

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE COMPLIANCE DIVISION PERMIT APPLICATION PROCESSING AND CALCULATIONS	PAGES 7	PAGE 2
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5. FOOD WASTE AND WET MANURE PLUG-FLOW MIX DIGESTER TANK, CONCRETE, 195' L. X 60' W. X 14' D., BELOW GROUND LEVEL, WITH A GAS-TIGHT CONCRETE COVER, WITH ASSOCIATED MIXERS, CIRCULATION AND EFFLUENT PUMPS, FOAM SUPPRESSION SYSTEM, AND FIVE (5) SHELL AND TUBE HEAT EXCHANGERS.
6. DIGESTER GAS HANDLING SYSTEM WITH ASSOCIATED PUMPS, PIPING, AND WATER TRAPS, CONSISTING OF:
 - A. DIGESTER GAS HOLDER (GAS BAG), 424 CUBIC FEET.
 - B. PRIMARY IRON SPONGE DESULFURIZATION SYSTEM WITH TWO IRON SPONGE VESSELS WITH DEMISTER (NEAR CONICAL ROOF DIGESTERS).
 - C. TWO (2) SECONDARY OPTIONAL IRON SPONGE VESSELS WITH DEMISTER (NEAR PLUG FLOW DIGESTER).
 - D. CONDENSATE KNOCK OUT TANK(S).
 - E. TWO (2) LOW PRESSURE DIGESTER GAS TANKS, 1,000 CUBIC FEET EACH.
 - F. GAS BLOWERS, WITH DEMISTER, SUPPLYING DIGESTER GAS FOR BOILERS, STAND-BY FLARE, OR OTHER PERMITTED COMBUSTION EQUIPMENT.
 - G. CONDENSATE KNOCK OUT TANK(S).
 - H. THREE (3) HIGH PRESSURE GAS COMPRESSORS, FOR IC ENGINES.
 - I. TWO (2) DIGESTER GAS TANKS, 4,120 CUBIC FEET EACH, FOR THE IC ENGINES.
7. STORAGE TANK, DIGESTED SOLID EFFLUENT, BELOW GROUND LEVEL, 53,957 GALLONS.
8. DIGESTER SOLIDS DEWATERING SYSTEM (CONTAINED INSIDE THE FOOD WASTE AND MANURE RECEIVING AND DEWATERING BUILDING) CONSISTING OF:
 - A. TWO (2) FOOD WASTE/MANURE PUMPS.
 - B. POLYMER FEED AND CONTROL SYSTEM, TO MAINTAIN WATER FLOW RATE AND SELECTED DILUTE POLYMER CONCENTRATION IN FEED SOLUTION.
 - C. TWO (2) ROTARY PRESSES.
 - D. TWO (2) FLOCCULATORS, WITH SUMP PUMP.
 - E. TWO POLYMER TANKS.
 - F. ONE SCREW CONVEYOR FOR DISCHARGE AND A LOADING CONVEYOR.
9. STORAGE TANK, FILTRATE, 140,000 GALLON CAPACITY, TO BE DISCHARGED TO INLAND EMPIRE BRINE LINE (IEBL) PREVIOUSLY KNOWN AS SANTA ANA RIVER INTERCEPTOR (SARI).
10. SLUDGE CAKE (BIOSOLIDS) FROM DEWATERING EQUIPMENT FOR REMOVAL TO COMPOSTING OR OTHER FACILITY.

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Background/Process Description

The above application was submitted on December 23, 2011 for expedited permit processing (XPP) for the alteration/modification of a food waste/ dairy manure processing plant. The previously issued permits for this facility include Permit to Operate F72331, A/N 388300 issued December 3, 2004, and subsequent Permit to Construct A/N 451067 issued August 28, 2006. A/N 530245 shall supersede A/N 451067.

Permit to Construct A/N 451067 allowed a maximum of 90 wTPD of food waste and a maximum of 615 wTPD of dairy manure, 705 wTPD of feedstock total. The processing plant permit was modified under A/N 530245 to exchange the permitted throughput limits of manure and food waste feedstock to the digesters and to keep the overall maximum throughput to the digesters. This change was requested since many local dairies have moved to the central valley and initiatives for landfill diversion are under way. The applicant requested to change the maximum food waste limit to 615 wTPD (approximately 165,000 gallons per day) and the maximum manure limit to 90 wTPD (approximately 25,000 gallons per day). The 1400 ppm hydrogen sulfide concentration limit for the raw digester gas from the permit was modified to allow the facility operating flexibility by complying with the 1400 ppm H₂S concentration limit or instead not conducting anaerobic digestion in the plug-flow digester and venting the pressure relief valves of the two digesters to activated carbon vessel(s) to address any H₂S or toxic emissions.

Vacuum trucks containing food waste and dairy manure enter the facility are weighed on the in-ground truck scale. The waste weight is recorded daily. Then the trucks will proceed to pump the food waste in the four 15,000 gallon tanks through a hose connected to one of three of the food waste tanks (T-200, T-300, and T-400). The contents of these three tanks can be blended in the fourth food waste tank (T-100) in various amounts to provide a stable and viable waste type for the anaerobic digesters. The contents of tank T-100 are pumped directly to the two European style continuously mixed anaerobic digesters to produce digester gas. Manure will either be pumped directly to the digesters or sent to the receiving pits/mix tanks in the receiving/dewatering building. The receiving/dewatering building is vented to a biofilter (A/N 536399) for odor and air pollution control. The four food waste tanks and a digested effluent liquid waste processing system (A/N 536401) will be vented to the biofilter through the receiving/dewatering building. There is a sump below the four food waste tanks to collect any spilled food waste, which can then be pumped back into the tanks. These four tanks and pumps are capable of accepting about 4 truckloads of waste per day. It takes about 45 minutes to an hour to discharge the waste from the truck into the four tanks. The waste in the four tanks may also be pumped into the two underground mix tanks as known as the receiving pits located on the southern center part of the receiving/dewatering building. These two mix tanks can also be pumped into the two European digesters or the plug-flow mix tank digester, as well. The two mix tanks are capable of accepting a larger capacity of waste, approximately 40 truckloads of waste per day, with a 150 gallons/min discharge rate from the trucks. The faster waste accepting rate of the two mix tanks/ receiving pits, compared to the four food waste tanks, allows the facility more operational flexibility. If the incoming waste trucks are pressurized they could be completely discharged in 10 minutes into the two mix tanks/receiving pits.

Digester gas produced in the two European digesters is sent from the top of the digesters to a biogas holding tank with a bladder (gas bag), before being sent to the iron sponge for H₂S reduction in the digester gas. The biogas holding tank with a bladder serves as a pressure balance to ensure the digesters aren't under vacuum and cave in. Condensate from the iron sponge and bladder collect in a sump and is pumped back to the digesters. Digester gas from the holding tank is sent to the compressors located on the northwest corner of the SHF and then to the two 4,120 cubic feet digester tanks for storage until the gas is used in the two 2131BHP IC engines each driving a 1.5 MW electrical generator to produce electricity for IEUA RP-5. This facility is expected to produce a maximum of 981,000 cubic feet of digester gas per day.

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The plug-flow mix tank anaerobic digester is not expected to be used, but the applicant requested to keep this equipment included in the permit for operational flexibility. The two 1,000 cubic feet low pressure digester gas tanks can be used in the boilers. In addition to the two ICEs, digester gas is also permitted to be used in two boilers, with boiler no. 1 used in heating the plug-flow or mix-tank anaerobic digester and boiler no. 2 used in heating the two European style anaerobic digesters. Any excess digester gas shall be flared.

Sludge from the digesters is sent to the receiving/dewatering building for dewatering with two rotary presses. A polymer system is used to assist in coagulation for the dewatering process. Liquid from the dewatering process can be rerouted back into the digesters or discharged into the Inland Empire Brine Line (IEBL) previously known as the Santa Ana Regional Interceptor (SARI) line. There is a large 140,000 gallon filtrate tank on the east side of the plug-flow mix tank digester that may store this liquid prior to discharge into the IEBL. Due to the reduced contaminant limits for discharge in the IEBL, since the issuance of the previous manure processing plant permit, additional wastewater treatment equipment used to treat the digested effluent will be installed and operated in the receiving/dewatering building to meet the facility's discharge permit. This equipment is described under A/N 536401. The treatment equipment will be used to recover biomass and return it to the digesters. When this wastewater treatment system is operating, the rotary presses may be used later in the sequences as needed to handle any excess biomass, if necessary. Biosolid sludge cake from the dewatering and wastewater treatment process are sent to a composting facility, landfill, or other appropriate facility for handling and disposal.

The facility only be accepts pre-screened liquid food waste and liquid dairy manure. This reduces any possible fugitive emissions during unloading the food waste and dairy manure from the vacuum trucks into the four (4) food waste storage tanks or receiving pits. Also this will simplify the operational process at the facility, since food waste and dairy manure will not need to be screened for debris, such as plastic, metal, needles, hooves, gravel/rocks/dirt, and other inorganic or organic obstructive material.

IEUA is working with Environ Strategies and Inland Bioenergy, LLC regarding their facility operations and application packages. Environ Strategies and Inland Bioenergy, LLC is in contract with IEUA to lease and the land and equipment of IEUA RP-5 SHF and operate the equipment and processes of the SHF. Inland Bioenergy, LLC is a LLC consisting of Burrtec and Environ Strategies.

The maximum operating schedule for this equipment is 24 hours/day, 7 days/week, 52 weeks/year. There is no school within 1000 feet of emission source. No public notice is required. There are no complaints filed or Notices to Comply or issued against the above facility in the last two years. A Notice of Violation was issued on September 19, 2012 for constructing and operating equipment at a Title V facility without first obtaining a permit revision allowing such construction and operation. The facility is currently operating under a Stipulated Order for Abatement (OA), Case No. 5209-4 concerning IEUA RP-5's restarted operations in January 2011 of the solids handling facility (SHF) since the February 2009 SHF shut down.

Emission Calculations

There is no expected emissions increase due to the alteration/modification of this application and facility operations. Emissions in **bold** will be used for maximum potential emissions for this equipment and NSR. All NSR 30-day average lbs/day emissions will be based on a schedule of 24 hours/day, 7 days/week, 52 weeks/year.

ROG emissions

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Previous emissions under A/N 451067 based on biofilter source test (7/30/2003) inlet emissions under A/N 388295:

R1 = 1.73 lbs/hr x 705 wTPD/225 wTPD = 5.42 lbs/hr = 131.89 lbs/day (NSR)

At the time the biofilter was source tested the manure processing plant was limited to accepting a maximum of 225 wTPD of manure.

R2 = 5.42 lbs/hr x (1.0-0.80) = 1.08 lbs/hr = 26.28 lbs/day (NSR)

80% control efficiency assumed by Rule 1133.2 transfer of technology.

Rule 431.1 compliance: 1) 40ppmv H2S in fuel, 2) Facility wide emission < 5 lbs/day

1) 40 ppmv H2S x 981,000 scf/day x day/24hr x lbmole/379E6 cf x 34.08 lbs/lbmole
= 0.15 lbs/hr = 3.65 lbs/day(NSR)

2) 5 lbs/day H2S x lb-mole/34.08 lbsH2S x 64.07 lbsSOx/lb-mole = 9.40 lbs/day SOx (as SO2)
= 0.39 lbs/hr SOx (as SO2)

Annual Emissions (AER 2012) SOx emission: 0.158 tons/yr

0.158 tons/yr x 2,000lbs/ton x 1yr/365days = 0.87 lbs/day SOx = 0.04 lbs/hr SOx

Toxic Risk Analysis

There is no expected increase of emissions or health risk due to the Permit to Construct to Permit to Operate conversion.

Rules Evaluation

Rule 212: Rule 212 (c)(1)- There is no school within 1000 feet of the facility.
Rule 212 (c)(2)- On-site emission increases does not exceed the following:

Volatile Organic Compounds	30 lbs/day
Nitrogen Oxides	40 lbs/day
PM10	30 lbs/day
Sulfur Dioxide	60 lbs/day
Carbon Monoxide	220 lbs/day
Lead	3 lbs/day

Rule 212(c)(3)(A)(i)- MICR is below 1 in a million.

Public Notice is not required.

Rule 401: Visible Emissions
No violations are expected; limits are listed under Rule 401(b)(1).

Rule 402: Nuisance
Nuisance is not expected with proper operation, monitoring and maintenance. No complaints have been received in the last two years for this facility. Based on previous operation of the facility for the last two years, compliance is expected.

Rule 407: Liquid and Gaseous Air Contaminants
Rule 407(a)(1)- CO shall not exceed 2000 ppmvd, averaged over 15 consecutive minutes.
Rule 407(a)(1)- Sulfur compounds which would exist as liquid or gas at standard conditions, shall not exceed 500 ppmv, calculated as SO2 and averaged over 15 consecutive minutes.
Compliance is expected.

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- Rule 431.1: Sulfur Content of Gaseous Fuels
- Rule 431.1(c)(1)- Natural gas contains \leq 16 ppmv sulfur compounds as H₂S.
- Rule 431.1(c)(2)- Other gases \leq 40 ppmv sulfur compounds as H₂S, averaged over 4 hours.
- Rule 431.1(d)(1)- If burning gaseous fuels, other than exclusively natural gas, in stationary equipment shall have a properly operating continuous fuel gas monitoring system (CFGMS) to determine the sulfur content, calculated as H₂S, of the fuel gas prior to burning; or a continuous emission monitoring system (CEMS) to determine SO_x emissions after burning. All continuous monitors require District approval, which shall be based on the requirements as specified in Attachment A.
- Rule 431.1(d)(1)(B)- A person subject to paragraph (c)(4) of this rule shall comply with paragraphs (d)(1) and (d)(2) no later than twelve months after the date a Permit to Construct is issued by the District for a sulfur removal system or comply with paragraph (d)(3).
- Rule 431.1(d)(1)(C)- Compliance with the Table 1 sulfur limits shall be determined based on readings obtained from an approved continuous monitor.
- Rule 431.1(d)(2)- A person installing a continuous monitor shall submit to the District for approval, a quality assurance procedure as specified in U.S. EPA 40 CFR, Part 60, Appendix F, Procedure 1 for CEMS and, as applicable, for CFGMS.
- Rule 431.1(d)(2)(A)- The quality assurance procedure specified above shall be submitted to the District for written approval by the Executive Officer prior to the CFGMS or CEMS final certification.
- Rule 431.1(d)(2)(B)- Any CFGMS or CEMS deemed to be out of control, as specified in Attachment A, according to the facility quality assurance procedure approved by the Executive Officer shall be corrected within 72 hours.
- Rule 431.1(d)(2)(B)(i)- The person operating the CFGMS or CEMS shall notify the Executive Officer by telephone or facsimile of any breakdown(s) of the monitoring systems if the duration of the breakdown is in excess of 60 minutes or if there are three or more breakdowns in any one day within 24 hours of the occurrence of the breakdown which triggers notification. Such report shall identify the time, location, equipment involved, and contact person.
- Rule 431.1(d)(2)(B)(ii)- The person who complies with the provisions of clause (d)(2)(B)(i) and paragraph (e)(3) shall not be considered in violation of this rule for the 72 hour period of breakdown provided that the breakdown did not result from operator error, neglect or improper operation or maintenance procedures.
- Rule 431.1(d)(3)- A person burning landfill gas or sewage digester gas, or who is subject to paragraph (c)(4) of this rule may use an alternative monitoring method, in lieu of the requirements in paragraphs (d)(1) and (d)(2), that ensures compliance with the daily total sulfur content limitation as specified in Table 1. Alternative monitoring methods shall not be used unless first approved in writing by the Executive Officers of the District, the CARB, and the Regional Administrator of the EPA, Region IX, or their designees.
- Rule 431.1(d)(3)(A)- At a minimum, the alternative monitoring method shall meet the guidelines of Attachment A, Section III.
- Rule 431.1(d)(3)(B)- A person subject to (c)(4) of this rule shall submit an alternative monitoring method for approval no later than 45 days after the date a Permit to Construct a sulfur removal system is issued.
- Rule 431.1(d)(3)(C)- All monitoring must comply with the approved alternative monitoring method.

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Rule 431.1(g)(8)- Any facility which emits less than 5 pounds per day total sulfur compounds, calculated as H₂S from the burning of gaseous fuels other than natural gas (not applicable to (c)(1)).

This facility is expected to comply either with sulfur limits as required or exemption requirement under Rule 431.1(g)(8). Compliance is expected.

- Rule 53A: San Bernardino County – Specific Contaminants (Contained in Addendum to Reg IV)
 Rule 53A(a)- Sulfur compound emission limit, as SO₂ 500 ppmv. Compliance is expected due to biofilter H₂S surface emission limits.
 Rule 53(b)- Combustion contaminants, this permit unit does not contain any combustion equipment, although combustion equipment on site is expected to be in compliance.
 Rule 53(c)- HF, HC, HBr, Br₂, Cl₂, F₂, and other fluorine compounds are to be controlled to the maximum degree technically feasible. There is no expected potential emission from the above listed compounds from this equipment. Compliance is expected.
- Rule 1127: Emission Reductions from Livestock Waste
 This facility is a permitted manure processing operation consisting of anaerobic digestion. Compliance is expected.
- Reg XIII: Rule 1303(a)- There is no expected emission increase, therefore BACT is not triggered.
 Rule 1303(b)(1)- Modeling for VOC and SO_x is not required (1303 Appendix A).
 Rule 1303(b)(2)- There is no expected emission increase for this permit unit. No offsets are required. Since the facility is an essential public service, any required offsets shall be provided through priority reserve.
- Rule 1401: Toxic Air Contaminants
 Rule 1401(d)(1)(A)- MICR is less than 1.0×10^{-6} based on previous evaluation.
 Rule 1401(d)(1)(C)- Cancer burden is less than 0.5 based on previous evaluation.
 Rule 1401(d)(2) and Rule 1401(d)(3)- HIC and HIA values are estimated to be less than 1 respectively based on previous evaluation.
 Compliance is expected.
- Rule 1401.1: Rule 1401.1(b)- Equipment is exempt since it is located at an existing facility.
- Reg. XXX: Converting the food waste/manure processing plant Permit to Construct into a Permit to Operate, removing Permit to Construct requirements which are no longer applicable, updating equipment description, and clarifying rule requirements is considered a Title V Minor permit revision under Rule 3000(b)(15), since there is no emission increase and the modification of the equipment does not result in new or additional NSPS or NESHAP requirements and will be subject to an EPA review (Rule 3003 (j)). A public notice is not required.
 Compliance is expected.

Conclusions & Recommendations

The equipment is in compliance with the Rules and Regulations of the SCAQMD. A Permit to Operate is recommended for application 530245. For Permit Conditions please see Sample Permit. A revised Title V permit is recommended after EPA review.