

**NON-METHANE ORGANIC COMPOUND EMISSIONS REPORT
TIER 2 PROTOCOL**

**CINDER LAKE LANDFILL
FLAGSTAFF, ARIZONA**

Prepared for:

CITY OF FLAGSTAFF
211 West Aspen Avenue
Flagstaff, Arizona 86001

Prepared by:

HYDRO GEO CHEM, INC.
6370 East Thomas Road, Ste 200
Scottsdale, Arizona 85251
(480) 421-1501

December 23, 2008

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Reviewed by

James G. Peck
Vice President of Engineering

Stephen B. Smith
President & COO

December 23, 2008

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EXECUTIVE SUMMARY

Hydro Geo Chem, Inc. performed a Tier 2 evaluation of the Cinder Lake Landfill (CLL), a municipal solid waste landfill facility owned and operated by the City of Flagstaff. Field sampling activities were conducted between October 23 and October 30, 2008. A total of 50 sampling locations were selected on a grid distribution over areas of the landfill with waste in place for more than 2 years, with a total of 52 sampling locations designated in the field. A direct push rig was used to drive the sampling point to a sufficient depth beneath soil covering the waste for collecting suitable landfill gas samples. Of the 52 sampling locations, a total of 49 acceptable samples were composited in 18 sample canisters for laboratory analysis consistent with Tier 2 protocols.

Samples were analyzed for methane, carbon dioxide, and nitrogen concentration consistent with EPA Method 3C, and for total non-methane organic compounds (NMOCs) consistent with EPA Method 25C. All samples had acceptable levels of oxygen, and six of the samples contained nitrogen in excess of the acceptable range for Method 25C analysis. All samples were analyzed with a laboratory correction for nitrogen content.

Laboratory results indicate that the average NMOC concentration in acceptable samples was 92 parts per million-hexane (ppmh), and 97 ppmh in all samples. An estimate of NMOC emissions was made using the measured NMOC concentrations and regulatory specified criteria for gas generation parameters. The CLL is estimated to be emitting 5.62 Megagrams per year (Mg/yr) of NMOCs in 2008, and is not projected to exceed the regulatory threshold of 50 Mg/yr during the next 5 year period.

1. INTRODUCTION

This report summarizes the field sampling, analytical results, and emissions estimates in support of a Tier 2 evaluation of non-methane organic compound (NMOC) emissions at the Cinder Lake Landfill (CLL), a municipal solid waste landfill (MSWLF) located approximately 8 miles northeast of Flagstaff, Arizona, as shown in Figure 1. All work was performed according to the protocol specified by the U.S. Environmental Protection Agency (EPA) in the New Source Performance Standards (NSPS) for municipal solid waste landfills (CFR, 2007).

The CLL is a MSWLF owned and operated by the City of Flagstaff. The CLL has been in operation since 1965, accepting non-hazardous solid waste materials, including domestic wastes, commercial and institutional wastes, and construction/demolition wastes. Operations are conducted according to an approved solid waste facility plan, which includes compaction and daily cover of landfilled wastes with soil. To date, approximately 81.3 acres (32.9 hectares) of permitted disposal area have received wastes that are more than 2 years old. Approximately 14.2 acres have been filled only with construction/demolition debris and were not a subject of the work performed in this report. Soil cover has been installed over the landfill wastes, and can be as thick as 8 feet in places.

The CLL is required by the NSPS to annually estimate the NMOC emissions as is required of all MSWLFs with a design capacity greater than 2.5 million Megagrams. MSWLFs that emit more than 50 Megagrams per year (Mg/yr) of NMOCs are required to install a landfill gas control system in open areas of the landfill that have retained waste for more than 5 years

and in closed areas or areas that are at final grade that have retained waste for more than 2 years. Three tiers of NMOC emissions estimating protocols are provided for in the NSPS; Tier 1 which uses assumed gas generation and NMOC concentration parameters, Tier 2 which uses assumed gas generation and site specific NMOC concentration parameters, and Tier 3 which uses site specific gas generation and NMOC concentration parameters. The NSPS requires that site-specific NMOC concentrations be measured every 5 years when performing a Tier 2 estimate of NMOC emissions. The NMOC concentrations at the CLL were last measured in November 2003 (SCS Engineers, 2003). The measurements of NMOC concentrations as established in this report are intended to satisfy Tier 2 requirements for 2009 to 2013 NMOC emission estimates.

The CLL operates under Title V Stationary Source Permit Number 36194, issued by the Arizona Department of Environmental Quality (ADEQ) on April 13, 2006. The Title V permit requires the CLL to periodically submit an NMOC emissions estimate report and retest NMOC concentrations every 5 years. This report is intended to satisfy Title V permit reporting requirements in addition to NSPS requirements.

2. SAMPLING AND ANALYTICAL PROCEDURE

The NSPS requires that a minimum of two sample probes be installed per hectare of landfill surface that has retained waste for at least 2 years with a maximum requirement of 50 samples. A total of 50 sampling points were selected on roughly a 230 foot by 230 foot grid pattern as the CLL has more than 50 acres of landfill surface that have retained waste for at least 2 years. Sampling locations included areas where waste younger than 2 years had been placed over older wastes, but did not include areas which are known to be landfilled with non-degradable construction debris wastes. Areas with steep sideslopes were also avoided in selecting sampling locations.

An additional 2 sampling locations were designated in the field for a total of 52 sampling locations. A direct push rig was used to drive the sampling point to a sufficient depth beneath soil covering the waste for collecting suitable landfill gas samples. Of the 52 sampling locations, a total of 49 acceptable samples were composited in 18 sample canisters for laboratory analysis consistent with Tier 2 protocols. All sampling points were flagged in the field and subsequently surveyed in using a global positioning system. Figure 2 illustrates the location of each sampling point.

All samples were collected between October 23 and October 30, 2008. Field sampling was conducted in a manner consistent with EPA Air Quality Test Method 25C, Determination of NMOC in Landfill Gas (Method 25C). Soil gas samples were collected through the use of a direct push rig (GeoprobeTM) operated by Vista Geoscience Inc. The direct push rig was

equipped with a soil gas sampling probe that was driven into the subsurface using a pneumatic hammer. A 1.25-inch diameter vapor sampling probe sampler with 3-foot extensions was driven to a depth typically 11.6 feet below the ground surface or deeper for sample collection to ensure a minimum depth of 3 feet below the bottom of the landfill cover to comply with Method 25C sampling requirements.

The sampler was connected to a sampling train and purged of 3 sampling train volumes. The purge gas was monitored for methane, oxygen, and carbon dioxide content during purging to verify gas quality prior to collecting samples. Nitrogen content was inferred as the concentration of balance gas. If unacceptably high concentrations of nitrogen (greater than 20 percent) or oxygen (greater than 5 percent) were detected, the sampling probe was driven deeper to minimize the potential for air intrusion during sampling. In areas of the CLL where operations involved shallow trench fills, the sampling probe was offset approximately 10 feet when unacceptable gas concentrations were detected. In several areas the sampler was unable to find landfill gas of sufficiently low concentration of nitrogen to satisfy Method 25C acceptance criteria, so samples with a high nitrogen content were collected for documentation purposes.

Samples were collected in stainless steel Summa canisters partially filled with helium by the analytical laboratory. All steel canisters were leak-tested by the analytical laboratory to verify that the valve and collection port on each tank was not leaking. Each canister was used for composite sampling of three, or in some cases two, sampling locations per canister. The canisters were filled at a constant rate of 250 cubic centimeters per minute (cc/min) at each location. Equal volumes of landfill gas were collected at each location and included in a

composite sample by evenly dividing the vacuum used in collecting samples. Each canister was documented in a field log with the laboratory canister number and sampling point. Date, time, depth of sampling point and initial sampling vacuum were also recorded in field logs. A copy of the field log is provided in Appendix A.

3. LABORATORY ANALYSES

Samples were packaged by the sampler and shipped by Federal Express to Air Technology Laboratories, Inc. in City of Industry, California, for analysis by Method 25C (CFR, 2007 Appendix A). All samples were processed in the laboratory with a gas chromatographic column to separate NMOCs from fixed gases. Consistent with Method 25C quality control requirements, each sample was first tested according to Method 3C (CFR 2007, Appendix A) protocols for nitrogen and oxygen concentration using a thermal conductivity detector. The laboratory report for the Method 3C and 25C results is provided in Appendix B. A summary of Method 3C and Method 25C results is provided in Table 1.

4. ANALYTICAL RESULTS

The Method 3C results indicate that of the 18 composite samples, six had unacceptable levels of nitrogen for Method 25C. All samples had acceptable levels of oxygen, indicating that the high nitrogen levels are likely the result of native gas conditions and not the result of active air intrusion during sampling. The results are consistent with prior Tier 2 evaluations of landfill gas at the CLL (URS, 2002, and SCS Engineers, 2003).

The Method 25C results indicate that the average NMOC concentration at the CLL ranged from 30 to 183 parts per million-hexane (ppmh) for all samples analyzed. The average NMOC concentration was 97 ppmh for all samples, and 92 ppmh for samples with acceptable levels of nitrogen. The average NMOC concentration of 92 ppmh for acceptable samples was used to evaluate NMOC emissions consistent with Tier 2 protocols.

5. NMOC EMISSIONS ESTIMATE

The EPA Landfill Gas Emissions Model (LandGEM) (EPA, 1998) was used to provide a first-order decay equation estimate of NMOC emissions consistent with the Tier 2 protocol. Default values for the methane generation constant and methane generation potential were used consistent with NSPS specifications. The NMOC concentration was set at 92 ppmh, as determined from the sample analyses. Historical waste acceptance rates from CLL records were used along with a projection of waste acceptance through 2013. The equation specified in 40 CFR 60.754 when the year to year solid waste acceptance rate is known is displayed below:

$$M_{NMOC} = \sum_{i=1}^n 2kL_oM_i(e^{-kt_i})(C_{NMOC})(3.6 \times 10^{-9})$$

Where:

M_{NMOC}	=	Total emission rate from landfill – (Mg/yr)
k	=	Methane generation constant = 0.02/yr (representative of an arid climate.)
L_o	=	Methane generation potential = 170 cubic meters per Megagram (m ³ /Mg)
M_i	=	Mass of waste in the i th section – Mg
t_i	=	Age of the i th section of waste - years
C_{NMOC}	=	92 ppmh, as determined from sample analyses.

Appendix C displays the model printout of projected NMOC emissions by year. Table 2 summarizes the output for years 2008 through 2013. The results show that the current 2008 NMOC emission rate is 5.62 Mg/yr. Estimated NMOC emissions in 2013 are 6.20 Mg/yr. Based on this Tier 2 analysis the CLL is not anticipated to exceed the 50 Mg/yr threshold during the next 5 year period.

6. LIMITATIONS

The opinions and recommendations presented in this report are based upon the scope of services and information obtained through the performance of the services, as agreed upon by HGC and the City of Flagstaff. Results of any investigations, tests, or findings presented in this report apply solely to conditions existing at the time HGC's investigative work was performed and are inherently based on and limited to the available data and the extent of the investigation activities. No representation, warranty, or guarantee, express or implied, is intended or given. HGC makes no representation as to the accuracy or completeness of any information provided by other parties not under contract to HGC to the extent that HGC relied upon that information. This report is expressly for the sole and exclusive use of the party for whom this report was originally prepared and for the particular purpose that it was intended. Reuse of this report, or any portion thereof, for other than its intended purpose, or if modified, or if used by third parties, shall be at the sole risk of the user.

7. REFERENCES

Code of Federal Regulations (CFR), 2007. Title 40 parts 60.750-759. 2007. Subpart WWW, Standards of Performance for Municipal Solid Waste Landfills, June 19, 2007.

EPA, 1998. User's Manual, Landfill Gas Emissions Model, Version 2.0. February 1998.

SCS Engineers, 2003. Tier II Sampling and Analysis Report for the City of Flagstaff Cinder Lake Landfill, November 14, 2003.

URS Corporation, 2002. NSPS Subpart WWW, Tier II Evaluation Report, Prepared for the City of Flagstaff, Cinder Lake Landfill, August 30, 2002.

TABLES

TABLE 1**Summary of Analytical Results**

Sample		Method 3C Results		Acceptable Sample by 25C	Method 25 C Results	
		Nitrogen (%)	Oxygen (%)		NMOC (ppm as C)	NMOC (ppm as C ₆)
1	1, 2, 3	53	2.0	No	610	102
2	4, 5, 6	5.9	<0.5	Yes	180	30
3	7, 8, 9	47	<0.5	No	410	68
4	11, 12, 14	49	<0.5	No	370	62
5	15, 16, 17	27	<0.5	No	770	128
6	18, 19	<1.0	<0.5	Yes	220	37
7	20, 21, 22	<1.0	<0.5	Yes	270	45
8	23, 24, 25	<1.0	<0.5	Yes	260	43
9	26, 27, 28	8.5	2.4	Yes	320	53
10	29, 30	<1.0	<0.5	Yes	750	125
11	31, 32, 33	<1.0	<0.5	Yes	510	85
12	34, 35, 36	<1.0	<0.5	Yes	1,100	183
13	37, 38, 39	<1.0	<0.5	Yes	840	140
14	40, 51, 52	<1.0	<0.5	Yes	680	113
15	41, 42, 43	<1.0	<0.5	Yes	670	112
16	44, 45, 46	7.9	<0.5	Yes	790	132
17	47, 48	22	<0.5	No	820	137
18	49A	45	<0.5	No	860	143
Mean					579	97
Mean (acceptable samples)					549	92

*Notes:**C = Carbon basis**C₆ = Hexane basis**NMOC = Non-methane organic compound**ppm = Parts per million*

TABLE 2

**NMOC Emissions Estimates
2008 through 2013**

Year	Refuse in Place (Mg)	(Mg/yr)	(m ³ /yr)
2008	3,283,000	5.62	1,569
2009	3,402,000	5.79	1,615
2010	3,526,000	5.96	1,663
2011	3,654,000	6.14	1,714
2012	3,787,000	6.33	1,766
2013	3,925,000	6.20	1,731

Notes:

Mg: Megagram

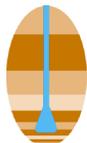
Mg/yr: Megagrams per year

m³/yr: cubic meters per year

FIGURES



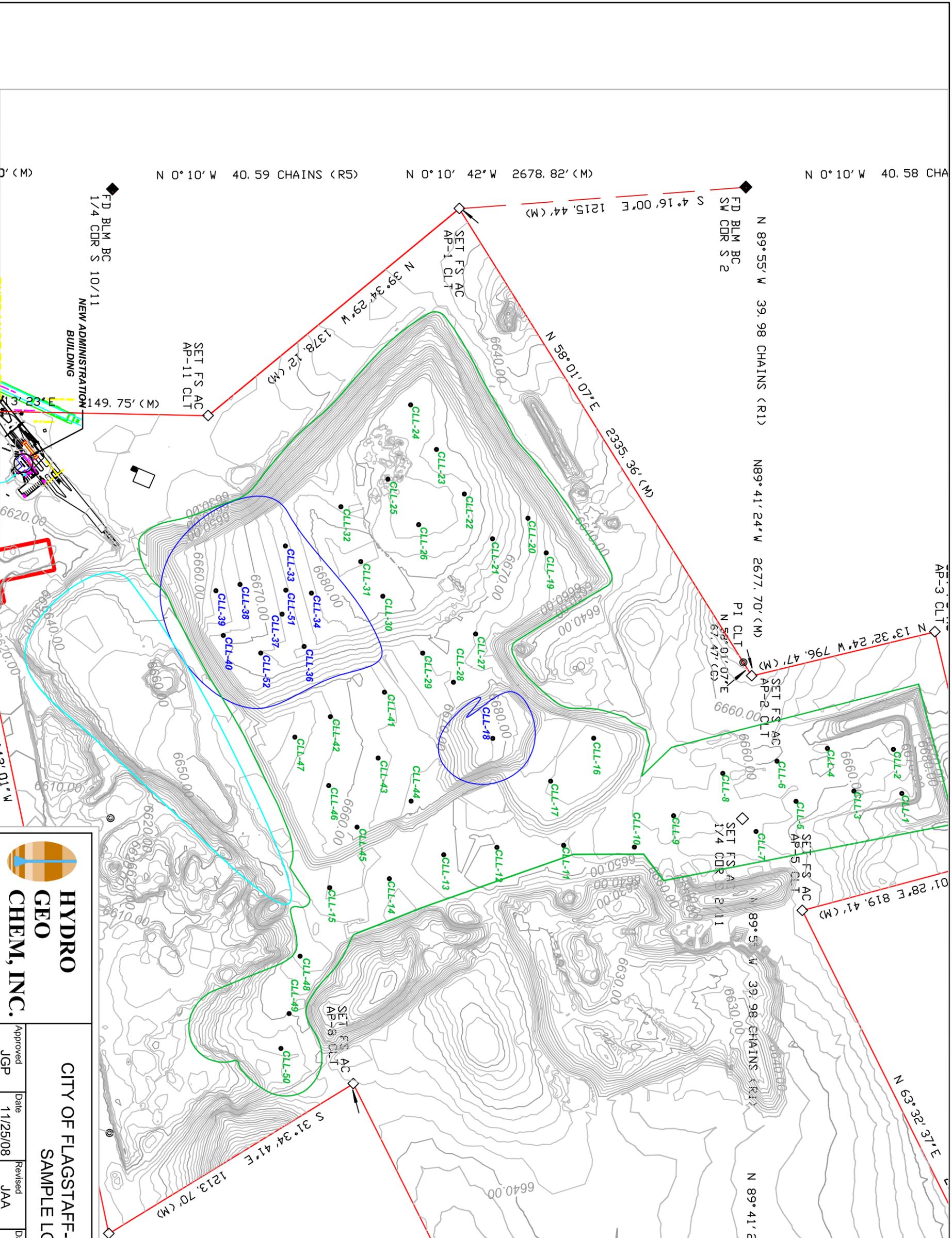
N



**HYDRO
GEO
CHEM, INC.**

**CITY OF FLAGSTAFF-CINDER LAKE LANDFILL
SITE LOCATION MAP**

Approved JGP	Date 11/25/08	Revised	Date	File Name 200802905A	Figure No. 1
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N 0° 10' W 40.58 CHAINS (R5)

N 0° 10' 42" W 2678.82' (M)

N 0° 10' W 40.59 CHAINS (R5)

0' (M)

FD BLM BC
1/4 CDR S 10/11

NEW ADMINISTRATION
BUILDING

149.75' (M)

SET FS AC
AP-11 CLT

SET FS AC
AP-1 CLT

FD BLM BC
SW CDR S 2

N 89° 55' W 39.98 CHAINS (R1)

S 4° 16' 00" E 1215.44' (M)

N 58° 01' 07" E 2335.36' (M)

N 89° 41' 24" W 2677.70' (M)

PI CLT
N 58° 01' 07" E 67.47' (M)

AP-3 CLT

SET FS AC
AP-2 CLT

SET FS AC
1/4 CDR S 2/11

SET FS AC
AP-5 CLT

N 01° 28' E 819.41' (M)

N 89° 55' W 39.98 CHAINS (R1)

N 89° 41' 2

N 39° 32' 31" E

S 31° 34' 41" E 1213.70' (M)

SET FS AC
AP-8 CLT



HYDRO
GEO
CHEM, INC.

CITY OF FLAGSTAFF-CINDER LAKE LANDFILL	
SAMPLE LOCATION MAP	
Approved	Date
JGP	11/25/08
Revised	Date
JAA	12/15/08
File Name	Figure No.
200802904A	2



- LEGEND**
- LIMITS OF MUNICIPAL SOLID WASTE
 - AREAS WITH WASTE LESS THAN 2 YEARS OLD OVERLYING OLDER WASTE
 - NON-DEGRADABLE WASTES

APPENDIX A

FIELD LOGS



METHOD 25C TIER II LANDFILL GAS SAMPLING LOG

DATE		Sample Location Number	SYSTEM PREPURGE TIME			LANDTEC GAS ANALYSIS					SUMMA CANNISTER PRESSURE			Surface	
			START	END	Volume (Liters)	O2 %	CH4 %	CO2 %	N2 % Balance	TOTAL	Canister I.D.	INITIAL in. Hg	FINAL in. Hg	Bottom TEMP. F	Surface TEMP F
Vista GeoScience Project No.: 8144			Field Technician: David West												
CLIENT: Hydro Geo Chem, Inc.			Gas Meter: Landtec GEN-500												
CLIENT FIELD REP: James Peck			Rig/Probe: Creeprobe DI-54												
LANDFILL NAME: Cinder Lakes Landfill			Flowmeter:												
LANDFILL ADDRESS: 6770 E. Landfill Rd. Flagstaff, Az			Vacuum Gauge:												
DATE	Sample Location Number	START	END	Volume (Liters)	O2 %	CH4 %	CO2 %	N2 % Balance	TOTAL	Canister I.D.	INITIAL in. Hg	FINAL in. Hg	Bottom TEMP. F	Surface TEMP F	
10/23/08	CELL-1	1155	1204	2.0	0.0	37.4	42.3	18.3	100.0	1428	14.6	10.0	79.0	87.0	
"	CELL-2	1233	1239	2.0	0.0	31.0	39.4	29.6	100.0	"	9.5	5.0	78.5	98.4	
"	CELL-3	1311	1319	2.0	0.0	1.5	21.5	77.0	100.0	"	5.0	0.9	78.4	88.5	
"	CELL-4	1341	1345	1.25	0.0	56.0	44.0	0.0	100.0	1396	14.5	10.0	Caved	91.5	
"	CELL-5	1421	1424	2.0	0.0	55.5	44.5	0.0	100.0	"	10.2	5.1	Caved	—	
"	CELL-6	1457	1503	2.0	0.0	51.5	35.1	13.4	100.0	"	4.9	0.8	Caved	—	
"	CELL-7	1557	1603	2.0	0.0	2.1	17.4	80.4	100.0	3747	14.0	10.0	Caved	—	
10/24/08	CELL-7	1111	1114	1.0	0.0	3.4	18.1	78.5	100.0	—	Did not collect	not collect	—	—	
"	CELL-8A	1148	1151	2.0	0.0	55.5	36.2	8.3	100.0	"	9.2	5.0	—	—	
"	CELL-8B	1208	1211	1.0	0.0	34.0	33.0	33.0	100.0	"	5.0	1.0	—	—	
"	CELL-9	1245	1248	1.0	0.0	7.5	17.5	74.5	100.0	—	Did not collect	not collect	—	—	
"	CELL-10	1418	1421	1.0	0.5	4.2	5.5	75.4	100.0	—	Did not collect	not collect	—	—	
"	"	1528	1534	3.0	14.8	0.4	30.6	54.0	100.0	—	Did not collect	not collect	—	—	
"	CELL-11	1029	1032	1.5	0.2	34.0	31.1	34.7	100.0	3590	14.0	10.0	—	—	
"	"				0.2	34.0	31.1	34.7	100.0						
10/26/08	CELL-12	1030	1037	2.25	0.1	5.8	18.9	75.2	100.0	3590	9.5	5.0	—	—	

Death
 86'
 11.6'
 14.6'
 14.6'
 11.6'
 11.6'
 14.7'
 9.0'
 12.8'
 13.9'
 14.0'
 14.0'
 14.6'
 14.0

METHOD 25C TIER II LANDFILL GAS SAMPLING LOG



Vista GeoScience Project No.: 8144 Field Technician: David West
 CLIENT: Hydro Geo Chem Gas Meter: Landtec GEN-500
 CLIENT FIELD REP. James Racks Rig/Probe: Geoprobe DF-54
 LANDFILL NAME: Cedar Lake Landfill Flowmeter:
 LANDFILL ADDRESS: 6776 E. Landfill Rd., Flagstaff, AZ Vacuum Gauge:

DATE	Sample Location Number	SYSTEM PURGE TIME			LANDTEC GAS ANALYSIS					SUMMA CANNISTER PRESSURE			Surface	
		START	END	Volume (Liters)	O2 %	CH4 %	CO2 %	N2 % Balance	TOTAL	Canister I.D.	INITIAL in. Hg	FINAL in. Hg	Bottom TEMP. F	Surface TEMP F
10/26/08	CELL-13	1137	1141	1.25	11.1	0.0	8.9	80.0	100.0	3590	Did not collect		11.5'	
"	CELL-14	1203	1209	2.0	0.2	39.6	32.1	28.1	100.0	3590	4.9	0.9	11.6'	
"	CELL-15	1237	1243	2.0	0.2	25.3	31.6	43.0	100.0	3177	14.8	9.5	11.6'	
"	CELL-16	1346	1350	2.5	0.0	46.4	39.4	14.2	100.0	"	9.2	4.9	11.6'	
"	CELL-17	1416	1420	2.5	0.1	59.3	40.7	0.0	100.0	"	4.4	0.5	11.6'	
"	CELL-18	1510	1515	3.0	0.0	54.0	46.0	46.0	100.0	1465	14.2	9.7	23.0'	
"	CELL-19	1600	1607	1.0	0.1	55.4	44.5	0.0	100.0	"	9.2	4.9	11.0'	
10/27/08	CELL-20	0907	0916	1.0	0.0	57.0	43.0	0.0	100.0	1291	13.1	9.0	11.0'	
"	CELL-21	1001	1005	1.5	0.0	57.8	41.4	0.8	100.0	"	8.8	4.9	8.7'	
"	CELL-22	1026	1031	1.5	0.0	56.0	41.7	2.3	100.0	"	4.9	0.9	8.7'	
"	CELL-23	1102	1106	1.5	0.0	56.2	41.0	2.8	100.0	3650	14.2	9.7	11.0'	
"	CELL-24	1135	1142	2.5	0.0	56.8	39.4	3.8	100.0	"	9.5	4.8	11.0'	
"	CELL-25	1230	1236	2.0	0.0	55.0	40.5	4.5	100.0	"	4.8	0.8	11.0'	
"	CELL-26	1309	1314	1.5	0.2	54.0	42.9	3.1	100.0	1168	14.3	9.7	11.0'	
"	CELL-27	1403	1407	1.25	0.4	58.0	36.0	5.6	100.0	"	9.2	4.7	11.6'	

N ↓ W 10°
O₂ ↓ S 9%



METHOD 25C TIER II LANDFILL GAS SAMPLING LOG

Vista GeoScience Project No.: 8144

Field Technician: David West

CLIENT: Hydro Geo Chem

Gas Meter: Landtec GEM-500

CLIENT FIELD REP: James Peck

Rig/Probe: Geoprobe DT-54

LANDFILL NAME: Cinder Lake Landfill

Flowmeter:

LANDFILL ADDRESS: 6770 E. Landfill Rd.; Flagstaff, AZ

Vacuum Gauge:

DATE	Sample Location Number	SYSTEM PREPURGE TIME			LANDTEC GAS ANALYSIS					SUMMA CANNISTER PRESSURE			Surface	
		START	END	Volume (Liters)	O₂ %	CH₄ %	CO₂ %	N₂ % Balance	TOTAL	Canister I.D.	INITIAL in. Hg	FINAL in. Hg	Bottom TEMP. F	TEMP F
10/27/08	CELL-28	1449	1453	2.5	0.1	55.4	41.1	3.4	100.0	1168	4.4	0.5	-	-
"	CELL-29	1541	1544	6.0	0.0	58.0	39.2	2.8	100.0	5480	14.6	10.0	-	-
"	CELL-30	1633	1638	1.5	0.0	56.2	41.7	2.1	100.0	"	9.5	4.7	-	-
10/28/08	CELL-31	0908	0914	3.5	0.0	55.4	44.6	0.0	100.0	1436	12.0	8.6	-	-
"	CELL-32	1069	1073	1.25	0.0	56.0	44.0	0.0	100.0	"	8.6	4.7	-	-
"	CELL-33	1137	1148	4.0	0.1	55.0	43.7	1.2	100.0	"	4.6	0.3	-	-
"	CELL-34	1256	1300	1.5	0.2	54.0	45.8	0.0	100.0	3647	14.3	9.7	-	-
"	CELL-35	1349	1353	6.25	0.2	53.6	46.2	0.0	100.0	"	9.2	4.9	-	-
"	CELL-36	1434	1439	1.25	0.2	51.6	48.2	0.0	100.0	"	4.6	0.5	-	-
"	CELL-37	1521	1525	6.25	0.2	54.0	44.6	1.3	100.0	1342	14.7	10.2	-	-
"	CELL-38	1555	1601	1.5	0.1	54.7	44.7	0.5	100.0	"	9.9	5.1	-	-
"	CELL-39	1629	1633	1.25	0.1	54.0	44.3	1.6	100.0	"	4.8	0.7	-	-
"	CELL-40	1719	1723	1.25	0.4	53.7	45.9	0.0	100.0	3089	15.4	10.3	-	-
10/29/08	CELL-51	1139	1146	2.5	0.2	56.5	43.3	0.0	100.0	"	9.7	5.0	-	-
"	CELL-52	1233	1237	6.25	0.2	52.7	47.1	0.0	100.0	"	4.9	0.4	-	-

11.6'
14.0'
20.6'
20.6'
20.4'
26.0'
11.7'
20.7'
11.6'
20.6'
11.6'
11.6'
23.6'
26.6'
26.6'

METHOD 25C TIER II LANDFILL GAS SAMPLING LOG



Vista GeoScience Project No.: 8144

Field Technician: David West

CLIENT: Hydro Geo Chem

Gas Meter: Landtec GEM-500

CLIENT FIELD REP. James Peck

Rig/Probe: Geo probe DT-54

LANDFILL NAME: Cinder Lake

Flowmeter:

LANDFILL ADDRESS:

Vacuum Gauge:

DATE	Sample Location Number	SYSTEM PURGE TIME		LANDTEC GAS ANALYSIS				SUMMA CANNISTER PRESSURE			Bottom TEMP. F	Surface TEMP F			
		START	END	Volume (Liters)	O2 %	CH4 %	CO2 %	N2 % Balance	TOTAL	Canister I.D.			INITIAL in. Hg	FINAL in. Hg	
10/29/08	CELL-41	1330	1334	1.0	0.5	63.5	36.0	0.0	100.0	3138	14.6	9.5	-	-	10.5'
"	CELL-42	1448	1451	1.0	0.5	56.8	42.7	0.0	100.0	"	9.6	5.0	-	-	10.5'
"	CELL-43	1554	1557	1.0	0.4	60.4	39.2	0.0	100.0	"	4.3	0.2	-	-	10.6'
10/30/08	CELL-44	1315	1319	1.25	0.2	51.7	43.3	4.8	100.0	3721	14.3	9.9	-	-	10.5'
"	CELL-45	1349	1354	1.75	0.1	49.5	46.3	4.1	100.0	"	9.4	5.0	-	-	10.6'
"	CELL-46	1420	1425	1.75	0.2	54.7	45.1	0.0	100.0	"	4.9	0.5	-	-	10.6'
"	CELL-47	1445	1449	1.25	0.2	52.3	47.5	0.0	100.0	1463	14.9	8.4	-	-	10.5'
"	CELL-48	1537	1543	2.0	0.2	31.8	35.5	32.5	100.0	"	8.0	1.5	-	-	10.5'
"	CELL-49	1620	1624	1.25	0.2	30.0	28.7	40.1	100.0	1387	Det not collect	Det not collect	-	-	10.6'
"	CELL-49A-1641	1641	1645	1.0	0.2	30.5	26.5	42.8	100.0	"	14.4	8.4	-	-	11.7'
"	CELL-50	1706	1712	1.5	0.2	1.3	16.9	81.6	100.0	"	Det not collect	Det not collect	-	-	11.0'

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/23/08	RIG: DTS4
Vista Field Engineers: DAVID WEST		UNCC Ticket Number:		
Client: Hydro Geo Chem, Inc.		Site Manager: James Pectz		
Client Project Name: Cinder Lake Landfill Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Day Number: 1	Total Hours on Site: 7 1/2	Mobilization Mileage:	
Time Requested on Location: 0915	- Client's Standby Hours: -	To Site: 12	
Time on Location: 0915	- Vista's Standby Hours: -	Return: 12	
Time off Location: 1650	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [D] 7 1/2	Hours: 4 1/2	
Standby Sessions (include reasons):			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[] Liners (ea) [type:]	[]	[30] or [55] gallon Drum, each
[]	[] Liners (ea) [type:]	[]	Bentonite [Granular], [Chip], [Powder] (50# bag)
[]	Other Liners: []	[]	Silica Sand (50# bag)
[]	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	[]	Portland Cement (94# bag)
16'	3/8" Silicone Tubing (ft)	[]	[Asphalt Patch], [Concrete] (# bag)
[]	Points (ea): [size: "], [type:]	[]	Bumpers
[]	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
[]	[]" x 5' PVC Riser (section) Sch []	[]	3' x 1 1/4" Geoprobe rod
[]	[]" x 10' PVC Riser (section) Sch []	[]	3' x 1 1/4" Geoprobe rod - perforated
[]	[]" x 5' PVC Screen (section) Sch []	[]	1 1/4" drive point (threaded)
[]	[]" x 10' PVC Screen (section) Sch []	[]	
[]	[]" x []' Steel Riser (ea)	[]	
[]	[]" Slip Cap (ea)	Rental Equipment / Contract:	
[]	[]" Female End Cap (ea)	[]	[Peristaltic Pump] or [Grout Pump]
[]	[]" Male End Cap (ea)	[]	[PID/OVM] or [LandTec]
[]	[]" Surface Completion (list item detail below)	[]	Exhaust Fan / Ductwork / CO Monitor
[]	[]" J-Plug and Lock (set)	[]	Subcontracted Concrete Coring / Barricading
[]	[]" x []' Prepacked Screen (ea)	[]	3.25" Casing and Auger Add-On
[]	PVC Drop-down Screens (ea)	[]	[Decon] or [Support] Trailer / Truck
[]	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]	[]	Gamma Logger
[]	Aluminum Locking Caps [2"], [4"]	[]	
[]	Concrete Anchor Bolts	[]	

APPROVALS	
Vista Field Engineer:	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
0900 - 1130: Site orientation / H&S Meeting	
Complete CU-1 to CU-6 (driven from 9 to 15' bgs): 102' total w/ multiple offsets.	
Wells Completed: []	Cores: []
H2O Samples: []	Total Test Holes: [6]
Gamma Log Ft: []	Total Footage: [102']

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

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To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/24/08	RIG: DT54
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem, Inc		Site Manager: James Peck		
Client Project Name: Cinder Lake Landfill Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Day Number: 2	Total Hours on Site: 8^{3/4}	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: -	To Site: 12	
Time on Location: 0830	- Vista's Standby Hours: 3	Return: 12	
Time off Location: 1715	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [D] 5^{3/4}	Hours: 1/2	
Standby Sessions (include reasons): 1 hr. AM - check leaking hydraulic hoses/fittings - repair fittings ; 2 hrs. PM - problems w/ Landtec "flow" - check filters (internal) order new.			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[]' Liners (ea) [type: []]	[30] or [55]	gallon Drum, each
[]	[]' Liners (ea) [type: []]	[]	Bentonite [Granular], [Chip], [Powder] (50# bag)
[]	Other Liners: []	[]	Silica Sand (50# bag)
[]	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	[]	Portland Cement (94# bag)
[]	3/8" Silicone Tubing (ft)	[]	[Asphalt Patch], [Concrete] ([] # bag)
[]	Points (ea): [size: []], [type: []]	[]	Bumpers
[]	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
[]	[]" x 5' PVC Riser (section) Sch []	[]	
[]	[]" x 10' PVC Riser (section) Sch []	[]	
[]	[]" x 5' PVC Screen (section) Sch []	[]	
[]	[]" x 10' PVC Screen (section) Sch []	[]	
[]	[]" x []' Steel Riser (ea)	[]	
[]	[]" Slip Cap (ea)	[]	
[]	[]" Female End Cap (ea)	Rental Equipment / Contract:	
[]	[]" Male End Cap (ea)	[]	[Peristaltic Pump] or [Grout Pump]
[]	[]" Surface Completion (list item detail below)	1	[PID/OVM] or (LandTec)
[]	[]" J-Plug and Lock (set)	[]	Exhaust Fan / Ductwork / CO Monitor
[]	[]" x []' Prepacked Screen (ea)	[]	Subcontracted Concrete Coring / Barricading
[]	PVC Drop-down Screens (ea)	[]	3.25" Casing and Auger Add-On
[]	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]	[]	[Decon] or [Support] Trailer / Truck
[]	Aluminum Locking Caps [2"], [4"]	[]	Gamma Logger
[]	Concrete Anchor Bolts	[]	

APPROVALS	
Vista Field Engineer:	Client's Supervisor: _____

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>				
<p>Complete CUL-7 to CUL-11 (multiple offsets at 7, 8, 10 to get out of soil profile and into trash profile). => 124' drilled to get 5 good locations. Did not collect gas at CUL-10 due to poor soil gas.</p>					
Wells Completed: []	Cores: []	H2O Samples: []	Total Test Holes: [5]	Gamma Log Ft: []	Total Footage: [124 ']

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

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To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/26/08	RIG: 8154
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem		Site Manager: James Peck		
Client Project Name: Cinder Lake Land Fill Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: YES / NO
Day Number: 3	Total Hours on Site: 7	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: -	To Site: 12	
Time on Location: 0730	- Vista's Standby Hours: -	Return: 12	
Time off Location: 1630	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: 7	Hours: 2	
Standby Sessions (include reasons):			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[] Liners (ea) [type:]	[]	[30] or [55] gallon Drum, each
[]	[] Liners (ea) [type:]	1	Bentonite [Granular] [Chip], [Powder] (50# bag)
	Other Liners: []		Silica Sand (50# bag)
	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)		Portland Cement (94# bag)
	3/8" Silicone Tubing (ft)		[Asphalt Patch], [Concrete] (# bag)
	Points (ea): [size: "], [type:]		Bumpers
	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
	[]" x 5' PVC Riser (section) Sch []		
	[]" x 10' PVC Riser (section) Sch []		
	[]" x 5' PVC Screen (section) Sch []		
	[]" x 10' PVC Screen (section) Sch []		
	[]" x []' Steel Riser (ea)		
	[]" Slip Cap (ea)		
	[]" Female End Cap (ea)	Rental Equipment / Contract:	
	[]" Male End Cap (ea)		[Peristaltic Pump] or [Grout Pump]
	[]" Surface Completion (list item detail below)	1	[PID/OVM] or [LandTec]
	[]" J-Plug and Lock (set)		Exhaust Fan / Ductwork / CO Monitor
	[]" x []' Prepacked Screen (ea)		Subcontracted Concrete Coring / Barricading
	PVC Drop-down Screens (ea)		3.25" Casing and Auger Add-On
	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]		[Decon] or [Support] Trailer / Truck
	Aluminum Locking Caps [2"], [4"]		Gamma Logger
	Concrete Anchor Bolts		

APPROVALS	
Vista Field Engineer: 	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
Complete CU-12 to CU-19 (offsets at CU-12, CU-13); did not collect CU-13 due to poor soil gas. CU-18 driven to 23.0' bgs to get beneath more recent trash; long mob. distance between holes.	
Wells Completed: [] Cores: [] H2O Samples: [] Total Test Holes: [8] Gamma Log Ft: [] Total Footage: [130]	

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

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To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/27/08	RIG: DT54
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem Inc.		Site Manager: James Pock		
Client Project Name: Cinder Lake Landfill - Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Day Number: 4	Total Hours on Site: 9 3/4	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: -	To Site: 12	
Time on Location: 0745	- Vista's Standby Hours: -	Return: 12	
Time off Location: 1730	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [D] 9 3/4	Hours: 12	
Standby Sessions (include reasons):			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[] Liners (ea) [type:]	[30] or [55]	gallon Drum, each
[]	[] Liners (ea) [type:]	[]	Bentonite [Granular], [Chip], [Powder] (50# bag)
[]	Other Liners: []	[]	Silica Sand (50# bag)
[]	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	[]	Portland Cement (94# bag)
[]	3/8" Silicone Tubing (ft)	[]	[Asphalt Patch], [Concrete] (# bag)
[]	Points (ea): [size: "], [type:]	[]	Bumpers
[]	[] [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
[]	[]" x 5' PVC Riser (section) Sch []	1	1 1/4" threaded drive cap
[]	[]" x 10' PVC Riser (section) Sch []	[]	[]
[]	[]" x 5' PVC Screen (section) Sch []	[]	[]
[]	[]" x 10' PVC Screen (section) Sch []	[]	[]
[]	[]" x []" Steel Riser (ea)	[]	[]
[]	[]" Slip Cap (ea)	[]	[]
[]	[]" Female End Cap (ea)	Rental Equipment / Contract:	
[]	[]" Male End Cap (ea)	[]	[Peristaltic Pump] or [Grout Pump]
[]	[]" Surface Completion (list item detail below)	/	[PID/OVM] or [LandTec]
[]	[]" J-Plug and Lock (set)	[]	Exhaust Fan / Ductwork / CO Monitor
[]	[]" x []" Prepacked Screen (ea)	[]	Subcontracted Concrete Coring / Barricading
[]	PVC Drop-down Screens (ea)	[]	3.25" Casing and Auger Add-On
[]	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]	[]	[Decon] or [Support] Trailer / Truck
[]	Aluminum Locking Caps [2"], [4"]	[]	Gamma Logger
[]	Concrete Anchor Bolts	[]	[]

APPROVALS	
Vista Field Engineer:	Client's Supervisor: _____

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>				
<p><i>Complete CU-20 to CU-30, start CU-31 (driven to 20.0'); no offsets required, but CU-30 & CU-31 driven to 21' to get into 2 year old trash. DT54 rig requires hydraulic fluid due to on-going leaks.</i></p>					
Wells Completed: []	Cores: []	H2O Samples: []	Total Test Holes: [11]	Gamma Log Ft: []	Total Footage: [148]

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

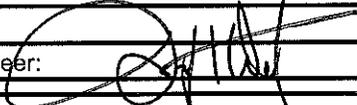
This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/28/07	RIG: 8754
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem, Inc.		Site Manager: James Peete		
Client Project Name: Cinder Lake Landfill Tier I		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: YES / NO
Day Number: 5	Total Hours on Site: 10 3/4	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: 1/2 hr.	To Site: 12	
Time on Location: 0730	- Vista's Standby Hours: -	Return: 12	
Time off Location: 1815	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	- Total Hours @ Level: [D] 9 3/4	Hours: 1/2	

Standby Sessions (include reasons): **1/2 hr.: Northern Arizona University class on site - give discussion of sampling methodology; 1/2 hr. talk w/ Matt Morales re: sampling depths.**

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[] Liners (ea) [type:]	[]	[30] or [55] gallon Drum, each
[]	[] Liners (ea) [type:]	1	Bentonite [Granular] [Chip], [Powder] (50# bag)
	Other Liners: []		Silica Sand (50# bag)
	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)		Portland Cement (94# bag)
	3/8" Silicone Tubing (ft)		[Asphalt Patch], [Concrete] (# bag)
	Points (ea): [size: "], [type:]		Bumpers
	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
	[]" x 5' PVC Riser (section) Sch []		
	[]" x 10' PVC Riser (section) Sch []	1	1 1/4" threadless drive cap
	[]" x 5' PVC Screen (section) Sch []		
	[]" x 10' PVC Screen (section) Sch []		
	[]" x []' Steel Riser (ea)		
	[]" Slip Cap (ea)		
	[]" Female End Cap (ea)	Rental Equipment / Contract:	
	[]" Male End Cap (ea)		[Peristaltic Pump] or [Grout Pump]
	[]" Surface Completion (list item detail below)	1	[PID/OVM] or [LandTec]
	[]" J-Plug and Lock (set)		Exhaust Fan / Ductwork / CO Monitor
	[]" x []' Prepacked Screen (ea)		Subcontracted Concrete Coring / Barricading
	PVC Drop-down Screens (ea)		3.25" Casing and Auger Add-On
	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]		[Decon] or [Support] Trailer / Truck
	Aluminum Locking Caps [2"], [4"]		Gamma Logger
	Concrete Anchor Bolts		

APPROVALS	
Vista Field Engineer: 	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
<p>Complete CU-31 to CU-40 (5 locations driven to 21', 2 locations to 26' bgs due to 8-month old trash approx. 20-25' overlying \geq 2 yr. old trash).</p>	
Wells Completed: []	Cores: []
H2O Samples: []	Total Test Holes: [10]
Gamma Log Ft: []	Total Footage: [180]

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/29/08	RIG: DT 54
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem, Inc.		Site Manager: James Peck		
Client Project Name: Cinder Lake Landfill Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO
Day Number: 6	Total Hours on Site: 8 1/4	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: 1/2	To Site: 12	
Time on Location: 0900	- Vista's Standby Hours: 2 1/2	Return: 12	
Time off Location: 1715	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [D] - 5 1/4 5 1/4	Hours: 1/2	

Standby Sessions (include reasons): **1/2 hr. : NAAU class on site - give discussion of sampling methods.**
2 1/2 hrs : new leak on 54 becomes fatal - lost > 2 1/2 gallons hyd. fluid; remove hose.

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	1" Liners (ea) [type: []]	[]	[30] or [55] gallon Drum, each
[]	1" Liners (ea) [type: []]	[]	Bentonite [Granular], [Chip], [Powder] (50# bag)
[]	Other Liners: []	[]	Silica Sand (50# bag)
[]	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	[]	Portland Cement (94# bag)
[]	3/8" Silicone Tubing (ft)	[]	[Asphalt Patch], [Concrete] ([] # bag)
[]	Points (ea): [size: "], [type: []]	[]	Bumpers
[]	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
[]	[]" x 5' PVC Riser (section) Sch []	[]	1 1/4" threadless drive cap
[]	[]" x 10' PVC Riser (section) Sch []	[]	
[]	[]" x 5' PVC Screen (section) Sch []	[]	
[]	[]" x 10' PVC Screen (section) Sch []	[]	
[]	[]" x []" Steel Riser (ea)	[]	
[]	[]" Slip Cap (ea)	[]	
[]	[]" Female End Cap (ea)	Rental Equipment / Contract:	
[]	[]" Male End Cap (ea)	[]	[Peristaltic Pump] or [Grout Pump]
[]	[]" Surface Completion (list item detail below)	[]	[PID/OVM] or [LandTec]
[]	[]" J-Plug and Lock (set)	[]	Exhaust Fan / Ductwork / CO Monitor
[]	[]" x []" Prepacked Screen (ea)	[]	Subcontracted Concrete Coring / Barricading
[]	PVC Drop-down Screens (ea)	[]	3.25" Casing and Auger Add-On
[]	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]	[]	[Decon] or [Support] Trailer / Truck
[]	Aluminum Locking Caps [2"], [4"]	[]	Gamma Logger
[]	Concrete Anchor Bolts	[]	

APPROVALS	
Vista Field Engineer:	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
Complete CL-51, CL-52 (driven to 26.6' bgs), CL-41 to CL-43 (driven to 10.5')	
Wells Completed: []	Cores: []
H2O Samples: []	Total Test Holes: [5]
Gamma Log Ft: []	Total Footage: [85]

VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/30/08	RIG: DTS4
Vista Field Engineers: David West		UNCC Ticket Number:		
Client: Hydro Geo Chem		Site Manager: James Peete		
Client Project Name: Cinder Lake Landfill Tier II		Client Project Number:		
Site Description:		Site Address: Flagstaff, AZ		

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: <input checked="" type="checkbox"/> YES / NO
Day Number: 7	Total Hours on Site: 8 3/4	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: -	To Site: 12	
Time on Location: 0900	- Vista's Standby Hours: 4 3/4	Return: 12	
Time off Location: 1745	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [D] 4	Hours: 1/2	
Standby Sessions (include reasons): Hydraulic hose repair & installation on rig; went to local CASE dealer for repair/replacement hoses & fittings x 2.			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	' Liners (ea) [type:]	[30] or [55]	gallon Drum, each
[]	' Liners (ea) [type:]		Bentonite [Granular], [Chip], [Powder] (50# bag)
	Other Liners: []		Silica Sand (50# bag)
	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)		Portland Cement (94# bag)
	3/8" Silicone Tubing (ft)		[Asphalt Patch], [Concrete] (# bag)
	Points (ea): [size: "], [type:]		Bumpers
	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
	[]" x 5' PVC Riser (section) Sch []		
	[]" x 10' PVC Riser (section) Sch []		
	[]" x 5' PVC Screen (section) Sch []		
	[]" x 10' PVC Screen (section) Sch []		
	[]" x []' Steel Riser (ea)		
	[]" Slip Cap (ea)		
	[]" Female End Cap (ea)	Rental Equipment / Contract:	
	[]" Male End Cap (ea)		[Peristaltic Pump] or [Grout Pump]
	[]" Surface Completion (list item detail below)	1	[PID/OVM] or (LandTec)
	[]" J-Plug and Lock (set)		Exhaust Fan / Ductwork / CO Monitor
	[]" x []' Prepacked Screen (ea)		Subcontracted Concrete Coring / Barricading
	PVC Drop-down Screens (ea)		3.25" Casing and Auger Add-On
	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]		[Decon] or [Support] Trailer / Truck
	Aluminum Locking Caps [2"], [4"]		Gamma Logger
	Concrete Anchor Bolts		

APPROVALS	
Vista Field Engineer:	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
<p>Complete CU-44 to CU-50 (all driven to 10.5 - 11.7' bgs); did not collect CU-49 & CU-50 since located in soil profile (no CH4 readings); 1 offset required at CU-49</p>	
Wells Completed: []	Cores: []
H2O Samples: []	Total Test Holes: [7]
Gamma Log Ft: []	Total Footage: [86]

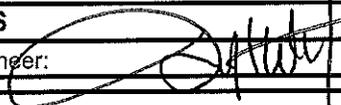
VISTA GEOSCIENCE DAILY FIELD SERVICES REPORT

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION		VISTA Project#: 8144	DATE: 10/31/08	RIG: DT54
Vista Field Engineers: David West	UNCC Ticket Number:			
Client: Hydro Geo Chem	Site Manager: James Peck			
Client Project Name: Cinder Lake Landfill Tier II	Client Project Number:			
Site Description:	Site Address: Flagstaff AZ			

DAILY TIME REPORT		(use 24-hour clock)	Time Exceeded 4 Hr Min: YES/NO <input checked="" type="checkbox"/>
Day Number: 8	Total Hours on Site: 1 + 1/2	Mobilization Mileage:	
Time Requested on Location: -	- Client's Standby Hours: -	To Site: 12	
Time on Location: 1400	- Vista's Standby Hours: -	Return: 12	
Time off Location: 1445	- Lunch / Break Hours: -	Total: 24	
Lunch Break - From: - To: -	= Total Hours @ Level: [] 3	Hours: 42	
Standby Sessions (include reasons):			

EXPENDABLES USED AND DAMAGED TOOLS		(circle or fill in bracketed items)	
QTY	ITEM	QTY	ITEM
[]	[]' Liners (ea) [type:]	[]	[30] or [55] gallon Drum, each
[]	[]' Liners (ea) [type:]	[]	Bentonite [Granular], [Chip], [Powder] (50# bag)
[]	Other Liners: []	[]	Silica Sand (50# bag)
[]	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	[]	Portland Cement (94# bag)
[]	3/8" Silicone Tubing (ft)	[]	[Asphalt Patch], [Concrete] (# bag)
[]	Points (ea): [size: "], [type:]	[]	Bumpers
[]	[]" [Grip Anchor Point] or [Expendable Cutting Shoe]	Additional Items Used / Damaged Tools / PPE:	
[]	[]" x 5' PVC Riser (section) Sch []	[]	
[]	[]" x 10' PVC Riser (section) Sch []	[]	
[]	[]" x 5' PVC Screen (section) Sch []	[]	
[]	[]" x 10' PVC Screen (section) Sch []	[]	
[]	[]" x []' Steel Riser (ea)	[]	
[]	[]" Slip Cap (ea)	[]	
[]	[]" Female End Cap (ea)	Rental Equipment / Contract:	
[]	[]" Male End Cap (ea)	[]	[Peristaltic Pump] or [Grout Pump]
[]	[]" Surface Completion (list item detail below)	[]	[PID/OVM] or [LandTec]
[]	[]" J-Plug and Lock (set)	[]	Exhaust Fan / Ductwork / CO Monitor
[]	[]" x []' Prepacked Screen (ea)	[]	Subcontracted Concrete Coring / Barricading
[]	PVC Drop-down Screens (ea)	[]	3.25" Casing and Auger Add-On
[]	Flush-Mount Traffic Cover [6"], [7"], [8"], [10"], [12"]	[]	[Decon] or [Support] Trailer / Truck
[]	Aluminum Locking Caps [2"], [4"]	[]	Gamma Logger
[]	Concrete Anchor Bolts	[]	

APPROVALS	
Vista Field Engineer: 	Client's Supervisor:

NOTES:	Samples Returned to Vista Lab <input type="checkbox"/>
1 hr. - pick up & load DT54 rig at Cinder Lake Landfill	
1 1/2 hrs - complete COCs, drop off & send SUMMA canisters at Fedx/kinses	
Demob to Golden, Co. on 11/1/08 (~790 miles / 14 hrs.)	
Wells Completed: []	Cores: [] H2O Samples: [] Total Test Holes: [] Gamma Log Ft: [] Total Footage: []

Use 24-hour clock for time. Fill out at end of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/23/08 Day #: 1 Page #: 1 of 2 Project #: 8144
 Client: Hydro Geo Chem Project Name: Cinder Lakes Landfill - City of Flagstaff

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0915			At Cinder Lake Landfill - Flagstaff Meet James Peck (Hydro Geo Chem) & Matt Morales (CELL manager) Go over H & S plan - sign.	
1050			Drive across site & orient to site w/ James & Matt Offload 85-54 rig at 1 st location offload trailer toward center	
1115			Calibrate GEM-500 Pre-calibration rdgs: CH ₄ =17.5, CO ₂ =16.5%, O ₂ =0.4%, Bal=66.1% Post-calibration rdgs: CH ₄ =15.0, CO ₂ =15.0, O ₂ =0.5%, Bal=69.5%	
			Leak check sample train => OK.	
1140			1 st Summa canister has low initial vacuum (14.5") 2 nd Summa canister also has low initial vacuum (14") Call lab to question Temp. effects 3 rd canister = 13.5" Hg 4 th canister = 14.5" Hg According to Lab, at ~7000 ft. elevation / colder Temp we will see reduced vacuum rdgs.	
1155		CLL-1	Start collection at CLL-1	
1208			Collection complete. (4" Hg per sample)	
1225		CLL-2	Driven to 11.6' bgs;	
1244			Collection complete	
		CLL-3	Driven to 11.6' bgs Factual Landtec rdgs indicate not in trash but in soil low O ₂ & low CH ₄ ; offset ~20' and redriving to 15'. Some what better readings but still low CH ₄ (6.5%)	
1354		1	Collection complete for Summa # 1428	
1417		CLL-4	Driven to 15' (14.6') bgs - mod. loose drive thru volcanic rubble	
1430			Summa collection complete.	
1457		CLL-5	Driven to 12' (11.6') - much lighter drive	
1509			Summa collection complete	
1526		CLL-6	Driven to 14.6' bgs - loose drive !; Landtec rdgs indicate soil - no trash at this location CH ₄ : 0.16%, O ₂ =1.7%, CO ₂ =15%; offset & redrive	

Operator Initials: _____ (Required)

Use 24-hour clock for time. Fill out at end of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/24/08 Day #: 2 Page #: 1 of 2 Project #: 8144

Client: Hydro Geo Chem Project Name: Cinder Lake Landfill Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0830			At Cinder Lake Landfill; meet team; pick up	
			Summa canisters delivered to CLL - store in Matt H's office.	
0900			At CLL-7; check rig - 2 hydraulic hoses need attention; one is loose fitting & repaired - other is frayed hyd hose and will eventually need replaced.	
0950			Calibrate Landtec Gem-500	
			Pre-calibration rdgs: CH ₄ = 14.5%, CO ₂ = 14.3%, O ₂ = 0.7%, Bal = 70.5%	
			Post-calibration rdgs: CH ₄ = 15.0%, CO ₂ = 15.0%, O ₂ = 0.6%, Bal = 69.4%	
			Leak check sample train => Ok	
1023		CLL-7	3 rd driver to get into solid material; 15' depth	
			Landtec rdgs indicate soil - not trash ↓ CH ₄ ↓ O ₂	
1027			Offset again (4 th time); drive to 15.0' - still getting soil (not trash) rdgs. => CH ₄ = 2.9%	
			offset was 30' NW of staked location; offset again => 30' North of staked location;	
			Same conditions encountered ↓ CH ₄ ↓ O ₂	
1111			Collect sample anyway.	
1153		CLL-8A	1 st drive at staked location - refusal @ 8.5' bgs.	
			check gas rdgs => poor readings: CH ₄ = 3.4%, CO ₂ = 18.1%, Bal = 78.5%; attempt 1 offset 40'	
			NW; 9	
1208		CLL-8B	Get better "normal" trash readings at offset	
1220			Collection complete	
		CLL-9	Driven to 13.9'; ok gas rdgs.	
1257			Summa collection complete for #3747	
1327		CLL-10	Driven to 14.0'; Landtec reading nearly ambient; offset > 50' SW; rdgs indicate no trash	
			CH ₄ = 0.0 CO ₂ = 2.6, O ₂ = 17.0, Bal = 80.5;	
			offset east ~ 50'	
			Initially get "normal" gas readings, but drift into moderate soil-type readings; problems with Landtec filter - check filter (internal) after calling Landtec - talk to service; to Landfill office	
			Change Landtec batteries & order new filters	
1609			Move to CLL-11	

Operator Initials: _____ (Required)

Use 24-hour clock for time. Fill out at end of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/26/07 Day #: 3 Page #: 1 of 2 Project #: 8144

Client: Hydro Geo Chem Project Name: Cinder Lake Landfill Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0900			Get diesel fuel for D154	
0930			At Cinder Lake Landfill - sign in; get Soma	
			Canisters & Landtec from office	
1005		CLL-12	1st drive to refusal at 8.5' bgs; offset 5' south	
			2nd drive complete to 14.0' bgs - soft drive w/	
			voids encountered 8-9', 10-11', 12-13' bgs.	
1015			Calibrate BEM-500, leak check sample train	
			Pre-calibration rdgs: CH ₄ =14.7, CO ₂ =14.6, O ₂ =0.6, Bat=69.7	
			Post-calibration rdgs: CH ₄ =14.8, CO ₂ =14.8, O ₂ =0.8, Bat=69.7	
			Leak check fails w/ in-line filter in place;	
			remove filter - leak check ok w/o filter	
1030			Start Landtec rdgs for CLL-12	
1045			Collection complete for CLL-12	
1105		CLL-13	Driven to 12.0', - loose drive - doesn't	
			feel like good seal.	
1115			Landtec rdgs indicate ambient air - drive 3' additional	
			Still no CH ₄ , O ₂ =13.5%; offset 50' west	
			Driven to 11.5' at refusal - tighter drive	
1137			Start landtec rdgs	
			Landtec Rdgs as before - CH ₄ =0.0, O ₂ =11.1, CO ₂ =8.9	
			Move to next location - do not collect Soma sample.	
1155		CLL-14	Driven to 11.6' bgs - tight drive	
1203			Start landtec rdgs - more "normal" gas rdgs.	
1214			Collection complete for Soma # 3540	
		CLL-15	Driven to 11.6' bgs - tight drive into	
			obstruction at 10.5-11.5'	
1250			Collection complete; move to CLL-16	
1330		CLL-16	Driven to 11.6' bgs - tight drive	
1355			Collection complete	
1410		CLL-17	Driven to 11.6' bgs - tight drive	
			Good gas rdgs → CH ₄ =60% CO ₂ =40%	
1427			Collection complete for Soma # 3177	
1504		CLL-18	Driven to 23.0' bgs (on top of current cap)	
1522			Collection complete; good gas rdgs → CH ₄ =54%	
			CO ₂ =46%	

Operator Initials: _____ (Required) 1548 Rig moved to CLL-19

Use 24-hour clock for time. Fill out at least one of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/27/08 Day #: 4 Page #: 1 of 2 Project #: 8144
 Client: Hydro Geo Chem Project Name: Cinder Lake Landfill Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0730			Get diesel fuel for DT-54	
0745			At Cinder Lake Landfill; sign in; get Suman & Landtec from office.	
0816		CU-20	Move rig from CU-19 to CU-20	
0830			Calibrate Landtec GEN-500	
			Pre-calibration rdgs: CH ₄ =15.3%, CO ₂ =15.4%, O ₂ =1.0%, Bal=68.4%	
			Post-calibration rdgs: CH ₄ =15.0%, CO ₂ =14.8%, O ₂ =0.7%, Bal=69.3%	
			Leak check sample train - OK; also repaired in-line filter which now passes leak check	
0900			CU-20 driven to 11.0' bgs	
			Talk to James Peck (Hydro Geo Chem); Jason S.	
0920			Collection complete - had to use new Soma since #1465 had only 2.8 psi at start	
			Switch to Soma #1291 for CU-20 to CU-22	
1000		CU-21	Driven to 8.6' bgs	
1015			Collection complete - good rdgs @ 8.6' => CH ₄ =5.8%	
1022		CU-22	Driven to 8.6' bgs - med. tight drive	
1040			Collection complete	
1056		CU-23	Driven to 11.0' bgs - mod. tight drive	
1112			Collection complete	
1132		CU-24	Driven to 11.0' bgs	
1150			Collection complete;	
1210		CU-25	Locate & mob to CU-25; Matt M. helps fine tune location w/ Tremble GPS	
1230			Start Landtec rdgs for CU-25	
1244			Collection complete for Soma #3650	
1307		CU-26	Driven to 11.0' bgs	
1322			Collection complete	
1340			Replaced Landtec particulate filter (internal) which arrived Fed-X	
1357		CU-27	Driven to 11.6' bgs	
1413			Collection complete	
1434		CU-28	Driven to 11.6' bgs - top of 1.25" drive cap fractured off, but still useable.	
1500			Collection complete	

Operator Initials: DW (Required)

Use 24-hour clock for time. Fill out at least one of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/28/08 Day #: 5 Page #: 1 of 2 Project #: 8144
 Client: Hydro Geo Chem Project Name: Cinder Lake Land Fill - Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0700			Gas up Whitey, Call Jason S.	
0730			At Cinder Lake Landfill	
			Add hydraulic fluid to BT-54; leak continues	
0830			Calibrate Landtec GRM-500	
			Pre-calibration rdgs: CH ₄ = 14.8%, CO ₂ = 14.7%, O ₂ = 0.8%, Bal = 69.7%	
			Post-calibration rdgs: CH ₄ = 14.7%, CO ₂ = 14.2%, O ₂ = 0.7%, Bal = 69.8%	
			Leak check sample chain => OK	
0900		CLL-31	Driven to 20.6' last night; Soma # 5480 has only 2.9" Hg vacuum; switch to new Soma # 1436 (which has only 12.0" Hg vacuum at start)	
0920			Collection complete	
0930			Talk w/ Ken Robinson - delivers 1 1/4" drive cap from UPS	
1007		CLL-32	Driven to 20.4' bgs	
1010			Collection complete, pull rods, move to CLL-33	
		CLL-33	Located in mulch/sludge pile w/in a cleared area; talk to Matt Morales about required depth in this area - need to collect from beneath newer trash (8 months old) and into older trash which is ~ 25' bgs - will attempt to push to ~ 27'	
1137			CLL-33 driven to 26.0' bgs - very tight drive	
1200			Collection complete for Soma # 1436 (no vacuum left) Talk to Jason S. re: drive caps; talk to James Peck x2 re: sampling depths. => Says to keep targeting 11.0' as long as N ↓ 10% and O ₂ ↓ 5%.	
1235			Rods pulled; take rdgs in open hole at ~ 4.0' bgs (with tubing hanging in open hole) => CH ₄ = 54.0%, CO ₂ = 45.8%, O ₂ = 0.2%, Bal = 0.0% !!!	
1255		CLL-34	Driven to 11.7' bgs	
1310			Collection complete; open hole rdgs as follows: CH ₄ = 52.1 CO ₂ = 47.4 O ₂ = 0.0 Bal = 0.0 (only 3' bgs)	
1345		CLL-35	Driven to 20.7 (moderately easy drive)	

Operator Initials: _____

(Required)

Use 24-hour clock for time. Fill out at _____ of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/29/08 Day #: 6 Page #: 1 of 1 Project #: 8144

Client: Hydro Geo Chem Project Name: Cinder Lake Landfill Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0900			At Cinder Lake Landfill ; pick up Sonmas & Landtec at office measure gas rdgs at CU-40 in open borehole from last night:	
		CU-40	CH ₄ = 37.2, CO ₂ = 40.0%, O ₂ = 4.8%; Bal = 18.9% Hole is only open to 30' bgs Calibrate Landtec GEM-500	
			Pre-calibration rdgs: CH ₄ = 14.1, CO ₂ = 14.3, O ₂ = 1.1, Bal = 70.4% Post calibration rdgs: CH ₄ = 15.0, CO ₂ = 14.8, O ₂ = 1.0, Bal = 69.2% Leak check sample chain; investigate leaking hyd. line on rig	
1138		CLL-51	Driven to 26.6' bgs.	
1153			Collection complete	
			Open hole rdgs: CH ₄ = 56.1, CO ₂ = 43.3, O ₂ = 0.6%, Bal = 0.0	
1230		CLL-52	Driven to 26.6' bgs (cracked drive cap).	
1245			Collection complete for Sonmas # 3089 (CLL-40, CLL-51, CLL-52) Open hole rdgs: CH ₄ = 53.7%, CO ₂ = 45.6%, O ₂ = 0.5%, Bal = 0.0	
			Move rig to CLL-41; to office to get new drive caps delivered via Fed-X from Geoprobe	
1329		CLL-41	Driven to 10.5' bgs	
			DI-54 rig has new hydraulic leak on left-hand track drive - may need repair.	
1345			Collection Complete; IA class on site - give brief talk on sampling methodology (Ken Robinson) Follow Ken back to CLL office - talk to Mike Gallegos about hydraulic repair - gives me contacts.	
1436		CLL-42	Attempt to drive to 10.5' at CLL-42 while monitoring leak	
1458			Collection complete	
1540		CLL-43	1 st & 2 nd drive to refusal @ 2.0' & 5.0' 3 rd drive to 10.5' bgs	
1609			Collection complete for Sonmas # 3188 Hydraulic leak on rig needs repair - have lost 1 1/2 gallons fluid.	
			Remove leaking hydraulic hose to left track motor	
1715			Leave CLL for Home Depot, Sears, Napa	

Operator Initials: _____ (Required) 1815 Complete

Use 24-hour clock for time. Fill out at least one of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/30/08 Day #: 7 Page #: 1 of 2 Project #: 8144

Client: Hydro Geo Chem Project Name: Cinder Lake Landfill Tier II

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
0800			At Empire Court; parts dept. doesn't have fitting needed to replace hydraulic hose on DT-54	
0830			To Falcon Power (CASE): parts was able to re-produce hydraulic hose & fittings; call James Pock	
0910			At Cinder Lake Landfill; start repair on DT-54 hydraulics	
1030			New hydraulic hose to left track planetary motor it replaced; need additional fitting to prevent previous hydraulic leak - find bad hyd. hose through cross-member pivot & remove	
1100			Leave CU for Falcon Power; new hose built (from master controls to rotary motor - through support cage)	
1150			Start installation of new hose	
1245			All repairs complete - rig cleaned up - no leaks added ~7 gallons AW-32 hydraulic fluid	
1249			Calibrate Landtec GEN-500	
			Pre-calibration rdgs: CH ₄ = 15.7%, CO ₂ = 16.2%, O ₂ = 0.0%, Bal = 68.2%	
			Post-calibration rdgs: CH ₄ = 14.1%, CO ₂ = 14.7%, O ₂ = 0.0%, Bal = 70.5%	
			Leak check sample chain ^{14.9} => ok.	
1315		CLL-44	Driven to 10.5' bgs	
1328			Collection complete	
1344		CLL-45	Driven to 10.6' bgs	
1400			Collection complete	
1418		CLL-46	Driven to 10.6' bgs	
1432			Collection complete for Summa # 3721	
1446		CLL-47	Previously driven (yesterday) to 10.5' bgs	
1455			Collection complete; move DT-54 to CLL-48	
1512			Open hole rdgs from CLL-47:	
			CH ₄ = 53.0%, CO ₂ = 46.9%, O ₂ = 0.1%, Bal = 0.0%	
1535		CLL-48	Driven to 10.5' bgs	
1555			Collection complete for Summa # 1463	
1616		CLL-49	Driven to 10.6' bgs	
			High N ₂ rdgs at this location - offset into across asphalt (North) ~ 50'	
		CLL-49A		

Operator Initials: _____ (Required)

Use 24-hour clock for time. Fill out at end of each probe hole entry. Number holes based on clients description of the location. Start with a new sheet for each day. Note operators and change of operator. Include all PID/Landtec/FID readings etc...

Date: 10/30/08 Day #: 7 Page #: 2 of 2 Project #: 8144

Client: _____ Project Name: _____

START TIME	END TIME	LOCATION#	ACTIVITY DESCRIPTION	READINGS
1642		CLL-49A	offset location; start Landtec rdgs @ 11.7' bgs Readings nearly identical to previous location Will collect anyway.	
1650			Collection complete	
1705		CLL-50	Driven to 11.0' bgs @ stacked location Gas rdgs are soil - not trash CH ₄ = 1.3%, CO ₂ = 16.8%, O ₂ = 0.2%, N ₂ = 81.6% Did not collect. Only one sample collected in Summa # 1387 May not analyze since N ₂ was high - will talk to James re: this sample.	
1715			Pull rods; leave DTS4 on site - landfill closing; get Summa's from CLL office	
1745			Leave CLL	
			10/31/08 FRI.	
1200			Complete COCs; to Fed-X/Inteco's - send 20 Summa canisters to Air Technology Lab	
1400			At CLL - pickup/load DTS4 rig.	
1445			Done	
			11/1/08 SAT.	
			Demob. Flagstaff to Vista shop (790 miles/ 14 hrs.)	

Operator Initials: DW

(Required)

APPENDIX B
ANALYTICAL REPORT

Client: Hydro Geo Chem, Inc.
 Attn: James Peck

Project Name: Cinder Lake Landfill Tier II
 Project Number: 2008029.00
 Date Received: 11/5/08
 Matrix: Vapor

TNMOC by EPA METHOD 25C
 Fixed Gases by EPA METHOD 3C

Lab Number:		A8110503-01	A8110503-02	A8110503-03	A8110503-04	A8110503-05						
Client Sample ID:		CLL-1 to CLL-3 (#1428)	CLL-4 to CLL-6 (#1396)	CLL-7 to CLL-9 (#3747)	CLL-11, CLL-12, CLL-14 (#3590)	CLL-15 to CLL-17 (#3177)						
Date Collected:		10/23/08	10/23/08	10/24/08	10/26/08	10/26/08						
Date Analyzed:		11/10/08	11/10/08	11/10/08	11/10/08	11/10/08						
Analyst Initials:		VM	VM	VM	VM	VM						
QC Batch:		081110GC8A1	081110GC8A1	081110GC8A1	081110GC8A1	081110GC8A1						
Dilution Factor:		3.9	3.6	3.9	3.7	3.9						
ANALYTE	Units	PQL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
TNMOC	ppmv C	10	610	39	180	36	410	39	370	37	770	39
TNMOC uncorr*	ppmv C	10	180	39	160	36	150	39	130	37	480	39
Nitrogen	% v/v	1.0	53	3.9	5.9	3.6	47	3.9	49	3.7	27	3.9
Oxygen	% v/v	0.50	2.0	1.9	ND	1.8	4.0	1.9	ND	1.9	ND	1.9

ND = Not detected at or above reporting limit.

PQL = Practical Quantitation Limit.

TNMOC = Total Non-Methane Organic Carbon.

TNMOC uncorr* = TNMOC concentration in sample without nitrogen/moisture correction.

NA = Nitrogen/moisture correction causes division by zero.

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date: 11-14-08

The cover letter is an integral part of this analytical report.



Client: Hydro Geo Chem, Inc.
 Attn: James Peck

Project Name: Cinder Lake Landfill Tier II
 Project Number: 2008029.00
 Date Received: 11/5/2008
 Matrix: Vapor

TNMOC by EPA METHOD 25C
 Fixed Gases by EPA METHOD 3C

Lab Number:		A8110503-06		A8110503-07		A8110503-08		A8110503-09		A8110503-10		
Client Sample ID:		CLL-18 to CLL-19 (#1465)		CLL-20 to CLL-22 (#1291)		CLL-23 to CLL-25 (#3650)		CLL-26 to CLL-28 (#1168)		CLL-29 to CLL-30 (#5480)		
Date Collected:		10/26/2008		10/27/2008		10/27/2008		10/27/2008		10/27/2008		
Date Analyzed:		11/10/2008		11/10/2008		11/12/2008		11/12/2008		11/12/2008		
Analyst Initials:		VM										
QC Batch:		081110GC8A1		081110GC8A1		081112GC8A1		081112GC8A1		081112GC8A1		
Dilution Factor:		5.1		3.9		3.6		3.6		5.6		
ANALYTE	Units	PQL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
TNMOC	ppmv C	10	220	51	270	39	260	36	320	36	750	56
TNMOC uncorr*	ppmv C	10	200	51	250	39	240	36	270	36	690	56
Nitrogen	% v/v	1.0	ND	5.1	ND	3.9	ND	3.6	8.5	3.6	ND	5.6
Oxygen	% v/v	0.50	ND	2.5	ND	1.9	ND	1.8	2.4	1.8	ND	2.8

ND = Not detected at or above reporting limit.
 PQL = Practical Quantitation Limit.
 TNMOC = Total Non-Methane Organic Carbon.
 TNMOC uncorr* = TNMOC concentration in sample without nitrogen/moisture correction.
 NA = Nitrogen/moisture correction causes division by zero.

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date: 11-14-08

The cover letter is an integral part of this analytical report.



Client: Hydro Geo Chem, Inc.
 Attn: James Peck

Project Name: Cinder Lake Landfill Tier II
 Project Number: 2008029.00
 Date Received: 11/5/2008
 Matrix: Vapor

TNMOC by EPA METHOD 25C
 Fixed Gases by EPA METHOD 3C

Lab Number:			A8110503-11		A8110503-12		A8110503-13		A8110503-14		A8110503-15	
Client Sample ID:			CLL-31 to CLL-33 (#1436)		CLL-34 to CLL-36 (#3647)		CLL-37 to CLL-39 (#1342)		CLL-40, CLL-51, CLL-52 (#3089)		CLL-41 to CLL-43 (#3138)	
Date Collected:			10/28/2008		10/28/2008		10/28/2008		10/29/2008		10/29/2008	
Date Analyzed:			11/12/2008		11/12/2008		11/12/2008		11/12/2008		11/12/2008	
Analyst Initials:			VM		VM		VM		VM		VM	
QC Batch:			081112GC8A1		081112GC8A1		081112GC8A1		081112GC8A1		081112GC8A1	
Dilution Factor:			3.6		3.9		3.9		3.6		3.6	
ANALYTE	Units	PQL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
TNMOC	ppmv C	10	510	36	1,100	39	840	39	680	36	670	36
TNMOC uncorr*	ppmv C	10	480	36	1,000	39	790	39	640	36	620	36
Nitrogen	% v/v	1.0	ND	3.6	ND	3.9	ND	3.9	ND	3.6	ND	3.6
Oxygen	% v/v	0.50	ND	1.8	ND	1.9	ND	1.9	ND	1.8	ND	1.8

ND = Not detected at or above reporting limit.
 PQL = Practical Quantitation Limit.
 TNMOC = Total Non-Methane Organic Carbon.
 TNMOC uncorr* = TNMOC concentration in sample without nitrogen/moisture correction.
 NA = Nitrogen/moisture correction causes division by zero.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date: 11-19-08

The cover letter is an integral part of this analytical report.



Client: Hydro Geo Chem, Inc.
 Attn: James Peck

Project Name: Cinder Lake Landfill Tier II
 Project Number: 2008029.00
 Date Received: 11/5/2008
 Matrix: Vapor

TNMOC by EPA METHOD 25C
 Fixed Gases by EPA METHOD 3C

Lab Number:			A8110503-16		A8110503-17		A8110503-18			
Client Sample ID:			CLL-44 to CLL-46 (#3721)		CLL-47 to CLL-48 (#1463)		CLL-49A (#1387)			
Date Collected:			10/30/2008		10/30/2008		10/30/2008			
Date Analyzed:			11/12/2008		11/12/2008		11/13/2008			
Analyst Initials:			VM		VM		VM			
QC Batch:			081112GC8A1		081112GC8A1		081113GC8A1			
Dilution Factor:			3.9		4.0		8.4			
ANALYTE	Units	PQL	Result	RL	Result	RL	Result	RL		
TNMOC	ppmv C	10	790	39	820	40	860	84		
TNMOC uncorr*	ppmv C	10	680	39	570	40	340	84		
Nitrogen	% v/v	1.0	7.9	3.9	22	4.0	45	8.4		
Oxygen	% v/v	0.50	ND	1.9	ND	2.0	ND	4.2		

ND = Not detected at or above reporting limit.
 PQL = Practical Quantitation Limit.
 TNMOC = Total Non-Methane Organic Carbon.
 TNMOC uncorr* = TNMOC concentration in sample without nitrogen/moisture correction.
 NA = Nitrogen/moisture correction causes division by zero.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date: 11-14-08

The cover letter is an integral part of this analytical report.

CHAIN OF CUSTODY RECORD

ATM TECHNOLOGY Laboratories, Inc.
 18501 E. Gale Avenue, Suite 130
 City of Industry, CA 91748
 626-964-4032 • Fax: 626-964-5832

Project Name: Cinder Lake Land Fill
Tier II
 Project #: 2008029.00
 P.O. #:

FOR LABORATORY USE ONLY
 Sample Condition Upon Receipt
 1. CHILLED Y N 4. SEALED Y N
 2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
 3. CONTAINER INTACT Y N 6. PRESERVED Y N

Company: Hydro Geo Chem, Inc.
 Contact: James Peets
 Address: 6370 E. Thomas Rd Suite 200 TEL: (480) 421-1501
Scottsdale State AZ Zip Code 85251 FAX: (480) 425-8794

Received by: (Signature and Printed Name) James Peets Date: 10/31/08 Time: 1430
 Received by: (Signature and Printed Name) David West Date: 11/14/08 (Return) Time: 0830
 Relinquished by: (Signature and Printed Name) James Peets Date: 11/14/08 Time: 0830
 Relinquished by: (Signature and Printed Name) David West Date: 11/14/08 Time: 0830

Send Report To:
 Attn: James Peets
 Co: Hydro Geo Chem
 Address: 6370 E. Thomas Rd
 City: Scottsdale State: AZ Zip: 85251

Bill To:
 Attn: James Peets
 Co: Hydro Geo Chem
 Address: 6370 E. Thomas Rd
 City: Scottsdale State: AZ Zip: 85251

Special Instructions/Comments:
Fed-X Acct. # 104761461

LAB USE ONLY	Lab No.	Sample Description	Date Time		DELIVERABLES
			Sample I.D.	Time	
	10110503 - 11	CIL-31 to CIL-33 (#1436)		10/28/08 1200	
	- 12	CIL-34 to CIL-36 (#3047)		10/29/08 1445	
	- 13	CIL-37 to CIL-39 (#1342)		10/28/08 1040	
	- 14	CIL-40, CIL-51, CIL-52 (#3087)		10/29/08 1245	
	- 15	CIL-41 to CIL-43 (#3138)		10/29/08 1009	
	- 16	CIL-44 to CIL-46 (#3921)		10/30/08 1432	
	- 17	CIL-47 to CIL-48 (#1463)		10/30/08 1555	
	- 18	CIL-49A (#1387)		10/30/08 1650	

Circle or Add Analysis(es) Requested:
 AIR • VAPOR
 LANDFILL GAS
 WATER
 SOLID • SOIL
 OIL • SOLVENT • LIQUID
 OTHER _____
 Container(s) # _____ Type _____

TAT: A= Overnight ≤ 24 hr B= Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays
 Container Types: B= Tedlar Bag C= Canister V=VOA O= Other
 Preservatives: H=Hcl N=None

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

APPENDIX C

LANDGEM OUTPUT FILE

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Model Parameters
=====

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Lo : 170.00 m^3 / Mg ***** User Mode Selection *****
k : 0.0200 1/yr ***** User Mode Selection *****
NMOC : 92.00 ppmv ***** User Mode Selection *****
Methane : 50.0000 % volume
Carbon Dioxide : 50.0000 % volume
=====

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=====
Landfill Parameters
=====

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Landfill type : No Co-Disposal
Year Opened : 1965   Current Year : 2013   Closure Year: 2069
Capacity : 12000000 Mg
Average Acceptance Rate Required from
Current Year to Closure Year : 142766.00 Mg/year
=====

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=====
Model Results
=====

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Year	Refuse In Place (Mg)	NMOC Emission Rate	
		(Mg/yr)	(Cubic m/yr)
1966	1.295E+04	2.904E-02	8.101E+00
1967	2.870E+04	6.378E-02	1.779E+01
1968	4.728E+04	1.042E-01	2.907E+01
1969	6.875E+04	1.503E-01	4.192E+01
1970	9.315E+04	2.020E-01	5.636E+01
1971	1.205E+05	2.594E-01	7.236E+01
1972	1.506E+05	3.217E-01	8.976E+01
1973	1.835E+05	3.891E-01	1.085E+02
1974	2.192E+05	4.613E-01	1.287E+02
1975	2.576E+05	5.385E-01	1.502E+02
1976	2.990E+05	6.206E-01	1.731E+02
1977	3.460E+05	7.137E-01	1.991E+02
1978	3.987E+05	8.178E-01	2.282E+02
1979	4.572E+05	9.327E-01	2.602E+02
1980	5.214E+05	1.058E+00	2.952E+02
1981	5.914E+05	1.194E+00	3.332E+02
1982	6.673E+05	1.341E+00	3.740E+02
1983	7.490E+05	1.497E+00	4.177E+02
1984	8.365E+05	1.664E+00	4.643E+02
1985	9.300E+05	1.841E+00	5.136E+02
1986	1.032E+06	2.033E+00	5.671E+02
1987	1.166E+06	2.293E+00	6.396E+02
1988	1.268E+06	2.476E+00	6.907E+02
1989	1.373E+06	2.664E+00	7.431E+02
1990	1.480E+06	2.850E+00	7.952E+02
1991	1.596E+06	3.054E+00	8.519E+02
1992	1.731E+06	3.296E+00	9.196E+02
1993	1.886E+06	3.579E+00	9.984E+02
1994	1.955E+06	3.662E+00	1.022E+03
1995	2.069E+06	3.845E+00	1.073E+03
1996	2.177E+06	4.012E+00	1.119E+03
1997	2.312E+06	4.236E+00	1.182E+03
1998	2.433E+06	4.422E+00	1.234E+03
1999	2.533E+06	4.560E+00	1.272E+03
2000	2.616E+06	4.655E+00	1.299E+03
2001	2.689E+06	4.727E+00	1.319E+03
2002	2.778E+06	4.833E+00	1.348E+03
2003	2.860E+06	4.920E+00	1.372E+03
2004	2.952E+06	5.030E+00	1.403E+03
2005	3.060E+06	5.172E+00	1.443E+03
2006	3.168E+06	5.311E+00	1.482E+03
2007	3.283E+06	5.463E+00	1.524E+03
2008	3.402E+06	5.623E+00	1.569E+03
2009	3.526E+06	5.789E+00	1.615E+03
2010	3.654E+06	5.962E+00	1.663E+03
2011	3.787E+06	6.142E+00	1.714E+03
2012	3.925E+06	6.330E+00	1.766E+03

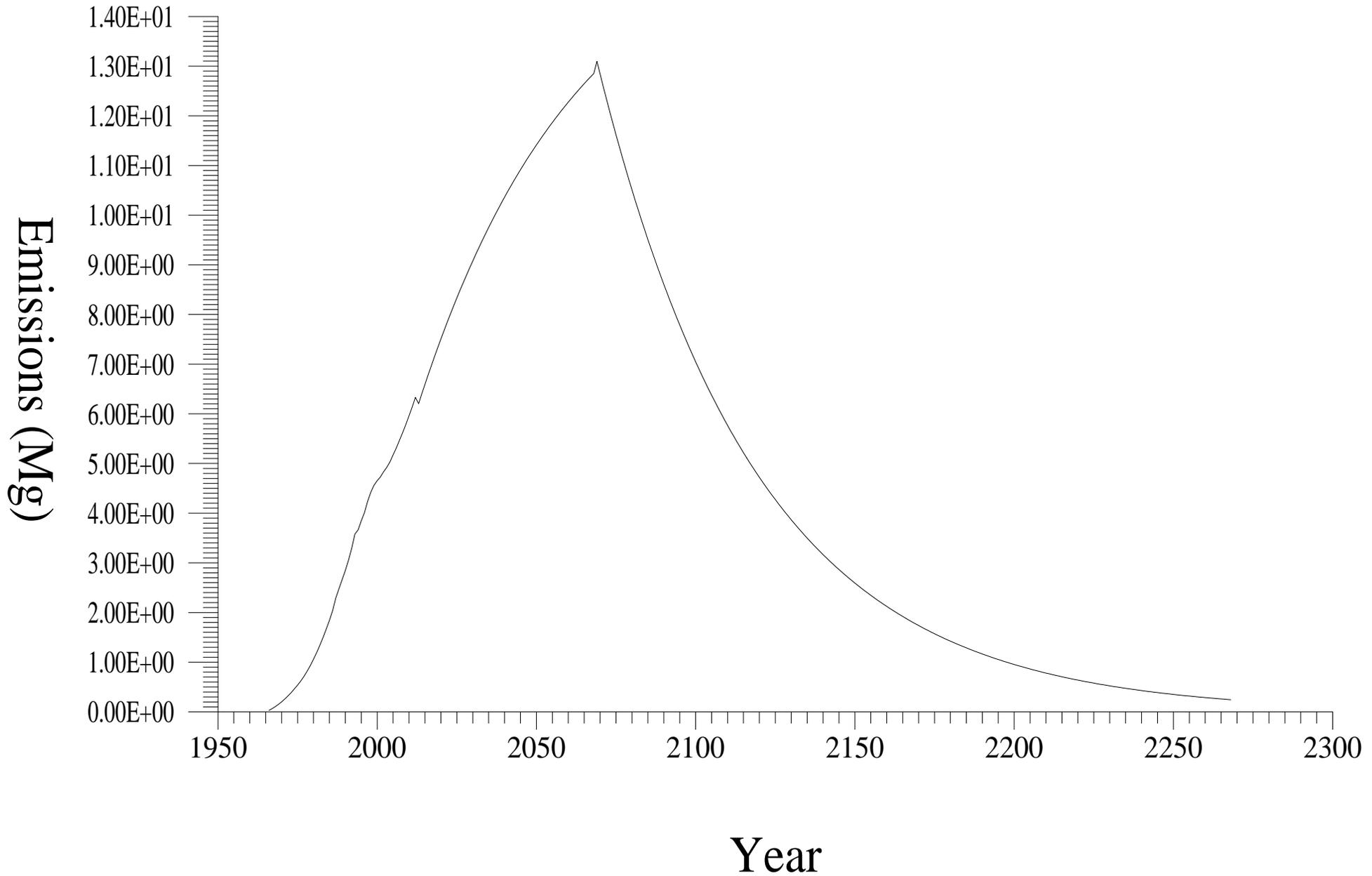
Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2013	3.925E+06	6.204E+00	1.731E+03
2014	4.068E+06	6.402E+00	1.786E+03
2015	4.210E+06	6.595E+00	1.840E+03
2016	4.353E+06	6.785E+00	1.893E+03
2017	4.496E+06	6.970E+00	1.945E+03
2018	4.639E+06	7.152E+00	1.995E+03
2019	4.781E+06	7.331E+00	2.045E+03
2020	4.924E+06	7.506E+00	2.094E+03
2021	5.067E+06	7.678E+00	2.142E+03
2022	5.210E+06	7.846E+00	2.189E+03
2023	5.352E+06	8.010E+00	2.235E+03
2024	5.495E+06	8.172E+00	2.280E+03
2025	5.638E+06	8.330E+00	2.324E+03
2026	5.781E+06	8.485E+00	2.367E+03
2027	5.923E+06	8.638E+00	2.410E+03
2028	6.066E+06	8.787E+00	2.451E+03
2029	6.209E+06	8.933E+00	2.492E+03
2030	6.352E+06	9.076E+00	2.532E+03
2031	6.495E+06	9.217E+00	2.571E+03
2032	6.637E+06	9.354E+00	2.610E+03
2033	6.780E+06	9.489E+00	2.647E+03
2034	6.923E+06	9.621E+00	2.684E+03
2035	7.066E+06	9.751E+00	2.720E+03
2036	7.208E+06	9.878E+00	2.756E+03
2037	7.351E+06	1.000E+01	2.791E+03
2038	7.494E+06	1.012E+01	2.825E+03
2039	7.637E+06	1.024E+01	2.858E+03
2040	7.779E+06	1.036E+01	2.891E+03
2041	7.922E+06	1.048E+01	2.923E+03
2042	8.065E+06	1.059E+01	2.954E+03
2043	8.208E+06	1.070E+01	2.985E+03
2044	8.350E+06	1.081E+01	3.015E+03
2045	8.493E+06	1.091E+01	3.045E+03
2046	8.636E+06	1.102E+01	3.074E+03
2047	8.779E+06	1.112E+01	3.102E+03
2048	8.922E+06	1.122E+01	3.130E+03
2049	9.064E+06	1.132E+01	3.158E+03
2050	9.207E+06	1.141E+01	3.184E+03
2051	9.350E+06	1.151E+01	3.211E+03
2052	9.493E+06	1.160E+01	3.236E+03
2053	9.635E+06	1.169E+01	3.262E+03
2054	9.778E+06	1.178E+01	3.286E+03
2055	9.921E+06	1.187E+01	3.311E+03
2056	1.006E+07	1.195E+01	3.334E+03
2057	1.021E+07	1.204E+01	3.358E+03
2058	1.035E+07	1.212E+01	3.380E+03
2059	1.049E+07	1.220E+01	3.403E+03
2060	1.063E+07	1.228E+01	3.425E+03
2061	1.078E+07	1.235E+01	3.446E+03
2062	1.092E+07	1.243E+01	3.467E+03
2063	1.106E+07	1.250E+01	3.488E+03
2064	1.121E+07	1.258E+01	3.508E+03
2065	1.135E+07	1.265E+01	3.528E+03
2066	1.149E+07	1.272E+01	3.548E+03
2067	1.163E+07	1.278E+01	3.567E+03
2068	1.178E+07	1.285E+01	3.585E+03
2069	1.200E+07	1.310E+01	3.654E+03
2070	1.200E+07	1.284E+01	3.582E+03
2071	1.200E+07	1.258E+01	3.511E+03
2072	1.200E+07	1.233E+01	3.441E+03
2073	1.200E+07	1.209E+01	3.373E+03
2074	1.200E+07	1.185E+01	3.306E+03
2075	1.200E+07	1.162E+01	3.241E+03
2076	1.200E+07	1.139E+01	3.177E+03
2077	1.200E+07	1.116E+01	3.114E+03
2078	1.200E+07	1.094E+01	3.052E+03
2079	1.200E+07	1.072E+01	2.992E+03
2080	1.200E+07	1.051E+01	2.932E+03
2081	1.200E+07	1.030E+01	2.874E+03
2082	1.200E+07	1.010E+01	2.817E+03
2083	1.200E+07	9.899E+00	2.762E+03

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2084	1.200E+07	9.703E+00	2.707E+03
2085	1.200E+07	9.510E+00	2.653E+03
2086	1.200E+07	9.322E+00	2.601E+03
2087	1.200E+07	9.138E+00	2.549E+03
2088	1.200E+07	8.957E+00	2.499E+03
2089	1.200E+07	8.779E+00	2.449E+03
2090	1.200E+07	8.605E+00	2.401E+03
2091	1.200E+07	8.435E+00	2.353E+03
2092	1.200E+07	8.268E+00	2.307E+03
2093	1.200E+07	8.104E+00	2.261E+03
2094	1.200E+07	7.944E+00	2.216E+03
2095	1.200E+07	7.787E+00	2.172E+03
2096	1.200E+07	7.632E+00	2.129E+03
2097	1.200E+07	7.481E+00	2.087E+03
2098	1.200E+07	7.333E+00	2.046E+03
2099	1.200E+07	7.188E+00	2.005E+03
2100	1.200E+07	7.046E+00	1.966E+03
2101	1.200E+07	6.906E+00	1.927E+03
2102	1.200E+07	6.769E+00	1.889E+03
2103	1.200E+07	6.635E+00	1.851E+03
2104	1.200E+07	6.504E+00	1.814E+03
2105	1.200E+07	6.375E+00	1.779E+03
2106	1.200E+07	6.249E+00	1.743E+03
2107	1.200E+07	6.125E+00	1.709E+03
2108	1.200E+07	6.004E+00	1.675E+03
2109	1.200E+07	5.885E+00	1.642E+03
2110	1.200E+07	5.768E+00	1.609E+03
2111	1.200E+07	5.654E+00	1.577E+03
2112	1.200E+07	5.542E+00	1.546E+03
2113	1.200E+07	5.432E+00	1.516E+03
2114	1.200E+07	5.325E+00	1.486E+03
2115	1.200E+07	5.219E+00	1.456E+03
2116	1.200E+07	5.116E+00	1.427E+03
2117	1.200E+07	5.015E+00	1.399E+03
2118	1.200E+07	4.915E+00	1.371E+03
2119	1.200E+07	4.818E+00	1.344E+03
2120	1.200E+07	4.723E+00	1.318E+03
2121	1.200E+07	4.629E+00	1.291E+03
2122	1.200E+07	4.538E+00	1.266E+03
2123	1.200E+07	4.448E+00	1.241E+03
2124	1.200E+07	4.360E+00	1.216E+03
2125	1.200E+07	4.273E+00	1.192E+03
2126	1.200E+07	4.189E+00	1.169E+03
2127	1.200E+07	4.106E+00	1.145E+03
2128	1.200E+07	4.024E+00	1.123E+03
2129	1.200E+07	3.945E+00	1.101E+03
2130	1.200E+07	3.867E+00	1.079E+03
2131	1.200E+07	3.790E+00	1.057E+03
2132	1.200E+07	3.715E+00	1.036E+03
2133	1.200E+07	3.641E+00	1.016E+03
2134	1.200E+07	3.569E+00	9.958E+02
2135	1.200E+07	3.499E+00	9.761E+02
2136	1.200E+07	3.429E+00	9.567E+02
2137	1.200E+07	3.362E+00	9.378E+02
2138	1.200E+07	3.295E+00	9.192E+02
2139	1.200E+07	3.230E+00	9.010E+02
2140	1.200E+07	3.166E+00	8.832E+02
2141	1.200E+07	3.103E+00	8.657E+02
2142	1.200E+07	3.042E+00	8.486E+02
2143	1.200E+07	2.981E+00	8.318E+02
2144	1.200E+07	2.922E+00	8.153E+02
2145	1.200E+07	2.864E+00	7.991E+02
2146	1.200E+07	2.808E+00	7.833E+02
2147	1.200E+07	2.752E+00	7.678E+02
2148	1.200E+07	2.698E+00	7.526E+02
2149	1.200E+07	2.644E+00	7.377E+02
2150	1.200E+07	2.592E+00	7.231E+02
2151	1.200E+07	2.541E+00	7.088E+02
2152	1.200E+07	2.490E+00	6.947E+02
2153	1.200E+07	2.441E+00	6.810E+02
2154	1.200E+07	2.393E+00	6.675E+02

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2155	1.200E+07	2.345E+00	6.543E+02
2156	1.200E+07	2.299E+00	6.413E+02
2157	1.200E+07	2.253E+00	6.286E+02
2158	1.200E+07	2.209E+00	6.162E+02
2159	1.200E+07	2.165E+00	6.040E+02
2160	1.200E+07	2.122E+00	5.920E+02
2161	1.200E+07	2.080E+00	5.803E+02
2162	1.200E+07	2.039E+00	5.688E+02
2163	1.200E+07	1.998E+00	5.575E+02
2164	1.200E+07	1.959E+00	5.465E+02
2165	1.200E+07	1.920E+00	5.357E+02
2166	1.200E+07	1.882E+00	5.251E+02
2167	1.200E+07	1.845E+00	5.147E+02
2168	1.200E+07	1.808E+00	5.045E+02
2169	1.200E+07	1.773E+00	4.945E+02
2170	1.200E+07	1.737E+00	4.847E+02
2171	1.200E+07	1.703E+00	4.751E+02
2172	1.200E+07	1.669E+00	4.657E+02
2173	1.200E+07	1.636E+00	4.565E+02
2174	1.200E+07	1.604E+00	4.474E+02
2175	1.200E+07	1.572E+00	4.386E+02
2176	1.200E+07	1.541E+00	4.299E+02
2177	1.200E+07	1.510E+00	4.214E+02
2178	1.200E+07	1.481E+00	4.130E+02
2179	1.200E+07	1.451E+00	4.049E+02
2180	1.200E+07	1.422E+00	3.968E+02
2181	1.200E+07	1.394E+00	3.890E+02
2182	1.200E+07	1.367E+00	3.813E+02
2183	1.200E+07	1.340E+00	3.737E+02
2184	1.200E+07	1.313E+00	3.663E+02
2185	1.200E+07	1.287E+00	3.591E+02
2186	1.200E+07	1.262E+00	3.520E+02
2187	1.200E+07	1.237E+00	3.450E+02
2188	1.200E+07	1.212E+00	3.382E+02
2189	1.200E+07	1.188E+00	3.315E+02
2190	1.200E+07	1.165E+00	3.249E+02
2191	1.200E+07	1.142E+00	3.185E+02
2192	1.200E+07	1.119E+00	3.122E+02
2193	1.200E+07	1.097E+00	3.060E+02
2194	1.200E+07	1.075E+00	2.999E+02
2195	1.200E+07	1.054E+00	2.940E+02
2196	1.200E+07	1.033E+00	2.882E+02
2197	1.200E+07	1.012E+00	2.825E+02
2198	1.200E+07	9.924E-01	2.769E+02
2199	1.200E+07	9.728E-01	2.714E+02
2200	1.200E+07	9.535E-01	2.660E+02
2201	1.200E+07	9.346E-01	2.607E+02
2202	1.200E+07	9.161E-01	2.556E+02
2203	1.200E+07	8.980E-01	2.505E+02
2204	1.200E+07	8.802E-01	2.456E+02
2205	1.200E+07	8.628E-01	2.407E+02
2206	1.200E+07	8.457E-01	2.359E+02
2207	1.200E+07	8.289E-01	2.313E+02
2208	1.200E+07	8.125E-01	2.267E+02
2209	1.200E+07	7.964E-01	2.222E+02
2210	1.200E+07	7.807E-01	2.178E+02
2211	1.200E+07	7.652E-01	2.135E+02
2212	1.200E+07	7.501E-01	2.093E+02
2213	1.200E+07	7.352E-01	2.051E+02
2214	1.200E+07	7.206E-01	2.010E+02
2215	1.200E+07	7.064E-01	1.971E+02
2216	1.200E+07	6.924E-01	1.932E+02
2217	1.200E+07	6.787E-01	1.893E+02
2218	1.200E+07	6.652E-01	1.856E+02
2219	1.200E+07	6.521E-01	1.819E+02
2220	1.200E+07	6.392E-01	1.783E+02
2221	1.200E+07	6.265E-01	1.748E+02
2222	1.200E+07	6.141E-01	1.713E+02
2223	1.200E+07	6.019E-01	1.679E+02
2224	1.200E+07	5.900E-01	1.646E+02
2225	1.200E+07	5.783E-01	1.613E+02

Year	Refuse In Place (Mg)	(Mg/yr)	(Cubic m/yr)
2226	1.200E+07	5.669E-01	1.581E+02
2227	1.200E+07	5.557E-01	1.550E+02
2228	1.200E+07	5.447E-01	1.519E+02
2229	1.200E+07	5.339E-01	1.489E+02
2230	1.200E+07	5.233E-01	1.460E+02
2231	1.200E+07	5.129E-01	1.431E+02
2232	1.200E+07	5.028E-01	1.403E+02
2233	1.200E+07	4.928E-01	1.375E+02
2234	1.200E+07	4.831E-01	1.348E+02
2235	1.200E+07	4.735E-01	1.321E+02
2236	1.200E+07	4.641E-01	1.295E+02
2237	1.200E+07	4.549E-01	1.269E+02
2238	1.200E+07	4.459E-01	1.244E+02
2239	1.200E+07	4.371E-01	1.219E+02
2240	1.200E+07	4.284E-01	1.195E+02
2241	1.200E+07	4.200E-01	1.172E+02
2242	1.200E+07	4.116E-01	1.148E+02
2243	1.200E+07	4.035E-01	1.126E+02
2244	1.200E+07	3.955E-01	1.103E+02
2245	1.200E+07	3.877E-01	1.082E+02
2246	1.200E+07	3.800E-01	1.060E+02
2247	1.200E+07	3.725E-01	1.039E+02
2248	1.200E+07	3.651E-01	1.019E+02
2249	1.200E+07	3.579E-01	9.984E+01
2250	1.200E+07	3.508E-01	9.786E+01
2251	1.200E+07	3.438E-01	9.592E+01
2252	1.200E+07	3.370E-01	9.402E+01
2253	1.200E+07	3.303E-01	9.216E+01
2254	1.200E+07	3.238E-01	9.034E+01
2255	1.200E+07	3.174E-01	8.855E+01
2256	1.200E+07	3.111E-01	8.679E+01
2257	1.200E+07	3.050E-01	8.508E+01
2258	1.200E+07	2.989E-01	8.339E+01
2259	1.200E+07	2.930E-01	8.174E+01
2260	1.200E+07	2.872E-01	8.012E+01
2261	1.200E+07	2.815E-01	7.853E+01
2262	1.200E+07	2.759E-01	7.698E+01
2263	1.200E+07	2.705E-01	7.546E+01
2264	1.200E+07	2.651E-01	7.396E+01
2265	1.200E+07	2.599E-01	7.250E+01
2266	1.200E+07	2.547E-01	7.106E+01
2267	1.200E+07	2.497E-01	6.965E+01
2268	1.200E+07	2.447E-01	6.827E+01

Projected NMOC Emissions



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