San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

2006 Area Source Emissions Inventory Methodology
120 – LANDFILLS – MUNICIPAL SOLID WASTE DISPOSAL

I. Purpose

This document describes the Area Source Methodology used to estimate emissions of volatile organic gas (VOC) and ammonia (NH_3) from municipal solid waste disposal facilities (landfills) in the San Joaquin Valley Air Basin. An area source is a collection of similar emission units within a geographic area (ie., a County). Area sources collectively represent individual sources that may not have been inventoried as specific point, mobile, or biogenic sources. California Air Resources Board (CARB) has grouped these individual sources with other like sources into area source categories. These source categories are grouped in such a way that they can be estimated collectively using one methodology.

II. Applicability

The emission calculations from this Area Source Methodology apply to facilities that are identified by the following Category of Emission Source (CES) code and Reconciliation Emission Inventory Code (REIC):

Table 1. Emission inventory codes.

CES	REIC	Description
57281	120-122-0242-0000	Landfills – Municipal Solid Waste Disposal

III. Point Source Reconciliation

Emissions from the area source inventory and point source inventory are reconciled against each other to prevent double counting. This is done using relationships created by the California Air Resources Board (ARB) between the area source REIC and the point sources' Standard Industry Classification (SIC) code and emissions process Source Category Code (SCC) combinations. The area sources in this methodology reconcile against processes in our point source inventory with the following SIC/SCC combinations:

Table 2. EIC, SCC and SIC codes in the District's 2006 point source inventory that reconciled to REIC 020-995-0012-0000.

EIC	SCC	Point Source Type	SIC
120-122-0242-0000	50200602	SOLID WASTE DISPL - COMMERCL/INSTITNL - LANDFILL DUMP - MUNCP-FUGITVE EMS	4953

IV. Methodology Description

Municipal solid waste (MSW) landfills may receive a variety of wastes including industrial solid waste, biosolids, agricultural wastes, green wastes, household wastes, oil and gas wastes, and various inert wastes. These waste materials are placed in an excavation, compacted, then covered with soil. Over time, the organic material within the buried waste undergoes anaerobic decomposition and produces gas. Refuse in a landfill may produce landfill gas for 20 to 30 years after it is covered (EPA, 2001). Landfill gas consists of approximately 40% by volume carbon dioxide (CO_2), 55% methane (CH_4), 5% nitrogen (N_2) and trace amounts of non-methane organic compounds (NMOCs) when gas generation reaches steady state conditions (EPA, 1999).

Landfill gas can move through the soil by diffusion, convection or displacement; and be either collected or lost to the atmosphere as a fugitive emission. The Federal New Source Performance Standards (NSPS) and Emission Guidelines for air emissions from MSW landfills (40 CFR §60.752) require facilities with a design capacity of 2.5 million Mg (2.75 million tons) or more and Non-Methane Non-Ethane Organic Carbon (NMOC) emissions of more than 50 Mg per year (55 tons per year) to install gas collection and control systems. These systems of wells and manifolds are installed in the landfill waste cells and actively or passively mobilize the gas to a treatment or control device such as a flare, thermal oxidizer, turbine or engine.

In this methodology, we use an EPA specified model to estimate landfill gas production from each landfill within the District. From this estimate, we subtract the amount of landfill gas reported through our point source inventory as collected and controlled. The difference in these amounts is considered lost to the atmosphere as fugitive emissions. The fraction of VOC in these fugitive landfill gas emissions are estimated using the landfill gas speciation profile developed by ARB.

V. Activity Data

A list of solid waste disposal sites located within the District was extracted from a database maintained by the California Integrated Waste Management Board (2007). Landfills that have been closed for more than 35 years (most facilities that operated prior to the enactment of regulations in the early 1970s were burn dumps, where wastes were combusted and not left in place), were clean closed (closed without waste in place), or have only accepted inert waste were deleted from this list.

Through this process, 51 sites were identified (Appendix A). For each disposal site, the annual waste acceptance rate was determined using one or more of the following means:

- Waste acceptance rates were obtained from the Integrated Waste Management Board (2007). Records are available from 1990 to the present.
- For Title V facilities, waste acceptance rates were obtained from the facility's permit application.
- Waste acceptance rates were estimated from District records of landfills total capacity and remaining capacity. For this, a density of 1,160 pounds per cubic yard of waste was assumed (EIIP, 1997).
- Waste acceptance rates were estimated from the landfills permitted throughput.
- Some landfills have gas collection systems that serve flares, IC engines or cogens. These units are permitted by the District, and report their process rates annually through the point source inventory.

VI. Emission Factors

Uncontrolled methane emissions from landfills were calculated using EPA's theoretical first-order kinetic model known as the Landfill Air Emission Estimation Model as implemented in LandGEM v3.02 (2005).

$$LG_{CH4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_0 \left(\frac{M_t}{10} \right) e^{-kt_{ij}}$$

Where:

LG_{CH4} = methane generation rate at time t, m^3/yr;
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 constant, yr^{-1} (AP-42 default = 0.02 for arid locations);
L_0 = methane generation potential, m^3 CH_4/Mg refuse (AP-42 default = 100);
M = 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 year
e = Base log, unitless;

Landfill gas collection systems are not 100% efficient, so emissions at a facility with a collection system still occur. Reported collection efficiencies typically range from 60 to 85%, with an average of 75% most commonly assumed (EPA, 1998). For each landfill with a gas collection system, the volume of landfill gas reported as consumed through the point source inventory was subtracted from the amount estimated as generated. If the amount reported as consumed exceeded the amount estimated as generated using the LandGEM equation, the amount generated was instead back-calculated using an assumed landfill gas collection efficiency of 75%.

VOC emissions are estimated as 0.6575% of total organic gas (TOG) using CARB's speciation profile for landfill gas. Ammonia emissions are estimated as 0.0073 pounds of ammonia per pound of methane (EPA, 2004).

VII. Emissions Calculations

A. Assumptions

- Landfill Gas = 55% methane (v/v), unless source test data is available
- Landfill Total Organic Gas (TOG) = 98.6% methane (w/w)
- Landfill TOG = 0.6575% VOC (w/w)
- Landfill gas collection system efficiency = 75%
- All landfill gas generated in a year is collected and destroyed or emitted in that same year.

B. Sample Calculations

Emissions for the Arvin Sanitary Landfill

Step 1. Determine the methane generation rate of the landfill using EPA's landfill gas equation:

$$LG_{CH4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_0 \left(\frac{M_t}{10} \right) e^{-kt_{ij}}$$

Where:

LG_{CH4} = methane generation rate at time t, m^3/yr;
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 constant, yr^{-1} (AP-42 default = 0.02 for arid locations);
L_0 = methane generation potential, m^3 CH_4/Mg refuse (AP-42 default = 100);
M = 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 year
e = Base log, unitless;

Example: Given that the Arvin Sanitary Landfill opened in 1971 and stopped accepting waste in 2003. The methane emissions in 2006 from the degradation of waste deposited in 1971 (16,660 Mg) are calculated as follows:

$$LG_{CH4} = [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.0)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.1)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.2)}) + (0.02 * 100 * 16{,}660 * e^{-0.02(34+0.3)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.4)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.5)}) + (0.02 * 100 * 16{,}660 * e^{-0.02(34+0.6)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.7)}) + [(0.02 * 100 * 16{,}660 * e^{-0.02(34+0.8)}) + (0.02 * 100 * 16{,}660 * e^{-0.02(34+0.9)})] / 10$$

$$LG_{CH4} = 16{,}730 \, m^3 \text{ in } 2006$$

Emissions from each waste year is then summed to yield the total methane production in the inventory year:

Table 3. Methane production in 2006 summed for all waste years (Arvin Sanitary Landfill).

Waste Year	Waste Landfilled (Mg)	Methane Production (m^3/yr)
1971	16,660	16,730
1972	34,955	35,809
1973	27,034	28,255
1974	46,185	49,245
1975	47,848	52,050
1976	104,493	115,964
1977	76,141	86,206
1978	89,130	102,951
1979	109,223	128,709
1980	82,991	99,772
1981	88,721	108,817
1982	76,921	96,249
1983	81,731	104,335
1984	92,433	120,380
1985	121,184	161,011
1986	154,859	209,910
1987	161,587	223,454
1988	201,972	284,944
1989	221,073	318,192
1990	198,796	291,909
1991	207,806	311,303
1992	238,771	364,916
1993	209,694	326,951
1994	165,477	263,221
1995	156,965	254,725
1996	166,264	275,267
1997	102,793	173,623
1998	87,274	150,388
1999	101,457	178,359
2000	65,077	116,714
2001	62,387	114,150
2002	64,642	120,666
2003	32,257	61,429
TOTAL		5,346,604

Step 2. From the methane production calculated, determine the total amount of landfill gas produced:

$$LG_{total,m^3} = LG_{CH_4,m^3} \; x \; \frac{1 \text{ part landfill gas}}{0.55 \text{ parts } CH_4}$$

where:

$$LG_{total,m^3} = \text{Landfill gas total emissions in cubic meters}$$
$$LG_{CH4,m^3} = \text{Landfill gas methane content in cubic meters}$$

Example: In 2006, the Arvin Sanitary Landfill was estimated to have produced 5,346,604 m^3 of methane. It is assumed that landfill gas is 55% methane.

$$LG_{total,m^3} = 5{,}346{,}604 \, m^3 \text{ methane produced } x \; \frac{1 \text{ part landfill gas}}{0.55 \text{ parts } CH_4} = 9{,}721{,}098 \, m^3 \text{ Landfill Gas}$$

Step 3. Subtract the volume of landfill gas collected and controlled from the amount generated:

$$LG_{fugutive,m^3} = LG_{total,m^3} - LG_{controlled,m^3}$$

where:

$$LG_{fugitive,m^3} = \text{Landfill gas fugitive emissions in cubic meters}$$
$$LG_{total,m^3} = \text{Landfill gas total emissions in cubic meters}$$
$$LG_{controlled,m^3} = \text{Landfill gas collected and controlled in cubic meters}$$

Example: For the Arvin Sanitary Landfill, 9,721,098 m^3 were estimated to have been produced in 2006, and 2,585,616 m^3 were reported as collected:

$$LG_{fugutive,m^3} = 9{,}721{,}098 \, m^3 \text{ produced} - 2{,}585{,}616 \, m^3 \text{ collected} = 7{,}135{,}042 \, m^3 \text{ emitted}$$

Step 4. Calculate the tons of methane produced from the cubic meters of fugitive landfill gas produced:

$$LG_{CH4,tons} = LG_{fugitive,m^3} \; x \; \frac{0.55 \text{ parts } CH_4}{1 \text{ part landfill gas}} \; x \; \frac{1000 \, L}{m^3} \; x \; \frac{1 \, mol}{22.4 \, L} \; x \; \frac{16 \, g}{mol} \; x \; \frac{1 \, ton}{9.072 \, x \, 10^5 \text{ grams}}$$

where:

$$LG_{CH4,tons} = \text{Methane emissions in tons}$$
$$LG_{fugitive,m^3} = \text{Landfill gas fugitive emissions in cubic meters}$$

Example:

$$LG_{CH4,tons} = 7{,}135{,}042\ m^3\ landfill\ gas\ x \frac{0.55\ parts\ CH_4}{1\ part\ landfill\ gas}\ x \frac{1000\ L}{m^3}\ x \frac{1\ mol}{22.4\ L}\ x \frac{16\ g}{mol}\ x \frac{1\ ton}{9.072\ x\ 10^5\ grams}$$

$$LG_{CH4,tons} = 3{,}090$$

Step 5. Back calculate VOC from methane using ARB's speciation profile for landfill gas.

$$LG_{VOC,tons} = LG_{CH4,tons}\ x \frac{1\ part\ TOG}{0.986\ parts\ CH_4}\ x \frac{0.006575\ parts\ VOC}{1\ part\ TOG}$$

Example:

$$LG_{VOC,tons} = 3{,}090\ tons\ CH_4\ x \frac{1\ part\ TOG}{0.986\ parts\ CH_4}\ x \frac{0.006575\ parts\ VOC}{1\ part\ TOG} = 20.6\ tons\ VOC\ produced\ in\ 2006$$

Therefore, 20.6 tons of VOC were emitted from the Arvin Sanitary Landfill in 2006.

VIII. Temporal Variation

A. Daily

ARB Code 24. 24 hours per day - uniform activity during the day.

B. Weekly

ARB Code 7. 7 days per week - uniform activity every day of the week

C. Monthly

Uniform monthly activity.

IX. Spatial Variation

For this methodology, emissions were calculated at the county level. The California Integrated Waste Management Board maintains a database with landfill coordinates that could be used to more accurately spatially allocate the data.

X. Growth Factor

Growth factors are developed by either the District's Planning Department or CARB for each EIC. These factors are used to estimate emissions in future years. The growth factors associated with this emissions category may be obtained from the District's Planning Department.

XI. Control Level

Control levels (CL) are developed by either the District's Planning Department or CARB for each EIC. Control levels are used to estimate emissions reductions in future years due to implementation of District rules.

Municipal solid waste landfills are subject to District Rule 4642 (Solid Waste Disposal Sites). The purpose of this rule is to reduce total organic gas (TOG) emissions from solid waste disposal sites which have a gas collection system and/or control device in operation, or undergoing maintenance or repair. Control levels associated with this rule may be obtained from the District's Planning Department

XII. ARB Chemical Speciation

CARB has developed organic gas profiles in order to calculate reactive organic gasses (ROG), volatile organic compounds (VOC) or total organic gas (TOG) given any one of the three values. For each speciation profile, the fraction of TOG that is ROG and VOC is given. The organic gas profile codes can also be used to lookup associated toxics. CARB's speciation profile for municipal solid waste landfills is presented in Table 5.

Table 5. CARB chemical speciation profiles for municipal solid waste landfills.

Profile Description	ARB Organic Gas Profile#	Fractions	
		ROG	VOC
Landfills, USEPA landfill emission model	1401	0.006575	0.006575

XIII. Assessment Of Methodology

The methodology used for the development of this emissions estimate is identified as the preferred method by the EPA's Emission Inventory Improvement Program (2001). It can be improved by using site specific landfill gas speciation data from source tests.

XIV. Emissions

Following is the 2006 area source emissions inventory for REIC 120-122-0242-0000 estimated by this methodology. Emissions are reported for each county in the District.

Table 6. Area source emissions for REIC 120-122-0242-0000 (2006).

County	Criteria Emissions (tons/year)						Toxic Emissions (lbs/year)
	NOx	CO	SOx	VOC[(1)]	PM_{10}	$PM_{2.5}$[(2)]	NH_3
Fresno	--	--	--	61.65	--	--	135,117
Kern	--	--	--	113.76	--	--	249,331
Kings	--	--	--	46.16	--	--	101,175
Madera	--	--	--	11.68	--	--	25,609
Merced	--	--	--	28.73	--	--	62,966
San Joaquin	--	--	--	126.56	--	--	277,385
Stanislaus	--	--	--	23.90	--	--	52,386
Tulare	--	--	--	36.10	--	--	79,119
TOTAL	--	--	--	448.54	--	--	983,088

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.
(2) At this time, the District does not calculate PM2.5 emissions. PM2.5 emissions can be estimated using the speciation profiles found in Section XII.

Following is the 2006 point source emissions inventory for REIC 120-122-0242-0000 as reported to the District by our permit holders. Emissions are reported for each county in the District.

Table 6. Point source emissions for REIC 120-122-0242-0000 (2006).

County	Criteria Emissions (tons/year)						Toxic Emissions (lbs/year)
	NOx	CO	SOx	VOC[(1)]	PM_{10}	$PM_{2.5}$[(2)]	NH_3
Fresno	--	--	--	0.0	--	--	0.0
Kern	--	--	--	0.0	--	--	0.0
Kings	--	--	--	0.0	--	--	0.0
Madera	--	--	--	0.0	--	--	0.0
Merced	--	--	--	0.0	--	--	0.0
San Joaquin	--	--	--	0.0	--	--	0.0
Stanislaus	--	--	--	0.0	--	--	0.0
Tulare	--	--	--	0.0	--	--	0.0
TOTAL	--	--	--	0.0	--	--	0.0

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.
(2) At this time, the District does not calculate PM2.5 emissions. PM2.5 emissions can be estimated using the speciation profiles found in Section XII.

Following is the 2006 total unreconciled (point source plus area source) emissions inventory for REIC 120-122-0242-0000. Emissions are reported for each county in the District.

Table 8. Total emissions for REIC 120-122-0242-0000 (2006).

County	Criteria Emissions (tons/year)						Toxic Emissions (lbs/year)
	NOx	CO	SOx	VOC[(1)]	PM_{10}	$PM_{2.5}$[(2)]	NH_3
Fresno	--	--	--	61.65	--	--	135,117
Kern	--	--	--	113.76	--	--	249,331
Kings	--	--	--	46.16	--	--	101,175
Madera	--	--	--	11.68	--	--	25,609
Merced	--	--	--	28.73	--	--	62,966
San Joaquin	--	--	--	126.56	--	--	277,385
Stanislaus	--	--	--	23.90	--	--	52,386
Tulare	--	--	--	36.10	--	--	79,119
TOTAL	--	--	--	448.54	--	--	983,088

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.
(2) At this time, the District does not calculate PM2.5 emissions. PM2.5 emissions can be estimated using the speciation profiles found in Section XII.

Following is the net change in total unreconciled emissions between this update (2006 inventory year) and the previous year's inventory (2005) for REIC 120-122-0242-0000. The change in emissions are reported for each county in the District.

Table 9. Net emissions change for REIC 120-122-0242-0000 (2006-2005).

County	Criteria Emissions (tons/year)						Toxic Emissions (lbs/year)
	NOx	CO	SOx	VOC[(1)]	PM_{10}	$PM_{2.5}$[(2)]	NH_3
Fresno	--	--	--	-382.62	--	--	-786,435
Kern	--	--	--	67.83	--	--	138,079
Kings	--	--	--	46.16	--	--	41,753
Madera	--	--	--	11.68	--	--	21,302
Merced	--	--	--	28.73	--	--	-171,729
San Joaquin	--	--	--	126.56	--	--	21,447
Stanislaus	--	--	--	-64.42	--	--	-134,129
Tulare	--	--	--	36.10	--	--	-178,571
TOTAL	--	--	--	-129.98	--	--	-1,048,283

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.
(2) At this time, the District does not calculate PM2.5 emissions. PM2.5 emissions can be estimated using the speciation profiles found in Section XII.

XV. Revision History

2007. This is a new District methodology.

XVI. Update Schedule

In an effort to provide needed information to CARB and other District departments and to maximize the limited resource available, the following criteria are used by the District to determine the appropriate update cycle for each area source methodology.

Table 10. District area source update frequency criteria.

Emissions Category (tons/day)	Update Cycle (years)
<1	4
>1 and <= 2.5	3
>2.5 and <=5	2
>5	1

Based upon these criteria, this area source category will be updated every three years.

XVII. References

1. Code of Federal Regulation. Standards for air emissions from municipal solid waste landfills. 40 CFR §60.752

2. Environmental Protection Agency. (2001). Landfills. *In:* Vol. III, Chapter 15 of The Emissions Inventory Improvement Program. Report prepared by the Eastern Research Group, Inc for the Area Sources Committee of the Emission Inventory Improvement Program.

3. Environmental Protection Agency. (2004). Estimating ammonia emissions from anthropogenic non-agricultural sources - Draft final report prepared by E.H. Pechan Inc for the Area Sources Committee of the Emission Inventory Improvement Program.

4. Environmental Protection Agency. (2005). Landfill gas emissions model (LandGEM), version 3.02. Software and user's manual prepared by Eastern Research Group, Inc., Morrisville, NC and Radian Corp., Research Triangle Park, NC. for the Air Pollution Prevention and Control Division of the Environmental Protection Agency, Research Triangle Park, NC.

5. Environmental Protection Agency. (1999). Municipal solid waste landfills. *In*: Compilation of Air Pollutant Emission Factors, Vol. 1: Stationary Point and Area Emission Units (AP-42), 5th ed. (January 1995), Supplement E (September 1999), Chapter 2.4. Report prepared by Office of Air Quality Planning and Standards of the EPA, Research Triangle Park, NC.

6. Integrated Waste Management Board. (2007). Landfill tonnage reports. Database maintained by the California Integrated Waste Management Board, Sacramento, and accessed on-line September 17, 2007 from Internet site http://www.ciwmb.ca.gov/Landfills/Tonnages/.

7. Integrated Waste Management Board. (2007). Solid waste information system (SWIS) database. Database maintained by the California Integrated Waste Management Board, Sacramento, and accessed on-line September 17, 2007 from Internet site http://www.ciwmb.ca.gov/SWIS/.

XVIII. Appendices

Appendix A. District Municipal Waste Landfills

Appendix A. District Municipal Waste Landfills

Table 11. Municipal waste landfills located within the San Joaquin Valley Unified Air Pollution District

County	Landfill Name	SWIS No.
Fresno	American Avenue Disposal Site	10-AA-0009
	Chateau Fresno Landfill	10-AA-0002
	Chestnut Avenue Sanitary Landfill	10-AA-0025
	City Of Clovis Landfill	10-AA-0004
	Coalinga Disposal Site	10-AA-0006
	Orange Avenue Disposal Inc	10-AA-0013
	Rice Road Recyclery & Transfer Station	10-AA-0145
	Southeast Regional Solid Waste Disposal	10-AA-0011
Kern	Arvin Sanitary Landfill	15-AA-0050
	Bakersfield Metropolitan (Bena) SLF	15-AA-0273
	Bakersfield Sanitary Landfill	15-AA-0044
	Buttonwillow Sanitary Landfill	15-AA-0047
	China Grade Sanitary Landfill	15-AA-0048
	Clean Harbors Buttonwillow LLC	15-AA-0257
	Glennville Landfill	15-AA-0051
	Lebec Sanitary Landfill	15-AA-0056
	Lost Hills Sanitary Landfill	15-AA-0052
	McFarland-Delano Sanitary Landfill `old`	15-AA-0063
	McKittrick Waste Treatment Site	15-AA-0105
	North Belridge Landfill	15-AA-0067
	Shafter-Wasco Sanitary Landfill	15-AA-0057
	Taft Sanitary Landfill	15-AA-0061
	Valley Tree & Construction Disposl Site	15-AA-0153
Kings	Avenal Regional Landfill	16-AA-0004
	CWMI, KHF (MSW Landfill B-19)	16-AA-0021
	Hanford Sanitary Landfill	16-AA-0009
	Kettleman Hills - B18 Nonhaz Codisposal	16-AA-0023
	KWRA Material Recovery Facility	16-AA-0015
Madera	Fairmead Solid Waste Disposal Site	20-AA-0002
	Billy Wright Disposal Site	24-AA-0002
	Highway 59 Disposal Site	24-AA-0001
San Joaquin	Austin Road /Forward Landfill	39-AA-0001
	Corral Hollow Landfill	39-AA-0005
	Foothill Sanitary Landfill	39-AA-0004
	Forward Landfill, Inc.	39-AA-0015
	French Camp Landfill	39-AA-0002
	Harney Lane Sanitary Landfill	39-AA-0003
	North County Landfill	39-AA-0022
Stanislaus	Bonzi Sanitary Landfill	50-AA-0003
	Fink Road Landfill	50-AA-0001
	Geer Road Sanitary Landfill	50-AA-0002
Tulare	Balance Rock Disposal Site	54-AA-0010
	Earlimart Disposal Site	54-AA-0001
	Kennedy Meadows Disposal Site	54-AA-0011
	Teapot Dome Disposal Site	54-AA-0004
	Visalia Disposal Site	54-AA-0009
	Woodville Disposal Site	54-AA-0008