

**UNITED STATES AIR FORCE
ARMSTRONG LABORATORY**

**Missile Launch Facility Sewage Lagoon
Sludge Survey Minot Air Force Base,
North Dakota (ACC)**

Doris A. Dohner, Master Sergeant, USAF

May 1998

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13. ABSTRACT (Maximum 200 words) A missile launch facility sewage lagoon sludge survey was conducted at Minot Air Force Base, North Dakota, during the week of 3 - 7 November 1997. The survey was the result of a request from the 5 Civilian Engineering Squadron, Environmental Flight (5 CES/CEV). The purpose of the sludge sampling request was to determine the amount of arsenic, cadmium, copper, lead, mercury, nickel, selenium, zinc, ammonia, Total Kjeldahl Nitrogen (TKN), nitrate/nitrite, percent solids and fecal coliform colonies in the sludge layer at each missile site's primary and secondary sewage lagoon. Minot AFB is located approximately 13 miles north of Minot, North Dakota. It occupies approximately 7.2 square miles of contiguous property and also operates 150 off-site Minuteman III missile launch facilities (LFs) and 15 missile alert facilities (MAFs). Metal sample results indicate the metals of concern in the sludge from both primary and secondary sewage lagoons are below both Ceiling Concentration Limits and "High Quality" Pollutant Concentration Limits in the 40 CFR 503. The geometric mean of seven discrete fecal coliform samples from each of the primary and secondary sewage lagoons at all sites are less than 2,000,000 CFU/g TS.				
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Missile Launch Facility Sewage Lagoon Sludge Survey Minot Air Force Base, North Dakota (ACC)

INTRODUCTION

A missile launch facility sewage lagoon sludge survey was conducted at Minot Air Force Base, North Dakota, during the week of 3 to 7 November 1997, by personnel from the Water Quality Branch of Detachment 1, Human System Center's Bioenvironmental Engineering Division (Det 1 HSC/OEBW). The survey was the result of a request from the 5th Civilian Engineering Squadron, Environmental Flight (5th CES/CEV). The purpose of the survey was to determine if sludge meets class B land application criteria.

DISCUSSION

Background

The Det 1 HSC/OEBW survey team was lead by MSgt Doris Dohner with technical assistance provided by MSgt Mary Fields. Other team members included: Mr. Jeff Lambrecht and Dr. Deb Hunter 5 CES/CEV, SSgt Doug Hammes 5 CES/CEOIU, and MSgt Michael Riha 91 OG/OGV.

Geographically, Minot AFB is located approximately 13 miles north of Minot, North Dakota. It occupies approximately 7.2 square miles of contiguous property and also operates 150 off-site Minuteman III missile launch facilities (LFs) and 15 missile alert facilities (MAFs). The MAFs are designated as missile sites A1 – O1. During this survey sludge samples were collected from the primary and secondary ponds at missile sites A1-G1 and I1 – J1. Sludge samples were collected from the primary sewage lagoon at missile site H1. This site does not have a secondary lagoon. Upon request additional sludge samples were also collected at missiles sites K1 and L1.

The base is home to the 5th Bomb Wing (5 BW) of the Eighth Air Force in the U.S. Air Force Combat Command (ACC). The 5 BW is composed of the 5th Operations Group (5 OG), 5th Logistics Group, 5th Support Group, and 5th Medical Group. The 5 OG consists of the 23rd Bomb Squadron (B-52 bombers) and the 5th Operational Support Squadron (RAPCON and Base Operations). The base has the capability to support 37 B-52 aircraft.

The base is also home to the 91st Space Wing of the Air Force Space Command. The 91st Space Wing is composed of the 91st Operations Group and 91st Logistics Group (91 LG). The 91 LG consists of the 740th, 741st, and 742nd Missile Squadrons, 91st Maintenance Squadron, and the 54th Rescue Flight helicopters. Minot AFB is responsible for the operation and maintenance of the Minuteman III Missiles located

outside the perimeter of the base, but within the 100-mile radius. The Minuteman III missile is an intercontinental ballistic missile.

MAFs have topside and underground rooms with crews to perform missile control operations 24 hours a day. A garage is located adjacent to each MAF and contains non-essential support materials. Twelve to fifteen personnel are at each of the MAFs. Each LF houses a missile and launch-associated support equipment. All LFs are built entirely under ground.

Land application of bulk sewage sludge must meet pollutant Ceiling Concentration and Cumulative Pollutant Loading Rates or Pollution Concentration limits in the 40 Code of Federal Regulations (CFR) 503. The limitations are listed in table 1.

TABLE 1: Land Application Pollutant Limits

Table in 503 Rule	Table #1	Table #2	Table #3	Table #4
Pollutant	Ceiling Concentration Limits* (mg/kg)	Cumulative Pollutant Loading** Rates (kg/ha)	"High Quality" Pollutant Concentration Limits*** (mg/kg)	Annual Pollutant Loading Rates**** (kg/ha/yr)
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	N/A	N/A	N/A
Nickel	420	420	420	21
Selenium	100	100	100	5.0
Zinc	7,500	2,800	2,800	140

* Absolute values

** This establishes the maximum kilograms per hectare of each regulated pollutant that can be land-applied during the life time of the site.

*** Monthly averages

**** Based on a 365 day time period

All limits are on dry weight basis

CFR 503 classifies sludge as either A or B. To classify sludge as A the sludge must be treated by one of six methods listed in CFR 503. For a B sludge classification the sludge must be analyzed by one of three methods to determine the sludge pathogenic content. The indicator organism method was used to determine the pathogenic content and classifies this sludge as B. Fecal coliform was as the chosen indicator organism. For class B sewage sludge analysis requires seven sludge samples be collected at the time of use or disposal. The geometric mean of the densities of the sample will be calculated and should meet the following criteria:

- Less than 2,000,000 Most Probable Number per gram of total dry solids (2,000,000 MPN/g TS).
- Or
- Less than 2,000,000 Colony Forming Units per gram of total dry solids (2,000,000 CFU/g TS).

Sampling Strategy: Table 2 and 3 identify the sites where sludge was sampled.

TABLE 2. Primary Pond Sampling and Missile Site Location Identificatoin

Site # Assigned by OEBW	Primary Pond Missile Site Identification #
1	A1
3	B1
5	C1
7	D1
9	E1
11	F1
13	G1
15	H1
16	H1 Duplicate
17	I1
19	J1
	Collected from Sludge Pile at Missile Site #
21	K1
23	L1

TABLE 3. Secondary Pond Sampling and Missile Site Location Identification

Site # Assigned by OEBW	Secondary Pond Missile Site Identification
2	A1
4	B1
6	C1
8	D1
10	E1
12	F1
14	G1
18	I1
20	J1
	Collected from Spread Sludge at Missile Site #
22	L1

One discrete sample from each location was submitted to Minnesota Valley Testing Laboratory (MVTl) for fecal coliform analysis. A composite sample consisting of equal portions from each of the four corners and three sample locations in the center of the pond was collected at each sewage lagoon. Two composite samples from each site were obtained by mixing equal portions of the sludge from the seven discrete samples. One composite sludge sample from each site was submitted to Detachment 1, Human System Center, Occupational and Environmental Analytical Services Division (Det 1 HSC/OEA) for metals. The second composite from each site was also submitted to Det 1 HSC/OEA for ammonia, total kjeldahl nitrogen (TKN), total nitrate/nitrite and percent solids. Table 4 lists the sampling methods MVTl and Det 1 HSC/OEA used to analyze the sludge samples.

TABLE 4 Sampling Parameters and Analysis Method

SAMPLING PARAMETER	SAMPLE ANALYSIS METHOD
Arsenic	SW 3050/6010B
Cadmium	SW 3050/6010B
Chromium	SW 3050/6010B
Copper	SW 3050/6010B
Lead	SW 3050/6010B
Molybdenum	SW 3050/6010B
Nickel	SW 3050/6010B
Selenium	SW 3050/6010B
Zinc	SW 3050/6010B
Mercury	SW 7471A
Percent Solids	Standard Method 2540G
Ammonia	EPA Method 350.1
Kjeldahl Nitrogen	EPA Method 351.2
Nitrate/Nitrite	EPA Method 353.2
Fecal Coliform	Standard Method 9222D

SAMPLE RESULTS

MISSILE SITE A1 – J1: The results of all metal analysis on sludge from all the missile site primary and secondary sewage lagoons (see Appendix A) indicate all metals of concern in the sludge are below both Ceiling Concentration Limits and “High Quality” Pollutant Concentration Limits in the 40 CFR 503 (see table 4 above). See Appendix A for ammonia, TKN, and total nitrates/nitrate sample results. Prior to land application the site in which this sludge will be land applied must be sampled for those parameters of concern in CFR 503. These sludge sample results will then be used to determine if the sludge can be applied at the chosen site. The geometric mean (see Appendix A) of seven discrete fecal coliform samples from each of the primary and secondary sewage lagoons at all sites are less than 2,000,000 CFU/g TS (See appendix A, Tables A-1 to A-5).

CONCLUSION

MISSILE SITE A1 – J1: Based on the sludge sample results, sludge from all sewage lagoons at all missile sites A1-J1 can be classified as Class B High Quality under 40 CFR 503. All sludge is eligible for land application.

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Appendix A

Minot Air Force Base, North Dakota

Table A-1 Missile Site A1 and B1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 3, 1997			
		Missile Site A1		Missile Site B1	
Analysis Method	Analytes (ug/G)	Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	3.5	4.83	3.9	4.98
SW 3050/6010B	Cadmium	1.13	1.46	0.2	1.49
SW 3050/6010B	Chromium	8.1	11	1.9	10.6
SW 3050/6010B	Copper	45.1	26.6	7.4	25.9
SW 3050/6010B	Lead	7	10.6	<3.4	12.8
SW 3050/6010B	Molybdenum	<0.5	<0.60	<1.0	<0.60
SW 3050/6010B	Nickel	16.1	22.9	4.9	20.4
SW 3050/6010B	Selenium	<1.7	<2.0	<3.4	<2.0
SW 3050/6010B	Zinc	70	74.9	15.6	138
SW 7471A	Mercury	0.129	0.083	0.097	0.098
STD MTD 2540G	Solids (%)	1.7	54.4	0.7	80.8
	milligrams/Liter Total Solids mg/L TS	0.017	0.544	0.007	0.808
EPA 350.1	Ammonia (mg/G)	888	<0.004	4429	<0.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	1529	0.06	6000	0.048
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<6	0.01	<14	0.1
Fecal Coliform		Locations of Sample Collection			
Method 9222 D	Location A (CFU/100ml) / CFU/g TS	<10 / <0.0017	<10 / <0.0544	6000 / 0.42	<10 / <0.0808
Method 9222 D	Location B (CFU/100ml) / CFU/g TS	10000 / 1.7	<10 / <0.0544	10000 / 0.7	<10 / <0.0808
Method 9222 D	Location C (CFU/100ml) / CFU/g TS	30000 / 5.1	1000 / 5.44	11000 / 0.77	<10 / <0.0808
Method 9222 D	Location D (CFU/100ml) / CFU/g TS	50000 / 8.5	<10 / <0.0544	18000 / 1.26	<10 / <0.0808
Method 9222 D	Location E (CFU/100ml) / CFU/g TS	10000 / 1.7	<10 / <0.0544	6000 / 0.42	<10 / <0.0808
Method 9222 D	Location F (CFU/100ml) / CFU/g TS	15000 / 2.55	<10 / <0.0544	7000 / 0.49	40000 / 323.2
Method 9222 D	Location G (CFU/100ml) / CFU/g TS	4000 / 0.68	<10 / <0.0544	7000 / 0.49	<10 / <0.0808
Geometric Mean		Colony Forming Unit/100ml sample			
	CFU/100ml	5102.1	<19.31	8604.72	<32.7
	Colony Forming Unit/grams Total Solids	<0.87	<0.11	0.6	<0.26
	CFU/g TS				
Base Sample #		GL970531	GL970538	GL970545	GL970552
		GL970532	GL970539	GL970546	GL970553
		GL970533	GL970540	GL970547	GL970554
		GL970534	GL970541	GL970548	GL970555
		GL970535	GL970542	GL970549	GL970556
		GL970536	GL970543	GL970550	GL970557
		GL970537	GL970544	GL970551	GL970558
OEHL Sample #		98004475	98004499	98004477	98004478
			98004476		98004501
MVTL Laboratories Sample #		97-L27334	97-L27341	97-L27348	97-L27355
		97-L27335	97-L27342	97-L27349	97-L27356
		97-L27336	97-L27343	97-L27350	97-L27357
		97-L27337	97-L27344	97-L27351	97-L27358
		97-L27338	97-L27345	97-L27352	97-L27359
		97-L27339	97-L27346	97-L27353	97-L27360
		97-L27340	97-L27347	97-L27354	97-L27361

CFU/100/ml - Colony Forming Units per 100 milliliter of sample
 CFU/g TS - Colony Forming Units per gram of Total Solids

Minot Air Force Base, North Dakota

Table A-2 Missile Site C1 and D1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 3, 1997			
		Missile Site C1		Missile Site D1	
Analysis Method	Analytes (ug/G)	Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	2.31	4.68	<2.2	5.06
SW 3050/6010B	Cadmium	0.49	1.85	<0.43	1.92
SW 3050/6010B	Chromium	3.07	15.2	<4.3	12.4
SW 3050/6010B	Copper	20.1	30.8	13.9	31.2
SW 3050/6010B	Lead	2.9	13.1	<8.7	11.2
SW 3050/6010B	Molybdenum	<0.53	<0.60	3.2	<0.91
SW 3050/6010B	Nickel	6.84	25.8	<4.3	25.6
SW 3050/6010B	Selenium	<1.8	<2.0	<8.7	<3.0
SW 3050/6010B	Zinc	49.1	2.1	<22	195
SW 7471A	Mercury	0.102	0.055	0.207	<0.061
STD MTD 2540G	Solids (%)	2.6	66.8	8.9	51.2
	milligrams/Liter Total Solids mg/L TS	0.026	0.668	0.089	0.512
EPA 350.1	Ammonia (mg/G)	1127	<0.004	163	12
EPA 351.2	Kjeldahl Nitrogen (mg/G)	1846	0.13	337	22
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<4	0.02	3	3
Fecal Coliform		Locations of Sample Collection			
Method 9222 D	Location A (CFU/100ml) / CFU/g TS	3000 / 0.78	<10 / <0.0668	1000 / 0.89	<10 / <0.0512
Method 9222 D	Location B (CFU/100ml) / CFU/g TS	4000 / 1.04	<10 / <0.0668	5000 / 4.45	<10 / <0.0512
Method 9222 D	Location C (CFU/100ml) / CFU/g TS	1600000 / 416	<10 / <0.0668	1100 / 0.979	80000 / 409.6
Method 9222 D	Location D (CFU/100ml) / CFU/g TS	300000 / 78	<10 / <0.0668	15000 / 13.35	<10 / <0.0512
Method 9222 D	Location E (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	13000 / 11.57	<10 / <0.0512
Method 9222 D	Location F (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	1000 / 0.89	<10 / <0.0512
Method 9222 D	Location G (CFU/100ml) / CFU/g TS	1000 / 0.26	<10 / <0.0668	3000 / 2.67	30000 / 153.6
Geometric Mean		Colony Forming Unit/100ml sample			
	CFU/100ml	9242.18	<10	3170	<36.11
	Colony Forming Unit/grams Total Solids	2.4	<0.0668	2.82	<0.588
	CFU/g TS				
Base Sample #		GL970559	GL970566	GL970573	GL970580
		GL970560	GL970567	GL970574	GL970581
		GL970561	GL970568	GL970575	GL970582
		GL970562	GL970569	GL970576	GL970583
		GL970563	GL970570	GL970577	GL970584
		GL970564	GL970571	GL970578	GL970585
		GL970565	GL970572	GL970579	GL970586
OEHL Sample #		98004479	98004480	98004481	98004482
			98004503		
MVTL Laboratories Sample #		97-L27362	97-L27369	97-L27376	97-L27383
		97-L27363	97-L27370	97-L27377	97-L27384
		97-L27364	97-L27371	97-L27378	97-L27385
		97-L27365	97-L27372	97-L27379	97-L27386
		97-L27366	97-L27373	97-L27380	97-L27387
		97-L27367	97-L27374	97-L27381	97-L27388
		97-L27368	97-L27375	97-L27382	97-L27389

CFU/100/ml - Colony Forming Units per 100 milliliter of sample

CFU/g TS - Colony Forming Units per gram of Total Solids

Minot Air Force Base, North Dakota

Table A-3 Missile Site E1 and F1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 4, 1997			
		Missile Site E1		Missile Site F1	
Analysis Method	Analytes (ug/G)	Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	4	3.79	3.2	3.41
SW 3050/6010B	Cadmium	1.42	1.44	0.394	1.57
SW 3050/6010B	Chromium	10.2	10.1	2.57	9.3
SW 3050/6010B	Copper	61.7	24.8	11.7	29.7
SW 3050/6010B	Lead	8.8	10.2	2.1	11.5
SW 3050/6010B	Molybdenum	<0.66	<0.60	<0.55	<0.60
SW 3050/6010B	Nickel	20.4	20.3	6.33	20.7
SW 3050/6010B	Selenium	<2.2	<2.0	<1.8	<2.0
SW 3050/6010B	Zinc	98.1	109	68.2	204
SW 7471A	Mercury	<0.0095	0.052	<0.037	0.073
STD MTD 2540G	Solids (%)	0.4	65.9	2.9	48.7
	miligrams/Liter Total Solids mg/L TS	0.004	0.659	0.029	0.487
EPA 350.1	Ammonia (mg/G)	3875	<0.004	931	0.15
EPA 351.2	Kjeldahl Nitrogen (mg/G)	6000	0.02	1448	0.32
EPA 353.2	Nitrate/Nitrate Total (mg/G)	25	0.014	3	0.026
Fecal Coliform		Locations of Sample Collection			
	Location A (CFU/100ml) / CFU/g TS	5000 / 0.2	<10 / <0.0659	16000 / 4.64	<10 / <0.0487
	Location B (CFU/100ml) / CFU/g TS	6000 / 0.24	<10 / <0.0659	17000 / 4.93	<10 / <0.0487
	Location C (CFU/100ml) / CFU/g TS	1000000 / 40	<10 / <0.0659	36000 / 10.44	<10 / <0.0487
	Location D (CFU/100ml) / CFU/g TS	47000 / 1.88	<10 / <0.0659	100000 / 29	<10 / <0.0487
	Location E (CFU/100ml) / CFU/g TS	10000 / 0.4	<10 / <0.0659	34000 / 9.86	<10 / <0.0487
	Location F (CFU/100ml) / CFU/g TS	10000 / 0.4	<10 / <0.0659	11000 / 3.19	<10 / <0.0487
	Location G (CFU/100ml) / CFU/g TS	12000 / 0.48	<10 / <0.0659	13000 / 3.77	<10 / <0.0487
Geometric Mean		Colony Forming Unit/100ml sample			
	CFU/100ml	20813.4	<10	24128.29	<10
	Colony Forming Unit/grams Total Solids	0.833	<0.0659	7	<0.0487
	CFU/g TS				
Base Sample #		GL970587	GL970594	GL970601	GL970608
		GL970588	GL970595	GL970602	GL970609
		GL970589	GL970596	GL970603	GL970610
		GL970590	GL970597	GL970604	GL970611
		GL970591	GL970598	GL970605	GL970612
		GL970592	GL970599	GL970606	GL970613
		GL970593	GL970600	GL970607	GL970614
OEHL Sample #		98004483	98004484	98004485	98004486
			98004507		98004509
MVTL Laboratories Sample #		97-L27549	97-L27556	97-L27563	97-L27570
		97-L27550	97-L27557	97-L27564	97-L27571
		97-L27551	97-L27558	97-L27565	97-L27572
		97-L27552	97-L27559	97-L27566	97-L27573
		97-L27553	97-L27560	97-L27567	97-L27574
		97-L27554	97-L27561	97-L27568	97-L27575
		97-L27555	97-L27562	97-L27569	97-L27576
CFU/100/ml - Colony Forming Units per 100 milliliter of sample					
CFU/g TS - Colony Forming Units per gram of Total Solids					

Minot Air Force Base, North Dakota

Table A-4 Missile Site G1 and H1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 4, 1997			
		Missile Site G1		Missile Site H1	
Analysis Method	Analytes (ug/G)	Primary Pond	Secondary Pond	Primary Pond	Primary Pond Dup.
SW3050/6010B	Arsenic	4.6	4.39	3.5	3.22
SW3050/6010B	Cadmium	1.19	1.46	1.46	1.08
SW3050/6010B	Chromium	9.8	10.6	6.6	6
SW3050/6010B	Copper	24.1	24.8	69.1	47.9
SW3050/6010B	Lead	8.1	11.8	14.4	9.8
SW3050/6010B	Molybdenum	<0.67	<0.60	<0.60	<0.60
SW3050/6010B	Nickel	17.7	21.4	16	13.5
SW3050/6010B	Selenium	<2.2	<2.0	<2.0	<2.0
SW3050/6010B	Zinc	136	173	382	175
SW7471A	Mercury	<0.011	0.076	0.366	0.135
STD MTD 2540G	Solids (%)	0.9	83.2	10.2	5.1
	milligrams/Liter Total Solids mg/L TS	0.009	0.832	0.102	0.051
EPA 350.1	Ammonia (mg/G)	2922	<0.004	515	726
EPA 351.2	Kjeldahl Nitrogen (mg/G)	4444	0.044	628	980
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<11	0.005	<1	<2
Fecal Coliform		Locations of Sample Collection			
	Location A (CFU/100ml) / CFU/g TS	1000 / 0.09	<10 / <0.0832	4000 / 4.08	2000 / 1.02
	Location B (CFU/100ml) / CFU/g TS	1000 / 0.09	<10 / <0.0832	2000 / 2.04	3000 / 1.53
	Location C (CFU/100ml) / CFU/g TS	230000 / 20.7	<10 / <0.0832	1000 / 1.02	2000 / 1.02
	Location D (CFU/100ml) / CFU/g TS	68000 / 6.12	<10 / <0.0832	2000 / 2.04	4000 / 2.04
	Location E (CFU/100ml) / CFU/g TS	16000 / 1.44	<10 / <0.0832	3000 / 3.06	1000 / 0.51
	Location F (CFU/100ml) / CFU/g TS	3000 / 0.27	<10 / <0.0832	3000 / 3.06	6000 / 3.06
	Location G (CFU/100ml) / CFU/g TS	7000 / 0.63	<10 / <0.0832	3000 / 3.06	3000 / 1.53
Geometric Mean		Colony Forming Unit/100ml sample			
	CFU/100ml	9121.84	<10	2379.57	2627.25
	Colony Forming Unit/grams Total Solids	0.82	<0.0832	2.43	1.34
	CFU/g TS				
	Base Sample #	GL970615	GL970622	GL970629	GL970636
		GL970616	GL970623	GL970630	GL970637
		GL970617	GL970624	GL970631	GL970638
		GL970618	GL970625	GL970632	GL970639
		GL970619	GL970626	GL970633	GL970640
		GL970620	GL970627	GL970634	GL970641
		GL970621	GL970628	GL970635	GL970642
	OEHL Sample #	98004487	98004488	98004489	98004490
			97004511		
	MVTL Laboratories Sample #	97-L27577	97-L27584	97-L27591	97-L27598
		97-L27578	97-L27585	97-L27592	97-L27599
		97-L27579	97-L27586	97-L27593	97-L27600
		97-L27580	97-L27587	97-L27594	97-L27601
		97-L27581	97-L27588	97-L27595	97-L27602
		97-L27582	97-L27589	97-L27596	97-L27603
		97-L27583	97-L27590	97-L27597	97-L27604

CFU/100/ml - Colony Forming Units per 100 milliliter of sample

CFU/g TS - Colony Forming Units per gram of Total Solids

Minot Air Force Base, North Dakota

Table A-5 Missile Site I1 and J1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 5, 1997			
		Missile Site I1		Missile Site J1	
Analysis Method	Analytes (ug/G)	Primary Pond	Secondary Pond	Primary Pond	Secondary Pond
SW 3050/6010B	Arsenic	3.93	4.35	2.26	5.41
SW 3050/6010B	Cadmium	1.28	1.24	0.21	1.36
SW 3050/6010B	Chromium	8.8	8.9	1.2	8.9
SW 3050/6010B	Copper	104	25.8	6.2	23
SW 3050/6010B	Lead	11.4	9.6	<1.5	10.6
SW 3050/6010B	Molybdenum	<0.60	<0.60	<0.45	<0.060
SW 3050/6010B	Nickel	21.6	18.9	3.68	21.4
SW 3050/6010B	Selenium	<2.0	<2.0	<1.5	<2.0
SW 3050/6010B	Zinc	116	100	72.5	159
SW 7471A	Mercury	0.081	0.074	0.035	0.07
STD MTD 2540G	Solids (%)	6	82		74.6
	milligrams/Liter Total Solids mg/L TS	0.06	0.82	0.021	0.746
EPA 350.1	Ammonia (mg/G)	350	0.01		<0.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	467	0.042		0.044
EPA 353.2	Nitrate/Nitrate Total (mg/G)	<2	0.006		0.064
Fecal Coliform	Locations of Sample Collection				
	Location A (CFU/100ml) / CFU/g TS	12000 / 7.2	<10 / <0.082	3000 / 0.63	<10 / <0.0746
	Location B (CFU/100ml) / CFU/g TS	23000 / 13.8	<10 / <0.082	3000 / 0.63	<10 / <0.0746
	Location C (CFU/100ml) / CFU/g TS	100000 / 60	<10 / <0.082	23000 / 4.83	<10 / <0.0746
	Location D (CFU/100ml) / CFU/g TS	20000 / 12	<10 / <0.082	130000 / 27.3	<10 / <0.0746
	Location E (CFU/100ml) / CFU/g TS	10000 / 6	<10 / <0.082	50000 / 10.5	<10 / <0.0746
	Location F (CFU/100ml) / CFU/g TS	10000 / 6	<10 / <0.082	1000 / 0.21	<10 / <0.0746
	Location G (CFU/100ml) / CFU/g TS	20000 / 12	<10 / <0.082	3000 / 0.63	<10 / <0.0746
Geometric Mean	Colony Forming Unit/100ml sample				
	CFU/100ml	19581.81	<10	8784.46	<10
	Colony Forming Unit/grams Total Solids	11.75	<0.082	1.84	<0.0746
	CFU/g TS				
	Base Sample #	GL970643	GL970650	GL970657	GL970664
		GL970644	GL970651	GL970658	GL970665
		GL970645	GL970652	GL970659	GL970666
		GL970646	GL970653	GL970660	GL970667
		GL970647	GL970654	GL970661	GL970668
		GL970648	GL970655	GL970662	GL970669
		GL970649	GL970656	GL970663	GL970670
	OEHL Sample #	98004491	98004492	98004493	98004494
			98004515		94004517
	MVTL Laboratories Sample #	97-L27696	97-L27703	97-L27710	97-L27717
		97-L27697	97-L27704	97-L27711	97-L27718
		97-L27698	97-L27705	97-L27712	97-L27719
		97-L27699	97-L27706	97-L27713	97-L27720
		97-L27700	97-L27707	97-L27714	97-L27721
		97-L27701	97-L27708	97-L27715	97-L27722
		97-L27702	97-L27709	97-L27716	97-L27723
CFU/100/ml - Colony Forming Units per 100 milliliter of sample					
CFU/g TS - Colony Forming Units per gram of Total Solids					

Appendix B

CHAIN-OF-CUSTODY RECORD

Project Officers:

MSgt Doris A. Dohner
Customer Address/Phone: (210) 536-3305
2402 E Drive Brooks AFB TX 78235

Project Title: MinotSld (PID)

Sampler (print): MSgt D. Dohner
Signature: *Doris A. Dohner*
Base Sample No. Date Time

GL970664 98004494 5 Nov 97 1105
GL970671 98004495 6 Nov 97 1030
GL970672 98004496 1 1240
GL970673 98004497 1 1216

Number of Containers

Received At:

Site Location Waste Name or Description

DEGREES CELCIUS

Site 20 Sludge
Site 21
Site 22
Site 23

Analysis Request

TKN or Organic N
Nitrate + Nitrite
Total Ammonia
Zinc SW-6010
Nickel, Selenium
Mercury SW-7471
Lead, Molybdenum
Copper SW-6010
Cadmium, Chromium
Arsenic SW-7060/7061/6010

Relinquished by: (Signature)

Date

Received by: (Signature)

Time

Relinquished by: (Signature)

Date

Received for Laboratory by: (Signature)

Time

Relinquished by: (Signature)

Date

Received by: (Signature)

Time

Remarks:

All analysis results must be dry weight basis. See attached

CHAIN OF CUSTODY

47

INORGANIC ANALYSIS REQUEST FORM				AL/OEA USE ONLY	
DATE/TIME COLLECTED: <u>97/11/3</u>		Mail Samples: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626			
DATE/TIME RECEIVED: _____		CHAIN OF CUSTODY			
Reason Submitted: ☐ (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? ☐			
☐ ROUTINE ☐ PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____			
☐ CHAIN OF CUSTODY (Litigation Purposes)		☐ CHAIN OF CUSTODY (Tracking Purposes)			
ON-SITE ANALYTICAL RESULTS		Sampling Site Identifier: _____			
WATER TEMPERATURE <u> </u> °C pH <u> </u> units COLLECTION METHOD ☐ GRAB ☐ COMPOSITE		BASE WHERE SAMPLE COLLECTED _____			
HOW WAS THE SAMPLE PRESERVED? ☐ Group D: Sodium Hydroxide ☐ Group A-C: Sulfuric Acid ☐ Group G: None ☐ Group J: Zinc Acetate		SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room) _____			
SAMPLE LOCATION: ☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____		SAMPLE COLLECTED BY (NAME, GRADE, AFSC) _____ DSN _____ FAX _____			
WATER TREATMENT: ☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____		SIGNATURE _____			
MAIL REPORTS TO: ORIGINAL _____ COPY 1 _____ COPY 2 _____		Armstrong Lab PID: _____ (AL Use Only)			
BASE SAMPLE NUMBER: <u>GL970552</u>		Date/Time Analysed: _____			
GROUP A Holding Time _____		GROUP G Holding Time _____			
COD 28 Days 410.4 mg/L		Acidity, Total 14 Days 305.1 mg/L			
Organic Carbon 28 Days 415.1 mg/L		Alkalinity, Total 14 Days 310.2 mg/L			
Date/Time Analysed: _____		Alkalinity, Bicarbonate 14 Days 310.1 mg/L			
GROUP B Holding Time _____		Bromide 28 Days 300.0 mg/L			
Oil & Grease 28 Days 413 mg/L		Chloride 28 Days 325.2/300.0 mg/L			
TPH 28 Days 418.1 mg/L		Color 48 Hrs 110.2 Units			
Date/Time Analysed: <u>Solid</u>		Fluoride 28 Days 340.2/300.0 mg/L			
GROUP C Holding Time <u>98004501</u>		Residue, Total 7 Days 160.3 mg/L			
☒ Ammonia <u>11/8</u> 28 Days 350.1 mg/L		Residue, Filterable 7 Days 160.1 mg/L			
☒ Kjeldahl Nitrogen 28 Days 351.2 mg/L		Residue, Nonfilterable 7 Days 160.2 mg/L			
☒ Nitrate + Nitrite <u>11/10</u> 28 Days 353.2/300.0 mg/L		Residue, Settleable 48 Hrs 160.5 ml/L			
Nitrate 48 Hrs 353.2/300.0 mg/L		Residue, Volatile 7 Days 160.4 mg/L			
Nitrite 48 Hrs 353.2/300.0 mg/L		Silica 28 Days 370.1 mg/L			
Orthophosphate 28 Days 365.1/300.0 mg/L		Specific Conductance 28 Days 120.1 Umho			
Phosphorus, Total 28 Days 365.1/300.0 mg/L		Sulfate 28 Days 375.2/300.0 mg/L			
Date/Time Analysed: _____		Surfactants-MBAS 48 Hrs 425.1 mg/L			
GROUP D Holding Time _____		Turbidity 48 Hrs 180.1 Units			
Cyanide, Total 14 Days 335.3 mg/L		Langlier Index 28 Days 203			
Cyanide, Free 14 Days 335.1 mg/L		Date/Time Analysed: _____			
Date/Time Analysed: _____		GROUP J Holding Time _____			
GROUP E Holding Time _____		Sulfides 7 Days 376.1 mg/L			
Phenols 28 Days 420.2		CHEMIST: <u>Blm Dr</u>			
Remarks: <u>70 Solid By Weight</u>		APPROVED BY: _____			
CHAIN OF CUSTODY					

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE

CHAIN OF CUSTODY

DATE/TIME COLLECTED:

97/11/3

Mail Samples To:

ARMSTRONG LABORATORY

Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

Reason Submitted:

(F3 For Selection)

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?

System Name:

System Number:

☐ ROUTINE☐

PRIORITY (pre-arrange with analyst)

AUTHORIZATION NUMBER:

☐ CHAIN OF CUSTODY
(Litigation Purposes)☐CHAIN OF CUSTODY
(Tracking Purposes)Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE

pH

°C

units

COLLECTION METHOD

☐ GRAB☐ COMPOSITE

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C,E:Sulfuric Acid☐ Group D:Sodium Hydroxide☐ Group G:None☐ Group J:Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE

NUMBER:

GL970559

Armstrong Lab PID:

(AL Use Only)

Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD 28 Days

410.4

mg/L

Organic Carbon 28 Days

415.1

mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days

413

mg/L

TPH 28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

☒ Ammonia 28 Days

350.1

29.3 mg/L

☒ Kjeldahl Nitrogen 28 Days

351.2

48 mg/L

☒ Nitrate + Nitrite 28 Days

353.2/300.0

50.1 mg/L

Nitrate 48 Hrs

353.2/300.0

mg/L

Nitrite 48 Hrs

353.2/300.0

mg/L

Orthophosphate 28 Days

365.1/300.0

mg/L

Phosphorus, Total 28 Days

365.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days

335.3

mg/L

Cyanide, Free 14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days

420.2

ug/L

Remarks:

0% Solid By Weight: 2.6%

Date/Time
Analysed:

GROUP J Holding Time

Sulfides

7 Days

376.1

mg/L

CHEMIST:

APPROVED BY:

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM				AL/OEA CHAIN OF CUSTODY ONLY	
DATE/TIME COLLECTED: <u>9/7/11/3</u>		Mail Samples To: ARMSTRONG LABORATORY			
DATE/TIME RECEIVED: _____		Occupational & Environmental Health Directorate			
		2402 E. Drive., Bldg 140			
		Brooks AFB, Texas 78235-5114			
		DSN: 240-3626 (210) 536-3626			
Reason Submitted: ☐ (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?			
		System Name: _____ System Number: _____			
☐ ROUTINE		☐ PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____	
☐ CHAIN OF CUSTODY (Litigation Purposes)		☐ CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier: _____	
ON-SITE ANALYTICAL RESULTS				BASE WHERE SAMPLE COLLECTED	
WATER TEMPERATURE $^{\circ}\text{C}$		pH units		COLLECTION METHOD ☐ GRAB ☐ COMPOSITE	
HOW WAS THE SAMPLE PRESERVED? ☐ Group A-C, E: Sulfuric Acid				SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)	
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate					
SAMPLE LOCATION: ☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____				SAMPLE COLLECTED BY (NAME, GRADE, AFSC) _____ DSN _____ FAX _____	
WATER TREATMENT: ☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____				SIGNATURE _____	
MAIL REPORTS TO: _____		ORIGINAL			
(USE ASSIGNED BASE CODE)		COPY 1			
		COPY 2			
BASE SAMPLE NUMBER: <u>GL-970566</u>		Armstrong Lab PID: _____		(AL Use Only) _____	
Date/Time Analysed: _____		Date/Time Analysed: _____			
GROUP A Holding Time		GROUP G Holding Time			
COD 28 Days 410.4 mg/L		Acidity, Total 14 Days 305.1 mg/L			
Organic Carbon 28 Days 415.1 mg/L		Alkalinity, Total 14 Days 310.2 mg/L			
Date/Time Analysed: _____		Alkalinity, Bicarbonate 14 Days 310.1 mg/L			
GROUP B Holding Time		Bromide 28 Days 300.0 mg/L			
Oil & Grease 28 Days 413 mg/L		Chloride 28 Days 325.2/300.0 mg/L			
TPH 28 Days 418.1 mg/L		Color 48 Hrs 110.2 Units			
Date/Time Analysed: <u>Soil</u>		Fluoride 28 Days 340.2/300.0 mg/L			
GROUP C Holding Time		Residue, Total 7 Days 160.3 mg/L			
Ammonia <u>11/18</u> 28 Days 350.1 mg/L		Residue, Filterable 7 Days 160.1 mg/L			
Kjeldahl Nitrogen 28 Days 351.2 mg/L		Residue, Nonfilterable 7 Days 160.2 mg/L			
Nitrate + Nitrite <u>11/20</u> 28 Days 353.2/300.0 mg/L		Residue, Settleable 48 Hrs 160.5 ml/L			
Nitrate 48 Hrs 353.2/300.0 mg/L		Residue, Volatile 7 Days 160.4 mg/L			
Nitrite 48 Hrs 353.2/300.0 mg/L		Silica 28 Days 370.1 mg/L			
Orthophosphate 28 Days 365.1/300.0 mg/L		Specific Conductance 28 Days 120.1 Umho			
Phosphorus, Total 28 Days 365.1/300.0 mg/L		Sulfate 28 Days 375.2/300.0 mg/L			
Date/Time Analysed: _____		Surfactants-MBAS 48 Hrs 425.1 mg/L			
GROUP D Holding Time		Turbidity 48 Hrs 180.1 Units			
Cyanide, Total 14 Days 335.3 mg/L		Langlier Index 28 Days 203			
Cyanide, Free 14 Days 335.1 mg/L					
Date/Time Analysed: _____		GROUP J Holding Time			
GROUP E Holding Time		Sulfides 7 Days 376.1 mg/L			
Phenols 28 Days 420.2 ug/L		CHEMIST: <u>Blm</u>			
Remarks: <u>0% SOLID By Weight 66.9%</u>		APPROVED BY: <u>W. R. Oude</u>			

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED:

97/11/3

YY / MM / DD

24 HR

Mail Samples To:

ARMSTRONG LABORATORY

Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

Reason Submitted:
(F3 For Selection)☐IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name:

System Number:

☐☐ ROUTINE☐

PRIORITY (pre-arrange with analyst)

☐ CHAIN OF CUSTODY
(Litigation Purposes)☐CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE
°C

pH

units

COLLECTION METHOD

☐ GRAB☐ COMPOSITE

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C, E: Sulfuric Acid☐ Group D: Sodium Hydroxide☐ Group G: None☐ Group J: Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE
NUMBER:

GL970573

Armstrong Lab PID:
(AL Use Only)

DEGREES CELSIUS

Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD 28 Days

410.4

mg/L

Organic Carbon 28 Days

415.1

mg/L

Acidity, Total 14 Days

305.1

mg/L

Alkalinity, Total 14 Days

310.2

mg/L

Alkalinity, Bicarbonate 14 Days

310.1

mg/L

Bromide 28 Days

300.0

mg/L

Chloride 28 Days

325.2/300.0

mg/L

Color 48 Hrs

110.2

Units

Fluoride 28 Days

340.2/300.0

mg/L

Residue, Total 7 Days

160.3

mg/L

Residue, Filterable 7 Days

160.1

mg/L

Residue, Nonfilterable 7 Days

160.2

mg/L

Residue, Settleable 48 Hrs

160.5

ml/L

Residue, Volatile 7 Days

160.4

mg/L

Silica 28 Days

370.1

mg/L

Specific Conductance 28 Days

120.1

Umho

Sulfate 28 Days

375.2/300.0

mg/L

Surfactants-MBAS 48 Hrs

425.1

mg/L

Turbidity 48 Hrs

180.1

Units

Langlier Index 28 Days

203

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days

413

mg/L

TPH 28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

Ammonia 11/18 28 Days

350.1

14.5 mg/L

Kjeldahl Nitrogen 28 Days

351.2

30 mg/L

Nitrate + Nitrite 11/20 28 Days

353.2/300.0

0.3 mg/L

Nitrate 48 Hrs

353.2/300.0

mg/L

Nitrite 48 Hrs

353.2/300.0

mg/L

Orthophosphate 28 Days

365.1/300.0

mg/L

Phosphorus, Total 28 Days

365.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days

335.3

mg/L

Cyanide, Free 14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days

420.2

ug/L

Date/Time
Analysed:

GROUP J Holding Time

Sulfides 7 Days

376.1

mg/L

CHEMIST: BL

APPROVED BY: [Signature]

Remarks:

70 Solid By Weight: 8.9%

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM				AL/OEA CHAIN OF CUSTODY ONLY			
DATE/TIME COLLECTED: <u>97/11/3</u>		YY / MM / DD		24 HR		Mail Samples To: ARMSTRONG LABORATORY	
DATE/TIME RECEIVED: _____		YY / MM / DD		24 HR		Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626	
Reason Submitted: ☐ (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____ System Number: _____					
☐ ROUTINE		☐ PRIORITY (pre-arrange with analyst)		AUTHORIZATION NUMBER: _____			
☐ CHAIN OF CUSTODY (Litigation Purposes)		☐ CHAIN OF CUSTODY (Tracking Purposes)		Sampling Site Identifier: _____			
ON-SITE ANALYTICAL RESULTS				BASE WHERE SAMPLE COLLECTED: _____			
WATER TEMPERATURE <u> </u> °C		pH <u> </u> units		COLLECTION METHOD ☐ GRAB ☐ COMPOSITE			
HOW WAS THE SAMPLE PRESERVED? ☐ Group A-C-E: Sulfuric Acid				SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room): _____			
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate				SAMPLE COLLECTED BY (NAME, GRADE, AFSG): _____ DSN: _____			
SAMPLE LOCATION: ☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____				SIGNATURE: _____			
WATER TREATMENT: ☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____				MAIL REPORTS TO: _____			
MAIL REPORTS TO: _____		ORIGINAL		Armstrong Lab PID: _____			
_____		COPY 1		(AL Use Only) _____			
_____		COPY 2		_____			
BASE SAMPLE NUMBER: <u>GL970580</u>		Date/Time Analyzed: _____					
GROUP A Holding Time		GROUP G Holding Time					
COD 28 Days		410.4		mg/L		Acidity, Total 14 Days	
Organic Carbon 28 Days		415.1		mg/L		305.1 mg/L	
Date/Time Analyzed: _____		Alkalinity, Total 14 Days					
GROUP B Holding Time		310.2 mg/L					
Oil & Grease 28 Days		413		mg/L		Alkalinity, Bicarbonate 14 Days	
TPH 28 Days		418.1		mg/L		310.1 mg/L	
Date/Time Analyzed: _____		Bromide 28 Days					
GROUP C Holding Time		300.0 mg/L					
Ammonia <u>11/8</u> 28 Days		350.1		mg/L		Chloride 28 Days	
Kjeldahl Nitrogen 28 Days		351.2		mg/L		325.2/300.0 mg/L	
Nitrate + Nitrite <u>11/8</u> 28 Days		353.2/300.0		mg/L		Color 48 Hrs	
Nitrate 48 Hrs		353.2/300.0		mg/L		110.2 Units	
Nitrite 48 Hrs		353.2/300.0		mg/L		Fluoride 28 Days	
Orthophosphate 28 Days		365.1/300.0		mg/L		340.2/300.0 mg/L	
Phosphorus, Total 28 Days		365.1/300.0		mg/L		Residue, Total 7 Days	
Date/Time Analyzed: _____		160.3 mg/L					
GROUP D Holding Time		Residue, Filterable 7 Days					
Cyanide, Total 14 Days		335.3		mg/L		160.1 mg/L	
Cyanide, Free 14 Days		335.1		mg/L		Residue, Nonfilterable 7 Days	
Date/Time Analyzed: _____		160.2 mg/L					
GROUP E Holding Time		Residue, Settleable 48 Hrs					
Phenols 28 Days		420.2		mg/L		160.5 ml/L	
Date/Time Analyzed: _____		Residue, Volatile 7 Days					
Remarks: <u>90 SOLID By Weight: 51.2%</u>		160.4 mg/L					
APPROVED BY: <u>[Signature]</u>		Silica 28 Days					
CHEMIST: <u>[Signature]</u>		370.1 mg/L					
APPROVED BY: <u>[Signature]</u>		Specific Conductance 28 Days					
CHAIN OF CUSTODY		120.1 Umho					
AF FORM 2752A, OCT 95		Sulfate 28 Days					
PREVIOUS EDITION IS OBSOLETE.		375.2/300.0 mg/L					
23		Surfactants-MBAS 48 Hrs					
		425.1 mg/L					
		Turbidity 48 Hrs					
		180.1 Units					
		Langlier Index 28 Days					
		203					
		Date/Time Analyzed: _____					
		GROUP J Holding Time					
		Sulfides 7 Days					
		376.1 mg/L					

INORGANIC ANALYSIS REQUEST FORM

AL/OEA

CHAIN OF CUSTODY
ONLY

DATE/TIME COLLECTED:

97/11/4

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

DATE/TIME RECEIVED:

YY / MM / DD

24 HR

Reason Submitted:
(F3 For Selection)☐IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name:

System Number:

☐ ROUTINE☐

PRIORITY (pre-arrange with analyst)

☐ CHAIN OF CUSTODY
(Litigation Purposes)☐CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE

pH

°C

units

COLLECTION METHOD

☐ GRAB☐ COMPOSITE

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C,E:Sulfuric Acid☐ Group D:Sodium Hydroxide☐ Group G:None☐ Group J:Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE
NUMBER:

GL970587

Armstrong Lab PID:
(AL Use Only)

DEGREES CELSIUS

Date/Time
Analysed:

GROUP A Holding Time

COD 28 Days

410.4

mg/L

Organic Carbon 28 Days

415.1

mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days

413

mg/L

TPH 28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

☒ Ammonia 11/18 28 Days

350.1

5.5 mg/L

☒ Kjeldahl Nitrogen 28 Days

351.2

24 mg/L

☒ Nitrate + Nitrite 11/20 28 Days

353.2/300.0

0.1 mg/L

Nitrate 48 Hrs

353.2/300.0

mg/L

Nitrite 48 Hrs

353.2/300.0

mg/L

Orthophosphate 28 Days

365.1/300.0

mg/L

Phosphorus, Total 28 Days

365.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days

335.3

mg/L

Cyanide, Free 14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days

420.2

ug/L

Remarks: 0% Solid By Weight; 0.4%

Date/Time
Analysed:

GROUP G Holding Time

Acidity, Total 14 Days

305.1

mg/L

Alkalinity, Total 14 Days

310.2

mg/L

Alkalinity, Bicarbonate 14 Days

310.1

mg/L

Bromide 28 Days

300.0

mg/L

Chloride 28 Days

325.2/300.0

mg/L

Color 48 Hrs

110.2

Units

Fluoride 28 Days

340.2/300.0

mg/L

Residue, Total 7 Days

160.3

mg/L

Residue, Filterable 7 Days

160.1

mg/L

Residue, Nonfilterable 7 Days

160.2

mg/L

Residue, Settleable 48 Hrs

160.5

ml/L

Residue, Volatile 7 Days

160.4

mg/L

Silica 28 Days

370.1

mg/L

Specific Conductance 28 Days

120.1

Umho

Sulfate 28 Days

375.2/300.0

mg/L

Surfactants-MBAS 48 Hrs

425.1

mg/L

Turbidity 48 Hrs

180.1

Units

Langlier Index 28 Days

203

Date/Time
Analysed:

GROUP J Holding Time

Sulfides 7 Days

376.1

mg/L

CHEMIST:

APPROVED BY: M. D. D. D.

INORGANIC ANALYSIS REQUEST FORM

CHAIN OF CUSTODY
ONLY

DATE/TIME COLLECTED:

YY / MM / DD

24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

Reason Submitted:

(F3 For Selection)

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name:

System Number:

☐ ROUTINE☐ PRIORITY (pre-arrange with analyst)☐ CHAIN OF CUSTODY
(Litigation Purposes)☐ CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE

pH

°C

units

COLLECTION METHOD

☐ GRAB ☐ COMPOSITE

BASE WHERE SAMPLE COLLECTED

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C,E:Sulfuric Acid☐ Group D:Sodium Hydroxide ☐ Group G:None ☐ Group J:Zinc Acetate

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

SAMPLE COLLECTED BY (NAME, GRADE, AFSC)

DSN

FAX

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

SIGNATURE

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE

NUMBER:

GL-970595

Armstrong Lab PID:

(AL Use Only)

Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD	28 Days	410.4	mg/L
Organic Carbon	28 Days	415.1	mg/L

Acidity, Total	14 Days	305.1	mg/L
Alkalinity, Total	14 Days	310.2	mg/L

Oil & Grease	28 Days	413	mg/L
TPH	28 Days	418.1	mg/L

Alkalinity, Bicarbonate	14 Days	310.1	mg/L
Bromide	28 Days	300.0	mg/L

GROUP B Holding Time			
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Chloride	28 Days	325.2/300.0	mg/L
Color	48 Hrs	110.2	Units

Oil & Grease	28 Days	413	mg/L
TPH	28 Days	418.1	mg/L

Fluoride	28 Days	340.2/300.0	mg/L
Residue, Total	7 Days	160.3	mg/L

Oil & Grease	28 Days	413	mg/L
TPH	28 Days	418.1	mg/L

Residue, Filterable	7 Days	160.1	mg/L
Residue, Nonfilterable	7 Days	160.2	mg/L

GROUP C Holding Time			
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Residue, Settleable	48 Hrs	160.5	ml/L
Residue, Volatile	7 Days	160.4	mg/L

Ammonia	28 Days	350.1	mg/L
Kjeldahl Nitrogen	28 Days	351.2	mg/L

Silica	28 Days	370.1	mg/L
Specific Conductance	28 Days	120.1	Umho

Nitrate + Nitrite	28 Days	353.2/300.0	mg/L
Nitrate	48 Hrs	353.2/300.0	mg/L

Sulfate	28 Days	375.2/300.0	mg/L
Surfactants-MBAS	48 Hrs	425.1	mg/L

Nitrite	48 Hrs	353.2/300.0	mg/L
Orthophosphate	28 Days	365.1/300.0	mg/L

Turbidity	48 Hrs	180.1	Units
Langlier Index	28 Days	203	

Nitrate	48 Hrs	353.2/300.0	mg/L
Nitrite	48 Hrs	353.2/300.0	mg/L

Orthophosphate	28 Days	365.1/300.0	mg/L
Phosphorus, Total	28 Days	365.1/300.0	mg/L

Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
-------------------	---------	-------------	------

Phosphorus, Total	28 Days	365.1/300.0	mg/L
-------------------	---------	-------------	------

Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Phosphorus, Total	28 Days	365.1/300.0	mg/L
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Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Cyanide, Total	14 Days	335.3	mg/L
Cyanide, Free	14 Days	335.1	mg/L

Remarks:

70 Solid By Weight: 65.9%

CHEMIST:

APPROVED BY:

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA

USE

CHAIN OF CUSTODY

DATE/TIME COLLECTED:

97/11/4

YY / MM / DD

24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

DATE/TIME RECEIVED:

YY / MM / DD

24 HR

Reason Submitted:

(F3 For Selection)

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?

System Name:

System Number:

☐ ROUTINE☐

PRIORITY (pre-arrange with analyst)

☐ CHAIN OF CUSTODY
(Litigation Purposes)☐CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE

pH

°C

units

COLLECTION METHOD

☐ GRAB☐ COMPOSITE

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C,E:Sulfuric Acid☐ Group D:Sodium Hydroxide☐ Group G:None☐ Group J:Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE

NUMBER:

G-970601

Armstrong Lab PID:

(AL Use Only)

Date/Time
Analysed:

GROUP A Holding Time

COD

28 Days

410.4

mg/L

Organic Carbon

28 Days

415.1

mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease

28 Days

413

mg/L

TPH

28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

☒ Ammonia

11/18 28 Days

350.1

27 mg/L

☒ Kjeldahl Nitrogen

28 Days

351.2

42 mg/L

☒ Nitrate + Nitrite

11/20 28 Days

353.2/300.0

40.1 mg/L

Nitrate

48 Hrs

353.2/300.0

mg/L

Nitrite

48 Hrs

353.2/300.0

mg/L

Orthophosphate

28 Days

365.1/300.0

mg/L

Phosphorus, Total

28 Days

365.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total

14 Days

335.3

mg/L

Cyanide, Free

14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols

28 Days

420.2

ug/L

Date/Time
Analysed:

GROUP G Holding Time

Acidity, Total

14 Days

305.1

mg/L

Alkalinity, Total

14 Days

310.2

mg/L

Alkalinity, Bicarbonate

14 Days

310.1

mg/L

Bromide

28 Days

300.0

mg/L

Chloride

28 Days

325.2/300.0

mg/L

Color

48 Hrs

110.2

Units

Fluoride

28 Days

340.2/300.0

mg/L

Residue, Total

7 Days

160.3

mg/L

Residue, Filterable

7 Days

160.1

mg/L

Residue, Nonfilterable

7 Days

160.2

mg/L

Residue, Settleable

48 Hrs

160.5

mg/L

Residue, Volatile

7 Days

160.4

mg/L

Silica

28 Days

370.1

mg/L

Specific Conductance

28 Days

120.1

Umhc

Sulfate

28 Days

375.2/300.0

mg/L

Surfactants-MBAS

48 Hrs

425.1

mg/L

Turbidity

48 Hrs

180.1

Units

Langlier Index

28 Days

203

Date/Time
Analysed:

GROUP J Holding Time

Sulfides

7 Days

376.1

mg/L

CHEMIST:

APPROVED BY:

Remarks:

0% SOLID By Weight, 2.9%
H2O2

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE

CHAIN OF CUSTODY

DATE/TIME COLLECTED:

97/11/4

YY / MM / DD

24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

Reason Submitted:

(F3 For Selection)

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?

System Name:

System Number:

☐ ROUTINE☐ PRIORITY (pre-arrange with analyst)☐ CHAIN OF CUSTODY
(Litigation Purposes)☐ CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE

pH

°C

units

COLLECTION METHOD

☐ GRAB ☐ COMPOSITE

HOW WAS THE SAMPLE PRESERVED?

☐ Group A-C, E: Sulfuric Acid☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE

NUMBER:

62970608

Armstrong Lab PID:

(AL Use Only)

Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD 28 Days

410.4

mg/L

Organic Carbon 28 Days

415.1

mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days

413

mg/L

TPH 28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

Ammonia 11/18 28 Days

350.1

mg/L

Kjeldahl Nitrogen 28 Days

351.2

mg/L

Nitrate + Nitrite 11/20 28 Days

353.2/300.0

mg/L

Nitrate 48 Hrs

353.2/300.0

mg/L

Nitrite 48 Hrs

353.2/300.0

mg/L

Orthophosphate 28 Days

355.1/300.0

mg/L

Phosphorus, Total 28 Days

355.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days

335.3

mg/L

Cyanide, Free 14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days

420.2

mg/L

Remarks:

70 SOLID By Weight: 48.7%

Date/Time
Analysed:

GROUP J Holding Time

Sulfides 7 Days

376.1

mg/L

CHEMIST:

APPROVED BY:

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM				AL/OEA CHAIN OF CUSTODY ONLY	
DATE/TIME COLLECTED: <u>97/11/4</u> YY / MM / DD 24 HR		Mail Samples To: ARMSTRONG LABORATORY Occupational & Environmental Health Directorate 2402 E. Drive, Bldg 140 Brooks AFB, Texas 78235-5114 DSN: 240-3626 (210) 536-3626			
DATE/TIME RECEIVED: _____ YY / MM / DD 24 HR		<u>10-10-00</u>			
Reason Submitted: ☐ (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? System Name: _____ System Number: _____			
☐ ROUTINE ☐ PRIORITY (pre-arrange with analyst) ☐ CHAIN OF CUSTODY (Litigation Purposes) ☐ CHAIN OF CUSTODY (Tracking Purposes)		AUTHORIZATION NUMBER: _____			
ON-SITE ANALYTICAL RESULTS		Sampling Site Identifier: _____			
WATER TEMPERATURE <u> </u> °C pH <u> </u> units COLLECTION METHOD ☐ GRAB ☐ COMPOSITE		BASE WHERE SAMPLE COLLECTED: _____			
HOW WAS THE SAMPLE PRESERVED? ☐ Group A-C,E:Sulfuric Acid ☐ Group D:Sodium Hydroxide ☐ Group G:None ☐ Group J:Zinc Acetate		SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room): _____			
SAMPLE LOCATION: ☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____		SAMPLE COLLECTED BY (NAME, GRADE, AFSC): _____		DSN FAX: _____	
WATER TREATMENT: ☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____		SIGNATURE: _____			
MAIL REPORTS TO: _____		ORIGINAL: _____			
COPY 1: _____		COPY 2: _____			
BASE SAMPLE NUMBER: <u>GL970622</u>		Armstrong Lab PID: _____ (AL Use Only)			
Date/Time Analysed: _____		Date/Time Analysed: _____			
GROUP A Holding Time		GROUP G Holding Time			
COD 28 Days 410.4 mg/L		Acidity, Total 14 Days 305.1 mg/L			
Organic Carbon 28 Days 415.1 mg/L		Alkalinity, Total 14 Days 310.2 mg/L			
Date/Time Analysed: _____		Alkalinity, Bicarbonate 14 Days 310.1 mg/L			
GROUP B Holding Time		Bromide 28 Days 300.0 mg/L			
Oil & Grease 28 Days 413 mg/L		Chloride 28 Days 325.2/300.0 mg/L			
TPH 28 Days 418.1 mg/L		Color 48 Hrs 110.2 Units			
Date/Time Analysed: <u>Soil</u>		Fluoride 28 Days 340.2/300.0 mg/L			
GROUP C Holding Time		Residue, Total 7 Days 160.3 mg/L			
Ammonia <u>N/18</u> 28 Days 350.1 mg/L		Residue, Filterable 7 Days 160.1 mg/L			
Kjeldahl Nitrogen 28 Days 351.2 mg/L		Residue, Nonfilterable 7 Days 160.2 mg/L			
Nitrate + Nitrite <u>R/20</u> 28 Days 353.2/300.0 mg/L		Residue, Settleable 48 Hrs 160.5 ml/L			
Nitrate 48 Hrs 353.2/300.0 mg/L		Residue, Volatile 7 Days 160.4 mg/L			
Nitrite 48 Hrs 353.2/300.0 mg/L		Silica 28 Days 370.1 mg/L			
Orthophosphate 28 Days 365.1/300.0 mg/L		Specific Conductance 28 Days 120.1 Umho			
Phosphorus, Total 28 Days 365.1/300.0 mg/L		Sulfate 28 Days 375.2/300.0 mg/L			
Date/Time Analysed: _____		Surfactants-MBAS 48 Hrs 425.1 mg/L			
GROUP D Holding Time		Turbidity 48 Hrs 180.1 Units			
Cyanide, Total 14 Days 335.3 mg/L		Langlier Index 28 Days 203			
Cyanide, Free 14 Days 335.1 mg/L		Date/Time Analysed: _____			
Date/Time Analysed: _____		GROUP J Holding Time			
GROUP E Holding Time		Sulfides 7 Days 376.1 mg/L			
Phenols 28 Days 420.2 ug/L		CHEMIST: <u>Blh</u>			
Remarks: <u>70 Solid By Weight: 83.2%</u>		APPROVED BY: <u>[Signature]</u>			

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM				AL/OEA USE ONLY	
DATE/TIME COLLECTED: <u>9/7/11/4</u>		Mail Samples To: ARMSTRONG LABORATORY			
DATE/TIME RECEIVED: _____		Occupational & Environmental Health Directorate			
		2402 E. Drive, Bldg 140			
		Brooks AFB, Texas 78235-5114			
		DSN: 240-3626 (210) 536-3626			
Reason Submitted: ☐ (F3 For Selection)		IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA? ☐			
		System Name: _____ System Number: _____			
☐ ROUTINE ☐ CHAIN OF CUSTODY (Litigation Purposes)		☐ PRIORITY (pre-arrange with analyst) ☐ CHAIN OF CUSTODY (Tracking Purposes)		AUTHORIZATION NUMBER: _____	
ON-SITE ANALYTICAL RESULTS		BASE WHERE SAMPLE COLLECTED			
WATER TEMPERATURE <u>0</u> C pH _____ units		COLLECTION METHOD ☐ GRAB ☐ COMPOSITE			
HOW WAS THE SAMPLE PRESERVED? ☐ Group A-C, E: Sulfuric Acid		SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)			
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate					
SAMPLE LOCATION: ☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____		SAMPLE COLLECTED BY (NAME, GRADE, AFSC)		DSN FAX	
WATER TREATMENT: ☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____		SIGNATURE _____			
MAIL REPORTS TO: _____		ORIGINAL		DEGREES CELSIUS	
COPY 1		COPY 2			
BASE SAMPLE NUMBER: <u>GL970679</u>		Armstrong Lab PID: _____		(AL Use Only)	
Date/Time Analysed: _____		Date/Time Analysed: _____			
GROUP A Holding Time		GROUP G Holding Time			
COD 28 Days 410.4 mg/L		Acidity, Total 14 Days 305.1 mg/L			
Organic Carbon 28 Days 415.1 mg/L		Alkalinity, Total 14 Days 310.2 mg/L			
Date/Time Analysed: _____		Alkalinity, Bicarbonate 14 Days 310.1 mg/L			
GROUP B Holding Time		Bromide 28 Days 300.0 mg/L			
Oil & Grease 28 Days 413 mg/L		Chloride 28 Days 325.2/300.0 mg/L			
TPH 28 Days 418.1 mg/L		Color 48 Hrs 110.2 Units			
Date/Time Analysed: _____		Fluoride 28 Days 340.2/300.0 mg/L			
GROUP C Holding Time <u>98104512</u>		Residue, Total 7 Days 160.3 mg/L			
☒ Ammonia <u>11/18</u> 28 Days 350.1 <u>52.5</u> mg/L		Residue, Filterable 7 Days 160.1 mg/L			
☒ Kjeldahl Nitrogen 28 Days 351.2 <u>64</u> mg/L		Residue, Nonfilterable 7 Days 160.2 mg/L			
☒ Nitrate + Nitrite <u>11/18</u> 28 Days 353.2/300.0 <u><0.1</u> mg/L		Residue, Settleable 48 Hrs 160.5 ml/L			
Nitrate 48 Hrs 353.2/300.0 mg/L		Residue, Volatile 7 Days 160.4 mg/L			
Nitrite 48 Hrs 353.2/300.0 mg/L		Silica 28 Days 370.1 mg/L			
Orthophosphate 28 Days 365.1/300.0 mg/L		Specific Conductance 28 Days 120.1 Umho			
Phosphorus, Total 28 Days 365.1/300.0 mg/L		Sulfate 28 Days 375.2/300.0 mg/L			
Date/Time Analysed: _____		Surfactants-MBAS 48 Hrs 425.1 mg/L			
GROUP D Holding Time		Turbidity 48 Hrs 180.1 Units			
Cyanide, Total 14 Days 335.3 mg/L		Langlier Index 28 Days 203			
Cyanide, Free 14 Days 335.1 mg/L					
Date/Time Analysed: _____		GROUP J Holding Time			
GROUP E Holding Time		Sulfides 7 Days 376.1 mg/L			
Phenols 28 Days 420.2 mg/L		CHEMIST: <u>Blu</u>			
Remarks: <u>70 SOLID By Weight: 10.2%</u>		APPROVED BY: <u>[Signature]</u>			

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

DATE/TIME COLLECTED: 9/7/11/4
YY / MM / DD 24 HR

Mail Samples To:

ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

DATE/TIME RECEIVED: _____
YY / MM / DD 24 HR

2402 E. Drive, Bldg 140
Brooks AFB, Texas 78235-5114
DSN: 240-3626 (210) 536-3626

Reason Submitted:
(F3 For Selection) ☐

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name: _____ System Number: _____

☐ ROUTINE ☐ PRIORITY (pre-arrange with analyst)
☐ CHAIN OF CUSTODY (Litigation Purposes) ☐ CHAIN OF CUSTODY (Tracking Purposes)

AUTHORIZATION NUMBER: _____

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE ☐ pH ☐ COLLECTION METHOD
°C units ☐ GRAB ☐ COMPOSITE
HOW WAS THE SAMPLE PRESERVED? ☐ Group A-C-E: Sulfuric Acid
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate

BASE WHERE SAMPLE COLLECTED

SAMPLE LOCATION:
☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other: _____

SAMPLE SITE DESCRIPTION (BLDG #, Location, Area, and/or Room)

WATER TREATMENT:
☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other: _____

SAMPLE COLLECTED BY (NAME, GRADE, AFSC) DSN
FAX

MAIL REPORTS TO: ORIGINAL
COPY 1
COPY 2
(USE ASSIGNED BASE CODE)

SIGNATURE

BASE SAMPLE
NUMBER:

GL970636

Armstrong Lab PID:
(AL Use Only)

Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD 28 Days 410.4 mg/L
Organic Carbon 28 Days 415.1 mg/L

Acidity, Total 14 Days 305.1 mg/L

Date/Time
Analysed:

GROUP B Holding Time

Alkalinity, Total 14 Days 310.2 mg/L

Oil & Grease 28 Days 413 mg/L
TPH 28 Days 418.1 mg/L

Alkalinity, Bicarbonate 14 Days 310.1 mg/L

Date/Time
Analysed:

GROUP C Holding Time

Bromide 28 Days 300.0 mg/L

Ammonia 11/18 28 Days 350.1 37 mg/L
Kjeldahl Nitrogen 28 Days 351.2 50 mg/L

Chloride 28 Days 325.2/300.0 mg/L

Nitrate + Nitrite 11/20 28 Days 353.2/300.0 40.1 mg/L
Nitrate 48 Hrs 353.2/300.0 mg/L

Color 48 Hrs 110.2 Units

Nitrite 48 Hrs 353.2/300.0 mg/L
Orthophosphate 28 Days 365.1/300.0 mg/L

Fluoride 28 Days 340.2/300.0 mg/L

Date/Time
Analysed:

GROUP D Holding Time

Residue, Total 7 Days 160.3 mg/L

Cyanide, Total 14 Days 335.3 mg/L
Cyanide, Free 14 Days 335.1 mg/L

Residue, Filterable 7 Days 160.1 mg/L

Date/Time
Analysed:

GROUP E Holding Time

Residue, Nonfilterable 7 Days 160.2 mg/L

Phenols 28 Days 420.2 11/18/47 mg/L

Residue, Settleable 48 Hrs 160.5 ml/L

Residue, Volatile 7 Days 160.4 mg/L

Silica 28 Days 370.1 mg/L

Specific Conductance 28 Days 120.1 Umho

Sulfate 28 Days 375.2/300.0 mg/L

Surfactants-MBAS 48 Hrs 425.1 mg/L

Turbidity 48 Hrs 180.1 Units

Langlier Index 28 Days 203

GROUP J Holding Time

Sulfides 7 Days 376.1 mg/L

CHEMIST: BA Ar

APPROVED BY: CHAD B. CUSTODY

Remarks: 70 Solid By Weight: 5.1%

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED:

97/11/5

YY / MM / DD

24 HR

Mail Samples To:

ARMSTRONG LABORATORY

Occupational & Environmental Health Directorate

2402 E. Drive., Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

DATE/TIME RECEIVED:

YY / MM / DD

24 HR

Reason Submitted:
(F3 For Selection)☐IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name:

System Number:

☐ ROUTINE☐

PRIORITY (pre-arrange with analyst)

☐ CHAIN OF CUSTODY
(Litigation Purposes)☐CHAIN OF CUSTODY
(Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE
°C

pH

units

COLLECTION METHOD

☐ GRAB☐ COMPOSITEHOW WAS THE SAMPLE PRESERVED? ☐ Group A-C, E: Sulfuric Acid
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE
NUMBER:

GL970643

Armstrong Lab PID:

(AL Use Only)

DEGREES CELCIUS

Date/Time
Analysed:

GROUP A Holding Time

COD

28 Days

410.4

mg/L

Organic Carbon

28 Days

415.1

mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease

28 Days

413

mg/L

TPH

28 Days

418.1

mg/L

Date/Time
Analysed:

GROUP C Holding Time

Ammonia 11/18

28 Days

350.1

21

mg/L

Kjeldahl Nitrogen

28 Days

351.2

28

mg/L

Nitrate + Nitrite 11/18

28 Days

353.2/300.0

50.1

mg/L

Nitrate

48 Hrs

353.2/300.0

mg/L

Nitrite

48 Hrs

353.2/300.0

mg/L

Orthophosphate

28 Days

365.1/300.0

mg/L

Phosphorus, Total

28 Days

365.1/300.0

mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total

14 Days

335.3

mg/L

Cyanide, Free

14 Days

335.1

mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols

28 Days

420.2

11/18/97

mg/L

Remarks:

70 Solid By Weight = 6.0%

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

CHAIN OF CUSTODY

DATE/TIME COLLECTED: 9/7/11/5
YY / MM / DD 24 HR

Mail Samples To:

ARMSTRONG LABORATORY

Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

DATE/TIME RECEIVED: YY / MM / DD 24 HR

Reason Submitted:
(F3 For Selection)IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?
System Name: System Number:☐ ROUTINE ☐ PRIORITY (pre-arrange with analyst)
☐ CHAIN OF CUSTODY (Litigation Purposes) ☐ CHAIN OF CUSTODY (Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE °C pH units COLLECTION METHOD
☐ GRAB ☐ COMPOSITEHOW WAS THE SAMPLE PRESERVED? ☐ Group A-C-E: Sulfuric Acid
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE
NUMBER:

GL970657

Armstrong Lab PID:
(AL Use Only)

DEGREES CELSIUS

Date/Time
Analysed:

GROUP A Holding Time

COD	28 Days	410.4		mg/L
Organic Carbon	28 Days	415.1		mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease	28 Days	413		mg/L
TPH	28 Days	418.1		mg/L

Date/Time
Analysed:

GROUP C Holding Time

Ammonia	11/18 28 Days	350.1	2.2	mg/L
Kjeldahl Nitrogen	11/25 28 Days	351.2	2.6	mg/L
Nitrate + Nitrite	11/20 28 Days	353.2/300.0	20.1	mg/L
Nitrate	48 Hrs	353.2/300.0		mg/L
Nitrite	48 Hrs	353.2/300.0		mg/L
Orthophosphate	28 Days	365.1/300.0		mg/L
Phosphorus, Total	28 Days	365.1/300.0		mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total	14 Days	335.3		mg/L
Cyanide, Free	14 Days	335.1		mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols	28 Days	420.2	11/18/97	ug/L

Remarks:

70 Solid By Weight: 2.1%

Date/Time
Analysed:

GROUP G Holding Time

Acidity, Total	14 Days	305.1		mg/L
Alkalinity, Total	14 Days	310.2		mg/L
Alkalinity, Bicarbonate	14 Days	310.1		mg/L
Bromide	28 Days	300.0		mg/L
Chloride	28 Days	325.2/300.0		mg/L
Color	48 Hrs	110.2		Unit
Fluoride	28 Days	340.2/300.0		mg/L
Residue, Total	7 Days	160.3		mg/L
Residue, Filterable	7 Days	160.1		mg/L
Residue, Nonfilterable	7 Days	160.2		mg/L
Residue, Settleable	48 Hrs	160.5		ml/L
Residue, Volatile	7 Days	160.4		mg/L
Silica	28 Days	370.1		mg/L
Specific Conductance	28 Days	120.1		Umho
Sulfate	28 Days	375.2/300.0		mg/L
Surfactants-MBAS	48 Hrs	425.1		mg/L
Turbidity	48 Hrs	180.1		Unit
Langlier Index	28 Days	203		

Date/Time
Analysed:

GROUP J Holding Time

Sulfides	7 Days	376.1		mg/L

CHEMIST: *an*APPROVED BY: *an*

CHAIN OF CUSTODY

INORGANIC ANALYSIS REQUEST FORM

AL/OEA
USE
ONLY

DATE/TIME COLLECTED:

97/11/15
YY / MM / DD

24 HR

Mail Samples To:

CHAIN OF CUSTODY
ARMSTRONG LABORATORY
Occupational & Environmental Health Directorate

2402 E. Drive, Bldg 140

Brooks AFB, Texas 78235-5114

DSN: 240-3626 (210) 536-3626

System Number:

Reason Submitted:
(F3 For Selection)☐

IS SAMPLE FOR STATE DRINKING WATER COMPLIANCE UNDER PHASE II to V of the FSDWA?

System Name:

System Number:

- ☐ ROUTINE ☐ PRIORITY (pre-arrange with analyst)
☐ CHAIN OF CUSTODY (Litigation Purposes) ☐ CHAIN OF CUSTODY (Tracking Purposes)

AUTHORIZATION NUMBER:

Sampling Site
Identifier

ON-SITE ANALYTICAL RESULTS

WATER TEMPERATURE °C pH units COLLECTION METHOD
☐ GRAB ☐ COMPOSITEHOW WAS THE SAMPLE PRESERVED? ☐ Group A-C: Sulfuric Acid
☐ Group D: Sodium Hydroxide ☐ Group G: None ☐ Group J: Zinc Acetate

SAMPLE LOCATION:

☐ Source ☐ Pt of Entry ☐ Distribution ☐ Other:

WATER TREATMENT:

☐ Raw ☐ Chlorination ☐ Fluoridation ☐ Other:

MAIL REPORTS TO:

ORIGINAL

COPY 1

COPY 2

(USE ASSIGNED BASE CODE)

BASE SAMPLE
NUMBER:

GL970664

Armstrong Lab PID:
(AL Use Only)Date/Time
Analysed:

GROUP A Holding Time

Date/Time
Analysed:

GROUP G Holding Time

COD 28 Days 410.4 mg/L

Organic Carbon 28 Days 415.1 mg/L

Date/Time
Analysed:

GROUP B Holding Time

Oil & Grease 28 Days 413 mg/L

TPH 28 Days 418.1 mg/L

Date/Time
Analysed:

GROUP C Holding Time

Ammonia 11/18 28 Days 350.1 mg/L

Kjeldahl Nitrogen 28 Days 351.2 mg/L

Nitrate + Nitrite 11/20 28 Days 353.2/300.0 mg/L

Nitrate 48 Hrs 353.2/300.0 mg/L

Nitrite 48 Hrs 353.2/300.0 mg/L

Orthophosphate 28 Days 355.1/300.0 mg/L

Phosphorus, Total 28 Days 355.1/300.0 mg/L

Date/Time
Analysed:

GROUP D Holding Time

Cyanide, Total 14 Days 335.3 mg/L

Cyanide, Free 14 Days 335.1 mg/L

Date/Time
Analysed:

GROUP E Holding Time

Phenols 28 Days 420.2 mg/L

Remarks:

70 SOLID By Weight: 74.6%

Date/Time
Analysed:

GROUP J Holding Time

Sulfides 7 Days 376.1 mg/L

CHEMIST: Bl. A.

APPROVED BY:

CHAIN OF CUSTODY

86

008



2.5 - Clay m 99000

MVT LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885
PHONE 701/258-9720 FAX 701/258-9724

ACC 81

CHAIN OF CUSTODY RECORD Brooks/Minst

PROJECT PO:		PROJECT NAME OR LOCATION: <u>AFB TX 7533S</u>		REPORT TO: <u>Det 1 HSC/GEA</u> <u>2402 E Drive</u> <u>Brooks AFB TX 782</u>		BILL TO: <u>Det 1 HSC/GEA</u> <u>2402 E Drive</u> <u>Brooks AFB TX 782</u>	
MVT LAB #		NAME OF SAMPLER: <u>MSgt Davis A Doherty</u>		ANALYSIS REQUESTED: <u>ANALYSIS 9221E/9220</u> <u>Recal Calibration</u>		CONTENTS OF SAMPLE	
MVT LAB #		SAMPLE DESCRIPTION		SAMPLE DATE		SAMPLE TIME	
M1240	G-970531	Nov 3 97	1015	Sludge Sample	MISSILE SITE	98006169	
M1241	G-970532	"	1020	"	"	98006170	
M1242	G-970533	"	1040	"	"	98006171	
M1243	G-970534	"	1050	"	"	98006172	
M1244	G-970535	"	1100	"	"	98006173	
M1245	G-970536	"	1025	"	"	98006174	
M1246	G-970537	"	1130	"	"	98006175	
M1247	G-970538	"	1020	"	"	98006176	
M1248	G-970539	"	1025	"	"	98006177	

REMARKS ON SITE/COMMENTS ON SAMPLES: All Samples refrigerated to 4°C
Sample time is military time 1300 = 1pm, 1400 = 2pm etc.

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COORDS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Doherty	11/04/97	0805		Rod Keeg	11/04/97	1430

Result must include Date & time of analysis, analyst identification, Laboratory Supervisor name & signature, Lab certification Statement & these chain of custody forms.

MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885
PHONE 701/258-9720 FAX 701/258-9721

7900

CHAIN OF CUSTODY RECORD

PROJECT NO:		PROJECT NAME OR LOCATION: <u>MINT AFB</u>				REPORT TO:		BILL TO:				
MUTL NO: <u>81-0665</u>		NAME OF SAMPLER: <u>MSGT Denis Dahner</u>				ANALYSIS REQUESTED						
MUTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	ACSC	SAMPLE SITE	G	C	PT	PH	COMMENTS
M1249	GL970540	3 Nov 97	1030				Site 2 missile site sludge AT bearing sludge	X			X	mul
M1250	GL970541		1035				"	X			X	"
M1251	GL970542		1040				"	X			X	"
M1252	GL970543		1045				"	X			X	"
M1253	GL970544		1050				"	X			X	"
M1254	GL970545		1255				Site 3 missile site primary fuel	X			X	best/west
M1255	GL970546		1300				"	X			X	"
M1256	GL970547		1320				"	X			X	"
M1257	GL970548		1325				"	X			X	"

REMARKS ON SITE/COMMENTS ON SAMPLES: All Samples Refrigerated to 4°C
Sample time is military time 1300 = 1 PM, 1400 = 2 PM etc

[illegible]

1/6



MVT LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885
PHONE 701/258-9720 FAX 701/258-9724

77000

CHAIN OF CUSTODY RECORD

PROJECT NO:		PROJECT NAME OR LOCATION: <u>Mint AFB</u>				REPORT TO: <u>see page 1</u>		BILL TO:				
MVT LAB #		NAME OF SAMPLER: <u>Msgr Doris A Dehner</u>				ANALYSIS REQUESTED		COMMENTS OF SAMPLE				
	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	MISC	SAMPLE SITE	G	C	PT	PH	COMMENTS
M1288	6L970549	Nov 3 97	1330				Site 3 missile site B1	X				98006187
M1289	6L970550		1310				Site 3 primary panel	X				98006188
M1260	6L970551		1315				"	X				98006189
M1264	6L970552		1255				Site 4 missile site B1	X				98006190
M1262	6L970553		1300				secondary panel	X				98006191
M1263	6L970554		1305				"	X				98006192
M1264	6L970555		1310				"	X				98006193
M1265	6L970556		1315				"	X				98006194
M1266	6L970557		1320				"	X				98006195

REMARKS ON SITE/COMMENTS ON SAMPLES: Refrigerated at 4°C

Time Military time 1400 = 2pm 1300 = 1pm etc.

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (MO/DAY/YR)	EDS	COMMENTS	SAMPLES RECEIVED BY:	DATE (MO/DAY/YR)	TIME
<u>Doris A. Dehner</u>	<u>11/04/97</u>	<u>0805</u>		<u>Red Roof</u>	<u>11/04/97</u>	<u>1430</u>

PL4



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885
PHONE 701/258-9720 FAX 701/258-9724

77060

CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <u>Max AF13</u>		REPORT TO:		BILL TO:		
MVTL LAB #		NAME OF SAMPLER: <u>Mst Doris A Dohner</u>		ANALYSIS REQUESTED		COMMENTS OF SAMPLE		
MVTL WOS: <u>81-0665</u>		SAMPLE SITE		Fecal Coliform		COMMENTS		
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	W ₁₀ SOIL	HSC	G	C	
M1267	GL970558	3 Nov 97	1325		Sludge	X		98006196
M1268	GL970559		1400		Site 4 missile site 4B1	X		98006197
M1269	GL970560		1355		Site 5 missile site 5C1	X		98006198
M1270	GL970561		1420		"	X		98006199
M1271	GL970562		1425		"	X		98006200
M1272	GL970563		1430		"	X		98006201
M1273	GL970564		1410		"	X		98006202
M1274	GL970565		1405		"	X		98006203
M1275	GL970566		1355		Site 6 missile site 6C1	X		98006204

REMARKS ON SITE/COMMENTS ON SAMPLES: Refrigerate 4°C

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Dohner	11/04/97	0805		Rud Roep	11/04/97	1438

Page 4 of 7



MVTL LABORATORIES, INC.
1411 S. 12TH STREET
BISMARCK, ND 58504
800-279-6885
PHONE 701/258-9720 FAX 701/258-9724

CHAIN OF CUSTODY RECORD

PROJECT NO:		PROJECT NAME OF LOCATION: Mvt AFB		REPORT TO:		BILL TO:	
MVTL NO:		NAME OF SAMPLER:		ANALYSIS REQUESTED		COMMENTS OF SAMPLE	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SOIL	WISC	SAMPLE SITE	COMMENTS
M1276	GL970567	Nov 3 97	1400			Site 6 missile site 5 ft	98006205
M1277	GL970568		1405			Secondary pit	98006206
M1278	GL970569		1410				98006207
M1279	GL970570		1415				98006208
M1280	GL970571		1420				98006209
M1281	GL970572		1425				98006210
M1282	GL970573		1535			Site 7 missile site 5 ft	98006211
M1283	GL970574		1530			Secondary pit	98006212
M1284	GL970575		1505				98006213

REMARKS ON SITE/COMMENTS ON SAMPLES: Refrigerated 4°C
military time 1400 = 2pm 1500 = 3pm

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Dohmer	11/04/97	0805		R. A. Reed	11/04/97	1430



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97000

CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OF LOCATION: <u>Minct AFB</u>				REPORT TO:		BILL TO:				
MVT LAB #		NAME OF SAMPLER: <u>Mst Denis Dohner</u>				ANALYSIS REQUESTED		CONENTS OF SAMPLE				
SAMPLE DESCRIPTION		SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	KG	SAMPLE SITE	G	C	PI	PH	CONENTS
M1285	GL970576	Nov 397	1510				Site 7 missile site DI	X				98006214
M1286	GL970577		1515				Sludge primary pond					98006215
M1287	GL970578		1525				"					98006216
M1288	GL970579		1530				"					98006217
M1289	GL970580		1505				Site 8 missile site PI					98006218
M1290	GL970581		1510				Secondary pond					98006219
M1291	GL970582		1515				"					98006220
M1292	GL970583		1540				"					98006221
M1293	GL970584		1535				"					98006222

REMARKS ON SITE/CONENTS ON SAMPLES: Refrigerator 4°C
Military time 1500 = 3pm 1400 = 2pm
*C = Grab Sample *G = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	CONENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Dohner	11/04/97	0805		Rod Reaf	11/04/97	1430

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7025

CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION:		REPORT TO:		BILL TO:	
MWTL NO:		NAME OF SAMPLER:		ANALYSIS REQUESTED		COMMENTS OF SAMPLE	
81-0665		M Sgt Davis Dinner		Fecal Coliform		980062224	
SAMPLE DESCRIPTION		DATE		TIME		DATE	
SAMPLE DATE		TIME		DATE		TIME	
M-1294	6-570585	Nov 397	1520	Site 7 missile site			
M1295	6-570586	1	1525	" "			
Sample for Aug 397							

REMARKS ON SITE/COMMENTS ON SAMPLES: Refrigerated 4°C

Military time 1500 = 3pm

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RECEIVED BY:		DATE		TIME	
SAMPLES RECEIVED BY:		DATE		TIME	
Raul Reed		11/04/97		1420	

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Q.S. Clay md

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CHAIN OF CUSTODY RECORD

PROJECT PO:				PROJECT NAME OR LOCATION: <u>Midway AFB</u>				REPORT TO: <u>DE-11 HSC/OEA</u>				BILL TO: <u>2402 E Drive</u>			
MVTL WOF: <u>81-0609</u>				NAME OF SAMPLER: <u>Ms. Anna A. Johnson</u>				ANALYSIS REQUESTED: <u>fecal coliform</u>				COMMENTS OF SAMPLE			
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	BOIL	HSC	SAMPLE SITE	ANALYSIS REQUESTED	G	C	PT	PH	COMMENTS		
M1305	GL970587	4/1/97	0950				Site 9 missile site 91						98006231		
M1306	GL970588		0955				primary pond						98006232		
M1307	GL970589		1015										98006233		
M1308	GL970590		1020										98006234		
M1309	GL970591		1025										98006235		
M1310	GL970592		1000										98006236		
M1311	GL970593		1005										98006237		
M1312	GL970594		0950				Site 10 missile site 61						98006238		
M1313	GL970595		0955				Secondary Pond						98006239		

REMARKS ON SITE/COMMENTS ON SAMPLES:

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (MO/DAY/YR)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (MO/DAY/YR)	TIME
Donis A Johnson	11/04/97	1700		* Bob Thomas	11/04/97	1705
R. Schief	11/5/97	1700		Phonda Schief	11/5/97	0800
				Fed ex		

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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <i>Minot AFB</i>		REPORT TO: <i>See page 1</i>		BILL TO: <i>See page 1</i>	
MVTL WORK:		NAME OF SAMPLER: <i>MSgt David A. Johnson</i>		ANALYSIS REQUESTED		COMMENTS OF SAMPLE	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	Q ₂	Q ₁	Q ₂	Q ₁
M1314	GL970596	4 Nov 97	1000				
M1315	GL970597		1005				
M1316	GL970598		1015				
M1317	GL970599		1025				
M1318	GL970600		1035				
M1319	GL970601		1050				
M1320	GL970602		1055				
M1321	GL970603		1110				
M1322	GL970604		1115				

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
<i>David A. Johnson</i>	<i>11/04/97</i>	<i>1700</i>		<i>Paul Rogers</i>	<i>11/04/97</i>	<i>1705</i>
<i>R. Scheek</i>	<i>11/15/97</i>	<i>1700</i>		<i>R. Scheek</i>	<i>11/15/97</i>	<i>0800</i>
				<i>Fed Ex</i>	<i>11/15/97</i>	<i>1700</i>

REMARKS ON SITE/COMMENTS ON SAMPLES:

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <i>Minto AFB</i>		REPORT TO: <i>See page 1</i>		BILL TO: <i>See page 1</i>	
MVTL WOB:		NAME OF SAMPLER: <i>M. S. Morris A. Dohner</i>		ANALYSIS REQUESTED: <i>Fecal coliform</i>		CONCENTS OF SAMPLE	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	DATE	TIME	CONCENTS	COMMENTS
M1323	GL970605	4/28/97	1125				98006249
M1324	GL970606		1100				98006250
M1325	GL970607		1105				98006251
M1326	GL970608		1050				98006252
M1327	GL970609		1100				98006253
M1328	GL970610		1105				98006254
M1329	GL970611		1115				98006255
M1330	GL970612		1120				98006256
M1331	GL970613		1125				98006257

REMARKS ON SITE/COMMENTS ON SAMPLES:

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	CONCENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
<i>Doris A. Dohner</i>	<i>11/04/97</i>	<i>1700</i>		<i>R. Scherb</i>	<i>11/04/97</i>	<i>1705</i>
				<i>R. Scherb</i>	<i>11/5/97</i>	<i>0808</i>
<i>R. Scherb</i>	<i>11/5/97</i>	<i>1700</i>		<i>Red 58</i>	<i>11/5/97</i>	<i>1700</i>

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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OF LOCATION: <u>Minut AFB</u>		REPORT TO:		BILL TO:	
MVT LAB #		NAME OF SAMPLER: <u>Mst Doris Dohner</u>		ANALYSIS REQUESTED		COMMENTS OF SAMPLE	
	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	%OIL	MISC	SAMPLE SITE
M1332	GL970614	4 Nov 97	1130				Site 12 missile site FI
M1333	GL970615		1315				Sludge Secondary Pond
M1334	GL970616		1320				Site 13 missile site FI
M1335	GL970617		1335				primary Pond
M1336	GL970618		1340				
M1337	GL970619		1345				
M1338	GL970620		1325				
M1339	GL970621		1330				
M1340	GL970622		1315				Site 14 missile site FI

REMARKS ON SITE/COMMENTS ON SAMPLES:

*0 = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Dohner	11/04/97	1700		Ral Thomas	11/04/97	1705
R. Schaefer	11/5/97	1700		R. Schaefer	11/5/97	0800
				Fed Ex	11/5/97	1700

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CHAIN OF CUSTODY RECORD

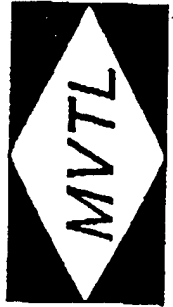
PROJECT PO:		PROJECT NAME OF LOCATION: <i>MINT AFF</i>		REPORT TO: <i>See Page 1</i>		BILL TO: <i>See Page 1</i>				
MVT LAB #		NAME OF SAMPLER: <i>Mst. Davis Dahner</i>		ANALYSIS REQUESTED		COMMENTS OF SAMPLE				
		H ₂ O	MTSC	SAMPLE SITE		G	C	PT	FM	COMMENTS
M1341	G4970623	4 Nov 97	1320	Site 14 missile site	Fecal coliform	X			X	98006267
M1342	G4970624		1325	shaded secondary pond						98006268
M1343	G4970625		1330							98006269
M1344	G4970626		1335							98006270
M1345	G4970627		1340							98006271
M1346	G4970628		1345							98006272
M1347	G4970629		1155	Site 15 missile site						98006273
M1348	G4970630		1200	primary pond						98006274
M1349	G4970631		1220							98006275

REMARKS ON SITE/COMMENTS ON SAMPLES:

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
<i>Davis A. Dahner</i>	<i>11/04/97</i>	<i>1700</i>		<i>R. Dahner</i>	<i>11/04/97</i>	<i>1705</i>
				<i>R. Scheuch</i>	<i>11/5/97</i>	<i>0800</i>
<i>R. Scheuch</i>	<i>11/5/97</i>	<i>1700</i>		<i>Fed Ex</i>	<i>11/5/97</i>	<i>1700</i>

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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <i>Mt. AFB</i>		REPORT TO: <i>See Page 1</i>		BILL TO: <i>See Page 1</i>	
MVTL NO#:		NAME OF SAMPLER: <i>Mgt Davis Dahner</i>		ANALYSIS REQUESTED		CONTENTS OF SAMPLE	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	SOIL	MISC	SAMPLE SITE	CONTENTS
M1350	GL970632	4/10/97	1225			Site 15 Mississippi Rd	98006276
M1351	GL970633		1230				98006277
M1352	GL970634		1205				98006278
M1353	GL970635		1210				98006279
M1354	GL970636		1155			Site 16 Mississippi Rd	98006280
M1355	GL970637		1200			primary parcel Duplicate	98006281
M1356	GL970638		1220				98006282
M1357	GL970639		1225				98006283
M1358	GL970640		1230				98006284

REMARKS ON SITE/COMMENTS ON SAMPLES:

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
<i>Davis A. Dahner</i>	<i>11/04/97</i>	<i>1700</i>		<i>R. Schuch</i>	<i>11/04/97</i>	<i>1705</i>
<i>R. Schuch</i>	<i>11/15/97</i>	<i>1700</i>		<i>R. Schuch</i>	<i>11/15/97</i>	<i>0800</i>
				<i>Phil E. G.</i>	<i>11/15/97</i>	<i>1700</i>

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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <u>Minot AFB</u>				REPORT TO: <u>Det 11 HSC/OEA</u>		BILL TO: <u>Det 11 HSC/OEA</u>	
MVTL WO#:		NAME OF SAMPLER: <u>M Sgt Davis A Dohner</u>				ANALYSIS REQUESTED: <u>Brooks AFB TX 7235</u>		2402 E Drive Brooks AFB TX 77803	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	MISC	SAMPLE SITE	COMMENTS OF SAMPLE	
M1382	GL970643	5 Nov 97	0930				Site 11 Missile Site 1	X	27696
M1383	GL970644		0935				Sledge primary by power		27697
M1384	GL970645		0950						27698
M1385	GL970646		0955						27699
M1386	GL970647		1000						27700
M1387	GL970648		0940						27701
M1388	GL970649		0945						27702
M1389	GL970650		0930				Site 11 Missile Site 1 became 11 by power		* 27703
M1390	GL970651		0940				"		* 27704

REMARKS ON SITE/COMMENTS ON SAMPLES: * Site had lots of cow manure

SAMPLES RELINQUISHED BY:		DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Davis A Dohner		11/05/97	1315		R. Schreck	11/15/97	1:10
R. Schreck		11/16/97	1700		R. Schreck	11/16/97	0800
					Fed SA J	11/16/97	1700
					Amy Dohner	11/17/97	0800



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CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME OR LOCATION: <u>Mind AFB</u>		REPORT TO:		BILL TO:	
MVTL WO#:		NAME OF SAMPLER: <u>M Sgt Doris Dobner</u>		ANALYSIS REQUESTED		COMMENTS OF SAMPLE	
MVTL LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	MISC	SAMPLE SITE
M1391	GL970652	5/10/97	0935				site 15 missile site J
M1392	GL970653		0945				site 15 missile site J
M1393	GL970654		0950				site 15 missile site J
M1394	GL970655		0955				site 15 missile site J
M1395	GL970656		1000				site 15 missile site J
M1396	GL970657		1035				site 15 missile site J
M1397	GL970658		1040				site 15 missile site J
M1398	GL970659		1055				site 15 missile site J
M1399	GL970660		1100				site 15 missile site J

REMARKS ON SITE/COMMENTS ON SAMPLES: * Site contained lots of cow manure

*G = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
<u>Doris A Dobner</u>	<u>11/05/97</u>	<u>1315</u>		<u>R. Schertz</u>	<u>11/16/97</u>	<u>0800</u>
<u>R. Schertz</u>	<u>11/16/97</u>	<u>1706</u>		<u>Fed Ex</u>	<u>11/16/97</u>	<u>1700</u>
				<u>Amy Dore</u>	<u>11/17/97</u>	<u>1030</u>



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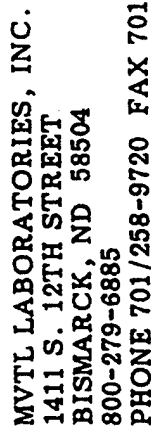
CHAIN OF CUSTODY RECORD

PROJECT PO:		PROJECT NAME or LOCATION: <u>Mint AFB</u>				REPORT TO:		BILL TO:			
MVT LAB #		NAME OF SAMPLER: <u>Mst Doris Dohner</u>				ANALYSIS REQUESTED		COMMENTS OF SAMPLE			
MVT LAB #	SAMPLE DESCRIPTION	SAMPLE DATE	SAMPLE TIME	H ₂ O	SOIL	MCSC	SAMPLE SITE	G	C	PH	COMMENTS
M1400	GL 970661	5 Nov 97	1105				Site 19 missile site J1 primary pond	X		X	27714
M1401	GL 970662		1045								27715
M1402	GL 970663		1050								27716
M1403	GL 970664		1035				Site 20 missile site J1 secondary pond				27717
M1404	GL 970665		1045								27718
M1405	GL 970666		1055								27719
M1406	GL 970667		1050								27720
M1407	GL 970668		1100								27721
M1408	GL 970669		1105								27722

REMARKS ON SITE/COMMENTS ON SAMPLES:

*C = Grab Sample *C = Composite Sample *P = Preserved Sample *Y = Yes *N = No

SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Dohner	11/05/97	1315		R. Scheetz	11/6/97	0800
R. Scheetz	11/6/97	1700		Fed Ex	11/6/97	1700
				Doris Dohner	11/7/97	1030



CHAIN OF CUSTODY RECORD

[illegible]

REMARKS ON SITE/COMMENTS ON SAMPLES:

'G = Grab Sample	*C = Composite Sample	*P = Preserved Sample	*Y = Yes	*N = No		
SAMPLES RELINQUISHED BY:	DATE (mo/day/yr)	TIME	COMMENTS	SAMPLES RECEIVED BY:	DATE (mo/day/yr)	TIME
Doris A. Johnson. R. Schuck	11/05/97	1315		R. Schuck	11/6/97	0800
	11/16/97	1700		Fed Ex	11/16/97	1100
				Amy Dorel	11/17/97	1030

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Appendix C

Calculating CFU/gram Total Solids

Converting CFU/100 ml to CFU/L

$$\frac{(\text{CFU}/100 \text{ ml})(1000 \text{ ml/L})}{\text{CFU/L}}$$

Converting % solids to mg/L Total Solids (TS)

$$\frac{(\%/100)(\text{mg/L TS})}{\text{mg/L TS}}$$

Calculating CFU/mg TS

$$\frac{(\text{CFU/L}) / (\text{mg/L TS})}{(10 \text{ CFU/L})(\text{L/mg TS})}$$
$$\frac{[(\text{CFU})(\text{mg TS})](0.1)}{\text{CFU/mg TS}}$$

Converting CFU/ mg TS to CFU/g TS

$$\frac{(\text{CFU/mg})(0.001 \text{ mg/g TS})}{\text{CFU/g TS}}$$

Converting from CFU/100ml to CFU/L					
Missile Site A1 Primary Sample Numbers GL970531-GL970537					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10000	100000		% TS	mg/L TS	
30000	300000		1.7	0.017	
50000	500000				
10000	100000				
15000	150000				
4000	40000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)			Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
1.7	<1.7	0.0017	<0.0017		
1700		1.7			
5100		5.1			
8500		8.5			
1700		1.7			
2550		2.55			
680		0.68			

Converting from CFU/100ml to CFU/L					
Missile Site A1 Secondary Sample Numbers GL970538-GL970544					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10	100	<100	% TS	mg/L TS	
1000	10000		54.4	0.544	
10	100	<100			
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)			Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
5440		5.44			
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		
54.4	<54.4	0.0544	<0.0544		

Converting from CFU/100ml to CFU/L Missile Site B1 Primary Sample Numbers GL970545-GL970551 Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS) Formula = (%TS/100)*(mg/L)		
6000	60000		% TS	mg/L TS	
10000	100000		0.7	0.007	
11000	110000				
18000	180000				
6000	60000				
7000	70000				
7000	70000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
420		0.42			
700		0.7			
770		0.77			
1260		1.26			
420		0.42			
490		0.49			
490		0.49			
Converting from CFU/100ml to CFU/L Missile Site B1 Secondary Sample Numbers GL970552-GL970558 Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (%TS/100)*(mg/L)		
10	100	<100	% TS	mg/L TS	
10	100	<100	80.8	0.808	
10	100	<100			
10	100	<100			
10	100	<100			
40000	400000				
10	100	<100			
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
80.8	<80.8	0.0808	<0.0808		
323200		323.2			
80.8	<80.8	0.0808	<0.0808		

Converting from CFU/100ml to CFU/L Missile Site C1 Primary Sample Numbers GL970559-GL970565 Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS) Formula = (%TS/100)*(mg/L)		
3000	30000		% TS	mg/L TS	
4000	40000				
1600000	16000000		2.6	0.026	
300000	3000000				
1000	10000				
1000	10000				
1000	10000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
780		0.78			
1040		1.04			
416000		416			
78000		78			
260		0.26			
260		0.26			
260		0.26			
Converting from CFU/100ml to CFU/L Missile Site C1 Secondary Sample Numbers GL970566-GL970572 Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS) Formula = (%TS/100)*(mg/L)		
10	100	<100	% TS	mg/L TS	
10	100	<100			
10	100	<100	66.8	0.668	
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		
66.8	<66.8	0.0668	<0.0668		

Converting from CFU/100ml to CFU/L					
Missile Site D1 Primary Sample Numbers GL970573-GL970579					
Formula for Calculation (CFU/100 ml)*(1000mL/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
1000	10000		Formula = (%TS/100)*(mg/L)		
5000	50000				
1100	11000		% TS	mg/L TS	
15000	150000		8.9	0.089	
13000	130000				
1000	10000				
3000	30000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
890		0.89			
4450		4.45			
979		0.979			
13350		13.35			
11570		11.57			
890		0.89			
2670		2.67			
Converting from CFU/100ml to CFU/L					
Missile Site D1 Secondary Sample Numbers GL970580-GL970586					
Formula for Calculation (CFU/100 ml)*(1000mL/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10	100	<100			
80000	800000		% TS	mg/L TS	
10	100	<100	51.2	0.512	
10	100	<100			
10	100	<100			
30000	300000				
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)		Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
51.2	<51.2	0.0512	<0.0512		
51.2	<51.2	0.0512	<0.0512		
409600		409.6			
51.2	<51.2	0.0512	<0.0512		
51.2	<51.2	0.0512	<0.0512		
51.2	<51.2	0.0512	<0.0512		
153600		153.6			

Converting from CFU/100ml to CFU/L				
Missile Site E1 Primary Sample Numbers GL970587-GL970593				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to	
5000	50000		mg/L Total Solids (TS)	
6000	60000		ormula = (%TS/100)*(mg/	
1000000	10000000		% TS	mg/L TS
47000	470000		0.4	0.004
10000	100000			
10000	100000			
12000	120000			
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
200		0.2		
240		0.24		
40000		40		
1880		1.88		
400		0.4		
400		0.4		
480		0.48		
Converting from CFU/100ml to CFU/L				
Missile Site E1 Secondary Sample Numbers GL970594-GL97060				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to	
10	100	<100	mg/L Total Solids (TS)	
10	100	<100	ormula = (%TS/100)*(mg/	
10	100	<100	% TS	mg/L TS
10	100	<100	65.9	0.659
10	100	<100		
10	100	<100		
10	100	<100		
10	100	<100		
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	
65.9	<65.9	0.0659	<0.0659	

Converting from CFU/100ml to CFU/L					
Missile Site F1 Primary Sample Numbers GL970601-GL970607					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
16000	160000		Formula = (%TS/100)*(mg/L)		
17000	170000				
36000	360000		% TS	mg/L TS	
100000	1000000		2.9	0.029	
34000	340000				
11000	110000				
13000	130000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
4640		4.64			
4930		4.93			
10440		10.44			
29000		29			
9860		9.86			
3190		3.19			
3770		3.77			
Converting from CFU/100ml to CFU/L					
Missile Site F1 Secondary Sample Numbers GL970608-GL970614					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10	100	<100			
10	100	<100	% TS	mg/L TS	
10	100	<100	48.7	0.487	
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		
48.7	<48.7	0.0487	<0.0487		

Converting from CFU/100ml to CFU/L					
Missile Site G1 Primary Sample Numbers GL970615-GL970621					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
1000	10000		Formula = (%TS/100)*(mg/L)		
1000	10000				
230000	2300000		% TS	mg/L TS	
68000	680000		0.9	0.009	
16000	160000				
3000	30000				
7000	70000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
90		0.09			
90		0.09			
20700		20.7			
6120		6.12			
1440		1.44			
270		0.27			
630		0.63			
Converting from CFU/100ml to CFU/L					
Missile Site G1 Secondary Sample Numbers GL970622-GL970628					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10	100	<100			
10	100	<100	% TS	mg/L TS	
10	100	<100	83.2	0.832	
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		
83.2	<83.2	0.0832	<0.0832		

Converting from CFU/100ml to CFU/L					
Missile Site H1 Primary Sample Numbers GL970629-GL970635					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
4000	40000		Formula = (%TS/100)*(mg/L)		
2000	20000		% TS	mg/L TS	
1000	10000		10.2	0.102	
2000	20000				
3000	30000				
3000	30000				
3000	30000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
4080		4.08			
2040		2.04			
1020		1.02			
2040		2.04			
3060		3.06			
3060		3.06			
3060		3.06			

Converting from CFU/100ml to CFU/L					
Missile Site H1 Duplicate Sample Numbers GL970636-GL970642					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
2000	20000		Formula = (%TS/100)*(mg/L)		
3000	30000		% TS	mg/L TS	
2000	20000		5.1	0.051	
4000	40000				
1000	10000				
6000	60000				
3000	30000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
1020		1.02			
1530		1.53			
1020		1.02			
2040		2.04			
510		0.51			
3060		3.06			
1530		1.53			

Converting from CFU/100ml to CFU/L				
Missile Site I1 Primary Sample Numbers GL970643-GL970649				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)	
12000	120000		Formula = (%TS/100)*(mg/L)	
23000	230000			
100000	1000000		% TS	mg/L TS
20000	200000		6	0.06
10000	100000			
10000	100000			
20000	200000			
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
7200		7.2		
13800		13.8		
60000		60		
12000		12		
6000		6		
6000		6		
12000		12		

Converting from CFU/100ml to CFU/L				
Missile Site I1 Secondary Sample Numbers GL970650-GL970656				
Formula for Calculation (CFU/100 ml)*(1000ml/L)				
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)	
10	100	<100	Formula = (%TS/100)*(mg/L)	
10	100	<100		
10	100	<100	% TS	mg/L TS
10	100	<100	82	0.82
10	100	<100		
10	100	<100		
10	100	<100		
Calculating CFU/mg TS		Calculating CFU/g TS		
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	
82	<82	0.082	<0.082	

Converting from CFU/100ml to CFU/L					
Missile Site J1 Primary Sample Numbers GL970657-GL970663					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L		Converting % Solids to mg/L Total Solids (TS)		
3000	30000		Formula = (%TS/100)*(mg/L)		
3000	30000				
23000	230000		% TS	mg/L TS	
130000	1300000		2.1	0.021	
50000	500000				
1000	10000				
3000	30000				
Calculating CFU/mg TS		Calculating CFU/g TS			
Formula=(CFU/L)/(mg/L)		Formula = (CFU/mg)*(0.001mg/g)			
CFU/ mg TS	CFU/ mg TS	CFU/g TS			
630		0.63			
630		0.63			
4830		4.83			
27300		27.3			
10500		10.5			
210		0.21			
630		0.63			

Converting from CFU/100ml to CFU/L					
Missile Site J1 Secondary Sample Numbers GL970664-GL970670					
Formula for Calculation (CFU/100 ml)*(1000ml/L)					
CFU/100 ml	CFU/L	CFU/L	Converting % Solids to mg/L Total Solids (TS)		
10	100	<100	Formula = (%TS/100)*(mg/L)		
10	100	<100			
10	100	<100	% TS	mg/L TS	
10	100	<100	74.6	0.746	
10	100	<100			
10	100	<100			
10	100	<100			
Calculating CFU/mg TS Formula=(CFU/L)/(mg/L)			Calculating CFU/g TS Formula = (CFU/mg)*(0.001mg/g)		
CFU/ mg TS	CFU/ mg TS	CFU/g TS	CFU/g TS		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		
74.6	<74.6	0.0746	<0.0746		

Appendix D

Minot Air Force Base, North Dakota

Table D-1 Missile Site K1 and L1

Missile Site Sewage Lagoon Sludge Sampling Survey: 3 to 7 November 1997

Date Collected:		November 6, 1997		
		Missile Site K1	Missile Site L1	
Analysis Method	Analytes (ug/G)	Sludge piles	Sludge Spread	Remaining Sludge
SW 3050/6010B	Arsenic	4.5	3.3	3.62
SW 3050/6010B	Cadmium	1.31	1.1	1.02
SW 3050/6010B	Chromium	9.7	8.6	8.5
SW 3050/6010B	Copper	22	9.3	9.3
SW 3050/6010B	Lead	8.6	6.8	6.4
SW 3050/6010B	Molybdenum	<0.60	<0.60	<0.60
SW 3050/6010B	Nickel	21.7	14.1	15.3
SW 3050/6010B	Selenium	<2.0	<2.0	<2.0
SW 3050/6010B	Zinc	65.1	41	33.6
SW 7471A	Mercury	0.036	<0.048	<0.049
	Solids (%)	85.08	89.42	91.52
STD MTD 2540G	Solids (%)	85.08	89.42	91.52
EPA 350.1	Ammonia (mg/G)	0.0074	<.004	<.004
EPA 351.2	Kjeldahl Nitrogen (mg/G)	0.03	0.02	0.02
EPA 353.2	Nitrate/Nitrate Total (mg/G)	0.019	0.017	0.0238
	Base Sample #	GL970671	GL970672	GL970673
	OEHL Sample #	98004495	98004496	98004497

Appendix E

Survey Field Notes

The influent is in the center of each primary pond. There is no direct effluent between the primary and secondary pond. When the primary pond needs to be drained CES Utilities pumps the water from the primary pond to the secondary pond.

Missile site B1 primary pond had a fuel odor, no sheen was noted.

Missile site F1 high alkali containing substance was applied to the area around the bank of the primary sewage lagoon at this site, a white ring on the bank of this pond was present during this survey.

Missile site H1 this site does not have secondary sewage lagoon.

Missile site I1 there was what appeared to be large amounts of cow manure in the secondary pond. Cow manure could increase the fecal coliform in the coliform sample.

Missile site J1 primary pond is located next to a surface lake or body of water. If sludge is land applied at this site there could be a potential to contaminate the lake with the run off from the sounding land.

Missile site K1 contractors were working on the secondary sewage lagoon. Sludge from the sewage lagoon was contained in approximately 90 to 100 piles of sludge, 4 ft high by 4 ft wide.

Missile site L1 Mr. Lambrecht requested additional sludge samples be collected from this site also. Contractors already moved sludge from the sewage lagoons. SSgt Hammes, 5 CES/COEIU does the routine maintenance on water utilities at the MAF and was a member of our sampling team. He indicated a few weeks ago that there were at least two large sludge piles at this site. SSgt Hammes noted upon arriving that the large piles of sludge no longer existed at this site. MSgt Fields, MSgt Dohner and SSgt Hammes surveyed the site and the land adjacent land. We found a small pile approximately four feet tall by four feet wide by the secondary sewage lagoon and areas by both the primary and secondary ponds with dirt that had the same color as the pile of sludge. The pile of dirt looked like it had recently been spread. One sample from the remaining sludge pile and a sample from the area that looked like freshly spread dirt/sludge were collected at this site.

Except for missile site H1, all other sites had a primary and secondary sewage lagoon. Except for site D1 all other secondary sewage lagoon were dry. During this survey the secondary lagoon at missile site D1 was marshy.

Appendix F

REFERENCES

1. Biosolids Management Handbook; United States Environmental Protection Agency; Undated
2. Sludge Management Technical Report Sludge Compliance Evaluation and Requirements Identification Minot Air Force Base, North Dakota; Contract No. F44650-94-D0006; Ecology and Engineering; July 1997
3. Environmental Reporter Final Regulations; The Bureau of National Affairs, Inc.; 1997
4. 40 Code of Federal Regulations 503; United States Environmental Protection Agency; 1997