
3. quantifying the odor emissions from the MRF; and
4. quantifying the odor emissions from the windrow compost facility.

A summary of the scope per task is provided in Table 1-1. Samples were collected following the methodology and protocols identified in the Sampling Plan.

Sampling and analysis included the following methods.

- **Direct Odor Flux Chamber Measurements-** Odor samples were collected using a flux chamber conforming to EPA-approved design parameters and sampling methodologies (see Ref 1). Odorous air samples were collected and shipped overnight express, for next day laboratory analysis. Screening was also performed using a real-time instrument for hydrogen sulfide (H₂S) and colorimetric detector tubes for ammonia.
- **Olfactometry** – Odor concentration by olfactometry (ASTM E-679, see Ref 2) using Odor Science and Engineering, Inc. odor panel analyses was completed to determine the magnitude of odor emissions from each source, to determine the relative offensiveness of odors from each source, and to provide input data for dispersion modeling. Odor panel analysis included odor concentrations expressed as dilutions to threshold (D/T), odor offensiveness as measured by hedonic tone, and odor character descriptors.
- **Advective Flow Assessment-** Advective flow from appropriate sources (e.g., compost piles) was determined using a trace gas (10% helium) in the flux chamber sweep air by collecting gas samples for analysis of residual helium by ASTM Method D-1945.

Table 1-1. Summary of Source Testing at WPWMA (Active LF working face, Inactive LF surfaces, MRF, and Green waste compost facility).

Test Condition	Flux Tests	Comments
Landfill Active Working Face and Interim Cover	12	Samples were collected over several days representing a spectrum of municipal waste and different ages of daily cover (no gas well installation).
Inactive Landfill Surfaces	20	One grid cell for the 'zero-detect' area and four grid cells for the methane detected area; four flux test per grid cell.
MRF	12	Source testing on waste piles, inside and outside of structure over several days.
Windrow Compost Site	40	Testing of green waste tipping pile, chop pile, 5-to-6 days in the compost cycle, cure pile, and finish pile.
Compost Leachate Pond	1	
Blank Test	6	Minimum 5%
Replicate Test	6	Minimum 5%
TOTAL SAMPLES	97	

2. Executive Summary

Key Findings and Recommendations

1. The composting operation shows very low odor for a green waste composting process as compared to industry average. Consequently, there are not many alternatives that for the classic windrow composting operations to improve site emissions from composting. However, odor from the composting processes dominates the odor from the site (see pie chart). In order to significantly reduce odor from composting, a new technology must be applied such as aerated static pile (ASP) composting. Recent test data have shown ASP technologies can reduce odor emissions by at least 80%, and employing one of several ASP technologies would likely decrease site odor by over 50%. The second largest composting source, the chop pile, should also see and emissions reduction if the size of the pile were reduced. Given that the compost cycle is greatly compressed with the ASP Technology, a proportional reduction in this source is also expected to be gained since there will be a much greater demand for chopped green waste in the process.
2. The materials recycling facility (MRF) shows low odor as compared to the industry standard for refuse sorting and processing. The contribution to site odor from the MRF is relatively minor. But, since the MRF is very close to the site border, operational practices (closing doors) that would further reduce odors from the MRF should be considered since odor sources nearest to the property fence line have a relatively greater effect on odors detected off site.

3. The active face of the landfill shows odors that are typical of municipal landfills, however two waste streams tested show relatively high odor in this small area of the site. The land filling of municipal wastewater biosolids has a very high contribution to the odor from the active face. In addition, the alternative daily cover (ADC) from the MRF also has high odor compared to the municipal refuse. Options for controlling odors from these sources, as well as best operational management practice, should reduce odors from the active face. Engineering options may need to be considered for reducing the odors from the biosolids such as temporary cover applications.
4. The inactive landfill was tested using the screening data for methane from the regulatory required monitoring program. High variability was observed in the in these data. This was likely related to operational changes experienced in the field related to the energy plant operations. In addition, some of the inactive landfill areas showed about twice normal odor emissions on a surface area basis. This is also likely related to the collection of landfill gas as controlled by the energy plant on site. It is important that the landfill gas collection system be operated in such a fashion that the fugitive emissions from the inactive, covered landfill (which is a huge surface area of the site) results in the minimum fugitive landfill gas emission. Note that it is likely that the conditions experienced during the testing on site reflects an upset condition, and it is recommended that a retest of the inactive landfill be conducted in order to generate more representative odor emissions from the inactive landfill surfaces.

Program Summary

All sampling took place during the week of August 17, 2015 and the following Monday, August 24, 2015. All sampling was completed per the attached Sampling Plan. All data taken is provided in the attached Data Validation Technical Memorandum.

The overall contribution to total site odor for each of the site processes is shown in Figure 2.1. Composting and the inactive landfill surfaces dominate the site odor, with composting being the largest contributor to site odor.

Figure 2.1 Overall Contribution to Site Odor by Process.

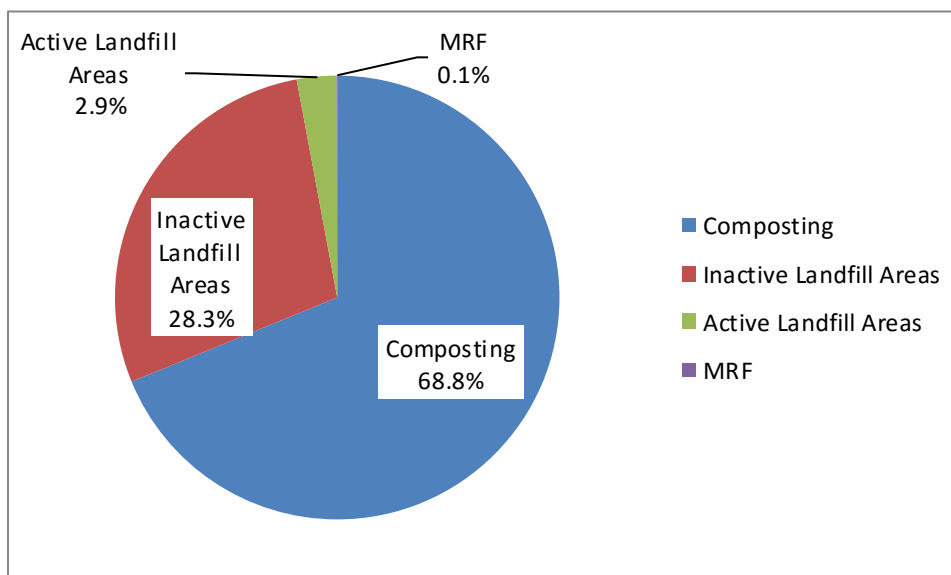


Table 2.1 presents a more detailed summary of sampling results. The windrow composting was the largest odor source on site. However, the composting operation was the lowest emitting composting source on a ton/day size basis, than any compost facility that we have recently tested (we have tested five similar facilities for odor in the last five years). This means that it is unlikely that any process changes to the windrow composting technology could lower the odor emission rate.

The next highest odor source on site are the inactive surfaces at the landfill. The estimate of the inactive surface emissions is driven predominantly by Grid Cell #39, that was anticipated to be low based on previous CARB screening, but turned out to be quite high. This grid cell may not be representative of all the low emitting cells. If not, then the estimate of the inactive landfill surfaces could be biased high by as much as a factor of 3. If Grid Cell #39 had the expected emissions, then the overall inactive surface emission value would be reduced to 700,000 DT/min instead of the measured 2,100,000 DT/min.

The remaining sources were very low, perhaps inconsequential. There were noticeable odors, from these sources, directly adjacent to these sources, but the odor from these sources was, in general, not detectable past the property lines.

The units in Table 2.1 are in DT/min. One DT/min is an odor emission rate approximately equal to 1 µg/min of hydrogen sulfide. If the site were vacant land, it would have an approximate emission rate of 650,000 DT/min.

Table 2.1 Summary of Sampling Results.

Source	Odor Emissions (DT/min)
Compost Tipping Pile	21,654
Compost Chop Pile	1,604,055
Compost Windrows	3,500,295
Compost Product	1,013
Ponds	31,126
Total	5,127,017
MRF Non-recycle Material	2,860
MRF Recycle Material	944
MRF ADC	199
Total	4,003
Open Face MSW	82,872
Open Face Biosolids	87,065
ADC on Landfill	33,249
Soil Cover on Landfill	10,963
Total	214,150
Inactive Landfill	2,105,365
Total Odor	7,481,661

3. Background on Odor Assessment Technology

Odors can be measured using both field and laboratory instruments. In the field, a scentometer is used (see Photo 3.1). This instrument is routinely used for odor regulation enforcement and can reliably measure odors down to 7.5 dilutions to threshold (DT). This means that the odor would require 7.5 cubic feet of odor free air to every 1 cubic foot of odorous air to render the result not-detectable by the average person.

Odor can also be measured in the laboratory using an olfactometer. A field sample is taken in a Tedlar® bag and shipped to a laboratory for analysis. The same units of measurement, dilutions to threshold (DT) are used for this. Photos 3.2 and 3.3 show the laboratory olfactometer and the odor bag sample.

When an odor sample is taken from a USEPA flux chamber (see photo 3.4) the odor source strength for a facility can be quantified. After a source has been quantified, the offsite impacts can be predicted using USEPA-approved dispersion models.

For this project, odor assessment included flux chamber testing, collection of gas samples in Tedlar bags, and off site analysis by the laboratory. Rather than ambient air testing using a scentometer, off site odor will be predicted by dispersion modeling. The advantage to this assessment approach is that the source assessment using the flux chamber provided valuable on site source apportionment data that is useful for diagnosing and remediating process odors, and these flux data are also used to develop odor emission factors which provide quantitative input to dispersion modeling that can be used to describe off site odors.

Photo 3.1 A Nasal Ranger® Scentometer.



Photo 3.2 Laboratory Olfactometer



Photo 3.3 Odor Sample in Tedlar® Bag



Photo 3.4 USEPA Flux Chamber



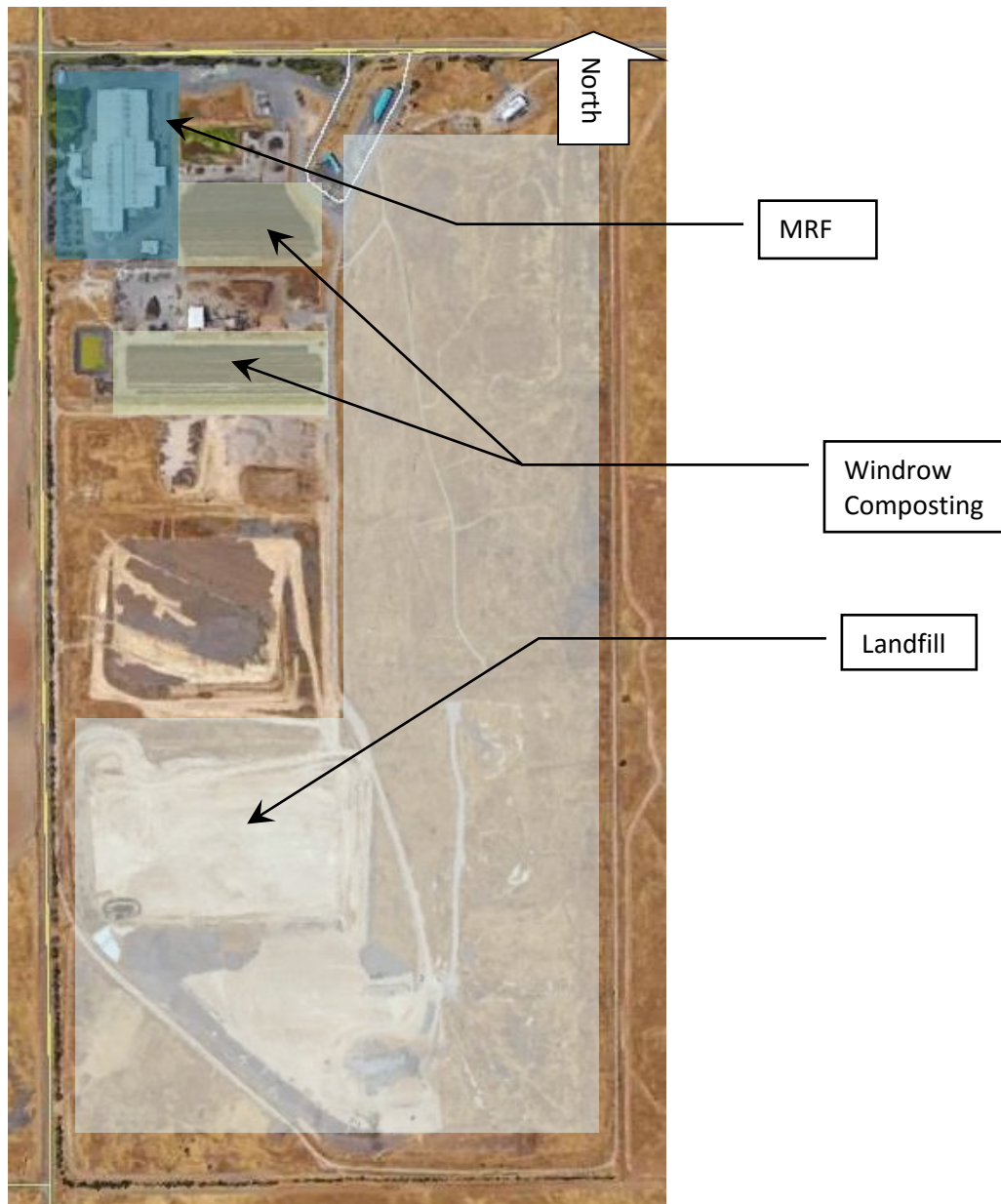
4. Odor Sampling Results

All sampling took place during the week of August 17, 2015 and the following Monday, August 24, 2015. All sampling was completed per the attached Sampling Plan. All data taken is provided in the attached Data Validation Technical Memorandum.

Process Description

The WPWMA Complex includes a Materials Recovery Facility (MRF), windrow composting, and a landfill. The location of these activities is shown in Figure 4.1. The site is approximately one-mile-long and 0.5 mile wide.

Figure 4.1 – WPWMA Process Locations.



Landfill Inactive Surfaces

Sample locations were selected based on the analysis of the annual/quarterly landfill gas screening data for methane emissions (integrated grid cell methane concentration data) that has been collected per the California Air Resources Board protocol (**Implementation Guidance Document for The Regulation To Reduce Methane Emissions From Municipal Solid Waste Landfills**). Methane screening data from 2012 to current was used as a surrogate for odor emissions. The CARB protocol is based on dividing the landfill into 50,000 ft² grid cells. Based on the analysis of the quarterly methane monitoring data, for the grid cells that are accessible and included in survey, all regularly monitored site grid cells have been placed into three groups, representing the highest emitting cells, lowest emitting cells, and the cells in between (see Table 4.1). Within these three groups, the grid cells have been ranked based on integrated methane grid data as shown, and one grid cell per group has been selected, on a methane emitted mass basis, to represent the group. The grid cell that represented the average methane emission for the group was selected as the primary target for sampling (see Table 4.1 for calculation). If that target grid cell was unavailable for testing, or not representative on the day of the test, then the grid cell closest to the average was selected.

In addition, a grid cell with no methane detection was selected to represent the 36 grid cells where no methane has been detected.

The technical approach for assessing the inactive landfill surface where historic methane emissions are used to represent current methane and odor emissions as a surrogate for odor, assumes that the operation of the landfill gas collection system is similar to the time of testing. Since operational changes in the landfill gas collection system were experienced prior to testing, it is likely that variation in landfill gas emissions compared to historic landfill operations resulted in additional variability in methane and odor emissions. This does not weaken the analysis per se, but it does add to variability in the measured data set and assumptions used in the calculation of inactive landfill gas odor emissions.

Although we had back-up grid cells selected for each test cell identified by the process described above, as shown in the data, divergence was found, in particular, with grid cell 39. The results found with this cell showed that the odor flux was actually the second highest cell tested where the historic methane data placed it in the low category of grid cells. Unfortunately, since the screening data collected for methane was also highly variable during the testing, there was no clear indication that an alternative grid cell should be used to represent this category. Regardless, the measured odor flux data were used to generate representative odor flux from the inactive landfill surface accounting for the observed variability in the data.

A summary of the tested grid cells is shown in Figure 4.2 and is given below:

Potential High Range Emitting: 129
Potential Mid-Range Emitting: 106, 104
Potential Low Range Emitting: 39
Zero-detect: 52

Figure 4.2 Sampled Grid Cells.

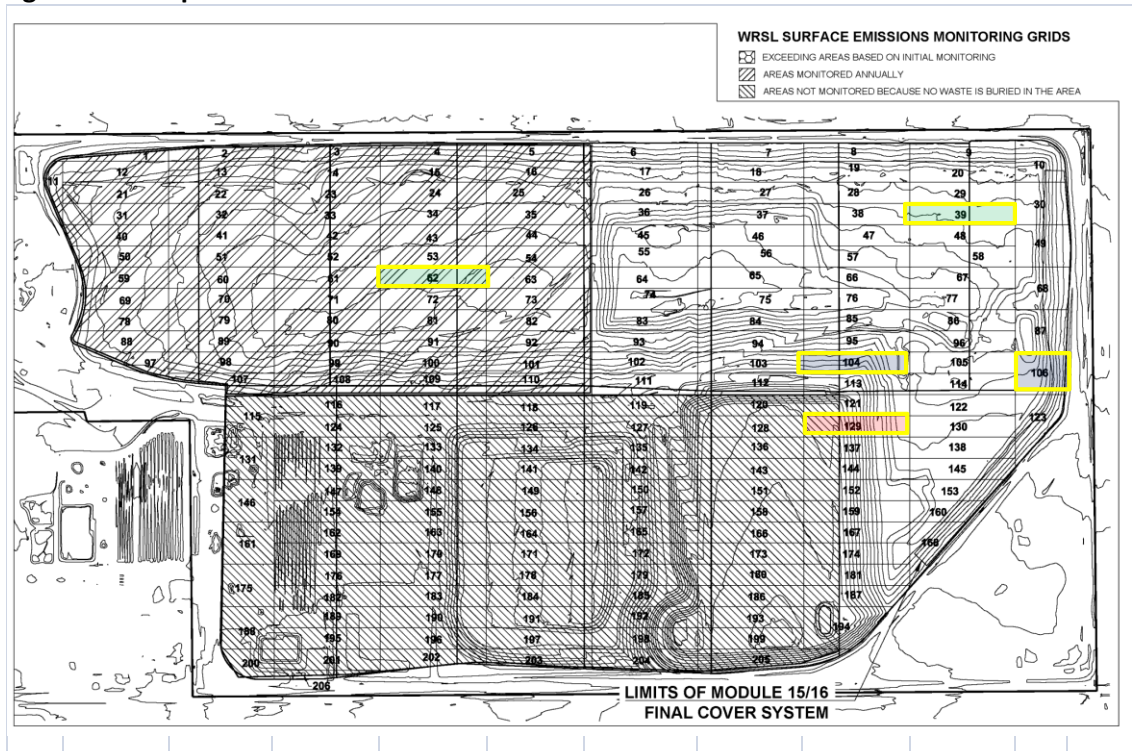


Table 4.1 Summary of Landfill Gas Survey Data Since 2012 (Sampled Cells Highlighted).

Index	Cell#	Average	StDev	Cumulative Sum	% of Total	Index	Cell#	Average	StDev	Cumulative Sum	% of Total
1	123	39.10	28.27	39.10	5.8%	66	56	1.54	2.54	654.24	96.7%
2	130	36.31	40.67	75.41	11.1%	67	28	1.31	2.46	655.55	96.9%
3	145	35.39	38.60	110.80	16.4%	68	65	1.23	2.45	656.78	97.1%
4	129	33.14	42.00	143.94	21.3%	69	6	1.15	1.46	657.94	97.2%
5	138	30.83	34.67	174.77	25.8%	70	27	1.15	2.73	659.09	97.4%
6	121	30.00	28.48	204.77	30.3%	71	79	1.00	1.73	660.09	97.6%
7	122	28.47	21.34	233.24	34.5%	72	97	1.00	1.73	661.09	97.7%
8	194	26.06	26.34	259.30	38.3%	73	107	1.00	1.73	662.09	97.9%
9	113	24.06	24.55	283.36	41.9%	74	109	1.00	1.73	663.09	98.0%
10	106	22.63	11.94	305.98	45.2%	75	110	1.00	1.73	664.09	98.2%
11	114	20.43	9.71	326.41	48.2%	76	7	0.92	1.38	665.01	98.3%
12	104	19.82	15.61	346.23	51.2%	77	75	0.92	1.32	665.94	98.4%
13	153	19.57	21.41	365.81	54.1%	78	45	0.85	1.57	666.78	98.5%
14	96	16.36	15.62	382.17	56.5%	79	64	0.85	1.72	667.63	98.7%
15	137	15.07	13.52	397.24	58.7%	80	36	0.77	1.17	668.40	98.8%
16	87	14.73	11.81	411.97	60.9%	81	17	0.69	1.70	669.09	98.9%
17	144	14.73	14.42	426.70	63.1%	82	26	0.69	1.49	669.78	99.0%
18	105	12.71	5.59	439.42	64.9%	83	74	0.69	0.85	670.48	99.1%
19	152	12.00	11.53	451.42	66.7%	84	42	0.67	1.15	671.14	99.2%
20	160	11.33	14.76	462.75	68.4%	85	98	0.67	1.15	671.81	99.3%
21	159	11.25	15.73	474.00	70.1%	86	99	0.67	1.15	672.48	99.4%
22	95	10.85	8.63	484.85	71.7%	87	108	0.67	1.15	673.14	99.5%
23	174	8.92	10.65	493.76	73.0%	88	18	0.46	0.78	673.60	99.6%
24	167	8.83	7.71	502.60	74.3%	89	3	0.33	0.58	673.94	99.6%
25	168	8.18	7.72	510.78	75.5%	90	11	0.33	0.58	674.27	99.7%
26	48	7.00	6.11	517.78	76.5%	91	12	0.33	0.58	674.60	99.7%
27	58	6.77	7.36	524.55	77.5%	92	21	0.33	0.58	674.94	99.8%
28	77	6.23	6.26	530.78	78.4%	93	50	0.33	0.58	675.27	99.8%
29	86	6.17	6.13	536.94	79.4%	94	51	0.33	0.58	675.60	99.9%
30	68	6.00	4.69	542.94	80.2%	95	53	0.33	0.58	675.94	99.9%
31	181	6.00	6.03	548.94	81.1%	96	100	0.33	0.58	676.27	100.0%
32	9	5.62	4.82	554.56	82.0%	97	101	0.33	0.58	676.60	100.0%
33	39	5.62	4.74	560.17	82.8%	98	1	0.00	0.00	676.60	100.0%
34	67	5.46	5.70	565.64	83.6%	99	2	0.00	0.00	676.60	100.0%
35	20	4.62	5.08	570.25	84.3%	100	4	0.00	0.00	676.60	100.0%
36	8	4.43	9.88	574.68	84.9%	101	5	0.00	0.00	676.60	100.0%
37	29	4.23	5.85	578.91	85.6%	102	13	0.00	0.00	676.60	100.0%
38	187	4.00	4.84	582.91	86.2%	103	14	0.00	0.00	676.60	100.0%
39	84	3.77	6.23	586.68	86.7%	104	15	0.00	0.00	676.60	100.0%
40	85	3.69	3.61	590.37	87.3%	105	16	0.00	0.00	676.60	100.0%
41	103	3.62	3.80	593.99	87.8%	106	22	0.00	0.00	676.60	100.0%
42	111	3.54	4.22	597.53	88.3%	107	23	0.00	0.00	676.60	100.0%
43	102	3.15	4.54	600.68	88.8%	108	24	0.00	0.00	676.60	100.0%
44	112	3.15	4.14	603.83	89.2%	109	25	0.00	0.00	676.60	100.0%
45	49	3.00	3.00	606.83	89.7%	110	31	0.00	0.00	676.60	100.0%
46	66	2.92	4.21	609.76	90.1%	111	32	0.00	0.00	676.60	100.0%
47	10	2.77	3.00	612.53	90.5%	112	33	0.00	0.00	676.60	100.0%
48	37	2.77	4.19	615.30	90.9%	113	34	0.00	0.00	676.60	100.0%
49	94	2.69	3.30	617.99	91.3%	114	35	0.00	0.00	676.60	100.0%
50	47	2.62	3.50	620.60	91.7%	115	40	0.00	0.00	676.60	100.0%
51	46	2.54	3.02	623.14	92.1%	116	41	0.00	0.00	676.60	100.0%
52	93	2.54	4.89	625.68	92.5%	117	43	0.00	0.00	676.60	100.0%
53	19	2.46	4.07	628.14	92.8%	118	44	0.00	0.00	676.60	100.0%
54	83	2.46	5.95	630.60	93.2%	119	52	0.00	0.00	676.60	100.0%
55	92	2.33	4.04	632.94	93.5%	120	54	0.00	0.00	676.60	100.0%
56	76	2.15	2.76	635.09	93.9%	121	59	0.00	0.00	676.60	100.0%
57	57	2.08	2.93	637.17	94.2%	122	60	0.00	0.00	676.60	100.0%
58	38	2.00	2.83	639.17	94.5%	123	61	0.00	0.00	676.60	100.0%
59	78	2.00	3.46	641.17	94.8%	124	62	0.00	0.00	676.60	100.0%
60	88	2.00	3.46	643.17	95.1%	125	63	0.00	0.00	676.60	100.0%
61	89	2.00	3.46	645.17	95.4%	126	69	0.00	0.00	676.60	100.0%
62	90	2.00	3.46	647.17	95.6%	127	70	0.00	0.00	676.60	100.0%
63	91	2.00	3.46	649.17	95.9%	128	71	0.00	0.00	676.60	100.0%
64	30	1.92	2.72	651.09	96.2%	129	72	0.00	0.00	676.60	100.0%
65	55	1.62	2.02	652.71	96.5%	130	73	0.00	0.00	676.60	100.0%
						131	80	0.00	0.00	676.60	100.0%
						132	81	0.00	0.00	676.60	100.0%
						133	82	0.00	0.00	676.60	100.0%

Within each grid cell, the field screening instantaneous methane data on the day prior to, and the day of sampling, allocated the area in each grid cell as low, middle, and high. Table 4.2 shows the portion of area in these ranges for each grid cell. For example, for Grid Cell #104, 85% of the total grid cell area (50,000 ft²) was represented by the low instantaneous methane screening range.

Table 4.2 Portion of each Grid Cell Sampled Represented by the Methane Instantaneous Screening Ranges (internal spatial representation of grid cells tested).

Cell Category	Grid No.	Low	Mid	High	Highest
Non-detect Grid Cells	52	25.0%	25.0%	25.0%	25.000%
Low Grid Cells	39	75.0%	20.0%	10.0%	0.003%
Mid Grid Cells	106	85.0%	10.0%	5.0%	0.003%
Mid Grid Cells	104	50.0%	25.0%	25.0%	0.003%
High Grid Cells	129	40.0%	40.0%	20.0%	0.003%

Finally, Table 4.3 presents the measured odor flux for each of these regions in each of the grid cells.

Table 4.3 Sampling Results for Grid Cells (Odor Flux, DT/min-m²).

Cell Category	Grid No.	Inter Cell Range Represented			
		Low	Mid	High	Highest
Non-detect Grid Cells	52	0.50	0.50	0.62	0.62
Low Grid Cells	39	5.27	0.42	6.27	6.81
Mid Grid Cells	106	0.35	0.42	13.62	405.08
Mid Grid Cells	104	2.04	2.42	1.23	0.88
High Grid Cells	129	0.50	1.23	29.19	163.00

Note that in Table 4.3, the highest reading only represents a single point in the 50,000 ft² grid cell and is therefore inconsequential to average grid emissions. The highest point was measured just to determine if there was odor breakthrough at any point on the grid surface.

Landfill Active Working Face

Five samples were taken from the active face (taken on two separate days) and one sample was taken from deposited biosolids. The sample values are presented in Table 4.4. The five measurements taken on two different days represent a normal variability of raw MSW on an active face. This source is typically highly variable, and the range of odor emissions observed on two different days and at five test locations is common to other active landfill surfaces tested at other sites.

The biosolids odor flux rate was about 50 times higher than the average MSW odor flux rate. This material, as demonstrated by the measured odor flux, is a significant contributor of active face odor emissions making the amount of this material or the surface area of this material disposed of at the active face of the landfill and key source of odor emissions. However, the active face as a source has been shown to contribute to only about 3% of the total site odor.

Table 4.4 Measured Odor Flux Values from the Active Working Face.

	Odor Flux
Source	DT/m2-min
Active Face	14.85
Active Face	22.88
Active Face	6.81
Active Face	6.81
Active Face	126.00
Average	35.47
Biosolids	1,863

Materials Recovery Facility (MRF)

Samples were taken from the various segregated materials in the MRF. Table 4.5 presents the sampling results. Based on these results, for MRF site odor analysis, all the combined solid waste values were averaged together and all the sorted recovered material were averaged together. The alternative daily cover was treated separately.

Table 4.5. Sampling Results for the MRF Odor Sources.

Source	Odor Flux (DT/min-m2)
Raw Commerical SW	4.81
Raw Commerical SW	4.08
Average	4.44
Raw Residential SW	4.08
Raw Residential SW	1.23
Raw Residential SW	1.58
Raw Residential SW	3.42
Average	2.58
Post-Sort SW	3.15
Post-Sort SW	3.15
Average	3.15
Plastics	0.88
Plastics	1.04
Average	0.96
Cardboard	1.23
Cardboard	0.88
Average	1.06
Alternative Daily Cover Material	6.81
Alternative Daily Cover Material	7.42
Average	7.12

Green Waste Composting Facility

Samples were taken from the feedstock pile, from active windrows at various stages (times) during the active composting process and from the finished product storage piles. The results are summarized in Table 4.6. Note the extreme variability of the chopped feedstock pile and the early compost cycle. In addition, mixing the compost rows resulted in the immediate lowering of emissions. Based on our experience emissions can either increase, decrease, or remain constant during mixing events. There currently is no hypothesis as to why the emissions decreased at this location. Our only comment is that highly aerobic compost material emissions are not very much affected by mixing. It is possible that the added aeration and the release of any gases in the interstitial spaces within the pile could result in lowering of the emissions after mixing.

Table 4.6. Summary of Compost Facility Sampling Results.

SOURCE	DAY	Odor D/T	Helium (%)	Helium Dilution	Total Flow (lpm)	Total Flow (m3/min)	Odor Flux DT/m2,min-1
Tipping Pile	Newer	30	9.91	1.304	38	0.038	8.8
Tipping Pile	Newer	12	9.91	0.638	78	0.078	7.2
Tipping Pile	Older	13	9.86	0.688	72	0.072	7.2
Tipping Pile	Older	58	9.86	0.686	72	0.072	32.1
Chopped Feedstock Pile	Newer	210	9.91	0.73	68	0.068	110
Chopped Feedstock Pile	Newer	354	9.91	0.8	62	0.062	169
Chopped Feedstock Pile	Older	11,615	9.86	0.775	64	0.064	5,684
Chopped Feedstock Pile	Older	163	9.86	1.024	48	0.048	60
Pre-mix Compost Windrow	0	638	9.89	0.366	135	0.135	663
Pre-mix Compost Windrow	0	82	9.89	0.816	61	0.061	38
Compost Windrow	1	35	9.86	0.874	56	0.056	15
Compost Windrow	1	45	9.86	0.967	51	0.051	18
Compost Windrow	1	23	9.91	0.696	71	0.071	13
Compost Windrow	1	2,990	9.91	0.85	58	0.058	1,341
						Average	347
Compost Windrow	5	979	9.89	0.426	116	0.116	874
Compost Windrow	5	126	9.89	0.272	182	0.182	176
Compost Windrow	5	4,602	10.01	0.642	78	0.078	2,760
Compost Windrow	5	250	10.01	0.409	122	0.122	235
						Average	1,011
Post Mix Windrow	5, T=0	1,553	9.89	0.893	55	0.055	662
Post Mix Windrow	5, T=4 hr	1,066	9.89	1.332	37	0.037	304
Compost Windrow	15	9	9.89	1.437	34	0.034	2.4
Compost Windrow	15	693	9.89	1.684	29	0.029	156.5
Compost Windrow	15	38	10.01	2.437	21	0.021	6.0
						Average	55.0
Compost Windrow	32	137	9.89	2.022	24	0.024	25.8
Compost Windrow	32	23	9.86	1.105	45	0.045	7.9
Compost Windrow	32	32	9.89	2.232	22	0.022	5.5
Compost Windrow	32	41	9.86	2.979	17	0.017	5.2
						Average	11.1
Compost Windrow	81	15	9.91	1.531	32	0.032	3.7
Compost Windrow	81	11	9.91	2.355	21	0.021	1.8
Compost Windrow	81	16	9.86	2.06	24	0.024	2.9
Compost Windrow	81	29	9.86	2.089	24	0.024	5.3
						Average	3.4
Compost Windrow	98	32	10.01	1.465	34	0.034	8.4
Compost Windrow	98	69	10.01	1.494	34	0.034	17.8
Compost Windrow	98	32	9.89	2.118	23	0.023	5.7
Compost Windrow	98	35	9.89	1.385	36	0.036	9.6
						Average	10.4
Finished Product	Newer	23	9.86	1.761	28	0.028	5.0
Finished Product	Newer	23	9.86	1.801	27	0.027	4.8
Finished Product	Older	38	9.89	3.983	12	0.012	3.6
Finished Product	Older	35	9.89	3.399	15	0.015	3.9
						Average	4.3
South Pond	As is	82	NA	NA	5	0.005	3.2

5. Data Analysis

In general, total process emissions are calculated by multiplying the measured odor flux value by the area the flux sample represented. However, in this section, the specific calculation methodology will be discussed in detail.

Inactive Landfill Surfaces

Each sampled grid cell was screened to determine the area to be represented (Table 4.2) and the measured flux values for each cell category (Table 4.3). Table 5.1 shows the total odor emissions calculated in this manner for each measured cell. Each cell is nominally 4,673 m². For example Non-detect grid low = 4,673 m² x 0.5 DT/min*m² x 25% = 584 DT/min

Table 5.1 Calculated total emissions (DT/min) for each measured cell.

Cell Category	Grid No.	Low	Mid	High	Highest	Total
Non-detect Grid Cells	52	584	584	719	719	2,606
Low Grid Cells	39	18,467	395	2,930	1	21,793
Mid Grid Cells	106	1,375	198	3,181	57	4,811
Mid Grid Cells	104	4,763	2,831	1,438	0	9,031
Highest Grid Cells	129	935	2,301	27,283	23	30,540

Then, based on Table 5.1, the number of cells that each tested cell represented were calculated. The total emissions from landfill inactive surfaces are the sum of all these individual emission cell ranges. Note that the second highest emission category was the low range grid cell. The sampling results for this cell (39) were not what were anticipated based on the screening assessment. The anticipated results would produce an emission estimate that would be dramatically lower than the measured results. It is possible that temporary gas system transients may have affected these results. The gas system was shut down due to power outage during the week of testing.

Table 5.2 Calculated total Emissions from Landfill Inactive Surfaces.

				Total
	Avg Flux	Emissions		Emissions
Cell Category	(DT/min-m2)	(DT/min)	# of Cells	(DT/min)
Non-detect Grid Cells	0.56	2,606	36	93,817
Low Grid Cells	4.66	21,793	79	1,721,634
Mid Grid Cells	1.48	6,921	11	76,131
Highest Grid Cells	6.54	30,540	7	213,783
				2,105,365

The anticipated emission rate for the low grid cells (based on the analysis of the CARB screening data) would be about 4,000 DT/min. If this were true, the total emissions would be reduced to about 700,000 DT/min instead of the 2,100,000 DT/min

Landfill Active Working Face

The emissions from the landfill working face area were calculated by using average areas multiplied the average measured flux values. Table 5.3 presents a summary of these calculations. Note that even

though the biosolids on the active face is a very small surface area, because their unit flux rate is significantly larger than that of the other solid wastes being buried, the resulting emissions from the biosolids are significant.

Table 5.3 Summary of Landfill Active Working Face Odor Emissions.

Source	Odor Flux (DT/min-m ²)	Area		Emissions (DT/min)
		(ft ²)	(m ²)	
Open Face MSW	35.47	25,000	2,336	82,872
Open Face Biosolids	1,863	500	47	87,065
ADC on Landfill	7.12	50,000	4,673	33,249
Soil Cover on Landfill	0.59	200,000	18,692	10,963
Total				214,150

Materials Recovery Facility (MRF)

Table 5.4 shows the emission calculations for the MRF. These emissions are quite low as compared to other solid waste sorting facilities. As they are now, they represent an insignificant odor source compared to the other process odor sources on site.

Table 5.4 Summary of MRF Odor Emissions.

Source	Odor Flux (DT/min-m ²)	Area		Emissions (DT/min)
		(ft ²)	(m ²)	
MRF Non-recycle Material	3.19	9,600	897	2,860
MRF Recycle Material	1.01	10,000	935	944
MRF ADC	7.12	300	28	199
Total				4,003

Green Waste Composting Facility

Computing the emissions from the windrow composting first involve calculating and averaging the flux rate for the windrow composting process. The process is first simulated by interpolating the measured process life cycle or 'days' to estimate the emissions for the process days that were not measured. For example, of the 90 to 100 days it takes the compost to mature, six of those days were sampled with the remaining day's emissions were estimated by interpolation. Figure 5.1 shows this interpolated emissions curve. The data represented by this curve was integrated to determine that the average compost emission rate at 94.5 DT/min-m² for the windrow process life cycle. Therefore, the average emissions, for each compost windrow, over the compost life cycle, is 94.5 DT/min-m².

Note that the vast majority of the emissions occur early in the compost cycle.

Based on the dimensions of the compost windrow, we can calculate the fraction of compost surface area per m² of pad area. This calculation shows that the compost surface area is 96.1% of the pad area.

Using these data, Table 5.5 was generated showing the total emissions from the composting operations. The emissions are dominated by the windrows, with a significant contribution from the chop piles.

The facility processes about 50,008 tons per year. This provides a compost emission factor of 25,548 DT/min per ton/day. The industry average (based on limited data) is about 200,000 DT/min per ton/day. This means that this facility is about 8 times lower in odor production than the industry average. This is the lowest odor emission factor for any windrow compost facility that we tested.

Figure 5.1 Interpolated Windrow Compost Emission Curve.

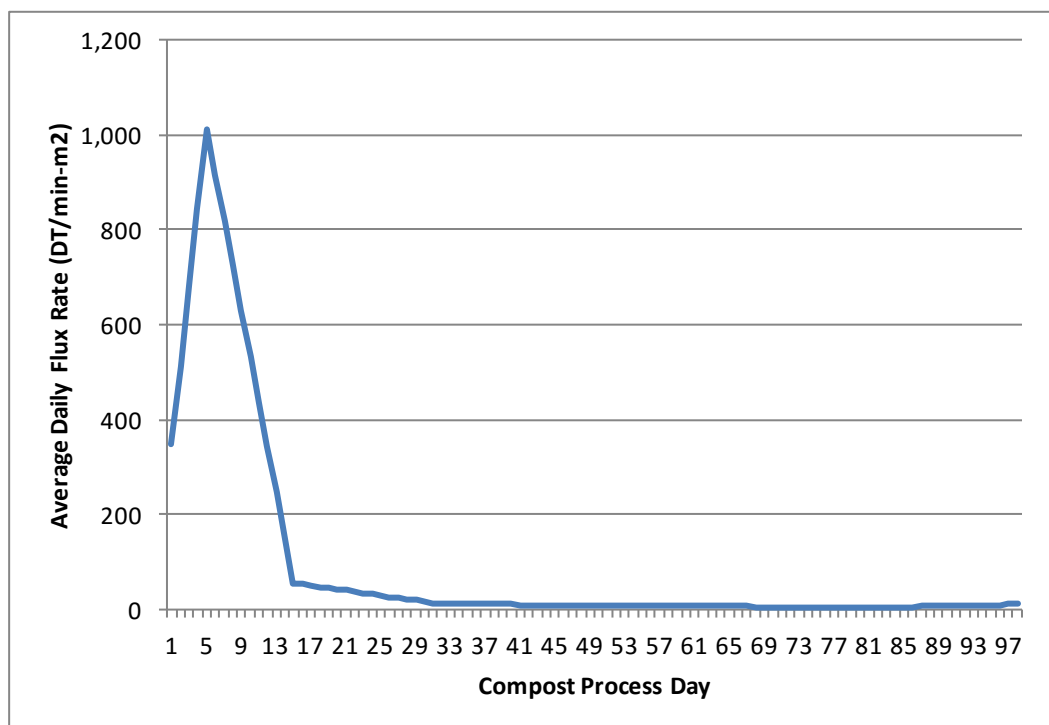


Table 5.5. Summary of Compost Emissions.

Source	Odor Flux (DT/min-m2)	Area		Emissions (DT/min)
		(ft2)	(m2)	
Compost Tipping Pile	14	16,800	1,570	21,654
Compost Chop Pile	1,506	11,400	1,065	1,604,055
Compost Windrows	94	396,346	37,042	3,500,295
Compost Product	4	2,500	234	1,013
Ponds	3.15	105,600	9,869	31,126
Total				5,158,143

APPENDIX C:
COMPOST ODOR IMPACT MINIMIZATION PLAN

Odor Impact
Minimization Plan

Western Placer Waste
Management Authority
Compost Facility

Revisions:

July 2016

April 2018

Contents

Section	Page
1 INTRODUCTION	1
Background	1
2 ODOR IMPACT MINIMIZATION PLAN	2
Odor Monitoring Protocol	2
Meteorological Conditions	4
Complaint Response Protocol	6
Design Considerations for Minimizing Odors.....	6
Operating Procedures for Minimizing Odors.....	9
Plan Revision.....	11

Table

1 Sources of Odor and Possible Management Techniques	T-1
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Appendices

A CIWMB Regulations regarding OIMP	A-1
B Compost Odor Wheel	B-1
C Historic Meteorological Information	C-1

ODOR IMPACT MINIMIZATION PLAN

Compost Facility

1.0 INTRODUCTION

California Integrated Waste Management Board (CIWMB) regulations, Title 14, CCR Section 17863.4 require that all compostable material handling operations and facilities prepare and maintain a site-specific Odor Impact Minimization Plan (OIMP). The following OIMP has been developed to meet regulatory requirements and to serve as a documentation of site-specific operating procedures designed to minimize the potential for nuisance-level off-site odors.

1.1 BACKGROUND INFORMATION

Project Name: Western Placer Waste Management Authority
Green Material Compost Facility

Project Location: 3033 Fiddymment Road
Roseville, CA 95747

Mailing Address: 11476 C Avenue
Auburn, CA 95603

Landowner: Western Placer Waste Management Authority
3033 Fiddymment Road
Roseville, CA 95747

Project Contacts: Eric Oddo, Program Manager
Western Placer Waste Management Authority
11476 C Avenue
Auburn, CA 95603
916-543-3984

Regulatory Contacts: Paul Holloway, R.E.H.S
Placer County
Department of Health & Human Services
Environmental Health Division
3091 County Center Drive, Suite 180
Auburn, CA 95603
530-745-2345

2.0 ODOR IMPACT MINIMIZATION PLAN

The following provides specific information on compliance with §17863.4 (b) – (d). The text from Title 14 is presented in *italics* followed by the Facility's proposed method of compliance.

- (b) Odor impact minimization plans shall provide guidance to on-site personnel by describing, at a minimum, the following items. If the operator will not be implementing any of these procedures, the plan shall explain why it is not necessary.*

2.1 ODOR MONITORING PROTOCOL

- (1) an odor monitoring protocol which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and*

The closest receptors are WPWMA staff and the operators that work at the compost facility, buy-back facility, MRF, scalehouse, and landfill. On-site staff is the best source of real-time information regarding odors.

One mile south, southeast and southwest of the WRSL property boundary are residential developments referred to as Crocker Ranch and Fiddymont Farm; the composting facility is approximately .7 miles north of the WRSL property boundary. Both developments include residential housing and schools. These are the primary off-site receptors.

Other potential receptors not in the primary path of air movement but also of concern since the wind direction sometimes moves towards these locations in relation to the WPWMA's facilities are established residential neighborhoods approximately 2 miles north of the WPWMA and a casino approximately 1.5 miles to the northeast of the WPWMA. The majority of land within a close proximity of the WPWMA is designated as agriculture/pasture and no residential, commercial, or industrial developments exist, though some are being contemplated for the future.

There are a number of potentially competing odor sources within a reasonable vicinity of the composting facility as well. Approximately 2.5 miles southeast of the WPWMA's composting facility is a composting and soil blending facility (Mallard Creek). The Rio Bravo wood-burning power plant is located approximately 2 miles to the east. Both of these sources stockpile significant amounts of organic materials. These receptor locations are directly in the primary path of the air movement in relation to the WPWMA's compost facility. North of the WPWMA's

composting facility are a chicken farm and a dairy. The aforementioned casino, in addition to being a potential receptor, is also a potential odor source as the facility operates its own on-site wastewater treatment plant.

Approximately 1.5 miles to the east and southeast of the WPWMA are various industrial plants, including a propane dealer.

Please see Figure 1 to see the relationship of the facility to nearby receptors and competing odor sources.

As discussed above, there are a number of potential odor sources on the WPWMA site and in the vicinity:

On-Site

Western Regional Sanitary Landfill
C&D sort line
Material Recovery Facility
LFG to Energy plant (Energy 2001)
Composting Facility

Off-Site

Rio Bravo Wood waste to energy power plant facility

- 1.5 miles southeast of the WPWMA
- 0.35 miles northeast of Crocker Ranch;

Mallard Creek composting facility

- 1.75 miles southeast of the WPWMA
- 0.70 miles east of Crocker Ranch;

Placer Propane – propane dealer

- 1.75 miles southeast of the WPWMA
- 1.0 mile east of Crocker Ranch;

Invirotec –accepts and processes septage

- 1.5 miles northeast of the WPWMA
- 2.0 miles north-northeast of Crocker Ranch;

Thunder Valley Casino WWTP

- 1.5 miles to the east-northeast of the WPWMA
- 2.5 miles to the north-northeast of Crocker Ranch

Chicken farm

- 0.75 miles northwest of the northwestern corner of the WPWMA
- 2.4 miles north-northwest of Crocker Ranch;

Dairy farm

- 2.75 miles west-northwest of the northwestern corner of the WPWMA

- 3.6 miles northwest of Crocker Ranch.

The compost operator evaluates weather conditions, on-site odor conditions and planned operations to minimize the potential release of objectionable odors. These include good composting practices as described in the Report of Composting Site Information (RCSI) (appropriate C:N ratio, sufficient moisture content, adequate porosity, etc.) to minimize production and persistence of odors; and good housekeeping measures (like clearing spilled materials between piles, eliminating areas where water could pond, and maintaining reasonably sized stockpiles of feedstock and finished compost). Additional site-specific odor-minimization practices are detailed in Table 1.

If WPWMA or operator detects an objectionable on-site odor, they will follow the following protocol:

1. Investigate and determine the likely source of the odor.
2. Determine if on-site management practices could remedy the problem and immediately take steps to remedy the situation. Potential odor sources and likely management actions are shown in Table 1.
3. Determine whether or not the odor is traveling beyond the site by patrolling the site perimeter and noting existing wind conditions.
4. Enter observations in an odor log.

DESCRIPTION OF METEOROLOGICAL CONDITIONS

(2) a description of meteorological conditions effecting migration of odors and/or transport of odor causing material off-site. Seasonal variations affect wind velocity and direction shall also be described; and

The geographic proximity of the compost facility is classified as an Intermediate/Semi-Mediterranean climate. It is Mediterranean in the sense that there is a dry season and a wet season. The length of the "wet" and "dry" seasons can be highly variable. Typically rain falls between October and May, and is far less likely in June through September. Average yearly rainfall for the nearby town of Lincoln is 24.62 inches.

Summers are much like coastal Southern California, only slightly warmer, when "Delta" maritime breezes are present. Ocean breezes flow from the southwest to the northeast,

traveling up the Sacramento River delta. Because of the river delta and the absence of coastal mountains blocking ocean maritime breezes, cooling takes place during the normally hot summer months in the Sacramento Valley and Sierra Nevada Foothills. When Delta breezes aren't blowing and the winds come overland from the north, generally hot conditions prevail.

Winters are more characteristic of Oregon and Washington, with rain and fog, but with slightly warmer temperatures due to more southerly latitude. Winter storms can come from three different sources. The first and the most common is the North Pacific Storm which brings rain and fog to the coast, and then through the Sacramento River Delta and up into the foothills. The second type of winter storm comes from the Gulf of Alaska. These are much colder than the North Pacific Storms. The third type of winter storm comes from Canada and is rare. These are very cold and occur when storms manage to make it across Idaho, Montana and Nevada and the barrier mountains to the east, and can result in snowfall as low as the Sacramento Valley floor.

Historical wind directional data has been compiled for the area surrounding the WPWMA. Wind roses for the project area showing the wind speed and direction for each month with direction estimated as emanating from a particular direction are contained in Appendix D. The general direction of the wind during the winter months is to the south-southeast (from the north-northwest) and to the south-southwest (from the north-northeast) in the summer months.

With ambient air as the pathway, three different mechanisms may cause odors to migrate to the surrounding residential areas: inversion, diffusion, and advection.

Inversions are stable atmospheric conditions resulting in limited vertical air movement. Certain atmospheric conditions can cause a temperature inversion to occur, trapping odors near the ground. A temperature inversion is a situation where a warmer body of air is located above a colder air mass, inhibiting the vertical movement of gases. One situation in which a low level, or surface inversion, might take place is on a clear night, when the earth's surface radiates heat away rapidly. If the air is clear, the ground and the air directly above it can be cooler than the air at higher altitudes. In many cases, temperature inversions are most prevalent from the evening to the early morning, which could explain why odors are more prevalent at those times.

Diffusion is the process whereby compounds move from a region of higher concentration to one of a lower concentration. Diffusion could cause odors to be detected even upwind of the Compost Facility. Odors experienced when wind is coming from varying directions could be an indication of diffusion causing dispersion of odors.

The third pathway is *advection*. Odors can be carried long distances by the wind. Based upon review of meteorological data in the vicinity of the Compost Facility, the wind generally blows from the facility toward the residences, indicating that advection may contribute to the dispersion of odors to residential areas.

The facility has an on-site weather station to monitor wind speed and direction, temperature, and other meteorological functions. The on-site weather station is consulted prior to scheduling major material handling activities. Daily records are logged to generate site-specific historical weather pattern information.

COMPLAINT RESPONSE PROTOCOL

(3) a complaint response protocol; and

Facility management will use the following protocol in responding to citizen-reported odor notifications and complaints.

Response to Citizen Complaints

The WPWMA solicits feedback from the public regarding facility odors and provides an Odor Notification Form on its website so that residents can quickly and easily report any experienced odors.

Upon receipt of an odor notification, WPWMA staff will:

1. Check and record weather conditions (especially wind direction) at the time of the notification.
2. Visit the location of the complaint (when possible) and attempt to characterize the odor.
3. If the complainant location is downwind of the WPWMA facility, staff will contact the compost facility operator to verify the operating conditions and activities at the time of the complaint.
4. Staff will document all of the information gathered and potential source (s) of the odor in the Odor Complaint log.

5. Respond to the complainant within 24 hours of receiving the complaint, or within 24 hours of returning from weekends or holidays should the complaint be received during those times.

Upon receipt of a complaint or notification of a complaint by the WPWMA staff, the compost facility operator will:

1. Promptly provide information needed to assess the nature and source of the odor.
2. Consider implementing one or more of the management practices (if deemed feasible, given the time of year, particular source of the odor, etc.) listed in Table 1.
3. Monitor and adjust management practices and report results to WPWMA staff.
- 4.

DESIGN CONSIDERATIONS FOR MINIMIZING ODORS

(4) a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and

Method and Degree of Aeration

Green waste windrow composting aeration is largely a function of the particle size of the feedstock, the moisture content and the height of the pile; collectively this is often referred to as “porosity”. ASP composting of food waste and other organics uses forced aeration via perforated pipes at the base of the piles that inject air into the piles eliminating the need for turning.

Moisture Content of Materials

Most of the material received consists of mainly woody material (shrubs, trees, bushes, etc.) with a small percentage of materials that have high moisture content, like grass clippings and food waste. It has historically been necessary to add significant amounts of water to maintain the minimum amount of moisture for effective composting.

Feedstock Characteristics

Windrow composting feedstock consists of green material, yard trimmings, and wood waste, as they are defined in 14 CCR §17852. ASP composting feedstock may include source

separated green waste, food waste, and mixed paper or a mix of these and other organic materials recovered from MRF sorting operations.

Airborne Emission Production

The main sources of dust and potential odor-carrying particles at the facility are from material handling, grinding, windrow turning, screening, and traffic. All access roads to the site are paved and properly maintained to minimize dust. Proper moisture management during the composting process also helps to prevent dust generation. Because of these measures, the storage and transfer of feedstock does not increase ambient levels of dust around the site. To the extent possible, dust generating-activities will be scheduled based on wind conditions.

Process Water Distribution

Process water is moved around the site using water trucks. In addition, the windrow turner is equipped with a mechanism to add water directly to the windrows as the piles are turned.

Pad and Site Drainage and Permeability

The MRF drainage system consists of ditches, berms, culverts, a stormwater detention basin and two compost leachate retention basins. With the exception of the compost leachate retention basins, the drainage system is designed to accommodate a 10-year, 12-hour storm per the requirements of the Placer County Stormwater Management Manual. The northern compost retention basin design is based on a 100-year, 24-hour storm event, with no discharge. The southern compost retention basin is designed based on a 500-year, 24-hour storm event, also with no discharge. All non-contact water from the MRF is directed to the stormwater detention basin for eventual discharge off-site. All contact water/leachate from the green and wood waste receiving, processing and storage area is directed to the northern compost retention basin.

The northern compost pad is paved and bisected by a drainage channel which drains the grinding pad and the compost pad into the north leachate pond.

Equipment Reliability

All equipment shall be maintained per manufacturer recommendations. The compost facility has an on-site back up windrow turner. The MRF has additional front-end loaders and manpower that could be directed to the composting operation in the event of an equipment failure.

Personnel Training

Personnel assigned to the compost facility have been trained in subjects applicable to the compost site operation and maintenance, load checking procedures, and heavy equipment operations. Monthly safety meetings occur on various topics to ensure proper and safe

procedures are followed. All heavy equipment operators must go through a training period before they are able to run each piece of machinery (loaders, roll-off, water truck, etc.). The training records and safety meeting attendance are kept on file.

Weather Event Impacts

Inversions are the most likely weather event to impact the facility (see discussion under Meteorological Conditions). Occasional severe rains could limit production at the compost site, but rarely last long enough to severely interrupt operations. The facility can be impacted by peak loads that can arrive after wet periods in the winter. As described in Table 1, the facility has developed contingency measures for these conditions.

The facility is equipped with a recording weather station and also has a prominently displayed windsock to direct on-site operations.

Utility Service Interruptions

Most mobile equipment is powered by diesel engines, with the exception of the horizontal grinder, which is electric. During an extensive outage a contract grinder could be brought in, though this would be an unlikely occurrence. Incoming green material could also be run across the adjacent C&D processing line, which also has an electric grinder.

Water Source

Potable water is available via on-site wells.

OPERATING PROCEDURES TO MINIMIZE ODOR

(5) a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel) weather impacts, biofiltration, and tarping.

The Facility manages all odor-producing areas of the facility to minimize the development of conditions that could lead to odor problems. A key management tool in this effort is the use of a recording weather station and the windsock. Other possible management tools are summarized in Table 1.

Areas with the potential for odor generation include:

Feedstock Receiving Area. Incoming feedstocks can generate odors if they are stored for excessive periods of time, particularly during the rainy season. In order to minimize these potential odors, the Facility will process material regularly and within regulatory limits. Food waste feedstock is introduced into the ASP process immediately upon receipt. Odors from

incoming materials can also be generated upstream of the facility, depending on collection practices (e.g. most curbside greenwaste is collected every other week).

Aisles between Processing Areas. Aisles between processing areas and windrows can be sources of odor if raw, uncomposted, or improperly mixed material is left for excessive amounts of time without being exposed to the high temperatures of composting. The facility practices good housekeeping methods which include regular patrolling of all aisles to clean any spilled materials. Additionally, all surfaces from the receiving area through the composting pads have been designed and graded so that contact water moves efficiently into the leachate ponds, minimizing potential ponding in raw feedstock areas.

Composting Piles. Odors emanating from windrows typically indicate problems in the initial mixing, turning frequency, pile porosity, and/or moisture content of the pile. The operator strives to manage the windrows with appropriate carbon to nitrogen ratio, assure adequate initial mixing, and maintaining adequate moisture within the piles. Piles are turned every 2 to 3 days. Any odors detected from the windrows will be corrected using the techniques described in Table 1.

Odors from ASP are controlled via the biofilter layer consisting of finished compost overs applied over the piles as well as the introduction of air into the piles via perforated pipes.

Curing Piles. Curing piles have the potential to create odors if unstable material is moved to curing too soon. In order to minimize curing odors, the operator will ensure that material is adequately composted prior to moving it into the curing pile.

Storm Water Retention Basin/Compost Leachate Pond.

The compost leachate ponds could cause odors if they were overloaded with sediment or nutrients. The ponds are aerated allowing some volatile particles to be released in a controlled manner.

Aeration

Windrow composting relies on the particle size of the feedstock to allow for natural aeration. The spaces between the particles are referred to as porosity. A rough measure of porosity can be obtained by measuring bulk density. Piles are turned regularly which may help to reestablish porosity. The facility typically strives for a bulk density of 800 pounds per cubic yard in its initial piles.

ASP composting uses forced aeration via perforated pipes at the base of the piles that inject air, eliminating the need for turning.

Moisture Management

The majority of the feedstocks processed at the facility have relatively low moisture content. The site is adequately graded and paved to minimize ponding of water that could lead to odors.

Feedstock Quality

Windrow composting uses only clean, source separated green waste. As commercial hauling collection programs are relatively mature, contamination is relatively low. However, in some cases the frequency of collection can have an impact on odor generation. The operator will work with the green material haulers to identify loads which may have been left sitting for substantial time periods prior to collection and delivery to the facility. When possible these loads should be expedited to assure that they are processed in a timely manner and that the processed material is rapidly incorporated into a windrow.

ASP feedstock may include source separated food and green waste and/or a mixture of organic materials recovered from MRF processing operations. ASP feedstocks are generally more odiferous than the green-only windrow feedstock, thus they are not stored longer than necessary for incorporation into the ASP process and are covered with a biofilter upon pile formation.

Drainage Controls

As discussed above, the facility separates stormwater from “contact” water. Any water that contacts compost feedstock or active compost on the northern compost pad is directed to the central channel drain which bisects the pad and drains to the northern compost leachate pond. The drain could become a source of odors from entrapped sediment if not cleaned out regularly. Any water that contacts compost on the southern pad is directed to the southern compost leachate pond.

Pad Maintenance

The pads are maintained regularly on an as needed basis.

Wastewater Pond Controls

Regular maintenance of the stormwater and leachate ponds should minimize potential odors from these features. The leachate ponds are more likely to be a source of odors, though they are aerated regularly.

Storage Practices

Finished compost ready for sale is stockpiled at the north end of both the northern and southern compost pads and/or on a portion of the green/wood/C&D self-haul tipping area pad. Additionally, small bags of finished compost are manually bagged and marketed. On average, compost is stored for approximately ninety days with an anticipated maximum of six months. If

stored compost accumulates to the point of interference with operations and there is no other alternative, the excess will be used on-site for beneficial purposes or donated to member agencies of the WPWMA for use in parks or landscaping.

CONTINGENCY PLANS

The following provides information on contingency planning for facility equipment, water, power, personnel, weather impacts, and storage.

Equipment. All equipment is maintained per the manufacturer recommendations. The facility has a fulltime mechanic who does scheduled maintenance and repairs on the composting equipment. In the event of equipment breakdown, composting services can be contracted out or equipment could be rented to continue operations. The compost facility has an on-site back up turner and additional front-end loaders are also on-site as part of other operations.

Water. If needed, water could be brought in by tanker truck, but this is an unlikely situation. In the short term the facility could re-use water from either of the retention basins during periods when the regular water supply was interrupted.

Power. Most mobile equipment, except for the horizontal grinder, is powered by diesel engines. During the unlikely event of a prolonged power outage a contract grinder could be contracted to provide grinding services.

Personnel. Additional trained personnel could be made available from other Nortech operations.

Weather impacts. The only severe weather event impacts are heavy rainfall or high wind conditions that could temporarily impede processing activities.

Biofiltration. The windrow composting process may use a “pseudo-biofilter” or “compost blanket” to reduce odors in the initial windrows. This may include adding compost “overs” into the initial compost mix to increase porosity or may include using finished compost as a windrow blanket during the first few weeks. The ASP composting process utilizes a one-foot biofilter comprised of finished compost or compost overs on each pile.

Tarpping. WPWMA may use tarps if necessary to assist with odor reduction of compost feedstock.

Storage. Given the current throughput, the facility is limited by the amount of available pad space. Under peak loading conditions, it may be desirable to re-direct processed green material to an off-site location rather than try to force a large throughput through the system. The

operator has identified the potential for off-site receiving locations, such as direct land application of green material.

PLAN REVISION

(c) The odor impact minimization plan shall be revised to reflect any changes, and a copy shall be provided to the enforcement agency, within 30 days of those changes.

A copy of this Odor Impact Minimization Plan will be kept at the facility's on-site administration office. The OIMP will be revised to reflect significant changes to operations that affect the OIMP.

TABLES

Table 1, describing sources of possible odor and potential management techniques, follows this page. The mitigation measures contained in Table 1 are not necessarily cumulative, i.e., not all measures will be implemented simultaneously. It will be up to the operator to determine the applicability of a given technique to a given situation.

Table 1
Sources of Odor and Possible Management Techniques

Source of Odor	Possible cause	Management approach
Feedstock receiving	Material sitting too long prior to processing	Reduce size of processed material stockpiles. Create discrete feedstock stockpiles with greater surface to volume ratio. Consider blanketing odiferous materials with one-foot layer of woody overs (water lightly to reduce odor releases).
Feedstock receiving	Material arrives with odors	Expedite material processing. Develop load-specific handling measures Consider blanketing odiferous materials with one-foot layer of woody overs (water lightly to reduce odor releases). Develop alternative processing option for odiferous loads. Consider treating odiferous loads with an odor neutralizer added to the water truck or otherwise sprayed on.
Material processing (Grinding)	Grinding volatilizes particles	Expedite material processing. Increase operating shifts or grinder capacity. First in, first out, processing. Consider using odor neutralizer in the water spray for the grinder. Use the weather station, windsock, and/or operational experience to curtail grinding operations during unfavorable weather conditions.
Processed material storage	Storing processed materials for extended periods can cause odors.	Move processed material to a windrow within 48 hours. Stockpile woody overs for use in adjusting porosity and/or for blanketing material stockpiles and/or windrows.

Table 1 (Continued)
Sources of Odor and Possible Management Techniques

Source of Odor	Possible cause	Management approach
Material Handling (during composting)	Material handling releases odorous gases. Anaerobic conditions can form odorous compounds. Ammonia odor (high nitrogen level). Sulfur odor (anaerobic conditions). Varying odors in pile. Odors generated after turning. Excessive temperature.	Reduce handling activities during stagnant air conditions. Check and correct carbon to nitrogen ratio and porosity in windrows. Maintain adequate moisture in piles. Avoid over-watering piles. Increase turning frequency, check temperatures, check pH, increase porosity, increase additive. Increase surface to volume ratios of active piles. Consider using “Pseudo-biofilter” to reduce emissions.
Material Handling (Turning)	Turning releases odorous gases and volatilizes particles	Reduce or avoid turning activities during stagnant weather conditions. Reduce turning activities when light winds are in the direction of sensitive receptors Consider adding an odor neutralizer to the water truck to be used as a topical odor neutralizer (after windrows are turned) and/or into the windrow via the turner.
Curing piles	Excessive temperatures	Decrease curing pile size (height). Increase compost residence time prior to moving to curing. Review moisture content of in-process compost. Use passive aeration to add oxygen to the curing pile

Table 1 (Continued)
Sources of Odor and Possible Management Techniques

Source of Odor	Possible cause	Management approach
Material processing (Screening)	Screening volatilizes particles.	Reduce screening activity during stagnant air conditions. Reduce screening activity when wind is in direction of sensitive receptors. Mist water or neutralizer at dust generation points.
Aisles	Storm water allowed to pond Uncomposted material in aisles	Clean or sweep aisles of spilled material. (Particularly at the end of each day). Remove and replace woody overs and spilled materials from the pad on a regular basis. Mechanically sweep paved areas at the end of each day. Apply water and/or neutralizer to reduce dust conditions.
Drainage channel	Channel can become saturated and overloaded with sediment	Increase cleaning frequency of the drainage channel Install filter socks at the upstream end of the windrow pad, especially during the rainy season.
Leachate ponds	Standing water overloaded with nutrients or sediment	Install filter berm before ponds. Consider increasing aeration and/or chlorinating as necessary. Clean leachate ponds during the dry season.

Appendix A
CIWMB REGULATIONS REGARDING OIMPs

California Integrated Waste Management Board (CIWMB) regulations regarding Odor Impact Minimization Plans follow this page.

COMPOSTABLE MATERIALS HANDLING OPERATIONS AND FACILITIES REGULATORY REQUIREMENTS

April 4, 2003

Chapter 3.1 Compostable Materials Handling Operations and Facilities Regulatory Requirements

Article 1. General

Section 17863.4. Odor Impact Minimization Plan.

(a) All compostable material handling operations and facilities shall prepare, implement and maintain a site-specific odor impact minimization plan. A complete plan shall be submitted to the EA with the EA Notification or permit application.

(b) Odor impact minimization plans shall provide guidance to on-site operation personnel by describing, at a minimum, the following items. If the operator will not be implementing any of these procedures, the plan shall explain why it is not necessary.

(1) an odor monitoring protocol which describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors; and,

(2) a description of meteorological conditions effecting migration of odors and/or transport of odor-causing material off-site. Seasonal variations that effect wind velocity and direction shall also be described; and,

(3) a complaint response protocol; and,

(4) a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and,

(5) a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel), biofiltration, and tarping.

© The odor impact minimization plan shall be revised to reflect any changes, and a copy shall be provided to the EA, within 30 days of those changes.

(d) The odor impact minimization plans shall be reviewed annually by the operator to determine if any revisions are necessary.

(e) The odor impact minimization plan shall be used by the EA to determine whether or not the operation or facility is following the procedures established by the operator. If the EA determines that the odor impact minimization plan is not being followed, EA may issue a Notice and Order (pursuant to section 18304) to require the operator to either comply with the odor impact minimization plan or to revise it.

(f) If the odor impact minimization plan is being followed, but odor impacts are still occurring, the EA may issue a Notice and Order (pursuant to section 18304) requiring the operator to take additional reasonable and feasible measures to minimize odors.

Authority cited: Sections 40502, 43020, 43021 and 43209.1 of the Public Resources Code

Reference: Sections 43020, 43021 and 43209.1 of the Public Resources Code.

Appendix B COMPOST ODOR WHEEL

A Compost Odor Wheel, used to help determine the nature and therefore the cause of typical compost odors follows this page.

Appendix C
HISTORIC WIND INFORMATION

Historic wind speed and direction for the Compost Site follows this page.

APPENDIX D:
ODOR RISK FORECASTING TOOL

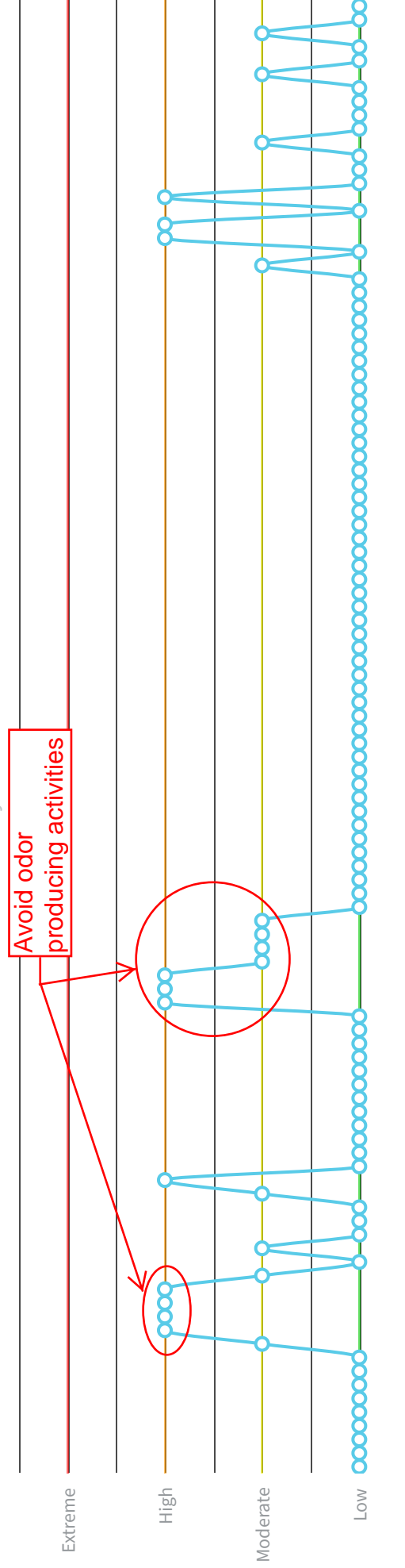
Odor Risk

Daily Risk

Site: Western Placer Waste Management Authority - Western Regional Sanitary Landfill
Report Issued: Aug 15, 2019 5:30 AM
Report Period: Shift starting Aug 14, 2019 6:00 PM

No Data None Low Moderate High Extreme

Weekly Risk Trend



None
Aug 14, 2019 6:00 PM
Aug 15, 2019 6:00 AM
Aug 15, 2019 6:00 PM
Aug 16, 2019 6:00 AM
Aug 16, 2019 6:00 PM
Aug 17, 2019 6:00 AM
Aug 17, 2019 6:00 PM
Aug 18, 2019 6:00 AM
Aug 18, 2019 6:00 PM

Night Shift - Wednesday

Aug 14, 2019 6:00 PM - Aug 15, 2019 6:00 AM













Hours	18 - 19	19 - 20	20 - 21	21 - 22	22 - 23	23 - 00	00 - 01	01 - 02	02 - 03	03 - 04	04 - 05	05 - 06
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Moderate</div>	<div><div></div>High</div>	<div><div></div>High</div>
Wind Direction	SW	S	S	SE	SE	E	SE	SE	SE	E	N	N
Mixing Height (m)	46.96	23.27	23.20	26.24	46.70	130.58	123.59	86.62	34.33	22.43	44.33	22.20
Temperature (°F)	89.37	83.32	80.86	75.37	73.82	74.15	70.87	68.76	67.21	67.92	63.27	62.52
Wind Speed (mph)	4.91	3.84	3.26	5.66	6.48	8.60	6.89	5.31	5.56	1.49	5.27	5.07
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

- Wednesday 18:00 - Thursday 03:00: Low odor risk
- Thursday 03:00 - 04:00: Low speed winds are causing a moderate odor risk
- Thursday 04:00 - 06:00: High odor risk due to winds blowing towards town

Day Shift - Thursday

Aug 15, 2019 6:00 AM - Aug 15, 2019 6:00 PM

Hours	06 - 07	07 - 08	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18
Risk	 High	 High	 Moderate	 Low	 Moderate	 Low	 Low	 Low	 Moderate	 High	 Low	 Low
Wind Direction	N	N	W	NW	W	W	W	W	NW	NW	W	W
Mixing Height (m)	32.09	47.37	99.42	214.96	320.04	442.11	496.21	579.25	678.45	810.26	536.20	99.33
Temperature (°F)	61.38	66.02	72.66	77.93	83.67	86.51	90.15	92.28	94.77	97.09	95.36	95.08
Wind Speed (mph)	3.73	3.01	2.71	4.69	2.95	6.15	5.11	5.21	2.80	2.45	7.07	4.28
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

- Thursday 06:00 - 08:00: High odor risk due to winds blowing towards town
- Thursday 08:00 - 09:00: Low speed winds are causing a moderate odor risk
- Thursday 09:00 - 10:00: Low odor risk
- Thursday 10:00 - 11:00: Low speed winds are causing a moderate odor risk
- Thursday 11:00 - 14:00: Low odor risk
- Thursday 14:00 - 15:00: Low speed winds are causing a moderate odor risk
- Thursday 15:00 - 16:00: High odor risk due to winds blowing towards town
- Thursday 16:00 - 18:00: Low odor risk

Avoid odor producing activities due to 3 continuous hour period of "high" odor risk. (See previous page for start of "high" risk period.)

Night Shift - Thursday

Aug 15, 2019 6:00 PM - Aug 16, 2019 6:00 AM

Hours	18 - 19	19 - 20	20 - 21	21 - 22	22 - 23	23 - 00	00 - 01	01 - 02	02 - 03	03 - 04	04 - 05	05 - 06
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>High</div>	<div><div></div>High</div>
Wind Direction	SW	S	SE	SE	SE	E	SE	S	SE	E	NE	N
Mixing Height (m)	49.23	23.28	23.11	55.71	86.33	185.50	129.77	89.84	40.97	22.47	45.88	22.35
Temperature (°F)	90.39	84.13	79.29	76.18	74.67	75.78	71.50	69.16	67.20	66.73	64.18	64.15
Wind Speed (mph)	4.40	3.62	4.72	7.20	6.95	10.73	6.48	5.95	5.59	4.57	6.36	5.80
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

Thursday 18:00 - Friday 04:00: Low odor risk

Friday 04:00 - 06:00: High odor risk due to winds blowing towards town

Day Shift - Friday

Aug 16, 2019 6:00 AM - Aug 16, 2019 6:00 PM

Hours	06 - 07	07 - 08	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18
Risk	<div><div></div>High</div>	<div><div></div>Moderate</div>	<div><div></div>Moderate</div>	<div><div></div>Moderate</div>	<div><div></div>Moderate</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>
Wind Direction	N	SE	W	W	W	W	W	W	W	W	W	W
Mixing Height (m)	22.28	35.16	114.04	289.80	487.19	620.08	646.72	680.19	904.73	907.91	731.59	263.94
Temperature (°F)	63.94	67.81	74.40	79.39	83.80	86.26	90.51	92.47	94.73	95.52	94.18	92.88
Wind Speed (mph)	3.83	1.61	1.41	2.75	2.67	3.18	3.75	4.62	4.48	5.24	6.57	4.32
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

Friday 06:00 - 07:00: High odor risk due to winds blowing towards town
Friday 07:00 - 11:00: Low speed winds are causing a moderate odor risk
Friday 11:00 - 18:00: Low odor risk

Avoid odor producing activities due to a 6 hour (or more) continuous time period of "moderate" (or worse) odor risk. (See previous page for start of "moderate" or worse risk period.)

Night Shift - Friday

Aug 16, 2019 6:00 PM - Aug 17, 2019 6:00 AM

Hours	18 - 19	19 - 20	20 - 21	21 - 22	22 - 23	23 - 00	00 - 01	01 - 02	02 - 03	03 - 04	04 - 05	05 - 06
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>
Wind Direction	S	S	SE	SE	SE	SE	SE	S	S	SE	S	SE
Mixing Height (m)	50.84	71.92	150.53	135.85	155.54	222.49	168.87	172.71	290.21	165.28	137.52	77.39
Temperature (°F)	89.26	82.74	77.80	75.21	73.35	72.92	69.89	67.44	65.60	62.71	61.17	59.94
Wind Speed (mph)	4.15	5.02	4.06	7.58	9.15	10.84	10.10	10.43	11.25	5.55	6.16	3.58
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

Friday 18:00 - Saturday 06:00: Low odor risk

Day Shift - Saturday

Aug 17, 2019 6:00 AM - Aug 17, 2019 6:00 PM

Hours	06 - 07	07 - 08	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>
Wind Direction	S	S	S	SW	SW	S	S	S	SW	SW	SW	SW
Mixing Height (m)	95.84	71.66	205.62	457.26	691.83	793.17	926.64	994.66	1038.81	1031.80	890.86	419.16
Temperature (°F)	59.83	64.10	68.22	72.47	77.64	81.57	84.21	85.12	85.99	87.26	86.43	84.67
Wind Speed (mph)	4.43	5.20	6.67	3.94	3.04	8.03	8.17	11.98	7.81	7.12	7.36	8.94
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

Saturday 06:00 - 18:00: Low odor risk

Night Shift - Saturday

Aug 17, 2019 6:00 PM - Aug 18, 2019 6:00 AM

Hours	18 - 19	19 - 20	20 - 21	21 - 22	22 - 23	23 - 00	00 - 01	01 - 02	02 - 03	03 - 04	04 - 05	05 - 06
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>
Wind Direction	SW	SW	S	S	SE	S	SE	S	S	S	SE	SE
Mixing Height (m)	62.91	27.04	319.23	67.29	339.14	410.00	439.97	368.24	378.23	195.34	149.25	49.74
Temperature (°F)	80.62	76.08	73.13	68.56	66.93	62.40	60.32	59.19	58.82	58.58	59.30	59.92
Wind Speed (mph)	8.27	10.10	13.06	9.14	7.60	14.52	12.32	10.31	9.94	11.59	7.77	4.36
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

Saturday 18:00 - Sunday 06:00: Low odor risk

Day Shift - Sunday

Aug 18, 2019 6:00 AM - Aug 18, 2019 6:00 PM

Hours	06 - 07	07 - 08	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18
Risk	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Moderate</div>	<div><div></div>Low</div>	<div><div></div>High</div>	<div><div></div>High</div>	<div><div></div>High</div>	<div><div></div>Low</div>	<div><div></div>High</div>	<div><div></div>Low</div>
Wind Direction	SE	S	S	S	SW	NW	NW	NW	W	NW	W	NW
Mixing Height (m)	255.35	287.72	495.73	532.39	769.66	929.97	925.92	903.57	846.37	955.45	950.34	819.55
Temperature (°F)	58.29	60.63	63.29	64.93	69.80	73.26	75.63	77.16	79.58	80.48	80.63	80.59
Wind Speed (mph)	4.51	3.37	4.15	3.41	1.89	5.38	4.46	7.66	5.18	8.34	4.99	4.74
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

- Sunday 06:00 - 10:00: Low odor risk
- Sunday 10:00 - 11:00: Low speed winds are causing a moderate odor risk
- Sunday 11:00 - 12:00: Low odor risk
- Sunday 12:00 - 14:00: High odor risk due to winds blowing towards town
- Sunday 14:00 - 15:00: Low odor risk
- Sunday 15:00 - 16:00: High odor risk due to winds blowing towards town
- Sunday 16:00 - 18:00: Low odor risk

Night Shift - Sunday

Aug 18, 2019 6:00 PM - Aug 19, 2019 6:00 AM

Hours	18 - 19	19 - 20	20 - 21	21 - 22	22 - 23	23 - 00	00 - 01	01 - 02	02 - 03	03 - 04	04 - 05	05 - 06
Risk	<div><div></div>Low</div>	<div><div></div>Moderate</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Moderate</div>	<div><div></div>Low</div>	<div><div></div>Low</div>	<div><div></div>Moderate</div>	<div><div></div>Low</div>	<div><div></div>Low</div>
Wind Direction	SW	W	SW	S	SE	SE	S	SW	SW	SE	S	--
Mixing Height (m)	68.73	60.55	232.63	191.73	200.07	240.66	22.28	89.46	120.59	86.33	113.56	--
Temperature (°F)	78.16	74.03	71.67	68.72	66.33	63.17	63.42	61.15	59.77	59.15	57.89	--
Wind Speed (mph)	6.65	2.95	8.34	8.75	4.67	5.87	2.46	4.07	4.87	2.13	5.20	--
Rainfall (mm)	--	--	--	--	--	--	--	--	--	--	--	--

Alerts

- Sunday 18:00 - 19:00: Low odor risk
- Sunday 19:00 - 20:00: Low speed winds are causing a moderate odor risk
- Sunday 20:00 - Monday 00:00: Low odor risk
- Monday 00:00 - 01:00: Low speed winds are causing a moderate odor risk
- Monday 01:00 - 03:00: Low odor risk
- Monday 03:00 - 04:00: Low speed winds are causing a moderate odor risk
- Monday 04:00 - 05:00: Low odor risk

APPENDIX E:
ODOR INVESTIGATION SUMMARY REPORT TEMPLATE

On- and Off-Site Odor Monitoring Event Summary

Date		Prepared by:	
Observed weather conditions			

Off-Site Location Notes

Location	A: Fiddymment Farms Elementary								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									
Location	B: Fiddymment Road and Settlers Ridge								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									
Location	C: Mel Hamel Park								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									
Location	D: Verrazona Drive and Vignolia Loop								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									
Location	E: Leonard Davis Park								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									
Location	F: Greywood Circle								
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5	
Notes:									

On- and Off-Site Odor Monitoring Event Summary (continued)

Location	G: Blue Oaks Theatres									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										
Location	H: Kathy Lund Park									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										
Location	I: William Jessop University									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										
Location	J: Whitney Highschool									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										
Location	K: Kaiser Lincoln									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										
Location	L: Pete Demas Park									
Time		Noticeable Odor: Y / N	Odor Intensity: N/A	1	2	3	4	5		
Notes:										

Comparison of Field Observations to Odor Dispersion Model Estimates

Notes:										
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APPENDIX F:
LFG AND LEACHATE MANAGEMENT SOP

LANDFILL GAS and LEACHATE MANAGEMENT

STANDARD OPERATING PROCEDURES



This document identifies the procedures for conducting operations and maintenance of landfill gas collection and control systems at the Western Regional Sanitary Landfill in compliance with regulatory obligations in a timely and safe manner.

Version **DRAFT**

Date: July 2020

Table of Contents	Page #
SECTION 1 Introduction	1-1
1.1 Goals	1-1
1.2 Site-Specific Variances	1-1
1.3 Procedures for Requesting Site-Specific SOP Variances	1-2
1.4 SOP Updates	1-2
1.5 Disclaimer	1-2
SECTION 2 General Information.....	2-3
2.1 Format of SOP	2-3
2.2 Health and Safety	2-3
2.3 Qualifications and General Requirements	2-3
2.3.1 Self-Performance of Work	2-3
2.3.2 Work by Trained and Certified Personnel.....	2-3
2.3.3 Skills and Knowledge.....	2-4
2.4 GCCS Emergencies	2-5
2.4.1 Notification to WPWMA Personnel.....	2-5
2.4.2 Regulatory Notification	2-5
2.4.3 Press/News Agencies	2-5
2.5 Contact Call Tree for GCCS Emergencies	2-5
SECTION 3 GCCS Operating Goals.....	3-1
3.1 Definitions	3-1
3.2 Vacuum Set Point.....	3-1
3.2.1 Goal of Vacuum Set Point.....	3-1
3.2.2 Changing the Vacuum Set Point	3-2
3.3 NSPS/EG Thresholds and WPWMA SOP Targets	3-2
3.4 Establishing Site-Specific Operating Limits.....	3-3
3.4.1 Management of Regulatory HOVs.....	3-3
3.4.2 Temporary Alternate Operating Limits.....	3-4
3.4.3 Permanent Alternate Operating Limits	3-4
SECTION 4 Wellfield Operation, Monitoring, and Tuning.....	4-1
4.1 Overview and General Principles	4-1
4.2 DATA TAGS.....	4-1
4.3 Identification of Wells and Probes Requiring Monitoring.....	4-2
4.4 Monitoring Equipment Minimum Standards.....	4-2
4.5 Monitoring Point Naming and Standard Comments.....	4-3
4.5.1 Calibration Reading IDs.....	4-3

4.5.2	Prime Mover Inlet and Outlet IDs.....	4-3
4.5.3	Inlet and Outlet of Each Blower IDs.....	4-3
4.5.4	Flame Arrestor Inlet and Outlet IDs	4-4
4.5.5	Greenhouse Gas Monitoring IDs.....	4-4
4.5.6	Replacement/Redrilled Wells	4-4
4.5.7	Allowable Comments	4-4
4.6	Vacuum Set Point and BLoWER/FLARE STATION Operation	4-5
4.7	Wellfield Component Integrity Checks.....	4-6
4.7.1	Survey Stakes or Poles	4-7
4.7.2	LFG Well and Collector Integrity.....	4-7
4.7.3	Valves and Condensate Management System Integrity	4-8
4.8	Wellfield Monitoring.....	4-8
4.8.1	Monitoring Schedule and Tuning Frequency	4-9
4.8.2	Conditions Required for Wellfield Monitoring.....	4-10
4.8.3	Field Monitoring Equipment Calibrations.....	4-10
4.8.4	Blower/Flare Station Monitoring.....	4-11
4.8.5	Wellhead Monitoring.....	4-11
4.8.6	Initial Wellhead Measurements	4-11
4.8.7	Adjusted Wellhead Measurements.....	4-13
4.8.8	Corrective Action Documentation and Rechecks	4-13
4.8.9	120-Day Exceedance Clock.....	4-14
4.8.10	Additional Monitoring Required	4-14
SECTION 5	Greenhouse Gas Monitoring.....	5-1
SECTION 6	Blower/Flare Stations.....	6-1
6.1	Operating Philosophy.....	6-1
6.2	Monitoring Minimum Requirements.....	6-2
6.3	Priority of Data Recorders	6-4
6.3.1	Remote Data Acquisition Systems.....	6-5
6.4	Restriction on Modifying Control Panels	6-5
SECTION 7	SUBSURFAce Gas Migration Monitoring.....	7-1
7.1	General	7-1
7.2	Site-Specific Monitoring Requirements.....	7-1
7.3	Monitoring Probe Construction	7-1
7.4	Timeline for Monitoring.....	7-2
7.5	Monitoring Procedures	7-2
7.5.1	On-Site Structure Monitoring.....	7-2
7.5.2	Probe Monitoring.....	7-3
7.6	Reporting	7-3

SECTION 8	Surface Emissions Monitoring	8-1
SECTION 9	Liquid Level Measurements.....	9-2
9.1	Overview of Liquid Level Evaluation Process	9-2
9.1.1	Basis of Calculations	9-2
9.2	Measurement Frequency	9-2
9.3	Equipment Specifications.....	9-3
9.4	Preparation	9-3
9.5	Liquid Measurement Procedure	9-3
9.6	Data Management	9-4
9.6.1	Site Build/As-Built Data	9-4
9.6.2	Field Measurements and Related Data	9-4
SECTION 10	Startup Procedures for New LFG Collectors.....	10-1
10.1	New LFG Collector Installation and Startup	10-1
10.1.1	Replacement Wells/Collectors.....	10-1
10.1.2	Startup Procedure for New Collectors	10-1
10.2	New GCCS Startup	10-2
SECTION 11	Data Management, Handling, and Reporting.....	11-4
11.1	Data Management and Handling.....	11-4
11.1.1	Data Management Responsibilities	11-4
11.1.2	Data Handling	11-4
11.1.3	Electronic Data.....	11-5
11.1.4	Written Log Book Data.....	11-5
11.1.5	Data Review	11-6
11.1.6	Data Approval.....	11-6
11.2	Reporting and Meetings	11-7
11.2.1	Daily Logs	11-7
11.2.2	Monthly Reports.....	11-7
11.2.3	Quarterly Reports.....	11-8
11.2.4	Monthly SOP Meetings	11-8
11.3	SSM Documentation.....	11-9
SECTION 12	Subsurface Oxidation Events.....	12-1
12.1	Symptoms.....	12-1
12.2	Notification	12-1
12.3	Initial Investigation.....	12-1
12.4	Data Analysis.....	12-2
12.5	Removing Sources of Oxygen.....	12-3
12.6	Things to Avoid	12-3

12.7 Continued Monitoring	12-4
12.8 Repairs.....	12-4
12.9 Timeline	12-4
SECTION 13 GCCS Inspection and Maintenance	13-1
13.1 Component Integrity Checks	13-1
13.2 Temporary Repairs.....	13-1
13.3 Cover Integrity and Well Inspection (MOnthly)	13-1
13.3.1 Cover Integrity	13-1
13.3.2 Well Casings	13-2
13.4 Control Device System Operation	13-2
13.5 Monthly Inspection and Maintenance	13-2
13.6 Quarterly Inspection and Maintenance	13-6
13.7 Semi-Annual Inspection and Maintenance	13-7
13.8 Annual Maintenance.....	13-7
13.9 Spare Parts	13-8
13.9.1 Control System	13-8
13.9.2 Collection System	13-8
SECTION 14.....	14-1
Leachate Collection System Operations	14-1
14.1.1 Pump Operation	14-1
14.1.2 Liquid level monitoring	14-1
14.1.3 Force Main Inspections	14-2
14.1.4 Flow meter monitoring and inspections	14-2
14.1.5 Monthly Monitoring of Leachate Water Quality	14-2
14.1.6 Annual LCRS Performance Testing	14-3

ABBREVIATIONS AND DEFINITIONS

Because it is common for state or local regulatory agencies to be delegated authority from U.S. EPA to implement federal environmental regulations, each state or local agency may define applicable terms differently or have different interpretations of how a Rule is to be implemented. Because of the wide variation that exists among agencies, specific definitions and interpretations are not addressed. It is the responsibility of the OM&M Provider to be aware of definitions and interpretations of Rules used by state or local agencies and to apply them appropriately, including the use of the following terms which, for purposes of this document, have these meanings:

Abandoned Well	An extraction well permanently removed from GCCS
ACO	Alternative Compliance Option(s)
APCD	Placer County Air Pollution Control District
CPVC	Chlorinated polyvinyl chloride pipe
Decommissioned Well	An extraction well that is temporarily removed from GCCS
EG	State Emission Guidelines for Municipal Solid Waste Landfills
GCCS	Gas collection and control system (landfill gas management system)
HASP	Health and Safety Plan
HDPE	High Density Polyethylene Pipe
Landfill Operations Manager	Person responsible for landfill operations - Other titles typically assigned to this individual include: General Manager, Site Manager, Operations Manager
LFG	Landfill gas
LFGE	Landfill Gas to Energy Facility
NSPS	New Source Performance Standards for Municipal Solid Waste Landfills
OM&M	GCCS operation, maintenance, and monitoring
OM&M Provider	Personnel responsible for the Operations and Maintenance of the GCCS. This term is used for internal WPWMA Environmental Technicians, Specialists, and management team and OM&M contractors.
OSHA	Occupational Safety and Health Agency
Prime Mover	Fan, blower, compressor or similar device used to generate negative pressure on the landfill gas collection system
PVC	Polyvinyl Chloride Pipe
SCADA	Supervisory Control and Data Acquisition
SEM	Surface Emissions Monitoring
SOP	Landfill gas management Standard Operating Procedures as described in this document
SOW	Site-specific scope of work for GCCS OM&M services
SSM	Startup, Shutdown and Malfunction
SWANA	Solid Waste Association of North America
WPWMA	Western Placer Waste Management Authority
WPWMA LFG Operations Manager	WPWMA staff representative(s) designated by the WPWMA to oversee the GCCS and LCRS operation

Terms not defined above shall have the meaning expressly defined in the body of this document.

SECTION 1 INTRODUCTION

This document presents the standard operating procedures (SOP) and minimum operation, maintenance, and monitoring (OM&M) efforts required of those parties responsible for performing landfill gas collection and control system (GCCS) management and leachate collection and recovery system (LCRS) OM&M services at the Western Regional Waste Management Authority (WPWMA) landfill. The procedures and guidelines apply to WPWMA employees and consultants and contractors providing GCCS OM&M services.

This document includes the procedures and minimum requirements for:

- Monitoring, inspection, and maintenance of GCCS and LCRS system components and ancillary equipment;
- Monitoring, inspection, and maintenance of blower stations and LFG control devices (flares, etc.);
- Data management; and
- Reporting related to GCCS and LCRS management.

1.1 GOALS

The WPWMA is committed to complying with federal, state, and local regulations related to LFG management and to being a good neighbor by controlling odor and subsurface migration of explosive gases that could potentially impact the surrounding community. To accomplish these goals and other goals, the WPWMA has adopted a stringent program for operating the GCCS and LCRS. This program may require effort above and beyond that which WPWMA is obligated to perform under applicable permits or regulations. The objective of this effort is to operate the GCCS in a proactive manner before issues arise that might otherwise demand immediate attention and/or substantial cost to remedy.

To ensure consistent and reliable GCCS operation, meet regulatory requirements, and be a good neighbor in the community, the GCCS must be operated with the following goals in mind:

- Meet and/or exceed the requirements of the federal New Source Performance Standards (NSPS) and Emission Guidelines (EG).
- Operate within the limits and guidelines of WPWMA's SOP.
- Control fugitive odors and surface emissions.
- Control subsurface LFG migration.
- Avoid negative groundwater impacts from LFG.
- Operate the GCCS using best industry practices in a professional and safe manner.
- Operate the GCCS to maximize the flow and methane content to the abatement devices

1.2 SITE-SPECIFIC VARIANCES

Site conditions and permit requirements may necessitate future site-specific revisions or modifications. Therefore, modifications may be requested with appropriate approvals of those changes by WPWMA's Manager, Landfill Gas Operations.

1.3 PROCEDURES FOR REQUESTING SITE-SPECIFIC SOP VARIANCES

If variances to the SOP are warranted to address updated conditions or permit requirements and not just as a matter of convenience, the process outlined below may be followed. Modifications will be considered and must be approved by WPWMA LFG Operations Manager.

At a minimum, a request for an SOP variance shall include:

- A. The original SOP statement, condition, or procedure redlined to illustrate the proposed changes.
- B. Engineering evaluation and supporting documentation that justifies the change, including:
 - 1. Engineering evaluation of the GCCS illustrating that changing the SOP, system or equipment would be beneficial, that the SOP cannot be met and is outside the control of the OM&M Provider and cannot be resolved through appropriate system or equipment modifications.
 - 2. Minimum of six months of data, testing information, or engineering calculations supporting the proposed change.
 - 3. Analysis showing that the proposed change does not impact any WPWMA goals or regulatory obligations.

1.4 SOP UPDATES

This SOP may be modified as new technology, methods, and procedures related to landfill gas management are adopted. Suggestions for changes should be directed to WPWMA's Manager, Landfill Gas Operations.

1.5 DISCLAIMER

Nothing presented in this document grants permission to any party engaged in GCCS OM&M services at the WPWMA facility to violate federal, state, or local laws, regulations, permits, ordinances, or consent orders while conducting the services.

SECTION 2 GENERAL INFORMATION

2.1 FORMAT OF SOP

Imperative and abbreviated language is used in the SOP that is directed at the party performing the OM&M services unless specifically noted otherwise. Note that whether stated imperatively or otherwise, all requirements must be met unless an approved variance is granted.

For incomplete sentences, the reader should insert “shall”, “OM&M Provider shall”, or similar mandatory phrases by inference.

2.2 HEALTH AND SAFETY

All WPWMA personnel performing work on LFG management systems shall abide by WPWMA health and safety policies and shall participate in WPWMA’s general safety training and supplemental training specifically related to landfill gas and leachate management. Each contractor, including the WPWMA GCCS and LCRS OM&M Provider(s) shall file with the WPWMA their own corporate and project-specific health and safety plans (HASP) prior to the commencement of work at any site, and abide by it.

2.3 QUALIFICATIONS AND GENERAL REQUIREMENTS

OM&M technicians are critical to the proper functioning of the GCCS. In order to ensure the project is staffed with professional and experienced technicians who perform services with WPWMA’s best interests in mind, WPWMA has implemented the following minimum personnel requirements.

- OM&M Providers shall provide routine and periodic training of field and office personnel from the Solid Waste Association of North America (SWANA) or similar trade group to ensure that services provided WPWMA are in accordance with the most recent state of the practice and consistent with industry standards and best practices.

2.3.1 Self-Performance of Work

The OM&M Provider must be able to self-perform all routine and non-routine services and have capability for performing monitoring, maintenance, troubleshooting, and repair work on all portions of the GCCS with the following exceptions:

- A. Electrical and mechanical repair and troubleshooting of proprietary systems (such as control logic, Supervisory Control and Data Acquisition [SCADA] Systems)
- B. Medium or high voltage electrical panel work
- C. Flare source testing

2.3.2 Work by Trained and Certified Personnel

Any confined space, excavation, or pipe fusion work conducted in support of OM&M work shall be performed only by trained and certified individuals, and the OM&M Provider shall take full responsibility for the safety and quality of work by their employees, contractors, and subcontractors. Certifications for such training shall be posted on the inside wall of the onsite job office.

2.3.3 Skills and Knowledge

Technicians performing OM&M services at WPWMA facilities must have a working knowledge of:

A. Equipment

1. Monitoring equipment (hardware, software, calibration procedures, etc.) used to perform the work.
2. Prime mover equipment (blowers, flares, control systems, compressors, piping, valves, gas driers, gas coolers, flow measurement devices, etc.).
3. LFG wellfield components (wellheads, vertical and horizontal wells, vents, geosynthetic liners and boots, electric and pneumatic pumps, drip legs, gravity traps, sumps, etc.).
4. Personal computers, specifically, software to download data, upload data to WPWMA's web-based LFG data management, email, and spreadsheets.
5. The WPWMA's GE iFix SCADA system software and related Historian Excel plug in.

B. Regulations and Permits

1. New Source Performance Standards (NSPS) for Municipal Solid Waste (MSW) Landfills (40 CFR 60 Subpart WWW)
2. Site-specific Title V operating permit and relevant state permits,
3. Federal and state regulations applicable to landfills and OM&M services
4. Site-specific consent orders, operation plans, guidance documents, etc., related to the GCCS, odor control, and perimeter probe and surface emission monitoring, including:
 - i. GCCS Design Plan
 - ii. SEM Plan

C. COORDINATION WITH LFGE PLANT OPERATOR

If the GCCS supplies gas to a LFGE plant or other beneficial use facility, WPWMA shall notify the plant operator of the schedule for obtaining liquid levels, performing system repairs and modifications and/or emergency repairs, so the plant can make adjustments to its operations during that time and reduce unnecessary downtime. The WPWMA, OM&M Provider, and LFGE Plant Operator shall conduct bi-weekly meetings to discuss operations, scheduled maintenance and areas of concern, etc. A group text message shall be established with the WPWMA, OM&M Provider and LFGE Plant Operator to ensure communication on shutdowns, wellfield activity and changes, unscheduled maintenance and/or repairs. During scheduled maintenance, construction or repairs, shut downs to the GCCS may be necessary. In the event of a shut down the following protocol will be followed:

1. The OM&M Provider shall send notification on the group text message to confirm LFGE Operator is prepared for the shut down of system. An estimated time of work completion will be given and verification of ready status will be given.
2. The OM&M Provider shall send group text message updates to work status during shut down and alert LFGE Operator to any delays.
3. The OM&M Provider shall send notification upon completion of work and GCCS start-up. Upon start-up of GCCS the OM&M Provider shall monitor the gas flow at the BFS to ensure the gas composition is within normal range for the safe start-up of the LFGE Plant.

2.4 GCCS EMERGENCIES

A GCCS emergency is defined as an urgent matter regarding the operation and maintenance of the GCCS (and not otherwise covered by other procedures, specifically the SSM or HASP) that is, or has the potential to be, a violation of the site's permit(s) or federal, state, or local regulations or could cause significant damage to the landfill or its infrastructure.

2.4.1 Notification to WPWMA Personnel

Communicate the GCCS emergency to the Landfill Operations Manager as soon as practical, but **no more than 1 hour after identifying the event**. The OM&M technician or project manager shall attempt to notify the Landfill Operations Manager by phone and then text; notification via e-mail alone shall only be acceptable if multiple attempts by phone or in person are unsuccessful in reaching the WPWMA personnel. In communicating the nature of emergencies to WPWMA, include the following information:

- A description of the GCCS emergency,
- Specific condition of the permit(s) or federal, state, or local regulation that may have been or could be exceeded if action is not taken immediately, and
- Specific location where the GCCS emergency occurred or is occurring.

If the GCCS emergency was conveyed verbally, follow up with an e-mail or other written documentation within one business day confirming the discussion.

The OM&M Provider shall not leave the site before either the Landfill Operations Manager is notified of the GCCS emergency and has agreed that the services of the OM&M Provider **are not** required to address the situation. If the Landfill Operations Manager is not available to address the GCCS emergency, the OM&M Provider shall use the call tree to contact another WPWMA representative regarding the situation.

2.4.2 Regulatory Notification

If necessary, the Landfill Operations Manager will notify the appropriate regulatory agency of the situation. The OM&M Provider **shall not** contact any federal, state, or local agencies on behalf of WPWMA unless specifically directed to do so by the Landfill Operations Manager.

2.4.3 Press/News Agencies

Only authorized WPWMA personnel are permitted to speak to the press, civic leaders, or other outside parties regarding WPWMA facilities or operations. The OM&M Provider shall not speak to these parties on behalf of WPWMA.

2.5 CONTACT CALL TREE FOR GCCS EMERGENCIES

Before starting field work, the OM&M project manager shall prepare a call tree that specifies, in order, who should be called in case of a GCCS emergency. At a minimum, the call tree shall include:

- OM&M lead technician and alternate technicians
- OM&M project manager

- Landfill Operations Manager – Person responsible for landfill operations - Other titles typically assigned to this individual include: General Manager, Site Manager, Operations Manager
- WPWMA LFG Operations Manager

Include the following information for each person:

- Office Phone
- Cell Phone
- Home Phone (optional)
- Email address
- Business Address

Provide a copy of the call tree to each person listed on the tree, including all OM&M personnel who perform work at the site. Place a copy of the call tree in a conspicuous location at the site's blower station control panel.

SECTION 3 GCCS OPERATING GOALS

3.1 DEFINITIONS

The following terms are used in this section and the remainder of this SOP.

- **Pressure vs. vacuum:** These terms are well known, but it is important to understand that vacuum is defined as negative pressure, and as such, there are two ways in which we can describe the pressure in a header or well. For example, we can say that a well has an initial static pressure of -3.5 inches of water column (in-w.c), or that it has a vacuum of +3.5 in-w.c. Similarly, we can say that the inlet of a blower skid has either -40 in-w.c. pressure or +40 in-w.c. vacuum.

Note that in most cases, WPWMA will refer to “pressure” and not “vacuum” in order to be consistent with nomenclature and standards used in typical monitoring equipment. The exception to this is when referring to the negative pressure set point at the inlet of the blower system, which is almost universally referred to in the industry as the “vacuum set point”. We recognize this inconsistency, but retain the use of that term since it is so commonly used in the LFG industry.

- **System pressure:** The static pressure measured in the header or lateral piping.

3.2 VACUUM SET POINT

WPWMA considers the vacuum set point an integral part of maintaining the overall “health” of the GCCS wellfield. Vacuum in the header should be held steady by using variable frequency drives (VFDs) on the blowers that are controlled by a pressure transmitter mounted upstream of the inlet of the blower station condensate knockout pot (KOP). Vacuum should be maintained as low as possible while ensuring minimum acceptable vacuum is available to the furthest points of the collection system. The site-specific vacuum set point is established and monitored at the inlet of the blower system (i.e., at the inlet of the KOP).

3.2.1 Goal of Vacuum Set Point

A vacuum “set point” shall be established by determining the highest pressure (i.e., smallest vacuum) at the blower skid inlet that allows the wells to remain within the operating range goals and to maximize LFG collection. The wellfield will be consistently balanced and tuned to this set point. The set point, once established, should not be changed unless wellfield conditions warrant an increase or decrease in pressure to accomplish balancing and tuning goals.

The goal of the vacuum set point is to:

- Provide sufficient vacuum to all portions of the LFG piping network
- Provide LFG extraction consistency.
- Facilitate consistent balancing and tuning of the wells.
- Minimize the potential to over pull the wells, which can lead to introducing ambient air into the waste mass.
- Prevent under pull, which can lead to reduced gas extraction and increased surface emissions, odors, and subsurface gas migration.
- Eliminate unnecessary use of electricity to generate unnecessary vacuum.

- Minimize impact if GCCS pipeline, fitting, or joint fails. Having minimal vacuum reduces the potential for large amounts of soil, trash, air and debris to enter the GCCS if a failure occurs.

A minimum system vacuum set point will be set based on the following:

- Input from the OM&M Provider.
- Other data, including engineering calculations and equipment performance limits and capacities.
- Analysis of the GCCS to ensure that the set point achieves sufficient negative pressure to keep the wellfield in compliance with:
 - Established operating parameters and thresholds
 - Perimeter gas probe limits
 - Programs to control fugitive gas emissions/odors
- As of July 2020, the inlet vacuum setting was 63.5" w.c.

3.2.2 Changing the Vacuum Set Point

Once established, the vacuum set point shall not be changed unless deemed necessary by WPWMA and OM&M Provider. If the set point is to be changed, the OM&M Provider shall notify WPWMA of the proposed change and why the change is necessary. The OM&M Provider shall not change the vacuum set point more than 10% (+ or -) without approval of the WPWMA.

3.3 NSPS/EG THRESHOLDS AND WPWMA SOP TARGETS

WPWMA is committed to providing consistent and reliable GCCS operation, and each GCCS must be operated with the goals listed in Section 1 in mind:

- Meet and/or exceed the requirements of the federal New Source Performance Standards (NSPS) and Emission Guidelines (EG).
- Operate within the limits and guidelines of WPWMA's SOP.
- Control fugitive odors and surface emissions.
- Control subsurface LFG migration.
- Avoid negative groundwater impacts from LFG.
- Operate the GCCS using best industry practices in a professional and safe manner.
- Operate the GCCS to maximize the flow and methane quality to the flare and on site LFGTE facility.

The following default operational targets have been established to ensure that WPWMA GCCS achieve the minimum criteria consistent with the NSPS or the California Landfill Methane Rule. The OM&M Provider shall meet the more stringent of either the:

- NSPS/LMR, state, or local regulatory operating limits,
- WPWMA SOP target operational levels, or
- Site-specific operating limits.

The table below summarizes NSPS/EG regulatory thresholds and WPWMA SOP targets. State, local, or site-specific limits may be inserted as they are approved (site-specific limits must be approved per the procedures presented in Section 1).

Parameter at the Wellhead	NSPS/EG Threshold	SOP Target
Oxygen (% by volume)	<5	<2 maximum (<1 typical)
Pressure (in-w.c.)	<0	<0
Gas temperature (°F)	<131	<131 ⁽¹⁾ (<120 typical)
Methane (% by volume)	N/A	(50 typical)
Balance gas (% by volume)	N/A	<20
Gas flow rate (scfm)	N/A	≥ 5
Minimum system pressure (in-w.c.)	N/A	≤ -10 ⁽²⁾
Monitoring frequency	Monthly	Monthly (see Section 3.3)

- (1) Unless reasonable higher operating values (HOVs) have been approved by the applicable regulatory agency or enhanced monitoring has been performed and appropriate measures are in place to accommodate elevated temperatures.
- (2) Measured at the hydraulically most distant point of the GCCS (i.e., the point in the GCCS with the highest system pressure (lowest system vacuum)).

3.4 ESTABLISHING SITE-SPECIFIC OPERATING LIMITS

There are alternate operating limits that can be established for a GCCS:

- 1) **Variances to regulatory parameter thresholds.** Variances to NSPS/EG parameter thresholds are also known as “higher operating values” (HOVs). Regulatory HOVs cannot be exceeded, regardless of any site-specific SOP limits. If applicable, establishing a site-specific operating value shall be performed in conjunction with obtaining an approved variance from the applicable regulatory agency.
- 2) These must be proposed by WPWMA to the APCD with assistance from the air compliance consultant and with input from the OM&M Provider, as necessary.

3.4.1 Management of Regulatory HOVs

Higher operating values may be requested from the applicable regulatory agency as deemed appropriate by WPWMA’s Landfill GCCS Design Plan provided in Appendix A.

WPWMA or the air compliance consultant shall track and document all alternate operating limits or HOVs approved by local, state, or federal regulatory agencies in accordance with the requirements of WPWMA’s *Landfill GCCS Design Plan provided in Appendix A*. At a minimum, the following information must be tabulated, kept up-to-date, and uploaded to WPWMA’s LFG database for each approved HOV:

1. Well ID
2. Date of approval of alternate value
3. Duration of approval (if temporary)
4. Parameter for which the alternate operating limit was granted
5. New allowable operating threshold
6. Regulatory citation or copy of document granting approval

If applicable, the OM&M Provider shall input pertinent information into WPWMA's LFG database for the purpose of automatically identifying exceedances or compliance timelines.

3.4.2 Temporary Alternate Operating Limits

Temporary alternate operating limits may be applicable under certain circumstances, including the following:

- Subsurface oxidation (SSO) or landfill fire – An example of this would be when wells are turned off in an attempt to prevent pulling oxygen into the waste mass.
- Decommissioned well(s) – This includes wells taken off-line from the permitted GCCS with regulatory approval. In this case, the well is left in place and is available to be reconnected to the GCCS in the event surface emissions in the area are detected.
- Other conditions as defined by permit or consent order.

If temporary alternate operating limits are used, the OM&M Provider shall make note that such limits are being applied within the monthly GCCS operating report.

3.4.3 Permanent Alternate Operating Limits

Alternate values for pressure, temperature, or oxygen may be established by:

- Variance letter from the local permitting authority or U.S. EPA.
- Permit condition listing the approved alternate value.
- Rule citing other allowable limits.
- Site-specific conditions, provided that limits established by permit, rule, or consent order are not exceeded.

SECTION 4 WELLFIELD OPERATION, MONITORING, AND TUNING

4.1 OVERVIEW AND GENERAL PRINCIPLES

To assure proper GCCS operation, WPWMA has established the following:

- **Single source of vacuum for the wellfield.** Negative system pressure shall be supplied by a single blower station for the wellfield. This requires the site infrastructure to be designed and constructed to accommodate all of the LFG flow to a single point, regardless of the number of control devices or end uses of the LFG. The single blower station then pushes the gas at minimal positive pressure to the flares and/or a delivery point from which it then travels to a beneficial end use (i.e., LFGE) project.
- **Blowers run on inlet vacuum control.** The blower system has VFDs that adjust the blower speed based on the blower discharge pressure continuously monitored at the outlet to the LFGE and flares that control vacuum applied to the wellfield.
- **Comprehensive wellfield data collection and wellhead flow rates.** This site-specific scope of work lists a myriad of data that must be collected. All of this information is vital to properly assess, troubleshoot, and improve, if necessary, the GCCS. For this reason, it is imperative that valid wellhead monitoring data include accurate wellhead flow rates and technician comments entered into the monitoring instrument (If applicable).
- **All data is considered compliance data.** All data, whether taken by the OM&M Provider, other parties, or regulatory agencies shall be treated as “compliance data”. All data must be uploaded to WPWMA’s LFG database, and all of it is subject to regulatory thresholds and scrutiny. Under no circumstances shall the OM&M Provider obtain data and not provide it to WPWMA or fail to enter it into the site operating record via the LFG database.
- **All data must be uploaded to WPWMA’s LFG database.** Without exception, all GCCS and gas migration monitoring (i.e., probes and structures) data must be uploaded to WPWMA’s LFG database.
- **Competency of OM&M personnel.** WPWMA has minimum standards for technician experience and competency, as listed Section 2.4.

4.2 DATA TAGS

Various information tags are used in this SOP and are commonly used in the practice of performing OM&M at the site. Some of these are defined or described below.

- **Location** – This is the physical location where the reading is taken. In many cases, the “Location” and “Point Name” will be the same, unless there are multiple sampling points at a given location. For example, if GP-5 has a shallow and deep component, the “Location” is designated as GP-5, but the actual monitoring “Points” would be designated as GP-5S and GP-5D for the shallow and deep probes, respectively, located at GP-5.
- **Point Name** – The Point Name is the name by which the well, probe, or sampling location is known (e.g., EW-01, GP-08, inlet, outlet, etc.) The Point Name is not limited by the number of

characters. It should be descriptive enough so that users understand what it is, but should not be overly long, either.

- **Point ID** – This is the ID used by the LFG monitoring instrument (commonly known as the “GEM ID” when using a Landtec instrument). Point IDs must be unique for each site and for each monitored location.
- **Point Type** – Points are described as any of the following:
 - Well
 - Monitoring Probe
 - Sample Port
 - Flare-Engine-GHG
 - Calibration Record
 - Grid

Additional types may be added to the database in the future. Users are responsible for knowing the options available and ensuring that each Point ID is characterized properly with the correct “point type” designation.

4.3 IDENTIFICATION OF WELLS AND PROBES REQUIRING MONITORING

The WPWMA shall provide the OM&M Provider a copy of the most recent site plans and permit requirements and shall direct any questions on the required scope of work to WPWMA. At least annually, the WPWMA will communicate whether there are any changes in the wells to be monitored or if changes are expected based on planned GCCS expansions.

LFG Wells and Collectors

Regardless of NSPS/EG status, all wells/collectors are to be monitored at least once per month, unless otherwise noted by WPWMA. This includes vertical wells, horizontal collectors, shallow collectors, under-liner collectors (tie-ins to the leachate collection and removal system (LCRS), soil vapor extraction (SVE) wells, etc. In addition, the requirement to obtain flow rate measurements for each wellhead reading applies to all of these collectors as well.

Gas Migration Monitoring Probes and Structure Monitoring Locations

As with the GCCS components, the OM&M Provider shall verify the gas migration monitoring probe and structure locations are current to ensure the correct locations for probes and structure monitoring are covered. The site and OM&M Provider shall confirm that the OM&M Provider has a copy of the most recent site monitoring plan. If probes or structures have been added to the site’s monitoring plan, WPWMA shall provide an updated list or map to the OM&M Provider.

4.4 MONITORING EQUIPMENT MINIMUM STANDARDS

The accuracy, completeness and dependability of the monitoring equipment used in the field is key to providing OM&M personnel with reliable results on which to base tuning decisions.

All GCCS field monitoring equipment must meet the following minimum requirements:

1. Infrared sensor technology for CH₄ and CO₂ measurement.
2. Electrochemical sensor for O₂ measurement.

3. Temperature probe to measure the temperature of the gas stream.
4. Internal pressure sensors to measure static, system, and differential pressures.
5. Ability to be calibrated in the field.
6. Ability to store measured data and user defined comments electronically.
7. Data shall be exported via a .csv file or encrypted file format supported by WPWMA's LFG database.

4.5 MONITORING POINT NAMING AND STANDARD COMMENTS

Each monitoring location must have a site-specific ID that is unique to the monitoring point. The IDs must be:

- Consistent with the site's GCCS Design Plan and Record Drawings
- Configured in the meter to accurately calculate flow rates from the well by recognizing the type and size of wellhead and the flow measuring device (pitot tube, orifice plate, venturi, etc.)

The OM&M Provider shall compile the Point IDs into a single ID set that shall be used for all work related to the site and upload it to WPWMA's LFG database. This will ensure that the most recent file is always available for alternate technicians and others who may perform monitoring at the site.

4.5.1 Calibration Reading IDs

All instrument calibrations shall be stored in the monitoring device and uploaded to WPWMA's LFG database. Calibration IDs shall consist of the 3 letter site code ("WES"), followed by "CG" to designate a calibration gas, followed by an indicator of the gas concentration. The "M" in the following examples indicates methane. The "O" indicates oxygen.

50% CH ₄ /35% CO ₂ /balance gas =	WESCGM50
15% CH ₄ /15% CO ₂ /remainder balance gas =	WESCGM15
4% O ₂ /remainder balance gas =	WESTCGO4
Atmospheric air =	WESCGAIR

4.5.2 Prime Mover Inlet and Outlet IDs

Establish IDs for the inlet and outlet of the prime movers (i.e., blower station) to differentiate readings taken at the beginning and end of each monitoring event.

4.5.3 Inlet and Outlet of Each Blower IDs

Establish IDs for the inlet and outlet of each individual blower. Each monitoring port shall be have a Point ID label affixed. These ports are used to measure pressure at the inlet and outlet of the blowers, without any losses that would be attributable to valves or fittings, and allow personnel to compare inlet and outlet pressure and flow rates to the blower curve for troubleshooting purposes or to confirm proper performance. For the Prime Movers, establish IDs to differentiate readings taken at the beginning and end of each monitoring event and record them. For all other blowers, it is not necessary to obtain readings at these monitoring locations during each monitoring event, however, these should be monitored periodically (i.e., at least semiannually) to compare blower performance to the blower curve.

4.5.4 Flame Arrestor Inlet and Outlet IDs

Flame arrestor ports provide the following important information:

1. Gas quality to the control device (for GHG monitoring purposes).
2. Flame arrestor inlet pressure (indicates whether excess pressure is present on the discharge side of the blowers, which impacts the amount of negative pressure that can be applied to the wellfield).
3. Flame arrestor outlet pressure (identifies whether there is excess pressure to the flare, which for an enclosed flare indicates clogging of the burner tips, or for an open flare may indicate that an orifice plate installed at the flare tip is too small).
4. Differential pressure across the flame arrestor indicates whether the flame arrestor element is in need of cleaning or other maintenance.

4.5.5 Greenhouse Gas Monitoring IDs

A separate Point ID is required for each LFG control device, including:

- Each flare
- LFG energy projects or other end users

If a control device is decommissioned and no longer in use, the OM&M Provider is responsible for changing the status of the applicable ID in the LFG database so that it is designated as inactive or decommissioned. Readings are not required for control devices that have been decommissioned and identified as such in the database.

4.5.6 Replacement/Redrilled Wells

If a well/collector is replaced (redrilled/reconstructed), a new collector name and Point ID must be established in accordance with the naming convention used on the Construction Drawings.

...Redrills shall have the same number as the well that it replaces, followed by a letter that indicates the number of times the well has been replaced. For example, if EW-16 is being abandoned and replaced with a new well, the replacement well shall be named EW-16A. If EW-16A is later abandoned and replaced with a new well, the new well shall be named EW-16B, and so on.

The OM&M Provider shall designate the ID for the old well as “Abandoned” in WPWMA’s LFG database, and the ID shall not be re-used in the future.

4.5.7 Allowable Comments

The OM&M Provider shall create a standard list of operational comments to utilize in the meter when monitoring and making adjustments. Comment Lists shall be unique for each point type. The utilized comments list will be the same on all site meters and OM&M technicians shall be trained to apply comments consistently. The following list presents suggested comments. Actual comments used can differ; however, a comment must be created and saved that clearly reflects the adjustment made:

- a.) No Change
- b.) Opened Valve ½ turn or less
- c.) Opened Valve ½ to 1 turn
- d.) Opened Valve > 1 turn
- e.) Valve already open 100%
- f.) Closed Valve ½ turn or less
- g.) Closed Valve ½ to 1 turn
- h.) Closed Valve > 1 turn
- i.) Valve already closed 100%
- j.) Barely Open
- k.) Second reading
- l.) Vadose Well NSPS Exempt
- m.) Decom SSO Concern (temporary)
- n.) Offline this Date
- o.) Reconnected this Date
- p.) Abandoned this Date (wellhead removed)
- q.) GHG Point not in use
- r.) Can Not Sample due to Access/Safety
- s.) Remote Wellhead
- t.) CO Tube Sample Completed
- u.) H2S Tube Sample Completed
- v.) Opened for Sample/Then Closed
- w.) Prime Mover Set Point Changed

The OM&M Provider shall also create a standard list of operational comments to utilize in the meter if an operational issue is observed. Examples are as follows:

- i) Surging in header (watered out)
- ii) Surging in well (watered in)
- iii) Bad sample ports
- iv) Orifice Plate Changed
- v) Valve needs replacement
- vi) Flex hose needs extension
- vii) Flex hose needs replacement
- viii) Header vacuum loss
- ix) Repair well bore seal
- x) Well needs to be extended/lowered
- xi) User defined – See field notes.

4.6 VACUUM SET POINT AND BLOWER/FLARE STATION OPERATION

The blower/flare station must be operated and maintained to provide a consistent negative pressure on the wellfield at the established set point. The OM&M Provider shall make necessary adjustments to the wellfield and the blower/flare station to maintain the set point during and after wellfield monitoring and tuning.

In the unique case where an outside party such as a LFGE plant is responsible for the prime mover operation (such as a temporary bypass condition if WPWMA's blower skid is offline), WPWMA or the OM&M Provider shall notify the party responsible for the prime mover of the following:

- Set point to be maintained
- The schedule for when monitoring will be performed.

The following actions shall be taken for situations in which consistent negative pressure is not being applied by the prime movers:

Prime Mover Shutdown

- If the prime mover(s) is/are down for 1 hour or more, WPWMA shall be notified immediately.
- Start back-up device (if present) and adjust the device to reach the vacuum to set point. Continue to monitor the wellfield once vacuum has stabilized from the back-up device.
- When prime mover shutdowns are the result of LFGE plant maintenance, it is imperative that monitoring schedules are communicated with the OM&M Provider to prevent future episodes.

Malfunction

- Postpone monitoring and adjustments until the malfunction is resolved, unless postponement will result in non-compliance of permit terms or regulatory requirements to obtain readings within a certain timeframe.
- Follow the SSM Plan.
- Perform postponed monitoring and adjustment as soon as practical after the resolution of the malfunction, but in no circumstance shall the postponement result in an exceedance of the applicable monitoring or adjustment standard timeline.

Design or Equipment Limitation

- WPWMA may initiate an investigation into system design or equipment limitations that may be preventing the application of a consistent negative pressure. The investigation must include at a minimum:
 - Analysis of cause of inconsistent negative pressure,
 - Evaluation of existing equipment,
 - Pricing to repair existing equipment or purchase of new equipment, and
 - Feasibility of achieving consistent negative pressure in a cost effective manner using best industry practices.
- If design or equipment modifications are not possible, the operator of the prime mover shall make periodic adjustments of the vacuum to maintain the set point. Adjustments should be made as necessary and at least weekly.

4.7 WELLFIELD COMPONENT INTEGRITY CHECKS

The purpose of the wellfield component integrity check is to identify any condition that renders or could render the GCCS inoperable or impair performance. This information will be used by WPWMA

to approve system improvements and schedule repairs. OM&M Provider shall submit this information to the WPWMA with the monthly report and bring any urgent issues to the attention of WPWMA and Landfill Operations Manager immediately.

4.7.1 Survey Stakes or Poles

During GCCS construction events, the contractor may use stakes or pipes to mark underground pipes to be surveyed. These are supposed to be removed before the contractor demobilizes from the site. Because the stakes can leave holes from which surface emissions may occur and because survey pipes can be conduits for direct emissions of LFG to the atmosphere, the OM&M Provider shall inform WPWMA if any stakes or pipe markers are left in place by the construction contractor so that WPWMA can coordinate their removal.

4.7.2 LFG Well and Collector Integrity

Before leaving each well, the technician shall check the well casing, wellhead, and lateral to ensure all components are tight, not leaking, and functioning properly. Issues observed during monthly inspections shall be documented and included in the monthly report or communicated to WPWMA by another means if otherwise requested. Repairs shall be made as expeditiously as possible, and in some cases, as listed below, shall be performed during the routine monitoring event. Items to inspect are listed below:

- **Flex Hose:** Ensure all flexible hoses are of adequate length, are not bound, kinked or constricted in any way and are providing proper drainage of condensate. Weathering of the hose shall be noted (breaks, cracks, brittle condition, etc.) and the hose shall be replaced if necessary.
- **Wellhead Valve:** Ensure all wellhead valves are properly functioning. This can only be performed by occasionally exercising the valve along its entire operating range to ensure proper function. Replace broken valve components as needed.
- **Sample and Temperature Ports:**
 - Check all sample and temperature ports on the well and wellhead to ensure they are installed tightly, functioning properly, and are not leaking. Replace leaking ports.
 - Ensure ports are free of debris, and clean as necessary.
 - Inspect sample port caps for damage or deterioration and replace if necessary.
 - Damaged or leaking sampling ports or missing port caps shall be replaced during routine monitoring.
 - Thermometers that are permanently installed shall be inspected for proper operation. Check thermometers that are installed with quick-connect fittings quarterly and those without quick-connect fittings annually, at a minimum.
 - Compare measurements to known standards to determine accuracy.
 - Rotate to ensure proper dial operation.
 - Inspect O-rings or seals for damage or wear.
 - Replace thermometer if necessary.
- **Flow Measurement Components:**
 - Flow measurement is mandatory for wellheads with flow capability, and the OM&M Provider shall take steps to ensure accurate readings are obtained.
 - Ensure that flow measurement components (pitot tubes, orifice plates, etc.) are properly installed and that the monitoring device is set up properly to record flow rates.

- If orifice plates are used, the OM&M Provider shall ensure the orifice plate is properly sized so that excessive pressure loss is not occurring across the plate, that the differential pressure is in the desired range specified by the wellhead manufacturer (generally between 6 and 0.5 inches of water column vacuum) to ensure accurate readings, and that the orifice plate size is correctly entered into the monitoring instrument and Site Build table in the WPWMA LFG database.
- **Mechanical Joints:**
 - Ensure all mechanical joints (Fernco [rubberized flexible] couplers, PVC unions, electrofusion couplings, etc.) are tight, functioning properly, and are not leaking.
 - Ensure all clamps and mechanical fasteners are tight and operating properly.
 - Document indications of vacuum leaks and immediately repair. Potential leaks include but are not limited to:
 - Hissing sound coming from a joint.
 - Staining or accumulation of liquid on a well casing or wellhead.
- **Well Casing:** Check well casing integrity and general ground conditions surrounding the extraction well. Voids and settlement near any well shall be noted and communicated to WPWMA and Landfill Operations Manager.
- **Well ID Label:** If the well is not labeled, the OM&M Provider shall install appropriate sized labels with the ID number.
- **Dewatering Pumps:** Note any kinked liquid discharge hoses, leaking liquid discharge hoses and fittings, leaking air supply components (regulators, fittings, valves), etc. The OM&M Provider shall bring these items to the attention of WPWMA or Landfill Operations Manager and make arrangements to fix them.

4.7.3 Valves and Condensate Management System Integrity

The OM&M Provider shall also inspect all condensate sumps/traps and isolation valves (header, air supply, and condensate/dewatering system force mains) to ensure the following:

- Vacuum is present in the sump or trap at expected and appropriate values.
- All sump components (gaskets, lids, bolts, etc.) are tight and not leaking.
- The pump is functioning and air is available to the pump. All pneumatic pumps shall have cycle counters to help ensure that the pump is cycling at the expected rate between inspections. If the pump is electric, check the control panel and totalizer (if present) to ensure the pump is properly functioning and pumping at the expected rate between inspections.
- All valves are operational. This can only be accomplished by regular exercise of the valve.
- No PVC or CPVC fittings or valves may be used on any air supply lines per OSHA. The OM&M Provider shall bring to the attention of WPWMA if PVC or CPVC components are installed on compressed air systems and coordinate replacing those components as soon as possible.

4.8 WELLFIELD MONITORING

Without complete and accurate data, improper tuning adjustments can occur, which can lead to compliance, odor, and/or migration issues, and potentially cause long-term damage to the gas

producing bacteria population in the landfill. **A complete and accurate data set for each monitoring event is required by WPWMA.** Data will be used to document compliance, track wellfield trends, and assist with budgeting wellfield expenditures, etc. Incomplete data sets, corrupted data, missing data, chevrons (placeholder data/blanks), etc., are unacceptable.

This section defines standards intended to help ensure valid data is obtained by the OM&M Provider.

4.8.1 Monitoring Schedule and Tuning Frequency

The ultimate goals of balancing and tuning a wellfield are to:

- Maintain the wellfield in accordance with federal, state and local regulations
- Maintain compliance with site permits
- Control odors
- Control subsurface migration and fugitive surface emissions of LFG

The following balancing and tuning protocols have been developed to achieve these goals and include flexibility to address site-specific situations.

Wellhead tuning shall typically occur at the same time the wells are monitored. Balancing and tuning events will be performed in one day or, if additional time is required, on consecutive days. The negative pressure at the blower/flare station must remain consistent for the entire monitoring event. Follow-up monitoring between events will be performed as needed.

4.8.1.1 NSPS/EG Regulated Sites

IMPORTANT: *The NSPS/EG regulations do not include exceptions to the monthly monitoring or recheck requirements. It is the responsibility of the OM&M Provider to work with WPWMA to ensure all parties understand the monitoring requirements and to properly document if any approved regulatory variances are applicable.*

At a minimum, the entire GCCS shall be monitored and tuned **one time per month**. If local, state or federal regulations dictate a different frequency, monitoring and tuning shall be performed according to the more stringent frequency.

Scheduling (NSPS/LMR Site)

The initial monitoring and tuning event should be completed by the 15th of the month, unless site conditions dictate otherwise. This guideline is intended to allow regulatory follow up monitoring, if required, within the month to meet the 30-day timeline.

- A. Perform NSPS/LMR 5-day corrective actions on the same day that the parameter exceeded the limit, if possible.
- B. Perform additional monitoring to troubleshoot compliance or operations issues as needed, with prior approval of WPWMA.
- C. WPWMA may place the site on a twice per month monitoring frequency if it is determined that there are odor concerns, there is evidence of subsurface gas migration (or concerns about subsurface migration), if there are excessive surface emissions, or for other reasons. Failure to meet site permit conditions may also warrant this level of increased monitoring

frequency. Twice per month monitoring shall continue until the more frequent monitoring is no longer necessary or appropriate.

- D. If the site is required to perform twice per month monitoring, the second monitoring and tuning event must be completed within 15 days of the start of the initial monitoring event and before the end of the month. The OM&M Provider shall schedule any 15-day remonitoring from the initial event in order to coincide with the second wellfield monitoring event. That is, the OM&M Provider shall avoid making special trips to the site for remonitoring events as much as possible.

4.8.2 Conditions Required for Wellfield Monitoring

Monitoring shall only be performed if the system pressure is stable and operations are representative of typical operating conditions. The exception to this shall be if regulatory deadlines are impending. *(Recall that earlier in this document it was explained that the NSPS/EG does not include provisions for not obtaining readings within the regulatory timeframes even if upset conditions exist.)* In that case, monitoring may proceed even if an uncharacteristically high number of exceedances might result (such as if the blower station is offline for multiple days and cannot be repaired in time to bring the system on line before the regulatory deadline for monitoring).

4.8.3 Field Monitoring Equipment Calibrations

Properly functioning equipment is vital for GCCS monitoring and ensuring data collected is accurate and reliable. This begins with using equipment that is properly calibrated and is functioning as designed by the manufacturer. The following section assumes that the monitoring unit has been factory calibrated and checked for proper performance at an interval recommended by the manufacturer, both of which are required by WPWMA.

Upon verification that the monitoring unit is properly maintained and functioning properly, use the following procedure for field calibration:

- A. Utilize the appropriate site Calibration Reading IDs to store all calibration data in the monitoring instrument so that it may be uploaded to WPWMA's LFG database with the other monitoring data that will be collected. Include the calibration gas cylinder Lot # in the comments field for documentation and quality control (QC) purposes.
- B. Inspect in-line filters for moisture and fine particles, and replace if necessary.
- C. Inspect the integrity of the sample train and replace parts as necessary.
 - 1. Test the sample train for leaks. Tubing should seal tight onto the hose barbs.
 - 2. Note the condition of the tubing.
 - 3. Note the condition of sample fitting O-ring(s).
 - 4. Inspect the carbon filter for signs of breakthrough, and replace at least monthly.
 - 5. Inspect the water trap for signs of blockage and replace at least monthly
- D. Perform field calibrations per the manufacturer's specifications. Including letting unit initialize and equilibrate to sampling conditions prior to calibration. At a minimum equipment calibration needs to be performed prior to each day of monitoring activities.

4.8.4 Blower/Flare Station Monitoring

The blower/flare station shall be monitored at the beginning and end of each day during which the wellfield is monitored. Data required to be collected includes the inlet gas concentrations, system pressure, flow rate, and blower system discharge pressure. Section 7 includes a comprehensive description of additional monitoring and maintenance activities that are required for the blower/flare station.

4.8.5 Wellhead Monitoring

The following requirements apply for wellhead monitoring:

1. If the initial reading at a well is not within NSPS/EG limits or the SOP targets, the technician must adjust the well and record a second complete reading. Utilizing the “adjusted flow”, “adjusted pressure”, and “adjusted temperature” in lieu of a complete second reading is not allowed because adjusted gas composition is not stored. If field instrument manufacturers modify their equipment in the future to record adjusted gas composition, WPWMA may reconsider not requiring a second complete reading.
2. The OM&M provider must make every attempt to avoid causing an NSPS/EG exceedance due to a well adjustment.
3. A “complete reading” is defined as an entire new set of measurements of methane, carbon dioxide, oxygen, balance gas, temperature, pressures, flow rate, etc. This includes the “Adjusted Values” that may be collected by a meter.
4. If any part of a complete reading (initial values or adjusted values) is not within the NSPS/EG limits, then the reading is considered an exceedance and corrective actions and rechecks must be performed.
5. A 15-day recheck is not required if the second complete reading that was taken to document the 5-day corrective action shows the well is back within NSPS/EG operating thresholds.

4.8.6 Initial Wellhead Measurements

The procedures listed in this section assume that the wellfield is already operating.

1. Make no wellhead adjustments while taking the initial readings. Adjustments should only be made while viewing the side-by-side (initial pressure vs. adjusted pressure) screen.
2. **ID Selection:** Select the appropriate well ID in the meter.
3. **Purge:** With the sample train and pressure sensor hoses disconnected, activate the meter’s internal sample pump so that the entire sample train is purged and the results are indicative of ambient air (approximately 20-21% O₂ and 79-80% balance gas).
4. **Zero Pressure Transducers:** Perform transducer zero function to ambient air conditions. Be sure to minimize wind effects during the procedure by shielding the hose ends. Do not block hose ends while zeroing pressure transducers.
5. **Monitoring Port Integrity:** Check wellhead sample ports and fittings for cracks, bad o-rings and blockage by liquid, ice, spider webs, or other substances.
6. **Sampling:**
 - a.) Connect all applicable sample train hoses. Verify that all connections are snug and air tight and that hoses are not pinched or kinked.

- b.) **Temperature:** Record temperature using the permanently installed thermometer, if installed, or by inserting a temperature probe or dial thermometer into wellhead temperature sample port. Verify and store temperature reading (measured in degrees Fahrenheit).
- c.) **Static Pressure:**
 - i. Ensure the wellhead static pressure has stabilized before storing readings.
 - ii. If pressure readings indicate surging, store the comment “surging” in the instrument.
- d.) **Differential pressure:**
 - i. The OM&M Provider shall ensure differential pressures are maintained within the range specified for each wellhead type to ensure accurate flow readings:
 - a. Orifice Plate (0.5 – 5.0 inches of water column vacuum) – *Currently the WPWMA exclusively uses this type.* The OM&M Provider shall increase/decrease the orifice plate size to bring the differential pressure within the acceptable range.
 - b. Pitot Tube (0.025 – 4.0) or Venturi (0.1 – 5.0) - OM&M Provider shall change the wellhead to the size required to maintain differential pressure is in the desired range.
 - ii. Negative differential pressures – not acceptable. Negative differential pressures may indicate the following:
 - a. An error in measurement.
 - b. Well ID is not set-up properly in the meter.
 - c. Surging
- e.) **System Pressure:**
 - i. Record the system pressure (i.e., header vacuum) from the port installed on the lateral side of the wellhead valve.
- f.) **Flow Rate:** Flow rate measurements are required for each wellhead reading.
 - i. Verify that the flow rate is properly displayed and appear accurate.
 - ii. Verify that the differential pressure is within the range specified by the particular wellhead manufacturer to ensure accurate readings.
 - iii. Provide results to WPWMA in the monthly report and identify if wellhead flow measuring device needs to be replaced or upgraded to the correct size to facilitate future flow rate measurements.
- g.) Confirm the Point ID is properly set up in the meter and the correct ID has been selected. If not, restart the monitoring process.
- h.) Select correct comment if an adjustment was made.
 - i. Ensure each adjusted reading has a stored comment.
 - ii. Choose a comment from the list in Section 5.5.9.
- 7. Store the reading.
- 8. **Exceedances:** If a wellhead adjustment was made, the technician shall take a second complete reading.
 - a.) If the reading indicates an exceedance of NSPS/EG or other permit requirements, make an adjustment following the adjustment guidelines listed below and adhere to the monitoring procedures listed in the following sections for documenting 5-day corrective action implementation and 15-day recheck events.

4.8.7 Adjusted Wellhead Measurements

If a wellhead adjustment is required, a complete second reading is required by WPWMA.

- A. Follow the monitoring procedures defined above for the initial reading.
- B. Limit vacuum or flow change to 10% increase or decrease from the initial reading, except in the following situations. If these situations arise, a more aggressive adjustment can be made, but must be justified in the monthly report.
 1. Elevated levels of oxygen greater than or equal to 5% by volume,
 2. Wellhead temperatures greater than or equal to 131 degrees Fahrenheit,
 3. The well is in the vicinity of an SSO or suspected SSO.
 4. Other conditions discussed with WPWMA that warrant more aggressive tuning adjustments.
- C. Once the adjustment has stabilized, store the reading with comments as described in Section 5.5.9.

4.8.8 Corrective Action Documentation and Rechecks

The NSPS requires two initial actions if an exceedance of the pressure, temperature, or oxygen (PTO) thresholds are detected:

- Within 5-days, implement corrective action to remediate the exceedance.
- Within 15-days, re-monitor the well to show that the exceedance has been remediated.

Additional steps may also be required by state or local regulatory agencies and other steps follow if the exceedance cannot be remediated within 15 days.

The OM&M Provider shall initiate/perform the corrective action (e.g., perform wellhead adjustments, address vacuum losses in a lateral pipe, etc.) on the same day as the initial monitoring. If this is not possible, the OM&M Provider shall implement the appropriate corrective within 5 days of the initial exceedance and re-monitor the well within 15 days of the initial exceedance.

4.8.8.1 NSPS/EG 5-Day Corrective Action Implementation

- A. If wellhead adjustments, alone, are able to correct the exceedance, then the OM&M Provider shall make the wellhead adjustments on the date of the initial exceedance reading or within 5 days of that initial reading. This “second reading” shall be complete with gas quality, temperature, pressures, flow rate, and a comment entered into the “Comment” field in the instrument documenting the corrective action taken.
- B. Comments entered into the monitoring instrument to document corrective actions must be consistent with the data collected.
- C. Make adjustments during the recheck in accordance with procedures listed earlier in this section, as applicable.
 1. Make no wellhead adjustments while taking the initial readings. Adjustments should only be made in the side-by-side (initial pressure vs. adjusted pressure) screen.

2. Allow sufficient time after making an adjustment for the well/collector to stabilize prior to taking and storing data.
3. Stabilization times will vary but **cannot** be allowed to extend beyond applicable regulatory timelines.
4. It is not permissible to sacrifice one compliance parameter for another.
5. Measure the same parameters as those that were recorded for the initial reading.

D. Document corrective action or well adjustment.

4.8.8.2 NSPS/EG 15-Day Recheck

If the recheck and correction of the exceedance cannot be performed on the day of initial monitoring or within the 5-day corrective action implementation timeline, the recheck must be performed within 15 days of the initial exceedance.

The OM&M Provider shall document any additional corrective actions performed and provide this information to WPWMA and air compliance consultant in the monthly report for recordkeeping and reporting purposes.

4.8.9 120-Day Exceedance Clock

If a wellhead exceedance cannot be corrected within 15 days, per the NSPS/EG, the well must be replaced or additional corrective actions must be taken within 120 days. The well still must be monitored during this 120-day period, regardless of whether the exceedance exists. The NSPS/EG does not provide a mechanism that allows this monitoring to be skipped although the WPWMA has an approved Alternative Compliance Option that may extend this deadline on a case-by-case basis with APCD approval. Because it is a significant compliance issue, failure by the OM&M Provider to read a well during this 120-day period may be cause to terminate the OM&M contract.

4.8.10 Additional Monitoring Required

Various data must also be collected monthly from condensate sumps, condensate/liquids management drain lines and force mains, and leachate dewatering pumps as listed below.

4.8.10.1 Header Monitoring Points

- Collect pressure, flow and gas composition readings from main header pipeline sample ports. If ports are not currently installed at these locations, the OM&M Provider shall install ports of the same type as those used on the wellheads.

4.8.10.2 Condensate Sumps

- Collect system pressure at each condensate sump riser. If a port is not installed on the riser, the OM&M Provider shall install a port as part of its routine monitoring services. If monitoring ports are installed on the inlet and outlet piping of a sump, vacuum readings shall be taken at those ports, instead. If system pressure is not in line with expected values, the technician shall troubleshoot the cause. The OM&M Provider shall notify WPWMA of any system pressure issues within 2 hours of detection.

- Collect liquid levels from permanently mounted devices.
- Collect pump cycle count or totalizer reading and condition of air filter, regulator, and other above grade components of pumps, including any leaks or items requiring repair or replacement.
- Collect readings from any condensate sump flow meters.

4.8.10.3 Gas Well Dewatering Pumps

- Cycle count (totalizer reading from the cycle counter) for each installed pump.
- Condition of air filter, regulator, and other above grade components of pump, including any leaks or items requiring repair or replacement.
- Collect liquid levels monthly to ensure proper operation

4.8.10.4 GCCS-Related Force Mains and Gravity Drain Lines

- Force main pressure as measured by any gauges installed on lines.
- Gallon Meter readings for condensate force mains shall be collected weekly

SECTION 5

GREENHOUSE GAS MONITORING

The OM&M Provider shall take monthly greenhouse gas (GHG) readings as part of the routine work. Monitoring shall be performed in accordance with the monitoring requirements of the federal GHG Mandatory Reporting Rule (MRR) and any applicable state or local requirements. At present, the MRR requires monthly readings of methane concentration. In addition to the gas concentrations, the OM&M Provider also shall record the flow rate to each control device and the gas temperature and pressure for each reading. This is consistent with the requirements for general blower/flare station and control device monitoring. Specific requirements include:

1. The OM&M Provider shall be familiar with and abide by the monitoring requirements for greenhouse gas.
2. A schematic showing the monitoring points and IDs shall clearly show the general location of the monitoring points relative to blower equipment, valves, control devices (flares, leachate evaporators, continuous LFG pilots on flares, LFGE end users), and piping appurtenances such as tees to the various control devices.
3. Obtain gas quality readings using a certified calibrated instrument in accordance with the regulations.
4. Reading frequency and timeframe between subsequent readings must be in accordance with applicable rules. The OM&M Provider shall be aware of the requirement regarding number of days between readings.
 - a. If readings are taken monthly, per WPWMA's standard policy, there must be at least 14 days between readings.
5. GHG readings must be obtained when the GCCS is operating. Individual control devices may be off as a course of normal operation, but the overall flow rate from the blower skid should be representative of typical extraction rates.
6. Use the site-specific GHG monitoring IDs for each control device.
7. Obtain GHG readings for all operating control devices at the same general time on a single day, and under the same operating condition. These readings should provide a "snapshot" of the operating condition at a given point in time. If a control device is offline, Contractor shall do one of the following:
 - a. Create a manual entry in the LFG database for the control device that is offline using the appropriate GHG ID, and indicate in the Comments field that the unit was not in use (NIU).
8. If a control device is decommissioned and no longer in use, the OM&M Provider is responsible for changing the status of the applicable ID in the LFG database so that it is designated as abandoned or decommissioned. Readings are not required for control devices that have been decommissioned and identified as such in the database.
9. All GHG readings must include a flow rate recorded (or manually entered) as the initial flow rate, at a minimum. An adjusted flow rate may also be recorded, but at a minimum the initial

flow rate field shall be populated. This flow data is used by WPWMA for periodic data evaluation, so it is imperative that the flow rate be recorded in the initial flow rate field. The OM&M Provider shall either type into the monitoring device the flow rate reading obtained from the flow meter or manually enter it in the database.

- a. Upload data to WPWMA's LFG database within 24 hours of taking the reading, and review and approve the data (or take other appropriate actions related to the data) within 48 hours of upload.
10. Flow meters shall be calibrated annually unless the flow meter manufacturer requires more/less frequent calibrations.

SECTION 6 BLOWER/FLARE STATIONS

6.1 OPERATING PHILOSOPHY

As referenced at the beginning of Section 5, WPWMA has established a standard operating philosophy for extracting LFG from its landfill.

First and foremost, there should be a single source of vacuum for the wellfield, which is the blower system owned and operated by WPWMA. WPWMA's blower system is to be the sole mechanism by which LFG is removed from the landfill and conveyed to WPWMA's flares, leachate evaporators, or other end users of the gas (e.g., LFGE facilities, etc.). The only exception to this is during a temporary outage of WPWMA's blower system, during which a LFGE plant may be allowed to exert vacuum on the wellfield until WPWMA's system is brought back on line. Other general standards are as follows:

- **Header design** – With a single source of vacuum, the site infrastructure must be designed and constructed to accommodate all of the LFG flow to a single point, regardless of the number of control devices or end uses of the LFG.
- **Distribution of collected gas** – The single blower station pushes LFG at a user-defined positive pressure to the flares and/or a delivery point from which it then travels to a beneficial end use (e.g., LFGE) project. As of July 2020 this setpoint was 16.0" w.c.
- **Dual Zone Flare** - The Dual Zone flare shall operate at all times at a minimum of 100 scfm. Zone A shall operate at flows ranging from 100 to 450 scfm. Zone B shall operate at a minimum flow of 450 scfm and maximum 2500 scfm. Setpoints are established to enable automatic switching between zones based on flow. The system was designed to operate automatically in conjunction with the LFGE plant engines, as well as in lieu of plant operation.
- **VFDs and inlet vacuum control** – Providing a consistent vacuum to the wellfield, irrespective of flow rate and end use of the gas has shown to be the most effective way to ensure stable wellfield operations, maximize LFG recovery, and minimize compliance, odor, and offsite migration issues. To this end, the WPWMA uses a dual zone flare with redundant blowers that maintains blower speed and gas throughput by controlling the blowers off discharge pressure to the LFGE facility and modulates flare flow to maintain wellfield vacuum at the flare station. The only time that inlet vacuum control is not maintained stable by the WPWMA blower/flare station is if LFGE facility is the only control device online. Once the flare is put back into service, the blower controls must return to establish vacuum control and LFG flow. The OM&M provider shall work with WPWMA to minimize the time of the shutdown and bring the flare back on line so that full control can resume as soon as practical.

Blower redundancy – Blower systems are to always have full redundant capacity so that if a blower is offline for maintenance or because of failure, the other blower(s) can handle the full amount of LFG that can be collected. Blowers are to be rotated in and out of service monthly at maximum so that each unit has an approximately equal number of runtime.

6.2 MONITORING MINIMUM REQUIREMENTS

The OM&M Provider shall monitor the blower/flare station at the beginning and end of each wellfield monitoring event and on other occasions as may be necessary to confirm or ensure proper system operation. In general, this shall include but may not be limited to monitoring and/or checking the following. All pressure and gas concentration readings must be taken using unique monitoring point IDs and the data must be uploaded to WPWMA's LFG database for recordkeeping and troubleshooting purposes. Other data (such as blower amps, blower hours, liquids present in the KOP, etc.) should be logged electronically in an Excel spreadsheet or other means approved by WPWMA, and WPWMA may require it to be uploaded to its LFG database.

- **Remote Monitoring, Control and Alarm Systems:**
 - Check that the SCADA system, including monitoring and control, and alarm system autodialer are working properly and continuously.
 - Periodically (but at least monthly) review data recorded online by the data acquisition system to ensure that data is being properly recorded, and report any problems to WPWMA.
 - Check that the system is properly recording flow rate to each flare or other control device, control device combustion temperature, and inlet vacuum to the KOP, at a minimum.
 - If the system provides email, text, and/or telephone notifications for alarm conditions, confirm the notification list programmed into the system is up to date.
 - Confirm that email addresses and phone numbers are correct.
 - Remove any of the OM&M Provider's employees who are no longer employed by the OM&M Provider or who no longer perform work at the site.
 - Review the list of individuals receiving notifications and who have access to the web-based system with WPWMA to ensure that only authorized individuals have access. The OM&M Provider shall be responsible for removing access for individuals no longer requiring access.
 - Make adjustments, as necessary, and notify WPWMA or Landfill Operations Manager if the SCADA is not functioning properly.
- **Automatic Mode:** Ensure the blowers and flare are operating in "Auto" mode.
 - Never allow the system to operate in "Hand" or "Manual" mode, except during short-duration testing. Operation in anything other than Auto mode is against WPWMA policy. Failure to comply with this may be cause to immediately terminate the OM&M Provider's contract.
 - If automatic mode is not working, immediately troubleshoot the system with the assistance of the flare manufacturer.
 - Electrical jumpers shall not be used to bypass Auto mode or any of the system safeties. The OM&M Provider shall immediately notify WPWMA if jumpers are found in the control panel. The flare manufacturer shall be contacted and their service technician or controls engineer shall remove any jumpers, correct the wiring, and ensure proper system operation. If it is determined that the OM&M Provider is responsible for the jumpers or modifications to wiring, the OM&M Provider shall reimburse all costs related to flare manufacturer's service call(s) and engineering support.
- **Blower Station/Prime Mover Inlet:**
 - Measure the gas composition and negative pressure at the inlet of the blower station/prime mover. The flow rate corresponding to this location shall also be stored with the reading. This flow rate may be read from the blower station control panel.
 - The location of the measurement shall be representative of the negative pressure applied to the main GCCS header.

- **BFS Condensate Sump Maintenance**
 - The pump at the condensate sump located at the BFS may need to be inspected and/or repaired while the GCCS is operational the following steps shall be taken prior to removing the pump for safety and to reduce risk of air intrusion into GCCS:
 1. The LFGE Plant Operator shall be notified of inspection being performed. The isolation valve on the west side of the condensate vault shall be closed.
 2. The pressurized air, equalization and condensate discharge line valves shall be closed.
 3. Safely remove pump for inspection.
 4. Reinstall pump and open valves.
- **Condensate Knockout Pot (KOP):**
 - Differential pressure across the KOP demister pad.
 - If pressure gauges are present, check the zero of each gauge to ensure the measured pressure is correct before recording a reading.
 - If differential pressure exceeds 3 inches of water column (in-w.c.), the OM&M Provider shall clean the demister pad. In general, the demister pad should be inspected and cleaned as needed.
 - Liquid level in the KOP.
 - Open the inlet and outlet valves of the liquid level sight glass in order to identify if liquid is present in the KOP.
- **Blower Inlet/Outlet Pressure:**
 - Record inlet and outlet pressure of each operating blower.
 - Note that these are the pressures immediately at the inlet and outlet of the blower, before any valves, fittings, etc. These are the true operating pressures of the blower and are needed in order to confirm the blower is achieving the flow and pressure shown on the blower curve. If pressure readings are instead taken at, say, the inlet of the blower skid and inlet of the flame arrestor, the readings will not be representative due to pressure losses. For example, it is common to have 5 to 10 in-w.c. pressure loss between the inlet of the blower and the inlet of the KOP.
- **Blower Amps:** Check and record blower amps. If amperage is excessive, begin troubleshooting blower operation.
- **Blower Vibration:** Note any excessive vibration and report to WPWMA or Landfill Operations Manager so that the blowers may be serviced.
- **Blower Hours:** Record the hours of blower operation (totalized) displayed at the blower station control panel.
- **Flow Meter:** Confirm that the flow meter is properly aligned. The OM&M Provider shall periodically clean the flow meter element in accordance with the manufacturer's recommended frequency or site-specific needs to ensure accurate flow rate readings.
- **Flame Arrestor:**
 - Measure the differential pressure across the flame arrestor.
 - If ports are not installed, the OM&M Provider shall install monitoring ports that are compatible with the ports on the wellheads.
 - If the drain port on the base of the flame arrestor is piped to a condensate drain line, open the valve to remove built-up condensate.
 - If the drain port is not connected to a hard-piped drain line, the OM&M Provider shall coordinate with WPWMA to have a drain line installed. Condensate shall not be drained onto the ground or concrete pad.

- If differential pressure exceeds 2 in-w.c., the OM&M Provider shall notify WPWMA and clean the flame arrestor element.
- If the flame arrestor requires cleaning more than once per year, the OM&M Provider shall coordinate with WPWMA to identify the reason for the fouling and attempt to remediate it.
- **Enclosed Flare Operating Temperature:**
 - Performance tests are required for enclosed flares (the frequency of testing varies by regulatory agency and permit). The OM&M Provider shall obtain the minimum temperature at which the flare is required to operate from WPWMA and air compliance consultant and enter the appropriate flare shut down set point temperature into the control panel. When the flame temperature drops to this level, the flare will shut off and trigger an alarm. This ensures that the flare does not operate below its permitted temperature.
 - Flare controls should be set to automatically select the appropriate thermocouple based on LFG flow rate or other parameter defined by the flare manufacturer.
 - **Thermocouples should not be set on manual selection unless specifically directed by the flare manufacturer and agreed by WPWMA and the Manager, Landfill Gas Operations.**
- **Enclosed Flare Inlet:**
 - Record the pressure measured between the outlet of the flame arrestor and the inlet of the enclosed flare stack.
 - If pressure exceeds 3 in-w.c., notify WPWMA of the need to clean the burner tips.
 - If they are clogged or partially clogged, burner tips shall be removed and cleaned per manufacturer recommendations. The OM&M Provider shall not leave the burner tips in place and pressure wash debris back into the burner manifold (i.e., back-flush them).
- **Enclosed Flare Shell Temperature:**
 - At least once per quarter, measure the temperature of the outside shell of the enclosed flare on a 10' grid and at all visible paint color changes or other suspicious areas using an infrared gun with an appropriate range to determine if there are any "hot spots" or areas of potential burn-through.
 - Notify WPWMA of the presence of any hot spots so that inspection and repair of the insulation may be performed.
- **Enclosed Flare Shell Condition:**
 - Note whether burn-through or significant corrosion is visible on the outer shell and immediately report it to WPWMA so that troubleshooting and repair can be performed.
 - Annually, shut down and visually inspect the flare internal lining for refractory conditions and photo document.
- **Electronic Chart Recorder:**
 - Check that the chart recorder is properly recording flow rate to each flare or other control device, control device combustion temperature, and inlet vacuum to the KOP, at a minimum.

The OM&M Provider shall be responsible for understanding the proper way to download data and ensure that the recording function is working and no data is not lost during the data transfer/review process.

6.3 PRIORITY OF DATA RECORDERS

WPWMA's standard for which data recorders take priority for regulatory compliance is as follows:

1. Electronic chart recorders

2. SCADA recorders

This prioritization is in place due to regulatory reporting considerations and features available in some equipment.

6.3.1 Remote Data Acquisition Systems

WPWMA does not have a written operations manual for its SCADA system. OM&M Providers must understand the operation of the system because of the value it brings in terms of quick visibility of operations data and troubleshooting information for technicians, project managers, and flare manufacturers. The WPWMA will provide annual training on the SCADA system to the OM&M Provider upon request. WPWMA's LFG Operations Manager can be consulted regarding features and past performance and track records of the various systems.

6.4 RESTRICTION ON MODIFYING CONTROL PANELS

Only the flare manufacturer is authorized to perform work inside blower and flare station control panels at the site. Consultants, OM&M Providers, LFGE developers or plant operators, or any other party is prohibited from performing any wiring modification, modifying touchscreens (also known as operator interface panels or OIPs), replacing or modifying PLCs, modifying controls logic, or any other work inside control panels without the express written consent of the flare manufacturer and approval from WPWMA.

SECTION 7 SUBSURFACE GAS MIGRATION MONITORING

7.1 GENERAL

The requirements for gas migration monitoring (e.g., methods, frequency, monitoring locations, compliance triggers, etc.) vary by regulatory agency and permit, and therefore, site-specific monitoring plans and protocols typically are required or recommended. This section of the SOP highlights minimum standards for gas migration monitoring at WPWMA landfills; more stringent requirements dictated by site permit, regulations, or site needs take precedent over these minimum standards.

7.2 SITE-SPECIFIC MONITORING REQUIREMENTS

Prior to beginning work at a site, the OM&M Provider shall obtain the following from WPWMA:

- Copy of the permit that includes the gas migration monitoring requirements and compliance thresholds.
- List and site map showing locations required to be monitored (probes and on-site structures).
- List and map of any off-site structures requiring monitoring.

It is imperative that the OM&M Provider has up-to-date information on which probes and structures are required to be monitored, as this can change over time due to landfill footprint expansions, regulatory agency action, construction of new buildings or other structures on the property, or other situations. For this reason, the OM&M Provider shall request updates to the monitoring plan and monitoring requirements each calendar quarter before monitoring. Or at the monthly meetings.

7.3 MONITORING PROBE CONSTRUCTION

While the construction details of probes is based on engineering design and regulatory requirements, the OM&M Provider is responsible for ensuring that each probe is capped and has a labcock or quick-connect monitoring port.

Static pressure in a probe is an important parameter for gas migration evaluation purposes. Probes cannot be sampled by removing a cap and slipping a sampling tube down into the probe. All probes must be capped and have an acceptable monitoring port installed. Hose barb fittings with no inline valves are not permitted on monitoring probes because built-up pressure in the probe can escape between the time the barbed fitting's cap is removed and the sampling hose of the instrument is attached. If probe piping is not capped or the caps do not have labcock or quick-connect monitoring ports, the OM&M Provider shall work with WPWMA to install these items.

Probe caps should incorporate a means to potentially take liquid levels in the probes. Therefore, caps should be threaded and not glued. Alternatively, the cap may have a port or bushing that allows a liquid level meter probe to be inserted down the probe. Note that liquid level meters that have been used for LFG extraction well liquid level measurements must never be used in groundwater wells or gas probes, as they can introduce contaminants to groundwater or the surrounding soils.

7.4 TIMELINE FOR MONITORING

Gas migration monitoring shall be performed in the first or second month of the quarter, as determined by WPWMA. However, monitoring frequency may be adjusted as directed by WPWMA or a regulatory agency as needed.

7.5 MONITORING PROCEDURES

Unless more stringent requirements are provided in the site-specific monitoring plan or regulations, the OM&M Provider shall adhere to the following:

1. Data collection and handling requirements for gas migration monitoring are consistent with the requirements for wellfield monitoring.
2. Calibrate the gas monitoring instrument as described in Section 5. All calibrations shall be stored in the instrument and uploaded with the rest of the monitoring data to WPWMA's LFG database.

The OM&M Provider must also be aware of all regulatory thresholds for gas concentration prior to performing any monitoring and enter those thresholds into the monitoring device and LFG database to be automatically verified upon data entry.

7.5.1 On-Site Structure Monitoring

On-site structures required to be monitored include the scale house, office buildings, maintenance garage, etc. Non-enclosed structures such as pole barns may be exempted from monitoring if sufficient natural ventilation is present, regulations permit the exemption, and approved by WPWMA and LEA.

If in-place explosive gas monitors are installed in sufficient locations inside structures, monitoring with handheld instruments may not be necessary, if allowed by permit. If permanent monitors are installed, the OM&M Provider shall document the locations of the meters on the floor plan/site map included with the written report to WPWMA and shall perform manufacturer recommended checks/calibrations on the in-place monitors to ensure proper operation.

1. Use site-specific monitoring IDs for all structures and calibrations in accordance with Section 5.5.1.
2. Calibrate the gas monitoring instrument as described in Section 5.8.3. All calibrations shall be stored in the instrument and uploaded with the rest of the monitoring data to WPWMA's LFG database.
3. Hold sample tubing approximately 4 inches from the floor.
4. Monitor:
 - a. Along each floor/wall interface
 - b. Inside ground level cabinets
 - c. Inside closets
 - d. At floor drains and plumbing penetrations
 - e. Along cracks in concrete slabs

5. The technician shall be aware of the instrument's response time when conducting monitoring and factor this in when investigating detections of methane, especially those that are intermittent or instantaneous/fleeting.

7.5.2 Probe Monitoring

1. Use site-specific monitoring IDs for all structures and calibrations in accordance with Section 5.5.1.
2. Calibrate the gas monitoring instrument as described in Section 5.8.3. All calibrations shall be stored in the instrument and uploaded with the rest of the monitoring data to WPWMA's LFG database.
3. Operate the meter in accordance with the requirements defined in Section 5.8.6, except related to pressure measurement as described below.
4. Do not purge the probe before monitoring. Any methane detected during monitoring shall be reported, as described below.
5. Zero the pressure transducers and attach the instrument hose to the monitoring port. If a labcock valve is installed on the probe cap, open the valve after attaching the hose and observe the relative pressure.
6. Record the initial pressure in the instrument.
 - a. Continue to observe the pressure and note any changes.
 - b. Record the final stabilized pressure (Note: Probe pressure must be measured before sampling for gas qualities because turning on the instrument's pump while connected to the probe may change the static pressures within the probe.
7. Measure gas qualities as described in Section 5.5. Continue to run the instrument's pump and record the reading when the methane concentration (if detected) has stabilized.
8. Store the stabilized gas reading.

Notify WPWMA immediately if any reading is above 5% methane (100% LEL) by volume. Provide monitoring report that complies with Section 12.

7.6 REPORTING

The OM&M Provider shall immediately notify WPWMA if any non-zero methane value is detected in any on-site structure (and off-site structure if required to be monitored) so that steps may be taken to protect building occupants. WPWMA shall also be notified by phone or email at the end of the monitoring event if methane exceedances were detected in any of the probes so that any regulatory notifications or remedial actions can be coordinated.

Unless a faster turnaround time is required by WPWMA or regulatory agency, the OM&M Provider shall submit a report detailing the monitoring results to WPWMA within two weeks of the end of each quarterly event. The report shall include the following:

- Brief summary of monitoring event

- Monitoring results
 - Calibration data
 - Static pressure and gas concentration for probes
 - Gas concentrations measured in on-site structures
 - Confirmation that in-place explosive gas meters were checked for proper operation (either by landfill personnel or OM&M technician)
- Identification of any regulatory exceedances
- Site map showing monitored locations
- Summary of any probes that need repair or replacement due to damage

SECTION 8

SURFACE EMISSIONS MONITORING

To comply with NSPS regulations (40 CFR 60.755(c)(1)), the EG, and the California Landfill Methane Rule (LMR) or other state or local regulations that may require it, surface emissions monitoring (SEM) shall be performed quarterly. This monitoring is intended to identify fugitive LFG emissions, but also acts as a GCCS performance test allowing WPWMA to evaluate areas of the collection system that may require upgrades or modifications to further minimize surface emissions.

This section addresses the SEM method required by NSPS/EG/LMR regulations. The OM&M Provider shall review the site-specific monitoring plan and determine the appropriate SEM method and procedures that are required during each quarterly event.

Please refer to Appendix B – Surface Emissions Monitoring Plan Dated July 29, 2013

SECTION 9

LIQUID LEVEL MEASUREMENTS

In order to maximize the efficiency of the vertical LFG extraction wells, WPWMA requires periodic liquid level measurements to aid in evaluating the wellfield.

Also, the OM&M Provider shall establish a baseline liquid level measurement for each new GCCS and for all new wells within the first 2 weeks of well operation.

9.1 OVERVIEW OF LIQUID LEVEL EVALUATION PROCESS

WPWMA's program of evaluating liquid levels in LFG extraction wells is designed to account for the following 3 scenarios, and the calculations are set up to be valid whether or not there is an obstruction in the well casing.

- Scenario A – Obstruction, pinch, or silt in the bottom of the perforated pipe section, and liquid level is beneath the top of perforations.
- Scenario B – Obstruction, pinch, or silt in the bottom of the perforated pipe section, and liquid level is above the top of perforations.
- Scenario C – Obstruction, pinch, or silt is above the top of perforated pipe section. (i.e., 100% obstructed perforations).

9.1.1 Basis of Calculations

The calculations are based on:

- Elevation of the top of perforated pipe
- Length of perforated pipe
- Total length of pipe below ground surface at the time of well installation
- Ground surface at the time of well installation
- Current ground surface elevation
- Field measurements of top of casing (TOC) to ground surface, TOC to liquid, TOC to bottom of well or any obstruction in the well.

Note: *Because the calculations use the elevation of the top of perforated pipe and the elevation of the bottom of the well pipe at time of installation, accurate as-built information is imperative.*

9.2 MEASUREMENT FREQUENCY

Liquid levels shall be measured in GCCS wells annually, as needed or directed by WPWMA if data indicate liquids are impacting gas extraction rates or if the data is necessary to aid in more aggressive troubleshooting, pursuant to the approval by WPWMA. The WPWMA may omit wells from water level monitoring list if prior measurements showed minimal water or change in water levels.

9.3 EQUIPMENT SPECIFICATIONS

At present, the preferred and most common method for measuring liquid levels is to use a down-hole electrical conductance probe with an indicator tape, as described below. The WPWMA may use a down-hole camera if the conductive probe is yielding unrepeatable or questionable results.

To maintain measurement consistency between monitoring events, the user must measure liquid levels from the same point of the well every time (i.e., top of casing, north side, i.e. towards the flare). To account for changes in top of casing elevation over time, WPWMA requires a ground surface elevation and measurement of the height of the top of casing above ground surface.

Note that it is imperative that any liquid level measuring devices used in LFG extraction wells or any portion of the GCCS must be dedicated to leachate and LFG well monitoring. To avoid potentially cross-contaminating soils and groundwater, they must never be used for groundwater well or perimeter gas migration monitoring probe measurements.

9.4 PREPARATION

In preparation of performing liquid level measurements and the related evaluation, the OM&M Provider shall compile as-built information for the wells and current ground surface elevations for all wells (or approximate ground surface elevations based on interpolation of the most recent survey data or field observations if waste filling or other activities have altered ground surface elevations since the date of the most recent survey).

The OM&M Provider shall document field measurements electronically (e.g., web form) or in a log book from which data will be copied to the LFG database at the completion of the field work.

9.5 LIQUID MEASUREMENT PROCEDURE

When preparing to take a liquid level, the technician should:

1. Measure the static pressure in the well and record it so the well can be returned to its prior state after completing the liquid level measurements.
2. Close the wellhead valve. This is particularly important for landfills with an LFGE project.
3. Remove the wellhead or open the access port.
4. Measure and record the depth to liquid from TOC using the liquid level indicator.
 - a. Problems that may be encountered:
 - i. Foam in the well may cause inaccurate measurements
 1. Mark in field notes "Foam present, liquid level will have to be visually verified using other method" (down well camera).
5. Obtain and record the depth to bottom of well measurements
 - a. Measurements are to be made from the TOC to the point where the probe will not progress any farther.
 - b. Problems that may be encountered:
 - i. Well has soft bottom due to silt or other material.
 1. Record in field book "soft or silty bottom, depth cannot be verified and is estimated".
 2. A down well camera can be used to attempt to verify well bottom. This activity must be approved by WPWMA before proceeding (non-routine work item).
 - ii. Probe may not extend to anticipated well casing depth.

1. Well may be deflected underground so much that indicator probe cannot reach bottom of well casing.
 2. Well may be pinched.
 3. Probe may be hung up on weld or coupling.
 4. Probe may be snagged on a pump component.
 5. A down well camera can be used to identify what is holding up the indicator probe. This activity must be approved by WPWMA before proceeding (non-routine work item).
 - iii. Well appears to be deeper than anticipated.
 1. This may be because the well was extended to accommodate additional waste filling.
 2. A down-well camera can be used to determine actual depth of well and how much solid pipe was installed to accommodate landfill operations. These activities must be approved by WPWMA before proceeding (non-routine work item).
6. If it was removed, reinstall the wellhead, open the wellhead valve back to pre-measurement static pressure, and record the stabilized static pressure in the log book.

9.6 DATA MANAGEMENT

Liquid level data will be managed by WPWMA and must be compiled within one month of completing liquid level measurements. As described below, two sets of data are required to be uploaded and maintained by the OM&M Provider (As an extra non routine service) unless WPWMA assigns the responsibility to the LFG design consultant or other consultant.

9.6.1 Site Build/As-Built Data

As-Built data that must be entered into the system (or related spreadsheets) includes:

- Well Name (e.g., W-104)
- Well ID (e.g., LivW0104)
- Ground surface elevation at time of well installation
- Depth to bottom of casing at time of installation
- Perforated pipe length

9.6.2 Field Measurements and Related Data

Information obtained at the time of liquid level measurements includes:

- Well Name
- Well ID
- Date of measurement
- Name of personnel obtaining measurements
- Ground surface at well at time of measurements
- Measured height of TOC above ground surface
- Depth from TOC to liquid
- Depth from TOC to bottom of well
- Whether a pump is installed in the well
- Depth from TOC to top of pump

SECTION 10 STARTUP PROCEDURES FOR NEW LFG COLLECTORS

10.1 NEW LFG COLLECTOR INSTALLATION AND STARTUP

10.1.1 Replacement Wells/Collectors

During construction of a GCCS expansion, the OM&M Provider shall maintain regular communication with WPWMA so that valuable information can be shared between all parties, and so that all required wellhead readings are obtained.

During some GCCS construction projects, wells may be abandoned or decommissioned. This communication and coordination is particularly important when an existing LFG collector is slated to be abandoned and a replacement collector will be installed. To avoid potentially missing monitoring for a well that is to be abandoned or decommissioned, the OM&M Provider shall communicate with WPWMA, air compliance consultant, and CQA Consultant during any construction project so that all parties are aware of the monitoring schedule. Only after the OM&M Provider and air compliance consultant have confirmed that the well no longer needs to be monitored may it be abandoned or decommissioned. The current well status shall be updated in the LFG database.

In this situation, it is imperative that initial readings and rechecks are performed before a well is abandoned. Once the required readings and rechecks are obtained, the OM&M Provider shall notify WPWMA, who in turn will notify the CQA observer and construction contractor that the well may be taken offline and abandoned and the new well connected to the collection piping.

10.1.2 Startup Procedure for New Collectors

Before bringing a well/collector online, establish its baseline conditions by obtaining the following information:

- Pressure – Wellhead static pressure with wellhead valve closed
- Temperature – in deg. F
- Gas quality – CH₄, CO₂, O₂ and balance gas
- Liquid levels – Depth to liquid and depth to bottom of the well

After recording baseline conditions and coordinating with the LFGE, slowly bring the well on line:

1. Be careful to avoid making aggressive adjustments to new wells/collectors.
2. Bring the collector on line during a scheduled monitoring event unless other conditions such as regulatory deadlines, the need to increase LFG collection for odor control, etc., warrant a sooner startup.
3. Adjust the wellhead valve so that the wellhead static pressure is set at 0.0 in-w.c. This allows gas to flow, but does not exert a vacuum on the well.
 - a. If the methane concentration in the new well/collector falls below the WPWMA SOP methane target (see Section 4.3), close the wellhead valve and an investigation shall be performed to determine why poor gas quality is present at such a low flow rate. Items that should be investigated include but are not limited to:
 - i. Amount of well screen available (liquid levels),

- ii. Well bore seal condition,
- iii. Visual inspection of wellhead and sample train for air leaks, etc.

Notify WPWMA of issues that are identified and propose a remedy. Once the issues are corrected, return the well to operation.

4. Allow the well/collector to stabilize for at least 1 hour and conduct other monitoring. Ensure nearby wells are operating in a manner that is consistent with typical or expected conditions.
5. Return to the well/collector after at least 1 hour and adjust the wellhead static pressure to -0.1 in-w.c.
6. During the next monitoring event (at least 1 week later), depending on gas quality, the wellhead static pressure may be adjusted down to -0.5 in-w.c., based on the professional judgment of the OM&M Provider. Recheck the well/collector 1 to 2 hours later to ensure that the reduction in wellhead static pressure has not negatively impacted gas quality.
7. Additional wellhead adjustments can be made in accordance with the procedures outlined in Section 5 during subsequent monitoring events, if necessary.

10.2 NEW GCCS STARTUP

Starting up a new system requires more effort and diligence than maintaining an existing system. During a new system startup the focus must include:

- Comparing the GCCS Record Drawings with the construction plans and permit plans to determine what has been installed and what variations, if any, have been made from the original design intent.
- Inspecting the system for construction issues (hoses tight, couplers tight, sample ports properly installed, wellhead properly installed, boot clamps tight, if equipped, etc.).
- Establishing the wellfield's operating gas composition and baseline flow rate.
- Preparing the system for operation.
- Bringing the system online. This should be done slowly without damaging mechanical components or biological activity within the landfill.
- Determining the capability of the system and defining its operational parameters.

Note that after the initial test of operation, the OM&M Provider shall bring the system back down and check all fittings, joints, and connections, including bolts, nuts, and clamps. Torque all fasteners to the manufacturer's recommendations. Also, inspect all electrical components for proper operation. Check all electrical connections and confirm that all components and connections remain intact and have not worked loose.

10.2.1.1 LFG Collection System Component Inspection

- A. Header isolation valves
 - a. Exercise valves to verify full range of motion.
 - b. Position header valves in 100% open position for startup.
 - c. After startup, return to the valves and confirm that the same negative pressure exists on both sides of each open valve. If the pressures differ, determine whether the valve indicator has been installed correctly and perform additional troubleshooting if necessary.

- d. Notify WPWMA if any header isolation valves are not labeled so that the construction contractor or others can complete this.
- B. Header access risers
 - a. Inspect cam-locks, monitoring ports, and fittings and ensure they are securely in place. Tighten any loose fittings or sampling ports.
 - b. Notify WPWMA if header access risers are not labeled so that this can be done.
- C. Drip legs
 - a. Verify that each drip leg has the correct amount of water in the u-trap.
 - b. Verify caps and flanges are tight.
 - c. Verify that monitoring ports are installed on both legs of the u-trap.
- D. Mechanical sumps
 - a. Inspect fittings and gaskets. If any are found to be loose or missing coordinate with WPWMA for repairs.
 - b. Verify that the condensate force main valve is open and ready to accept liquids.
 - c. Verify pump is energized and functional.
 - d. Record cycle counts for pneumatic pumps and hour meters for electric pumps.
- E. Wellheads
 - a. Tuning valve – Exercise valve and verify full range of operation.
 - b. Flex hose – Verify length, adjust if needed, and verify that clamps are tight.
 - c. Sample ports – Inspect for broken or plugged fittings and replace, if necessary.
- F. Well bore seals and liner boots
 - a. Notify WPWMA or Landfill Operations Manager if well bore has settled or seal appears to be broken.
 - b. Verify that all connections between liner boots and wells/other piping are sealed tight, and notify WPWMA of any deficiencies.

SECTION 11

DATA MANAGEMENT, HANDLING, AND REPORTING

11.1 DATA MANAGEMENT AND HANDLING

Proper management of field data is critically important. Manipulation or misrepresentation of field data is a violation of the Clean Air Act, **will not be tolerated, and may be grounds for contract termination, or subject to addition criminal investigation.**

The OM&M Provider's data management team and/or project manager (or WPWMA if OM&M work is performed by internal WPWMA technicians) are required to review, approve, and analyze all collected data in order to bring to the attention of WPWMA any issues of concern and to identify areas where improvements are needed. Issues and updates shall be communicated verbally, by e-mail, and in monthly meetings and reports. The OM&M Provider is also responsible for certain data management administrative tasks, which are outlined below. The following text outlines WPWMA's expectations regarding data management and reporting.

11.1.1 Data Management Responsibilities

The OM&M Provider is responsible for the following data management tasks to the extent it collected that data. If the APCD or WPWMA collected the data or a portion of it, that entity shall be responsible for managing and reporting that data unless other arrangements are made.

- Updating Site Build information, including well construction details, monitoring point coordinates, etc.
- Maintaining Point IDs
- Reviewing data
- Revising erroneous data within the database
- Approving data to lock data from additional editing
- Maintaining, updating, and tracking alternative operating values and alternate compliance timelines within WPWMA's LFG database.
- Administering user permissions within WPWMA's database for users that have access to a facility's data and periodically checking to ensure that all users with access are appropriate. If users are found to no longer require access (e.g., they are no longer employed by the firm, no longer perform work at the site, etc.), the responsible individual must remove those privileges.
- Adding new users with the appropriate level of user access according to the requirements established by WPWMA. User information must include the following, at a minimum:
 - Name
 - Company
 - Position/Title
 - Email address (A company email address is required. No user may have, for example, a gmail.com, yahoo.com, or similar email address.)
 - Telephone number

11.1.2 Data Handling

Each day's monitoring data shall be uploaded to the database within 48 hours of collection. Data files from the monitoring instrument or data recorders (e.g., flare station electronic chart recorders)

may not be sorted, edited, or otherwise modified before uploading to the database. Data edits must only be made within WPWMA's LFG database.

11.1.3 Electronic Data

Electronic data shall be handled in such a way that data integrity is maintained. The OM&M Provider is responsible for backing up all WPWMA data not entered into WPWMA's LFG database on a regular frequency (minimum monthly back-up). All data and reports are the property of WPWMA and will be relinquished to WPWMA upon request or at the close of the project.

11.1.3.1 Preservation of Raw Data Files

Data files from GCCS monitoring events shall be downloaded from the gas monitoring instrument and then uploaded directly to WPWMA's LFG database. **Raw data files from monitoring equipment shall not be altered in any way.** If there are known errors in the data, they are to be edited within the database so that there is a record of the change and documentation of the reason for the edit(s). Because the database has this feature, there is no reason to view, sort, or modify the raw data file in any way before uploading it to the system. **Failure to follow this directive may be cause for termination of the OM&M Provider's contract.**

OM&M Providers are encouraged to retain copies of unaltered data files for their records.

11.1.3.2 Data Upload

Wellfield monitoring data (including blower/flare station, gas migration monitoring, etc.) shall be uploaded to WPWMA's LFG database within 48 hours of monitoring. If a monitoring event spans multiple days, each day's data shall be uploaded within 48 hours of collection (resulting in multiple uploads).

11.1.3.3 Loss of Data

If all of the data from a monitoring event is corrupted, lost, or is unusable, the OM&M Provider will immediately re-monitor the entire wellfield. If data from certain wells is corrupted, lost, or is unusable, the wells for which data are lost must be re-monitored immediately.

11.1.4 Written Log Book Data

In an effort to record conditions that cannot be stored electronically within the monitoring instrument, field technicians are required to keep a site-specific logbook. This logbook is the property of WPWMA, and will be relinquished to WPWMA upon request. The log book must be accessible to the OM&M Provider and WPWMA at all times, as it may be used as a reference for troubleshooting wellfield issues.

- A. Logbook requirements:
 - 1. Waterproof book,
 - 2. Record entries in logbook using waterproof ink.
- B. Requirements for recording data in log book:
 - 1. Do not remove pages or portions of pages.
 - 2. Use one log book
 - 3. Date each page in the top right hand corner.
 - 4. Technician recording data shall initial each correction.

5. Cross out blank lines on a page when the page is completed.
6. Do not go back to previous pages and insert comments or additional measurements. Always use a new page for each event.
7. Record the following, at a minimum:
 - a.) If maintenance is performed, write a description of maintenance performed.
 - b.) Record non-tuning efforts for NSPS/EG 5-day corrective actions. Examples include: tighten flex hose, replace sample port, call contractor to regrade header, increase flare vacuum to field, etc.
 - c.) Date, time on- and time off-site
 - d.) Unusual conditions
 - e.) Erosion areas
 - f.) Surface depressions
 - g.) Document damage to wellheads and/or surrounding surface area discovered during monitoring event or repairs completed during event;
 - i. Take photographs of damage and repairs,
 - ii. Describe damage,
 - iii. Forward photographs of any well that appears to have been damaged by landfill operations to WPWMA within 48 hours.
 - h.) Pump cycle counts, if not recorded otherwise in the gas monitoring instrument or other device.
 - i.) Summary of discussions with site personnel
 - j.) Other pertinent information that in the technician's judgment may be useful at a later date
 - k.) Recommendations for non-routine system repairs or upgrades to the GCCS
 - l.) Hand drawings that identify specific locations or distances from wellfield components.
8. When the book is full, submit it to WPWMA and start a new logbook.

11.1.5 Data Review

Both the technician and project manager (or WPWMA manager if work is performed by WPWMA personnel) are required to review the data for completeness and accuracy, to identify erroneous or questionable data that may require further action, and to identify exceedances that require corrective action. The technician shall review the data upon upload (i.e., within 48 hours of taking the readings) and the OM&M project manager shall review the data within 120 hours of upload.

If any erroneous data are identified, such as incorrectly typed readings or comments (such as flow rate or temperatures that are entered manually while storing the data), the erroneous readings must be edited within WPWMA's LFG database so that there is a record of the change. The database will prompt the user for a brief explanation of the reason for the edit, and then both the explanation and revised data will be stored.

11.1.6 Data Approval

The technician shall check the uploaded data for correctness and completeness. The designated Data Approver shall then review and approve or take other appropriate actions related to the data within 120 hours of data upload. All data handling, approval, etc., shall be in accordance with WPWMA's Standards and other WPWMA policies that may be implemented in the future. The OM&M Provider shall coordinate with the air compliance consultant, as required, to ensure compliance dates are not missed.

- Coordinating with the LFG database support staff, as necessary to meet WPWMA's requirements.
- Ensuring that the OM&M Provider's staff participates in training sessions that will periodically be required by WPWMA.

11.2 REPORTING AND MEETINGS

All data and monthly and quarterly reports are to be submitted to WPWMA electronically. Hardcopies may also be required at the discretion of WPWMA or to satisfy regulatory agency requirements. The OM&M Provider's technicians, project manager, and other pertinent team members will be provided access and log-in information for the database.

Monthly reports generated as part of this work are to be submitted to WPWMA personnel only, unless otherwise directed by WPWMA. These reports are intended to keep WPWMA personnel informed about the current condition of the GCCS. These documents will be retained for historical reference, and placed in the site's operating record to comply with regulatory requirements.

11.2.1 Daily Logs

The OM&M Provider shall submit Daily Logs of completed activities to WPWMA Landfill Operations Manager at the end of each day or each work week if performing multiple days of work at the site.

11.2.2 Monthly Reports

The OM&M Provider is required to submit a monthly report to WPWMA by the 20th of every month, unless WPWMA requests the report by a different date, for data collected and routine and non-routine work performed during the prior month. At a minimum, reports must include the following:

- General summary of operations of the previous month. Report text shall not include editorializing; the focus shall be on the data, observations, and recommendations.
- Wellfield data
 - Data table for the most recent monitoring, highlighting any NSPS/EG and SOP exceedances. Data table shall include the following:
 - Gas quality data (CH₄, CO₂, O₂, and balance gas)
 - Gas pressures (static, differential, system)
 - Gas temperature in degrees Fahrenheit
 - Flow rate in scfm
 - Comments stored in the instrument for the reading
 - Monitoring summary addressing NSPS/EG thresholds and any surface emissions and gas migration monitoring conducted.
 - List of wells/collectors with NSPS/EG/LMR exceedances
- Liquid level data (if measurements taken that month)
- SEM data and/or gas migration monitoring data (if monitoring was performed that month)
- Blower/flare station
 - Gas composition and flow rates overall and for each control device

- General operational issues
- Maintenance activities performed
- Maintenance activities planned or needed in upcoming month
- SSM forms
- Changes in wellfield conditions that are significant or of concern. This includes an evaluation of trends and variations in data over time.
- Logs and equipment checklists
- Recommended repairs

The report shall include all the monitoring data, checklists, logs, SSM forms, and other supporting information regarding GCCS operations and maintenance. Wellfield monitoring data shall be tabulated and presented in the same general format as output from WPWMA's LFG database.

These reports shall be submitted to WPWMA and other designated parties (air compliance consultant, design engineers, etc., as directed by WPWMA) by the 20th of the following month, unless an alternate schedule is requested by WPWMA. Timeliness of the data is paramount, as WPWMA and other team members will use this data to identify trends and to recognize operational adjustments needed to optimize system performance. In addition, the data may be necessary to satisfy NSPS reporting requirements that have firm deadlines.

11.2.3 Quarterly Reports

The OM&M Provider shall also prepare and submit to WPWMA quarterly gas migration and SEM monitoring reports as detailed in Sections 8 and 9, respectively.

11.2.4 Monthly SOP Meetings

A monthly meeting is required. At a minimum, WPWMA and OM&M Provider's project manager and technicians shall attend. Except for extenuating circumstances, the lead technician shall attend the meeting at the site in person unless directed otherwise by WPWMA. Others who may be invited by WPWMA and whose attendance may be beneficial include:

- WPWMA's Landfill Operations Manager
- Air compliance consultant
- Landfill gas energy project developer (for sites that have a LFGE project in operation)
- Design consultant (if issues related to design or construction are to be discussed)

WPWMA shall:

1. Determine the meeting location and whether the meeting will be held in person or via a conference call with a web-based presentation by the OM&M Provider.
2. Either set the meeting agenda or have input on what topics and the depth of content that will be covered during the meeting. Topics of discussion may include:
 - a. Most recent monitoring results and rechecks or corrective actions planned or taken.
 - b. NSPS compliance and status relative to operational goals.
 - c. Wellfield maintenance recommendations/status, including pump maintenance
 - d. Well raisings
 - e. SSM summary

- f. Blower/flare operation
- g. Cover integrity inspections
- h. Surface emissions monitoring
- i. Gas migration monitoring (probes and on-site structures)

This list is provided for illustrative purposes only. WPWMA and OM&M Provider are free to develop an agenda that is site-specific or most appropriate for the site's needs.

The OM&M Provider shall:

1. Prepare graphs, maps, and tables as needed for use during the meeting, the content of which shall be discussed with and approved in advance by WPWMA.
2. Take notes summarizing the meeting and distribute to the group.

Meeting attendees will review recent and historical data, database maps and graphs of interest, and other pertinent metrics, data, schematics, etc., that may be necessary to describe and evaluate the data and system operation.

11.3 SSM DOCUMENTATION

Startup, Shutdown, and Malfunction (SSM) Plans are required for all NSPS/EG sites under the NESHAP (National Emission Standards for Hazardous Air Pollutants) regulations.

The OM&M Provider shall be familiar with the requirements of the SSM Plan and shall complete the required SSM forms for SSM events that occur when its OM&M technicians are on site. This includes any forced shutdowns performed in order to check fail-safe operation of the blower/flare system or to perform maintenance on the blower or flare system. Forms shall be prepared and submitted to WPWMA and air compliance consultant with the monthly monitoring report or more frequently if requested. The OM&M Provider shall note on the appropriate form whether any actions were taken that were not consistent with the SSM Plan.

For SSM events that occur when the OM&M Provider is not on site, WPWMA and site personnel will ensure the proper forms are filled out. Any questions related to SSM requirements should be directed to WPWMA.

SECTION 12

SUBSURFACE OXIDATION EVENTS

Because subsurface oxidation (SSO) events are serious situations that could potentially damage large areas of the landfill, generate odors, and create community concern, discovery of an SSO must be immediately reported to WPWMA and the Landfill Operations Manager and immediate steps must be taken to remediate it and minimize its impact on the GCCS and landfill.

12.1 SYMPTOMS

The following symptoms are indicative of an SSO:

- Dramatic localized landfill settlement
- Charred or cracked surface cover
- Stressed or dead vegetation in an area that is otherwise properly vegetated
- Smoke or smoky odor emanating from the landfill surface or wellhead
- Drastic or unusual increase in flowing gas temperature
- Significant drop in methane content in the gas
- Abnormal discoloration of wellhead/riser assembly
- Abnormally high CO and ammonia (NH₃) concentration in LFG
- Deformed riser pipes

12.2 NOTIFICATION

If any of the signs of a potential SSO are detected, WPWMA and Landfill Operations Manager shall be immediately notified.

12.3 INITIAL INVESTIGATION

An initial investigation of the situation should include the following:

1. Health and Safety
 - a. The first step in investigating a suspected SSO must be to ensure the proper health and safety measures are in place.
 - b. A number of additional hazards may be present when an SSO occurs, including exposure to hazardous compounds in smoke or fugitive gas emissions, unstable ground surface due to subsurface subsidence or collapse, potential flames, and others.
2. Do not attempt to douse or flood the wells or area of the suspected SSO with water.
3. Individuals responding to or investigating an SSO should take the following safety precautions, at a minimum:
 - a. Consult the site (or project) health and safety plan (HASP) for procedures related to landfill fires and SSOs.
 - b. Under no circumstances shall an initial investigation be conducted without first consulting the HASP and implementing appropriate controls and procedures.
 - c. Do not breathe landfill gas or smoke. Stand upwind of any emissions.

- d. Wear appropriate PPE. Burns may be caused by hot PVC/HDPE/steel.
 - e. **Do not walk or drive heavy equipment or vehicles near wells or any surface depressions until ground stability has been verified.** If necessary, position deck boards near the well to maintain surface stability if it is questionable. The burned waste mass may give way and equipment/personnel may fall into the sinkhole.
4. Do not change the condition of the LFG extraction wells/collectors.
5. Personnel shall conduct a physical inspection that includes the following:
- a. Inspect the nearest extraction well to the suspected SSO location.
 - b. Inspect all wells within 500 feet of the nearest extraction well to the suspected SSO location.
 - c. Inspect the landfill surface within 500 feet of the nearest extraction well to the suspected SSO location.
 - d. Visually inspect for large localized settlement, cracks, holes, collapse, missing components, or areas that could be sources of air intrusion into the waste mass:
 - i. Monitoring ports
 - ii. Well casing
 - iii. Geomembrane boots at wells or other components
 - iv. Hoses
 - v. Erosion ruts/rills
 - vi. Dry soil cracks
 - vii. Manways
 - viii. Lift stations
 - ix. Sumps
 - x. Leachate cleanout risers
6. Measure gas quality, pressure and temperature at all wells within 500 feet of the nearest extraction well to the suspected SSO location. Special precautions may be necessary to address high gas temperatures.
7. Measure CO concentrations with colorimetric tubes (Draeger tubes) at all wells within 500 feet of the nearest extraction well to the suspected SSO location.
- a. Gas temperature and interference gases can affect the accuracy of the measurement; therefore, the results of any CO monitoring should be expressed qualitatively only.
 - b. Follow tube manufacturer's instruction on the use of pre-filters and/or carbon pre-tubes to minimize the impact of potential interference gases.
8. Infrared Thermometer Survey – Use an IR laser thermometer to measure the temperature of the ground surface in the area of the suspected SSO. Shallow fires or fires that have consumed large amounts of trash will produce elevated surface temperatures. Extreme caution must be taken in these areas due to the potential for the ground to give way.

12.4 DATA ANALYSIS

In order to determine the state of the SSO, the following should be performed or evaluated:

1. Obtain carbon monoxide samples using colorimetric tubes.
2. Temperature gradient between monitored wells.
3. Oxygen gradient between monitored wells.
4. Balance gas (or nitrogen if measured directly) to oxygen ratio gradient between monitored wells.
5. Pressure gradient between monitored wells.
6. Methane to CO₂ ratio gradient between monitored wells.

Analytical data on the gas in the wells in the vicinity shall also be collected using either Tedlar bags or pre-evacuated SUMMA canisters. The analysis shall include fixed gases (CH₄, CO₂, O₂, and N₂), CO, and ammonia. Other compounds may be added if necessary. **Take samples of flowing gas, not stagnant gas.**

12.5 REMOVING SOURCES OF OXYGEN

The key to stopping an SSO once it has begun is to completely restrict oxygen from entering the smoldering waste mass (i.e., snuff it out). Once the initial investigation has been performed and a general sense of the extent of the SSO has been determined, safely begin to restrict further oxygen intrusion using the following method:

- A. Shut down any wells that are believed to have been the cause of the SSO. Complete SSM forms as necessary.
- B. Shut down all wells within the perceived area of influence (often within approximately 300-500 feet of the suspect well(s)). Complete SSM forms as necessary.
- C. Cap or repair any item identified during the physical inspection that may be contributing to oxygen intrusion.
- D. Carefully add additional cover soil to areas that show cap integrity issues, if necessary. Work slowly and pay special attention to the ground surface as material placement commences.
 1. During cover placement activities there should be a minimum of two people available: the equipment operator and a line-of-sight person on the ground that is responsible for watching the ground surface as the equipment operator places the soil.
 2. Slowly push soil into the area and compact with the bucket or tracks of the equipment.
- E. Verify the air-tightness of all pneumatic devices within 1000' of the suspected SSO area and verify system air consumption is consistent with times prior to the event and during.

12.6 THINGS TO AVOID

1. Flushing the well with water. Flushing the well with water can potentially clog the well. It will also generate steam, pressure, and odor when water hits the SSO area.
2. Excavating soil in the SSO area. Excavation will allow additional oxygen to enter the already smoldering waste mass and can potentially cause it to auto-ignite.

3. Venting. Do not remove the wellhead to vent the well. Wellfields are typically under negative pressure. Residual vacuum may exist in the waste mass for a period of time when wells are closed. If the wellhead is removed to vent, it is highly possible that the residual vacuum in the area will pull ambient air into the waste mass, adding oxygen to the SSO.
4. Dry ice application. While dry ice may have a temporary cooling effect on the physical well casing, it will have little to no effect extinguishing the SSO
5. Introduction of water into open landfill cap or cover soil fissures. Applying water to open fissures in the cap where an SSO exists can create a plume of highly odorous steam and could potentially impact slope stability. It is also dangerous to bring a heavy, rubber tired water truck to the area to apply water. The steam created can be dangerous to workers in the immediate area. If an open cap fissure exists in an SSO area, follow the procedure for placing cover soil described above. Removing the pathway for oxygen intrusion is the most effective way to extinguish the SSO.

12.7 CONTINUED MONITORING

Site personnel or the OM&M Provider should visually monitor the area of the suspected SSO at least three times a week until the SSO has been fully remediated. In addition, the wells closest to the SSO area and adjacent wells should be monitored three times a week for two weeks. The wells should be monitored for gas quality, temperature, and CO.

As the SSO subsides, residual CO will remain in the waste mass for weeks and possibly months. Elevated CO levels are not a reliable indicator that an SSO is still in progress. However, CO levels should generally decline with time if the oxidation has been terminated.

Once SSO indicators are no longer noted, the wells in the SSO area and the adjacent wells should be monitored once per week for at least 4 months before returning to a normal monitoring schedule.

12.8 REPAIRS

Repairs should be made to the SSO area, as necessary. The OM&M Provider shall visually inspect the following:

- Wellheads and lateral piping
- Cover soil and geosynthetics
- Other items within the SSO area

Findings and repair options shall be forwarded to WPWMA and Landfill Operations Manager who will facilitate repairs, as appropriate.

12.9 TIMELINE

It is important that a structured SSO monitoring plan and diligent adherence to the plan be carried out to return the wellfield to SOP operations as soon as possible. However, it is advisable to take time and slowly ensure the SSO is fully extinguished, and that the anaerobic bacteria population in the area has recovered and is consistently producing gas.

The severity of the SSO, the age of the waste, moisture content, and a number of other variables will all determine how long it takes the wellfield to regain compliance with the SOP. Experience has

shown that the timeline from the point when the SSO is identified and extinguished to the point when the wellfield resumes normal operations can vary from 2 to 3 weeks up to (in some serious SSO situations) 1 year or more.

SECTION 13

GCCS INSPECTION AND MAINTENANCE

Regular inspection and maintenance of GCCS components is critical to the consistent and reliable operation of the system. Maintenance procedures are intended to be preventative in nature and to identify problems before they impact the performance of the GCCS or its components. Failure to perform proper inspections and maintenance may result in failure of critical components that could render the GCCS inoperable or reduced operational life. Failure to perform proper inspections may also cause permit and/or air compliance violations.

13.1 COMPONENT INTEGRITY CHECKS

Inspections are intended to identify conditions that impact the effectiveness or efficiency of the GCCS. Inspection data will be used by WPWMA to identify possible system improvements and to schedule repairs.

- A. Record issues found during inspections in the monthly O and M reports.
- B. Notify WPWMA immediately if an identified problem could cause a GGCS emergency, regulatory exceedance, or non-compliance with site-specific permit requirements or federal, state, or local regulations.

13.2 TEMPORARY REPAIRS

The application of duct tape and/or silicone to malfunctioning joints is considered a short term (15-days or less) “quick fix” and is not an acceptable long-term repair option. Once a joint malfunction is identified, notify WPWMA of the situation and install a permanent replacement immediately. If duct tape is used to temporarily repair a joint, the duct tape will be dated with a permanent marker to verify the duration the tape has been in place.

13.3 COVER INTEGRITY AND WELL INSPECTION (MONTHLY)

WPWMA requires all sites to perform monthly cover integrity inspections, regardless of whether they are subject to the NSPS/EG requirements listed in 40 CFR 60.755(c)(5).

The OM&M Provider shall conduct these inspections during routine OM&M activities and report any findings immediately following the event to the Landfill Operations Manager or WPWMA so that the appropriate repairs can be performed. The verbal report shall include an accurate description and location of the repair needed. The OM&M personnel shall also make notes of the repairs needed within the log book.

13.3.1 Cover Integrity

Visually inspect the surrounding cover surface integrity:

- Pay special attention to the cover located directly around each well casing, noting signs that the soil is desiccating or pulling away from the well casing.
- Note surface water erosion, ponding, leachate breakouts, or staining.

- Note any settlement around the well casing. Immediately report settlement to the Landfill Operations Manager or WPWMA. Soil should be immediately applied to the area by site personnel or a contractor to match the surrounding grade.

13.3.2 Well Casings

- Visually inspect above grade well casings and surrounding areas for signs of damage, deterioration, or potential problems.
- Use below grade inspection techniques when GCCS monitoring data indicates it is appropriate. (This type of non-routine work must be approved by WPWMA in advance.)

13.4 CONTROL DEVICE SYSTEM OPERATION

GCCS control devices (blower/flare, compression skids, etc.) all have safety features built into the system that insure proper operation of components at tolerances supplied by the manufacturers. These safety features (presence of flame, bearing temperature, flashback monitoring, flame temperature, louver control, fail-safe valve operation, etc.) may individually or wholly be compromised if the flare is not operated in automatic mode. Automatic mode ensures that the flare is operating safely, and the system will properly go through a shutdown procedure if tolerances do not meet programmed set points. **Operation of the flare in manual mode bypasses most, if not all, of these safety features and is not allowed except for the following situations:**

- A. If the system will not operate in automatic mode, stop the system, and begin troubleshooting to determine the cause.
 1. If a cause cannot be readily found, immediately notify WPWMA or Landfill Operations Manager of the situation. Do not restart the system.
 2. Contact the flare manufacturer to perform troubleshooting and/or to begin repair of the system.
 3. Prepare an SSM form, if applicable.

To perform other tests or purposefully operate the system in limp mode for greater compliance reasons. This type of operation may only start after WPWMA LFG Operations Manager has agreed to the non-standard operation.

13.5 MONTHLY INSPECTION AND MAINTENANCE

The following work is required to be performed as part of the routine OM&M work on a monthly basis. Issues observed during monthly inspections shall be documented and included in the monthly report or communicated to WPWMA otherwise as requested. Repairs shall be made as expeditiously as possible, and in some cases, if possible, shall be performed during the routine monitoring event. All data collected (e.g., pump cycle counts, force main pressures, condensate knockout pot pressures, blower operating parameters, etc.) shall be recorded, tabulated, and graphed (if appropriate) and included in the monthly report for record keeping and future troubleshooting purposes.

1. **LFG Wells/Collectors:** Inspect and repair wells/collectors, wellheads, and related components as detailed in Section 5.7. Items to be inspected include:
 - a. Wellhead valve
 - b. Flexible hose

- c. Sample ports, thermometer (if permanently installed), and related components
- d. Well casing
- e. Mechanical joints and fittings
- f. Flow measurement devices
- g. Well ID label

2. Dewatering Pumps

- a. Record cycle counter readings, tabulate, and chart historical cycle counts for inclusion in the monthly report to be submitted to WPWMA.
- b. Note and repair kinked discharge hoses, leaking discharge hoses and fittings, leaking air supply components (regulators, fittings, valves), etc.
- c. Identify if pump is working. If stalled, attempt to return it to operation. If it is necessary to pull the pump for inspection or cleaning, coordinate that work with WPWMA so that it can be performed according to the OM&M Provider's contract.

3. Condensate/LFG Well Dewatering Lines

- a. Inspect air and force mains/gravity lines for proper operation.
- b. Open air supply line isolation valves monthly to remove any built-up condensation. Use caution as this line will have significant pressure.
- c. PVC pipe, fittings, and valves may not be used on air supply lines due to safety concerns. If PVC pipe, fittings, or valves are installed on any air supply systems, notify WPWMA so that they can be replaced with metal or HDPE components.

4. Condensate Sumps/Pump Stations

- a. Inspect all sumps and traps to confirm that vacuum is present at expected and appropriate values.
- b. Confirm that sump components (gaskets, lids, bolts, etc.) are tight and not leaking.
- c. Check pump to confirm proper operation. If the pump is pneumatic, confirm that adequate air pressure is available to the pump. If the pump is electric, check the control panel to ensure the pump is properly functioning.
- d. Record pump cycle counts or hour meter measurements and verify that the pump is advancing liquid.
 - i. If no liquid advancement is found where it normally exists, investigate to determine if pump is operational.
 - ii. Pull and inspect pumps for damage/wear when problems are suspected or as part of the routine pump cleaning service for the site.
- e. Check that all valves are operational. This can only be accomplished by regular exercise of the valve.
- f. No PVC or CPVC fittings or valves may be used on any air supply lines. The OM&M Provider shall bring to the attention of WPWMA if PVC or CPVC components are installed on compressed air systems and coordinate replacing those components as soon as possible.

5. Air Compressor

- a. The OM&M Provider shall check the air compressor when doing blower/flare monitoring or maintenance:
 - i. Manually bleed liquid from the system components
 - ii. Notify WPWMA if it appears service is warranted or there are operational issues that need to be addressed.
- b. Other service that may be required and performed by either site personnel or others include:

- i. Check oil level
- ii. Clean all filters
- iii. Inspect and adjust belts
- iv. Record hour meter information, if equipped
- v. Inspect air dryer for proper operation (if installed). If a desiccant dryer is being used, check the date of the last media change. If new media is needed or service is due, notify WPWMA or Landfill Operations Manager.

6. **Blower Station and Related Piping**

- a. **Automatic Mode:** Ensure the blowers and flare are operating in “Auto” mode. (See Section 7.2)
 - i. Never allow the system to operate in “Hand” or “Manual” mode, except during short-duration testing. Operation in anything other than Auto mode is against WPWMA policy.
 - ii. Failure to comply with this will be cause to immediately terminate the OM&M Provider’s contract.
- b. **Condensate knockout pot (KOP)**
 - i. See Section 7.2.
- c. **General blower station operation**
 - i. Check blower/flare station operation in accordance with the manufacturer’s requirements.
 - ii. Troubleshoot or coordinate with WPWMA to troubleshoot any recurring alarms, shutdown conditions, or fluctuating flow or vacuum conditions.
 - iii. Notify WPWMA of any required maintenance or preventative maintenance needed on the system.
 - iv. Inspect for proper operation during each monitoring event.
 - v. Ensure that all moving parts are properly lubricated per manufacturer recommendations.
- d. **Control Panel**
 - i. Verify all indicator lights, gauges, and other components are operational during monthly monitoring.
 - ii. Check for and remove debris, rodents, and insects that may have entered the panel.
- e. **Blower Rotation and Usage**
 - i. Rotate which blowers are being used so that the primary and backup blowers are in use approximately the same amount of time and are kept in good working order.
- f. **Blower Greasing**
 - i. The OM&M Provider shall know the requirements for greasing the particular blower in use, and shall consult with the blower manufacturer to confirm the requirements based on the unit’s Shop Order No., if necessary.
 - ii. In accordance with blower manufacturer’s instructions, ensure blower bearings are properly lubricated with the appropriate grease/oil.
- g. **Blower Bearing Temperature**
 - i. Inspect for excessive bearing temperature (relative to design or manufacturer’s suggested operating temperature) during each monitoring event.
 - 1. If bearing thermocouples are installed, record the temperature displayed on the control panel touchscreen.

2. If bearing thermocouples are not installed, collect a temperature reading using an infrared laser thermometer at a consistent location on the bearing cap.
 - ii. Tabulate and plot historical temperature trends in an Excel spreadsheet to be maintained on WPWMA's LFG database.
 - h. **Blower Vibration**
 - i. Inspect for excessive vibration relative to normal operations.
 - ii. If excessive vibration occurs, switch to the other blower and notify WPWMA of the need for repairs.
 - i. **Blower/Motor Safety Devices**
 - i. Ensure safety devices (belt shrouds, cages, shields, etc.) are installed and functioning properly on a monthly basis.
 - ii. If safety devices are not installed or are not functioning properly, notify WPWMA and Landfill Operations Manager immediately so that repairs can be performed.
 - iii. Document and repair/replace, as necessary.
 - j. **Chart Recorder** (See Section 7.2)
 - k. **Flow Meter** (See Section 7.2)
 - l. **Flame Arrestor** (See Section 7.2)
 - m. **Thermocouples**
 - i. Inspect for indication of thermocouple failure monthly.
 - ii. If erratic operation, check tightness of wiring.
 - iii. Replace if necessary.
 - n. **Valves**
 - i. Exercise all valves monthly, and during each forced shutdown.
 - ii. Exercise valves across the complete operational range of the valve.
7. **Enclosed Flares** (See Section 7.2 for detailed requirements.) The OM&M Provider's personnel shall be thoroughly trained in the operating principles and troubleshooting of enclosed flares. Demonstration of competency and training certification is required by WPWMA.
 - a. **Operating Data Review**
 - i. Review the recent flow rate, pressure, and other data via the remote data acquisition system or the digital chart recorder.
 - ii. Identify shutdowns and the cause of the shutdowns in order to determine if additional troubleshooting is necessary. Discuss any findings with WPWMA and include a brief summary in the monthly report.
 - b. **Thermocouple Selection**
 - i. Enclosed flares have multiple thermocouples located at different elevations. Systems controlled by a PLC will automatically choose the appropriate thermocouple based on the flow rate of LFG to the flare. The upper thermocouple is reserved for the highest flow rates and the lowest thermocouple is used for the lowest flow rate range.
 - ii. Confirm that that thermocouple selection is set to "Auto".
 - iii. If a thermocouple is being manually selected, WPWMA requires the OM&M Provider to confirm this approach with the flare manufacturer and to provide a written explanation to WPWMA and WPWMA's Manager, Landfill Gas Operations as to why this is the preferred mode of operation and why the Auto selection mode cannot be used.

- c. **Pilot System**
 - i. Verify supply of pilot gas during each monitoring event.
 - ii. Coordinate with WPWMA or Landfill Operations Manager if the propane tank needs to be refilled.
- d. **Flare Tips:** Visually inspect flare tips monthly to ensure they are operating properly and are not obstructed with debris.
- e. **UV Scanner**
 - i. Verify proper operation during each monitoring event and forced shutdown.
 - ii. Clean bulb and sight tube, where applicable, annually.
- f. **Dampers**
 - i. Verify proper set points
 - ii. Observe operation of flare for proper damper (louver) operation. Harmonic vibration, “popping” sounds, or flames emanating from the top of an enclosed flare are obvious signs of improper damper operation or settings. If these are observed, contact the flare manufacturer for troubleshooting assistance.
- g. **Monthly Testing for Backup Devices:**

If an enclosed flare is used as a backup control device to an LFGE plant, the flare must be operated monthly for a period of time to ensure proper operation, remove moisture from the shell insulation, lubricate blower bearings (for the rare situation in which a separate blower is used for the flare system), and drive out animals and birds that will nest in and damage the unit.

 - i. Contact LFGE plant operations personnel to schedule the startup of the enclosed flare. This procedure may require the plant operator to reduce plant output for a period of time to ensure vacuum set point is unaffected.
 - ii. Start the flare. Pay close attention to startup procedure, and ensure flare has ignited.
 - iii. Allow flare to run for a minimum of 1-hour.
 - iv. Shut down flare, and alert LFGE plant operator to resume prior plant output. Ensure vacuum set point is unaffected.
 - v. Prepare SSM form, if applicable.
- 8. **Spare Parts Inventory:** Update the flare station and wellfield spare parts inventory and provide it to WPWMA or Landfill Operations Manager, along with recommendations for additional parts or materials that should be ordered and kept on site.

13.6 QUARTERLY INSPECTION AND MAINTENANCE

- 1. **Belt Drive Blowers**
 - a. Inspect and adjust drive belts quarterly.
 - b. Document the condition of the belts and replace as necessary.
- 2. **Direct Drive Blowers**
 - a. Inspect for wear or damage quarterly.
 - b. Document conditions and replace parts as necessary.
- 3. **Combustible Gas Monitoring Systems in On-Site Structures**

- a. Stand-alone system
 - i. Inspect and test for proper operation.
 - ii. Inspect and test quarterly.
 - 1. Apply a span gas to activate alarm and adjust the activation set point, if applicable.
 - 2. Calibrate according to the manufacturer's recommendations.
 - iii. If units fail to calibrate or are non-functional, notify WPWMA and Landfill Operations Manager immediately so that units can be replaced and alternate safety measures may be implemented, if necessary.
 - b. Alarm monitoring system
 - i. Inspect quarterly.
 - ii. Test annually for proper operation.
 - iii. Calibrate according to the manufacturer's recommendations.
 - b. If units fail to calibrate or are non-functional, notify WPWMA and Landfill Operations Manager immediately so that the units can be replaced and alternate safety measures may be implemented, if necessary.
 - c. If units are not installed, notify WPWMA immediately.
4. **Flow Meter**
- a. Remove the flow meter element and clean it quarterly per manufacturer recommendations. Ensure that the probe is properly aligned when reinstalling it.
5. **Access Points:** Inspect quarterly, at a minimum.
- a. Inspect collection piping access points (sumps, access risers, manholes, etc.) for integrity (gaskets, flanges, piping, etc.).
 - b. Inspect leachate clean-out risers, manholes, tanks, etc. for gas leaks or possible points of air intrusion.
 - c. Any areas of apparent gas leaks or air intrusion should be noted and brought to the immediate attention of WPWMA and/or Landfill Operations Manager.

13.7 SEMI-ANNUAL INSPECTION AND MAINTENANCE

- 1. **Control Panel:** Check for loose wires and tighten, as necessary, taking care to not over-tighten any connections.
- 2. **Flare Thermocouples**
 - a. Confirm proper operation of thermocouples.
 - b. Check for heat damage.
 - c. Check thermocouple wiring and terminal connections.
- 3. **Valves (Header, Condensate System, Flare Station)**
 - a. Exercise valves through their full range of motion to ensure proper operation.
 - i. Perform semi-annually
 - ii. During this task, monitor system pressure on both sides of the valve to verify that the valve is operating as intended.

13.8 ANNUAL MAINTENANCE

- 1. **Open Flare Pilot System**
 - a. Inspect and clean pilot. Remove debris, spider webs, etc.
- 2. **Flow Meter**
 - a. Flow meters are maintenance items that need to be serviced and calibrated at regular frequencies. Proper flow meter performance is imperative in order to properly

- report emissions (GHG, Title V, etc.), gauge system performance against expectations (metrics), and for LFGE purposes. Without proper maintenance, flow measurement accuracy declines over time.
- b. Calibration requirements
 - i. Flow meters shall be calibrated per manufacturer's recommendations, or annually at a minimum.
 - ii. Calibration usually requires removal of the flow measuring device from the gas conveyance pipe.
 - iii. Only qualified individuals may perform field calibrations.
 - iv. A calibration certificate shall be issued for all calibrations.
- c. Insertion type meters (heat probe)
 - i. Pull and clean the probe quarterly according to manufacturer recommendations.
 - ii. Verify proper position and orientation prior to removal and following replacement.
 - iii. Verify meter is properly zeroed by forcing shutdown and observing the recorded flow. Flow should be zero during a forced shutdown.
- d. Pressure transmitter type
 - i. Verify consistent measurements and that the meter zeroes properly when system is down or during forced shutdowns.

13.9 SPARE PARTS

The OM&M Provider shall keep an inventory of spare parts on site for the GCCS and shall consult the site-specific OM&M manual(s) for each system component to ensure that the recommended spare parts are included in the inventory. When parts are used from the inventory, the OM&M Provider shall reorder those parts as soon as possible and after confirming with WPWMA whether parts are to be purchased directly through WPWMA vendors. The OM&M Provider is required to always keep WPWMA informed of any spare part orders.

The OM&M Provider shall prepare and submit to WPWMA on a quarterly basis report identifying the type and number of spare parts on-hand.

At a minimum the spare parts inventory shall include, but is not limited to:

13.9.1 Control System

1. Drive belts
2. UV scanner/bulb (where installed)
3. One thermocouple of each type/size present on control device
4. Propane for pilot system
5. Compressed gas (nitrogen or compressed air) for pneumatic valve operation
6. Flexible shaft coupler
7. Blower bearing set (front and back) for each blower on-site
8. Indicator light bulbs
9. Media for recording device

13.9.2 Collection System

1. Wellhead flex hoses
2. Flex hose clamps

3. Sample ports (brass hose barbs or plastic quick connect fittings)
4. Sample port stoppers (silicone plugs) if using hose barb equipped wellheads
5. Thermometer (where installed)
6. Wellheads
7. Elastomeric (Fernco) couplers
8. Band clamps
9. Gaskets
10. HDPE pipe/fittings
11. Bolt kits

SECTION 14

LEACHATE COLLECTION SYSTEM OPERATIONS

The Leachate Collection and Recovery System (LCRS) has been installed at the WPWMA Landfill in order to comply with the requirements of Title 27 of the California Code of Regulations. This requires that owners/operator of landfills remove leachate from the landfill in order to maintain liquid levels on the subliner to no more than 1 foot of liquid (for Modules 1, 2, 10, 11-15) and 3 inches (for Modules 16, 5 and future modules). The below procedures have been developed to maintain proper operation of the LCRS to meet the requirement.

14.1.1 Pump Operation

14.1.1.1 In order to maintain proper liquid levels the pumps (pneumatic or electric) must be monitored and inspected on a weekly basis for proper operation. These inspections should include the following: individual pump station inspection, gallons removed since previous visit, electronic liquid level data (if applicable), and amperage while in operation and operating hours.

14.1.1.2 Maintenance of the pumps shall be performed in accordance with the manufacturer's specifications and repaired if the pumps appear to be malfunctioning.

14.1.1.3 Until such a time as dedicated power is available to all locations, the pumps shall be operated at the frequency required to maintain proper liquid levels using portable generators.

14.1.2 Liquid level monitoring

14.1.2.1 Liquid level monitoring at the leachate sumps shall be performed on a monthly basis unless liquid level sensors with direct level readouts are present. This will verify that the liquid levels are being maintained at the required regulatory level.

14.1.2.2 Liquids levels shall be verified using a sound actuated liquid level meter which shall be lowered into the casing of the leachate riser until liquids are observed by an audible tone. If a different manual level meter is to be used, it must be approved by the WPWMA manager.

14.1.2.3 Liquid level on the liner shall be determined by comparing the level observed to the bottom depth and calculating the level based on the following calculation: measured bottom depth minus observed liquid level divided by the slope of the module's side slope. For a 3:1 side slope, the calculation looks like this:

$$(BD-LD)/3=\text{liquid on liner.}$$

14.1.2.4 If liquid level monitoring results indicate an elevated liquid level (greater than the allowable depths noted above) the pump operational frequency (if site power is not yet available) shall be re-evaluated by WPWMA and the operator in order to increase liquid removal.

14.1.3 Force Main Inspections

14.1.3.1 On a weekly basis the force main shall be inspected for leaks or damage, which if any is noted the system will be shut-down and the WPWMA manager shall be immediately notified. It is the responsibility of OM&M Provider or WPWMA manager to determine if repairs can be performed or if the system will need to remain off line. If the system cannot be repaired within 48 hours, WPWMA will notify the appropriate regulatory agencies if needed.

14.1.3.2 On a weekly basis, OM&M Provider shall obtain total gallons removed from the landfill at the outfall location. This data is required for reporting purposes and shall be submitted to WPWMA on a monthly basis for inclusion in the semiannual reports.

14.1.3.3 On a monthly basis OM&M Provider shall perform collection of pipeline back pressure readings from the force main at selected locations to determine if fouling/plugging of the pipeline is occurring. If needed, additional pressure gauges shall be installed by OM&M Provider upon approval from the WPWMA manager. This data is critical in maintaining and verifying proper system operation. The OM&M Provider shall develop a system curve based on pipe throughput and measured pressure levels along the pipeline, and chart the current period's readings against that system curve. If pressure levels indicate greater than 10% deviation from the system curve, the OM&M Provider shall notify the WPWMA LFG Operations Manager and the WPWMA may request additional investigation or cleaning of the force main.

14.1.3.4 If cleaning of the force main is indicated based on pressures, OM&M Provider or WPWMA will choose the locations for performing the cleaning using high pressure water, snaking or other approved method. This work will be coordinated through WPWMA and is performed as needed.

14.1.4 Flow meter monitoring and inspections

14.1.4.1 On a weekly basis all flow meters shall be inspected and total gallons removed will be recorded. If the meter indicates a low flow condition the meter will be cleaned and tested.

14.1.4.2 On an annual basis, or more frequently if warranted, the flow meters will be tested for accuracy. This will be done by performing a bucket test and comparing the volume pumped into a graduated cylinder or drum and comparing the value on the meter to the level in the drum. This work will be coordinated with the WPWMA manager and is performed by OM&M Provider as part of the annual system performance test and is not considered routine maintenance.

14.1.5 Monthly Monitoring of Leachate Water Quality

14.1.5.1 On a monthly basis, the WPWMA will sample each location for the following water quality parameters in accordance with the requirements of the site Waste Discharge Requirements (WDR) by grab sample method from the pumping system: pH, Electric Conductivity (EC), Turbidity and Temperature. This information shall be reported to the Water Board, retained and sent to the others as required.

14.1.6 Annual LCRS Performance Testing

14.1.6.1 In accordance with the requirements of Title 27 of the CCR, on an annual basis the system will be tested for proper operation. This test shall be performed to verify that the system is operating normally and no fouling/plugging of the LCRS is occurring in the individual modules. The test shall be performed by installing dye, salts or other additive into the cleanouts on the opposite side of the landfill from the pumping stations, or into the extraction wells on the module where a liner system is present and then observing the discharge from the pumps for evidence of the injected material. OM&M Provider will record the time necessary for the test additive to transit the waste mass. The actual procedures for this work will be agreed upon by WPWMA, site personnel and the contractor performing the test.

Appendix A – Landfill GCCS Design Plan

Landfill Gas Collection and Control System Design Plan

Western Regional Sanitary Landfill

October 2016

Prepared for:

Western Placer Waste Management Authority
3033 Fiddymont Road
Roseville, CA 95747

REPORT CERTIFICATION

Landfill Gas Collection and Control System Design Plan

Western Regional Sanitary Landfill Lincoln, California

The material and data in this report were prepared under the supervision and direction of the undersigned.

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TABLE OF CONTENTS

REPORT CERTIFICATION	II
LIST OF TABLES	VI
1 INTRODUCTION.....	7
1.1 PURPOSE OF REPORT	7
1.2 COMPLIANCE SUMMARY TABLES	7
2 EXISTING SITE CONDITIONS.....	8
2.1 LANDFILL DESCRIPTION	8
2.2 LANDFILL GAS COLLECTION AND CONTROL SYSTEM	9
2.2.1 EXISTING GAS COLLECTION AND CONTROL SYSTEM	9
2.2.2 PROPOSED GAS COLLECTION AND CONTROL SYSTEM IMPROVEMENTS.....	10
3 FUTURE SITE DEVELOPMENT	11
3.1 GCCS DEVELOPMENT PLAN	11
3.2 LANDFILL GAS CONTROL SYSTEM EXPANSION CAPABILITIES	11
3.3 INTERIM LANDFILL GAS CONTROL SYSTEM DESIGN CONSIDERATIONS.....	11
3.3.1 GAS COLLECTION SYSTEM EXPANSION DURING INTERIM CONDITIONS	11
3.3.2 COMPATIBILITY WITH REFUSE FILLING OPERATIONS	13
4 COMPLIANCE REVIEW AND EVALUATION.....	14
4.1 COMPLIANCE WITH §60.759(A)(1)	14
4.1.1 CONTROL SURFACE EMISSIONS.....	14
4.1.2 DEPTHS OF REFUSE	14
4.1.3 LANDFILL GAS GENERATION RATES AND FLOW CHARACTERISTICS.....	15
4.1.4 LANDFILL COVER PROPERTIES	15
4.1.5 LANDFILL GAS CONTROL SYSTEM EXPANDABILITY	15
4.1.6 CONDENSATE MANAGEMENT	16
4.1.7 ACCESSIBILITY	16
4.1.8 COMPATIBILITY WITH REFUSE FILLING OPERATIONS	16
4.1.9 INTEGRATION WITH CLOSURE END USE.....	16
4.1.10 AIR INTRUSION CONTROL	17
4.1.11 CORROSION RESISTANCE	17
4.1.12 FILL SETTLEMENT.....	17
4.1.13 RESISTANCE TO DECOMPOSITION HEAT	18

4.2	COMPLIANCE WITH §60.759(A)(2)	19
4.3	COMPLIANCE WITH §60.759(A)(3)	20
4.3.1	ASBESTOS AND NON-DEGRADABLE MATERIALS	20
4.3.2	NONPRODUCTIVE AREAS	20
4.4	COMPLIANCE WITH §60.759(B)(1), (2), AND (3).....	20
4.4.1	LANDFILL GAS EXTRACTION COMPONENT CONSTRUCTION	20
4.4.1.1	Materials.....	21
4.4.1.2	Component Sizing	21
4.4.1.3	Component Loading.....	21
4.4.1.4	System Expansion.....	21
4.4.1.5	Component Perforation	22
4.4.1.6	Air Infiltration	22
4.4.2	LANDFILL GAS EXTRACTION COMPONENT INSTALLATION.....	22
4.4.2.1	Component Placement.....	22
4.4.2.2	Leachate.....	22
4.4.2.3	Vertical Wells.....	23
4.4.2.4	Horizontal Wells	23
4.4.2.5	Component Short Circuiting.....	23
4.4.2.6	Gravel Backfill	24
4.4.3	LANDFILL GAS EXTRACTION COMPONENT CONNECTIONS TO LFG TRANSMISSION PIPING	24
4.5	COMPLIANCE WITH §60.759(C)(1) OR (2).....	24
4.5.1	EXISTING LANDFILL GAS FLOW RATE DATA	24
4.5.2	FUTURE LANDFILL GAS FLOW RATE ESTIMATES	25
4.6	ALTERNATIVES AND COMPLIANCE WITH §60.752(B)(2)	25
4.6.1	SUBMIT A DESIGN PLAN.....	25
4.6.2	ALTERNATIVES TO THE NSPS	25
4.6.3	SPECIFICATIONS FOR ACTIVE COLLECTION SYSTEMS.....	26
4.6.4	INSTALLATION OF LANDFILL GAS COLLECTION AND CONTROL SYSTEM.....	26
4.6.5	CONTROL SYSTEMS	27
LIMITATIONS.....		29
TABLES		30

APPENDICES

APPENDIX A 2016 GCCS DESIGN DRAWINGS

APPENDIX B ALTERNATIVES TO LANDFILL NEW SOURCE PERFORMANCE STANDARDS (NSPS) REQUIREMENTS

APPENDIX C LANDGEM LANDFILL GAS EMISSIONS MODELING

APPENDIX D LANDFILL METHANE RULE (LMR) SURFACE EMISSIONS MONITORING PLAN

List of Tables

Tables

Table 1	Regulatory Compliance Checklist
Table 2	Landfill Gas Collection and Control System Design Review Checklist

1 INTRODUCTION

1.1 Purpose of Report

This Landfill Gas Collection and Control System (GCCS) Design Plan update was prepared by Cornerstone Environmental Group, LLC (Cornerstone) on behalf of the Western Placer Waste Management Authority (WPWMA). This Plan update follows the requirements of the New Source Performance Standards (NSPS) for the GCCS at the Western Regional Sanitary Landfill (Landfill) located in Lincoln, California and was prepared pursuant to 40 Code of Federal Regulations (CFR) Part 60, Subpart A (General Provisions), and Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills). This GCCS Design Plan supersedes all other previously prepared submittals pertaining to the GCCS design and is the document that will govern the operating, monitoring, and recordkeeping standards for the GCCS at the Landfill.

1.2 Compliance Summary Tables

A summary of the pertinent NSPS regulations and implementation of these regulations at the Landfill is presented in Table 1 of this Plan. Additionally, location references of the regulations in this Plan and in Appendix E of the NSPS enabling documents are presented in Table 1.

A Design Review Checklist from *Training Course for Landfill Gas NSPS/EG Regulatory Personnel to Review GCCS Design Submittals*, North Carolina State University, September 1998 is provided as Table 2.

2 EXISTING SITE CONDITIONS

2.1 Landfill Description

The Landfill, owned by WPWMA and operated by a third party, is located off Athens Avenue in Lincoln, California. The Landfill opened in October of 1979 and accepts municipal solid waste (MSW). The final footprint will comprise approximately 231 acres. The site is permitted to contain a total of approximately 36.35 million tons of waste at closure. The Landfill operates under Solid Waste Facility Permit (SWFP) Number 31-AA-0210, issued by the California Integrated Waste Management Board (CIWMB).

The Landfill is a mound-over-excavation type fill. The Landfill currently consists of 16 modules for MSW placement. Module Numbers 1, 2, 10 and approximately 55 percent of Module Number 11 are identified as pre-Subtitle D, Class III, and were constructed without a geomembrane base liner. Module Number 2 has a single leachate sump and Module Numbers 10 and a portion of Module 11 have a gravel layer leachate control and recovery system (LCRS) constructed over native subgrade. The native soil subgrade was recompacted in areas where permeable soil was encountered. Module Numbers 12, and 45 percent of Module Number 11, are geomembrane-lined and have LCRSs, but are also classified as pre-Subtitle D, Class III. These modules were constructed by placing flexible member liner (FML) and a gravel LCRS layer over the native subgrade. The Module Number 13 base liner was constructed per Subtitle D requirements (FML and LCRS over two (2)-feet of compacted clay), and is also classified as Class III.

The remaining Module Numbers 14 through 16, and 5 through 9 have been redesignated as Subtitle D, Class II. The modules designated as Class II have been, or will be, constructed with a certified low permeability soil layer, a secondary geomembrane liner, and LCRS, as required. Module designation Numbers 3 and 4 have been removed from the MSW landfill design to provide area for the materials recovery facility (MRF).

The Landfill is regulated by the California Department of Resources Recycling and Recovery (CalRecycle), the Central Valley Regional Water Quality Control Board (RWQCB), Placer County Department of Health and Human Services (PCDHHS), and the Placer County Air Pollution Control District (PCAPCD). PCDHHS is the local enforcement agency (LEA) for the CalRecycle regulations. The Landfill is operated under a Title V Permit (Facility Identification WR-01) under the Federal Clean Air Act, as implemented by PCAPCD, with an expiration date of July 6, 2021.

2.2 Landfill Gas Collection and Control System

2.2.1 Existing Gas Collection and Control System

At the time of this plan, an active GCCS has been constructed and is operating at the Landfill. This section identifies both existing and proposed components of the GCCS at the Landfill. In conjunction with this plan, a GCCS design will be implemented to comply with the NSPS regulations.

The Landfill has installed and currently operates a GCCS with control devices including an enclosed flare (WPWMA flare), one (1) primary and two (2) standby landfill gas (LFG) transmission blowers, associated piping and controls. The WPWMA flare is operated under PCAPCD Permit Number PLWR-01-01. In addition, a third party LFG-to-energy (LFGTE) facility is operated on the Landfill which consists of internal combustion engines with generators and a small enclosed LFG flare for combusting excess LFG. The small enclosed flare at the LFGTE facility is operated under PCAPCD Permit Number PLWR-05-01.

The existing GCCS wellfield consists of approximately 63 vertical LFG extraction wells (interior wells), 27 perimeter wells, and 13 horizontal collectors. The existing infill (interior) LFG extraction wells are spaced between 150 and 300 feet on center and are perforated in ranges from approximately 35 feet to 85 feet below ground surface. Interior wells are typically constructed with six (6)-inch polyvinyl chloride (PVC) or high density polyethylene (HDPE) pipe and are completed with wellheads that are above the ground surface, with an approximate 36-inch bore diameter.

The perimeter wells are typically located in native soil within five (5) to 15 feet of the edge of the landfilled waste. The perimeter wells have an average well spacing of approximately 100 feet on center and are perforated in ranges from approximately 42 feet to 50 feet below ground surface, with an approximate 16-inch bore diameter. The well casings are constructed of two (2)-inch PVC pipe for the older perimeter wells with buried well heads, and four (4)-inch pipe for newer perimeter wells (GW-35 and up). The top of each casing is completed with a wellhead which is approximately one and a half feet below the ground surface and contained within a concrete vault. These perimeter wells are not considered "interior wells" and are therefore exempt from the NSPS wellhead monitoring criteria.

LFG collection piping consists of a combination of below grade and above grade PVC and HDPE pipe. Most of the currently active pipeline is above grade HDPE. The primary header pipe originates from the WPWMA flare station and consists of a 12-inch and eight (8)-inch diameter HDPE header loop that extends from the WPWMA flare station along the west and east sides of the landfill and around Module 15. Various lateral piping sections extend from the main header connecting the vertical LFG extraction wells to the GCCS. The perimeter wells are on separate six (6)-inch diameter PVC and HDPE headers connected to the primary header.

The LFG is conveyed through the pipe network to the WPWMA flare station located at the northern edge of the landfill adjacent to the northern landfill access road. From the WPWMA flare and blower station, LFG is routed to a combination of the WPWMA flare the LFGTE facility, and the small flare at the LFGTE facility.

The GCCS also includes a condensate collection and handling system composed of collection sumps, above ground condensate storage tank, transfer piping, pneumatic pumps and a compressed air system, and force mains that terminate at an existing sewer manhole near the WPWMA flare,. The condensate formed in the GCCS drains into perimeter condensate sumps with pneumatic pumps. Condensate is automatically pumped from these sumps to the sanitary sewer system.

2.2.2 Proposed Gas Collection and Control System Improvements

WPWMA has prepared a design to construct GCCS improvements both at the flare station and in the wellfield in 2016. Wellfield improvement plans include the installation of approximately 19 new vertical LFG extraction wells with associated four (4)- and six (6)-inch and eight (8) inch HDPE lateral piping. New eight (8)-inch HDPE header piping will be installed to connect the new wells to the perimeter header system. One (1) horizontal collector is also planned for installation.

Improvements for the flare station include the installation of a new blower skid and enclosed flare with associated interconnected piping. Various existing components at the flare station will either be removed or relocated for the new equipment.

Additional information and drawings of the GCCS are included in Appendix A.

3 FUTURE SITE DEVELOPMENT

3.1 GCCS Development Plan

Installation of additional GCCS components is anticipated to be coordinated with fill development and following NSPS regulations regarding installation of GCCS components stipulated in §60.752(b)(2)(ii)(A)(2). Due to any future operational changes, the GCCS design presented in Appendix A may be altered to follow the provisions of the NSPS and to accommodate actual field conditions at the time of construction.

3.2 Landfill Gas Control System Expansion Capabilities

The GCCS is designed to be readily expanded as waste fill operations proceed. Vertical or horizontal extraction wells will typically be installed in areas that have received waste for five (5) years and will be installed within two (2) years in areas that have reached final grade. However, extraction wells may be installed as a temporary control measure in disposal areas that have been in place for less than five (5) years and are not yet at final refuse grades.

Vertical extraction wells installed prior to reaching final grade will either be extended to the final grade level or abandoned and replaced. This determination will be made based upon the physical condition of the wells, their ability to provide effective LFG extraction, and field conditions at the time of final cap installation.

Proposed LFG headers are sized to accommodate the maximum expected LFG flow (refer to Section 4.5.2), and are fitted with flanged tees for expansion as new wells and piping are installed, following NSPS requirements. Additionally, the use of HDPE header piping provides for flexible and efficient connections for future expansion of the header piping system.

Additional information and drawings of the GCCS are included in Appendix A.

3.3 Interim Landfill Gas Control System Design Considerations

The purpose of this section is to address interim GCCS design following NSPS installation schedules in fill areas that are actively accepting waste, prior to achieving final fill grades.

3.3.1 Gas Collection System Expansion During Interim Conditions

NSPS requirements that specify additional LFG collection devices and the corresponding expansion of the overall GCCS will be followed. Furthermore, the expansions made to the GCCS during interim conditions will ensure that LFG will be collected at sufficient rates

that may change over the interim time frame, and will be designed and installed properly to minimize the potential for off-site subsurface LFG migration. Some of these requirements are specifically stated below:

§60.751 Sufficient density means any number, spacing, and combination of collection system components, including vertical wells, horizontal collectors, and surface collectors, necessary to maintain emission and migration control as determined by measures of performance set forth in this part.

§60.755(b) For purposes of compliance with § 60.753(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan.....Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

§60.755(b) (1) 5 years or more if active; or

§60.755(b) (2) 2 years or more if closed or at final grade.

§60.759(a)(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

§60.759(a)(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.

§60.759(c) Each owner or operator seeking to comply with §60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with §60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment...

Following these regulations, the GCCS has been designed and will be further expanded as necessary during interim conditions, to extract LFG at a sufficient rate to minimize the potential for off-site subsurface LFG migration and surface emissions of LFG.

Per the definition stated in §60.751, “sufficient density” means “any number, spacing, and combination of collection system components necessary to maintain emission and migration control as determined by measures of performance set forth in this part.” Well spacing is established based on surface emissions monitoring (SEM) results, site-specific conditions (waste age, waste density, moisture content, etc.), well radius of influence (ROI) estimates, past operational experience, and engineering judgment. This is consistent with spacing criteria used at other landfills and limits the potential for surface emissions and off-site subsurface migration of LFG.

Per the NSPS requirements, a GCCS must be installed in all areas with waste that is five (5) years or older if active; and two (2) years or more if closed or at final grade. The interim placement of wells at the site will occur in a manner per the NSPS requirements.

In the event that the actual LFG extraction rate exceeds the capacity of the system, additional GCCS components will be designed and installed following NSPS requirements as dictated by actual site conditions at the time of construction. Therefore, actual operating parameters may dictate changes in the system flow characteristics and process equipment as the GCCS is expanded.

GCCS design for the Landfill will appropriately size sufficient collection elements, LFG mover equipment, and control device(s) for the estimated maximum flow rate of LFG. Furthermore, the header and lateral systems will be sized to accommodate the peak flows depending on the planned life of the pipe. If the Landfill plans to operate the header/lateral only during interim conditions, and then dismantle/replace prior to final build out of the GCCS, then it will be sized for the anticipated LFG flows equating to the period of time it is planned to be operational. The portions of the pipe network that the Landfill plans to use as part of the final design will be appropriately sized to handle the anticipated LFG flows in the portion of the Landfill at final build-out.

3.3.2 Compatibility with Refuse Filling Operations

One of the key factors in constructing and operating a GCCS during interim conditions, is to design and install the collectors to be compatible with the refuse filling operations of an active landfill. As refuse filling operations proceed and portions of the site reach final or near final grades, additional GCCS components may be installed to follow the five (5)-year/two (2)-year requirements of NSPS. Using this method allows GCCS components to be installed following §60.752(b)(2)(ii)(A)(2)(i) and (ii) while minimizing interference of the GCCS with ongoing filling operations.

During the process of refuse filling operations, periodically, vertical LFG extraction wells may be “raised” so the new refuse is not placed over the top of an existing well in a manner that covers the wellhead with refuse, thereby preventing access to the well. Vertical LFG extraction wells are raised in anticipation of a new lift of refuse, or in advance of the refuse being added to the area in order to maintain worker safety in the active area during these well raising construction activities. A variance request for monitoring these raised wells is contained in Appendix B of this Plan.

4 COMPLIANCE REVIEW AND EVALUATION

4.1 Compliance with §60.759(a)(1)

§60.759(a)(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.

The Landfill's GCCS has been designed to be consistent with NSPS requirements to achieve comprehensive control of both potential for off-site subsurface LFG migration and surface emissions of LFG. The GCCS is an existing system which is continued to be expanded upon to comply with NSPS regulations. Additional information on the compliance of the GCCS with 60.759(a)(1) is presented in the sections below.

Applicable information used in the design of the GCCS is included in Appendix A (GCCS Design Drawings), Appendix B (Alternatives to the NSPS), Appendix C (Landfill Gas Generation Rate Modeling), and Appendix D (Surface Emissions Monitoring Plan).

4.1.1 Control Surface Emissions

The GCCS was designed to minimize the potential for both off-site subsurface LFG migration and surface emissions of LFG from the Landfill. System performance depends upon the installation of a satisfactory GCCS system, its proper management, and maintenance of a suitable final refuse cover. If there is a temporary exceedance in emissions it will be addressed by appropriate response, evaluating both the GCCS and final cover systems. Appropriate action will then be taken to correct the exceedance as required by NSPS.

4.1.2 Depths of Refuse

Depths of refuse were calculated, at the time of the design of the GCCS, based upon existing topography, permit plan, and record documentation of landfill liner or bottom elevations. The landfill surface elevation was determined from aerial and/or ground survey data available at the time of the design.

4.1.3 Landfill Gas Generation Rates and Flow Characteristics

In compliance with §60.752(b)(2)(ii)(A), the maximum expected LFG generation rate was estimated as 4,060 standard cubic feet per minute (scfm) in the year 2056 based on LFG generation modeling done in 2015 utilizing the United States Environmental Protection Agency (USEPA) Landfill Gas Emissions Mode, Version 3.02. In accordance with §60.755 (a)(1)(iii), following the installation of the initial GCCS, actual flow data has been used to project the maximum expected LFG generation flow rate instead of, or in conjunction with, the equations in paragraphs (a)(1)(i) and (ii) of this regulation.

As specified in 40 CFR 60.759(c)(1), the LFG mover equipment has been sized to handle the maximum LFG generation rate expected over the intended use period of the LFG moving equipment. Additional control device capacity will be installed if warranted in accordance with the NSPS.

LFG generation projections are provided in Appendix C.

4.1.4 Landfill Cover Properties

Modules 1, 2, and the eastern side slope and top deck portions of Modules 10 and 11 are closed. The final cover system for the closed portion of these modules consists of two (2) feet of foundation soils, one (1) foot of clay, and one (1) foot of vegetative support layer. The western portions of Modules 10 and 11 have interim cover consisting of onsite soils.

The final cover for active and future modules is prescribed in the Waste Discharge Requirements but not fully designed. It will likely consist of a low permeable soil layer, geomembrane, or other approved final cover system in accordance with California Code of Regulations (CCR) Title 27 regulations. The primary purpose of the final cover system is to preclude precipitation infiltration that would generate additional leachate. However, the final cover system design also provides a significant barrier to LFG emissions and air infiltration when combined with an active LFG extraction system. The GCCS will provide components for collecting LFG from beneath the final cover system.

4.1.5 Landfill Gas Control System Expandability

Expandability of the GCCS is achieved by installing tees with blind flanges along the transmission piping within the wellfield and at the control facility(s). These flanges provide planned access for expansion of the LFG transmission piping and LFG control devices in the future. In the event that actual LFG flow rates do exceed the capacity of the system, additional GCCS components will be designed and installed in accordance with NSPS requirements.

4.1.6 Condensate Management

Pipelines and wells will be designed to manage condensate and leachate intrusion. This may require the use of in-well condensate/leachate pumping facilities, routing liquid flow into the leachate collection and recovery system (LCRS), temporary pumping of wells if feasible, or abandonment and replacement of wells whose flow rates are insufficient due to condensate/leachate inundation. Whenever feasible, wells will be designed to drain into the LCRS. Wells installed in new waste or active filling areas may need to be larger diameter (i.e. 8" or more) to accommodate in-well pumping systems while, based on site experience, allowing for greater bending of the well casing as it is extended or affected by the waste load around it. Condensate collected in perimeter sumps at low points along the LFG header system is pumped to the WPWMA flare station area by pneumatic pumps. The pumps' discharge is connected to an HDPE force main which discharges condensate to the sanitary sewer system immediately north of the WPWMA flare station.

4.1.7 Accessibility

Accessibility to the GCCS components is achieved by installing commonly accessed components (such as wellheads and monitoring ports) on relatively flat surfaces of the Landfill or near the Landfill's road network. Wellheads, piping risers, valves and monitoring ports will be installed above grade to maintain accessibility and will include valve handle extensions should piping and valves be buried in the future to accommodate fill operations.

4.1.8 Compatibility with Refuse Filling Operations

At the time of this report, an active GCCS has been constructed and is operating at the Landfill. Future additions or expansions of the GCCS will be considered when planning waste filling operations and will be designed to integrate the existing GCCS, to the extent practical.

As refuse filling operations proceed and portions of the site reach final or near-final grades, additional GCCS components will be installed. This method of installation allows GCCS components to be constructed in accordance §60.752(b)(2)(ii)(A)(2)(i) and (ii) while minimizing interference of the GCCS with ongoing filling operations.

4.1.9 Integration with Closure End Use

Currently, the post-closure end-use for the site is unspecified. Future closure end-use must be approved by Landfill personnel to evaluate compatibility with the GCCS. Any items of concern related to maintaining and operating the GCCS will be mitigated by either altering the proposed post-closure end-use or by adjusting or modifying the GCCS in accordance with Landfill and NSPS requirements.

4.1.10 Air Intrusion Control

Potential air intrusion and LFG emissions through the cover system will be controlled through adequate cover system design, cover system pipe penetration design, periodic monitoring and adjustment of the GCCS, and appropriate maintenance of the landfill cover system.

Air intrusion around LFG wells will be minimized by placing a bentonite seal above the screened (perforated) portion of the well and at the landfill surface surrounding the well casing. Pipe boots may also be used to further decrease the likelihood for air intrusion at points where pipes penetrate the cover system. Air intrusion in horizontal collectors will be accomplished by burying horizontal collection trenches under subsequent lifts of refuse and by offsetting the start of perforated piping from side slopes. Based on site experience with pipes breaking in the shallow cover soil, only resilient pipes (i.e. not PVC) will be allowed to extend through the cover system.

Furthermore, air intrusion will be controlled through periodic monitoring for nitrogen or oxygen at each wellhead and conducting adjustments to the GCCS in accordance with the NSPS requirements.

4.1.11 Corrosion Resistance

Corrosion resistance of the GCCS is achieved through the use of corrosion resistant materials or materials that have a corrosion resistant coating, in accordance with 40 CFR §60.759(b)(1). The GCCS components will be constructed of PVC, HDPE, fiberglass, corrosion-resistant steel, neoprene (gaskets and seals) and other non-porous corrosion resistant materials.

Components will be inspected during routine GCCS monitoring for abrasion, chipping, or other potential deterioration of the components. If damage to the materials is observed that may be detrimental to the performance of the GCCS, the components will be replaced or repaired.

4.1.12 Fill Settlement

Settlement will occur due to decomposition and consolidation of the refuse. To accommodate refuse settlement, the GCCS components were designed and installed with several features to account for this settlement including:

- LFG extraction wellheads connected to the LFG transmission piping by a flexible pipe or hose connection. This allows the LFG piping to accommodate some changes in the orientation of the LFG transmission piping or LFG extraction well;

- HDPE piping will be used for the construction of the header piping and transmission system. HDPE piping is flexible and absorbs differential settlement without breaking or cracking; and
- LFG transmission piping will be sloped at sufficient grades so that reasonable amounts of differential and total settlement may occur without causing pipe breakage, or disrupting the overall flow gradient of the LFG transmission piping, with the following minimum slopes unless infeasible;
 - Above ground pipe within the limit of landfilled waste, with LFG flow in same direction as condensate flow – approximately 2%
 - Above ground pipe within the limit of landfilled waste, with LFG flow against the condensate flow direction – approximately 3%
 - Buried pipe within the limit of landfilled waste (seldom used) – approximately 4%
 - Buried pipe within the limit of landfilled waste in actively filling or road crossing areas (seldom used) – approximately 6%
 - Buried pipe outside the limit of landfilled waste in engineered fill or undisturbed soil (seldom used) – approximately 1%

4.1.13 Resistance to Decomposition Heat

Resistance of the GCCS to the heat generated as a result of refuse decomposition is achieved through the use of materials tested and proven to withstand temperatures well above those typically found in landfills. The GCCS will be inspected during routine LFG system monitoring for heat damage. If heat damage of the GCCS components is observed and is believed to be detrimental to the operation of the GCCS, the cause of the elevated landfill temperature will be investigated and the GCCS will be adjusted or modified to mitigate the effects of the elevated temperatures.

The primary point of observation during routine LFG system monitoring will be at the individual wellheads. Each wellhead will possess either an integral thermometer or a connection for the use of portable thermometer. The extraction wells will generally be operated at temperatures of less than 131 degrees Fahrenheit (°F), unless an alternative temperature parameter is approved for an individual monitoring point.

Wellhead components are visually inspected and the control valve and monitoring connection physically exercised during each monitoring event, to ensure correct operation of the components.

4.1.14 Restraint of Pipe in Temperature Fluctuations and UV Protection

Resistance of the GCCS pipeline components to heat generated expansion and contraction is achieved through the use of earth berms, concrete anchors and other materials designed to restrain the pipe, combined with areas designed to allow for pipe expansion. The areas for pipe expansion may include flexible restraint systems (concrete ties with straps oriented perpendicular to the passing pipeline) or flattened areas of land to allow for pipe movement without creating a sag.

UV protection is a concern for the PVC pipelines and PVC based flexible hoses used at each well head. Permanent PVC pipe may be coated with a protective coating of paint. Future permanent piping will be constructed of HDPE instead of PVC.

The GCCS will be inspected during routine LFG system monitoring for UV, heat or expansion/contraction damage, excessive abrasion, collapse or excessive sagging. If damage is observed and is believed to be detrimental to the reliable operation of the GCCS, the cause will be investigated and the GCCS components will be adjusted, modified or replaced to mitigate the effects of the temperature fluctuations.

4.2 Compliance with §60.759(a)(2)

§60.759(a)(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

Per the definition stated in §60.751, “sufficient density” means “any number, spacing, and combination of collection system components. . . necessary to maintain emission and migration control as determined by measures of performance set forth in this part.”

The GCCS consists of vertical wells installed within the waste footprint and just outside the waste footprint, and horizontal collection wells buried within the waste mass. The adequacy of the well density will be confirmed with SEM. Quarterly SEM will be performed using a flame ionization detector (FID), as required under §60.754(c)(3). All exceedances will be properly mitigated and re-tested in accordance with the NSPS. Monitoring of perimeter LFG probes is also conducted and will help determine the GCCS effectiveness to control potential for off-site subsurface LFG migration. All findings are submitted to the facility’s operating record.

If the GCCS does not meet the measures of performance set forth in the NSPS, the GCCS will be adjusted or modified in accordance with the NSPS requirements. These adjustments or modifications may include the installation of additional LFG collection elements, cap repairs or other actions defined by field conditions at the time of monitoring.

4.3 Compliance with §60.759(a)(3)

§60.759(a)(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.

Compliance related to §60.759(a)(3) are discussed in the following sections.

4.3.1 Asbestos and Non-degradable Materials

§60.759(a)(3)(i) Any segregated area of asbestos or non-degradable material may be excluded from collection if documented as provided under §60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or non-degradable material deposited in the area, and shall be provided to the Administrator upon request.

The Landfill was previously permitted to accept asbestos but currently does not.

4.3.2 Nonproductive Areas

§60.759(a)(3)(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill.

There are currently no non-productive areas at the Landfill.

4.4 Compliance with §60.759(b)(1), (2), and (3)

§60.759(b) Each owner or operator seeking to comply with §60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:

4.4.1 Landfill Gas Extraction Component Construction

§60.759(b)(1) The landfill gas extraction components shall be constructed of PVC, HDPE pipe, fiberglass, stainless steel, or other non-porous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with

emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration

Compliance with §60.759(b)(1) is discussed in the following sections.

4.4.1.1 Materials

The GCCS components will be constructed of PVC, HDPE, fiberglass, corrosion-resistant steel, neoprene (gaskets and seals) and other non-porous corrosion resistant materials. Pipelines that penetrate the landfill cover will only be constructed of resilient materials such as HDPE, not of PVC due to site experience with PVC breakage.

4.4.1.2 Component Sizing

The piping network, blowers, and flare are sized for the current anticipated LFG flow rates for the facility. The GCCS is installed with expansion capabilities and the capacity of the extraction and treatment system components may be phased in as LFG generation and extraction rates increase.

4.4.1.3 Component Loading

The GCCS components were designed to withstand the estimated installation, static, settlement, overburden, and traffic loads. The GCCS components that will be installed at the Landfill are consistent with those at other landfills which have been in-place for extended periods of time (in excess of 15 years) and verified to be withstanding applied static and settlement forces. Overburden and traffic loads for the proposed LFG transmission piping are less than the allowable loads recommended by the piping manufacturer. Foundations used for GCCS components were designed to handle the applied loads.

4.4.1.4 System Expansion

The GCCS shall be expanded as necessary to comply with NSPS requirements. Expansion of the GCCS will be certified by a professional engineer and the measures of performance of the LFG system verified as set forth in the NSPS. The Landfill will continue to conduct monitoring and document compliance of the GCCS in accordance with NSPS requirements. If the GCCS at the Landfill does not meet the measures of performance set forth in the NSPS, the GCCS will be adjusted or modified in accordance with NSPS requirements.

4.4.1.5 Component Perforation

The vertical well elements will be perforated similar to those shown on the design drawings (Appendix A), or as approved by the design engineer at the time of installation, to allow LFG entry without inducing head losses sufficient to impair performance across the intended extent of control. The perforation patterns used for the GCCS design have been successfully used in previous LFG control applications.

4.4.1.6 Air Infiltration

The LFG collection elements were designed to prevent excessive air infiltration through the use of solid pipe and solid backfill near the ground surface for vertical extraction wells. Hydrated bentonite clay chips, and/or geomembrane seals will be provided around the vertical extraction well casings where they penetrate the landfill final cover systems. Further, air intrusion control will be accomplished through monitoring of the operational monitoring standards for the LFG collection elements in accordance with NSPS requirements. If the GCCS does not meet the operational monitoring standards, it will be adjusted or modified in accordance with NSPS requirements.

4.4.2 Landfill Gas Extraction Component Installation

§60.759(b)(2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

Compliance with §60.759(b)(2) is discussed in the following sections.

4.4.2.1 Component Placement

Depths of refuse were calculated, at the time of the design of the GCCS, based upon existing topography and permit plan and record documentation of Landfill liner grades. The Landfill surface elevations are determined from aerial survey data at the time of design.

4.4.2.2 Leachate

The occurrence of leachate within the Landfill is addressed by the leachate management system. Leachate management is accomplished through the use of a leachate drainage

layer, perforated collection piping, liquid pumping and discharge to the sanitary sewer system.

For this reason, it is not expected that free liquids will be encountered during the drilling of the vertical extraction wells. If free liquids are encountered, the drilling contractor will attempt to drill through the perched zone of liquids allowing drainage into the underlying waste mass and the leachate collection system. In the event that the zone of perched liquids cannot be penetrated, the well installation may be terminated and relocated. If necessary, appropriate measures will be taken to complete the well installation procedure at a nearby location.

If perched liquids are observed within the vertical extraction wells after installation and it is determined that the liquid level is restrictive to efficient LFG extraction, the leachate level will be reduced. This is typically accomplished by periodic pumping of the liquids using either electric or pneumatic pumping systems. Liquids removed from the well casings will be discharged to the sanitary sewer system in accordance with applicable permits.

4.4.2.3 Vertical Wells

Vertical extraction wells constructed for LFG collection are of sufficient cross-section to allow for their proper construction and completion, including centering of the pipes and placement of gravel backfill. The vertical wells will be constructed under supervision of a construction quality assurance program implemented by the Landfill and verified to be properly constructed.

4.4.2.4 Horizontal Wells

Horizontal LFG collection wells are also used to control LFG emissions and are typically buried in 50 to 100 feet of waste as waste lifts are constructed vertically. Horizontal LFG collection trenches are installed across active areas and tied into adjacent GCCS piping with solid pipe or risers. Due to the propensity for air intrusion since the horizontal trenches are normally completed in shallow trenches across new waste, the horizontal wells are typically operated after placement of at least one to two subsequent lifts of refuse. In addition, the perforated piping portion of the horizontal collectors are normally offset from side slopes to prevent air intrusion from the side slope.

4.4.2.5 Component Short Circuiting

Air intrusion control will be verified through monitoring of LFG quality at the extraction components, monitoring of surface emission levels and maintenance of the landfill cover in accordance with NSPS requirements. Separation of the collection elements from the refuse is accomplished by placing gravel backfill in the annular borehole space around extraction well casings, providing a filter pack between the refuse and the LFG collection elements.

The potential for direct venting of the LFG to the atmosphere is limited by operating the GCCS under a controlled application of vacuum and is monitored by quarterly monitoring of surface emissions (see Section 4.2).

4.4.2.6 Gravel Backfill

Gravel of sufficient size is specified to prevent penetration or blockages of the LFG collector pipe perforations. Gravel (non-calcareous) to be utilized will be typically nominal one-inch to three-inch particle size.

4.4.3 Landfill Gas Extraction Component Connections to LFG Transmission Piping

§60.759(b)(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other non-porous material of suitable thickness.

The collection devices are connected to the collection header pipes using lateral piping. The lateral piping is connected to the header piping either above or below the landfill surface, as required by field conditions at the time of installation. The connector assemblies (vertical extraction wellheads) are located above grade. These assemblies include a positive closing throttle valve, necessary seals and couplings, access ports and couplings, and a minimum of two sampling ports. The collection devices are constructed of PVC, HDPE, fiberglass, corrosion-resistant steel, and other non-porous materials of suitable thickness. The GCCS components are designed to withstand anticipated installation, static, settlement, overburden, and traffic loads.

4.5 Compliance with §60.759(c)(1) or (2)

§60.759(c) Each owner or operator seeking to comply with §60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with §60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

Compliance with §60.759(c) is discussed in the following sections.

4.5.1 Existing Landfill Gas Flow Rate Data

§60.759(c)(1) For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section shall be used.

At the time of this report, an active GCCS has been constructed and is operating at the Landfill. The LFG mover equipment has been sized to handle the LFG flow rate expected over the intended use period of the LFG moving equipment.

LFG generation projections are provided in Appendix C.

4.5.2 Future Landfill Gas Flow Rate Estimates

§60.759(c)(2) For new collection systems, the maximum flow rate shall be in accordance with §60.755(a)(1).

In compliance with §60.752(b)(2)(ii)(A), the maximum expected LFG flow rate for the GCCS is based on LFG modeling and site specific LFG flow data. As specified in 40 CFR 60.759(c)(1), the LFG mover equipment has been sized to handle the maximum LFG generation rate expected over the intended use period of the LFG moving equipment. Additional control device capacity will be installed if warranted in accordance with the NSPS.

LFG generation projections are provided in Appendix C.

4.6 Alternatives and Compliance with §60.752(b)(2)

§60.752(b)(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall:

4.6.1 Submit a Design Plan

§60.752(b)(2)(i) Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year:

A Tier 1 analysis conducted in 1997 indicated the Landfill exceeded the 50 megagrams per year (Mg/yr) threshold. A Design Plan was prepared in 1998 within one year of the Tier 1 analysis which indicated the Landfill exceeded 50 Mg/yr of NMOCs.

On behalf of WPWMA, Cornerstone prepared this GCCS Design Plan to update and replace the most recent version of the GCCS Design Plan. WPWMA is submitting this Design Plan update to the PCAPCD, with a copy sent to the USEPA Region IX office consistent with NSPS requirements. Refer to Table 2 for further details.

4.6.2 Alternatives to the NSPS

§60.752(b)(2)(i)(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance

measures, monitoring, record keeping or reporting provisions of §60.753 through §60.758 proposed by the owner or operator.

A number of alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, record keeping or reporting provisions of §60.753 through §60.758 of the NSPS are proposed at this time. These alternatives are discussed in Appendix B of this document.

4.6.3 Specifications for Active Collection Systems

As stated in Sections 4.1 through 4.5 of this Design Plan, the GCCS proposed at the Landfill complies with the specifications for active collection systems as stipulated in §60.759 of the NSPS. If future expansions of the GCCS are necessary, they will be designed to comply with the NSPS requirements or any approved alternatives.

4.6.4 Installation of Landfill Gas Collection and Control System

§60.752(b)(2)(ii) Install a collection and control system within 18 months of the submittal of the design plan under paragraph (b)(2)(i) of this section that effectively captures the gas generated within the landfill.

§60.752(b)(2)(ii)(A)(2) Collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of:

§60.752(b)(2)(ii)(A)(2)(i) 5 years or more if active; or

§60.752(b)(2)(ii)(A)(2)(ii) 2 years or more if closed or at final grade;

Refer to Table 2 for further details regarding §60.752(b)(2)(ii). Future expansions to the GCCS will proceed in accordance with the schedules under paragraphs (i) and (ii) of this section.

§60.752(b)(2)(ii)(A)(3) Collect gas at a sufficient extraction rate;

§60.752(b)(2)(ii)(A)(4) Be designed to minimize off-site migration of gas.

In compliance with §60.752(b)(2)(ii)(A)(3) and (4), the GCCS is designed to extract LFG at a sufficient rate to minimize the potential for off-site subsurface LFG migration and surface emissions of LFG. This is achieved by sizing and installing sufficient collection elements, transmission piping, blower(s), and flare for the estimated maximum flow rate of LFG.

The GCCS is designed to collect LFG at a sufficient rate, which per the definition in §60.751 means to maintain a negative [gage] pressure (vacuum) at the wellheads without causing air infiltration. Application of a negative gage pressure and minimization of air infiltration will be verified by monitoring the static pressure and nitrogen or oxygen concentrations of the LFG at the extraction points.

Each extraction point will be monitored on a minimum of a monthly basis in accordance with 40 CFR §60.753 (b) and (c). Monitoring will be performed for pressure, temperature, oxygen and/or nitrogen, at a minimum.

Verification of the GCCS's ability to minimize the potential for off-site subsurface LFG migration will be achieved through the routine monitoring of perimeter LFG monitoring probes installed around the Landfill.

The Landfill will monitor the GCCS extraction points, after installation, for static pressure and for LFG quality in accordance with NSPS requirements and will continue to monitor the perimeter LFG monitoring locations to detect potential for off-site subsurface LFG migration. If off-site LFG migration is detected, the Landfill will take the necessary actions in accordance with NSPS requirements.

4.6.5 Control Systems

§60.752(b)(2)(iii) Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii)(A), (B) or (C) of this section.

The control systems have the ability to utilize the LFG collected as part of the GCCS. The required operational performance of these components is stipulated by §60.752(b)(2)(iii) which states:

§60.752(b)(2)(iii)(A) An open flare designed and operated in accordance with §60.1

§60.752(b)(2)(iii)(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test, required under §60.8 using the test methods specified in §60.754(d).

§60.752(b)(2)(iii)(C) Route all collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii)(A) or (B) of this section.

LFG collected at the Landfill is routed to a 75.9 Million British Thermal Units per hour (MMBTU/hr) (2,500 scfm at 55 percent methane) capacity enclosed flare with a destruction efficiency of at least 98 percent. A new proposed 90 MMBTU/hr (3,000 scfm at 50 percent methane) capacity enclosed flare with a destruction efficiency of at least 99 percent is to be installed at the site in 2016.

The flare operating temperature and LFG flow rate is monitored and recorded a minimum of every 15 minutes with a paperless recorder in accordance with §60.756(b). The flare exhaust temperature is monitored using thermocouples installed within the flare stack. The LFG flow rate is measured by a continuous flow metering device installed along the LFG piping, downstream of the blowers. There are no bypass valves or other conveyances that will allow untreated LFG to be discharged to the atmosphere.

The flare is monitored for the presence of a flame, indicating that combustion is occurring. Monitoring for the presence of a flame is accomplished by an ultraviolet (UV) flame scanner, thermocouple, or comparable device. In the event that a flame is not detected, indicating that the combustion process has been disrupted, the monitoring system will automatically:

- a) Eliminate power to the LFG blowers; and
- b) Initiate the closure of a pneumatic-activated valve at the inlet to the flare (there is no bypass around the control device).

Stopping the blowers will cause the LFG extraction process to cease. Closing the inlet valve to the flare will eliminate the potential for direct venting of LFG through the control device system.

A small enclosed flare at the LFGTE facility is operated under PCAPCD Permit Number PLWR-05-01. The small flare has a capacity of 13.9 MMBTU/hr (450 scfm at 55 percent methane) and is not permitted to operate at the same time as the large flare, except for a one (1)-hour transition time when switching from operation of one flare to the other. The small flare has a destruction efficiency of at least 98 percent, and is equipped with an alarm and automatic blower and LFG supply shutoff valve system to isolate the flare from the landfill gas supply line in the event of a failure.

A portion of the LFG from the Landfill is processed by the LFGTE facility. The LFGTE facility is capable of processing the maximum flow of LFG from the landfill, around 3,300 scfm. LFG that is not utilized by the power plant is routed to the WPWMA flare or small flare control devices.

In the event that LFG extracted from the landfill exceeds the capacity of the control systems, additional control mechanisms will be installed. These additional control mechanisms may include, but are not limited to, installing additional or upgraded control devices or installation of beneficial-use facilities.

LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client recognizing these considerations and limitations. Cornerstone shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

The modeling techniques used by Cornerstone and the LFG industry are, by definition, hypothetical, and can only be used as a very general tool for producing a range of estimates to aid in determining the direction of further investigations. Actual LFG generation and collection rates are dependent on many variables, including: refuse composition, moisture, pH, cover soil permeability, well spacing, continuing fill rates, etc. Typically these parameters are not well defined at the time of modeling and/or differ somewhat from those actually experienced during future site operation.

The modeling provided herein was performed with today's current standards of practice and no warranty or representation, expressed or implied, is made, as to the actual LFG production that will occur in the future. Opinions and recommendations contained in this report are based on the information available and certain assumptions that were deemed reasonable when our services were performed. We are not responsible for the impacts of any changes in information, site operations or methods that may change in the future.

TABLES

TABLE 1 – SUMMARY OF LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN PLAN

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
60.759 (a)(1)	Section 4.1	Page E-3, Section 3	Design Plan must address depth of refuse, refuse LFG generation rates and flow characteristics, cover properties, LFG system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end-use, air intrusion control, corrosion resistance, fill settlement, resistance to the refuse decomposition heat.	The Landfill Design Plan addresses all of the requirements listed under §60.759 (a)(1).
§60.759 (a)(2)	Section 4.2	Page E-3, Section 4	LFG collection devices shall be installed at a sufficient density to control surface emissions and subsurface migration of LFG.	The LFG collection devices have been designed to control surface emissions and subsurface migration of LFG.
§60.759 (a)(3)(i)	Section 4.3.1	Page E-3, Section 5	Areas containing asbestos or other non-degradable materials may be excluded from coverage by the LFG collection and control system (GCCS).	The Landfill does not accept asbestos.
§60.759 (a)(3)(ii)	Section 4.3.2	Page E-3, Section 6	Areas considered to be non-productive (contributing less than one percent of the total non-methane organic compounds (NMOC) from the landfill) may be excluded from coverage of the landfill GCCS.	There are currently no non-productive areas at the Landfill.
§60.759 (b)(1)	Section 4.4.1	Page E-5, Section 7	Landfill GCCS components shall be constructed of PVC, HDPE or other non-porous corrosion resistant materials.	Landfill GCCS components shall be constructed of PVC, HDPE or other non-porous corrosion resistant materials.

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
	Section 4.4.1	Page E-5, Section 8	Landfill GCCS components shall have suitable dimensions to convey the maximum LFG flow rate and withstand future settlement, overburden and traffic loads.	Landfill GCCS components were designed to accommodate the maximum LFG flow rate and withstand future settlement, overburden and traffic loads.
	Section 4.4.1	Page E-5, Section 9	Expansion of the landfill GCCS will occur as needed to meet LFG emissions and migration standards.	Expansion of the landfill GCCS will occur as needed following LFG emissions and migration standards.
	Section 4.4.1	Page E-5, Section 10	Extraction well perforations will control head loss and air infiltration throughout the system,	The LFG collection elements shall be constructed to minimize head loss and prevent excessive air infiltration into the system.
§60.759 (b)(2)	Section 4.4.2	Page E-5, Section 11	Extraction wells must not endanger the landfill base liner and must address the occurrence of water in the landfill.	The extraction wells are designed based on depths of refuse which are calculated at the time of the design of the GCCS based upon existing topography and permit plan and record documentation of Landfill liner grades. The Landfill surface elevations are determined from survey data at the time of design. Liquids in the refuse are addressed by the leachate and condensate management systems.
	Section 4.4.2	Page E-6, Section 12	Suitable cross-section of the well holes and trenches is required for construction and completion of the collection elements.	The vertical boreholes will be constructed with sufficient cross section to allow for the proper construction of the collection elements.

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
	Section 4.4.2	Page E-6, Section 13	Landfill GCCS components must be designed to control air intrusion, prevent LFG from escaping the GCCS, and prohibit refuse from entering the GCCS.	Control of air intrusion and the escape of LFG from the system will be accomplished through the monitoring of the landfill GCCS, operating the system under vacuum and continued maintenance of the landfill cover. The refuse is prohibited from entering the collection devices by gravel backfill or other approved materials placed in the hole or trench separating the refuse from the LFG collection elements.
	Section 4.4.2	Page E-6, Section 14	Gravel backfill in the extraction wells and trenches shall not obstruct pipe perforations.	Backfill of sufficient size will be used to prohibit entry or blockage of the collector perforations.
§60.759 (b)(3)	Section 4.4.3	Page E-6, Section 15	Collection device connections may be above or below ground, must include a positive closing throttling valve, necessary seals, access couplings, and at least one monitoring point.	The collection devices shall be connected to the collection header pipe and will include a positive closing throttling valve, necessary seals, access couplings, and at least one monitoring point.
§60.759 (c)	Section 4.5	Page E-6, Section 16	The collection header pipes must be adequate to handle the maximum LFG flow rate.	The collection header pipes are adequate to handle the current maximum LFG flow rate.
§60.752 (b)(2)(i)	Section 4.6.1	Page E-3, Section 2	Submit a collection and control system design plan prepared by a professional engineer to the Administrator within 1 year. Landfill GCCS Design Plan must be certified, sealed and signed by a professional engineer.	The GCCS Design Plan has been certified, sealed and signed by a professional engineer. See Table 2, below, for further details.

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
\$60.752 (b)(2)(i)(B)	Section 4.6.2		The GCCS Design Plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, record keeping or reporting provisions of \$60.753 through \$60.758 proposed by the owner or operator.	The GCCS Design Plan includes alternatives per the requirements by the owner or operator in Appendix B.
\$60.752 (b)(2)(ii)(A)(2)	Section 4.6.4	Page E-2, Section 2	LFG collection shall occur in active cells with waste in place for five years or more; in closed cells with waste at final grade for two years or more.	The landfill GCCS components will be installed following NSPS schedule requirements.
\$60.752 (b)(2)(ii)(A)(3)	Section 4.6.4	Page E-2, Section 3	LFG extraction wells shall apply a negative gage pressure to maintain a sufficient extraction rate of LFG without causing air infiltration.	A negative gage pressure shall be applied to the LFG collection elements via a blower. The Landfill will monitor the landfill GCCS wellheads for static pressure and indications of air infiltration following NSPS operating standards.
\$60.752 (b)(2)(ii)(A)(4)	Section 4.6.4	Page E-2, Section 4	Subsurface migration of LFG will be controlled.	The landfill GCCS shall control potential off-site subsurface migration through proper operation of the GCCS and control will be verified by the monitoring of perimeter monitoring probes installed at the site.
\$60.752 (b)(2)(iii)	Section 4.6.5		Route all the collected LFG to a control system.	The landfill GCCS shall route the collected LFG to a control system that complies with the requirements \$60.752 (b)(2)(iii)(A), (B), or (C).

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
\$60.753(a)	Section 4.1		Operate the collection system such that LFG is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for: (1) 5 years or more if active; or (2) 2 years or more if closed or at final grade.	The GCCS is and will be installed to collect LFG from all areas of the landfill that conform to this requirement. Since the Landfill is active, expansion of the GCCS will be as required and in accordance with this requirement.
\$60.753(b)	Section 5.1 Section 6		Operate the collection system with negative pressure at each well head.	Extraction wells shall operate under a negative pressure, except for any approved exemptions and alternatives.
\$60.753(c)	Section 6.1.3		Operate each interior well head in the collection system with a LFG temperature of less than 55° C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.	Extraction wells will operate under these conditions, except for any approved exemptions and alternatives.
\$60.755(a)(1)(iii)	Section 2.1.4 Section 3.3 Section 4.1	Page E-6, Section 17	\$60.755 (a)(1) For purposes of calculating the maximum expected LFG generation flow rate from the landfill to determine compliance with §60.752 (b)(2)(iii)(1), one of the following equations shall be used. The k and L _o factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site-specific values demonstrated to be appropriate and approved by the Administrator.	The maximum flow for evaluating the initial enclosed flare for the GCCS was derived from the USEPA NSPS-based model using site specific data in accordance with §60.755 (a)(1)(iii). Following installation of the initial GCCS, subsequent GCCS expansion

Regulatory Citation	Report Reference	Appendix E Reference ¹	Regulatory Requirement	Implementation of Regulatory Requirement
			§60.755 (a)(1)(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected LFG generation flow rate instead of, or in conjunction with, the equations in paragraphs (a)(1)(i) and (ii) of this section.	sizing was based on actual flow data and was used to project future flows.
§60.756	Section 6.2.5		Monitoring of Operations	The WPWMA will comply with the provisions of this rule.
§60.757	Section 5.1.4		Reporting Requirements	The WPWMA will comply with the provisions of this rule.
§60.758	Section 6		Recordkeeping Requirements	The WPWMA will comply with the provisions of this rule.

(1) From Appendix E ("Collection System Design Plans") of the NSPS Enabling Documents ("Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills", EPA-453R/96-004).

TABLE 2 - LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN REVIEW CHECKLIST

Landfill Site Name: Western Regional Sanitary Landfill
Location of Landfill: 3195 Athens Avenue, Lincoln, California
Landfill Owner: County of Placer
Date of Submittal: May 2016

Goals for the GCCS: control migration control emissions safety
(circle all that apply, add more as appropriate)

Is the GCCS proposed to be active or passive? (circle one)

The proposed GCCS is active in nature and should serve to mitigate the potential for both subsurface and airborne migration, as well as the potential for accumulation in occupied structures.

-
1. Was the design certified by a PE? **60.752(b)(2)(i)** Yes No
(circle one)

Maura Dougherty is a Registered Professional Engineer in California and has certified this Gas Collection and Control System (GCCS) Design Plan as the design engineer.

2. Was the design submitted within 12 months of the first report of the site exceeding 50 Mg/yr. of NMOC's? **60.752(b)(2)(i)** Yes No
(circle one)

If no, describe circumstances: On behalf of the Western Placer Waste Management Authority, Cornerstone Environmental Group, LLC has prepared this landfill gas collection and control system (GCCS) Design Plan to update and replace the existing GCCS Design Plan submitted in 2012. The facility's initial GCCS Design Plan (1998) was submitted in accordance with the NSPS compliance schedule and or local PCAPCD rules and regulations.

3. Is the GCCS planned to be operational within 30 months of the first report of the site exceeding 50 MG/yr of NMOC's? **60.752(b)(2)(ii)** Yes No
(circle one)

If no, describe circumstances: At the time of this report, an active GCCS has been constructed and is operating at WSRL.

4. Does the GCCS comply with the 2 year/5 year rule? **60.752(b)(2)(ii)(A)(2)**

☒ Yes ☐ No
(circle one)

If no, describe circumstances: Please reference Section 4.6.4 of the Design Plan.

5. What is the design life of the GCCS? **60.752(b)(2)(v)** The design life of the GCCS includes the operational period of the facility up to 20 years. The system has been designed to accommodate expansion as needed in the future. Individual components of the GCCS will be replaced or repaired as age and usage reduce their efficiency.

6. Is the GCCS design for the maximum expected flow rates during its design life?

60.752(b)(2)(ii)(A)(1) ☒ Yes ☐ No
(circle one)

If no, describe circumstances: Please reference Section 4.5 of the Design Plan.

7. Describe the measures taken to control lateral LFG migration in the design. If no measures were taken, describe why? **60.752(b)(2)(ii)(A)(4)** The design of the GCCS uses active extraction to mitigate the potential for lateral landfill gas (LFG) migration. This process is enhanced by the presence of a low-permeability soil and/or flexible membrane liner (FML) base liner system as well as a low-permeability soil and/or FML final cap system where applicable. Please reference Section 4.1 of the Design Plan.

8. If a passive system is planned, are the necessary liners in place? **60.752(b)(2)(ii)(B)(2)**

☐ Yes ☒ No
(circle one)

If no, describe circumstances: Not Applicable – an active system is installed and operating.

9. Is adequate density of collectors planned? Refer to Section 5.1 ☒ Yes ☐ No
(circle one)

If no, describe circumstances: Please reference Section 4.2 of the Design Plan.

10. Is the LFG Conveyance System sized properly? Refer to Section 5.2

☒ Yes ☐ No
(circle one)

The LFG conveyance system is adequately sized to handle the future peak LFG generation rate calculated using the United States Environmental Protection Agency

(USEPA) LandGEM V3.02, and is expandable. The LFG conveyance system may be expanded to handle future LFG generation rates in accordance with the New Source Performance Standards (NSPS) to mitigate surface and lateral LFG migration. Please reference Sections 4.4.1.2 and 4.6.5 of the Design Plan.

11. Is the LFG planned to be routed to a control device? **60.752(b)(2)(iii)**
☒ Yes ☐ No
(circle one)

Please reference Section 4.6.5 of the Design Plan.

12. Describe the control device utility flare ☒ enclosed flare ☐ other
(circle one)

The control devices installed consist of two enclosed LFG flares rated for 2,500 and 450 standard cubic feet per minute (scfm) of LFG at 50 percent methane, respectively. The flares are operated in accordance with §60.752(b)(2). The Landfill also provides LFG to an onsite Third Part Power Plant operated under a separate permit. A proposed 3,000 scfm enclosed flare has been proposed for installation in 2017. Please reference Section 4.6.5 of the Design Plan.

13. If the control device is a flare, does it include continuous temperature monitoring and a flow measurement device? **60.756(b) and (c)** ☒ Yes ☐ No
(circle one)

If no, describe circumstances: The WPWMA flare and the small flare at the LFGTE facility have paperless recorders which monitor and record data, including both the flares' operating temperatures and flow rates to demonstrate combustion and the inlet LFG flow rate, in accordance with §60.756. Please reference Section 4.6.5 of the Design Plan.

14. Is the flare sized properly? Refer to section 5.3 of the student manual.

☒ Yes ☐ No
(circle one)

The flares are adequately sized to accommodate the predicted flow rate in accordance with §60.752(b)(2)(iii)(B). Please reference Section 4.6.5 of the Design Plan.

15. If a control device other than a flare is planned, describe the estimated hours and duration it will be down for maintenance per year:

The WPWMA flare will act as the primary control device. The small flare at the LFGTE facility is used for handling excess LFG not utilized by the power plant if the excess LFG is of insufficient quantity for operating the WPWMA flare.

16. Operational Issues **60.753(b), (c), (d), (e), (f)**

Will the GCCS be operated with a vacuum at every well?

☒ Yes No
(circle one)

The GCCS will be operated with a vacuum at each extraction point, with the exception of mitigating circumstances under §60.753(b)(1).

17. Will the GCCS be operated at the appropriate LFG temps?

☒ Yes No
(circle one)

The GCCS is intended to operate at LFG temperatures below 55°C (131°F). Please see Section 4.1.14 for details.

18. Will the GCCS be operated with minimal amounts of air?

☒ Yes No
(circle one)

The GCCS is designed to prevent excessive air infiltration. Please reference Section 4.1.10 of the Design Plan.

19. Will monitoring be done monthly to confirm these operational issues?

☒ Yes No
(circle one)

Monitoring will be conducted in accordance with NSPS requirements. Please reference Section 4.6.4 of the Design Plan.

20. Will surface emissions monitoring be completed?

☒ Yes No
(circle one)

Monitoring will be conducted in accordance with NSPS requirements. Please reference Section 4.2 of the Design Plan.

21. Will the blower automatically be shutdown if the control device is inoperable?

☒ Yes No
(circle one)

The blower system will automatically be shut down if the control device becomes inoperable. Please reference Section 4.6.5 of the Design Plan.

22. Does the GCCS include fittings to allow connection of additional collectors if necessary in the future? **60.756(2)**

☒ Yes No
(circle one)

If no, describe circumstances: The header system incorporates tees with blind flanges along the transmission piping to facilitate expansion of the system, including additional collectors and control devices. Additionally, high density polyethylene

(HDPE) piping can be readily modified to accept tees or other fittings necessary for system expansion.

23. Does the wellhead for all collectors include at least one sample port and one thermometer port? **60.756(2)** ☒ Yes ☐ No (circle one)

If no, describe circumstances: The wellheads for all collectors include at least one sample port and one thermometer port. Please reference Section 4.6.4 and Appendix A of the Design Plan.

APPENDIX A
2016 GCCS DESIGN DRAWINGS

CONSTRUCTION PLANS FOR 1 GCCEXPANSION

WESTERN PLACER WASTE MANAGEMENT AUTHORITY
WESTERN REGIONAL SANITARY LANDFILL
PLACER COUNTY, CALIFORNIA

AUGUST 2016

PREPARED FOR:

WESTERN PLACER WASTE MANAGEMENT AUTHORITY

PREPARED BY:

GOLDER ASSOCIATES INC.

425 LAKESIDE DRIVE

SUNNYVALE, CA 94085

(408) 220-9223

PGF AND EXISTING FLARE FOR THE PROJECT DURATION THROUGH SUCCESSFUL COMPLETION, START-UP, SUSTAINED OPERATION, AND ACCEPTANCE OF THE NEW EQUIPMENT BY THE OWNER.

- IDENTIFY, LOCATE, POTHOLE AND PROTECT ALL EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE AREAS OF WORK.
- INSTALL TEMPORARY PIPING AND CONTROLS NECESSARY TO PROVIDE CONTINUOUS AND SAFE LFG CONVEYANCE TO THE PGF AND EXISTING FLARE DURING THE ENTIRE PROJECT.
- DECOMMISSION EXISTING FLARE, BLOWERS, APPURTENANT PIPING AND EQUIPMENT AS DESIGNATED BY WPMWA.
- RESTORE AND CLEAN-UP ALL WORK AREAS FOR PROJECT CLOSE-OUT.

LFG COLLECTION SYSTEM:

CONTRACTOR SHALL PROVIDE MATERIALS, LABOR AND EQUIPMENT TO CONSTRUCT NEW LFG EXTRACTION WELLS AND COLLECTORS AND ALL PIPING COMPONENTS AND APPURTENANCES REQUIRED FOR CONNECTION TO EXISTING OPERATIONAL FACILITIES. CONTRACTOR SHALL SUPPLY AND INSTALL LFG EXTRACTION WELLS, COLLECTORS, CONDENSATE DRAINS/SUMPS, CONVEYANCE PIPING, VALVES, FITTINGS AND APPURTENANCES.

SYSTEM CONTROLS AND INTEGRATION:

THE CONTRACTOR SHALL PROVIDE A COMPREHENSIVE CONTROL SYSTEM FOR BOTH AUTOMATED AND MANUAL OPERATION OF THE NEW BLOWER AND FLARE EQUIPMENT. THE FLARE CONTROLS SHALL INCLUDE A PROGRAMMABLE LOGIC CONTROLLER (PLC) THAT COORDINATES AUTOMATIC OPERATION OF THE BLOWERS AND FLARE FOR CONSISTENT CONTROLS AND STABILIZATION OF LFG PRESSURES AND FLOWS TO THE PGF AND THE FLARE. THE BLOWER CONTROLS SHALL INCLUDE VARIABLE FREQUENCY DRIVE AND NECESSARY MONITORING PRESSURES AND FLOW RATES.

THE CONTRACTOR SHALL PROVIDE A NEW SCADA SYSTEM AND INTEGRATION OF SPECIFIED SIGNALS AND DATA STREAMS FROM BOTH NEW AND EXISTING EQUIPMENT CONTROLS. SCADA SYSTEM SHALL INCLUDE ALL REQUIRED TELEMETRY, CONNECTIONS AND COMPREHENSIVE INTEGRATION WITH EXISTING AND NEW BPS AND SCADA SYSTEMS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY HARDWARE, SOFTWARE AND OTHER SIGNALS FOR VIEWING, ACCESS AND ADJUSTMENTS BY AUTHORIZED REMOTE SYSTEM OPERATORS.

REGULATORY COMPLIANCE:

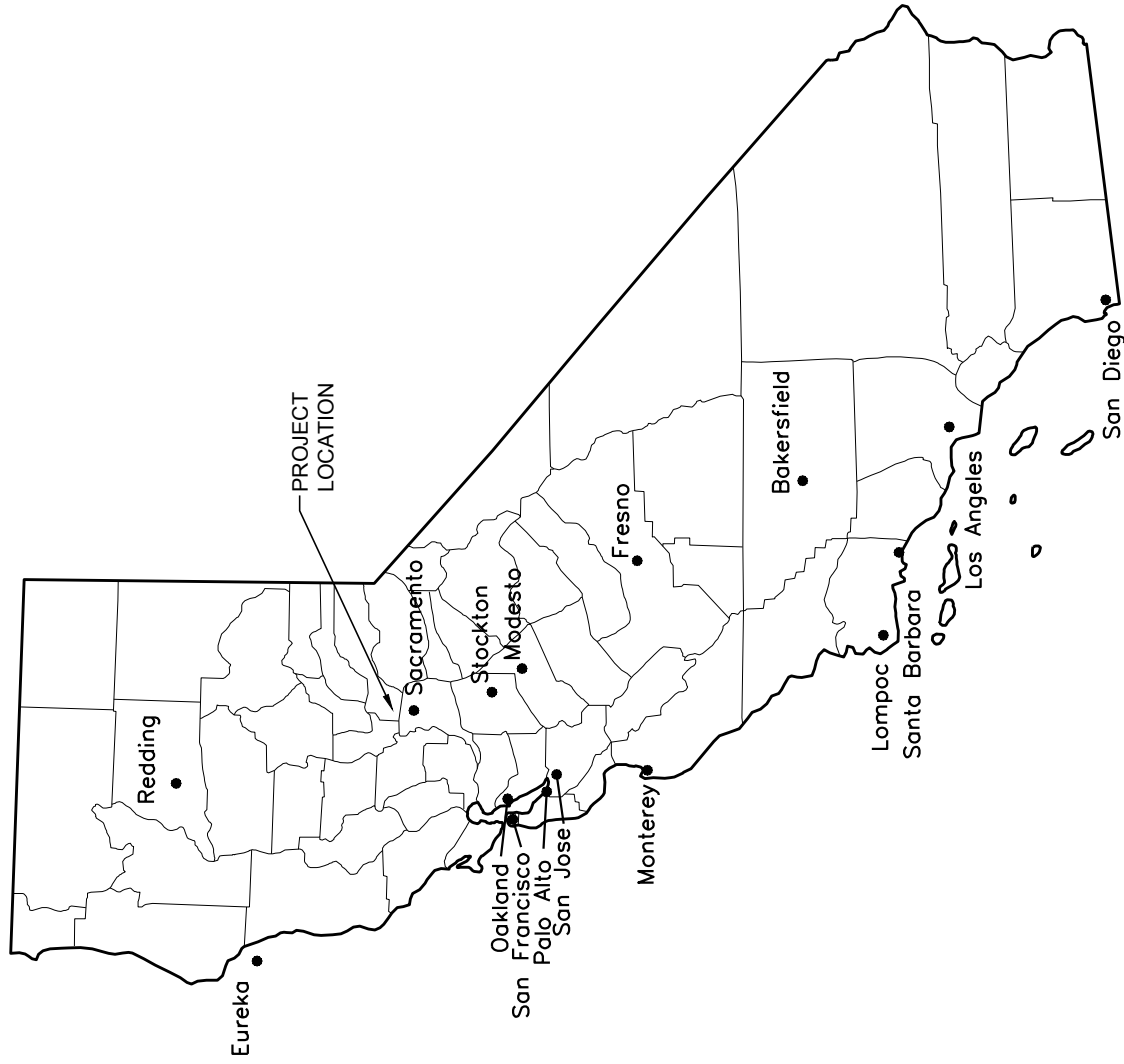
THE PLACER COUNTY AIR POLLUTION CONTROL DISTRICT (PCAPCD) WILL ISSUE AN AUTHORITY TO CONSTRUCT (ATC) PERMIT FOR THE NEW FLARE EQUIPMENT. THE CONTRACTOR SHALL PROCURE AND INSTALL THE NEW EQUIPMENT TO OPERATE IN CONTINUOUS COMPLIANCE WITH ALL PERMIT CONDITIONS, PCAPCD REGULATIONS, AND OPERATIONAL REQUIREMENTS AS MAY BE FURTHER DESCRIBED IN THE CONTRACT DOCUMENTS.

THE CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION AND PRODUCTS IN STRICT ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES OF THE COUNTY OF PLACER, INCLUDING ALL APPLICABLE STATE AND FEDERAL REGULATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND EACH SUBCONTRACTOR TO BE IN FULL COMPLIANCE, REGARDLESS OF ANY DISCREPANCIES THAT MAY EXIST WITHIN THE DRAWINGS OR SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO NOTIFY THE CONTRACTOR, WHO IN TURN SHALL NOTIFY THE OWNER/ENGINEER PRIOR TO PERFORMANCE, IF A CONFLICT EXISTS BETWEEN ANY PORTION OF THE CONTRACT DOCUMENTS OR WORK AND APPLICABLE CODES OR ORDINANCES, OR FOR ANY OTHER APPARENT CONFLICT OR DISCREPANCY OF THE CONTRACT DRAWINGS OR SPECIFICATIONS.

BASIS OF EQUIPMENT DESIGN AND MANUFACTURE. THE CONTRACTOR SHALL PROVIDE EQUIPMENT DESIGNED AND MANUFACTURED TO COMPLY WITH THE REQUIREMENTS OF CURRENT NATIONAL, STATE AND LOCAL CODES AND STANDARDS FOR WASTE GAS PROCESSING EQUIPMENT, INCLUDING BUT NOT LIMITED TO:

- STRUCTURAL DESIGN: ANSI
- SHOP AND RECORD DRAWINGS: ANSI S5.1
- FABRICATION (WELDING): AWS
- ELECTRICAL (COMPONENTS): UL
- ELECTRICAL (WIRING): NEC
- PAINTING, SANDBLAST: SSP, SP-6

IF REQUIRED FOR APPROVED SUBSTITUTIONS, THE CONTRACTOR SHALL PROVIDE ADDITIONAL FOUNDATION OR STRUCTURAL ENGINEERING IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE (CBC, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS [ICBO], 2013 EDITION).



REGIONAL MAP

GENERAL NOTES

SCOPE OF WORK

GENERAL

THE PROPOSED PROJECT IS THE CONSTRUCTION OF EXPANSIONS AND UPGRADES TO THE LANDFILL GAS COLLECTION AND CONTROL SYSTEM (GCCS) AT THE WESTERN REGIONAL SANITARY LANDFILL (WRSL). THESE PLANS SHALL BE USED WITH THE TECHNICAL SPECIFICATIONS AND THE COUNTY OF PLACER STANDARD SPECIFICATIONS AND STANDARD DRAWINGS. THE PROJECT INCLUDES FOUR MAJOR ELEMENTS OF WORK: 1) CONSTRUCTION OF TWO NEW BLOWERS, TWO NEW FLARES, AND TWO NEW LFG COLLECTION WELLS; 2) EXPANDING THE LFG COLLECTION WELLS AND PIPING SYSTEM; 3) PROVIDING AND ERECTING NEW PRE-ENGINEERED METAL BUILDINGS IN THE BLOWER FLARE STATION (BFS); 4) PROVIDING AND INTEGRATING NEW BLOWER/FLARE SYSTEM CONTROLS AND A NEW SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM FOR COMPREHENSIVE BFS AND SITE REMOTE MONITORING AND CONTROL.

SITE INFORMATION AND DESIGNS IN THESE DRAWINGS ARE DEPICTED SCHEMATICALLY. A BASE CONCEPTUAL PLAN IS SHOWN IN DRAWING 7A. THE PLAN INCLUDES NEW 480VAC ELECTRICAL SERVICE AND EQUIPMENT, A SECOND NEW LFG BLOWER, AND ADDITIONAL SITE PREPARATION AND DECOMMISSIONING WORK AS SHOWN IN THE DRAWINGS OR DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS OUTLINED IN GENERAL CONDITIONS C-2. THE CONTRACTOR MAY SUBMIT ALTERNATIVE LAYOUTS AND/OR OTHER VALUE ENGINEERING CHANGE PROPOSALS FOR THE AUTHORITY'S CONSIDERATION. THE FINAL SHOP DRAWINGS SHALL BE THE FINAL LAYOUTS AND VALUE ENGINEERING CHANGES APPROVED BY THE AUTHORITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR CONSTRUCTION. THE FINAL SHOP DRAWINGS AND LAYOUTS MUST COMPLY WITH ALL PERFORMANCE REQUIREMENTS AND FUNCTIONAL INTENTS AS SHOWN OR DESCRIBED IN THESE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PROVIDE, INSTALL AND DEMONSTRATE PROPER OPERATION OF ALL EQUIPMENT AND COMPONENTS SHOWN IN THE CONTRACT DRAWINGS AND FINAL SHOP DRAWINGS OR DESCRIBED IN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO MAINTAIN THE GCCS AND LFG DELIVERY PROCESS IN CONTINUOUSLY ACTIVE AND COMPLIANT OPERATION AT ALL TIMES THROUGHOUT THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING THE WORK IN ACCORDANCE WITH THE ENTIRETY OF THE CONTRACT DOCUMENTS.

LFG BLOWER FLARE STATION:

THE CONTRACTOR SHALL PROCURE, CONSTRUCT, CONNECT, START-UP, AND SUCCESSFULLY TEST AN APPROVED ENCLOSED LFG FLARE, BLOWERS, AND APPURTENANT CONTROL SYSTEMS AND COMPONENTS FOR THE BFS. THE CONTRACTOR SHALL INSTALL THE NEW GAS BLOWERS IN PARALLEL SO THAT EACH CAN PROVIDE CONSISTENT VACUUM TO THE LANDFILL FOR EXTRACTION OF THE LFG FLOWS REQUIRED FOR REGULATORY COMPLIANCE. THE WELL-FIELD HEADER VACUUM SHALL BE CONTROLLED BY ADJUSTING FLOW TO THE FLARE AND DIRECT BLOWER SPEED CONTROL. THE BLOWER DISCHARGE FLOW SHALL BE CONTROLLED TO CONVEY THE LFG FLOWS TO THE FLARE. THE CONTRACTOR SHALL PROVIDE, INSTALL AND DEMONSTRATE PROPER OPERATION OF THE LFG AUTOMATIC DIVERSION OF EXCESS LFG TO THE NEW FLARE FOR THERMAL OXIDATION. THE NEW FLARE SHALL INCLUDE ADDITIONAL TURNDOWN CHARACTERISTICS TO ACCOMMODATE LFG FLOWS FROM 2% TO 100% OF ITS MAXIMUM DESIGN CAPACITY. CONTRACTOR SHALL:

- PROVIDE SUBGRADE PREPARATION, ENGINEERED FILL, AND CONCRETE FOUNDATIONS FOR PROPER PLACEMENT AND ANCHORING OF ALL EQUIPMENT AND STRUCTURES.
- PROVIDE THE NEW EQUIPMENT AS PRE-ASSEMBLED AND PRE-WIRED, SKID-MOUNTED, FULLY-INTEGRATED PROCESS PACKAGES.
- EXTEND AND CONNECT NEW AND EXISTING PIPING AND UTILITIES (LFG, PROPANE, COMPRESSED AIR, CONDENSATE, ELECTRICAL, ETC.)
- COMPLETE ELECTRICAL POWER, CONTROL AND COMMUNICATION CONNECTIONS BETWEEN EXISTING SERVICE PANEL, EXISTING AND NEW CONTROL PANELS, AND FIELD COMPONENTS, A 480VAC 3 PHASE POWER SYSTEM.
- SUCCESSFULLY START-UP, TEST AND OPERATE ALL NEW EQUIPMENT AND CONTROLS.

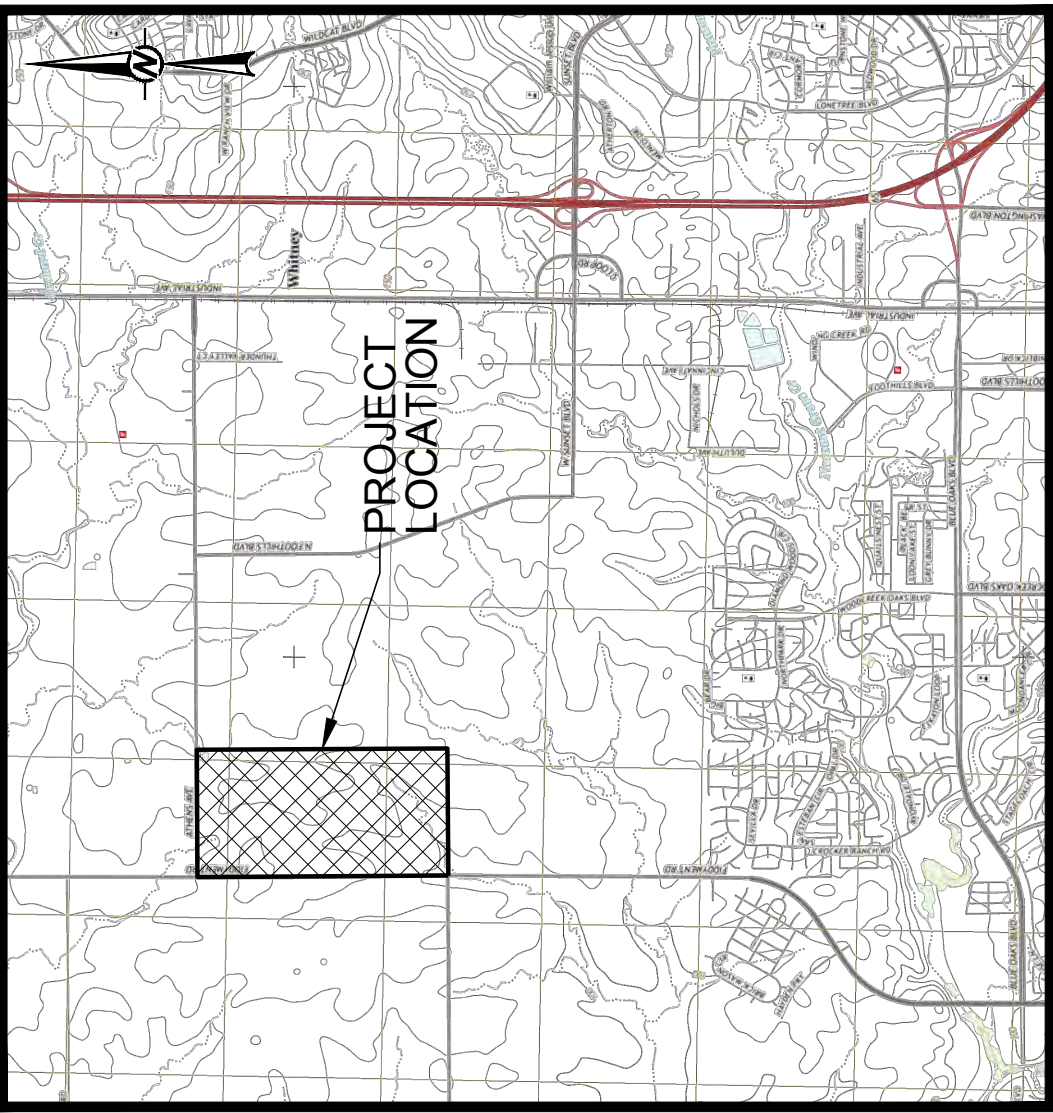
THE CONTRACTOR SHALL PROVIDE DECOMMISSIONING, DEMOLITION, AND REMOVAL OF THE EXISTING FLARE, 28HP BLOWERS, PIPING AND COMPONENTS, PHASED TO ENABLE INSTALLATION OF THE NEW EQUIPMENT AND STRUCTURES. THE CONTRACTOR SHALL RELOCATE AND REINSTALL EXISTING EQUIPMENT AND EXTEND CONNECTIONS AS SHOWN IN THE PLANS, INCLUDING TWO AIR COMPRESSORS AND A PROPANE STORAGE TANK. THE CONTRACTOR SHALL PROVIDE, INSTALL AND DEMONSTRATE PROPER OPERATION OF THE NEW EQUIPMENT AND STRUCTURES. THE CONTRACTOR SHALL PROVIDE TEMPORARY POWER, PIPING AND CONTROLS AS NEEDED TO MAINTAIN CONTINUOUS LFG CONVEYANCE TO THE

Sheet Number	Sheet Title	Sheet Number Sequence
S10	PEM STORAGE BUILDING RIGID FRAME	47
S11	PEM CANOPY BUILDING COVER SHEET	48
S12	PEM CANOPY BUILDING ANCHOR ROD PLAN	49
S13	PEM CANOPY BUILDING ANCHOR DETAILS	50
S14	PEM CANOPY BUILDING LOADS & ANCHOR REQUIREMENTS	51
S15	PEM CANOPY BUILDING PRIMARY STEEL LOCATION PLAN	52
S16	PEM CANOPY BUILDING ROOF SHEETING PLAN	53
S17	PEM CANOPY BUILDING ROOF SHEETING PLAN	54
S18	PEM CANOPY BUILDING SIDEWALL, FRAME LINE A	55
S19	PEM CANOPY BUILDING SIDEWALL, FRAME LINE B	56
S20	PEM CANOPY BUILDING SIDEWALL, FRAME LINE 1	57
S21	PEM CANOPY BUILDING CROSS SECTION, FRAME LINE 2	58

Sheet Number	Sheet Title	Sheet Number Sequence
E1	NOT IN CONTRACT	24
E2	NOT IN CONTRACT	25
E3	NOT IN CONTRACT	26
E4	NOT IN CONTRACT	27
E5	NOT IN CONTRACT	28
E6	NOT IN CONTRACT	29
E1A	ELECTRICAL ONE LINE DIAGRAM	30
E2A	ELECTRICAL MCC	31
E3A	ELECTRICAL EQUIPMENT SITE PLAN	32
E4A	ELECTRICAL CONDUIT BLOCK DIAGRAM	33
E5A	ELECTRICAL DETAILS	34
E6A	ELECTRICAL FLOOR PLAN, STORAGE BUILDING	35
E7A	ELECTRICAL SITE PLAN REMOVAL	36
E8A	ELECTRICAL ONE LINE DIAGRAM & MCC REMOVAL	37
S1	PEM STORAGE BUILDING COVER SHEET	38
S2	PEM STORAGE BUILDING ANCHOR BOLT PLAN	39
S3	PEM STORAGE BUILDING LOADS & ANCHOR REQUIREMENTS	40
S4	PEM STORAGE BUILDING ANCHOR DETAILS	41
S5	PEM STORAGE BUILDING ROOF FRAME PLAN	42
S6	PEM STORAGE BUILDING SIDEWALL, FRAME LINE A	43
S7	PEM STORAGE BUILDING SIDEWALL, FRAME LINE F	44
S8	PEM STORAGE BUILDING SIDEWALL, FRAME LINE 1	45
S9	PEM STORAGE BUILDING SIDEWALL, FRAME LINE 4	46

Sheet Number	Sheet Title	Sheet Number Sequence
T1	TITLE SHEET	1
1	LANDFILL SITE PLAN	2
2	LFG COLLECTION SYSTEM PLAN-SOUTHERN AREA	3
3	VERTICAL LFG EXTRACTION WELL DETAILS	4
4	LFG PIPING DETAILS	5
5	HORIZONTAL LFG COLLECTION DETAILS	6
6	NOT IN CONTRACT	7
6A	BLOWER-FLARE STATION EXISTING CONDITIONS-DECOM PLAN	8
7	NOT IN CONTRACT	9
7A	BLOWER-FLARE STATION CONCEPTUAL SITE PLAN	10
7B	CONDENSATE DETAILS	11
8	STRUCTURAL NOTES AND DETAILS	12
9	BLOWER-FLARE STATION FOUNDATION DETAILS	13
10	PEM STORAGE BUILDING FOUNDATION DETAILS	14
11	PEM STORAGE BUILDING FOUNDATION DETAILS (PRELIMINARY)	15
12	METHANE PROTECTION DETAILS	16
13	NOT IN CONTRACT	17
14	NOT IN CONTRACT	18
14A	BLOWER-FLARE EQUIPMENT TOP ASSEMBLY	19
15	BLOWER-FLARE EQUIPMENT PID LEGEND	20
16	NOT IN CONTRACT	21
16A	BLOWER-FLARE CONCEPTUAL EQUIPMENT PID (1 of 2)	22
17	BLOWER-FLARE EQUIPMENT PID (2 of 2)	23

INDEX OF DRAWINGS



LOCATION MAP
0 4000 8000
1" = 4000'
FEET

THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FLARE STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

ABBREVIATIONS

DISC	DISCONNECT	KVA	KILOVOLT-AMP
E	EASTING OR ELECTRIC	LFG	LANDFILL GAS
(E)	EXISTING	MAX	MAXIMUM
ELEV.	ELEVATION	MIN	MINIMUM
ET	COMMUNICATION	MPT	MALE PIPE THREAD
B.P.	BRASS PIPE	N	NORTHING
E.W.	EACH WAY	N.I.C.	NOT IN CONTRACT
F	FAHRENHEIT	NTS	NOT TO SCALE
FT-MSL	FEET- MEAN SEA LEVEL	NPT	NATIONAL PIPE THREAD
FPT	FEMALE PIPE THREAD	Ø	DIAMETER OR PHASE
GPM	GALLON PER MINUTE	O.C.	ON CENTER
HDG	HOT DIPPED GALVANIZED	O.D.	OUTSIDE DIAMETER
HDPE	HIGH DENSITY POLYETHYLENE	P&ID	PIPING AND INSTRUMENTATION DIAGRAM
I.D.	INSIDE DIAMETER	PSI, PSIG	POUND PER SQUARE INCH, GAUGE
IN. W.C.	INCH WATER COLUMN (GAUGE)		
KOP	KNOCK-OUT-POT		

A	COMPRESSED AIR	DISC	DISCONNECT
AB	AGGREGATE BASE	E	EASTING OR ELECTRIC
AMP	AMPERE	(E)	EXISTING
ASSY	ASSEMBLY	ELEV.	ELEVATION
B.P.	BRASS PIPE	ET	COMMUNICATION
BTU/HR	BRITISH THERMAL UNITS PER HOUR	E.W.	EACH WAY
CLR	CLEARANCE	F	FAHRENHEIT
CLSM	CONTROLLED LOW STRENGTH MATERIAL	FT-MSL	FEET- MEAN SEA LEVEL
CMP	CORRUGATED METAL PIPE	FPT	FEMALE PIPE THREAD
C	CONDENSATE	GPM	GALLON PER MINUTE
CO	CLEAN OUT	HDG	HOT DIPPED GALVANIZED
CS	CONDENSATE SUMP	HDPE	HIGH DENSITY POLYETHYLENE
DI	DUCTILE IRON	I.D.	INSIDE DIAMETER
DIA	DIAMETER	IN. W.C.	INCH WATER COLUMN (GAUGE)
		KOP	KNOCK-OUT-POT

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

CLIENT
WESTERN PLACER WASTE MANAGEMENT AUTHORITY
3033 FIDDYMENT ROAD
ROSEVILLE, CA. 95747

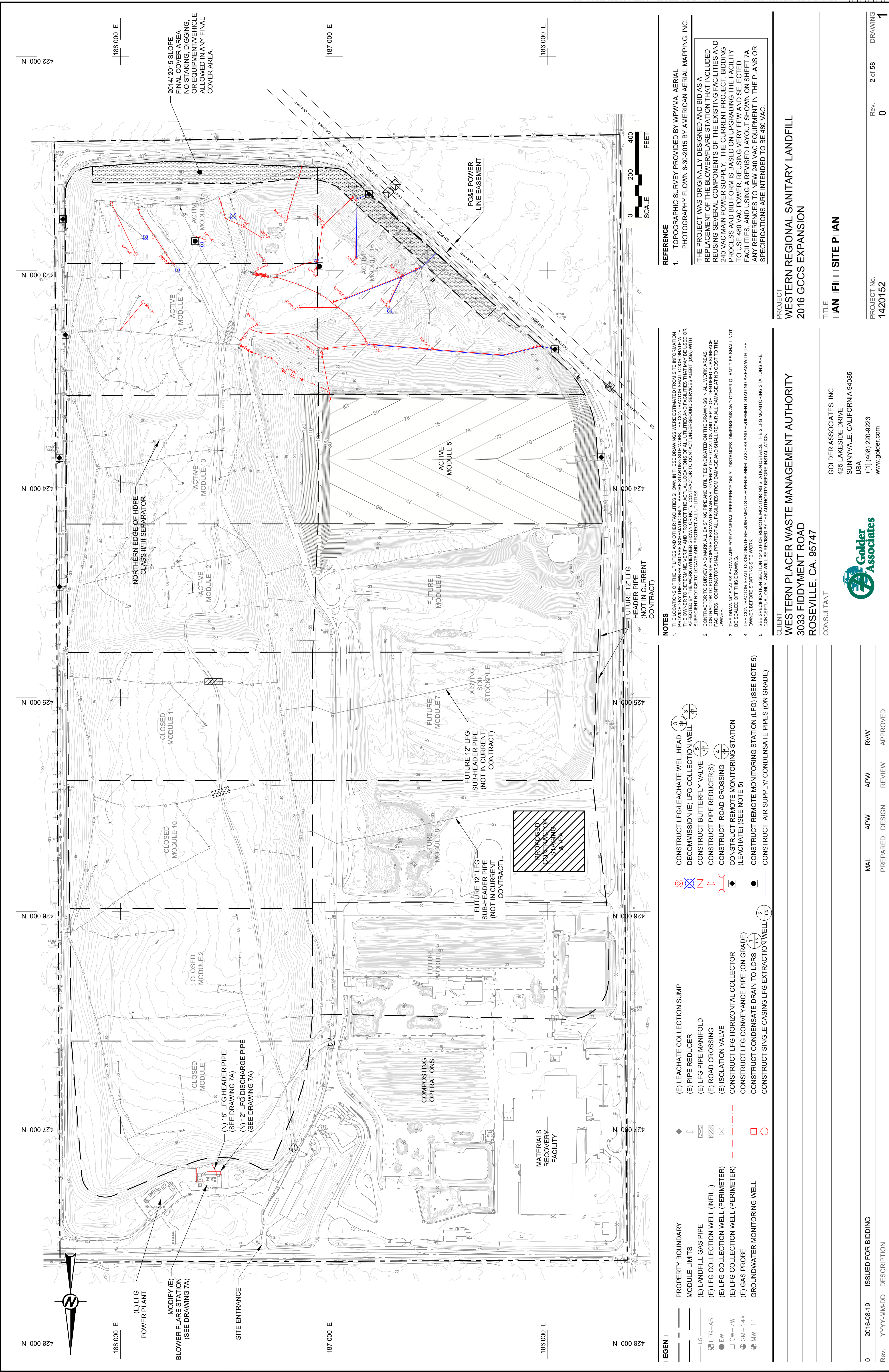
TITLE
TITLESHEET

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0	2016-08-19	ISSUED FOR BIDDING	MAL	APW	APW	RWW
REV.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGNED	REVIEWED	APPROVED

PROJECT NO.
1420152
REV.
1 of 58
DRAWING
T1



- NOTES**
- THE LOCATIONS OF THE UTILITIES AND OTHER FACILITIES SHOWN IN THESE DRAWINGS WERE ESTIMATED FROM SITE INFORMATION PROVIDED BY THE OWNER AND ARE SCHEMATIC ONLY. BEFORE STARTING SITE WORK, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO DETERMINE, VERIFY AND PROTECT THE ACTUAL LOCATIONS OF ALL UTILITIES AND FACILITIES THAT MAY BE USED OR ENCOUNTERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SERVICES ALERT (GSA) WITH SUFFICIENT NOTICE TO LOCATE AND PROTECT ALL UTILITIES.
 - CONTRACTOR TO SURVEY AND MARK ALL EXISTING PIPE AND UTILITIES INDICATED ON THE DRAWINGS IN ALL WORK AREAS. CONTRACTOR TO POT-HOLE PROPOSED EXCAVATION AREAS TO VERIFY THE LOCATION AND DEPTH OF IDENTIFIED SUBSURFACE FACILITIES. CONTRACTOR SHALL PROTECT ALL FACILITIES FROM DAMAGE AND SHALL REPAIR ALL DAMAGE AT NO COST TO THE OWNER.
 - THE DRAWING SCALES SHOWN ARE FOR GENERAL REFERENCE ONLY. DISTANCES, DIMENSIONS AND OTHER QUANTITIES SHALL NOT BE SCALED OFF THIS DRAWING.
 - THE CONTRACTOR SHALL COORDINATE REQUIREMENTS FOR PERSONNEL ACCESS AND EQUIPMENT STAGING AREAS WITH THE OWNER BEFORE STARTING SITE WORK.
 - SEE SPECIFICATION SECTION 13430 FOR REMOTE MONITORING STATION DETAILS. THE 2 LFG MONITORING STATIONS ARE CONCEPTUAL ONLY, AND WILL BE REVISED BY THE AUTHORITY BEFORE INSTALLATION.

- LEGEND**
- | | |
|-------------------------------------|---|
| PROPERTY BOUNDARY | (E) LEACHATE COLLECTION SUMP |
| MODULE LIMITS | (E) PIPE REDUCER |
| (E) LANDFILL GAS PIPE | (E) LFG PIPE MANIFOLD |
| (E) LFG COLLECTION WELL (INFILL) | (E) ROAD CROSSING |
| (E) LFG COLLECTION WELL (PERIMETER) | (E) ISOLATION VALVE |
| (E) LFG COLLECTION WELL (PERIMETER) | CONSTRUCT LFG HORIZONTAL COLLECTOR |
| (E) GAS PROBE | CONSTRUCT LFG CONVEYANCE PIPE (ON GRADE) |
| GROUNDWATER MONITORING WELL | CONSTRUCT CONDENSATE DRAIN TO LORS |
| | CONSTRUCT SINGLE CASING LFG EXTRACTION WELL |
- | | |
|---|----|
| CONSTRUCT LFG/LEACHATE WELLHEAD | 3 |
| DECOMMISSION (E) LFG COLLECTION WELL | 3 |
| CONSTRUCT BUTTERFLY VALVE | 5 |
| CONSTRUCT PIPE REDUCER(S) | 24 |
| CONSTRUCT ROAD CROSSING | 4 |
| CONSTRUCT REMOTE MONITORING STATION (LEACHATE) (SEE NOTE 5) | 24 |
| CONSTRUCT REMOTE MONITORING STATION (LFG) (SEE NOTE 5) | 2 |
| CONSTRUCT AIR SUPPLY/ CONDENSATE PIPES (ON GRADE) | 15 |

REFERENCE

- TOPOGRAPHIC SURVEY PROVIDED BY WPWMA, AERIAL PHOTOGRAPHY FLOWN 6-30-2015 BY AMERICAN AERIAL MAPPING, INC.

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PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

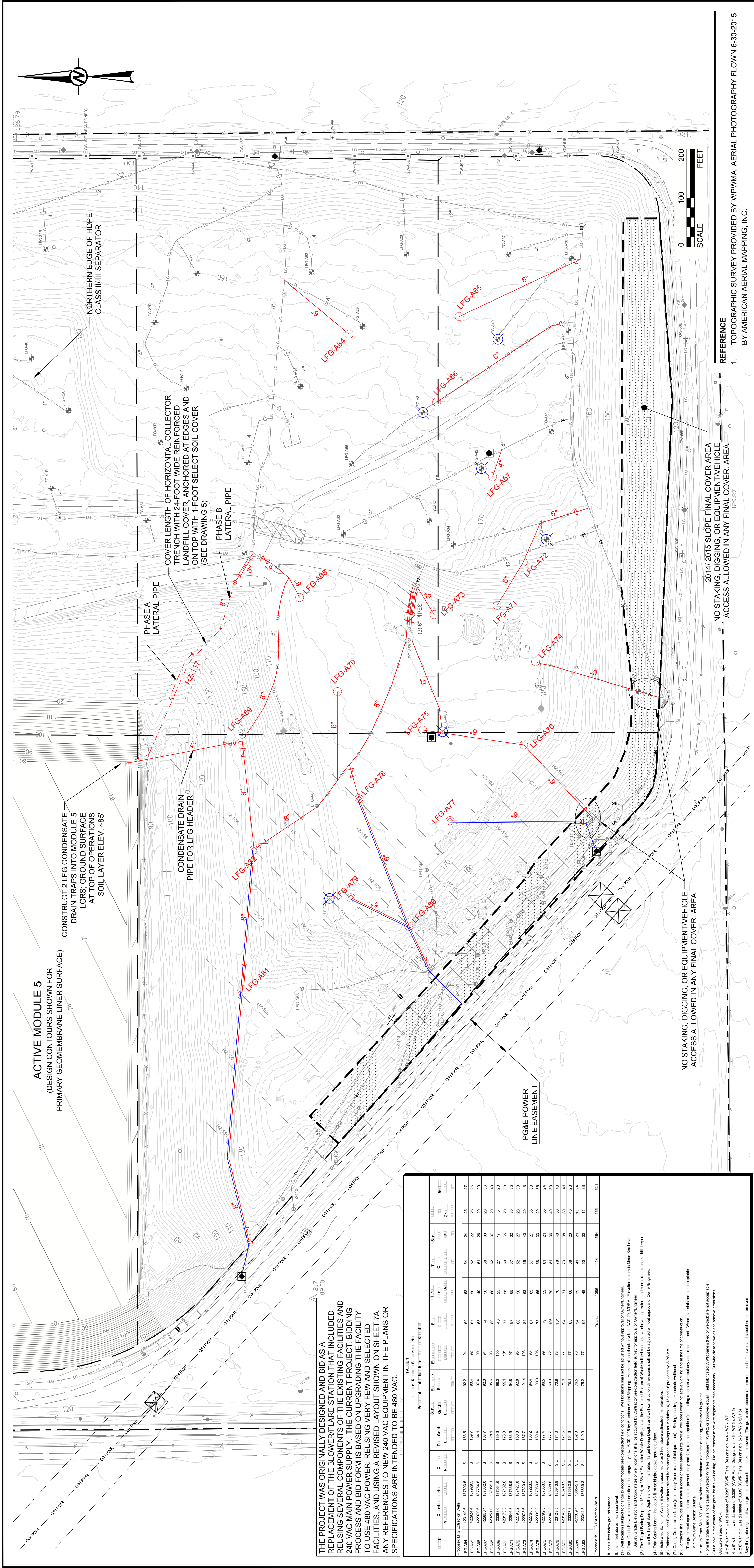
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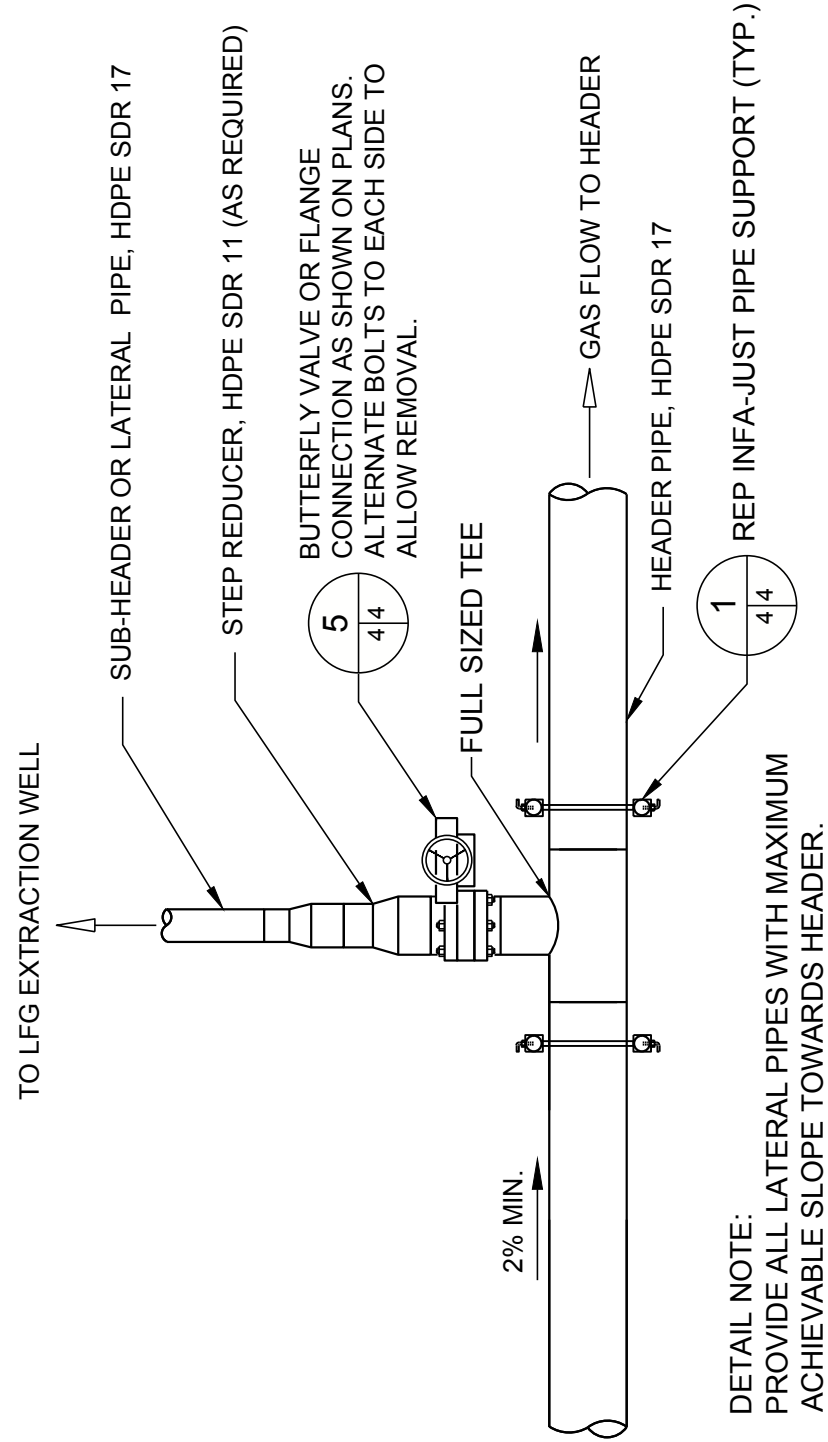
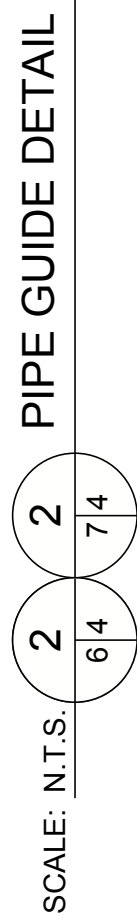
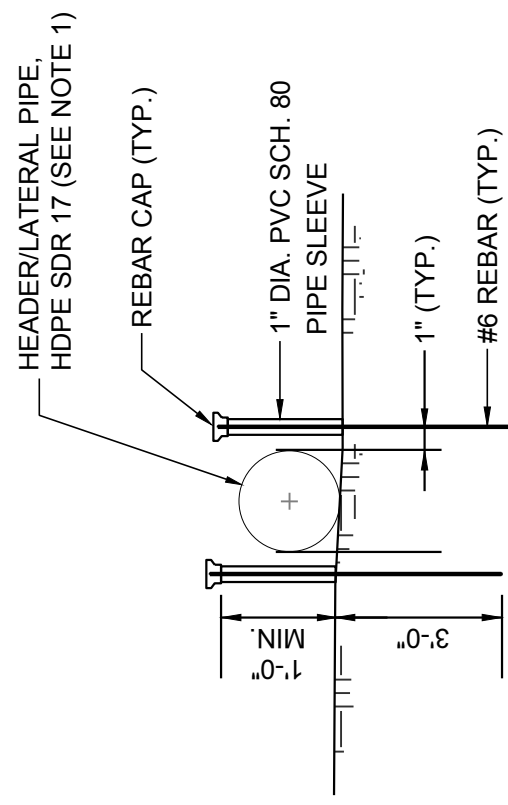
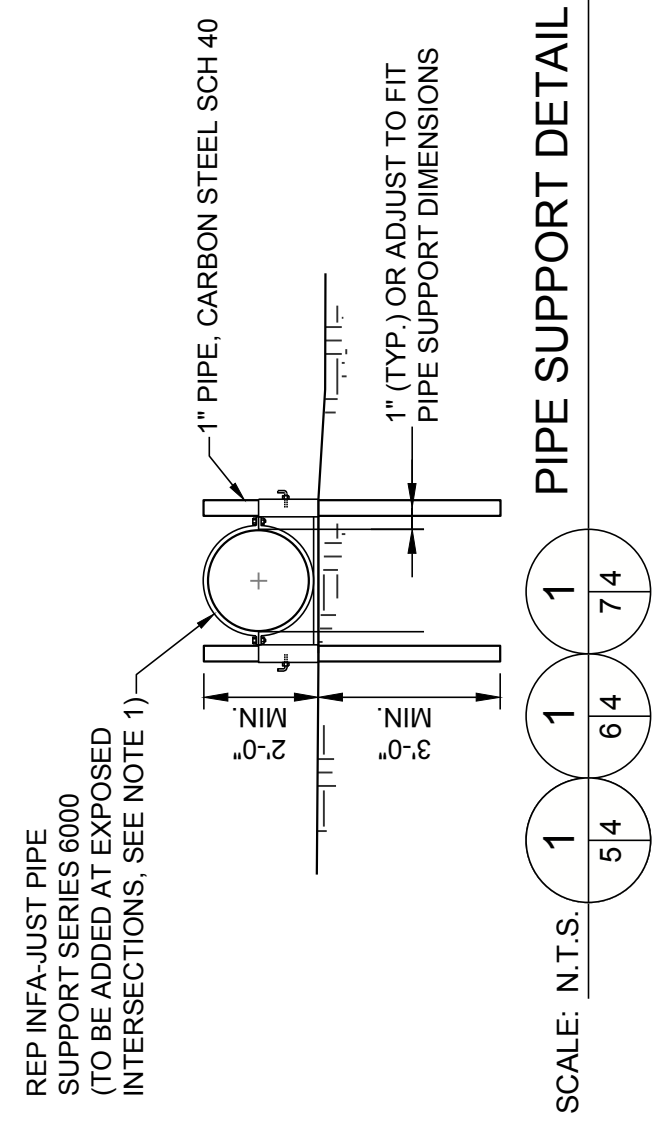
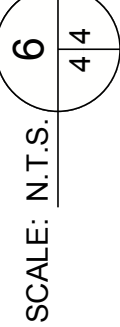
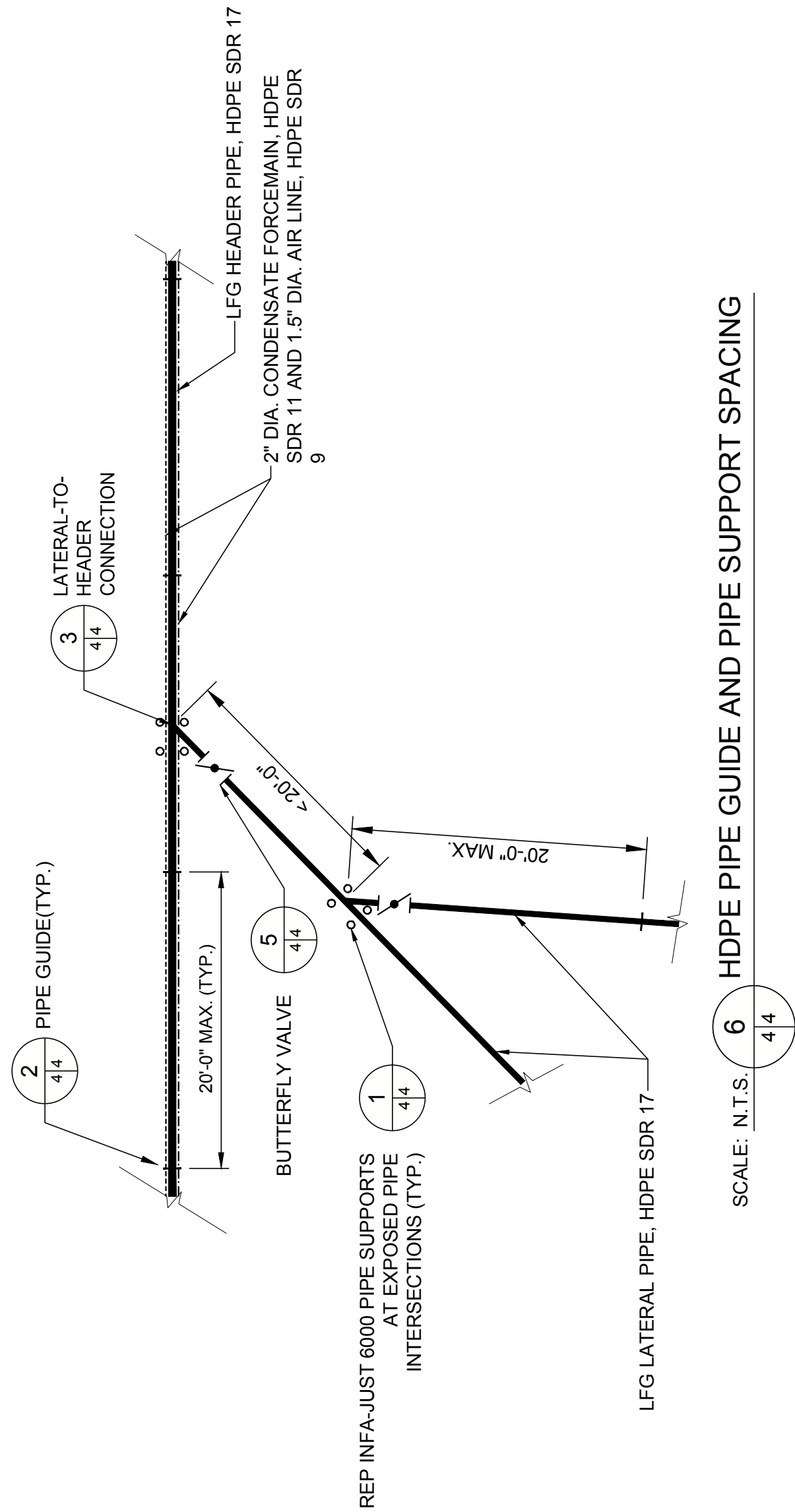
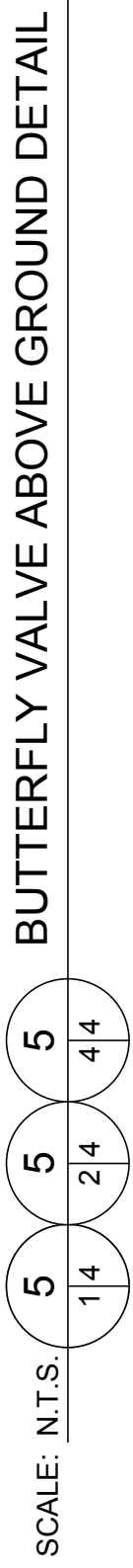
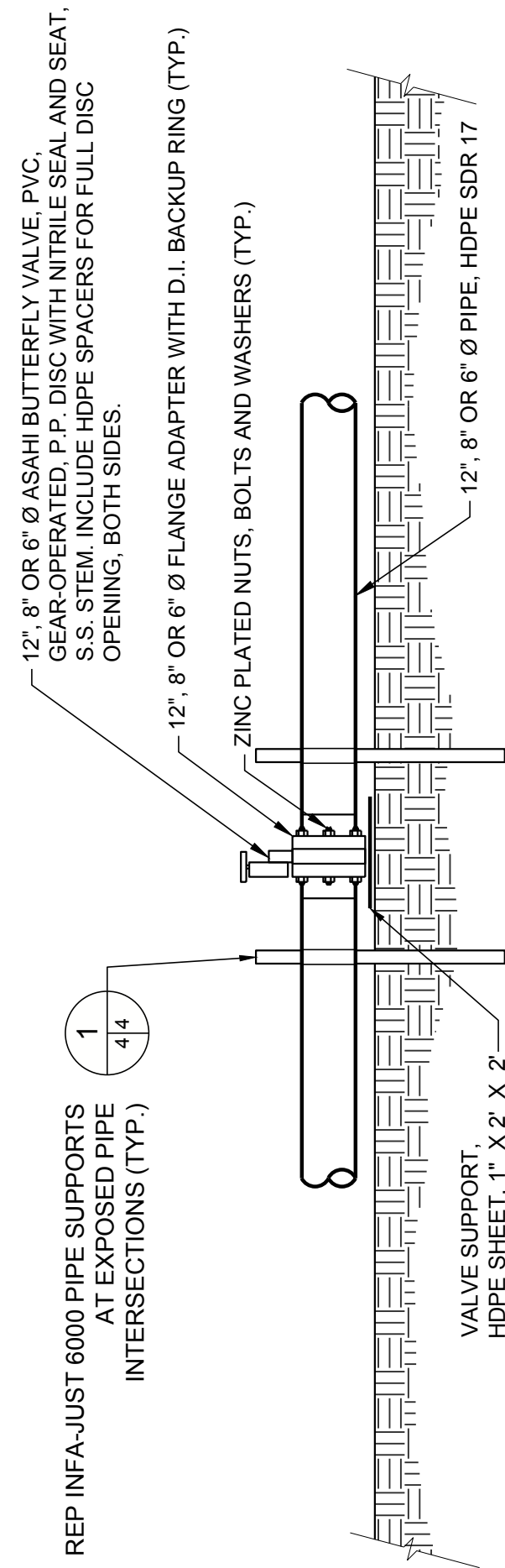
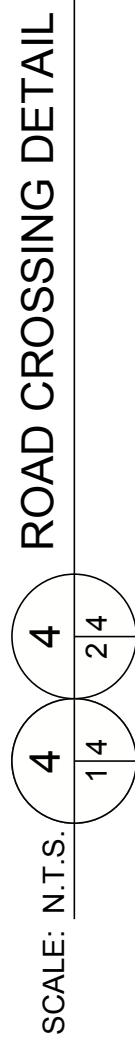
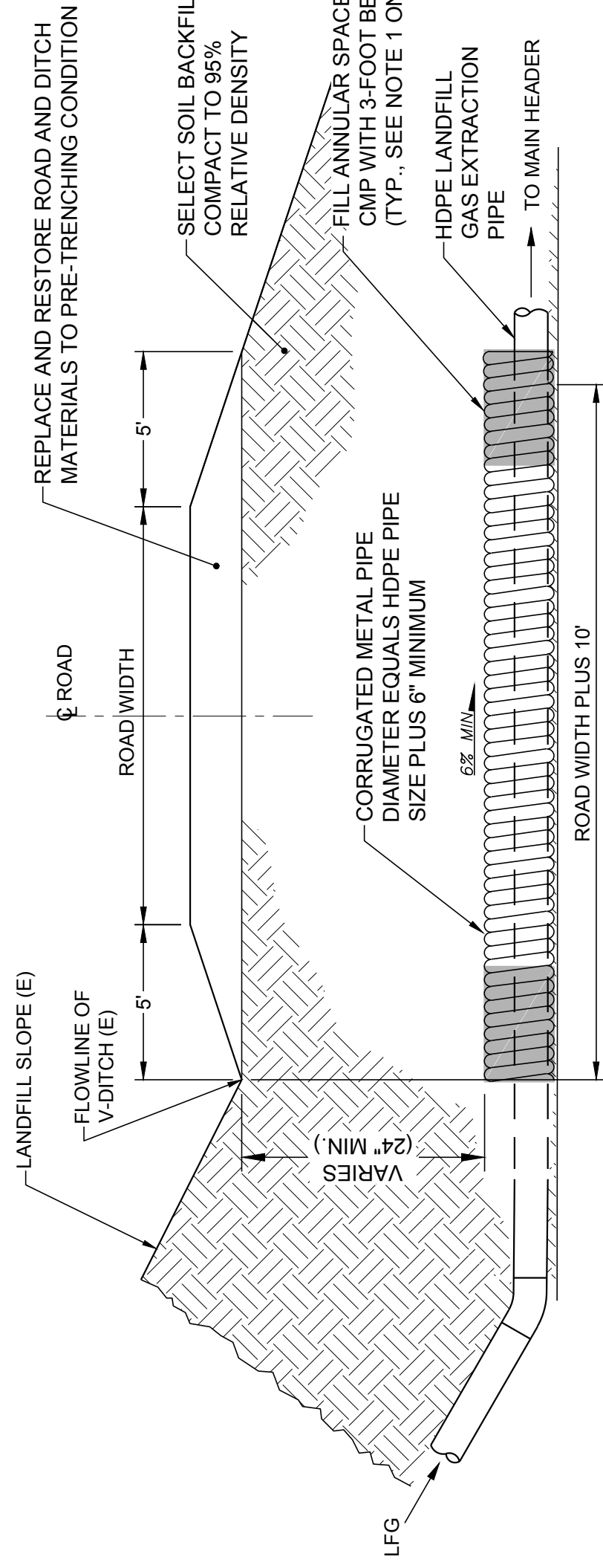
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DRAWING
1

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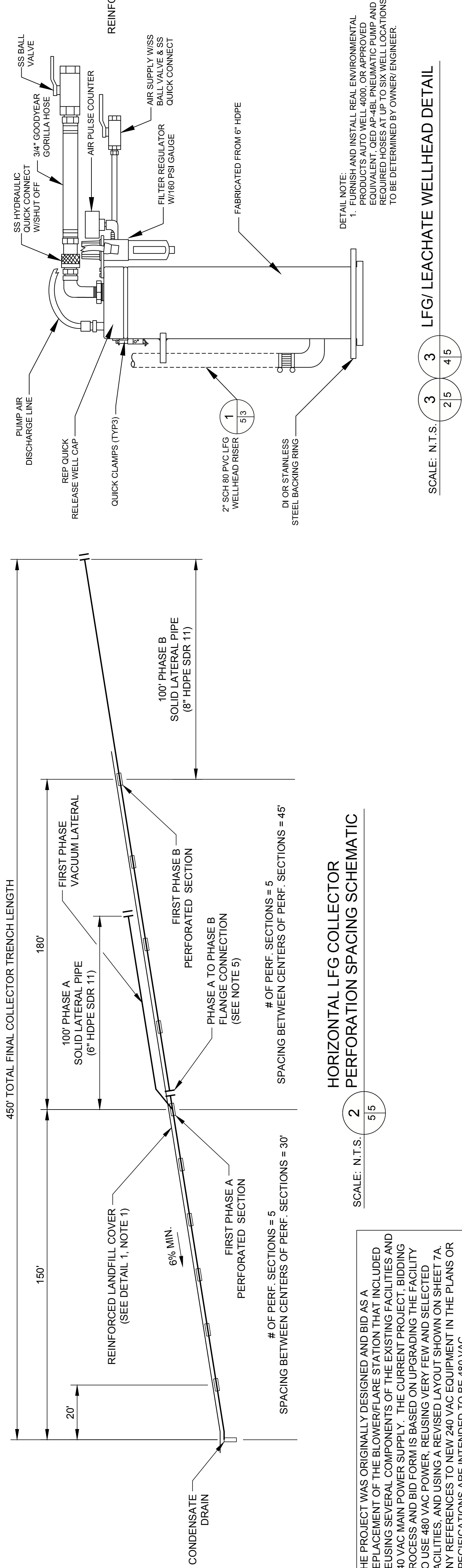
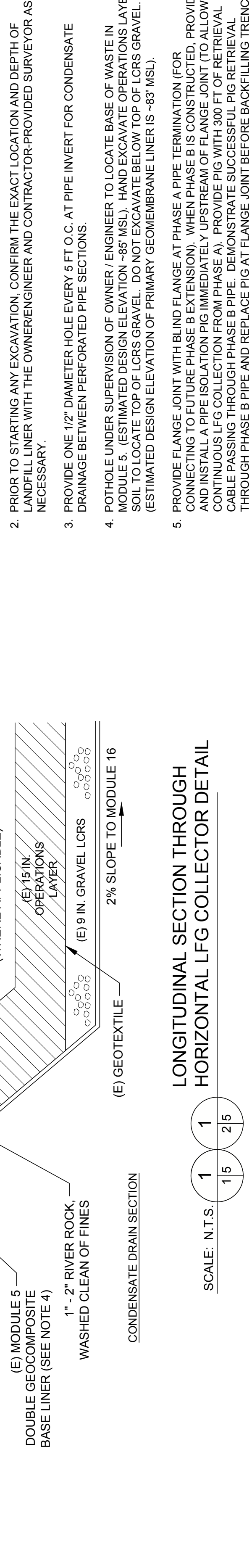
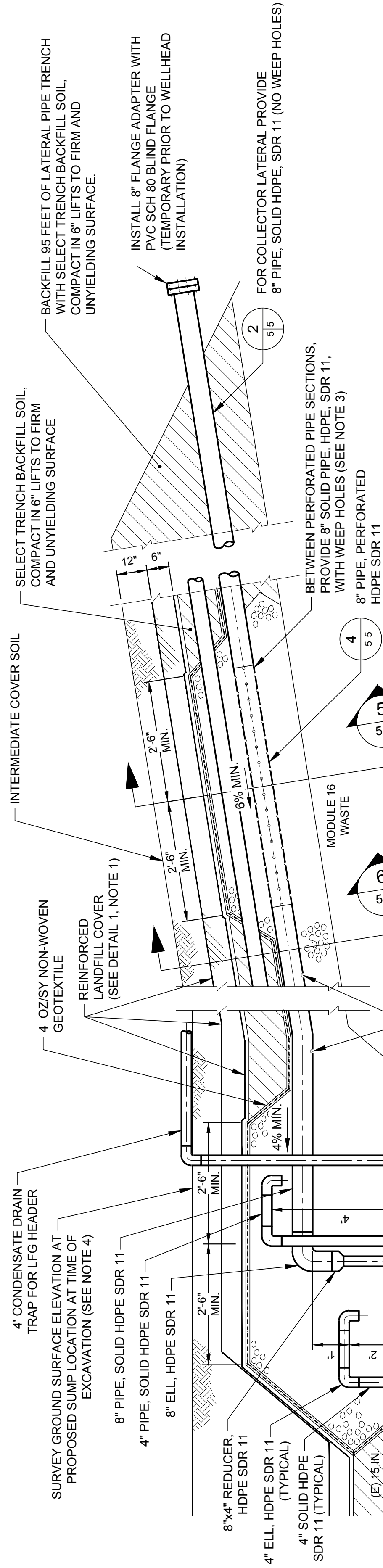
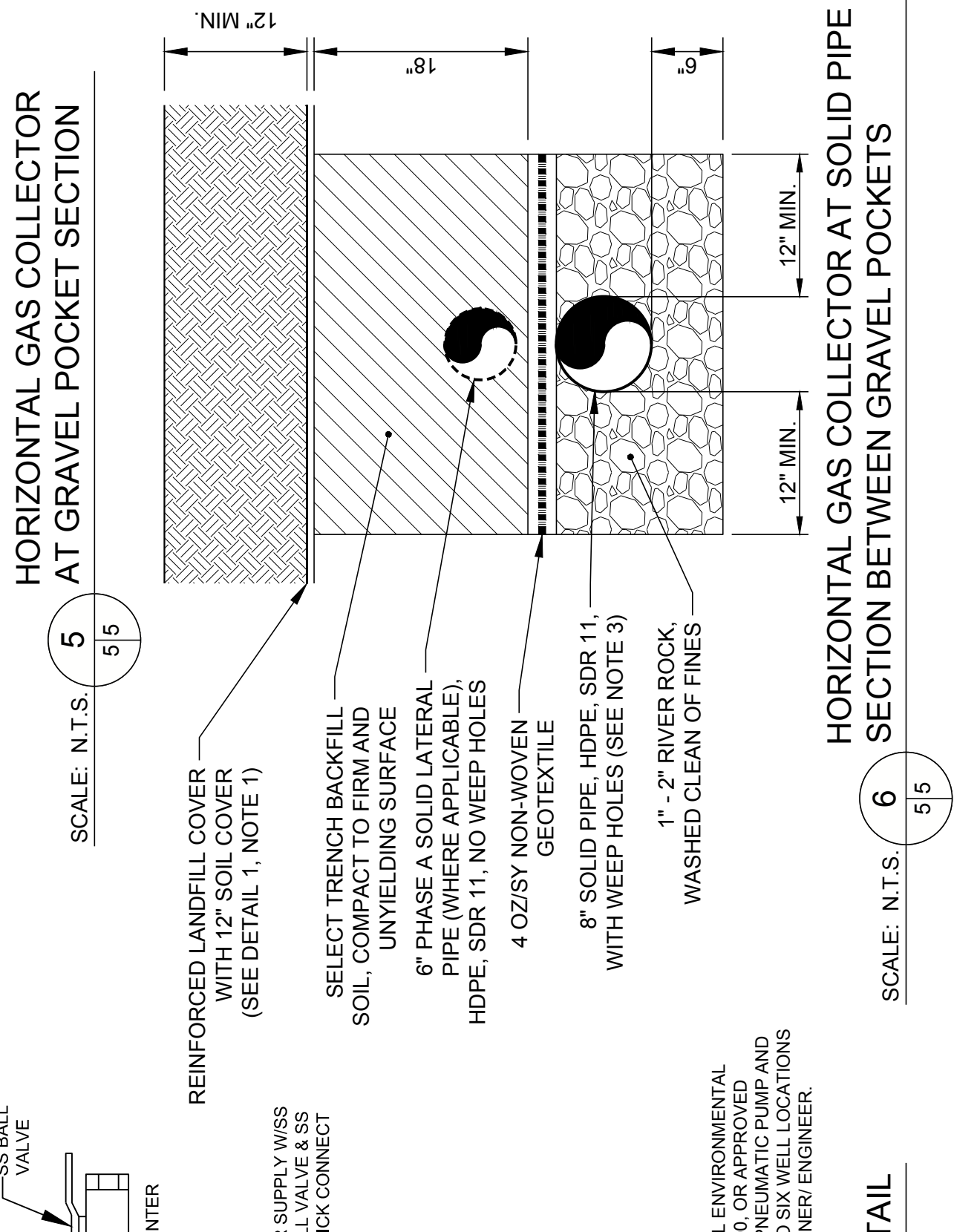
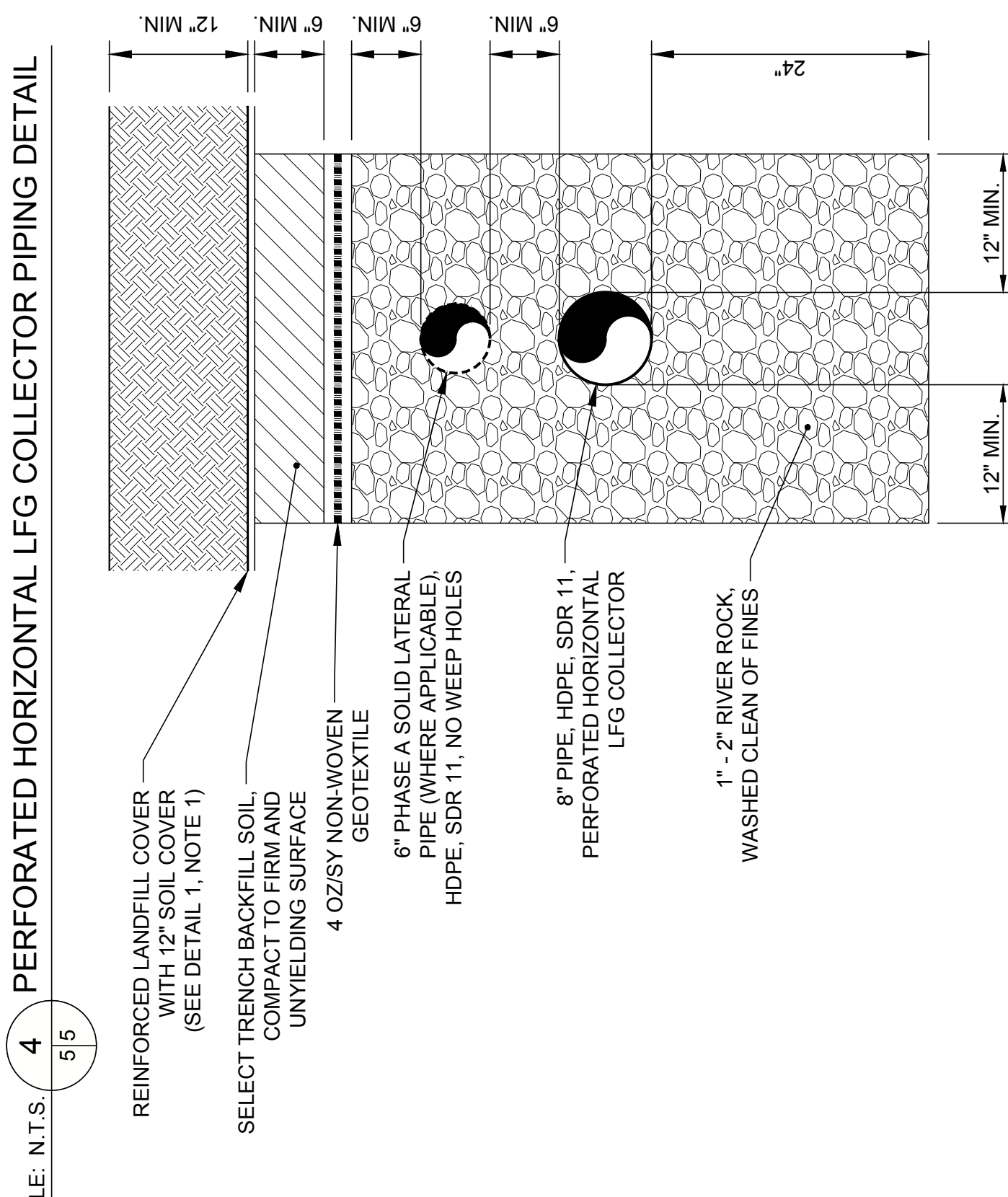
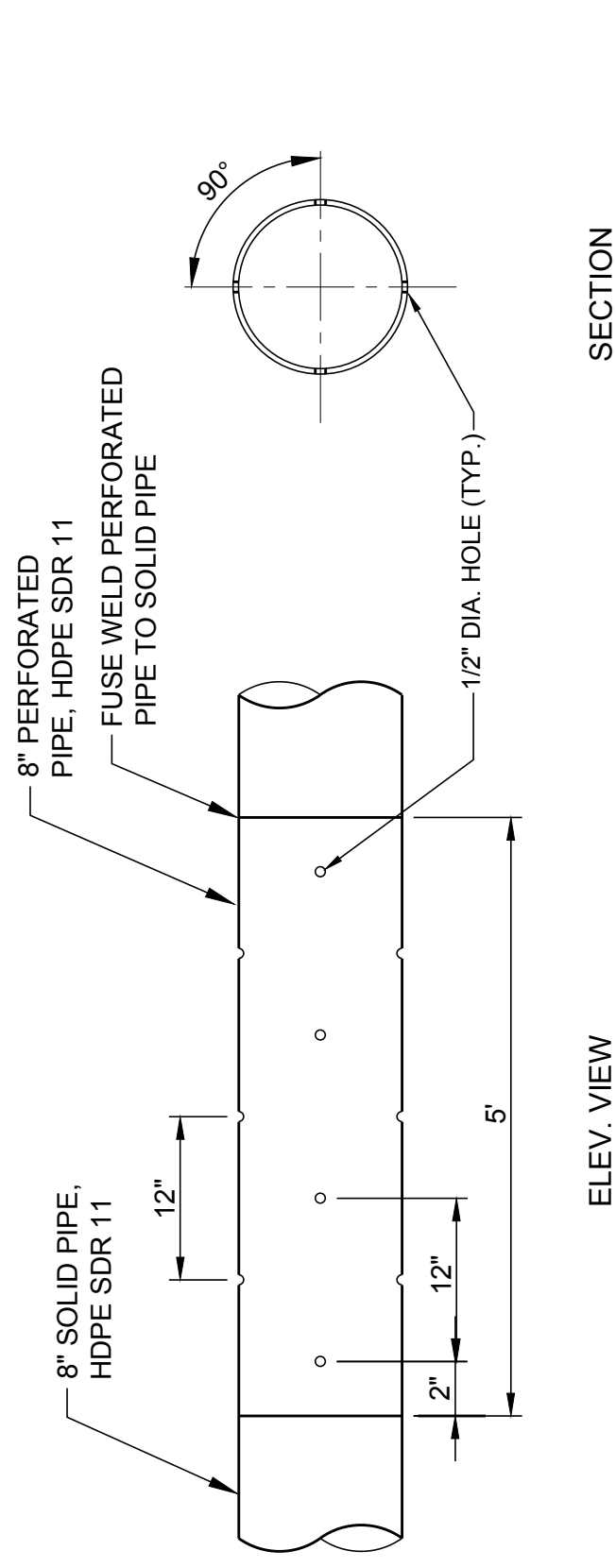


NOTES

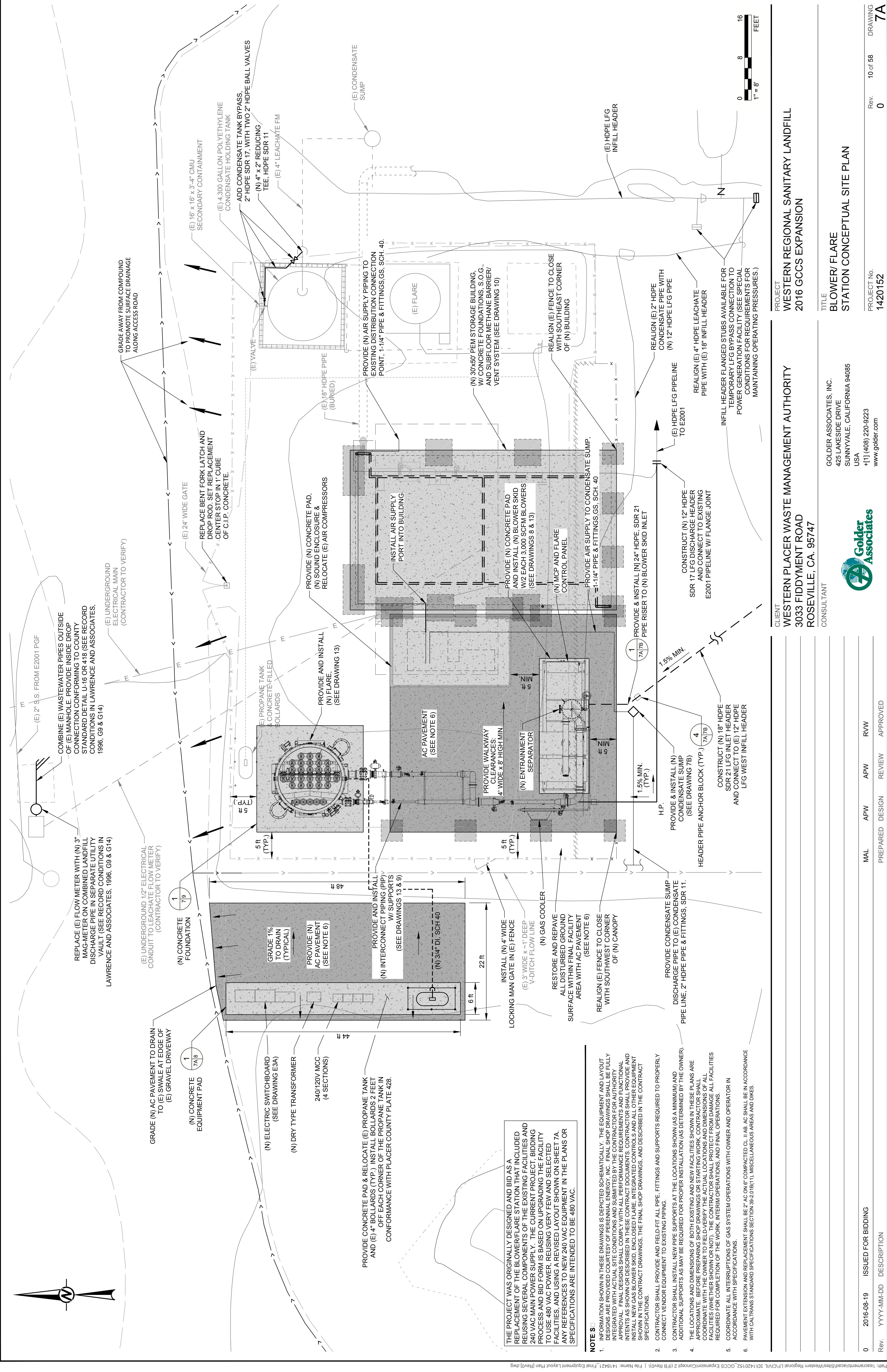
1. CONTRACTOR TO SNAKE PIPE AND INSTALL PIPE GUIDES AT 20' SPACING ALONG EXPOSED PIPE. CONTRACTOR TO INSTALL REP INNA-JUST PIPE ANCHORS AND ON ALL PIPES >20' LONG AT EXPOSED PIPE JOINTS. DO NOT INSTALL PIPE GUIDES, ANCHORS, SUPPORTS OR OTHER SURFACE PENETRATIONS IN FINAL COVER AREAS.
2. COORDINATE ALL TIE-INS TO EXISTING PIPING SYSTEMS WITH OWNER AND LEG SYSTEM OPERATOR TO MAINTAIN PERSONNEL SAFETY AND FACILITY REGULATORY COMPLIANCE. AND MINIMIZE OPERATIONAL DOWNTIME.
3. INSTALLED HOPE FITTINGS SHALL BE FULL PRESSURE RATED OR ONE SDR LOWER THAN HOPE SDR. NO SADDLE FITTINGS SHALL BE USED. ALL HOPE FITTINGS SHALL BE FULLY INSULATED AND PROTECTED. ALL HOPE FITTINGS BE PROPOSED FOR SUBSTITUTION TIE-IN TO EXISTING HEADER IF FULL SIZE TIE CANNOT BE INSTALLED. CONTRACTOR SHALL REQUEST PRIOR ENGINEER/OWNER APPROVAL FOR ALL PROPOSED ELECTROFUSION LOCATIONS.

THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWERFAN STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

		CLIENT		WESTERN PLACER WASTE MANAGEMENT AUTHORITY		PROJECT		WESTERN REGIONAL SANITARY LANDFILL					
		3033 FIDDYMENT ROAD		2016 GCCS EXPANSION									
		ROSEVILLE, CA. 95747											
		CONSULTANT		GOLDER ASSOCIATES, INC.		TITLE		FG PIPING DETAIL S					
				425 LAKESIDE DRIVE									
				SUNNYVALE, CALIFORNIA 94085									
				USA									
				+1(1) (408) 220-9223		PROJECT No.		1420152					
				www.golder.com		Rev.		5 of 58					
						DRAWING		4					
0		2016-08-19		ISSUED FOR BIDDING		MAL		APW		APW		RWV	
						PREPARED		DESIGN		REVIEW		APPROVED	

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PROJECT WESTERN REGIONAL SANITARY LANDFILL 2016 GCCS EXPANSION		TITLE □ ORI □ ONTA □ □ FG CO □ □ ECTION □ ETAI □ S	
PROJECT No. 1420152	Rev. 0	6 of 58	DRAWING 5



THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FLARE STATION THAT INCLUDED REPLACING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

- NOTE 3:**
- INFORMATION SHOWN IN THESE DRAWINGS IS DEPICTED SCHEMATICALLY. THE EQUIPMENT AND LAYOUT SHOWN ARE NOT TO BE CONSIDERED AS A FINAL DESIGN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULLY INTERPRETING THE DRAWINGS AND PROVIDING THE NECESSARY DETAILS FOR THE CONTRACTOR TO PROCEED WITH APPROVAL. FINAL DESIGNS SHALL COMPLY WITH ALL PERFORMANCE REQUIREMENTS AND FUNCTIONAL INTENTS AS SHOWN OR DESCRIBED IN THESE CONTRACT DOCUMENTS. CONTRACTOR SHALL PROVIDE AND INSTALL NEW GAS BLOWER SKID, ENCLOSED FLARE, INTEGRATED CONTROLS AND ALL OTHER EQUIPMENT SHOWN IN THE CONTRACT DRAWINGS. THE FINAL SHOP DRAWINGS, AND DESCRIBED IN THE CONTRACT SPECIFICATIONS.
 - CONTRACTOR SHALL PROVIDE AND FIELD-FIT ALL PIPE, FITTINGS AND SUPPORTS REQUIRED TO PROPERLY CONNECT VENDOR EQUIPMENT TO EXISTING PIPING.
 - CONTRACTOR SHALL INSTALL NEW PIPE SUPPORTS AT THE LOCATIONS SHOWN (AS A MINIMUM) AND ADDITIONAL SUPPORTS AS MAY BE REQUIRED FOR PROPER INSTALLATION (AS DETERMINED BY THE OWNER).
 - THE LOCATIONS AND DIMENSIONS OF BOTH EXISTING AND NEW FACILITIES SHOWN IN THESE PLANS ARE APPROXIMATE. BEFORE PREPARING SHOP DRAWINGS OR STARTING WORK, CONTRACTOR SHALL CONDUCT A FIELD SURVEY TO VERIFY THE EXISTING FACILITIES AND THE LOCATIONS OF ALL FACILITIES (WHETHER SHOWN OR NOT) AND SHALL REPORT ANY DISCREPANCIES TO THE OWNER. ALL FACILITIES REQUIRED FOR COMPLETION OF THE WORK, INTERIM OPERATIONS, AND FINAL OPERATIONS.
 - COORDINATE ALL INTERRUPTIONS OF GAS SYSTEM OPERATIONS WITH OWNER AND OPERATOR IN ACCORDANCE WITH SPECIFICATIONS.
 - PAVEMENT EXTENSION AND REPLACEMENT SHALL BE 2" AC ON 6" COMPACTED CL. II AB. AC SHALL BE IN ACCORDANCE WITH CALTRANS STANDARD SPECIFICATIONS SECTION 309-2.01B(11), MISCELLANEOUS AREAS AND DIKES.

Rev.	YYYY-MM-DD	DESCRIPTION
0	2016-08-19	ISSUED FOR BIDDING

PREPARED	DESIGN	REVIEW	APPROVED
MAL	APW	APW	RWW

CLIENT
WESTERN PLACER WASTE MANAGEMENT AUTHORITY
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TITLE
BLOWER/ FLARE
STATION CONCEPTUAL SITE PLAN

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

PROJECT No.	Rev.	10 of 58	DRAWING
1420152	0		7A

GENERAL NOTES

- G1. THE CONTRACT CONCRETE DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OR SEQUENCES OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING AND SHORING OF LOADS DUE TO CONSTRUCTION EQUIPMENT, BACKFILL AND WIND.
- G2. THE CONTRACTOR SHALL ALSO ASSUME RESPONSIBILITY AND PROVIDE ALL NECESSARY SAFETY PRECAUTIONS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK IN ACCORDANCE WITH OSHA, OWNER AND OTHER AGENCY REGULATIONS.
- G3. IMMEDIATELY NOTIFY THE ENGINEER WHEN EMBEDDED ITEMS ARE FOUND TO CONFLICT WITH FORM FRAMEWORK, REINFORCING STEEL OR OTHER EMBEDMENTS. THE ENGINEER SHALL SPECIFY MEASURES TO CORRECT THE CONFLICT.
- G4. ANY FABRICATION OR CONSTRUCTION DONE PRIOR TO APPROVAL OF DRAWINGS WILL BE DONE AT THE CONTRACTORS RISK AND ANY REMEDIES TO CORRECT ANY WORK DONE PRIOR TO APPROVAL WILL BE AT THE CONTRACTORS EXPENSE. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS SHOWING LAYOUT OF STEEL REINFORCEMENT, ANCHORAGE AND EMBEDMENTS FOR ALL DEVIATIONS FROM CONTRACT DRAWINGS.
- EXISTING CONDITIONS: CONTRACTOR SHALL EXAMINE ALL ELEVATIONS AND DIMENSIONS FOR EXISTING CONDITIONS IN THE FIELD BEFORE PROCEEDING. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES OR FIELD CHANGES PRIOR TO INSTALLATION OF FABRICATION. IN CASE OF DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS, THE CONTRACTOR SHALL OBTAIN DIRECTIONS FROM THE CONSTRUCTION MANAGER BEFORE PRECEDING. DIMENSIONS NOTED AS PLUS OR MINUS (+) INDICATE UNVERIFIED DIMENSIONS AND ARE APPROXIMATE. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF CONFLICT OR EXCESSIVE VARIATIONS FORM INDICATED DIMENSIONS. DO NOT SCALE DRAWINGS.

FOUNDATION GENERAL NOTES

- F1. FOUNDATIONS SHALL BE CONSTRUCTED TO THE DIMENSIONS AS SHOWN ON THE STRUCTURAL DRAWINGS.
- F2. NO STRUCTURAL CONCRETE SHALL BE POURED IN THE FOOTING OR SLAB EXCAVATIONS CONTAINING WATER.
- F3. FLOW FILL CONCRETE (3000 PSI MINIMUM) MAY BE USED TO LEVEL GRADE BELOW FOOTINGS AND SLABS UPON APPROVAL OF THE DESIGN ENGINEER.
- F3. EXCAVATION SHALL NOT ENCRoACH BEYOND A 45° LINE EXTENDING FROM THE TOE OF AN EXISTING STRUCTURE/EQUIPMENT FOOTING.

CONCRETE GENERAL NOTES

- C1. PRIOR TO PLACING CONCRETE, CONTRACTOR SHALL VERIFY THE REQUIREMENTS FOR ALL MECHANICAL AND ELECTRICAL SERVICES FOR THE LOCATION OF EMBEDDED ITEMS; (HOLDS, UTILITIES, AND OTHERS).
- C2. MATERIAL FORMING, PLACING, FINISHING AND CURING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318 SPECIFICATION.
- C3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 4000 PSI AT THE AGE OF 28 DAYS.
- C4. REINFORCING BARS SHALL BE DEFORMED BARS AND SHALL CONFORM TO ASTM A615, GRADE 60, EXCEPT AS NOTED.
- C5. PROVIDE BAR SUPPORTS AND SPACERS TO PLACE ALL BARS IN PROPER LOCATION, AND WIRE ADEQUATELY AT INTERSECTIONS TO HOLD BARS FIRMLY IN POSITION WHILE CONCRETE IS PLACED.
- C6. CONTINUOUS BARS SHALL LAP AND DOWELS SHALL PROJECT ADEQUATELY TO PROVIDE A CLASS B SPLICE IN ACCORDANCE WITH ACI 318 CHAPTER 12.
- C7. FOR REINFORCED CONCRETE, UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS CLASS B SPLICE IS DEFINED AS 1.3 Ld. ALL LAPS ARE TENSION SPLICES, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
"TOP BARS" ARE HORIZONTAL BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THE BARS.

REINFORCING BAR SPLICE LENGTH SCHEDULE FOR GRADE 60.

BAR SIZE	TENSION SPICE LENGTH=1.3ld		COMPRESSION SPICE LENGTH
	TOP BARS	OTHER BARS	
#4	32"	25"	15"
#5	40"	31"	19"
#6	48"	37"	23"

- C8. DO NOT SPLICE AT MAXIMUM STRESS LOCATIONS.
- C9. THE CONCRETE MIX DESIGN SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN ON THE DESIGN DRAWINGS:

fc-28 DAY DESIGN COMPRESSION STRENGTH	MAXIMUM AGGREGATE SIZE	SUMP AT POINT OF PLACEMENT	AIR ENTRAINED PERCENT ($\pm 1\%$)	MAXIMUM WATER/CEMENT RATIO
4000 psi	3/4"	4"	4-6.0	0.5

- C10. CONCRETE COVER FOR REINFORCEMENT (UNLESS OTHERWISE NOTED):
- | | |
|---|--------|
| A. CONCRETE POURED AGAINST EARTH..... | 3" |
| B. CONCRETE POURED IN FORMS BUT EXPOSED TO WEATHER OR EARTH | |
| (1.) #5 BARS OR SMALLER..... | 1 1/2" |
| (2.) BARS LARGER THAN #5..... | 2" |
- C11. ALL REINFORCING BAR HOOKS SHALL BE STANDARD HOOKS, UNLESS NOTED OTHERWISE.

GENERAL STRUCTURAL STEEL NOTES

- S1. WITH CBC SPECIAL INSPECTION PROGRAM IS PROVIDED IN CONFORMANCE WITH CBC SECTION 1704.
- S2. THE ITEMS CHECKED WITH AN "X" IN THE "SPECIAL INSPECTION SCHEDULE" SHALL BE INSPECTED IN ACCORDANCE WITH CBC CHAPTER 17 BY A CERTIFIED SPECIAL INSPECTOR. A CERTIFIED TESTING AGENCY SHALL COMPLETE MATERIAL SAMPLING AND TESTING REQUIREMENTS. THE SPECIAL INSPECTOR AND TESTING AGENCY SHALL FURNISH REPORTS TO THE ENGINEER OF RECORD AND CONTRACTOR FOR EACH TEST OR REPORT. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF DISCREPANCIES ARE NOT CORRECTED, ALL REMAINING DISCREPANCIES SHALL BE CLEARLY SHOWN ON THE REPORT. WITH A RECORD OF THE UNCORRECTED ITEMS, THE REPORT SHALL BE IMMEDIATELY FURNISHED TO THE ENGINEER OF RECORD AND CONTRACTOR AFTER EACH TEST RESULT OR INSPECTION. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY EQUALLY TO ALL BIDDER DESIGNED COMPONENTS. THE SPECIAL INSPECTOR SHALL BE EMPLOYED BY THE OWNER, ENGINEER OF RECORD, OR THE AGENT OF THE OWNER, BUT NOT CONTRACTOR OR ANY OTHER PERSON RESPONSIBLE FOR THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE SPECIAL INSPECTOR AND SCHEDULING ANY SPECIAL INSPECTION, WITHIN THE SCHEDULING REQUIREMENTS OF THE TESTING AGENCY OR SPECIAL INSPECTOR.
- S3. CONTINUOUS SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ON THE SITE AT ALL THE TIMES OBSERVING THE WORK REQUIRING INSPECTION. PERIODIC SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ON THE SITE AT THE TIME INTERVALS NECESSARY TO CONFORM WITH THAT ALL WORK REQUIRING SPECIAL INSPECTION IS IN COMPLIANCE.

- SI4. INSPECTION OF CONCRETE SHALL BE IN ACCORDANCE WITH CBC SECTION 1705.3. THE CONCRETE CONSTRUCTION SHALL BE INSPECTED FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS.
- SI5. CONCRETE: MAKE ONE SET OF FOUR CYLINDERS OF MIXED AND PLACED CONCRETE. AS A MINIMUM, ONE SET SHALL BE TAKEN AT LEAST ONCE IN THE FIELD FOR EACH DAY, FOR EVERY 150 CUBIC YARDS OF CONCRETE, OR FOR EVERY 5000 FT2 OF SURFACE AREA OF SLABS AND WALLS.
- CURE THE CYLINDERS IN THE FIELD FOR THREE DAYS IN THE SAME MANNER AS THE PLACED CONCRETE. AFTER THREE DAYS, TRANSPORT TO THE TESTING LABORATORY FOR COMPRESSIVE STRENGTH TESTING. PER SET, TEST ONE CYLINDER AT SEVEN DAYS AND TWO AT TWENTY-EIGHT DAYS. THE FINAL CYLINDER SHALL BE TESTED AT DISCRETION OF THE CONTRACTOR.

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MAL	APW	APW	RVW
PREPARED	DESIGN	REVIEW	APPROVED

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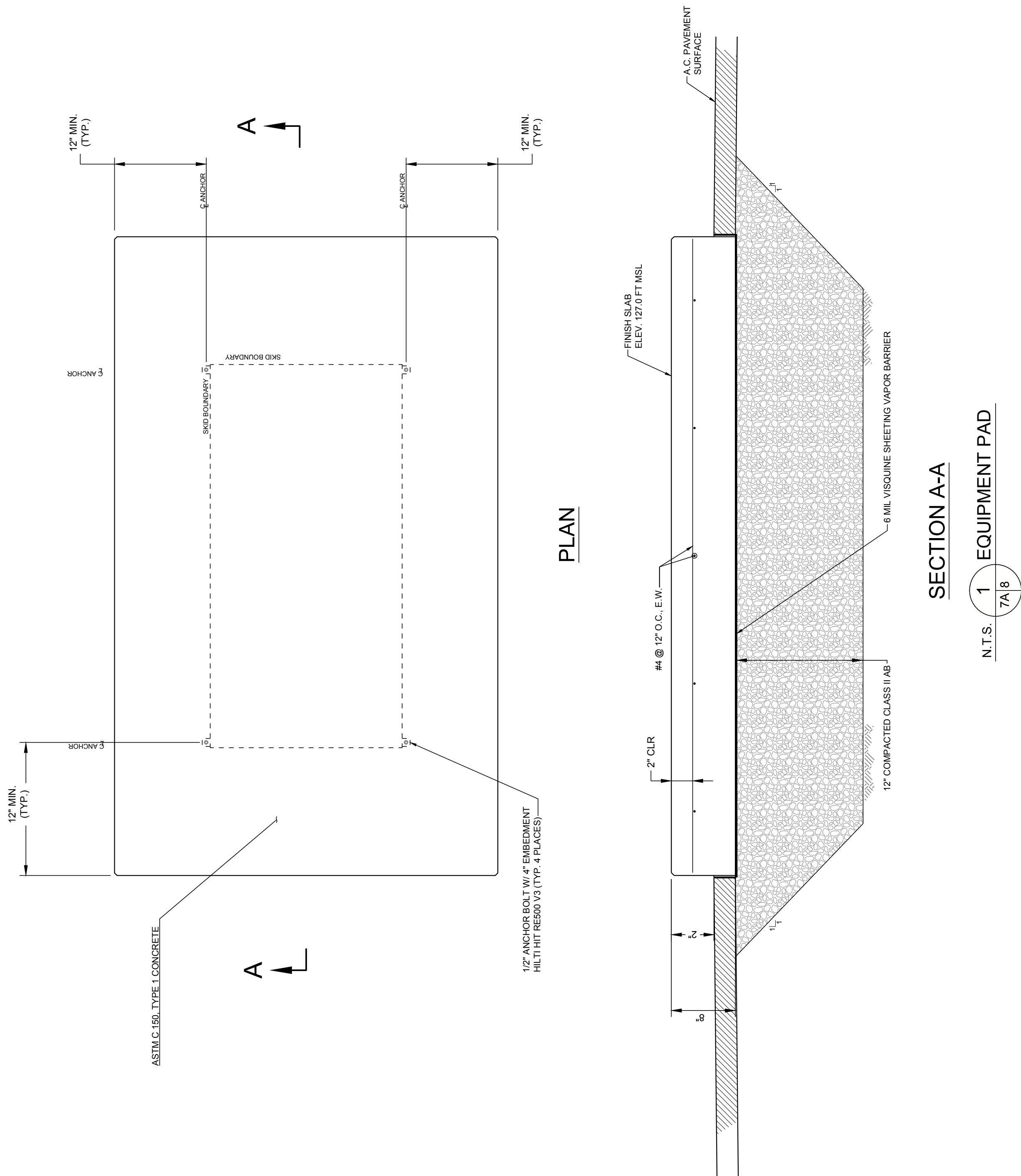
PROJECT No.
1420152

12 of 58

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THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWERFAN STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

SPECIAL INSPECTION SCHEDULE AS PER 2013 CBC CHAPTER 17			
ITEM	CONTINUOUS INSPECTION	PERIODIC INSPECTION	COMMENTS
INSPECTION OF REINFORCING STEEL AND PLACEMENT		X	REF. NOTE S12 AND S13
VERIFYING USE OF DESIGN MIX		X	REF. NOTE S12 AND S13
AT THE TIME OF FRESH CONCRETE SAMPLING TO FABRICATE TEST SPECIMENTS	X		REF. NOTE S12 AND S13
INSPECTION OF CONCRETE PLACEMENT	X		REF. NOTE S12, S13 AND S15



N.T.S. 1 EQUIPMENT PAD

CLIENT

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PROJECT

WESTERN REGIONAL SANITARY LANDFILL 2016 GCCS EXPANSION

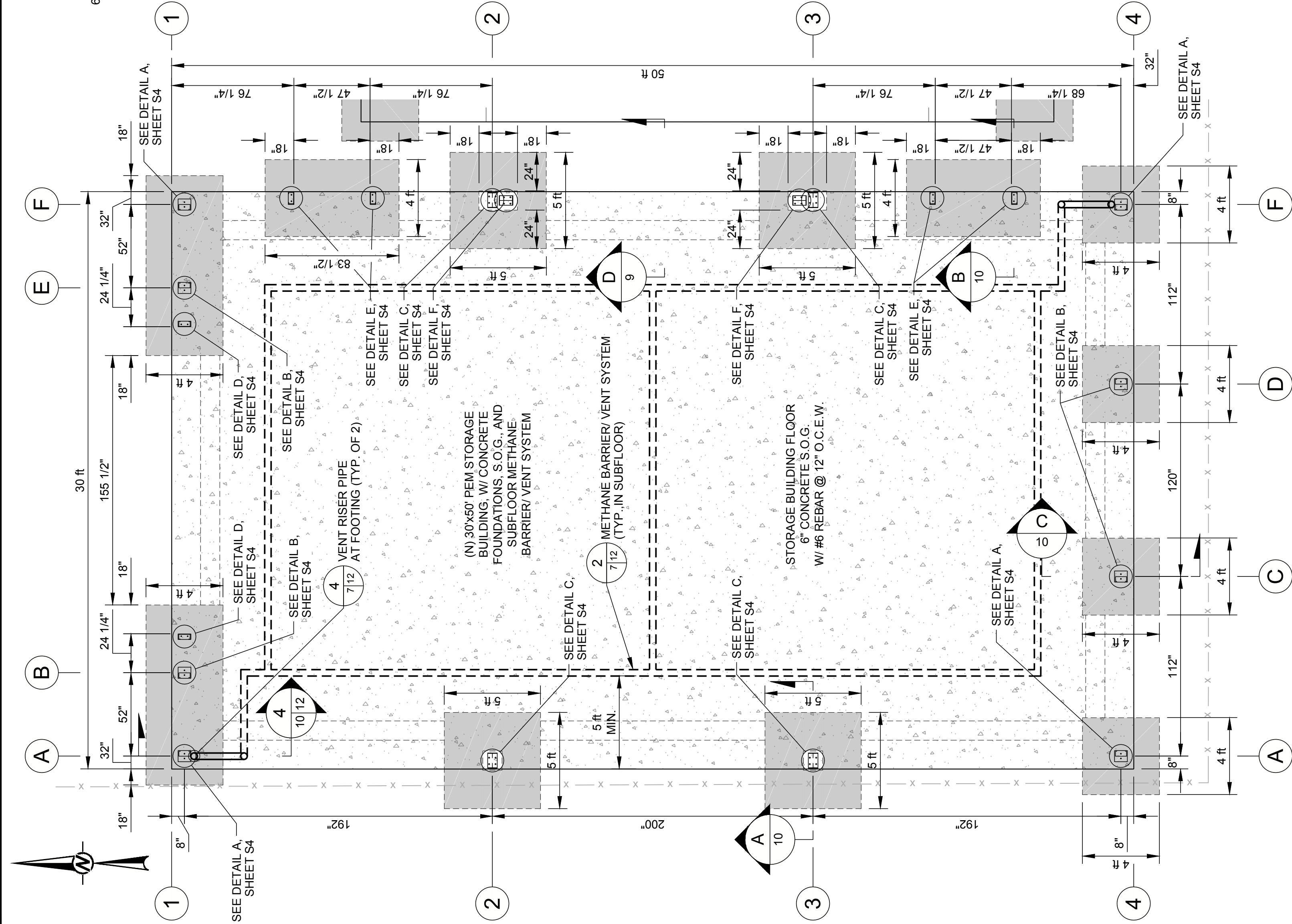
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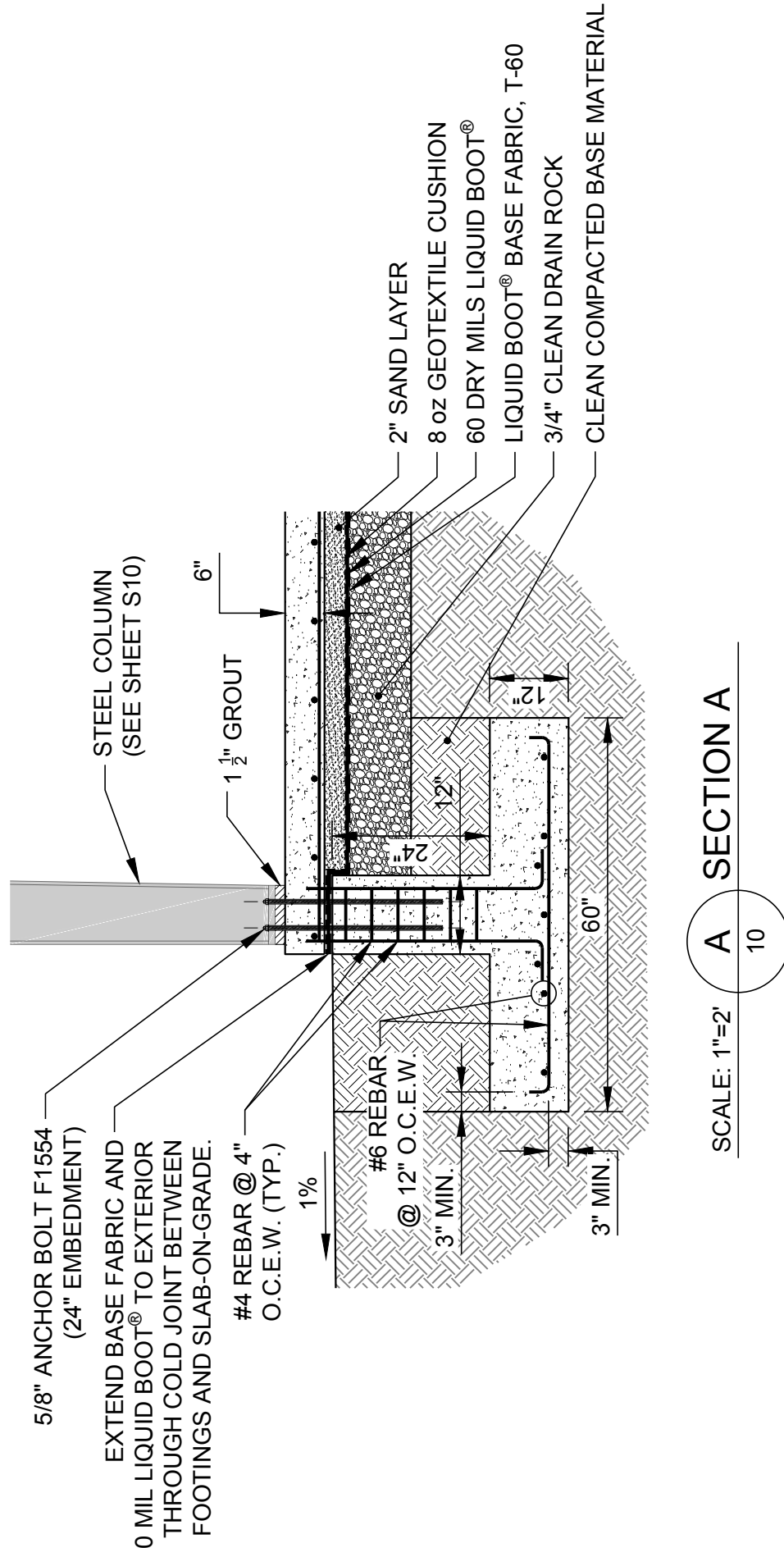
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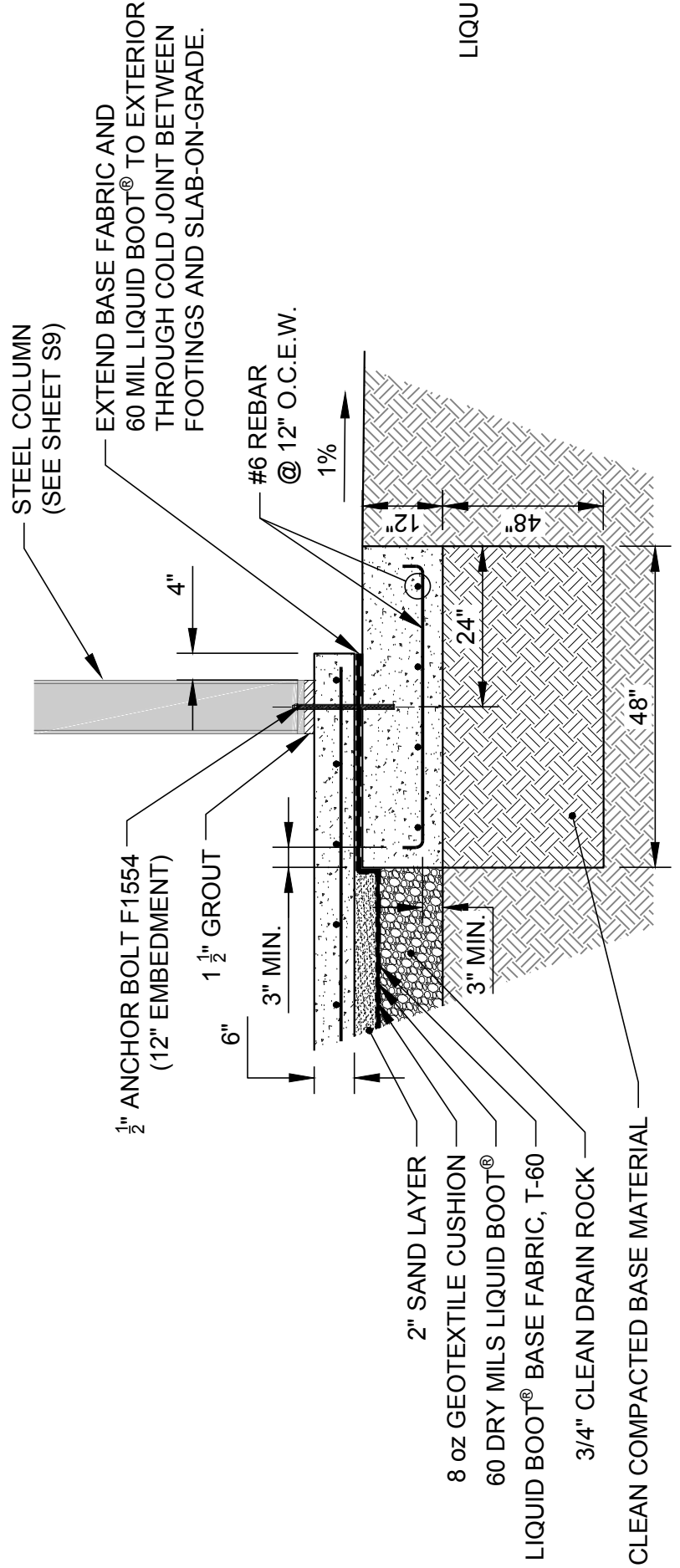
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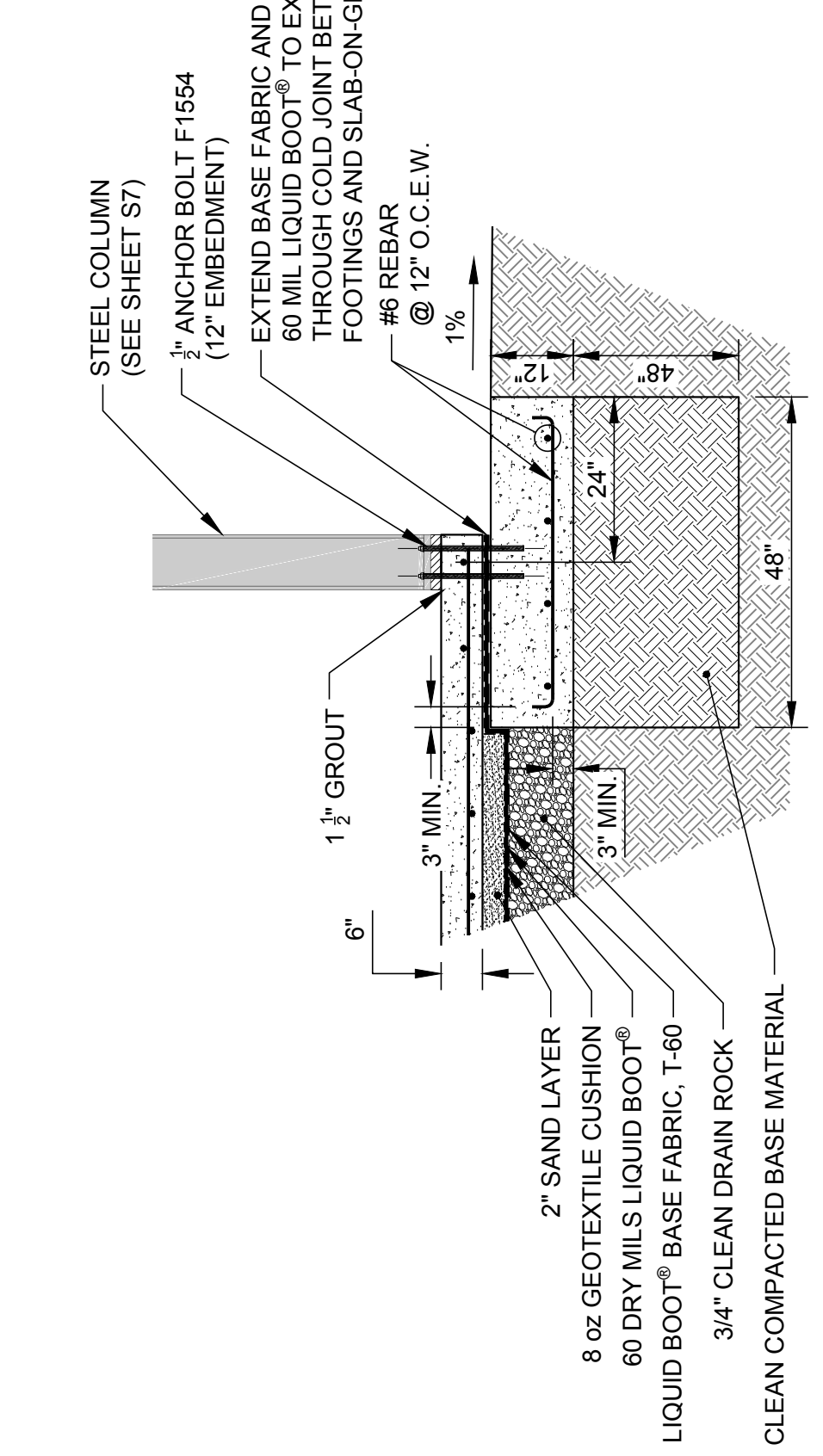
SCALE: 1"=4' 1 PEM STORAGE BUILDING FOUNDATION PLAN VIEW



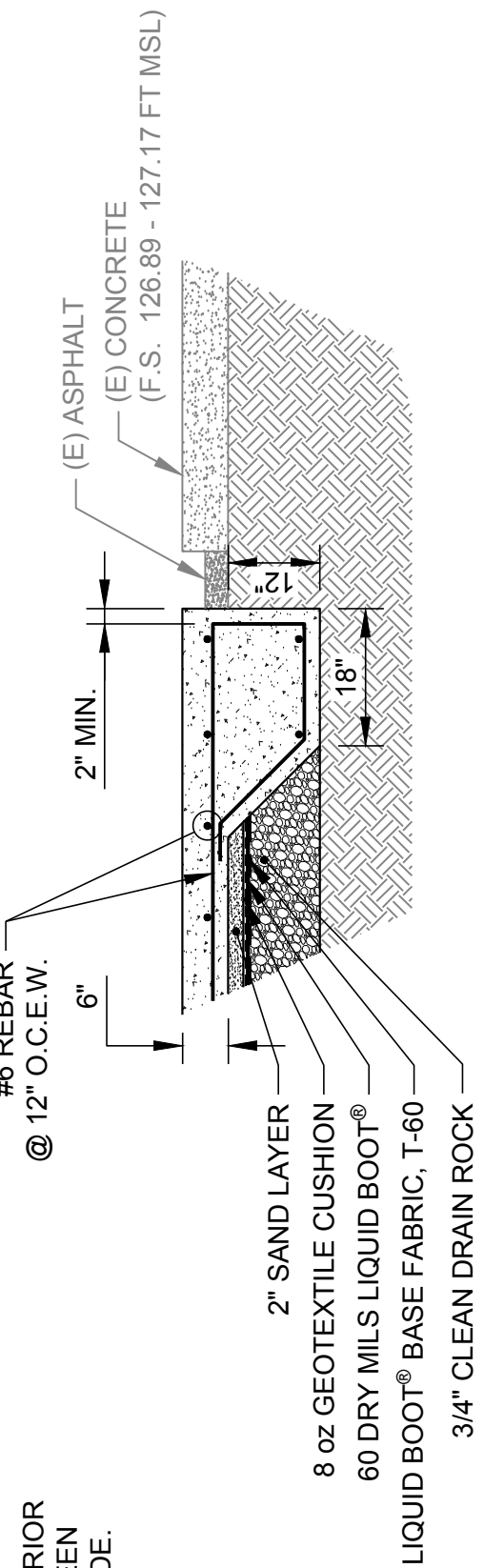
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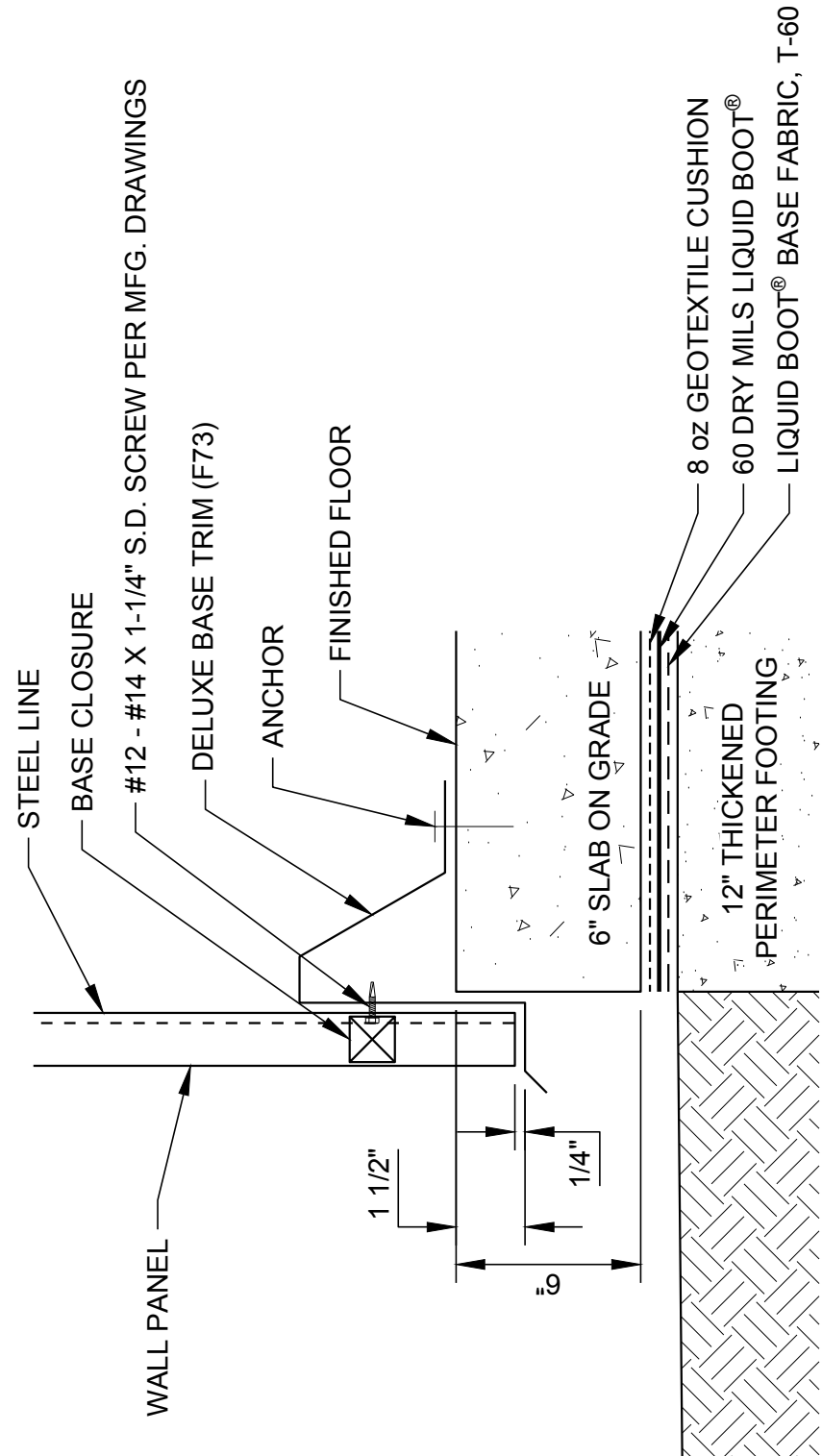
SCALE: 1"=2' C SECTION C



SCALE: 1"=2' B SECTION B



SCALE: 1"=2' D SECTION D



* MINIMUM 3/4" DIA. ANCHOR OR EQUIVALENT POWER-DRIVEN FASTENER AT 24" ON CENTER MAXIMUM.

SCALE: NTS 2 SECTION THRU WALL PANEL AND CONCRETE FOUNDATION WITH DELUXE BASE TRIM

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GEOTEC- NCA NOTE S

- FOR DETAILS ON SUBSURFACE CONDITIONS, RECOMMENDED SOIL BEARING PRESSURE, SITE GRADING, AND SUBGRADE PREPARATION REQUIREMENTS, REFER TO "GEOTECHNICAL INVESTIGATIONS REPORT" BY BROWN & MILLS, INC. DATED FEBRUARY 28, 1999.
- FOUNDATION EXCAVATION AND FILL SHALL BE OBSERVED AND APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCEMENT AND CONCRETE.
- ALL FOUNDATIONS SHALL BE FOUNDED AT LEAST 3 FEET BELOW EXISTING GRADES AFTER REMOVING THE EXISTING FILL SOILS.
- THE SUBGRADE BELOW THE FOUNDATIONS SHALL BE SCARIFIED AND BE COMPACTED TO 95% RELATIVE COMPACTION RELATIVE TO THE MODIFIED PROCTOR TEST, I.E. ASTM D1557, TO A MINIMUM DEPTH OF 12 INCHES. THE PROJECT GEOTECHNICAL ENGINEER MAY WAIVE THIS REQUIREMENT IF DENSE NATIVE SOILS ENCOUNTERED AT OR ABOVE THE 3 FEET EXCAVATION DEPTH.
- ALL FILL AND BACKFILL MATERIALS SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER BEFORE PLACEMENT. ALL BACKFILL SHALL CONSIST OF GRANULAR MATERIAL WITH A PLASTICITY INDEX OF LESS THAN 10 AND PLACED IN 8-INCH LOOSE LIFTS AND COMPACTED TO MINIMUM 90 PERCENT RELATIVE COMPACTION (ASTM D1557) AT A MOISTURE CONTENT OF BETWEEN -3 AND +3% OF THE OPTIMUM DETERMINED FROM ASTM D1557. BACKFILL NEXT TO FOUNDATIONS AND PEDESTALS SHALL BE DONE USING A HAND-OPERATED COMPACTOR IN 4-INCH LOOSE LIFTS.
- THE EXISTING SUBGRADE BELOW THE DRAIN ROCK UNDERLYING THE SLAB-ON-GRADE SHALL BE SCARIFIED AND RE-COMPACTED TO 90 PERCENT RELATIVE COMPACTION (ASTM D1557) AT A MOISTURE CONTENT OF BETWEEN +2 AND +5% OF THE OPTIMUM DETERMINED FROM ASTM D1557, TO A MINIMUM DEPTH OF 12 INCHES BELOW THE BOTTOM OF DRAIN ROCK. THE SUBGRADE PREPARATION SHALL BE OBSERVED BY A QUALIFIED GEOTECHNICAL ENGINEER. IF UNACCEPTABLE SOILS ARE ENCOUNTERED, SUCH SOILS SHALL BE REMOVED AND REPLACED WITH BACKFILL AS NOTED IN NO. 5 ABOVE.

CLIENT
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ROSEVILLE, CA. 95747

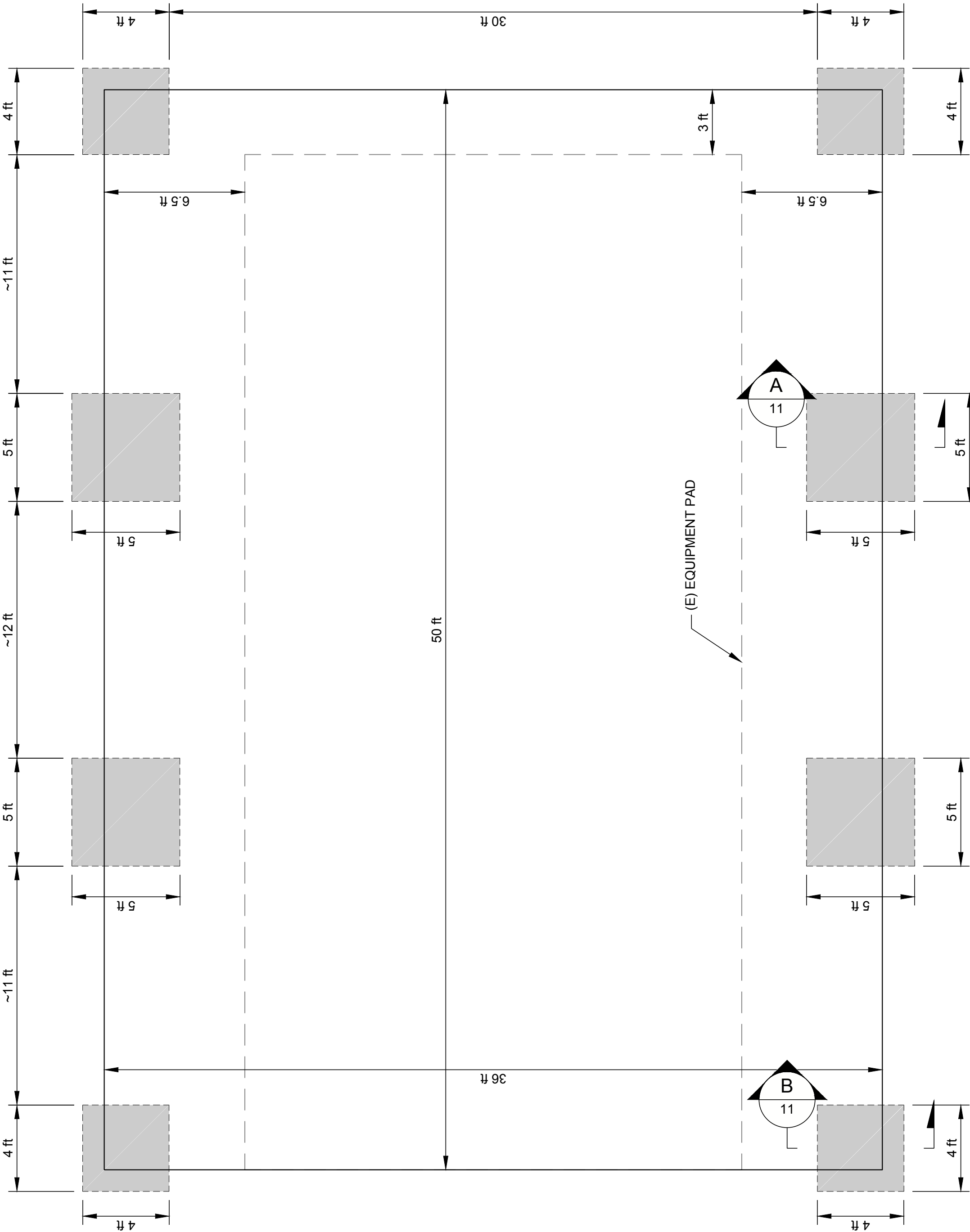
PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

TITLE
PEM STORAGE UIING FOUNDATION ETALS

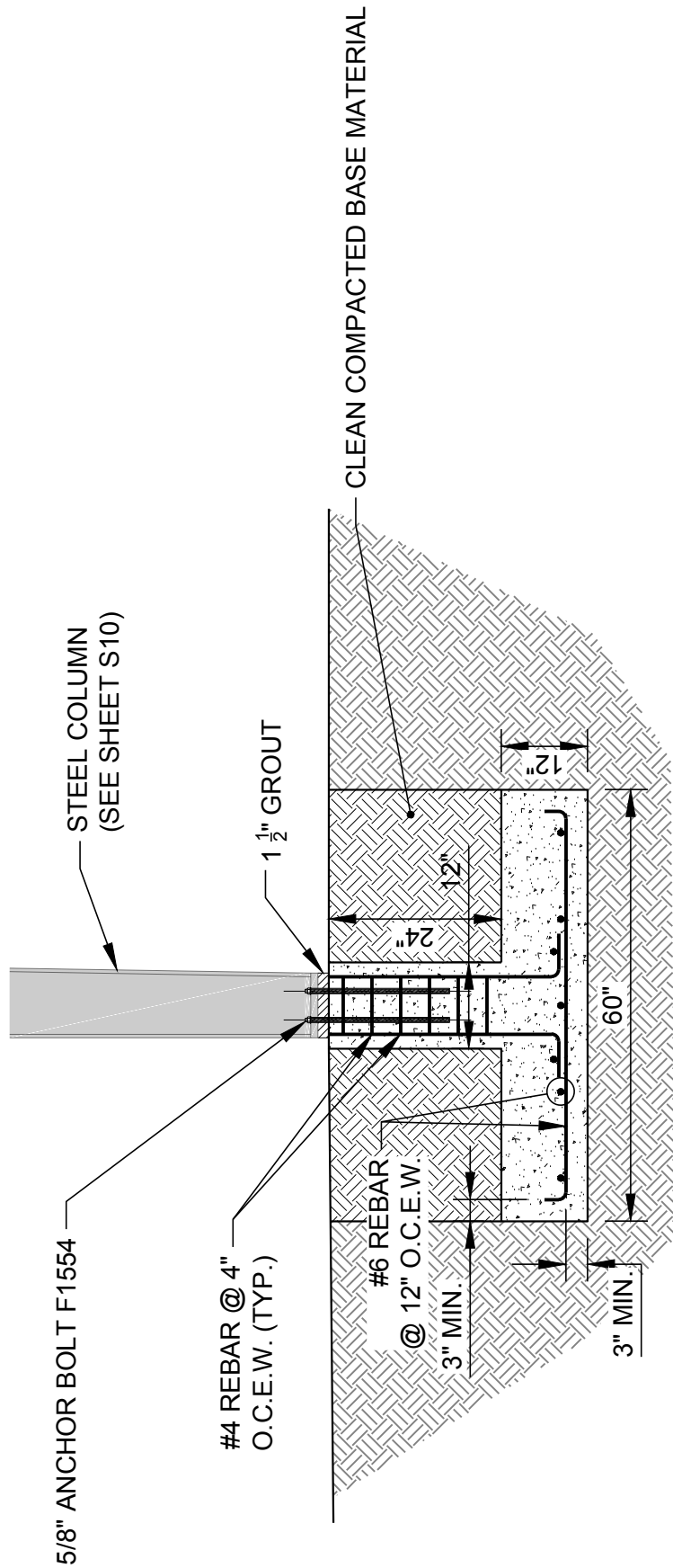
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PROJECT No.
1420152
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14 of 58
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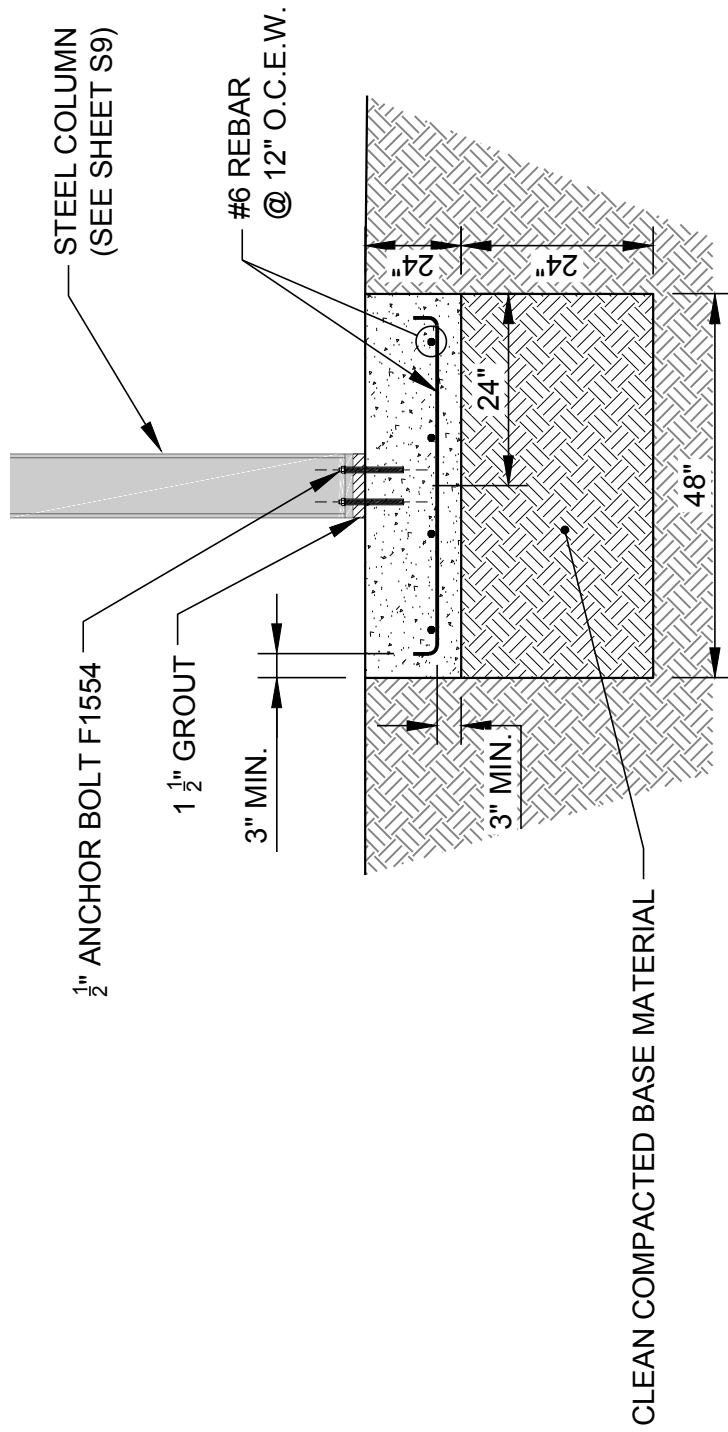
0 2016-08-19 ISSUED FOR BIDDING
Rev. YYYY-MM-DD DESCRIPTION
MAL APW APW RWV
PREPARED DESIGN REVIEW APPROVED



SCALE: 1"=4' 1 7/11 EQUIPMENT CANOPY FOUNDATION PLAN VIEW



SCALE: 1"=2' A 11 SECTION A



SCALE: 1"=2' B 11 SECTION B

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NOTE S - SEE GEOTEC, NICA - NOTES ON S - EET 1

- CANOPY FOUNDATION LOCATIONS AND DIMENSIONS ARE ESTIMATES FOR BIDDING PURPOSES ONLY. FINAL LOCATIONS AND DIMENSIONS WILL BE PROVIDED FOR CONSTRUCTION, BASED ON CANOPY VENDOR FINAL CALCULATIONS AND DRAWINGS.

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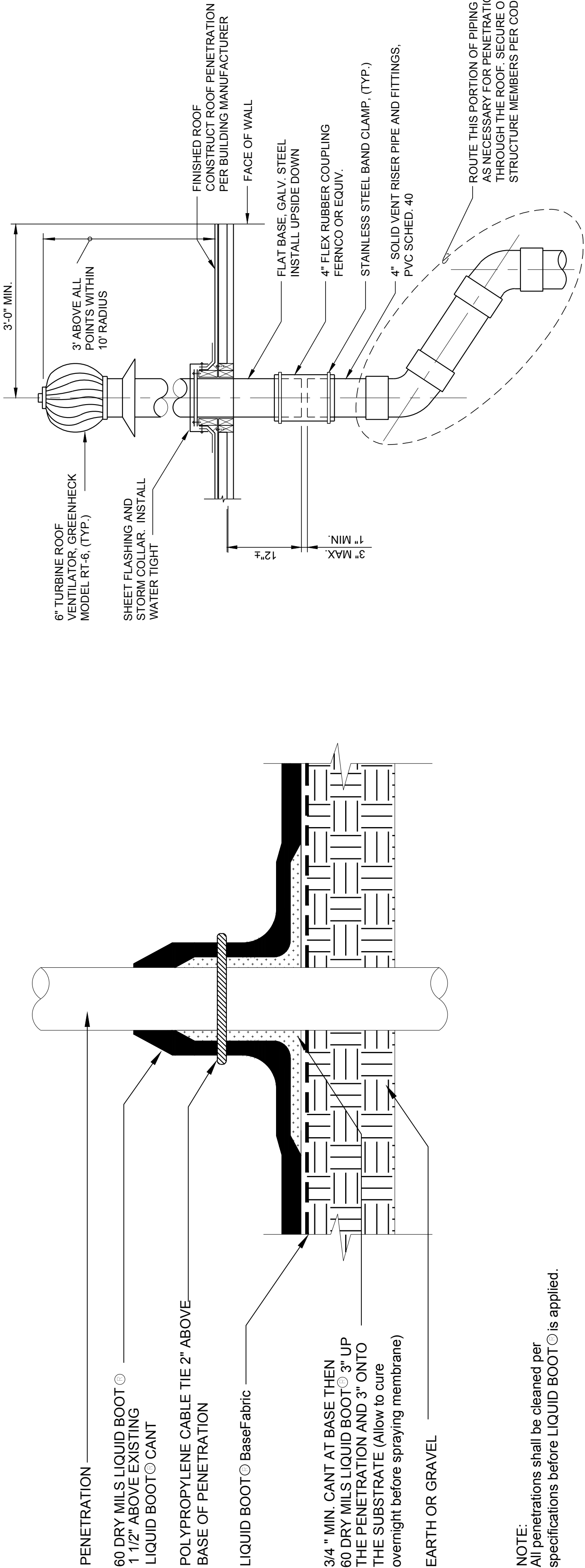


PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

TITLE
EQUIPMENT CANOPY FOUNDATION DETAILS PRELIMINARY

PROJECT No. 1420152
Rev. 0
15 of 58
DRAWING 11

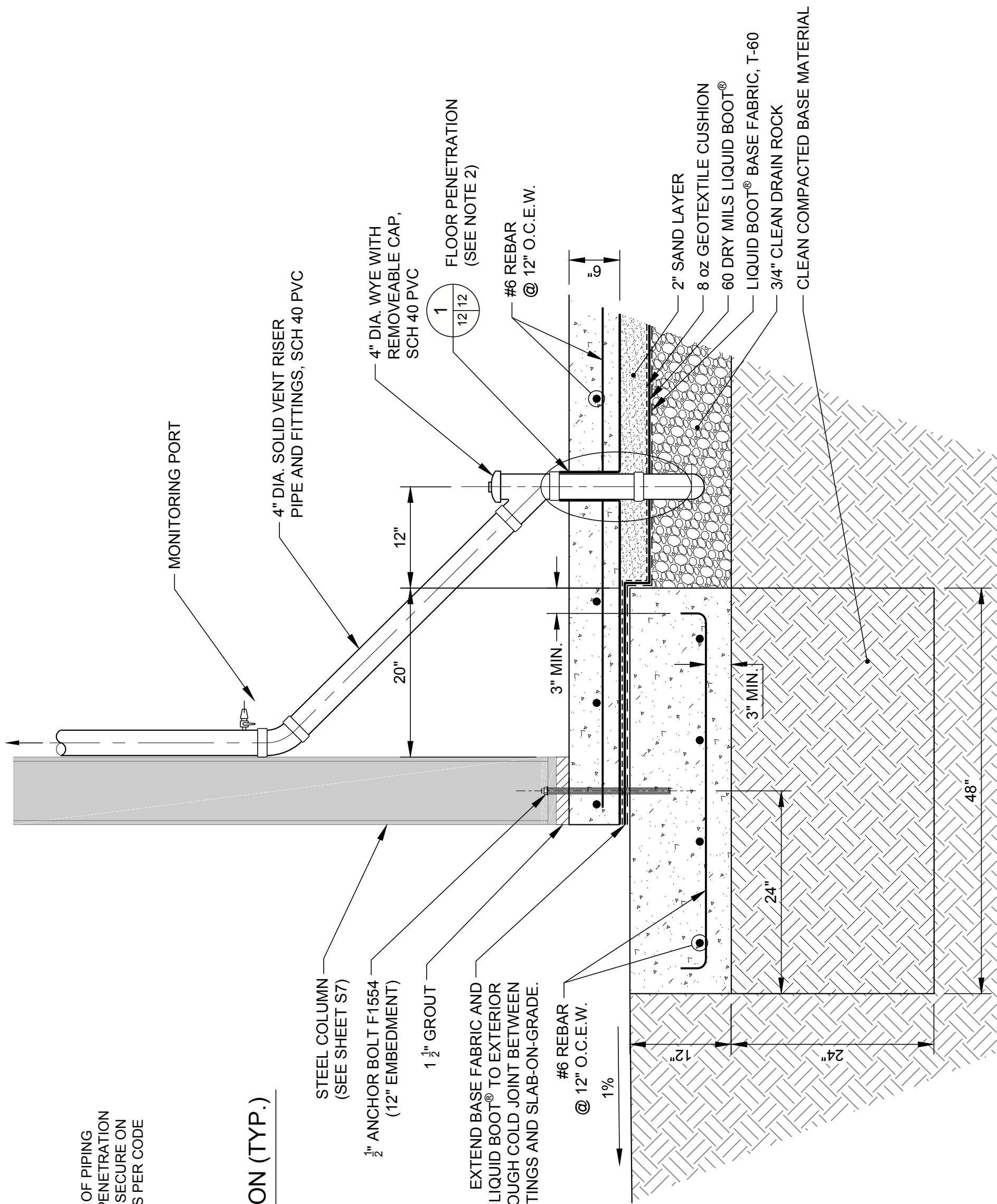
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NOTE:
All penetrations shall be cleaned per specifications before LIQUID BOOT is applied.

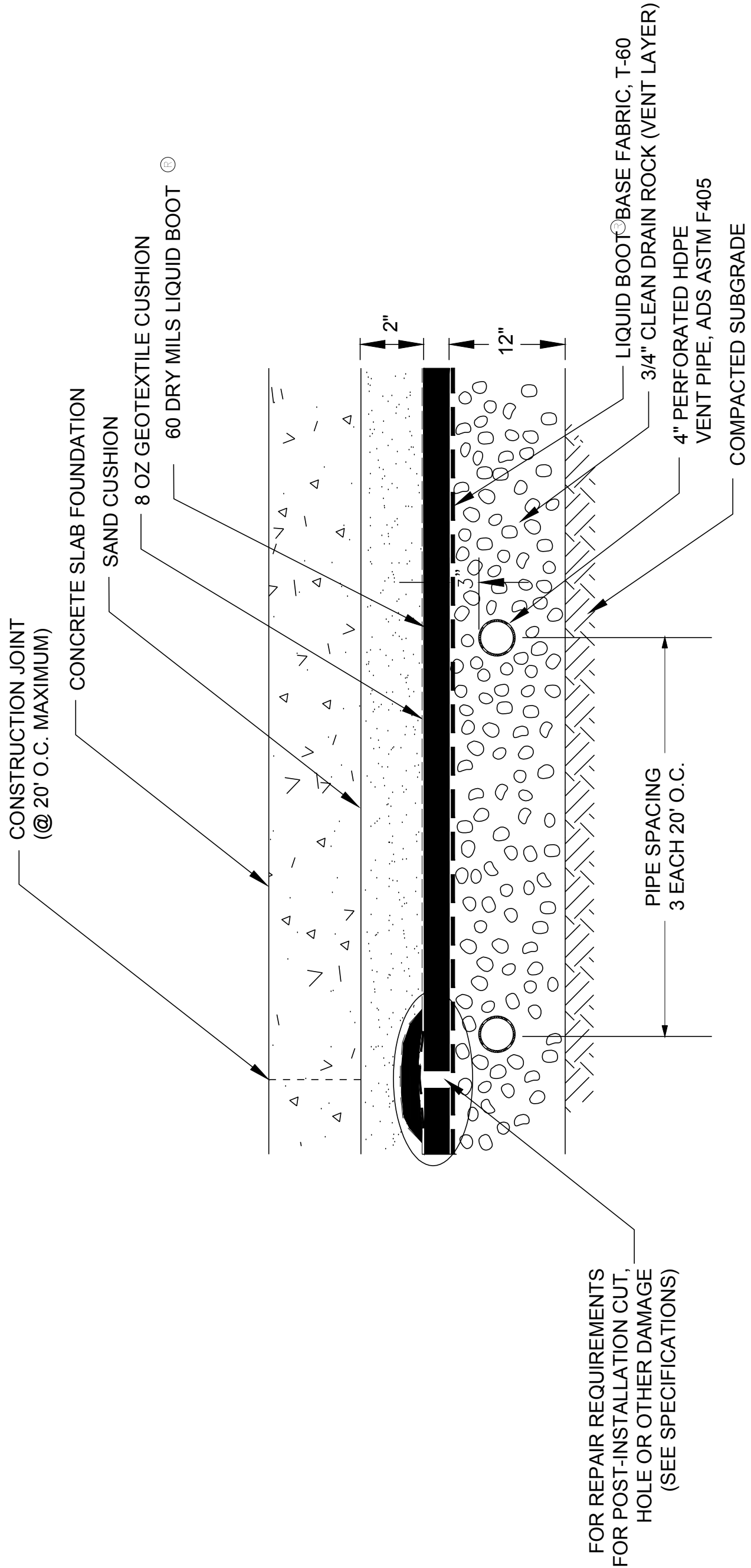
METHANE BARRIER PENETRATIONS ON EARTH OR GRAVEL SUBGRADE TYPICAL DETAIL

SCALE: N.T.S. 1 12 12



- DETAIL NOTE(S)
1. STRUCTURAL ELEMENTS SHOWN ON THIS DRAWING ARE SCHEMATIC ONLY. SEE DRAWING 10 FOR SLAB-ON-GRADE AND STRUCTURAL FOUNDATION PLAN AND DETAILS.
 2. PIPING SHOWN OFFSET TO INTERIOR FOR CLARITY. ALIGN SUBFLOOR RISER THROUGH PERIMETER FOOTING CLOSE TO FACE OF WALL. MAINTAIN 1.5" CLEAR TO CONCRETE REINFORCEMENT.

SCALE: N.T.S. 4 7 12 VENT RISER PIPE AT FOOTING



SCALE: N.T.S. 2 7 12 METHANE BARRIER/ VENT SYSTEM TYPICAL SECTION

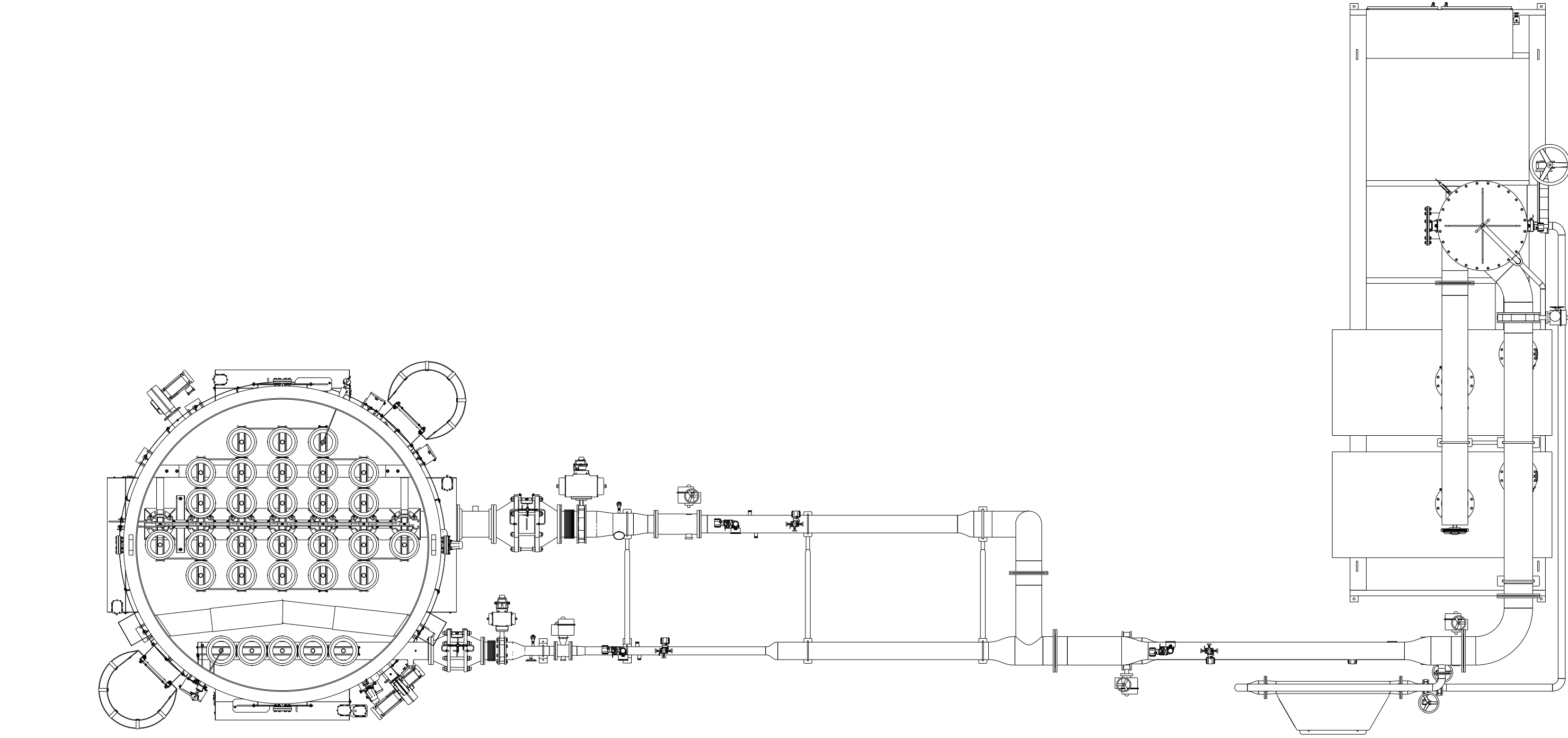
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WESTERN PLACER WASTE MANAGEMENT AUTHORITY
3033 FIDDYMENT ROAD
ROSEVILLE, CA. 95747
CONSULTANT

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

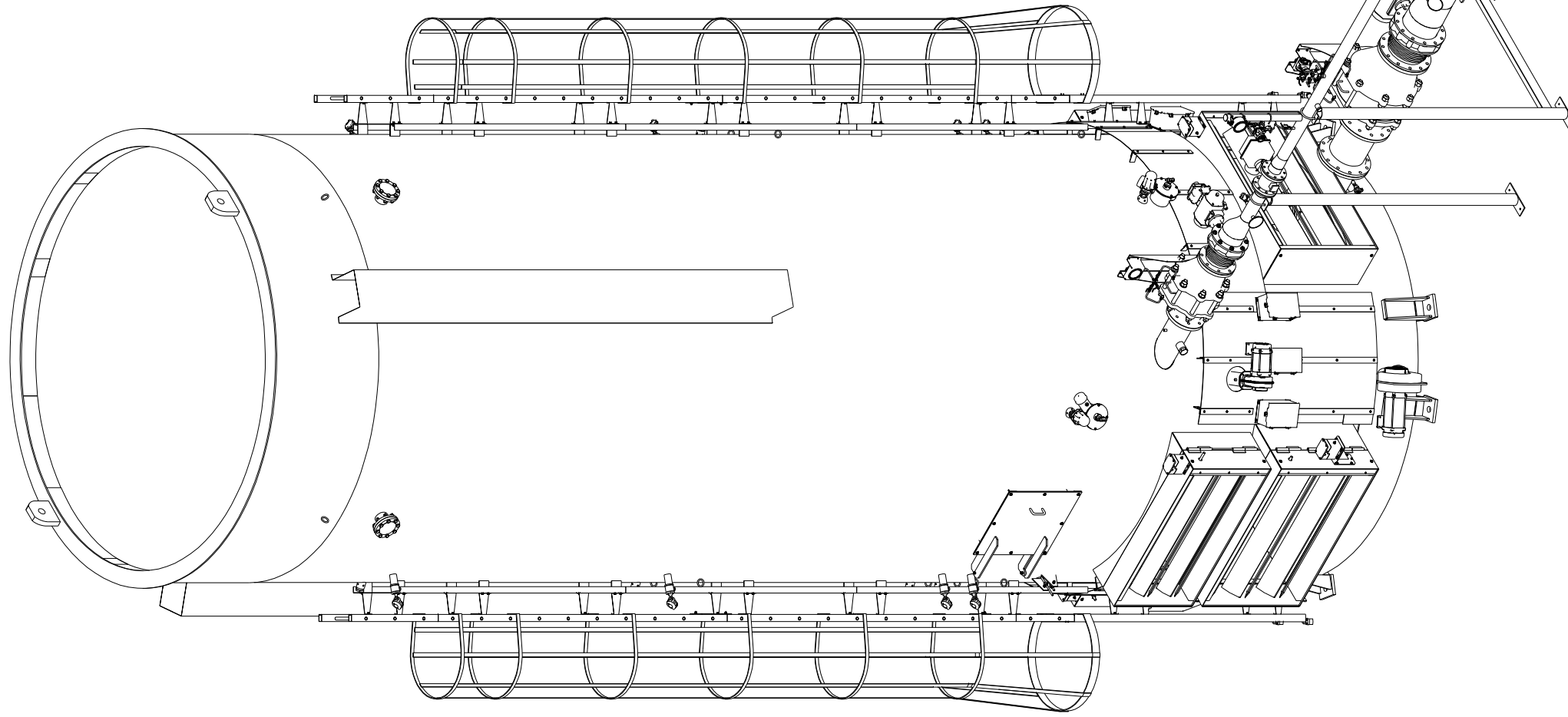
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TITLE
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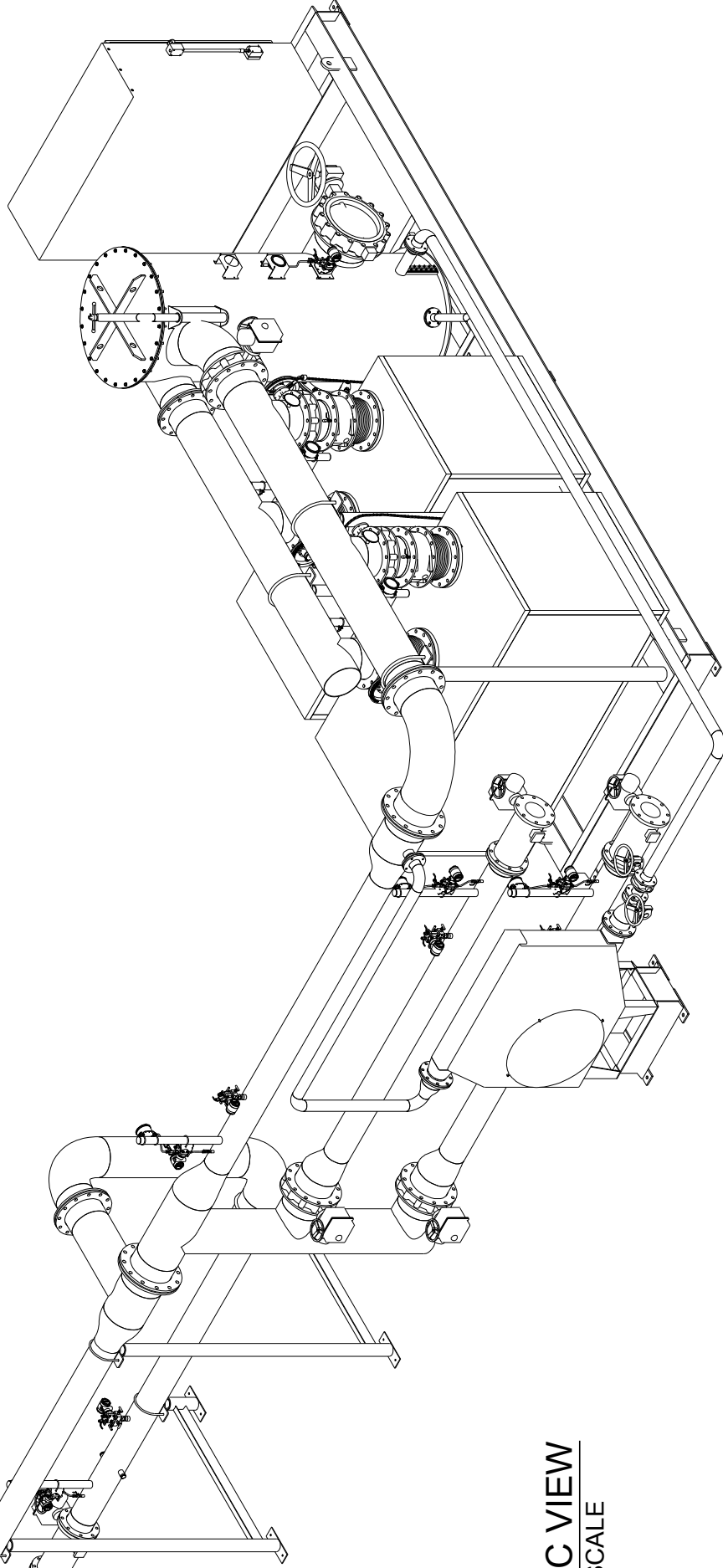
0	2016-08-19	ISSUED FOR BIDDING	MAL	APW	APW	RVW
Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
PROJECT No.		1420152	Rev.		0	16 of 58
DRAWING		1420152	Rev.		0	12



PLAN VIEW
NOT TO SCALE



ISOMETRIC VIEW
NOT TO SCALE



THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FLARE STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

NOTES

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2. THE LOCATIONS AND DIMENSIONS OF BOTH EXISTING AND NEW FACILITIES SHOWN IN THESE PLANS ARE ONLY APPROXIMATIONS. BEFORE STARTING WORK CONTRACTOR SHALL FIELD-VERIFY THE ACTUAL LOCATIONS AND DIMENSIONS OF ALL REQUIRED FACILITIES (WHETHER SHOWN OR NOT) FOR ORDERING AND PREPARING FINAL DESIGNS AND EQUIPMENT SHOP DRAWINGS.
3. FINAL DESIGNS SHALL BE PROPOSED BY THE CONTRACTOR FOR OWNER REVIEW. CONTRACTOR SHALL DEMONSTRATE THAT EACH DESIGN COMPLIES WITH ALL PERFORMANCE REQUIREMENTS AND FUNCTIONAL INTENTS AS SHOWN OR DESCRIBED IN THESE CONTRACT DOCUMENTS.
4. CONTRACTOR SHALL SUPPLY AND INSTALL ALL EQUIPMENT IN ACCORDANCE WITH FINAL SHOP DRAWINGS, SUBMITTALS AND VENDOR INSTALLATION REQUIREMENTS, AS REVIEWED AND APPROVED BY THE OWNER / ENGINEER.
5. FINAL ALIGNMENTS FOR ALL INTERCONNECTING PIPE SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR APPROVAL BY THE OWNER/ENGINEER. CONTRACTOR SHALL PROVIDE AND FIELD-FIT ALL PIPE, CONDUIT, FITTINGS AND SUPPORTS REQUIRED TO PROPERLY CONNECT ALL SUPPLIED EQUIPMENT TO EXISTING PIPING AND ELECTRICAL.
6. CONTRACTOR SHALL INSTALL NEW PIPE SUPPORTS AT THE LOCATIONS SHOWN IN THE FINAL SHOP DRAWINGS AS A MINIMUM AND ADDITIONAL SUPPORTS AS MAY BE REQUIRED FOR PROPER INSTALLATION (AS DETERMINED BY THE OWNER / ENGINEER).

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TITLE
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PROJECT No.
1420152

Rev. 0

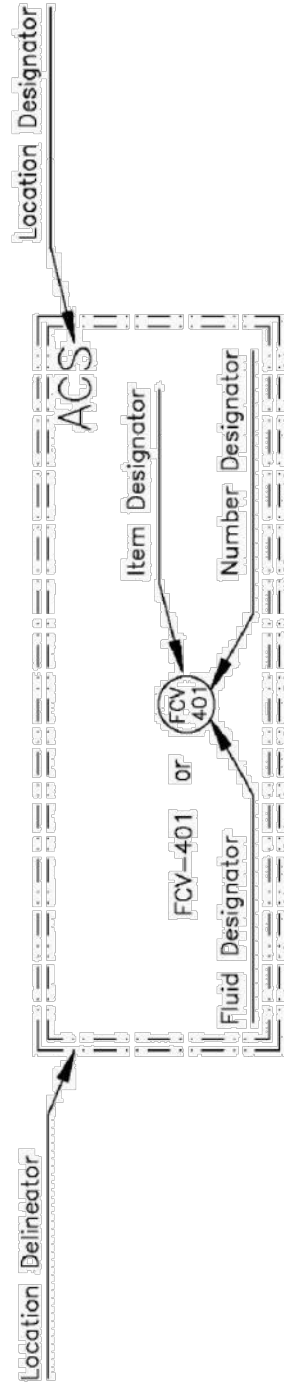
19 of 58

DRAWING
14A

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APW	RWW	APPROVED
0	2016-08-19	ISSUED FOR BIDDING						

Location Designators

Ref Des	Location
ACS	Air Compressor Skid
CDS	Condensate Destruction System
COGS	Coagulation Skid
CP	Control Panel
CST	Condensate Storage Tank
EG	Engine Generator
FLR	Flare
GAC	Gas Analysis Cabinet
GCS	Gas Compression Skid
GVS	Gas Handling Skid
ITC	Ignition Transformer Cabinet
MCC	Motor Control Center
MSC	Loose Parts
PCS	Precooler Skid
PIP	Piping Not On Skid



If the Reference Designator is in a bubble, then the item will be listed on that drawing's material list.
If the Reference Designator is not in a bubble, then it is referring to an item listed on another drawing's material list, or it is supplied as an integral part of another item called out by a bubbled reference designator.

Parts Reference Designators

Ref ID's	Reference Item	Typical Usage/Description
AC	Air Conditioner	Air Conditioner
ACF	Activated Carbon Filter	Condensate Tank Vent Filter
AD	Auto Dailer	Auto Dailer
AI	Analog Input	PLC Analog Input Module
AO	Analog Output	PLC Analog Output Module
AP	Analysis Port	Gas Sample Ports
BALL	Burner Alarm	Flame Fail Shutdown
BE	Burner Element	UV Sensor
BG	Burner Glass	View Ports
BLR	Burner	Air or Gas Blower
BN	Burner Switch	Boiler, Hot Water Heater
BS	Burner	Flame Recognition Switch
CBT	Combustible Gas Transmitter	Cables, Specialty Wiring Between Devices
CGT	Chart Recorder	LED Transmitter
CHP	Chart Recorder	Paper or Paperless Chart Recorder
CMP	Compressor	Air or Gas Compressor
D	Dials	Dials
DI	Digital Input	PLC Digital Input Module
EDP	Electrical Distribution Panel	Load Centers, Breaker Panels
E/E	Electrical Transmitter	Electrical Transmitters, Power Supplies
ES	Exhaust Silencer	System Voltage Monitoring
ES	Exhaust Silencer	Muffler
FAH	Flow Alarm High	High Flow Alarm
FAL	Flow Alarm Low	High Flow Shutdown
FLL	Flow Control Valve	Flow Control Valve
FLL	Flow Control Valve	Flow Control Valve
FLL	Flow Control Valve	Flow Control Valve
FDV	Flow Control Valve	Flow Control Valve
FDV	Flow Control Valve	Flow Control Valve
FE	Flow Element	Fixed Orifice
FE	Flow Element	Flow Element
FI	Flow Indicating Recorder	Flow Indicating Recorder
FLT	Filter	Filter
FLTP	Flow Filter	Flow Filter
FO	Flow Orifice	Flow Orifice
FQI	Flow Totalization Indicator	Flow Totalization Indicator
FSV	Flow Safety Valve	Flow Safety Valve
FV	Flow Transmitter	Flow Transmitter
FU	Fuse	Fuse
FU	Fuse Holder	Fuse Holder
FVH	Flow Valve	Flow Valve
FX	Flex	Flex
GBK	Ground Block	Ground Block
HS	Hand Switch	Hand Switch
HT	Heat Trace	Heat Trace
HV	Heater	Heater
HW	Hard Valve	Hard Valve
HW	Hard Valve Port	Hard Valve Port
I/I	Current Transformer	Current Transformer
IAH	Current Alarm High	Current Alarm High
IAL	Current Alarm Low	Current Alarm Low
IAL	Current Alarm Low	Current Alarm Low
IAL	Current Alarm Low	Current Alarm Low
IGN	Ignitor	Ignitor
IR	Current Indicator	Current Indicator
IR	Current Indicator Recorder	Current Indicator Recorder
ITC	Current Transmitter	Current Transmitter
JB-V	Just-In-Time Cabinet	Just-In-Time Cabinet
JB-LV	Just-In-Time Box-Low Voltage	Just-In-Time Box-Low Voltage
KL	Time Indicator	Time Indicator
LALH	Level Alarm High	Level Alarm High
LAL	Level Alarm Low	Level Alarm Low
LAL	Level Alarm Low	Level Alarm Low
LAL	Level Alarm Low	Level Alarm Low
LCH	Level Controller	Level Controller
LCH	Level Control High	Level Control High
LE	Level Element	Level Element
LE	Level Element	Level Element
LE	Level Indicator	Level Indicator
LMP	Lamp	Lights, Lamps, Beacons
S	Level Switch	Level Switch

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Fluid Designators

Ref Des	Fluid
1XX	Fossil Fuels
2XX	Oils
3XX	Biogas
4XX	Air
5XX	Combustion Exhaust
6XX	Coolants
7XX	Condensate
8XX	Inert Gases
9XX	Digester Fluids

Ref Des		Reference Item	Typical Usage/Description
LT	LUB	Air Lubricator	Liquid Level Measuring Transmitter
LZ	LZ	Level controller	AR Vent
MA	MA	Methane Alarm Low	Low Methane Level Alarm
MALL	MALL	Methane Alarm Low	Low Methane Level Shutdown
MI	MI	Methane Indicator	Methane Level Gauge
MIR	MIR	Methane Indicating Recorder	Paper or Paperless Chart Recorder
MOD	MOD	Modem	Modem
MV	MV	Mixer Valve	Engine Carburetor
NK	NK	Neutral Black	Neutral Black
NEH	NEH	Oxygen Alarm High	High Oxygen Level Alarm
OH	OH	Oxygen Alarm High	High Oxygen Level Shutdown
OE	OE	Oxygen Element	Oxygen Sensor
OI	OI	Oxygen Indicator	Oxygen Level Gauge
OR	OR	Oxygen Indicating Recorder	Paper or Paperless Chart Recorder
OT	OT	Oxygen Transmitter	Oxygen Level Transmitter
PAH	PAH	Pressure Alarm High	High Pressure Alarm
PAHH	PAHH	Pressure Alarm High	High Pressure Shutdown
PAL	PAL	Pressure Alarm Low	Low Pressure Alarm
PALL	PALL	Pressure Alarm Low	Low Pressure Shutdown
PCL	PCL	Pressure Controller	PD Loop Pressure Controller, Valve Opening Regulators, Actuated or Hand Modulating Differential Pressure Gauge
PCV	PCV	Pressure Control Valve	PD Loop Pressure Controller, Valve Opening Regulators, Actuated or Hand Modulating Differential Pressure Gauge
PDI	PDI	Pressure Differential Indicator	DP Flow Meter
PDT	PDT	Pressure Differential Transmitter	DP Flow Meter
PI	PI	Pressure Indicator	Pressure Gauge
PIH	PIH	Pressure Indicator & Alarm	Pressure Gauge w/Switch
PIL	PIL	Pressure Indicating Logic Controller	Pressure Indicating Logic Controller
PRL	PRL	Pressure Indicating Recorder	Paper or Paperless Chart Recorder
PPL	PPL	Programmable Logic Controller	Programmable Logic Controller
PLC	PLC	PLC	Pilot Wiring Assembly
PMP	PMP	Pump	Liquid Pump
PR	PR	Pressure Recorder	Paper or Paperless Recorder
PSE	PSE	Pressure Switch	Pressure Switch
PSEI	PSEI	Pressure Safety Element	Rupture Disk
PT	PT	Pressure Transmitter	Pressure Transmitter
REC	REC	Receptacle	Control Relay
RCS	RCS	Relay	Electrical Receptacle
RES	RES	Resistor	Resistor
RM	RM	Relay Module	PLC Relay Module
RN	RN	Relay	Relay
SCN	SCN	Sign	Sign
SI	SI	Speed Indicator	Speed or Frequency Meter
SSR	SSR	Surge Arrestor	Surge Protectors, Lightning Arrestors
TAH	TAH	Temperature Alarm High	High Temperature Alarm
TAHH	TAHH	Temperature Alarm High	High Temperature Shutdown
TAL	TAL	Temperature Alarm Low	Low Temperature Alarm
TALL	TALL	Temperature Alarm Low	Low Temperature Shutdown
TB	TB	Terminal Block	Terminal Block
TC	TC	Temperature Controller	Thermostat
TDV	TDV	Temperature Control Valve	Control Valves
TE	TE	Temperature Element	Thermocouple, RTD, Thermistor
TES	TES	Temperature Element Switch	Thermocouple Switch
TEV	TEV	Thermostatic Expansion Valve	Thermostatic Expansion Valve
TW	TW	Temperature Element Well	Port for Thermocouple, RTD or Thermistor
TI	TI	Temperature Indicator	Temperature Gauge
TIA	TIA	Temperature Indicator & Alarm	Temperature Gauge w/Switch
TIR	TIR	Temperature Indicating Recorder	Paper or Paperless Chart Recorder
TSE	TSE	Temperature Safety Element	Pressure Tank, Rupture Disk, Temperature Tank
TSK	TSK	Temperature Switch	Thermostat
TSV	TSV	Temperature Safety Valve	Thermostatic Expansion Valve
TX	TX	Temperature Transmitter	Temperature Transmitter
UPE	UPE	Heat Exchanger	Heat Exchanger
UPS	UPS	Uninterrupted Power Supply	Uninterrupted Power Supply
VH	VH	Vibration Alarm High	High Vibration Alarm
VAH	VAH	Vibration Alarm High	High Vibration Shutdown
VFD	VFD	Variable Frequency Drive	Variable Frequency Drive
VI	VI	Vibration Indicator	Vibration Gauge
VIR	VIR	Vibration Indicating Recorder	Paper or Paperless Chart Recorder
VIT	VIT	Vibration Transmitter	Vibration Transmitter
VYSD	VYSD	Event Alarm	VFD Faults
YI	YI	Event Indicator	Run Lamps
YIC	YIC	Event Indicator Controller	Touch Screens, Softstart/Display Panels, etc
ZA	ZA	Position Alarm	Position Alarm
ZC	ZC	Position Controller	PD Loop Position Controller
ZI	ZI	Position Indicator	Valve or Damper Position Indicator
ZS	ZS	Position Switch	Valve Open, Close Switches

Item Designators

Ref Des		Reference Item	Typical Usage/Description
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RN	RN	Relay	Relay
SCN	SCN	Sign	Sign
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ZS	ZS	Position Switch	Valve Open, Close Switches

THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FARE STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND NEW 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING REVENUED LAYOUT SHOWN ON SHEET 7A, MANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.

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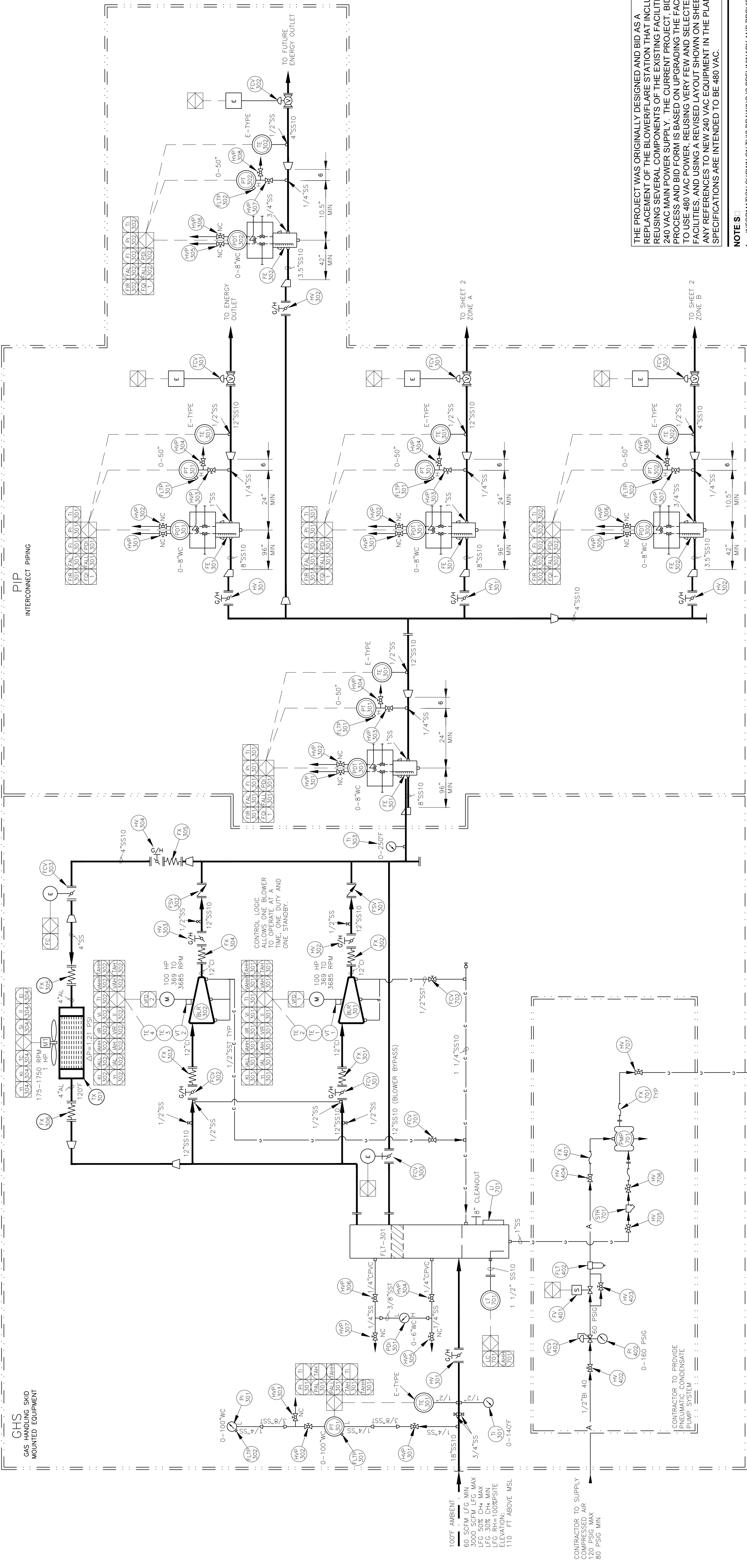
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PROJECT No. 1420152 Rev. 0 20 of 58 DRAWING 15

GHS
GAS HANDLING SKID
MOUNTED EQUIPMENT



CONTRACTOR TO PROVIDE PNEUMATIC CONDENSATE PUMP SYSTEM

CONTRACTOR TO SUPPLY AND INSTALL ALL EQUIPMENT IN ACCORDANCE WITH FINAL SHOP DRAWINGS, SUBMITTALS AND VENDOR INSTALLATION REQUIREMENTS, AS REVIEWED AND APPROVED BY THE OWNER'S ENGINEER.

PIPING MATERIALS LEGEND

AL:	ALUMINUM
BI:	BLACK IRON
CH:	CHLOROPOLYVINYL CHLORIDE
CPVC:	CARBON STEEL
EPDM:	ETHYLENE PROPYLENE DIENE MONOMER
ES:	ETHYLENE
GS:	GALVANIZED STEEL
HDBE:	HIGH DENSITY POLYETHYLENE
PVC:	POLYVINYL CHLORIDE
(EXAMPLE: 6"AL40 = 6" ALUMINUM SCHEDULE 40 PIPE)	

PIPING LINES LEGEND

---	ELECTRICAL CONNECTIONS
---	INSULATION
---	MAIN PIPING
---	SUB PIPING
---	CONDENSATE PIPING
---	COMPRESSED AIR PIPING
---	CUSTOMER SUPPLIED PIPING
---	PEI SCOPE OF PROJECT

PID LOOPS

LOOP #	NAME	CONTROLLED ELEMENT	CONTROLLER, OUTPUT ELEMENT	PROCESS VARIABLE, UNITS	PV SENSOR
1	LANDFILL VACUUM CONTROL	FCV-301.2	PLC, A01-CHP	LANDFILL VACUUM, 0.0 INWC	PT-301
2	LANDFILL FLOW CONTROL	FCV-301.2	PLC, A01-CHP	LFG FLOWRATE, SCFM	TOTAL MASS FLOW
3	FLARE ZONE A TEMPERATURE CONTROL	FCV-401.2	PLC, A01-CHP	FLARE ZONE A TEMPERATURE, °F	SELECTED FLARE ZONE A THERMOCOUPLE
4	FLARE ZONE B TEMPERATURE CONTROL	FCV-403.4,5,6	PLC, A01-CHP	FLARE ZONE B TEMPERATURE, °F	SELECTED FLARE ZONE B THERMOCOUPLE

CONTRACTOR TO PROVIDE PNEUMATIC CONDENSATE PUMP SYSTEM

1	AL	10	SCH 10 PIPE
2	CH	40	SCH 40 PIPE
3	CPVC	80	SCH 80 PIPE
4	EPDM	10	SCH 10 HOSE
5	ES	10	SCH 10 TUBING
6	GS	10	SCH 10 TUBING
7	HDBE	10	SCH 10 TUBING
8	PVC	10	SCH 10 TUBING

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 4. CONTRACTOR SHALL INTEGRATE NEW EQUIPMENT CONTROLS AND DATA OUTPUT WITH EXISTING SCADA SYSTEM AND BIDDING PROCESS. CONTRACTOR SHALL PROVIDE TECHNICAL SPECIFICATIONS FOR SUMMARY OF SYSTEMS CONTROL LOGIC AND CONTROLS INTEGRATION REQUIREMENTS.
 5. CONTRACTOR SHALL PROVIDE AND COORDINATE SCADA PROGRAMMING, INCLUDING PROVIDING HUMAN MACHINE INTERFACE (HMI) FOR REMOTE INTERNET AND MOBILE ACCESS TO SCADA DATA, VIEWING EQUIPMENT AND PROCESS STATUS, AND MAKING PROCESS ADJUSTMENTS.

PROJECT

WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

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TITLE

BLOWER/ FLARE CONCEPTUAL EQUIPMENT P&ID (1
OF 2)

PROJECT No.

1420152

Rev.

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2016-08-19

ISSUED FOR BIDDING

XXXX-MM-DD

DESCRIPTION

Rev.

22 of 58

DRAWING

16A

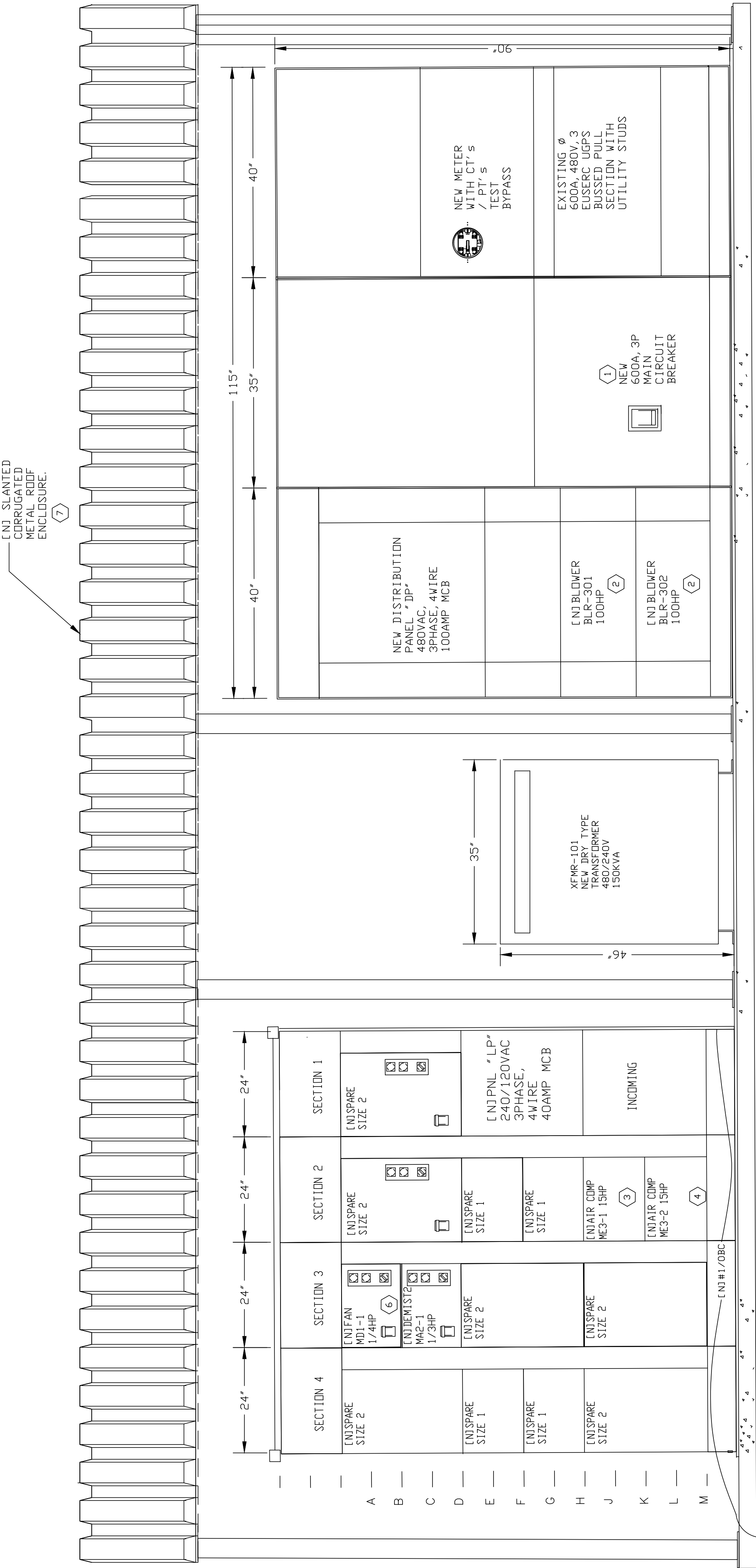
GENERAL NOTES

1. EQUIPMENT LAYOUT IS GENERALLY DIAGRAMMATIC. THE SIZE AND LOCATIONS OF DEVICES SHOWN ON THESE DRAWINGS SHALL BE VERIFIED. ROUTING OF WIRING SHALL BE GOVERNED BY ACTUAL CONDITIONS.
2. MOTOR CONTROL CENTER SHALL BE PROVIDED WITH ALL NECESSARY ASSEMBLIES, COMPONENTS, CONTROLLERS, PUSHBUTTONS, NAMEPLATES, TERMINAL BLOCKS AND ASSOCIATED WIRING NECESSARY TO COMPLETE THE PROJECT.
3. MOTOR WIRING AND FIELD CONTROL WIRING SHALL FEED THRU TERMINAL BLOCKS OR MARSHALLING PANELS. MCC WIRING SHALL MEET NEMA TYPE IIC REQUIREMENTS. CONTROL WIRING SHALL BE POWER LIMITED, TYPE MTW, #14AWG CU, 600V, UL1015.
4. ENDS OF CONTROL WIRING SHALL HAVE HEAT-SHRINK TYPE TAGS AT BOTH ENDS. TAGS SHALL DENOTE WIRE DESIGNATIONS.
5. ELECTRICAL CONTRACTOR SHALL ARRANGE WITH PG&E TO LOCK OUT THE INCOMING ELECTRICAL SERVICE DURING MAIN BREAKER CHANGE OVER.
6. [N] COOLING FAN AND [N] FLARE PURGE BLOWERS FED FROM [N] FLARE CONTROL PANEL.
7. PROVIDE AND INSTALL NEW NAMEPLATES AND ATTACH TO FRONT OF CUBICAL DOORS.

NUMBERED NOTES

1. MAIN SWITCHBOARD, 600-AMP, 480V-VOLT, 3-PHASE, 3-WIRE, 42KAIC. DISCONNECT AND REMOVE EXISTING 400 AMP MAIN CIRCUIT BREAKER. PROVIDE AND INSTALL NEW 600 AMP MOLDED CASE G.E. SPECTRA ELECTRONIC TRIP MAIN CIRCUIT BREAKER, 100% CONTINUOUS RATED. RECONNECT TO EXISTING LINE AND LOAD SIDE CIRCUITRY. PROVIDE NEW TRIP PLUG, MOUNTING HARDWARE, LOAD SIDE LUGS AND ENCLOSURE FRONT PANEL AS NECESSARY. PROVIDE AND INSTALL NEW PARALLEL 350KCmil CU. CONDUCTORS FROM NEW BREAKER TO MCC IF REQUIRED.
2. PROVIDE AND INSTALL NEW 600AF 200AT, 3POLE, 480VAC MOLDED CASE CIRCUIT BREAKER IN NEW DISTRIBUTION BOARD. MATCH VFD RECOMMENDATION. PROVIDE NEW DOOR WITH NEW LOCKABLE SWITCH AND HANDLE.
3. DISCONNECT EXISTING AIR COMPRESSOR No. 1 <ME3-1>. RECONNECT RELOCATED AIR COMPRESSOR No. 1 <ME3-1>.
4. DISCONNECT EXISTING AIR COMPRESSOR No. 2 <ME3-2>. RECONNECT RELOCATED AIR COMPRESSOR No. 2 <ME3-2>.
5. PROVIDE AND INSTALL #1/0 BARE COPPER GROUND CABLE AND CONNECT EQUIPMENT TOGETHER TO FORM A CONTINUOUS GROUND NETWORK. CONNECT GROUND CABLE TO THE [N] MCC. [N] GROUND RODS, [N] FLOOR SKID, [N] PT. SKID, AND [N] BLOWER MOTORS. USE [N] NEMA ONE HOLE COMPRESSION LUGS AT EQUIPMENT. USE [N] EXOTHERMIC WELDS AT TEES. CABLE BENDS SHALL MEET NEC 312.6(k).
6. DISCONNECT EXISTING EXHAUST FAN <MD1-3>. RECONNECT RELOCATED EXHAUST FAN RELABELLED AS <MD1-1>.
7. CORRUGATED METAL ROOF STRUCTURE TO BE 25' LENGTH BY 9' WIDE. ROOF OVERHANGS SHALL HAVE SCREENED GUTTERS AND DOWNSPOUTS AT CORNERS OF ROOF. BUILDINGS CONTRACTOR TO PROVIDE FINAL DETAILS OF GUTTERS DOWNSPOUTS AND OTHER SHEET METAL ACCESSORIES AND METHODS OF JOINING AND ANCHORAGES. ROOF PANELS SHALL BE 24 GAUGE, G-90 ZINC-COATED (GALVANIZED) STEEL, CONFORMING TO ASTM A653, GRADE 50, 24 INCH OR 36 INCH WIDE STANDING SEAM METAL ROOF PANELS ATTACHED WITH CONCEALED SELF-TAPPING FASTENERS AT SUPPORTS AND MECHANICALLY SEALED SIDE LAP JOINTS.

THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FLARE STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER. REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.



MOTOR CONTROL CENTER

SPECTRA SWITCHBOARD

CLIENT
WESTERN PLACER WASTE MANAGEMENT AUTHORITY

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

CONSULTANT

Golder Associates Inc.
425 Lakeside Drive
Sunnyvale, California 94085
USA
408-220-9223
www.golder.com

TITLE
BLOWER FLARE MODIFICATIONS
ELECTRICAL MOTOR CONTROL CENTER

PROJECT No.
1420152

Rev.
1

27 of 58
DRAWING
E2A

Rev.	YYYY-MM-DD	DESCRIPTION	PREPARED	DESIGN	REVIEW	APPROVED
A	2016-08-11	ISSUED FOR BID	SMA	JR	APW	JR

NUMBERED ELECTRICAL NOTES

NJFLARE CONTROL PANEL PROVIDED BY FLARE VENDOR. INSTALLED BY ELECTRICAL CONTRACTOR. VERIFY EXACT INSTALLATION REQUIREMENTS.

NJMOTOR CONTROL CENTER 600A, 240/120V, 3PH, 4W
SEE ELEVATION DETAIL SHEET E2A FOR NEW WORK.

DECOMMISSION [E] CONDENSATE CONTROL PANEL. DISCONNECT AND REMOVE [E]CIRCUITRY TO [E] FLARE CONTROL PANEL. PROVIDE AND INSTALL [N]CIRCUITRY AND EXTEND TO [N]FLARE CONTROL PANEL.

NJ150 KVA DRY TYPE TRANSFORMER SEE ELEVATION SHEET E2A FOR NEW WORK.

[E] AUBURN RTU PANEL: TRANSFER REMAINING ACTIVE SIGNALS FROM [E] RTU TO NEW FLARE CONTROL PANEL INPUT MODULE FOR TRANSMISSION TO CENTRAL SCADA SERVER (COMMUNICATIONS PROTOCOL T.B.D.)

NJPANEL "SP" INSTALLED IN NEW BUILDING, SEE DRAWING E-6 FOR DETAIL
20/240V, 3PH, 4W, 40A MCB, TYPE 1 SURFACE CABINET.

REPAIR COMPRESSORS. DISCONNECT AND REMOVE [E]CONDUIT AND CIRCUITRY FROM [E]COMPRESSORS. PROVIDE AND INSTALL [N]CONDUIT AND CIRCUITRY TO RELOCATED COMPRESSORS AND CONNECT.

7. [N]725P BLOWER GAS HANDLING SKID [GHS-1]. PROVIDE AND INSTALL [N]CONDUIT AND CIRCUITRY AND CONNECT TO SKID MOUNTED FIELD WIRING TERMINAL BOXES. SKID MOUNTED PRE-WIRED BOXES BY OTHERS. VERIFY EXTERMINATION REQUIREMENTS WITH FLARE EQUIPMENT CONTRACTOR.

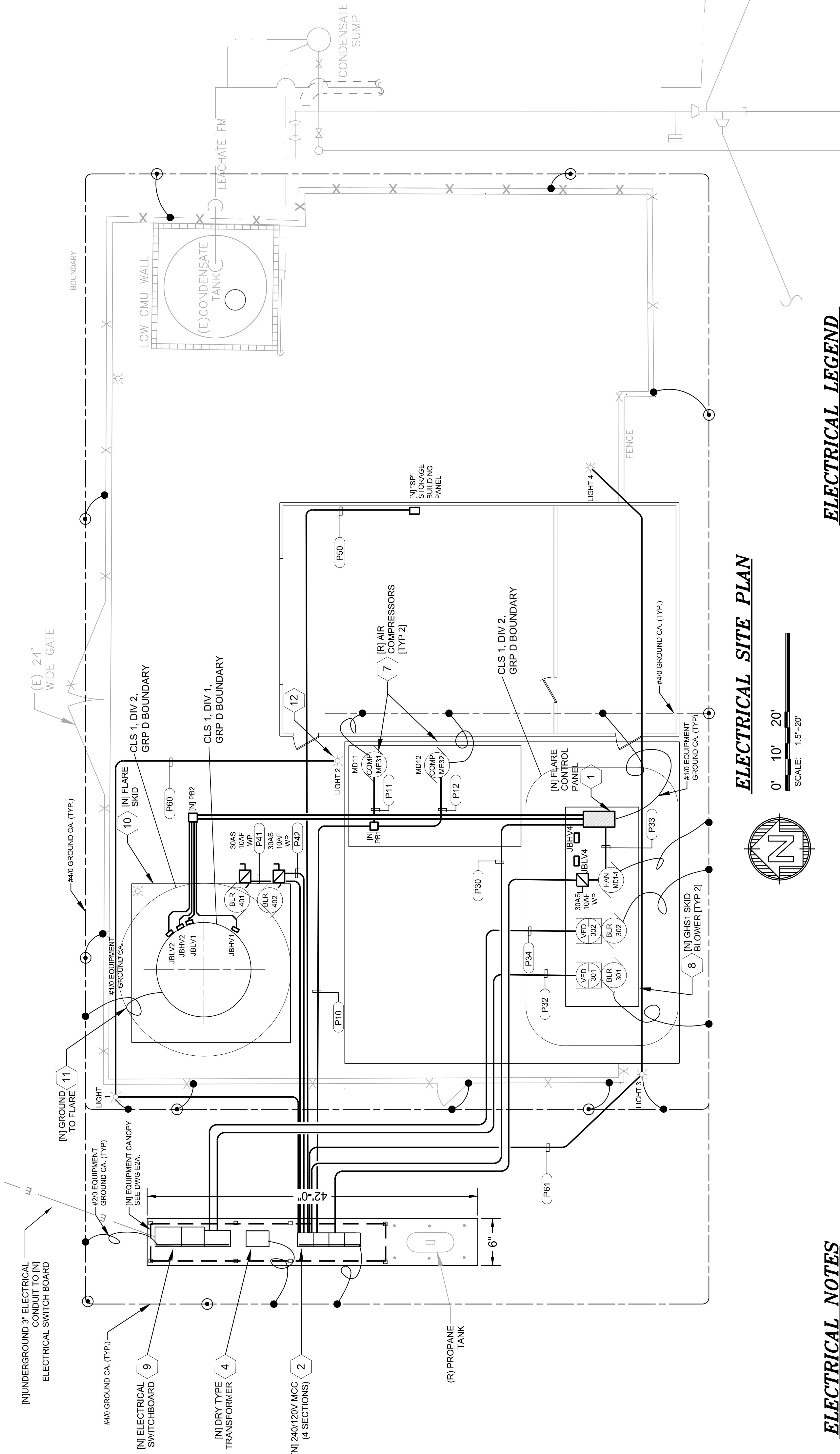
IN SWITCHBOARD WITH METERING 600A, 480VAC, 3PHASE, 4 WIRE
SEE ELEVATION DETAIL SHEET E2A FOR NEW WORK.

UNLESS OTHERWISE SPECIFIED, ALL SKID MOUNTED FIELD WIRING SHALL BE IN CONFORMANCE WITH THE FOLLOWING REQUIREMENTS:

GROUNDING. PROVIDE AND INSTALL ONE (1) #10 BARE COPPER GROUND CABLE AND CONNECT TO FLARE AND PIP SKID STEEL, BLOWER ENCLOSURES, CONTROL PANEL AND MCC GROUNDED BUS BAR.

[N] LIGHTING SHOWN PER PLACER COUNTY REGULATIONS.

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ELECTRICAL SITE PLAN



0' 10' 20'

SCALE: 1"=20'

ELECTRICAL NOTES

1. ELECTRICAL MATERIALS INSTALLED IN HAZARDOUS LOCATIONS, AS DEFINED BY NFPA 70, SHALL HAVE UTILIZATION LISTING. APPLIES TO NEW CONSTRUCTION ONLY.
2. BOUNDARIES AND - THE AREA RADIATING 3' FROM BURNER EXHAUST OPENING- CLASS 1, DIVISION 1, GROUP D. CLASSIFICATIONS - THE AREA RADIATING 5' FROM BLOWERS, AND BLOWER DISCHARGE VALVES AND FLANGES - CLASS 1, DIVISION 2, GROUP D.
3. PROVIDE CONDUITS WITH UL888 SEALS AND APPROVED SEALING COMPOUND WHEN PENETRATING BOUNDARIES OR WHEN PIERCING GRADE. SEALS SHALL BE WITHIN 18" OF ENCLOSURES OR GRADE. SEALS SHALL BE PACKED AND POURED AFTER COMMISSIONING.
4. COMMON GROUNDING SYSTEM IS REQUIRED. UTILIZE (E)GROUND RODS, REPLACE ANY GROUND CABLE OR GROUND CONNECTORS THAT ARE LOOSE OR WORN, AS REQUIRED. TEST GROUND RESISTANCE. THE SYSTEM SHALL NOT EXCEED 25 OHMS.
5. PROVIDE AND INSTALL CONDUIT AND WIRE FROM TRAY TO TERMINAL BOXES. CONTROL PANELS, MOTORS, AND INSTRUMENTATION. TERMINAL BOXES PROVIDED AND INSTALLED BY SKID MANUFACTURER. REFER TO VENDOR DRAWINGS FOR TERMINATION REQUIREMENTS.
6. MOTORS, INSTRUMENTS AND THE LIKE THAT ARE NOT PRE-CONNECTED TO A TERMINAL BOXES SHALL BE CONNECTED BY ELECTRICAL CONTRACTOR. COORDINATE WITH VENDOR FOR THE EXACT NUMBER OF DEVICES TO BE FIELD CONNECTED.

ELECTRICAL LEGEND

	P - POWER	CIRCUIT BREAKER
	C - CONTROL	CONTACTOR
	S - SIGNAL	OVERLOAD
		MOTOR
		[N] NEW
		[E] EXISTING
		[R] REPLACE OR RELOCATE
NUMBERED NOTE		
CONDUIT TAG		
INSTRUMENT TAG		
NEW CONDUIT		
CONDUIT BY OTHERS (OR CONDUIT EXISTING)		
GROUND CABLE		
GROUND ELECTRODE		
CONNECTION		
CONDUIT SEAL		
BOX		
NEW PANEL		

PRIMARY U/G GROUND CABLE, #4/0 STRANDED BARE COPPER

BRANCH GROUND CABLE TAP, #2/0 STRANDED BARE COPPER

GROUND CONNECTION OR BOND

GROUND ROD

CLIENT

WESTERN PLACER WASTE MANAGEMENT AUTHORITY

PROJECT

WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

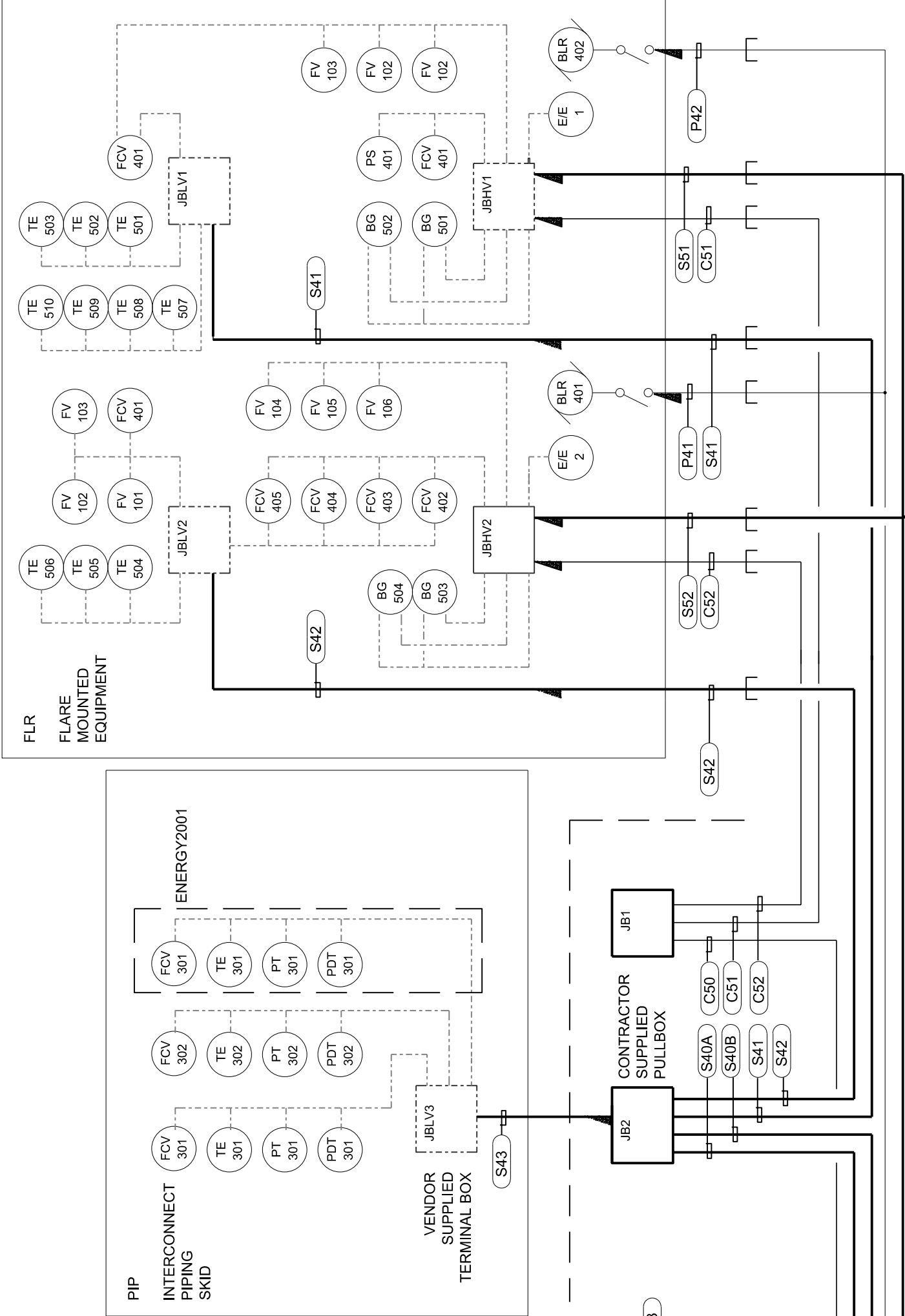
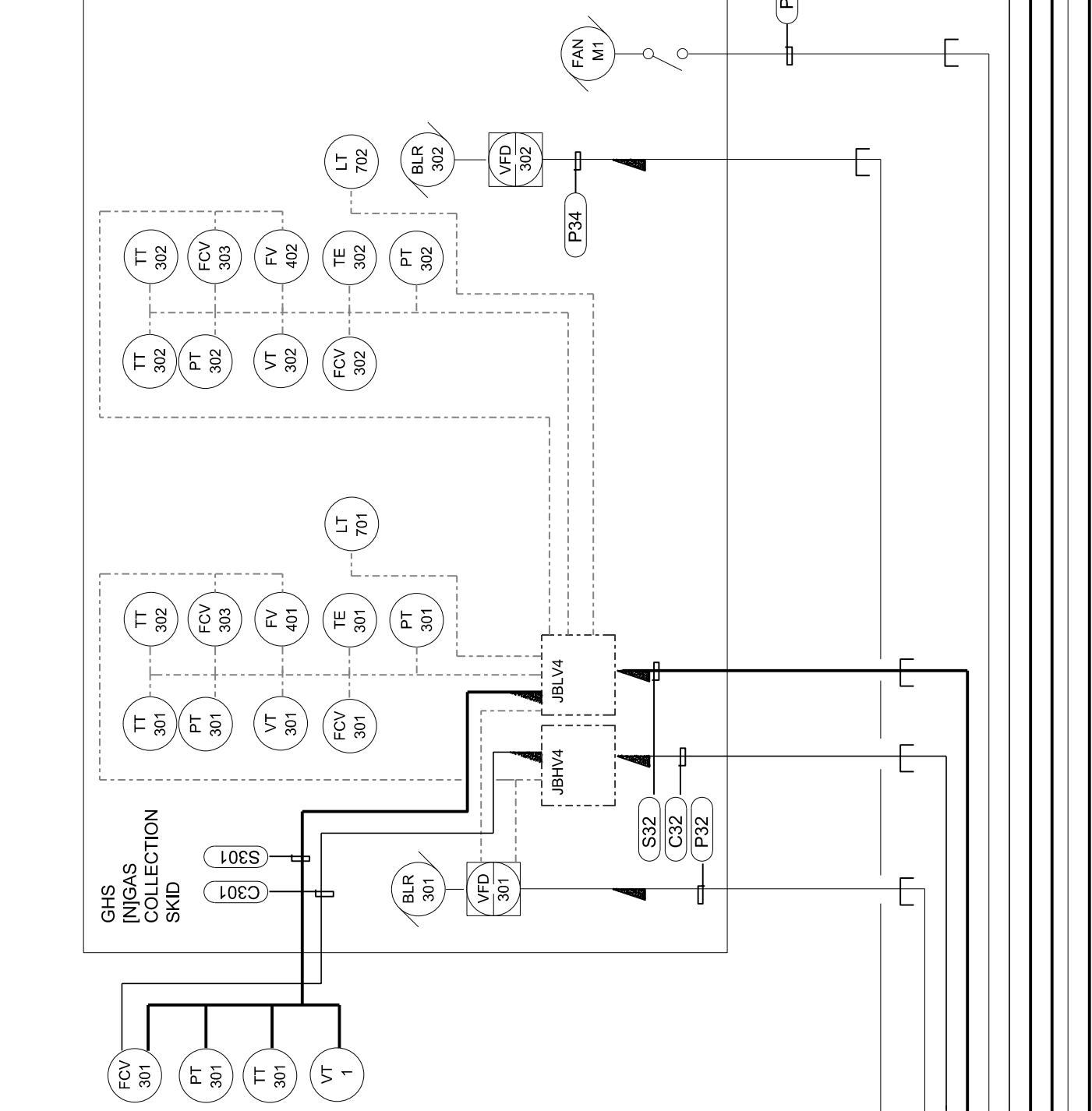
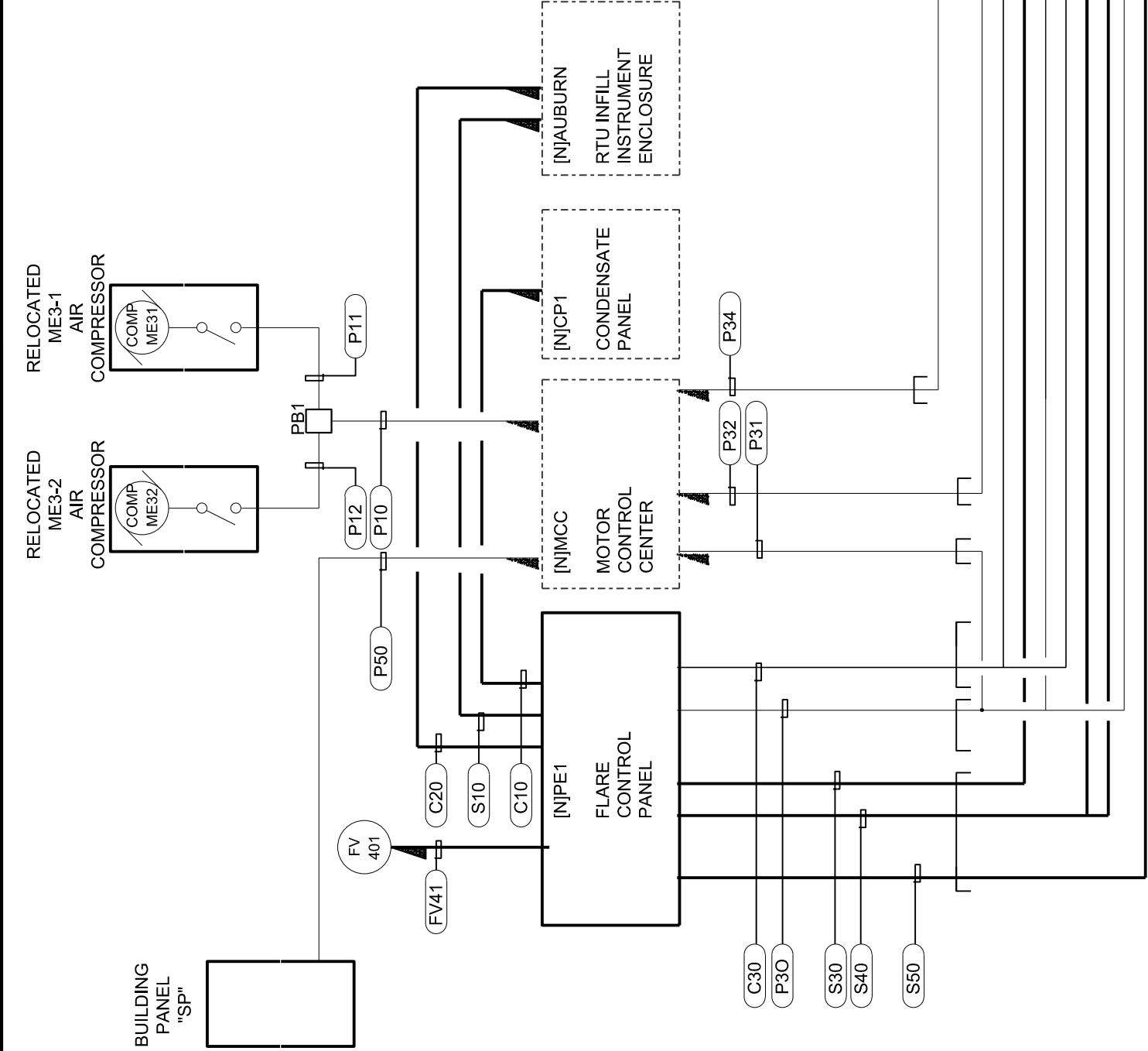
CONSULTANT

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TITLE BLOWER FLARE MODIFICATIONS ELECTRICAL SITE PLAN

PROJECT No. 1420152 Rev. 1 29 of 58 DRAWING E3A



CONDUIT BLOCK DIAGRAM

LINE	TAG	SIZE	TYPE	GRND	FILL	MAT	INSUL	FROM	TO
1	P10	1 1/4"	RMC	1#6g	6#3	CU	THWN	INJMCC	Compressors JB
2	P11	1"	RMC	1#6g	3#3	CU	THWN	Compressors JB	Compressor ME3-1
3	P12	1"	RMC	1#6g	3#3	CU	THWN	Compressors JB	Compressor ME3-2
4	P30	2"	RMC	2#12G, 1#8G	2C#10, 2C#12, 3C#8	CU	THWN/TC	PE1 Flare Control	M1 Fan/MCC/BLR 401,2
5	P31	1"	RMC	1#8g	3C#8	CU	THWN/TC	PE1 Flare Control	INJMCC
6	P32	2"	RMC	1#3G	3#4/0	CU	THWN	VFD-301	INJMCC
7	P33	3/4"	RMC	1#12g	2C#12	CU	THWN/TC	PE1 Flare Control	M1 Fan
8	P40	1 1/2"	RMC	1#10g	2-2C#10	CU	THWN/TC	BLR 401/402	PE1 Flare Control
9	P41	3/4"	RMC	1#10g	2C#10	CU	THWN/TC	PE1	BLR 401
10	P42	3/4"	RMC	1#10g	2C#10	CU	THWN/TC	PE1	BLR 402
11	P50	1"	RMC	1#8G	3#8	C U	THWN	INJMCC	PANEL SP
12	P32	2"	RMC	1#3G	3#4/0	CU	THWN	VFD-302	INJMCC
13	C10	1"	RMC	1#14g	8C#14	CU	THWN/TC	PE1 Flare Control	[E]Condensate Panel
14	C20	1"	RMC	1 #14g	2-8C#14 (8rd,8wt)	CU	THWN/TC	PE1 Flare Control	INRTU
15	P51	1"	RMC	1 #8g					
16	C30	2"	MC	1#14g	17-2C#14 (16rd,1bl,11wt)	CU	THWN/TC	PE1 Flare Control	INIVFD-1/GHS1/PIP JB1
17	C31	1 1/2"	RMC	1#14g	6-2C#14 (6rd,6wt)	CU	THWN/TC	PE1	INIVFD-1
18	C32	1 1/2"	RMC	1#14g	4-2C#14 (3rd,1bl,4wt)	CU	THWN/TC	RE1	HS1 JBHV4
19	C301	1"	RMC	1#14g	2C#14 (1bl,1wt)	CU	THWN/TC	FCV-301	GHS1 JBHV4
20	C50	2"	RMC	1#16g	7-2C#16 (11rd,2wt)	CU	THHN/TC	PE1 Flare Control	PIP JB1
21	C51	1 1/2"	RMC	5#16g	4-2C#16 (6rd,2wt)	CU	THHN/TC	FLR JBHV1	PIP JB1
22	C52	1 1/2"	RMC	5#16g	3-2C#16 (5rd,1wt)	CU	THHN/TC	FLR JBHV2	PIP JB1
23	C60	1"	RMC	1#14g	8C#14	CU	THWN/TC	PE1	INFLARE CTRL
24	S10	1"	RMC	-	Empty	-	-	PE1 Flare Control	INBLDG
25	S20	3/4"	RMC	-	1-CAT 5 Cable	-	-	PE1 Flare Control	INRTU
26	S30	1 1/2"	RMC	1#16g	8-2C#16TSP	-	Belden 8760	PE1 Flare Control	INIVFD-1/GHS1 JBLV4
27	S31	3/4"	RMC	1#16g	2-2C#16TSP	-	Belden 8760	PE1	INIVFD-1
28	S32	2"	RMC	1#16g	17-2C#16TSP	-	Belden 8760	PE1	GHS1 JBLV4
29	S301	1 1/4"	RMC	1#16g	4-2C#16TSP	-	Belden 8760	FCV-301	GHS1 JBLV4
30	S40A	1 1/2"	RMC	1#16g	17-2C#16TSP	-	Belden 8760	PE1 Flare Control	PIP JB2
31	S40B	1 1/2"	RMC	13#16g	10-2C#18(Type K),3-2C#18	-	(Type E)	PE1 Flare Control	PIP JB2
32	S41	1 1/2"	RMC	7#16g	7-2C#18(Type K),4-2C#16TSP	-	Belden 8760	FLR JBLV1	PIP JB2
33	S42	1 1/2"	RMC	3#16g	3-2C#18(Type K),4-2C#16TSP	-	Belden 8760	FLR JBLV2	PIP JB2

No	TAG	SIZE	TYPE	GRND	FILL	MAT	INSUL	FROM	TO
34	S43	2"	RMC	3#16g	3-2C#18(Type E), 9-2C#16TSP	-	Belden 8760	PIP JBLV3	PIP JB2
35	S50	1 1/4"	RMC	1#16g	4-2C#16TSP	-	Belden 8760	PE1 Flare Control	FLR JBHV1,2
36	S51	3/4"	RMC	1#16g	2-2C#16TSP	-	Belden 8760	PE1	FLR JBHV1
37	S52	3/4"	RMC	1#16g	2-2C#16TSP	-	Belden 8760	PE1	FLR JBHV2
38									
39	VT1	3/4"	RMCLFMC	1#14g	1-2C#16TSP	CU	Belden 8760	S301	VT1
40	TT301	3/4"	RMCLFMC	1#16g	1-2C#18(Type E)	-	Omega	S301	TE1
41	PT301	3/4"	RMCLFMC	1#14g	1-2C#16TSP	CU	Belden 8760	S301	VT2
42	P60	1"	RMC	1#10g	1-2C#10	CU	THWN/TC	"LP" LIGHTING PANEL	LGHT 1, 2
43	P61	1"	RMC	1#10g	1-2C#10	CU	THWN/TC	"LP" LIGHTING PANEL	LGHT 2,3
44	FCV301	3/4"	RMCLFMC	1#16g	2C#14	-	THWN	C201	TE302
45	FV41	3/4"	RMCLFMC	1#14g	2-2C#16TSP	CU	Belden 8760	PE1 Flare Control	FCV303
46	S40	2"	RMC	14#16g	17-2C#16TSP,3-2C#18(TYPE E) 10-2C#18(Type K)	-	Belden 8760	PE1 Flare Control	PIP JB2

CONSTRUCTION NOTES

- 1 WHEN CABLE TRAY IS USED AS A SUBSTITUTE TO CONDUIT REPLACE SINGLE CONDUCTORS FOR MULTI CONDUCTOR CABLE USE UL LISTED TC CABLE. EXAMPLE: 14#14THWN SINGLE CONDUCTORS IS EQUAL TO 7-2C#14THHN TC CABLES.
- 2 CABLE TYPES AS FOLLOWS:
2C#14 TC 2-Wire THHN in PVC Tray Cable, Include B.C.GROUND
2C#16TSP 2 Insulated Twisted Shield Pair, Belden 8760
2C#18(type E) E-Type Thermocouple Wire Omega
2C#18(type K) K-Type Thermocouple Wire Omega XC-k-20
- 3 BUILDING LIGHTING AND RECEPTACLES NOT INCLUDED IN SCHEDULE. CONDUIT AND CIRCUITY NOT SHOWN HERE SHALL BE SIZED USING 20160 NATIONAL ELECTRICAL CODE.

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CLIENT
WESTERN PLACER WASTE MANAGEMENT AUTHORITY

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

CONSULTANT
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USA
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TITLE
BLOWER FLARE MODIFICATIONS
ELECTRICAL CONDUIT BLOCK DIAGRAM

REMOTE TELEMETRY UNIT - I/O SCHEDULE

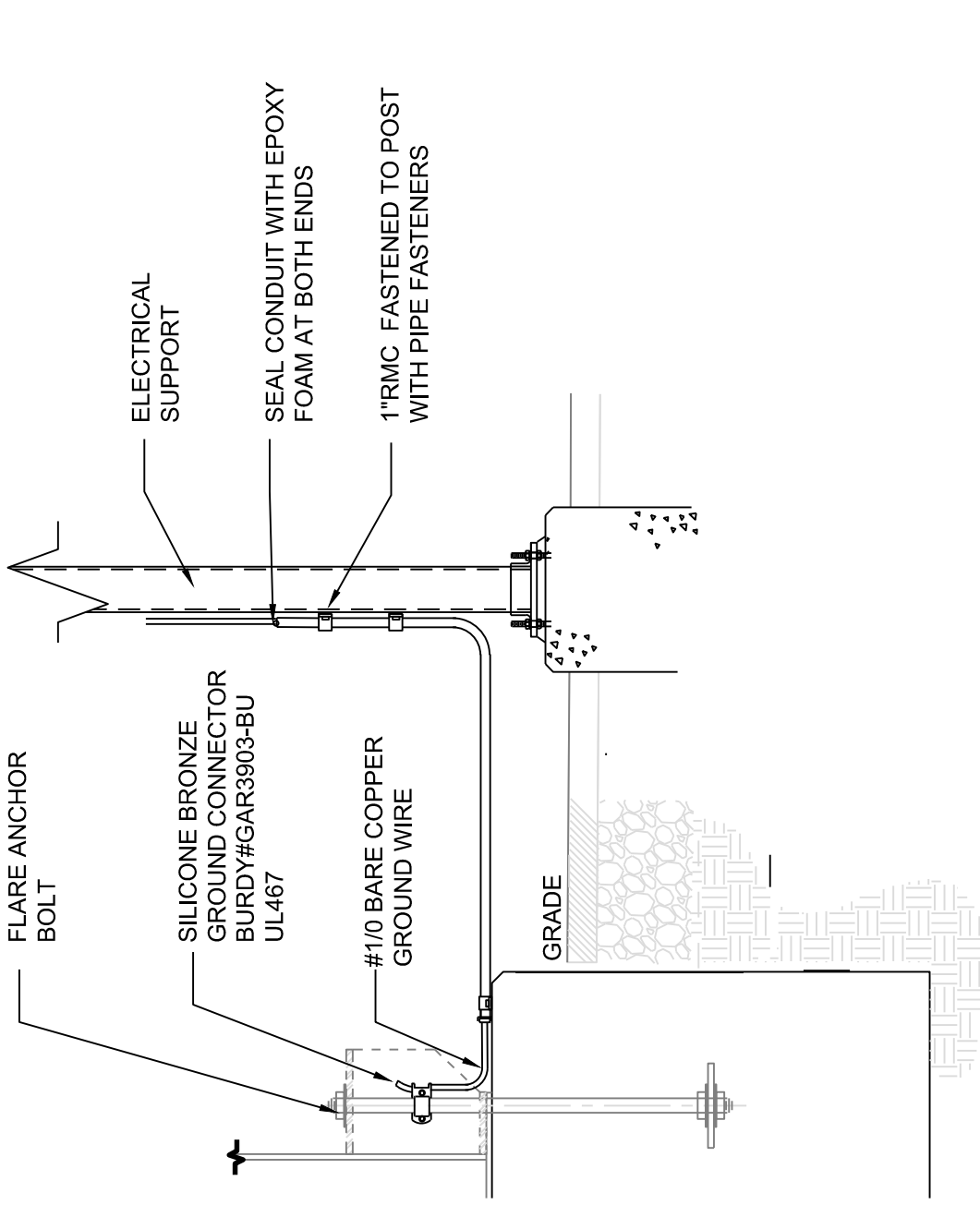
TAG NAME	TYPE DESCRIPTION	CONNECTION	MISC.
EXISTING FLARE SIGNALS TO AUBURN PLC VIA HARD WIRE INPUTS			
LLF11	DA PLC STATUS	RTU DI 3	[No Change]
LLF12	DA FLARE FLAME OUT	RTU DI 4	NOTE 1
LLF13	DA DEMISTER PUMP FAILURE	RTU DI 5	[No Change]
LLF14	DA FAILURE TO RE-START	RTU DI 6	NOTE 1
LLF15	DA PERIMETER BLOWER 1 FAILURE	RTU DI 7	NOTE 2
LLF21	DA GENERAL FLAME FAILURE	RTU DI 8	NOTE 1
LLF22	DA INFILL BLOWER 3 FAILURE	RTU DI 9	NOTE 3
LLF23	DA PERMETER BLOWER 2 FAILURE	RTU DI 10	NOTE 2
LLF24	DA FLARE TEMPERATURE HIGH	RTU DI 11	NOTE 1
LLF25	DA CONDENSATE TANK 66% FULL	RTU DI 12	[No Change]
LLF26	DA FLARE TEMPERATURE LOW	RTU DI 13	NOTE 1
LLF27	DA CONDENSATE TANK 100% FULL	RTU DI 14	[No Change]
LLF28	DA INFILL DEMISTER TANK LEVEL	RTU DI 15	[No Change]
LLFANALF	DA ANALYZER FAULT	RTU DI 2	[No Change]
LLFANALCL	DA ANALYZER CALIBRATING	RTU DI 1	[No Change]
LLFCH4	AI GAS ANALYZER METHANE	RTU AI 1	[No Change]
LLFO2	AI GAS ANALYZER OXYGEN	RTU AI 2	[No Change]
LLFFLOW3	AI GAS ANALYZER FLOW	RTU AI 3	[No Change]
LLFTVFD	AI VFD SPEED	RTU AI 4	NOTE 3
LLF2001FLOW1	AI ENERGY2001 FLOW	YOKOGAWA 1	[T.B.D.]
LLF2001TEMP	AI ENERGY2001 TEMP	YOKOGAWA 2	[T.B.D.]
LLFWMFLOW 1	AI WPSL INFILL FLOW	YOKOGAWA 3	[T.B.D.]
LLF2001FLOWTOTAL	AI ENERGY2001 FLOW TOTAL	YOKOGAWA 5	[T.B.D.]
LLFVMTMP	AI WPMW FLARE TEMP	YOKOGAWA 6	NOTE 1

NEW DUAL FLARE SIGNALS TO AUBURN PLC VIA LAN DATA LINK WITH [N]FLARE CONTROL PANEL.

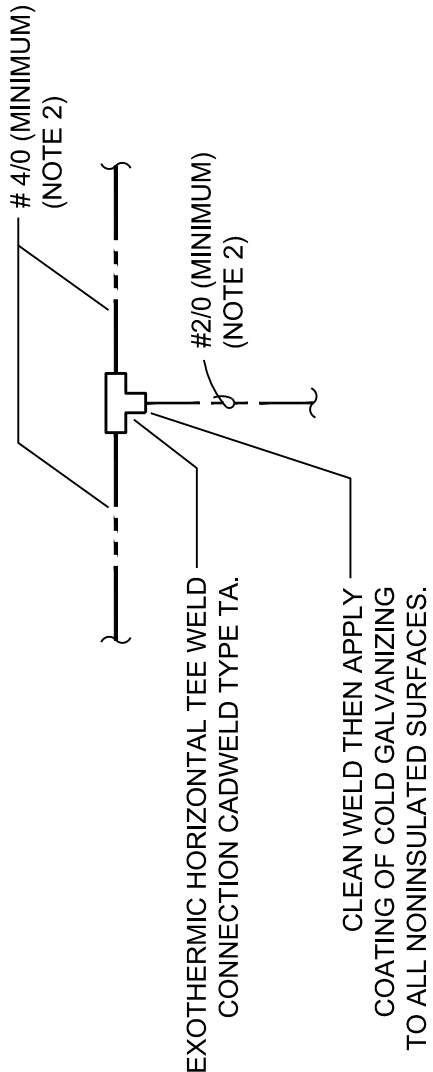
LLF--	DA FAILURE TO RE-START
LLF--	DA GENERAL FLAME FAILURE
LLF--	DA ZONE A FLARE FLAME OUT
LLF--	DA ZONE B FLARE FLAME OUT
LLF--	DA ZONE A FLARE TEMPERATURE HIGH
LLF--	DA ZONE B FLARE TEMPERATURE HIGH
LLF--	DA ZONE A FLARE TEMPERATURE LOW
LLF--	DA ZONE B FLARE TEMPERATURE LOW
LLF--	DA BLOWER 1 FAILURE
LLF--	DA BLOWER 2 FAILURE
LLF--	DA COMPRESSOR STARTS 1 - 2
LLF--	AI VFD 1 SPEED
LLF--	AI VFD 2 SPEED
AI CONDENSATE/LEACHATE METER GPM	
AI CONDENSATE/LEACHATE METER TOTAL GALLONS	
AI ZONE A FLOW FPM	
AI ZONE B FLOW FPM	
AI ZONE A TEMPERATURE	
AI ZONE B TEMPERATURE	
AI PRIMARY BLOWER BEARING TEMPERATURE	
AI LFG TEMPERATURE	
AI COMPRESSOR AIR PRESSURE	
AI REMOTE LEACHATE FLOW METER TOTALS	

1. SIGNALS TO REMAIN AS LONG AS EXISTING FLARE CONTINUES TO REMAIN IN SERVICE.
2. BLOWER SHALL BE DECOMMISSIONED AND STATUS SIGNAL SHALL BE ABANDON.
3. BLOWER TO REMAIN IN SERVICE. STATUS SIGNAL TO BE TRANSFERRED OVER TO NEW FLARE CONTROL PANEL.
4. THIS SCHEDULE IS PRELIMINARY AND IS INTENDED TO BE USED AS A REFERENCE ONLY.

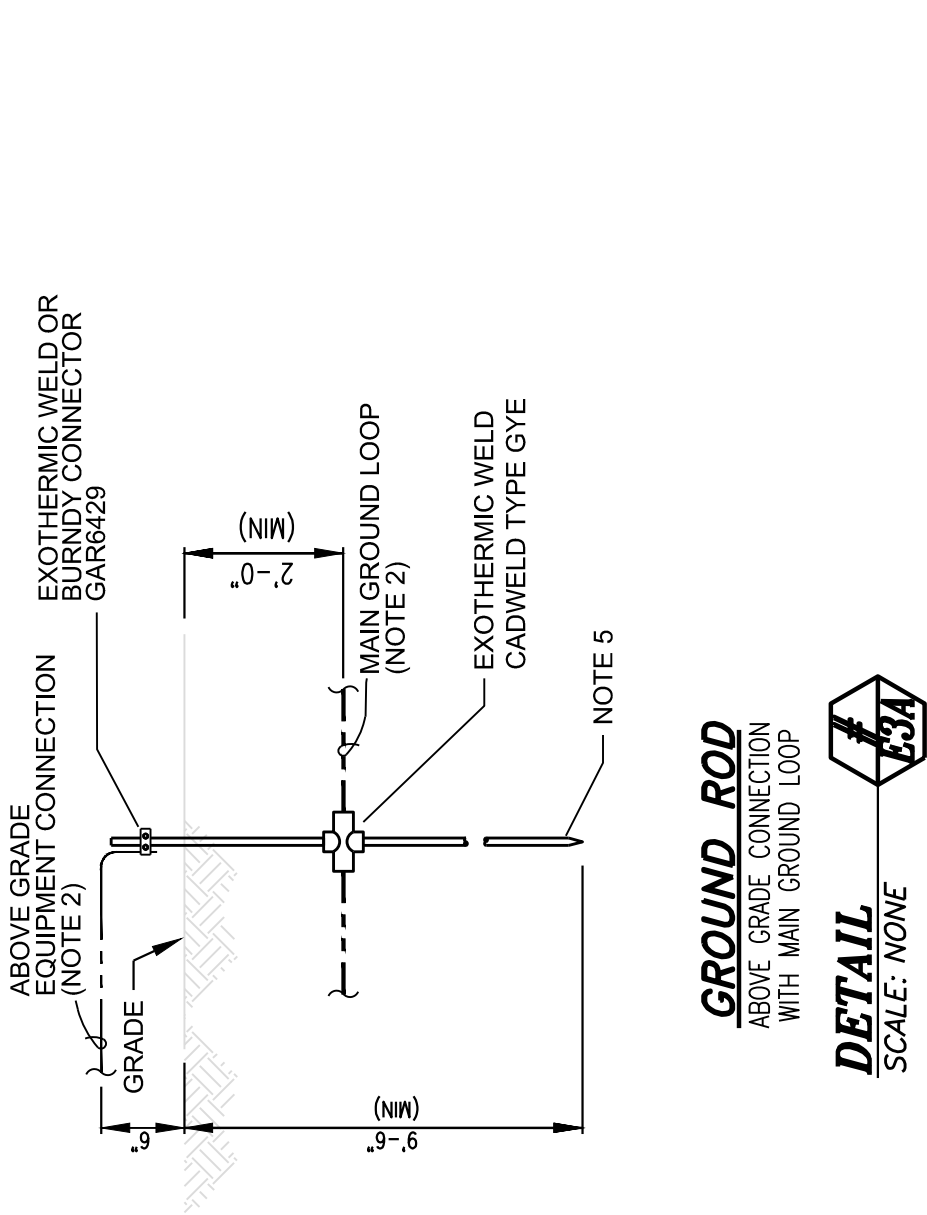
THE PROJECT WAS ORIGINALLY DESIGNED AND BID AS A REPLACEMENT OF THE BLOWER/FLARE STATION THAT INCLUDED REUSING SEVERAL COMPONENTS OF THE EXISTING FACILITIES AND 240 VAC MAIN POWER SUPPLY. THE CURRENT PROJECT, BIDDING PROCESS AND BID FORM IS BASED ON UPGRADING THE FACILITY TO USE 480 VAC POWER, REUSING VERY FEW AND SELECTED FACILITIES, AND USING A REVISED LAYOUT SHOWN ON SHEET 7A. ANY REFERENCES TO NEW 240 VAC EQUIPMENT IN THE PLANS OR SPECIFICATIONS ARE INTENDED TO BE 480 VAC.



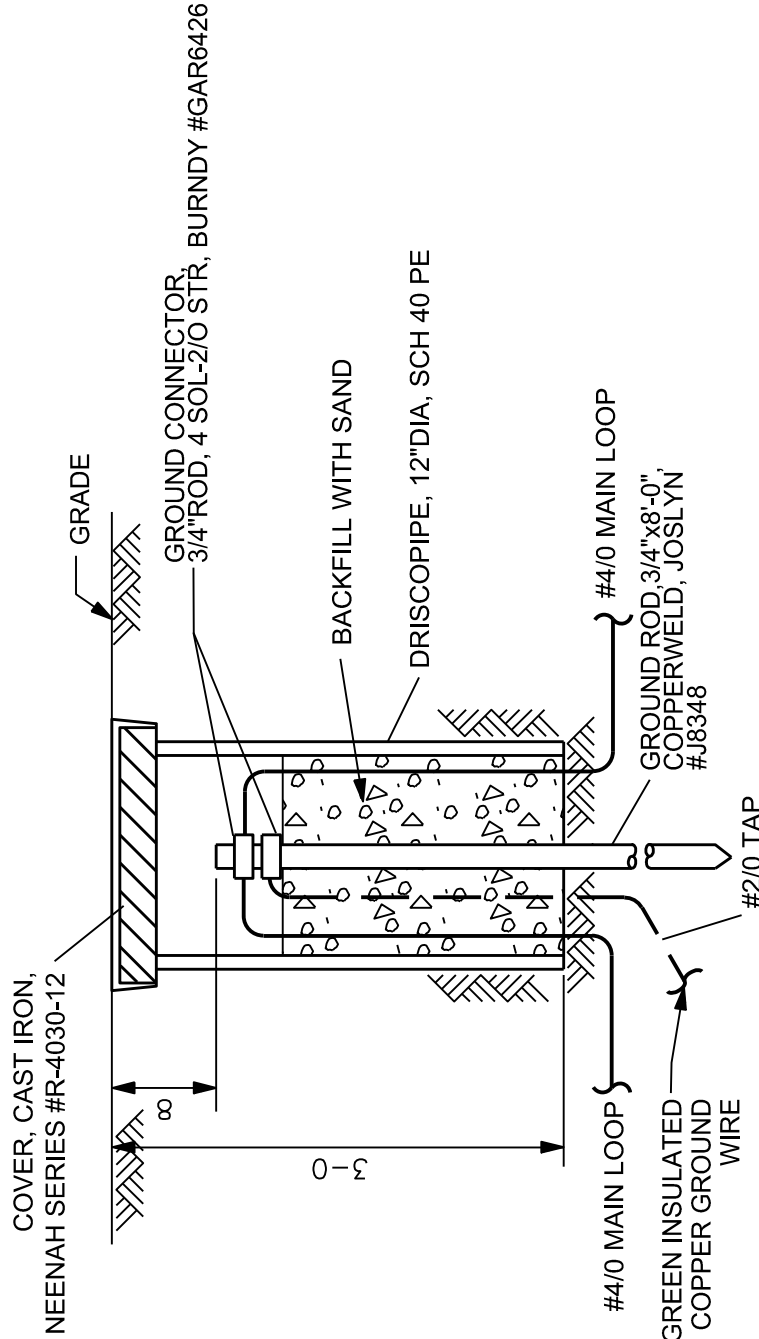
FLARE GROUNDING
DETAIL
SCALE: NONE



UNDERGROUND IAP
DETAIL
SCALE: NONE



GROUND ROD
DETAIL
SCALE: NONE



GROUND TEST WELL
DETAIL
SCALE: NONE

NOTES

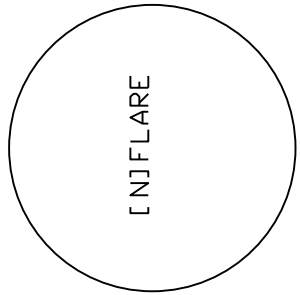
1. CABLE TERMINALS TO BE EQUAL TO BURNDY "EA."
2. ALL GROUND WIRE TO BE STRANDED COPPER WITH GREEN 600V XHHW OR THW INSULATION.
3. MOTOR CONTROL CENTERS AND SWITCH GEAR SHALL HAVE A MINIMUM OF TWO "MAIN GROUND LOOP" SIZED GROUND CONNECTIONS FROM THE EQUIPMENT GROUND BUS DIRECTLY TO THE MAIN GROUND LOOP.
4. SERVIT POST SHALL BE EQUAL TO BURNDY "KC"
5. GROUND ROD TO BE 3/4" x 10' GALVANIZED STEEL. FOR EFFECTIVE USE OF GROUND ROD, RODS SHALL BE SPACED A MINIMUM OF 20' APART. REMOVE ROD GALVANIZING TO BARE STEEL BEFORE MAKING EXOTHERMIC (ADWELDED) CONNECTION. THAN APPLY COATING OF COLD GALVANIZING TO ALL BARE METAL NON-GALVANIZED SURFACES.
6. SECURE PVC CONDUIT TO CONCRETE AT TWO LOCATIONS WITH CONDUIT CLAMPS.
7. MAIN GROUND LOOP TO BE DESIGNED ACCORDING TO FACILITY REQUIREMENTS BUT NOT SMALLER THAN #1/0.

PROJECT	WESTERN REGIONAL SANITARY LANDFILL 2016 GCCS EXPANSION
TITLE	BLOWER FLARE MODIFICATIONS ELECTRICAL DETAILS
PROJECT No.	1420152
Rev.	33 of 58
	1
DRAWING	E5A

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RELOCATED (E) LIGHTING STANDARD INSIDE FENCE NEAR (N) FLARE. CONNECT TO EXISTING LIGHTING CIRCUITRY. PROVIDE AND INSTALL NEW 12" DIA x 48" DEEP CONCRETE FOUNDATION.



FIXTURE TYPE C
TYPICAL OF 2
PROVIDES REMOTE
PHOTOCELL

DUPLEX GFCI RECEPTACLE
ON COLUMN @+36" AFF
NEMA 5-20R STAINLESS
STEEL COVERPLATES

SINGLE POLE AND 3-WAY LIGHT
SWITCHES, 40A, 120V, STAINLESS
STEEL COVERPLATES

DUPLEX RECEPTACLES
IN STORAGE @+36" AFF
NEMA 5-20R STAINLESS
STEEL COVERPLATES

METHANE SENSOR
VERIFY LOCATION OF
CONTROLLER

TYPE B FIXTURE
TYPICAL OF 2

NEW PANEL SP
120/240V, 300.4W
40A MAIN BREAKER

EQUIPMENT GROUND ROD
1/2" X 12' COPPER CLAD
IRON CORE

DUPLEX RECEPTACLES
IN OFFICE @+18" AFF
NEMA 5-15R (WORK)

TYPE A FIXTURE
80WATTS EACH
TYPICAL OF 4

WALL MOUNTED HEAT PUMP
5000W, 240V, 1.0 SELF
CONTAINED.
PROVIDE CORD AND
MATCHING NEMA 6-30R
RECEPTACLE AND PLUG.

(N) LIGHTING STANDARDS
TYPICAL #

PROVIDE AND INSTALL NEW PHOTO
CELL AND CONNECT TO (E) FLOOD
LIGHTING CIRCUITRY

NEW
LIGHTING PANEL "SP"
240/120VAC, 3PHASE, 4WIRE
40AMP MCB

METHANE DETECTOR	1	20	A	B	C	N	30	2	5000W	HEAT PUMP
SPACE	3	20					30	4	5000W	HEAT PUMP
REC - STORAGE	360W	5					20	6	1660W	LIGHTS
SPACE	7	20					20	8	SPACE	
SPACE	9	20					20	10	SPACE	
REC - CANOPY	400W	11					20	12	900W	REC OFFICE
FROM MCC PNL LP	13	40					20	14	SPACE	
FROM MCC PNL LP	15	40					20	16	SPACE	
FROM MCC PNL LP	17	40					20	18	SPACE	
FROM MCC PNL LP										

CONNECTED LOAD
PHASE A 5000W
PHASE B 5000W
PHASE C 2450W
TOTAL 12450W
AMPS = 30.0

PANEL SCHEDULE

STORAGE BUILDING / CANOPY

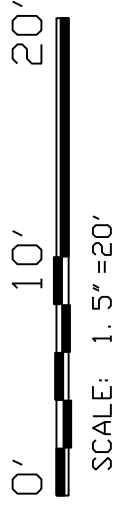
ELECTRICAL FLOOR PLAN

LIGHTING FIXTURE SCHEDULE

TYPE	WATTAGE	DESCRIPTION
FIXTURE TYPE A	3-32W/78 CW LAMPS	2X4 RECESSED T-BAR FIXTURE PRISMATIC LENS, 2-BALLAST
FIXTURE TYPE B	4-T8HO 57WATT LAMPS	2X4 LOWBAY FLUORESCENT PENDENT SECULAR REFLECTOR, MOTION SENSOR
FIXTURE TYPE C	1-ARRAY 60WATT LED 5000K	LED FLOOD IN WALL PACK @+12'-0"
FIXTURE TYPE D	2-T8HO 57WATT LAMPS	2X4 ENCLOSED FLUORESCENT PENDENT UL WET LOCATIONS, REMOTE MOTION SENSOR

CONSTRUCTION NOTE

- CIRCUITRY SHALL BE IN CONDUIT AT ALL TIMES. CONDUIT CONCEALED IN WALLS OR CEILINGS SHALL BE EMT, RMC, OR IMC. CONDUIT IN EXPOSED AREAS IN STORAGE OR UNDER CANOPY SHALL BE GALVANIZED RIGID METAL CONDUIT "RMC".
- PROVIDE AND INSTALL APPROVED AUTOMATIC FIRE ALARM SYSTEM, IF REQUIRED BY CODE.
- LIGHTING FIXTURE INSTALLATION SHALL MEET REQUIREMENTS IN CALIFORNIA TITLE 24 ENERGY COMPLIANCE REGULATIONS.



CLIENT
WESTERN PLACER WASTE MANAGEMENT AUTHORITY

PROJECT
WESTERN REGIONAL SANITARY LANDFILL
2016 GCCS EXPANSION

CONSULTANT

Golder Associates Inc.
425 Lakeside Drive
Sunnyvale, California 94085
USA
408-220-9223
www.golder.com



TITLE
BLOWER FLARE MODIFICATIONS
ELECTRICAL FLOOR PLAN -
STORAGE BUILDING

PROJECT No.
1420152
Rev. 1
35 of 48
DRAWING
E6A

A 2016-08-11 ISSUED FOR BID
Rev. YYYY-MM-DD DESCRIPTION

PREPARED DESIGN REVIEW APPROVED

SMA JR APW JR

APPENDIX B
ALTERNATIVES TO LANDFILL NEW SOURCE
PERFORMANCE STANDARDS (NSPS) REQUIREMENTS

1 ALTERNATIVE TO LANDFILL NSPS REQUIREMENTS

§60.752(b)(2)(i)(B) The collection and control system design plan shall include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, record keeping or reporting provisions of §60.753 through §60.758 proposed by the owner or operator.

Pursuant to Code of Federal Regulations (CFR) Title 40 Part 60 (known as New Source Performance Standards [NSPS]) Section (§)60.752(b)(2)(i)(B), a landfill gas collection and control system (GCCS) design plan may include proposed alternative procedures to the operational standards, test methods, procedures, compliance measures, monitoring, record keeping and reporting provisions of §60.753 through §60.758 in the NSPS. This section of the landfill GCCS design plan report identifies proposed exemptions/alternatives to the NSPS.

1.1 Temporary Partial GCCS Shutdowns

From time to time during normal operation and maintenance of the GCCS, control valves in the collection system must be closed in order to isolate a portion of the system for troubleshooting, maintenance, or addition of new wells. During such periods, wells in the temporary closure area may exhibit positive pressure for the static reading on the wellhead and gas collection header. The WPWMA requests this flexibility and notes that these temporary events will be documented as Startup, Shutdown and Malfunction (SSM) events as defined in the site's SSM Plan with proper documentation.

Exclusion of Leachate System from Operating Parameters

§60.753(c) Operational Standards: "Operate each interior wellhead in the collection system with a LFG temperature less than 55 degrees Celsius and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens."

The GCCS may include future connections to leachate manholes and cleanout risers to extract LFG from the leachate collection system for interim odor and surface emissions control. Industry experience at other NSPS sites shows that leachate collection manholes and cleanout risers sometimes contain concentrations of nitrogen and oxygen similar to that of ambient air, above the NSPS thresholds. This is due to the fact that the leachate collection system is not an air-tight vacuum system, and was not designed as such. However, it does

provide a valuable collection point for LFG, since LFG production tends to be heaviest in areas of moist refuse (such as that found directly above the leachate drainage layer).

Unlike the vertical gas extraction wells, the leachate manhole draws from the leachate collection system beneath the refuse. Therefore, concentrations of air within these extraction points will not cause subsurface oxidation within the refuse, as could potentially happen in a classic vertical extraction well within refuse. Therefore, WPWMA requests that the pressure and nitrogen/oxygen exceedance limits not apply to leachate cleanout risers and leachate manhole extraction points.

Determination of Oxygen Levels at Monitoring Points

§60.753(c)(2) Operational Standards: "Unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A or 3C ... "

When applicable, WPWMA proposes to use a portable on-site multi-gas analyzer, in lieu of a laboratory method, for determining the oxygen content of the LFG at each vertical extraction well and monitoring point. The site will be using a portable meter, such as a Landtec GEM-2000 or equivalent, calibrated to the manufacturer's specifications, to determine the oxygen content of the LFG. This is acceptable to and has previously been approved by the USEPA.

Monitoring of Extraction Wells in Active Fill Areas

§60.755(a)(3) Compliance Provisions: "For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §60.752(b)(2)(ii)(A)(3), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly."

§60.755(a)(5) Compliance Provisions: "For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in § 60.753(c)."

§60.756(a) Monitoring of Operations: "Except as provided in §60.752(b)(2)(i)(B), Each owner or operator seeking to comply with §60.752(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in §60.755(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the LFG on a monthly basis as provided in §60.755(a)(5); and

(3) Monitor temperature of the LFG on a monthly basis as provided in §60.755(a)(5)."

Future vertical extraction wells may be placed in the active areas several years before the waste has reached final elevation grades. This is in compliance with the NSPS. However, since the vertical extraction wells are placed in active areas, they periodically need to be "raised" (i.e., the well casing extended 15 feet to 25 feet vertically) in order to not be buried under lifts of waste. In such cases, the well is temporarily disconnected until the surrounding lift of waste is brought high enough to reconnect the well to the collection system. The time period between when a vertical extraction well is disconnected and raised, and when the waste height is high enough to reconnect the lateral pipeline riser, may range from a few weeks to a few months. This can result in missed monthly readings at the vertical extraction well, since the well casing is too high for the technician to safely reach.

Since the NSPS allows for exclusion of surface monitoring in "dangerous areas" of the site, WPWMA believes it is reasonable to request exclusion to monitoring the vertical extraction wells raised in active areas. WPWMA proposes that readings will be missed at a particular vertical extraction well, for up to two (2) months, as long as the vertical extraction well cannot be safely accessed. If WPWMA cannot bring the waste height up to the new grade and re-attach the vertical extraction well within a two (2) month period, then modifications to the lateral pipeline riser and wellhead assembly (such as the vertical extraction well being cut back down and re-attached) will be made for monitoring. This request is in accordance with §60.752(b)(2)(i)(B), which allows the operator to propose alternatives to the monitoring procedures in the NSPS.

Start-Up of New or Replacement Wells

§60.755(a)(4) Compliance Provisions: "Owners or operators are not required to expand the system as required in paragraph (a)(3) of this section during the first 180 days after gas collection system startup."

Landfill GCCS are typically built in phases to accommodate for additional waste placement and occasionally require the installation of new or replacement vertical extraction wells due to settlement, damage, etc. Installation of one or a few new or replacement vertical extraction wells can cause challenges with balancing the entire system and therefore may require additional time to not only achieve negative pressure in all vertical extraction wells but to also maintain the operating standard for oxygen, nitrogen, and/or temperature.

Per 40 CFR §60.755(a)(4), the Landfill is not required to expand the system during the first 180 days after GCCS start-up where pressure exceedances were recorded at one or more vertical extraction wells. Given the wellfield balancing challenges, WPWMA proposes that the exemption from system expansion applies to any individual vertical extraction well or

series of vertical extraction wells associated with the new or replacement vertical extraction wells upon start-up.

2 ALTERNATIVE COMPLIANCE OPTIONS TO CALIFORNIA CODE OF REGULATIONS - PREVIOUSLY APPROVED

WPWMA previously submitted a proposal for alternative compliance options to CCR Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 6 (Title 17) to the PCAPCD. PCAPCD responded and approved various alternatives in an August 7, 2012 letter. The approved alternatives are presented below.

Methane Destruction Compliance Parameter - Flares

CCR §95464(b)(2)(A)(4) requires that an enclosed flare operated as a control device be operated within the parameter ranges established during the initial or most recent source test.

Approved alternative: PCAPCD believes that it is reasonable that there be a tolerance on the flare operating temperature. If the last source test were used as the minimum operating temperature, then the allowable flare temperature would continually ratchet up with subsequent flare tests. PCAPCD accepts the requested 50 degree Fahrenheit below source test request. However, flare temperature is not the only compliance parameter. The methane destruction efficiency of at least 99 percent by weight of 95464(B)(2)(A)(1) must be demonstrated by annual or triennial source test. PCAPCD plans to amend the flare permits to include the annual methane destruction test.

Source Test Methods

CCR §95464(b)(4) requires annual compliance testing of the control devices specifies the use of the test methods identified in CCR 95471(f), as follows: USEPA Methods 18, 25, 25A, or 25C.

Approved alternative: PCAPCD intends to add to the flare permits the 99 percent methane destruction requirement and use the test methods required in the permits. So the SEM should state that the test methods are called out in the permits. The Landfill Regulation requires flare testing annually until the destruction limit is achieved three (3) years consecutively, and then the testing frequency can be extended to three (3) years. The testing frequency in PCAPCD permits is biennially. Once the three (3) consecutive years of meeting the methane destruction requirement is achieved, PCAPCD intends to require the methane testing biennially with the other flare testing.

Wellhead Pressure Requirements

CCR §95469(c) requires corrective action if monthly wellhead pressure monitoring results in a positive pressure reading except as exempted in CCR 95464(d) (well raising) and CCR 95464(e) (temporary shutdown in order to repair the components, due to catastrophic events such as earthquakes, to connect new LFG collection system components to the existing system, to extinguish landfill fires, or to perform construction activities.)

Approved alternative: PCAPCD approved the WPWMA request to allow temporary exemption from well head pressure requirements due to potential subsurface oxidation, well damage, poor LFG quality, or other reasons as documented by the WPWMA not listed in §95469. The event is to be described to the PCAPCD in writing and PCAPCD must concur.

Wellhead Pressure Exceedance Corrective Action

CCR §95469(c)(2) requires further corrective actions be initiated, including, but not limited to, any necessary expansion of the GCCS, to correct any positive pressure readings if positive pressure readings cannot be corrected within 15 days after the initial positive pressure reading. CCR 95469(c)(3) requires corrective action, including any necessary expansion of the GCCS, to correct any positive pressure readings within 120 days of the initial positive pressure reading.

Approved alternative: PCAPCD will consider requests for alternative engineering solutions to be evaluated and allow an alternative timeline to consider and implement alternative solutions. This will require concurrence by PCAPCD for the engineering study and implementation.

Wellhead Negative Pressure Requirements

CCR §95464(c) requires that wellheads be operated under negative pressure except as noted in CCR 95464(c)(d) or (e).

Approved alternative: PCAPCD concurred with WPWMA's interpretation is that this applies to wells within the limit of the waste and not to perimeter wells or soil vapor extraction wells which are not in refuse and are not extracting LFG, consistent with the NSPS.

Continuous Routing of LFG/Operations of GCCS

CCR §95464(b)(1)(A) requires that the owner or operator of a GCCCS "Route the collected gas to a gas control device or devices, and operate the gas collection and control system continuously except as provided in CCR 95464(d) and (e)".

Approved alternative: PCAPCD will accept WPWMA's interpretation, consistent with the NSPS, that GCCS downtime of less than five (5) days and/or control device downtime of less than one (1) hour not be considered reportable deviations, and therefore only subject to the SSM reporting requirements.

Surface Emissions Monitoring Requirements

The sections below present the alternatives approved by PCPAPCD in their August 7, 2012 letter for surface emissions monitoring requirements.

Areas Excluded from Collection and SEM

CCR §95464(a)(1)(F)(1) allows any areas of the landfill that contain only asbestos-containing waste, inert waste, or non-decomposable solid waste may be excluded from collection.

Approved alternative: Any areas of the landfill that contain only asbestos-containing waste, inert waste or non-decomposable solid waste may be excluded from collection and SEM.

Areas Excluded from SEM Where Safety Issues Exist

CCR §95471(c)(1) requires that the entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated SEM.

Approved alternative: PCAPCD accepts and allows the exclusion of areas of greater than 25 percent slope.

Re-monitoring After Instantaneous and Integrated Exceedances

CCR §95469(a)(1)(B) and (a)(2)(B) require correct action be taken by the owner or operator require corrective action be taken by the owner or operator such as, but not limited to, cover maintenance or repair, or well vacuum adjustments and location re-monitored within ten calendar days of a measured exceedance of the instantaneous and/or integrated surface emission standards.

Approved alternative: PCAPCD will allow additional time for re-monitoring in cases where the area is dangerous or cannot be safely reached.

SEM Remediation after Third Instantaneous and/or Third Integrated SEM Exceedance

CCR §95469(a)(1)(B)(2) and (a)(2)(B)(2) require the installation of a new or replacement well within 120 calendar days of detecting a third exceedance of the Instantaneous SEM limit of CCR 95465(a)(1) and/or the Integrated SEM limit of CCR 95465(a)(2).

Approved alternative: PCAPCD will allow other modifications than just additional wells, as appropriate, to correct exceedances. A corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.

SEM Monitoring Height

CCR §95471(c)(1)(A) requires that SEM be conducted by holding the probe within three (3) inches of the landfill surface while traversing the grid.

Approved alternative: If an area clear of surface vegetation cannot be found in the walking path, PCAPCD will allow the top of the vegetation to be considered the landfill surface and the probe be held within three inches vertical of the vegetation surface.

Wind Speed

CCR §95471(c)(1)(C) requires that SEM must be terminated when the average wind speed exceeds five miles per hour or the instantaneous wind speed exceeds 10 miles per hour.

Approved alternative: PCAPCD will accept the alternative wind speeds of 10 miles per hour for average wind and 20 miles per hour for instantaneous wind speed.

Measurable Precipitation

CCR §95471(c)(1)(D) requires that SEM must be conducted only when there has been no measurable precipitation in the preceding 72 hours.

Approved alternative: PCAPCD will allow SEM to be conducted only when there has been no measurable precipitation in the preceding 24 hours. WPWMA shall minimize the times when SEM is conducted with precipitation in the preceding 24 to 72 hours.

Grid Areas – Near Landfill Waste Boundaries

CCR §95471(c)(1) requires that the entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated SEM.

Approved alternative: Since landfills are not sized in 50,000 square foot increments, PCAPCD will allow along waste area boundaries and around areas that cannot be subjected to SEM due to safety reasons, grid segments that are slightly larger or smaller than 50,000 square feet.

Closed Areas – Reduction to Annual SEM

CCR §95469(a)(3) allows an owner or operator of a closed or inactive MSWQ landfill, or any closed or inactive areas on an active MSW landfill that can demonstrate that in the three years before the effective date of this subarticle that there were no measured exceedances of the limits specified in 95469 by annual or quarterly monitoring may monitor annually.

Approved alternative: PCAPCD will allow closed areas designated as Modules 1, 2, 10 and 11 to be tested annually. If an exceedance of the limits is measured, the testing of the affected area shall return to quarterly testing.

APPENDIX C

LANDGEM LANDFILL GAS EMISSIONS MODELING



Summary Report

Landfill Name or Identifier: Western Regional Sanitary Landfill

Date: Friday, October 28, 2016

Description/Comments:

LandGEM analysis for low food waste diversion case (34.5% food waste average after 2021)

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 k L_o \left(\frac{M_i}{10} \right) e^{-k t_{ij}}$$

Where,

Q_{CH_4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (decimal years, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	1979	
Landfill Closure Year (with 80-year limit)	2056	
Actual Closure Year (without limit)	2056	
Have Model Calculate Closure Year?	No	
Waste Design Capacity		<i>short tons</i>

MODEL PARAMETERS

Methane Generation Rate, k	0.036	<i>year⁻¹</i>
Potential Methane Generation Capacity, L ₀	116	<i>m³/Mg</i>
NMOC Concentration	595	<i>ppmv as hexane</i>
Methane Content	50	<i>% by volume</i>

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	Total landfill gas
Gas / Pollutant #2:	Methane
Gas / Pollutant #3:	Carbon dioxide
Gas / Pollutant #4:	NMOC

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1979	1,610	1,771	0	0
1980	36,205	39,826	1,610	1,771
1981	37,272	40,999	37,815	41,597
1982	39,026	42,929	75,087	82,596
1983	66,034	72,637	114,114	125,525
1984	99,795	109,775	180,147	198,162
1985	116,264	127,890	279,943	307,937
1986	132,545	145,799	396,206	435,827
1987	140,678	154,746	528,751	581,626
1988	186,641	205,305	669,429	736,372
1989	170,483	187,531	856,070	941,677
1990	170,042	187,046	1,026,553	1,129,208
1991	166,837	183,521	1,196,595	1,316,254
1992	168,149	184,964	1,363,432	1,499,775
1993	171,245	188,370	1,531,581	1,684,739
1994	158,437	174,281	1,702,826	1,873,109
1995	165,445	181,989	1,861,264	2,047,390
1996	165,146	181,661	2,026,708	2,229,379
1997	160,968	177,065	2,191,855	2,411,040
1998	181,424	199,566	2,352,823	2,588,105
1999	202,045	222,250	2,534,246	2,787,671
2000	235,023	258,525	2,736,292	3,009,921
2001	249,346	274,281	2,971,315	3,268,446
2002	266,225	292,847	3,220,661	3,542,727
2003	227,683	250,451	3,486,885	3,835,574
2004	233,951	257,346	3,714,568	4,086,025
2005	244,051	268,456	3,948,519	4,343,371
2006	256,545	282,199	4,192,570	4,611,827
2007	242,057	266,263	4,449,115	4,894,027
2008	217,299	239,029	4,691,172	5,160,290
2009	200,534	220,587	4,908,472	5,399,319
2010	187,152	205,867	5,109,005	5,619,906
2011	189,136	208,050	5,296,157	5,825,773
2012	181,798	199,978	5,485,293	6,033,822
2013	194,106	213,516	5,667,091	6,233,800
2014	198,375	218,213	5,861,197	6,447,317
2015	212,976	234,274	6,059,572	6,665,530
2016	202,644	222,908	6,272,549	6,899,804
2017	201,331	221,464	6,475,192	7,122,712
2018	193,676	213,044	6,676,523	7,344,175

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2019	196,484	216,133	6,870,199	7,557,219
2020	199,405	219,345	7,066,683	7,773,352
2021	203,097	223,406	7,266,088	7,992,697
2022	206,986	227,685	7,469,185	8,216,103
2023	210,951	232,046	7,676,171	8,443,788
2024	214,992	236,491	7,887,122	8,675,834
2025	219,112	241,023	8,102,114	8,912,325
2026	223,311	245,642	8,321,226	9,153,348
2027	227,592	250,351	8,544,537	9,398,991
2028	231,955	255,150	8,772,129	9,649,341
2029	236,403	260,043	9,004,084	9,904,492
2030	240,937	265,030	9,240,486	10,164,535
2031	245,558	270,114	9,481,423	10,429,565
2032	250,269	275,296	9,726,981	10,699,679
2033	255,072	280,579	9,977,250	10,974,976
2034	259,967	285,964	10,232,322	11,255,554
2035	264,957	291,453	10,492,289	11,541,518
2036	270,044	297,048	10,757,246	11,832,971
2037	275,229	302,752	11,027,290	12,130,019
2038	280,515	308,567	11,302,519	12,432,771
2039	285,903	314,494	11,583,034	12,741,338
2040	291,396	320,536	11,868,938	13,055,832
2041	296,995	326,695	12,160,334	13,376,367
2042	302,703	332,973	12,457,329	13,703,062
2043	308,521	339,373	12,760,032	14,036,035
2044	314,453	345,898	13,068,553	14,375,409
2045	320,499	352,549	13,383,006	14,721,306
2046	326,662	359,329	13,703,505	15,073,855
2047	332,945	366,240	14,030,167	15,433,184
2048	339,351	373,286	14,363,112	15,799,424
2049	345,880	380,468	14,702,463	16,172,709
2050	352,536	387,789	15,048,343	16,553,177
2051	359,321	395,253	15,400,879	16,940,967
2052	366,238	402,862	15,760,200	17,336,220
2053	373,289	410,618	16,126,438	17,739,082
2054	373,289	410,618	16,499,727	18,149,700
2055	373,289	410,618	16,873,017	18,560,318
2056	0	0	17,246,306	18,970,937
2057	0	0	17,246,306	18,970,937
2058	0	0	17,246,306	18,970,937

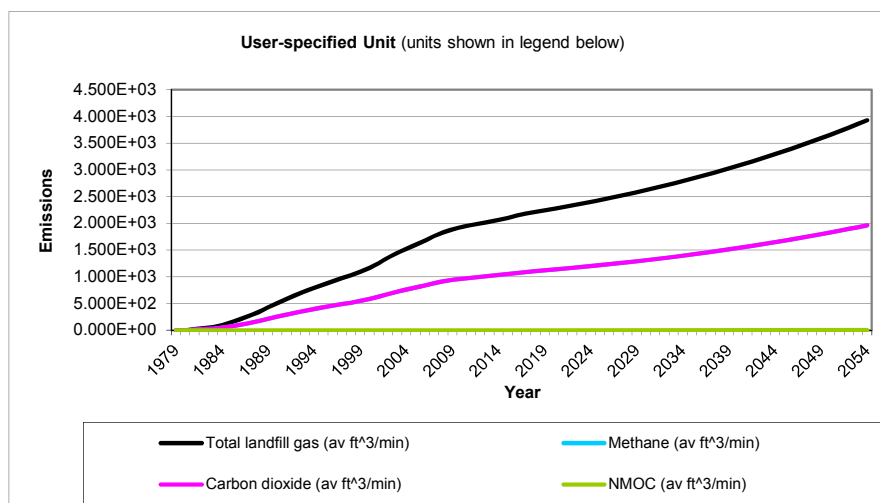
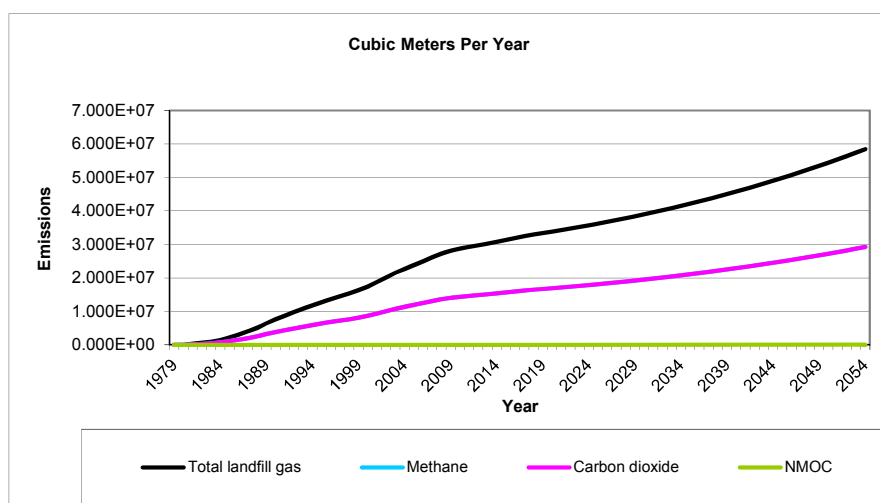
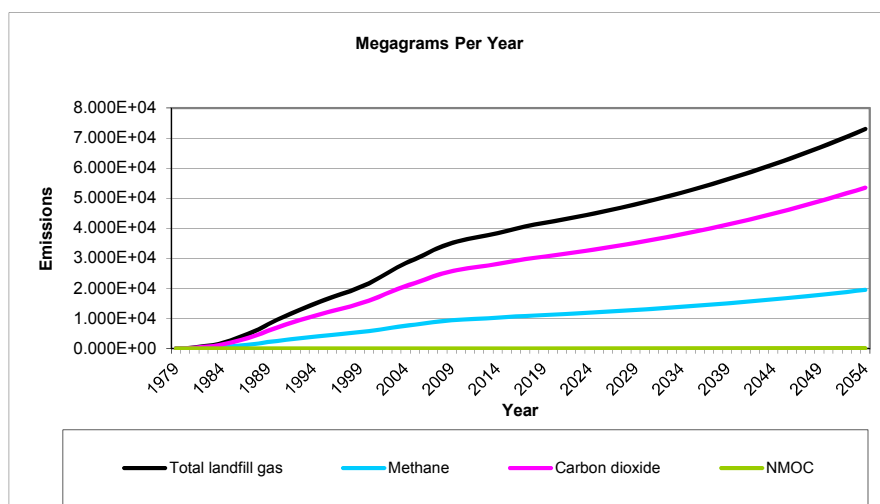
Pollutant Parameters

Gas / Pollutant Default Parameters:				User-specified Pollutant Parameters:	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,2,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Pollutant Parameters (Continued)

Gas / Pollutant Default Parameters:				User-specified Pollutant Parameters:	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Pollutants	Ethyl mercaptan (ethanethiol) - VOC	2.3	62.13		
	Ethylbenzene - HAP/VOC	4.6	106.16		
	Ethylene dibromide - HAP/VOC	1.0E-03	187.88		
	Fluorotrichloromethane - VOC	0.76	137.38		
	Hexane - HAP/VOC	6.6	86.18		
	Hydrogen sulfide	36	34.08		
	Mercury (total) - HAP	2.9E-04	200.61		
	Methyl ethyl ketone - HAP/VOC	7.1	72.11		
	Methyl isobutyl ketone - HAP/VOC	1.9	100.16		
	Methyl mercaptan - VOC	2.5	48.11		
	Pentane - VOC	3.3	72.15		
	Perchloroethylene (tetrachloroethylene) - HAP	3.7	165.83		
	Propane - VOC	11	44.09		
	t-1,2-Dichloroethene - VOC	2.8	96.94		
	Toluene - No or Unknown Co-disposal - HAP/VOC	39	92.13		
	Toluene - Co-disposal - HAP/VOC	170	92.13		
	Trichloroethylene (trichloroethene) - HAP/VOC	2.8	131.40		
	Vinyl chloride - HAP/VOC	7.3	62.50		
	Xylenes - HAP/VOC	12	106.16		

Graphs



Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
1979	0	0	0	0	0	0
1980	1.654E+01	1.324E+04	8.898E-01	4.417E+00	6.621E+03	4.449E-01
1981	3.879E+02	3.106E+05	2.087E+01	1.036E+02	1.553E+05	1.043E+01
1982	7.570E+02	6.062E+05	4.073E+01	2.022E+02	3.031E+05	2.036E+01
1983	1.131E+03	9.057E+05	6.086E+01	3.021E+02	4.529E+05	3.043E+01
1984	1.769E+03	1.417E+06	9.520E+01	4.726E+02	7.084E+05	4.760E+01
1985	2.732E+03	2.188E+06	1.470E+02	7.297E+02	1.094E+06	7.349E+01
1986	3.830E+03	3.067E+06	2.060E+02	1.023E+03	1.533E+06	1.030E+02
1987	5.056E+03	4.048E+06	2.720E+02	1.350E+03	2.024E+06	1.360E+02
1988	6.322E+03	5.062E+06	3.401E+02	1.689E+03	2.531E+06	1.701E+02
1989	8.016E+03	6.418E+06	4.313E+02	2.141E+03	3.209E+06	2.156E+02
1990	9.483E+03	7.594E+06	5.102E+02	2.533E+03	3.797E+06	2.551E+02
1991	1.089E+04	8.724E+06	5.862E+02	2.910E+03	4.362E+06	2.931E+02
1992	1.222E+04	9.788E+06	6.576E+02	3.265E+03	4.894E+06	3.288E+02
1993	1.352E+04	1.082E+07	7.273E+02	3.611E+03	5.412E+06	3.637E+02
1994	1.480E+04	1.185E+07	7.962E+02	3.953E+03	5.925E+06	3.981E+02
1995	1.590E+04	1.273E+07	8.556E+02	4.248E+03	6.367E+06	4.278E+02
1996	1.704E+04	1.365E+07	9.168E+02	4.552E+03	6.823E+06	4.584E+02
1997	1.813E+04	1.452E+07	9.757E+02	4.844E+03	7.261E+06	4.878E+02
1998	1.915E+04	1.533E+07	1.030E+03	5.114E+03	7.666E+06	5.151E+02
1999	2.033E+04	1.628E+07	1.094E+03	5.431E+03	8.141E+06	5.470E+02
2000	2.169E+04	1.737E+07	1.167E+03	5.794E+03	8.684E+06	5.835E+02
2001	2.334E+04	1.869E+07	1.256E+03	6.233E+03	9.343E+06	6.278E+02
2002	2.507E+04	2.008E+07	1.349E+03	6.697E+03	1.004E+07	6.745E+02
2003	2.692E+04	2.156E+07	1.448E+03	7.191E+03	1.078E+07	7.242E+02
2004	2.831E+04	2.267E+07	1.523E+03	7.561E+03	1.133E+07	7.615E+02
2005	2.971E+04	2.379E+07	1.598E+03	7.936E+03	1.190E+07	7.992E+02
2006	3.117E+04	2.496E+07	1.677E+03	8.325E+03	1.248E+07	8.384E+02
2007	3.270E+04	2.618E+07	1.759E+03	8.734E+03	1.309E+07	8.797E+02
2008	3.403E+04	2.725E+07	1.831E+03	9.090E+03	1.362E+07	9.154E+02
2009	3.506E+04	2.807E+07	1.886E+03	9.364E+03	1.404E+07	9.431E+02
2010	3.588E+04	2.873E+07	1.930E+03	9.584E+03	1.436E+07	9.652E+02
2011	3.653E+04	2.925E+07	1.966E+03	9.758E+03	1.463E+07	9.828E+02
2012	3.718E+04	2.977E+07	2.001E+03	9.932E+03	1.489E+07	1.000E+03
2013	3.774E+04	3.022E+07	2.030E+03	1.008E+04	1.511E+07	1.015E+03
2014	3.840E+04	3.075E+07	2.066E+03	1.026E+04	1.537E+07	1.033E+03
2015	3.908E+04	3.129E+07	2.102E+03	1.044E+04	1.564E+07	1.051E+03
2016	3.988E+04	3.194E+07	2.146E+03	1.065E+04	1.597E+07	1.073E+03
2017	4.055E+04	3.247E+07	2.182E+03	1.083E+04	1.624E+07	1.091E+03
2018	4.119E+04	3.298E+07	2.216E+03	1.100E+04	1.649E+07	1.108E+03
2019	4.172E+04	3.341E+07	2.245E+03	1.114E+04	1.670E+07	1.122E+03
2020	4.226E+04	3.384E+07	2.274E+03	1.129E+04	1.692E+07	1.137E+03
2021	4.282E+04	3.429E+07	2.304E+03	1.144E+04	1.714E+07	1.152E+03
2022	4.339E+04	3.474E+07	2.334E+03	1.159E+04	1.737E+07	1.167E+03
2023	4.398E+04	3.522E+07	2.366E+03	1.175E+04	1.761E+07	1.183E+03
2024	4.459E+04	3.571E+07	2.399E+03	1.191E+04	1.785E+07	1.200E+03
2025	4.522E+04	3.621E+07	2.433E+03	1.208E+04	1.811E+07	1.217E+03
2026	4.588E+04	3.674E+07	2.468E+03	1.225E+04	1.837E+07	1.234E+03
2027	4.655E+04	3.727E+07	2.504E+03	1.243E+04	1.864E+07	1.252E+03
2028	4.724E+04	3.783E+07	2.542E+03	1.262E+04	1.891E+07	1.271E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2029	4.795E+04	3.840E+07	2.580E+03	1.281E+04	1.920E+07	1.290E+03
2030	4.868E+04	3.898E+07	2.619E+03	1.300E+04	1.949E+07	1.310E+03
2031	4.944E+04	3.959E+07	2.660E+03	1.321E+04	1.979E+07	1.330E+03
2032	5.021E+04	4.021E+07	2.702E+03	1.341E+04	2.010E+07	1.351E+03
2033	5.101E+04	4.084E+07	2.744E+03	1.362E+04	2.042E+07	1.372E+03
2034	5.182E+04	4.150E+07	2.788E+03	1.384E+04	2.075E+07	1.394E+03
2035	5.266E+04	4.217E+07	2.833E+03	1.407E+04	2.108E+07	1.417E+03
2036	5.352E+04	4.286E+07	2.880E+03	1.430E+04	2.143E+07	1.440E+03
2037	5.440E+04	4.356E+07	2.927E+03	1.453E+04	2.178E+07	1.464E+03
2038	5.531E+04	4.429E+07	2.976E+03	1.477E+04	2.214E+07	1.488E+03
2039	5.623E+04	4.503E+07	3.025E+03	1.502E+04	2.251E+07	1.513E+03
2040	5.718E+04	4.579E+07	3.076E+03	1.527E+04	2.289E+07	1.538E+03
2041	5.815E+04	4.657E+07	3.129E+03	1.553E+04	2.328E+07	1.564E+03
2042	5.915E+04	4.736E+07	3.182E+03	1.580E+04	2.368E+07	1.591E+03
2043	6.016E+04	4.818E+07	3.237E+03	1.607E+04	2.409E+07	1.618E+03
2044	6.121E+04	4.901E+07	3.293E+03	1.635E+04	2.451E+07	1.647E+03
2045	6.227E+04	4.986E+07	3.350E+03	1.663E+04	2.493E+07	1.675E+03
2046	6.336E+04	5.074E+07	3.409E+03	1.692E+04	2.537E+07	1.705E+03
2047	6.448E+04	5.163E+07	3.469E+03	1.722E+04	2.582E+07	1.735E+03
2048	6.562E+04	5.254E+07	3.530E+03	1.753E+04	2.627E+07	1.765E+03
2049	6.678E+04	5.348E+07	3.593E+03	1.784E+04	2.674E+07	1.797E+03
2050	6.797E+04	5.443E+07	3.657E+03	1.816E+04	2.722E+07	1.829E+03
2051	6.919E+04	5.541E+07	3.723E+03	1.848E+04	2.770E+07	1.861E+03
2052	7.044E+04	5.640E+07	3.790E+03	1.881E+04	2.820E+07	1.895E+03
2053	7.171E+04	5.742E+07	3.858E+03	1.915E+04	2.871E+07	1.929E+03
2054	7.301E+04	5.846E+07	3.928E+03	1.950E+04	2.923E+07	1.964E+03
2055	7.426E+04	5.946E+07	3.995E+03	1.984E+04	2.973E+07	1.998E+03
2056	7.547E+04	6.043E+07	4.060E+03	2.016E+04	3.022E+07	2.030E+03
2057	7.280E+04	5.829E+07	3.917E+03	1.945E+04	2.915E+07	1.958E+03
2058	7.023E+04	5.623E+07	3.778E+03	1.876E+04	2.812E+07	1.889E+03
2059	6.774E+04	5.424E+07	3.645E+03	1.809E+04	2.712E+07	1.822E+03
2060	6.535E+04	5.233E+07	3.516E+03	1.745E+04	2.616E+07	1.758E+03
2061	6.304E+04	5.048E+07	3.392E+03	1.684E+04	2.524E+07	1.696E+03
2062	6.081E+04	4.869E+07	3.272E+03	1.624E+04	2.435E+07	1.636E+03
2063	5.866E+04	4.697E+07	3.156E+03	1.567E+04	2.348E+07	1.578E+03
2064	5.658E+04	4.531E+07	3.044E+03	1.511E+04	2.265E+07	1.522E+03
2065	5.458E+04	4.371E+07	2.937E+03	1.458E+04	2.185E+07	1.468E+03
2066	5.265E+04	4.216E+07	2.833E+03	1.406E+04	2.108E+07	1.416E+03
2067	5.079E+04	4.067E+07	2.733E+03	1.357E+04	2.034E+07	1.366E+03
2068	4.899E+04	3.923E+07	2.636E+03	1.309E+04	1.962E+07	1.318E+03
2069	4.726E+04	3.785E+07	2.543E+03	1.262E+04	1.892E+07	1.271E+03
2070	4.559E+04	3.651E+07	2.453E+03	1.218E+04	1.825E+07	1.226E+03
2071	4.398E+04	3.522E+07	2.366E+03	1.175E+04	1.761E+07	1.183E+03
2072	4.242E+04	3.397E+07	2.283E+03	1.133E+04	1.699E+07	1.141E+03
2073	4.092E+04	3.277E+07	2.202E+03	1.093E+04	1.638E+07	1.101E+03
2074	3.948E+04	3.161E+07	2.124E+03	1.054E+04	1.581E+07	1.062E+03
2075	3.808E+04	3.049E+07	2.049E+03	1.017E+04	1.525E+07	1.024E+03
2076	3.673E+04	2.942E+07	1.976E+03	9.812E+03	1.471E+07	9.882E+02
2077	3.544E+04	2.837E+07	1.907E+03	9.465E+03	1.419E+07	9.533E+02
2078	3.418E+04	2.737E+07	1.839E+03	9.130E+03	1.369E+07	9.195E+02
2079	3.297E+04	2.640E+07	1.774E+03	8.808E+03	1.320E+07	8.870E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2080	3.181E+04	2.547E+07	1.711E+03	8.496E+03	1.274E+07	8.557E+02
2081	3.068E+04	2.457E+07	1.651E+03	8.196E+03	1.228E+07	8.254E+02
2082	2.960E+04	2.370E+07	1.592E+03	7.906E+03	1.185E+07	7.962E+02
2083	2.855E+04	2.286E+07	1.536E+03	7.626E+03	1.143E+07	7.681E+02
2084	2.754E+04	2.205E+07	1.482E+03	7.357E+03	1.103E+07	7.409E+02
2085	2.657E+04	2.127E+07	1.429E+03	7.097E+03	1.064E+07	7.147E+02
2086	2.563E+04	2.052E+07	1.379E+03	6.846E+03	1.026E+07	6.894E+02
2087	2.472E+04	1.980E+07	1.330E+03	6.604E+03	9.898E+06	6.651E+02
2088	2.385E+04	1.910E+07	1.283E+03	6.370E+03	9.548E+06	6.415E+02
2089	2.300E+04	1.842E+07	1.238E+03	6.145E+03	9.211E+06	6.189E+02
2090	2.219E+04	1.777E+07	1.194E+03	5.928E+03	8.885E+06	5.970E+02
2091	2.141E+04	1.714E+07	1.152E+03	5.718E+03	8.571E+06	5.759E+02
2092	2.065E+04	1.654E+07	1.111E+03	5.516E+03	8.268E+06	5.555E+02
2093	1.992E+04	1.595E+07	1.072E+03	5.321E+03	7.975E+06	5.359E+02
2094	1.922E+04	1.539E+07	1.034E+03	5.133E+03	7.693E+06	5.169E+02
2095	1.854E+04	1.484E+07	9.973E+02	4.951E+03	7.421E+06	4.986E+02
2096	1.788E+04	1.432E+07	9.620E+02	4.776E+03	7.159E+06	4.810E+02
2097	1.725E+04	1.381E+07	9.280E+02	4.607E+03	6.906E+06	4.640E+02
2098	1.664E+04	1.332E+07	8.952E+02	4.444E+03	6.662E+06	4.476E+02
2099	1.605E+04	1.285E+07	8.635E+02	4.287E+03	6.426E+06	4.318E+02
2100	1.548E+04	1.240E+07	8.330E+02	4.136E+03	6.199E+06	4.165E+02
2101	1.494E+04	1.196E+07	8.035E+02	3.989E+03	5.980E+06	4.018E+02
2102	1.441E+04	1.154E+07	7.751E+02	3.848E+03	5.768E+06	3.876E+02
2103	1.390E+04	1.113E+07	7.477E+02	3.712E+03	5.564E+06	3.739E+02
2104	1.341E+04	1.073E+07	7.213E+02	3.581E+03	5.367E+06	3.606E+02
2105	1.293E+04	1.036E+07	6.958E+02	3.454E+03	5.178E+06	3.479E+02
2106	1.247E+04	9.989E+06	6.712E+02	3.332E+03	4.995E+06	3.356E+02
2107	1.203E+04	9.636E+06	6.474E+02	3.214E+03	4.818E+06	3.237E+02
2108	1.161E+04	9.295E+06	6.245E+02	3.101E+03	4.648E+06	3.123E+02
2109	1.120E+04	8.967E+06	6.025E+02	2.991E+03	4.483E+06	3.012E+02
2110	1.080E+04	8.650E+06	5.812E+02	2.885E+03	4.325E+06	2.906E+02
2111	1.042E+04	8.344E+06	5.606E+02	2.783E+03	4.172E+06	2.803E+02
2112	1.005E+04	8.049E+06	5.408E+02	2.685E+03	4.024E+06	2.704E+02
2113	9.696E+03	7.764E+06	5.217E+02	2.590E+03	3.882E+06	2.608E+02
2114	9.353E+03	7.490E+06	5.032E+02	2.498E+03	3.745E+06	2.516E+02
2115	9.022E+03	7.225E+06	4.854E+02	2.410E+03	3.612E+06	2.427E+02
2116	8.703E+03	6.969E+06	4.683E+02	2.325E+03	3.485E+06	2.341E+02
2117	8.396E+03	6.723E+06	4.517E+02	2.243E+03	3.361E+06	2.259E+02
2118	8.099E+03	6.485E+06	4.357E+02	2.163E+03	3.243E+06	2.179E+02
2119	7.812E+03	6.256E+06	4.203E+02	2.087E+03	3.128E+06	2.102E+02

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
1979	0	0	0	0	0	0
1980	1.212E+01	6.621E+03	4.449E-01	2.824E-02	7.879E+00	5.294E-04
1981	2.843E+02	1.553E+05	1.043E+01	6.624E-01	1.848E+02	1.242E-02
1982	5.548E+02	3.031E+05	2.036E+01	1.293E+00	3.607E+02	2.423E-02
1983	8.290E+02	4.529E+05	3.043E+01	1.932E+00	5.389E+02	3.621E-02
1984	1.297E+03	7.084E+05	4.760E+01	3.022E+00	8.430E+02	5.664E-02
1985	2.002E+03	1.094E+06	7.349E+01	4.666E+00	1.302E+03	8.746E-02
1986	2.807E+03	1.533E+06	1.030E+02	6.540E+00	1.825E+03	1.226E-01
1987	3.705E+03	2.024E+06	1.360E+02	8.634E+00	2.409E+03	1.618E-01
1988	4.633E+03	2.531E+06	1.701E+02	1.080E+01	3.012E+03	2.024E-01
1989	5.875E+03	3.209E+06	2.156E+02	1.369E+01	3.819E+03	2.566E-01
1990	6.950E+03	3.797E+06	2.551E+02	1.620E+01	4.518E+03	3.036E-01
1991	7.985E+03	4.362E+06	2.931E+02	1.861E+01	5.191E+03	3.488E-01
1992	8.958E+03	4.894E+06	3.288E+02	2.087E+01	5.824E+03	3.913E-01
1993	9.907E+03	5.412E+06	3.637E+02	2.309E+01	6.441E+03	4.328E-01
1994	1.085E+04	5.925E+06	3.981E+02	2.527E+01	7.051E+03	4.738E-01
1995	1.166E+04	6.367E+06	4.278E+02	2.716E+01	7.577E+03	5.091E-01
1996	1.249E+04	6.823E+06	4.584E+02	2.910E+01	8.119E+03	5.455E-01
1997	1.329E+04	7.261E+06	4.878E+02	3.097E+01	8.640E+03	5.805E-01
1998	1.403E+04	7.666E+06	5.151E+02	3.270E+01	9.122E+03	6.129E-01
1999	1.490E+04	8.141E+06	5.470E+02	3.473E+01	9.688E+03	6.509E-01
2000	1.590E+04	8.684E+06	5.835E+02	3.704E+01	1.033E+04	6.943E-01
2001	1.710E+04	9.343E+06	6.278E+02	3.985E+01	1.112E+04	7.471E-01
2002	1.838E+04	1.004E+07	6.745E+02	4.282E+01	1.195E+04	8.026E-01
2003	1.973E+04	1.078E+07	7.242E+02	4.598E+01	1.283E+04	8.618E-01
2004	2.075E+04	1.133E+07	7.615E+02	4.834E+01	1.349E+04	9.062E-01
2005	2.177E+04	1.190E+07	7.992E+02	5.074E+01	1.416E+04	9.511E-01
2006	2.284E+04	1.248E+07	8.384E+02	5.323E+01	1.485E+04	9.977E-01
2007	2.397E+04	1.309E+07	8.797E+02	5.584E+01	1.558E+04	1.047E+00
2008	2.494E+04	1.362E+07	9.154E+02	5.812E+01	1.621E+04	1.089E+00
2009	2.569E+04	1.404E+07	9.431E+02	5.987E+01	1.670E+04	1.122E+00
2010	2.630E+04	1.436E+07	9.652E+02	6.127E+01	1.709E+04	1.149E+00
2011	2.677E+04	1.463E+07	9.828E+02	6.239E+01	1.741E+04	1.169E+00
2012	2.725E+04	1.489E+07	1.000E+03	6.350E+01	1.772E+04	1.190E+00
2013	2.766E+04	1.511E+07	1.015E+03	6.445E+01	1.798E+04	1.208E+00
2014	2.814E+04	1.537E+07	1.033E+03	6.557E+01	1.829E+04	1.229E+00
2015	2.864E+04	1.564E+07	1.051E+03	6.673E+01	1.862E+04	1.251E+00
2016	2.923E+04	1.597E+07	1.073E+03	6.811E+01	1.900E+04	1.277E+00
2017	2.972E+04	1.624E+07	1.091E+03	6.926E+01	1.932E+04	1.298E+00
2018	3.019E+04	1.649E+07	1.108E+03	7.034E+01	1.962E+04	1.319E+00
2019	3.058E+04	1.670E+07	1.122E+03	7.125E+01	1.988E+04	1.336E+00
2020	3.097E+04	1.692E+07	1.137E+03	7.218E+01	2.014E+04	1.353E+00
2021	3.138E+04	1.714E+07	1.152E+03	7.312E+01	2.040E+04	1.371E+00
2022	3.180E+04	1.737E+07	1.167E+03	7.410E+01	2.067E+04	1.389E+00
2023	3.223E+04	1.761E+07	1.183E+03	7.511E+01	2.095E+04	1.408E+00
2024	3.268E+04	1.785E+07	1.200E+03	7.616E+01	2.125E+04	1.428E+00
2025	3.314E+04	1.811E+07	1.217E+03	7.724E+01	2.155E+04	1.448E+00
2026	3.362E+04	1.837E+07	1.234E+03	7.835E+01	2.186E+04	1.469E+00
2027	3.411E+04	1.864E+07	1.252E+03	7.949E+01	2.218E+04	1.490E+00
2028	3.462E+04	1.891E+07	1.271E+03	8.068E+01	2.251E+04	1.512E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2029	3.514E+04	1.920E+07	1.290E+03	8.189E+01	2.285E+04	1.535E+00
2030	3.568E+04	1.949E+07	1.310E+03	8.314E+01	2.320E+04	1.559E+00
2031	3.623E+04	1.979E+07	1.330E+03	8.443E+01	2.355E+04	1.583E+00
2032	3.680E+04	2.010E+07	1.351E+03	8.575E+01	2.392E+04	1.607E+00
2033	3.738E+04	2.042E+07	1.372E+03	8.711E+01	2.430E+04	1.633E+00
2034	3.798E+04	2.075E+07	1.394E+03	8.851E+01	2.469E+04	1.659E+00
2035	3.860E+04	2.108E+07	1.417E+03	8.994E+01	2.509E+04	1.686E+00
2036	3.923E+04	2.143E+07	1.440E+03	9.140E+01	2.550E+04	1.713E+00
2037	3.987E+04	2.178E+07	1.464E+03	9.291E+01	2.592E+04	1.742E+00
2038	4.053E+04	2.214E+07	1.488E+03	9.445E+01	2.635E+04	1.770E+00
2039	4.121E+04	2.251E+07	1.513E+03	9.603E+01	2.679E+04	1.800E+00
2040	4.191E+04	2.289E+07	1.538E+03	9.765E+01	2.724E+04	1.830E+00
2041	4.262E+04	2.328E+07	1.564E+03	9.931E+01	2.771E+04	1.862E+00
2042	4.335E+04	2.368E+07	1.591E+03	1.010E+02	2.818E+04	1.893E+00
2043	4.409E+04	2.409E+07	1.618E+03	1.027E+02	2.867E+04	1.926E+00
2044	4.486E+04	2.451E+07	1.647E+03	1.045E+02	2.916E+04	1.959E+00
2045	4.564E+04	2.493E+07	1.675E+03	1.063E+02	2.967E+04	1.993E+00
2046	4.644E+04	2.537E+07	1.705E+03	1.082E+02	3.019E+04	2.028E+00
2047	4.725E+04	2.582E+07	1.735E+03	1.101E+02	3.072E+04	2.064E+00
2048	4.809E+04	2.627E+07	1.765E+03	1.121E+02	3.126E+04	2.101E+00
2049	4.894E+04	2.674E+07	1.797E+03	1.141E+02	3.182E+04	2.138E+00
2050	4.982E+04	2.722E+07	1.829E+03	1.161E+02	3.239E+04	2.176E+00
2051	5.071E+04	2.770E+07	1.861E+03	1.182E+02	3.297E+04	2.215E+00
2052	5.162E+04	2.820E+07	1.895E+03	1.203E+02	3.356E+04	2.255E+00
2053	5.255E+04	2.871E+07	1.929E+03	1.225E+02	3.417E+04	2.296E+00
2054	5.351E+04	2.923E+07	1.964E+03	1.247E+02	3.478E+04	2.337E+00
2055	5.442E+04	2.973E+07	1.998E+03	1.268E+02	3.538E+04	2.377E+00
2056	5.531E+04	3.022E+07	2.030E+03	1.289E+02	3.596E+04	2.416E+00
2057	5.635E+04	3.075E+07	2.065E+03	1.312E+02	3.659E+04	2.459E+00
2058	5.747E+04	3.132E+07	2.102E+03	1.337E+02	3.726E+04	2.506E+00
2059	5.865E+04	3.193E+07	2.144E+03	1.364E+02	3.797E+04	2.557E+00
2060	5.989E+04	3.259E+07	2.191E+03	1.393E+02	3.872E+04	2.612E+00
2061	6.120E+04	3.330E+07	2.243E+03	1.424E+02	3.952E+04	2.672E+00
2062	6.257E+04	3.406E+07	2.300E+03	1.457E+02	4.037E+04	2.737E+00
2063	6.400E+04	3.487E+07	2.362E+03	1.493E+02	4.127E+04	2.807E+00
2064	6.549E+04	3.573E+07	2.429E+03	1.532E+02	4.222E+04	2.882E+00
2065	6.704E+04	3.664E+07	2.501E+03	1.574E+02	4.322E+04	2.962E+00
2066	6.865E+04	3.761E+07	2.583E+03	1.619E+02	4.427E+04	3.047E+00
2067	7.033E+04	3.864E+07	2.670E+03	1.667E+02	4.537E+04	3.137E+00
2068	7.207E+04	3.974E+07	2.762E+03	1.718E+02	4.652E+04	3.232E+00
2069	7.388E+04	4.090E+07	2.859E+03	1.772E+02	4.772E+04	3.332E+00
2070	7.576E+04	4.213E+07	2.961E+03	1.829E+02	4.897E+04	3.437E+00
2071	7.771E+04	4.343E+07	3.068E+03	1.889E+02	5.027E+04	3.547E+00
2072	7.973E+04	4.480E+07	3.180E+03	1.952E+02	5.162E+04	3.662E+00
2073	8.183E+04	4.624E+07	3.297E+03	2.018E+02	5.302E+04	3.782E+00
2074	8.400E+04	4.775E+07	3.420E+03	2.087E+02	5.447E+04	3.907E+00
2075	8.634E+04	4.933E+07	3.548E+03	2.160E+02	5.597E+04	4.037E+00
2076	8.885E+04	5.098E+07	3.682E+03	2.237E+02	5.752E+04	4.172E+00
2077	9.153E+04	5.270E+07	3.822E+03	2.318E+02	5.912E+04	4.312E+00
2078	9.438E+04	5.450E+07	3.968E+03	2.403E+02	6.077E+04	4.457E+00
2079	9.740E+04	5.638E+07	4.120E+03	2.492E+02	6.247E+04	4.607E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2080	2.331E+04	1.274E+07	8.557E+02	5.432E+01	1.515E+04	1.018E+00
2081	2.249E+04	1.228E+07	8.254E+02	5.240E+01	1.462E+04	9.822E-01
2082	2.169E+04	1.185E+07	7.962E+02	5.055E+01	1.410E+04	9.475E-01
2083	2.093E+04	1.143E+07	7.681E+02	4.876E+01	1.360E+04	9.140E-01
2084	2.019E+04	1.103E+07	7.409E+02	4.704E+01	1.312E+04	8.817E-01
2085	1.947E+04	1.064E+07	7.147E+02	4.537E+01	1.266E+04	8.505E-01
2086	1.878E+04	1.026E+07	6.894E+02	4.377E+01	1.221E+04	8.204E-01
2087	1.812E+04	9.898E+06	6.651E+02	4.222E+01	1.178E+04	7.914E-01
2088	1.748E+04	9.548E+06	6.415E+02	4.073E+01	1.136E+04	7.634E-01
2089	1.686E+04	9.211E+06	6.189E+02	3.929E+01	1.096E+04	7.364E-01
2090	1.626E+04	8.885E+06	5.970E+02	3.790E+01	1.057E+04	7.104E-01
2091	1.569E+04	8.571E+06	5.759E+02	3.656E+01	1.020E+04	6.853E-01
2092	1.513E+04	8.268E+06	5.555E+02	3.527E+01	9.839E+03	6.611E-01
2093	1.460E+04	7.975E+06	5.359E+02	3.402E+01	9.491E+03	6.377E-01
2094	1.408E+04	7.693E+06	5.169E+02	3.282E+01	9.155E+03	6.151E-01
2095	1.358E+04	7.421E+06	4.986E+02	3.166E+01	8.831E+03	5.934E-01
2096	1.310E+04	7.159E+06	4.810E+02	3.054E+01	8.519E+03	5.724E-01
2097	1.264E+04	6.906E+06	4.640E+02	2.946E+01	8.218E+03	5.522E-01
2098	1.219E+04	6.662E+06	4.476E+02	2.842E+01	7.927E+03	5.326E-01
2099	1.176E+04	6.426E+06	4.318E+02	2.741E+01	7.647E+03	5.138E-01
2100	1.135E+04	6.199E+06	4.165E+02	2.644E+01	7.377E+03	4.956E-01
2101	1.095E+04	5.980E+06	4.018E+02	2.551E+01	7.116E+03	4.781E-01
2102	1.056E+04	5.768E+06	3.876E+02	2.460E+01	6.864E+03	4.612E-01
2103	1.019E+04	5.564E+06	3.739E+02	2.373E+01	6.621E+03	4.449E-01
2104	9.825E+03	5.367E+06	3.606E+02	2.290E+01	6.387E+03	4.292E-01
2105	9.478E+03	5.178E+06	3.479E+02	2.209E+01	6.161E+03	4.140E-01
2106	9.143E+03	4.995E+06	3.356E+02	2.130E+01	5.944E+03	3.993E-01
2107	8.819E+03	4.818E+06	3.237E+02	2.055E+01	5.733E+03	3.852E-01
2108	8.508E+03	4.648E+06	3.123E+02	1.982E+01	5.531E+03	3.716E-01
2109	8.207E+03	4.483E+06	3.012E+02	1.912E+01	5.335E+03	3.585E-01
2110	7.916E+03	4.325E+06	2.906E+02	1.845E+01	5.146E+03	3.458E-01
2111	7.637E+03	4.172E+06	2.803E+02	1.780E+01	4.965E+03	3.336E-01
2112	7.367E+03	4.024E+06	2.704E+02	1.717E+01	4.789E+03	3.218E-01
2113	7.106E+03	3.882E+06	2.608E+02	1.656E+01	4.620E+03	3.104E-01
2114	6.855E+03	3.745E+06	2.516E+02	1.597E+01	4.456E+03	2.994E-01
2115	6.612E+03	3.612E+06	2.427E+02	1.541E+01	4.299E+03	2.888E-01
2116	6.379E+03	3.485E+06	2.341E+02	1.486E+01	4.147E+03	2.786E-01
2117	6.153E+03	3.361E+06	2.259E+02	1.434E+01	4.000E+03	2.688E-01
2118	5.935E+03	3.243E+06	2.179E+02	1.383E+01	3.859E+03	2.593E-01
2119	5.726E+03	3.128E+06	2.102E+02	1.334E+01	3.722E+03	2.501E-01

APPENDIX D

**LANDFILL METHANE RULE (LMR) SURFACE EMISSIONS
MONITORING PLAN**



Landfill Methane Rule Surface Emissions Monitoring Plan

Western Regional Sanitary Landfill

May 2016

Prepared for:

Western Placer Waste Management Authority
3195 Athens Avenue
Lincoln, CA 95468

Revision History

Landfill Methane Rule (LMR) Surface Emissions Monitoring (SEM) Plan

Western Regional Sanitary Landfill Lincoln, California

Add the effective date of the most recent revision to the list below. Do not overwrite or delete any dates. This is intended to be a complete record of all revisions made to this Plan, and assists in making certain that all plan revisions are retained at least five (5) years as required by California Code of Regulations (CCR) Title 17 §95470(a)(1)(D).

Date of Initial Issuance
November 2, 2011
REVISION DATES
May 20, 2016

TABLE OF CONTENTS

REVISION HISTORY	II
1 INTRODUCTION	4
1.1 PURPOSE OF PLAN	4
2 LMR SURFACE EMISSIONS MONITORING PLAN	5
2.1 SEM REQUIREMENTS	5
2.1.1 ALTERNATIVE REQUESTS	5
2.1.2 MONITORING AREA AND GRIDS	5
2.1.3 WEATHER CONDITIONS	6
2.1.4 FREQUENCY	7
2.1.5 RECORDKEEPING	8
2.2 INSTANTANEOUS SEM REQUIREMENTS	8
2.2.1 INSTANTANEOUS SEM PROCEDURES	8
2.2.2 INSTANTANEOUS SEM MONITORING EQUIPMENT	10
2.2.3 200 PPMV METHANE INSTANTANEOUS SEM EXCEEDANCES	11
2.2.4 500 PPMV METHANE INSTANTANEOUS SEM EXCEEDANCES	11
2.3 INTEGRATED SEM REQUIREMENTS	13
2.3.1 INTEGRATED SEM PROCEDURES	13
2.3.2 INTEGRATED SEM MONITORING EQUIPMENT	14
2.3.3 INTEGRATED SEM RESULTS BELOW 25 PPMV	14
2.3.4 25 PPMV INTEGRATED SEM EXCEEDANCES	15
LIMITATIONS	17

APPENDICES

APPENDIX A PCAPCD CORRESPONDENCE

APPENDIX B APPROVED ALTERNATIVE COMPLIANCE OPTIONS SUMMARY

APPENDIX C INSTANTANEOUS AND INTEGRATED SEM EVENT MAP

APPENDIX D LMR SURFACE EMISSIONS MONITORING REPORT TEMPLATE

1 INTRODUCTION

1.1 Purpose of Plan

The Western Regional Sanitary Landfill (WRSL) is an active landfill located in Lincoln, Placer County, California, owned and operated by the Western Placer Waste Management Authority (WPWMA). This Surface Emissions Monitoring (SEM) Plan (Plan) has been prepared by Cornerstone on behalf of WPWMA to provide a monitoring protocol in compliance with the requirements of the California Code of Regulations (CCR) Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 6, Methane Emissions from Municipal Solid Waste Landfills (CCR Title 17) Landfill Methane Rule (LMR), as mandated by Assembly Bill (AB) 32.

WRSL is subject to the SEM requirements of CCR Title 17 per §95463(b) because the waste-in-place (WIP) is greater than 450,000 tons and heat input capacity (HIC) of WRSL exceeds 3.0 million British thermal units per hour (MMBTU/hr). A landfill gas collection and control system (GCCS) has been installed at WRSL and is in continuous operation. Surface emissions will be monitored quarterly, as required by regulations and as described in this SEM Plan, unless otherwise approved.

2 LMR SURFACE EMISSIONS MONITORING PLAN

2.1 SEM Requirements

The purpose of SEM is to ensure that no location on the municipal solid waste (MSW) landfill surface exceeds 500 parts per million by volume (ppmv) (other than non-repeatable, momentary readings) during instantaneous SEM, nor any identified approximately 50,000 square foot (ft²) grid exceed an average methane concentration of 25 ppmv methane during integrated SEM. Pursuant to CCR Title 17 §95469(a), instantaneous and integrated surface monitoring must be conducted on a quarterly basis unless otherwise approved. Due to a delay in implementation, per the California Air Resources Board (CARB), December 1, 2010 MSW Landfill Regulation Regulatory Advisory, the SEM became effective and starting July 1, 2011. The following test methods and procedures for surface emissions testing satisfy 40 Code of Federal Regulations (CFR) §60.753 (d) and the requirements of CCR Title 17 §95471.

2.1.1 Alternative Requests

Pursuant to CCR Title 17 §95468, WPWMA may request alternatives to the compliance measures, monitoring requirements, test methods and procedures of CCR Title 17 §95464, §95469, and §95471. The landfill owner or operator must file a written request with an explanation of the alternative compliance option (ACO) with the Executive Officer (EO), in this case the Placer County Air Pollution Control District (PCAPCD). The EO shall notify the landfill owner or operator in writing of the decision. An ACO Request was submitted to the PCAPCD on February 29, 2012, per CCR Title 17 §95468(a). A formal response to the ACO request was received by the Western Placer Waste Management Authority (WPWMA) on August 7, 2012.

Within this Plan, a brief description of approved ACO requests are included at the end of each section identifying any applicable alternative methods. ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.1.2 Monitoring Area and Grids

Pursuant to CCR Title 17 §95471(c)(1), the entire landfill surface must be divided into individually identified approximately 50,000 ft² grids, which shall be used for both instantaneous and integrated SEM. Appendix C contains an SEM Grid Map for WRSL which was developed in accordance with the requirements of CCR Title 17 §95471(c)(1):

- The walking pattern must be no more than a 25-foot spacing interval and must traverse each grid;

- Per CCR Title 17 §95471(c)(1)(B)(1) and (2), if no SEM exceedances (refer to Sections 2.2 and 2.3 for instantaneous and integrated SEM exceedance limits) were detected in the past *three years prior to the effective date (July 1, 2011)* or are detected *after four consecutive quarterly monitoring events*, the walking pattern spacing may be increased to 100-foot intervals. If SEM exceedances are detected and cannot be remediated within ten calendar days or are detected during a compliance inspection, the landfill must return to a 25-foot spacing interval;
- The sampling path resembles a “serpentine” pattern which traverses the grid; and
- The walking pace should be approximately 100 feet per minute, except when limited by terrain or vegetation.

As of the date of this Plan, WRSL is divided into a total of 206 individual monitoring grids. The SEM Grid Map is located in Appendix C.

The following ACO requests are approved for monitoring areas and grids:

ACO Summary Description	Date Approved
Areas containing only asbestos-containing waste, inert waste, or non-decomposable waste.	August 7, 2012
Areas with a 25% slope or greater can be excluded.	August 7, 2012
Since landfills are not sized in 50,000 square foot increments, grid segments are allowed to be slightly larger or smaller than 50,000 square feet along waste area boundaries and around areas that cannot be subjected to SEM due to safety reasons.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.1.3 Weather Conditions

Monitoring will be performed during typical meteorological conditions. The onsite weather station will be used for monitoring and recording wind speed data during the SEM events and reviewing periods of rainfall. The onsite weather station continuously measures and records wind speed and weather data. The onsite weather station is located at the scale house and can be seen on the Placer County website at:

<http://www.placer.ca.gov/Departments/Facility/facweather.aspx>

The field technician will check the wind speed using a hand-held anemometer. The wind speed will be measured and recorded to ensure the 15 minute averaged speed does not

exceed 10 mph or the instantaneous wind speed does not exceed 20 mph, per the approved ACO (see below).

The field technician will also confirm the surface of WRSL is dry enough to traverse safely and there has been no measured precipitation within the past 24 hours, per the approved ACO (see below). Historical weather data at the onsite weather station will be checked prior to conducting SEM to ensure there has been no measurable precipitation in the preceding 24 hours.

The following ACO requests are approved for weather conditions:

ACO Summary Description	Date Approved
The District will accept alternative wind speeds of the following: If the average wind speed exceeds 10 miles per hour (mph), or the instantaneous wind speed exceeds 20 mph, surface testing can be terminated until the wind speed decreases and is within the acceptable limits.	August 7, 2012
The District will allow surface monitoring when there has been no measureable precipitation in the preceding 24 hours. WPWMA will minimize the times when SEM is conducted with precipitation in the preceding 24 to 72 hours.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.1.4 Frequency

SEM will be performed quarterly (calendar basis) for the portion of the landfill with an active GCCS.

If portions of WRSL are closed or inactive, and if there is no measured instantaneous methane reading greater than 500 ppmv after four (4) consecutive quarterly monitoring periods, WRSL may thereafter perform SEM on an annual basis. Any exceedance of the 500 ppmv limit that cannot be remediated within 10 calendar days will result in a return to quarterly SEM of WRSL.

For a closed or inactive municipal solid waste (MSW) landfill, if there is no measured concentration of 200 ppmv methane or greater from the surface of the landfill, pursuant to CCR Title 17 §95463 (b)(2)(B)(3), WRSL may discontinue surface monitoring. WRSL must, however, submit a WIP report per CCR Title 17 §95470(b)(4) and all instantaneous surface monitoring records for review and approval by the EO within 90 days.

The following ACO requests are approved for SEM frequency:

ACO Summary Description	Date Approved
The District will allow closed areas designated as Modules 1, 2, 10 and 11 to be tested annually. If an exceedance of the limits is measured, then the testing of the affected area shall return to quarterly testing.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.1.5 Recordkeeping

Per CCR Title 17 §95470, instantaneous and integrated SEM records must be stored onsite and be readily accessible in either a paper or electronic format. These records shall be kept for at least five (5) years. These records shall include calibration forms, weather data, the location and reading of the exceedance, as well as the results of the follow-up readings in the subsequent months (whether or not these readings were exceedances), the action taken to repair the area, and the date of the repair.

Alternative recordkeeping requirements may be allowed, following approval of an ACO request, as described in Section 2.1.1. The following ACO requests are approved for recordkeeping:

ACO Summary Description	Date Approved

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.2 Instantaneous SEM Requirements

2.2.1 Instantaneous SEM Procedures

Prior to initiating the instantaneous SEM monitoring event, the field technician will:

- Confirm the surface of WRSL is dry enough to traverse safely and there has been no measured precipitation within the past 24 hours, per the approved ACO (see Section 2.1.3);
- Check the wind speed using a hand-held anemometer. The wind speed will be measured and recorded to ensure the 15 minute averaged speed does not exceed 10 mph or the instantaneous wind speed does not exceed 20 mph, per the approved ACO (See Section 2.1.3);
- Assess the monitoring grids, locate grid boundaries, and on the SEM map identify all inaccessible areas;
- Calibrate the monitoring equipment (see Section 2.2.2); and
- Establish background methane concentrations by waving the wand of the flame ionization detector (FID) upwind and downwind outside the boundary of the landfill from a distance of at least 30 meters from perimeter wells.

During the instantaneous SEM monitoring event, the field technician will employ the following procedures:

- For each monitoring grid, the field technician will follow the traverse walking path and hold the monitoring probe no more than three (3) inches above the landfill surface;
- Continuously record the wind speed using the onsite anemometer and check the instantaneous wind speed periodically with a hand-held anemometer to ensure instantaneous wind speed does not exceed 20 mph, per the approved ACO;
- Document on the Exceedance and Monitoring Log and on the grid map 200 ppmv and 500 ppmv exceedance locations, along with any re-test dates and results (See Sections 2.2.3 and 2.2.4);
- While walking, the probe should be slowly moved from side to side to cover a path of four (4) to six (6) feet wide (approximately two [2] to three [3] feet on each side);
- Any areas where visual observations indicate elevated concentrations of landfill gas (LFG), such as distressed vegetation and cracks or seeps in the cover, will be visually inspected and monitored;
- A constant walking pace of approximately 100 feet per minute should be maintained except when limited by terrain or vegetation; and
- If the pace is interrupted for more than 10 to 15 seconds, the data logging should be paused and the cause should be noted on recordkeeping forms.

The following ACO requests are approved for procedures required prior to instantaneous SEM:

ACO Summary Description	Date Approved
The wand tip of the FID may be held within 3 inches of the top of vegetation in areas where the landfill surface is covered with low-lying vegetation such as grasses, while traversing the grid.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.2.2 Instantaneous SEM Monitoring Equipment

An organic vapor analyzer, FID, or other portable hydrocarbon detector in general conformance with 40 CFR Part 60, Appendix A, Method 21 will be used to determine the methane concentration at each sampling point, pursuant to CCR Title 17 §95471(a). The instrument will be calibrated according to the manufacturer's recommendations prior to each monitoring period and calibration results recorded on the calibration forms located in Attachment A of the Surface Emissions Monitoring Report Template. The SEM Report Template is included in Appendix D.

A hand-held anemometer will be used for monitoring instantaneous wind speed. The onsite weather station will be used to record wind speed and weather data.

Alternative instantaneous SEM monitoring equipment may be allowed following approval of an ACO request, as described in Section 2.1.1. The following ACO requests are approved for instantaneous SEM monitoring equipment:

ACO Summary Description	Date Approved

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.2.3 200 PPMV Methane Instantaneous SEM Exceedances

In accordance with CCR Title 17 §95471(c)(2), the field technician must record instantaneous surface emissions readings ranging from 200 ppmv to 500 ppmv methane using the Instantaneous SEM 200 ppmv Exceedance and Monitoring Log, located in Attachment B of the LMR Surface Emissions Monitoring Report. The LMR Surface Emissions Monitoring Report Template is included in Appendix D of this Plan.

The field technician will record the date, time, grid and instantaneous reading location, methane concentration, and any additional comments. If multiple readings are observed in a given area, the technician will delineate the area with exceedances on the map and document the readings observed. Per CCR Title 17 §95471(c), instantaneous surface emissions from 200 ppmv up to and including 500 ppmv methane readings are only required to be recorded. No remedial action is required.

Alternatives may be approved for instantaneous SEM readings of 200 to 500 ppmv following approval of an ACO request, as described in Section 2.1.1. The following ACO requests are approved for instantaneous SEM readings of 200 to 500 ppmv:

ACO Summary Description	Date Approved

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.2.4 500 PPMV Methane Instantaneous SEM Exceedances

In accordance with CCR Title 17 §95471(c)(2), the field technician must record and remediate instantaneous surface emissions exceeding 500 ppmv methane. The Instantaneous SEM 500 ppmv Exceedance and Monitoring Log, located in Attachment B of the LMR Surface Emissions Monitoring Report Template must be completed for the monitoring event. The LMR Surface Emissions Monitoring Report Template is included in Appendix D of this Plan.

The field technician will record the date, time, grid and exceedance location, mark location on the SEM grid map, exceedance methane concentration, remedial action, and any additional comments.

If an exceedance of 500 ppmv methane is detected during instantaneous surface monitoring, the following procedures for monitoring and remediation will be employed:

Initial monitoring event: Any SEM reading greater than 500 ppmv methane above background will be recorded as an exceedance. The location of the exceedance will be marked and recorded. Cover maintenance or adjustments to the GCCS will be made following the initial monitoring event.

- *First 10-day re-monitoring event:* The locations where initial exceedances were detected will be re-monitored within 10 calendar days of the initial monitoring date. If the location continues to be in exceedance, it must be re-monitored within 10 calendar days. If no exceedance is detected, no further monitoring is required.
- *Second 10-day re-monitoring event:* If a location continues to be in exceedance during the first 10-day re-monitoring, the location must be re-monitored again within 10 calendar days. If no exceedance is detected, no further monitoring is required. Additional corrective action will be taken following the second 10-day re-monitoring.
 - If the second 10-day re-monitoring shows an exceedance (which is considered three times within a quarterly period), a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header piping or control device, and a corresponding timeline for installation may be submitted to the EO for approval.

The following ACO requests are approved for instantaneous SEM readings greater than 500 ppmv:

ACO Summary Description	Date Approved
The District will allow additional time for re-monitoring in cases where the area is dangerous or cannot be safely reached.	August 7, 2012
The District will allow other modifications than just additional wells, as appropriate, to correct exceedances. A corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.3 Integrated SEM Requirements

2.3.1 Integrated SEM Procedures

Prior to initiating the integrated SEM monitoring event, the field technician will:

- Confirm the surface of the landfill is dry enough to traverse safely and there has been no measured precipitation within the past 24 hours, per the approved ACO (see Section 2.1.3);
- Check the wind speed using a hand-held anemometer. The wind speed will be measured and recorded to ensure the 15-minute averaged speed does not exceed 10 mph or the instantaneous wind speed does not exceed 20 mph, per the approved ACO (See Section 2.1.3);
- Assess the monitoring grids, locate grid boundaries, and on the SEM map identify all inaccessible areas;
- Assemble the sampling unit and calibrate the monitoring equipment (see Section 2.3.2); and
- Establish background methane concentrations by waving the wand of the FID upwind and downwind outside the boundary of the landfill from a distance of at least 30 meters from perimeter wells.

During the integrated SEM monitoring event, the field technician will employ the following procedures:

- For each monitoring grid, the field technician will follow the traverse walking path and hold the monitoring probe no more than three inches above the landfill surface;
- Continuously record the wind speed using the onsite anemometer and check the instantaneous wind speed periodically with a hand-held anemometer to ensure instantaneous wind speed does not exceed 20 mph, per the approved ACO;
- While walking, the probe should be slowly moved from side to side to cover a path of four to six feet wide (approximately two to three feet on each side);
- Any areas where visual observations indicate elevated concentrations of LFG, such as distressed vegetation and cracks or seeps in the cover, will be visually inspected and monitored;
- If the pace is interrupted for more than 10 to 15 seconds, the data logging should be paused and the cause should be noted on recordkeeping forms; and
- Record the average methane concentration for each grid as well as any re-test dates and results (See Sections 2.3.3 and 2.3.4).

Alternative procedures required prior to integrated SEM may be allowed following approval of an ACO request, as described in Section 2.1.1. The following ACO requests are approved for procedures required prior to integrated SEM:

ACO Summary Description	Date Approved

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.3.2 Integrated SEM Monitoring Equipment

Similar equipment used in instantaneous monitoring will be used for the integrated monitoring. The meter used will be capable of averaging the methane readings collected across each grid to obtain the integrated reading.

2.3.3 Integrated SEM Results Below 25 PPMV

Per CCR Title 17 §95471(c)(3)(A), the field technician must record the average methane concentration for each grid. The Integrated Surface Monitoring Grid Log, located in Attachment B of the LMR Surface Emissions Monitoring Report Template must be completed for the monitoring event. The LMR Surface Emissions Monitoring Report Template is included in Appendix D of this Plan. The Log must include the average methane concentration for each grid. Grids with methane concentrations greater than 25 ppmv methane must be recorded on a separate exceedance log, as discussed in Section 2.3.4.

Alternatives for integrated SEM exceedances below 25 ppmv methane may be allowed following approval of an ACO request. See Section 2.1.1 for additional information. The following ACO requests are approved for integrated SEM procedures:

ACO Summary Description	Date Approved

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

2.3.4 25 PPMV Integrated SEM Exceedances

In accordance with CCR Title 17 §95471(c)(3), the field technician must record and remediate grids containing integrated surface emissions exceeding 25 ppmv on average. The Integrated SEM 25 ppmv Exceedance and Monitoring Log, located in Attachment B of the LMR Surface Emissions Monitoring Report Template must be completed for the monitoring event. The LMR Surface Emissions Monitoring Report Template is included in Appendix D of this Plan.

The field technician will record the date, time, grid number, mark location on the SEM grid map, average methane concentration for each grid, remedial action, and any additional comments.

If an exceedance of 25 ppmv methane is detected during integrated surface monitoring, the following procedures for monitoring and remediation will be employed:

- *Initial monitoring event:* Any detection of 25 ppmv or more will be recorded as an exceedance. Cover maintenance or adjustments to the GCCS will be made following the initial monitoring event.
- *First 10-day re-monitoring event:* The grid where initial exceedances were detected will be re-monitored within 10 calendar days of the initial monitoring date. If the grid continues to be in exceedance, it must be re-monitored within 10 calendar days. If no exceedance is detected, no further monitoring is required.
- *Second 10-day re-monitoring event:* If a grid continues to be in exceedance during the first 10-day re-monitoring, the grid must be re-monitored again within 10 calendar days. If no exceedance is detected, no further monitoring is required. Additional corrective action will be taken following the second 10-day re-monitoring.
 - If the second 10-day re-monitoring shows an exceedance (which is considered three (3) times within a quarterly period), a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the EO for approval.

The following ACO requests are approved for integrated SEM procedures:

ACO Summary Description	Date Approved
The District will allow additional time for re-monitoring in cases where the area is dangerous or cannot be safely reached.	August 7, 2012
The District will allow other modifications than just additional wells, as appropriate, to correct exceedances. A corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.	August 7, 2012

The ACO requests are included in Appendix A, PCAPCD Correspondence. Detailed ACO requirements are included within Appendix B, Approved Alternative Compliance Options Summary.

LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client recognizing these considerations and limitations. Cornerstone shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product. Cornerstone is not responsible for the impacts of any changes in information, site operations or methods that may change in the future.

APPENDIX A

PCAPCD CORRESPONDENCE

August 7, 2012

Mr. Keith J. Schmidt, P.E.
Western Placer Waste Management Authority
11476 C Avenue
Auburn, CA 95603

Subject: District Response to Proposed Exceptions to SEM Plan

Dear Mr. Schmidt:

The following responds to the proposed alternative compliance options for the Western Regional Sanitary Landfill.

1) Areas Excluded from Collection and Surface Emission Monitoring (SEM)

CCR 95464(a)(1)(F)(1) allows the exclusion of areas containing only asbestos-containing waste, inert waste, or non-decomposable waste.

Placer County Air Pollution Control District (District) accepts and allows the clarifications made in the proposal.

2) Areas Excluded from SEM Where Safety Issues Exist

CCR 95471(c)(1) requires that SEM activities be conducted over the entire landfill surface.

The District accepts and allows the exclusion of areas as described in the proposal. Specifically, the use of 25% slope is allowed.

3) Methane Destruction Compliance Parameter – Flares

CCR 95464(b)(2)(A)(4) requires that an enclosed flare operated as a control device be operated within the parameter ranges established during the initial or most recent source test.

The District believes that it is reasonable that there be a tolerance on the flare operating temperature. If the last source test were used as the minimum operating temperature, then the allowable flare temperature would continually ratchet up with subsequent flare tests. The District accepts the requested 50 degree F below source test request.

However, flare temperature is not the only compliance parameter. The methane destruction efficiency of at least 99 percent by weight of 95464(B)(2)(A)(1) must be demonstrated by annual or triennial source test. The District plans to amend your flare permits to include the annual methane destruction test.

4) Source Test Methods

As specified in CCR 95464(b)(4), annual compliance testing of the control devices specifies the use of the test methods identified in CCR 95471(f), as follows: USEPA Methods 18, 25, 25A, or 25C.

The District intends to add to the flare permits the 99 percent methane destruction requirement and use the test methods required in the permits. So the SEM should state that the test methods are called out in the permits.

The Landfill Regulation requires flare testing annually until the destruction limit is achieved three years consecutively, and then the testing frequency can be extended to three years. The testing frequency in the District permits is biennially. Once the three consecutive years of meeting the methane destruction requirement is achieved, we intend to require the methane testing biennially with the other flare testing.

5) Timeline for Leak Repairs

CCR 95468(a)(2) allows additional time for leak repairs at landfills with procurement and delivery delays for necessary parts to complete the repair, or adverse weather conditions that impede work.

WPWMA seems to be requesting a blanket ACO for times when requirements cannot be implemented within the timeline due to procurement or weather issues. This request is denied. The District prefers to initially have these requests be made specific to the individual incident. If there are numerous repetitive incidents, the District may consider a blanket ACO for this particular situation.

6) SEM Procedures

CCR95469(a) requires that owners or operators of landfills with a GCCS conduct instantaneous and integrated SEM quarterly using the procedures specified in CCR 95471(c).

Article 95471(c) does not specify whether the instantaneous and integrated SEMs are to be done individually or simultaneously. Either way is acceptable to the District as long as the SEM meets the requirements of the article.

7) Re-monitoring After Instantaneous and Integrated Exceedances

CCR95469(a)(1)(B) and (a)(2)(B) require corrective action be taken by the owner or operator such as, but not limited to, cover maintenance or repair, or well vacuum adjustments and location re-monitored within ten calendar days of a measured exceedance of the instantaneous and/or integrated surface emission standards.

The District will allow additional time for re-monitoring in cases where the area is dangerous or cannot be safely reached, as requested.

8) SEM Remediation after Third Instantaneous and/or Third Integrated SEM Exceedance

CCR 95469(a)(1)(B)(2) and (a)(2)(B)(2) require the installation of a new or replacement well within 120 calendar days of detecting a third exceedance of the Instantaneous SEM limit of CCR 95465(a)(1) and/or the Integrated SEM limit of CCR 95465(a)(2).

The District will allow other modifications than just additional wells, as appropriate, to correct exceedances. A corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.

9) SEM Monitoring Height

CCR 95471(c)(1)(A) requires that SEM be conducted by holding the probe within three (3) inches of the landfill surface while traversing the grid.

If an area not clear of surface vegetation cannot be found in the walking path, the District will allow the top of the vegetation to be considered the landfill surface and the probe be held within three inches vertical of the vegetation surface.

10) Wellhead Pressure Requirements

CCR 95469(c) requires corrective action if monthly wellhead pressure monitoring results in a positive pressure reading except as exempted in CCR 95464(d) (well raising) and CCR 95464(e) (temporary shutdown in order to repair the components, due to catastrophic events such as earthquakes, to connect new LFG collection system components to the existing system, to extinguish landfill fires, or to perform construction activities.)

The WPWMA is requesting to allow temporary exemption from well head pressure requirements due to potential subsurface oxidation, well damage, poor LFG quality, or other reasons as documented by the WPWMA not listed in 95469. The District will allow these additional exemptions provided the event is described to the District in writing and the District concurs.

11) Wellhead Pressure Exceedance Corrective Action

CCR 95469(c)(2) requires further corrective actions be initiated, including, but not limited to, any necessary expansion of the GCCS, to correct any positive pressure readings if positive pressure readings cannot be corrected within 15 days after the initial positive pressure reading. CCR 95469(c)(3) requires corrective action, including any necessary expansion of the GCCS, to correct any positive pressure readings within 120 days of the initial positive pressure reading.

The District will consider requests for alternative engineering solutions to be evaluated and allow an alternative timeline to consider and implement alternative solutions. This will require concurrence by the District for the engineering study and implementation.

12) Wind Speed

CCR 95471(c)(1)(C) requires that SEM be terminated when the average wind speed exceeds five miles per hour (mph) or the instantaneous wind speed exceeds 10 mph. The Executive Officer may approve alternatives to this wind speed SEM termination for MSW landfills consistently having measured winds in excess of these specified limits.

The District agrees that the landfill is located in a windy area and will accept the alternative wind speeds of 10 mph for average wind and 20 mph for instantaneous wind speed.

13) Measurable Precipitation

CCR 95471(c)(1)(D) requires that SEM be conducted only when there has been no measurable precipitation in the preceding 72 hours.

The District will allow SEM to be conducted only when there has been no measurable precipitation in the preceding 24 hours, as requested. WPWMA shall minimize the times when SEM is conducted with precipitation in the preceding 24-72 hours.

14) Source Testing Schedule

CCR 95464(b)(4) requires that annual source testing be conducted no later than 45 days after the anniversary of the initial source test.

WPWMA is requesting that the control device source test be conducted with the District source testing of the flares for the Title V permit on the timing for the Title V tests without regard to the 45 day requirement. The District denies this request. The CCR 95464(b)(4) testing is initially required annually, while the Title V testing frequency is biennially. In years when both types of testing are required, the testing can be combined and scheduled to meet the 45 day requirement.

15) Grid Area – Near Landfill Waste Boundaries

CCR 95471(c)(1) requires that the entire surface of the landfill be divided up into individually identified 50,000 square foot grids which would be used for both instantaneous and integrated SEM.

Since landfills are not sized in 50,000 square foot increments, the District will allow, along waste area boundaries and around areas that cannot be subjected to SEM due to safety reasons, grid segments that are slightly larger or smaller than 50,000 square feet.

16) Grid Sizes – Areas Excluded from SEM

See ACP (15) above.

17) Closed Areas – Reduction to Annual SEM

In accordance with CCR 95469(a)(3), an owner or operator of a closed or inactive MSW landfill, or any closed or inactive area on an active MSW landfill that can demonstrate that in the three years before the effective date of this subarticle that there were no measured exceedances of the limits specified in 95465 by annual or quarterly monitoring may monitor annually.

The District will allow closed areas designated as Modules 1, 2, 10, and 11 to be tested annually. If an exceedance of the limits is measured, then the testing of the affected area shall return to quarterly testing.

18) Exemption from Compliance with Sections 95464 through 95470

In accordance with 95463(b)(2)(B)(3), if there is no measured concentration of methane of 200 ppmv or greater from the surface of a closed or inactive MSW landfill, the requirements of sections 95464 through 95470 no longer apply provided that the following information is submitted to and approved by the EO within 90 days:

- a. Waste-in-Place report
- b. All instantaneous monitoring records.

WPWMA is requesting that Modules 1, 2, 10, and 11 be exempted from compliance with these noted sections. This request is denied at this time. The request will be granted once the measured concentration of methane does not exceed 200 ppmv for four consecutive quarters.

19) Increase in Walking Pattern Spacing

Per CCR 9547(c)(1)(B)(1) and (2), if no SEM exceedances were detected in the past three years prior to the effective date (July 1, 2011) or are detected after four consecutive quarterly monitoring events, the walking pattern spacing may be increased to 100-foot intervals. If SEM exceedances are detected and cannot be remediated within ten calendar days or are detected during a compliance inspection, the WPWMA must return to a 25-foot spacing interval.

No ACO is required for increasing the walking pattern spacing for grids that have had no exceedances as described above. WPWMA should keep records to justify the larger walking pattern.

PROPOSED CLARIFICATIONS

1) Continuous Routing of LFG/Operation of GCCS

CCR 95464(b)(1)(A) requires that the owner or operator of a GCCCS "Route the collected gas to a gas control device or devices, and operate the gas collection and control system continuously except as provided in CCR 95464(d) and (e)".

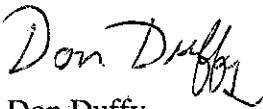
The District will accept WPWMA's interpretation, consistent with the NSPS, that GCCS downtime of less than five days and/or control device downtime of less than one hour not be considered reportable deviations, and therefore only subject to the SSM reporting requirements.

2) Wellhead Negative Pressure Requirements

CCR 95464(c) requires that wellheads be operated under negative pressure except as noted in CCR 95464(c)(d) or (e). WPWMA's interpretation is that this applies to wells within the limit of the waste and not to perimeter wells or soil vapor extraction wells which are not in refuse and are not extracting LFG, consistent with the NSPS. The District will concur with this interpretation.

If you have any questions regarding this matter, please contact me at (530) 745-2336.

Sincerely,



Don Duffy
Air Pollution Control Engineer

APPENDIX B
APPROVED ALTERNATIVE COMPLIANCE OPTIONS
SUMMARY

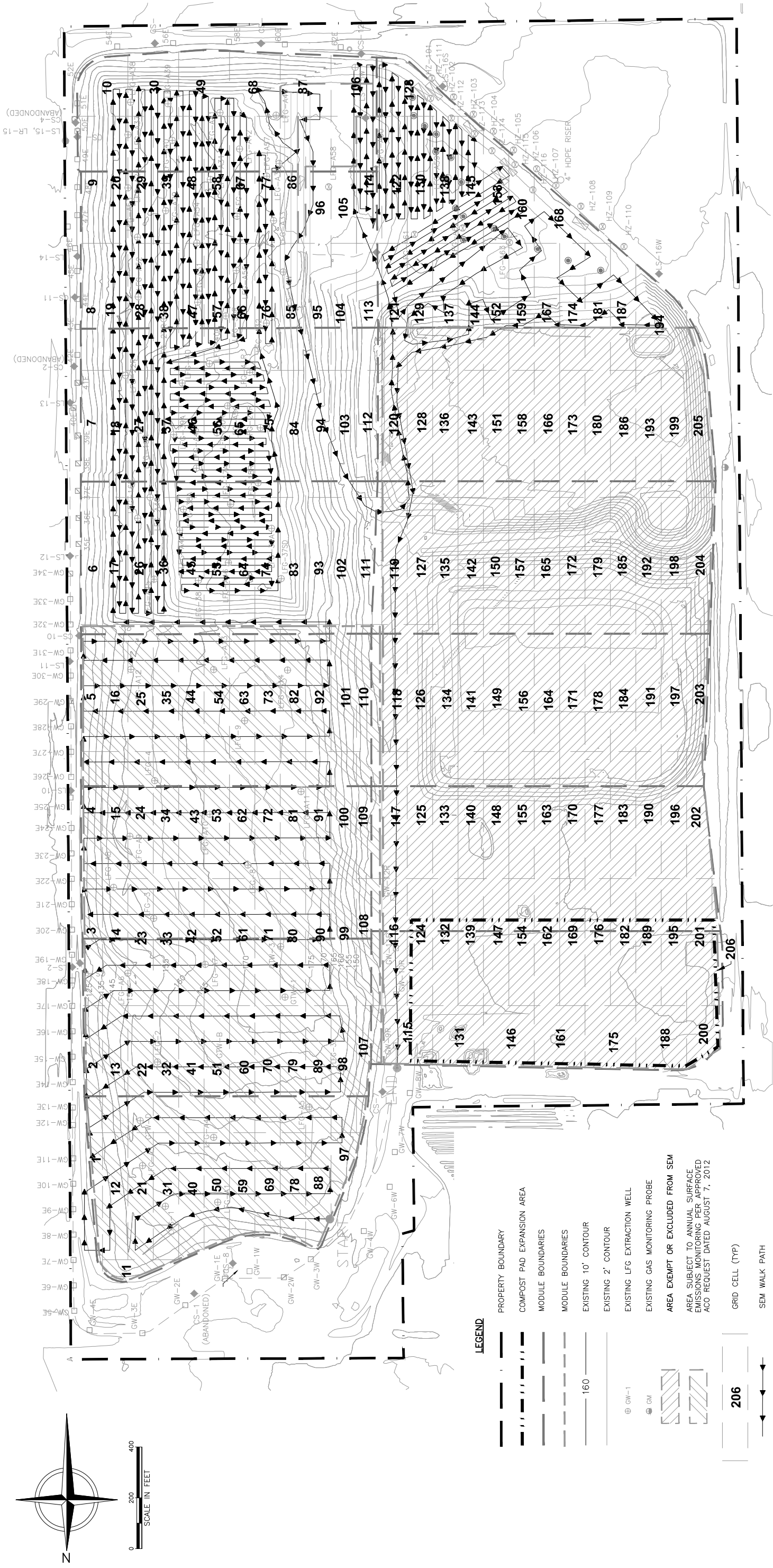
WESTERN REGIONAL SANITARY LANDFILL APPROVED ALTERNATIVE COMPLIANCE OPTIONS SUMMARY

Title 17 Section	Requirement	Alternative	Approval Date
95464(a)(1)(F)(1)	Any areas of the landfill that contain only asbestos-containing waste, inert waste or non-decomposable solid waste may be excluded from collection.	Any areas of the landfill that contain only asbestos-containing waste, inert waste or non-decomposable solid waste may be excluded from collection and surface emission monitoring.	August 7, 2012
95471(c)(1)	The entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated surface emissions monitoring.	The District accepts and allowed the exclusion of areas of greater than 25% slope.	August 7, 2012
95469(a)(1)(B) and (a)(2)(B)	For integrated and instantaneous monitoring corrective action is to be taken within ten calendar days of the measured exceedance of the SEM standards.	The District will allow additional time for re-monitoring in cases where the area is dangerous or cannot be safely reached.	August 7, 2012
95469(a)(1)(B)(2) and (a)(2)(B)(2)	For integrated and instantaneous monitoring a new or replacement will be installed within 120 days of detection of a third exceedance of the SEM limit.	The District will allow other modifications than just additional wells, as appropriate, to correct exceedances. A corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.	August 7, 2012
95471(c)(1)(C)	Surface testing must be terminated when the average wind speed exceeds five miles per hour or the instantaneous wind speed exceeds 10 miles per hour.	The District will accept the alternative wind speeds of 10- miles per hour for average wind and 20 miles per hour for instantaneous wind speed.	August 7, 2012

Title 17 Section	Requirement	Alternative	Approval Date
95471(c)(1)(D)	Surface emissions testing must be conducted only when there has been no measurable precipitation in the preceding 72 hours.	The District will allow SEM to be conducted only when there has been no measurable precipitation in the preceding 24 hours. WPWMA shall minimize the times when SEM is conducted with precipitation in the preceding 24 to 72 hours.	August 7, 2012
95471(c)(1)	The entire landfill surface must be divided into individually identified 50,000 square foot grids. The grids must be used for both instantaneous and integrated surface emissions monitoring.	Since landfills are not sized in 50,000 square foot increments, the District will allow along waste area boundaries and around areas that cannot be subjected to SEM due to safety reasons, grid segments that are slightly large or smaller than 50,000 square feet.	August 7, 2012
95469(a)(3)	An owner or operator of a closed or inactive MSWQ landfill, or any closed or inactive areas on an active MSW landfill that can demonstrate that in the three years before the effective date of this subarticle there were no measured exceedances of the limits...by annual or quarterly monitoring may monitor annually.	The District will allow closed areas designated as Modules 1, 2, 10 and 11 to be tested annually. If an exceedance of the limits is measured, the testing of the affected area shall return to quarterly testing.	August 7, 2012

APPENDIX C

INSTANTANEOUS AND INTEGRATED SEM EVENT MAP



WESTERN REGIONAL SANITARY LANDFILL
PLACER COUNTY, CALIFORNIA

SHEET NO.

→

PROJECT NO.
110343



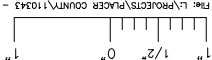
PREPARED BY:
CORNERSTONE ENVIRONMENTAL GROUP, LLC

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
DATE OF ISSUE						
05/18/2016						
DRAWN BY			RAW		ML	
DESIGNED BY			JR		CWY	
APPROVED BY						

NOTES:

1. TOPOGRAPHY COMPILED BY PHOTOGRAMMETRIC METHODS BY THE BASE MAPPING COMPANY LTD. DATE OF PHOTOGRAPHY: JULY 31, 2013.
2. FEATURES, CONTOURS, AND ELEVATIONS ON THESE BASE MAPS ARE APPROXIMATE INDICATIONS OF CURRENT AND FUTURE CONDITIONS.
3. SOURCE OF 2012 AS-BUILT DATA: AMERICAN ENVIRONMENTAL GROUP LTD. SUPPLEMENTAL 2013 GCS IMPROVEMENTS AS-BUILT PIPING AND WELL LOCATIONS PER FIELD SURVEY PERFORMED BY F3 AND ASSOCIATES, DATED NOVEMBER 20, 2013 AND NOVEMBER 25, 2013. SUPPLEMENTAL GCS LOCATIONS, INCLUDING HORIZONTAL COLLECTORS HZ-111 THROUGH HZ-116, PER FIELD OBSERVATIONS PERFORMED IN JANUARY 2014.
4. MONITORING DATES:
5. TECHNICIANS:

1" 1/2" 0"



APPENDIX D

LMR SURFACE EMISSIONS MONITORING REPORT TEMPLATE

DATE

Mr. Keith Schmidt
Western Regional Sanitary Landfill
3033 Fiddymment Road
Roseville, CA 95648

Re: **QUARTER/YEAR** Landfill Methane Rule Surface Emissions Monitoring Report
Western Regional Sanitary Landfill

Dear Mr. Schmidt:

This report for the Western Regional Sanitary Landfill (WRSL) contains the results of the **QUARTER/YEAR** Integrated and Instantaneous Landfill Methane Rule (LMR) Surface Emissions Monitoring (SEM). This monitoring was conducted in accordance with the requirements set forth in the California Code of Regulations (CCR) Title 17, Division 3, Chapter 1, Subarticle 6 (Title 17), as mandated by Assembly Bill (AB) 32 LMR. All monitoring and reporting was completed in accordance with the LMR WRSL SEM Plan, dated May 2016, prepared by Cornerstone Environmental Group, LLC (Cornerstone).

An Alternative Compliance Option (ACO) Request was submitted to the Placer County Air Pollution Control District (PCAPCD) on February 29, 2012, per CCR Title 17 §95468(a). A formal response to the ACO request was received by the Western Placer Waste Management Authority (WPWMA) on August 7, 2012.

The following is a summary of the monitoring results completed for **QUARTER/YEAR** on **DATE**.

Instantaneous and Integrated Surface Monitoring Procedures

The surface of the WRSL disposal area has been divided into 206 monitoring grids – approximately 50,000 square feet each. The Instantaneous and Integrated SEM was conducted using a flame ionization detector (FID) which meets or exceeds all guidelines set forth in the LMR SEM CCR Title 17 §95471(a). The FID was calibrated prior to use in accordance with the United States Environmental Protection Agency (USEPA) Method 21. The Instantaneous SEM procedures followed the requirements of CCR Title 17 §95471(c)(2). The Integrated SEM was conducted using an FID with averaging capabilities to average the

methane readings measured while walking the surface of each grid. Calibration logs were completed by the field technician performing the SEM and a copy of the calibration forms are included in Appendix A of this report.

Weather Conditions during Monitoring

The wind speed was recorded and averaged in 15-minute intervals using an onsite anemometer with a continuous recorder for the entire duration of the monitoring event. Pursuant to the approved ACO request, if the average wind speed exceeded 10 miles per hour (mph), or the instantaneous wind speed exceeded 20 mph, surface testing was terminated until the wind speed decreased and was within the acceptable limits. During these monitoring events, the instantaneous and integrated wind speeds were within the required limits. Pursuant to the approved ACO request, surface monitoring was not conducted within 24 hours of measureable precipitation. Weather data collected during surface monitoring is available onsite, upon request.

Instantaneous Surface Monitoring

Field personnel walked the surface of the Landfill following the walking pattern as depicted in Attachment C, which traverses each monitoring grid. Pursuant to the approved ACO areas of the Landfill slopes greater than 14 degrees (25 percent) and areas only containing asbestos-containing waste, inert waste and/or non-decomposable waste were not monitored. As allowed by CCR Title 17 §95466, areas of the Landfill with active operations and areas of the landfill surface where the landfill cover materials have been removed and refuse has been exposed for the purpose of installing, expanding, replacing, or repairing components of the landfill gas, leachate or gas condensate collection and removal system, were excluded.

While walking, the wand tip of the FID was held within three (3) inches of the landfill surface while traversing the grid. Per an approved ACO request, the wand tip of the FID was held within 3 inches of vegetation in areas where the landfill surface is covered with low-lying vegetation such as grasses, while traversing the grid. All instantaneous surface monitoring was performed in accordance with Title 40 Code of Federal Regulation (CFR) §60.755 (c)(3) and CCR Title 17 §95471(c).

Any instantaneous surface readings of methane over 500 parts per million by volume (ppmv) methane were recorded and marked on the SEM Map, and Exceedances and Monitoring Log (Appendix B) and flagged for remediation. Any instantaneous surface readings of methane from (and including) 200 to 500 ppmv were recorded and marked on the SEM Map and the Exceedances and Monitoring Log (Appendix B). Readings between 200 to 500 ppmv are not an exceedance of CCR Title 17 §95465(a)(1-2), therefore no further action is required. The SEM Map is included in Appendix C of this report. WRSL personnel were informed of the SEM results immediately following monitoring.

Results of **QUARTER/YEAR** Instantaneous SEM

Readings between 200 ppmv and 500 ppmv Methane

There were **INSERT** readings between 200 ppmv and 500 ppmv methane detected during the initial monitoring event conducted on **DATE**. See Appendix B, Instantaneous SEM 200 ppmv Methane Readings and Monitoring Log, for details. Pursuant to CCR Title 17 §95471(c), instantaneous surface emissions exceeding 200 ppmv but below 500 ppmv methane are required to be recorded, however no remedial action is required.

500 ppmv or Higher Methane Exceedances

There was **INSERT** exceedance, in Grid **#**, of 500 ppmv methane detected on **DATE**. See Appendices B and C, Instantaneous SEM 500 ppmv Methane Exceedances and Monitoring Log, and SEM Map, for details.

[If no exceedances detected: Since there were no location with exceedances detected during the initial monitoring event, ten-day re-monitoring and thirty-day follow-up monitoring events were not required.]

First Ten-day Re-monitoring Results

The first ten-day re-monitoring event was completed on **DATE**. Upon re-monitoring, Grid **#** was found to be in compliance of 500 ppmv methane.

[If no exceedances detected: No exceedances (methane readings above 500 ppmv) were detected during this monitoring event.]

Second Ten-day Re-monitoring Results

On **DATE**, field personnel completed a 30-day follow-up monitoring of the exceedance of 500 ppmv methane in Grid **#** in accordance with the LMR SEM Regulations. Results indicated that no further exceedance of the 500 ppmv limit remained.

Integrated Surface Monitoring

Field personnel walked the surface of the Landfill following the walking pattern which traverses each monitoring grid, as depicted in Appendix C. Pursuant to the approved ACO areas of the Landfill slopes greater than 14 degrees (25 percent) and areas only containing asbestos-containing waste, inert waste and/or non-decomposable waste were not monitored. As allowed by CCR Title 17 §95466 areas of the Landfill with active operations and areas of the landfill surface where the landfill cover materials have been removed and refuse has been exposed for the purpose of installing, expanding, replacing, or repairing components of the landfill gas, leachate or gas condensate collection and removal system, were excluded.

The integrated surface sampling equipment consisted of an FID which meets or exceeds all guidelines set forth in the CCR Title 17 §95471(a). The FID was calibrated prior to use in accordance with the USEPA Method 21. The FID averaged the methane readings observed while walking the surface of each grid. During sampling, the probe was held within 3 inches of the landfill surface and any vegetation in areas where the landfill surface is covered with low-lying vegetation, as allowed by the approved ACO request.

The field technician traversed the grid walking path at a pace of approximately 100 feet per minute. Grids with results greater than 25 ppmv methane were recorded, marked on the SEM map, and flagged for remediation. The SEM Map is included in Appendix C of this report. WRSL personnel were informed of the SEM results immediately following monitoring.

Results of QUARTER/YEAR Integrated SEM

The average methane concentration of each grid was recorded during the monitoring event. See Appendix C, Integrated Surface Monitoring Grid Log.

There were INSERT grids (Grids #, #, and #) with exceedances of 25 ppmv or higher methane detected during the initial monitoring event conducted on DATE.

[If no exceedances detected: Since there were no location with exceedances detected during the initial monitoring event, no further monitoring is required.]

See Appendices B and C, Integrated SEM 25 ppmv Exceedances and Monitoring Log, and SEM Map, for details.

First Ten-day Re-monitoring Results

The first ten-day re-monitoring event was completed on DATE.

If exceedances detected: Upon re-monitoring, all INSERT grids remained in exceedance of 25 ppmv methane.

Second Ten-day Re-monitoring Results

The second ten-day re-monitoring event was completed on **DATE**.

[If no exceedances detected: No exceedances (methane readings above 25 ppmv) were detected during this monitoring event.]

If exceedances detected: All **INSERT** grids continued to be in exceedance of 25 ppmv methane.

Pursuant to CCR Title 17 §95469(a)(2)(B)(2), the owner and operator must install a new or replacement well as determined to achieve compliance no later than 120 calendar days after detecting the third exceedance. However, in accordance with the approved ACO, the District will allow other modifications than just additional wells such as upgrading the blower, header pipes or control device, as appropriate to correct exceedances, and a corresponding alternative compliance timeline beyond 120 days will be allowed, as appropriate.

All monitoring was completed in accordance with the 40 CFR §60.753 (d) and the LMR SEM CCR Title 17 requirements. If you have any questions regarding this report, please do not hesitate to contact me at **PHONE NUMBER**.

Sincerely,

Cornerstone Environmental Group, LLC

Enclosures: Appendix A - Calibration Records
 Appendix B - Exceedances and Monitoring Log
 Instantaneous SEM 200 ppmv Exceedance and Monitoring Log
 Integrated SEM Monitoring Grid Log
 Integrated SEM 25 ppmv Exceedances and Monitoring Log
 Appendix C - SEM Event Map
 Instantaneous and Integrated SEM Map

APPENDIX A

CALIBRATION RECORDS

CALIBRATION PRECISION TEST RECORD

Date: _____

Expiration Date (3 months): _____

Time: _____ AM _____ PM

Instrument Make: _____ Model: _____ S/N: _____

Measurement #1:

Meter Reading for Zero Air: _____ ppm (a)

Meter Reading for Calibration Gas: _____ ppm (b)

Measurement #2:

Meter Reading for Zero Air: _____ ppm (c)

Meter Reading for Calibration Gas: _____ ppm (d)

Measurement #3:

Meter Reading for Zero Air: _____ ppm (e)

Meter Reading for Calibration Gas: _____ ppm (f)

Calculate Precision:

$$\frac{|(500) - (b)| + |(500) - (d)| + |(500) - (f)|}{3} \times \frac{1}{500} \times 100$$

Less than 0.33% (must be < than 10%)

Performed By: _____

RESPONSE TIME TEST RECORD

Date: _____

Expiration Date (3 months): _____

Time: _____ AM _____ PM

Instrument Make: _____ Model: _____ S/N: _____

Measurement #1:

Stabilized Reading Using Calibration Gas: _____ ppm
90% of the Stabilized Reading: _____ ppm
Time to Reach 90% of Stabilized Reading after
switching from Zero Air to Calibration Gas: _____ seconds (a)

Measurement #2:

Stabilized Reading Using Calibration Gas: _____ ppm
90% of the Stabilized Reading: _____ ppm
Time to Reach 90% of Stabilized Reading after
switching from Zero Air to Calibration Gas: _____ seconds (b)

Measurement #3:

Stabilized Reading Using Calibration Gas: _____ ppm
90% of the Stabilized Reading: _____ ppm
Time to Reach 90% of Stabilized Reading after
switching from Zero Air to Calibration Gas: _____ seconds (c)

Calculate Response Time:

$$\frac{(a) + (b) + (c)}{3} = \text{_____ seconds (must be less than 30 seconds)}$$

Performed By: _____

CALIBRATION PROCEDURE AND BACKGROUND DETERMINATION REPORT

Landfill Name: Western Regional Sanitary Landfill Date: _____

Time: _____ AM _____ PM

Instrument Make: _____ Model: _____ S/N: _____

Calibration Procedure

1. Allow instrument to internally zero itself while introducing zero air.
2. Introduce the calibration gas into the probe.

Stable Reading = _____ ppm

3. Adjust meter to read 500 ppm.

Background Determination Procedure

1. Upwind Reading (highest in 30 seconds): _____ ppm (a)
2. Downwind Reading (highest in 30 seconds): _____ ppm (b)

Calculate Background Value:

$$\frac{(a) + (b)}{2} \quad \text{Background} = \quad \text{_____ ppm}$$

Performed By: _____

APPENDIX B
EXCEEDANCES AND MONITORING LOGS

WESTERN REGIONAL SANITARY LANDFILL INSTANTANEOUS SURFACE EMISSIONS MONITORING
INSTANTANEOUS SEM 200 PPMV EXCEEDANCES AND MONITORING LOG

Grid #/Location	Brief Description	Initial Monitoring Event		Comments
		Monitoring Date/Time	Exceedance (ppmv)	

ppmv = parts per million by volume

Pursuant to CCR Title 17 §95471(c), instantaneous surface emissions exceeding 200 ppmv but below 500 ppmv are required to be recorded. No remedial action is required.

**WESTERN REGIONAL SANITARY LANDFILL INSTANTANEOUS SURFACE EMISSIONS MONITORING
INSTANTANEOUS SEM 500 PPMV EXCEEDANCES AND MONITORING LOG**

[illegible]

**WESTERN REGIONAL SANITARY LANDFILL
INTEGRATED SURFACE EMISSIONS MONITORING LOG**

Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
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51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					

Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
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86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					

Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
97					
98					
99					
100					
101					
102					
103					
104					
105					
106					
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Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
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Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
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Grid Number	Date	Start Time	Stop Time	Average Methane Concentration (ppmv)	Comments
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ppmv = parts per million by volume

WESTERN REGIONAL SANITARY LANDFILL INSTANTANEOUS SURFACE EMISSIONS MONITORING INTEGRATED SEM 25 PPMV EXCEEDANCES AND MONITORING LOG

[illegible]

APPENDIX C

INSTANTANEOUS AND INTEGRATED SEM EVENT MAP

EXHIBIT K

PROCEDURES FOR ARBITRATION

A. Request for Arbitration

If a question or dispute should arise, WPWMA or Contractor may indicate its desire to resolve the matter through arbitration proceedings by service of a written Request for Arbitration setting forth the issues to be arbitrated and the general contentions relating to those issues of the party serving the Request.

If a Request is made by Contractor, it shall be served in accordance with the notice provisions in Section 9.9 of the Agreement.

If the party upon which a Request for Arbitration is served wishes to submit the matter to arbitration it shall, within 30 days after service of the Request, serve a Notice of Election to become a party to arbitration and a Response to the Request, setting forth its position and general contentions with respect to the issues set forth in the Request. In this case, the arbitration will proceed in accordance with the procedures herein.

If the party upon which a Request for Arbitration is served does not wish to submit the matter to arbitration, it shall, within 30 days after service of the Request, serve a Notice of Refusal to Arbitrate. If no action is taken within the 30 days, it shall be presumed that the party upon which the Request for Arbitration has been served does not want to arbitrate and no future proceedings will occur under the procedures herein.

B. Number and Appointment of Arbitrators

All arbitration proceedings shall be conducted by a single arbitrator selected by Contractor and WPWMA. The arbitrator shall be selected within 45 days after the service of the Request for Arbitration. If the Parties to the arbitration cannot agree on an arbitrator within 45 days, either party may petition the California Superior Court in and for Placer County for the appointment of an arbitrator.

C. Guidelines for Qualification of Arbitrators

The Parties acknowledge that the arbitrator should have experience in one or more of the following fields: construction, civil engineering, solid waste disposal engineering, materials recovery facility operation and management, utility accounting methods and practices. The Parties to the arbitration shall use their best efforts to agree in advance upon the qualifications of any arbitrator to be appointed by the Superior Court.

D. Powers of Arbitrator; Conduct of Proceedings

Except as hereinafter provided, arbitrations shall be conducted by and in accordance with the commercial arbitration rules of the American Arbitration Association. Unless waived in writing by the Parties to the arbitration, the notice of hearing served by the arbitrator shall not be less than 90 days. The arbitrator shall not base his or her award on information not obtained at the hearing. The arbitrator shall have the power to issue orders mandating compliance with the terms of this Agreement or enjoining violations of this Agreement only if both Parties agree to make the decision of the arbitrator binding.