WIDSETH SMITH NOLTING

2014 ANNUAL GROUNDWATER MONITORING REPORT

FOR

CAMP RIPLEY CLOSED MIXED MUNICIPAL LANDFILL
Little Falls, Minnesota

Prepared for:

Mr. Mark Erickson
Minnesota Department of Military Affairs
Minnesota Army National Guard Facilities Management Office
Little Falls, MN 56345

January 22, 2015

WSN No. 0283B0009.014

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January 22, 2015

Mr. Neal Wilson, P.G.
MPCA
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

RE: Camp Ripley Closed Mixed Municipal Landfill
2014 Annual Groundwater Monitoring Report
WSN No. 0283B0009.014

Dear Mr. Wilson:

This report has been prepared in accordance with Minnesota Rule 7035.2585, item H and Minnesota Rule part 7035.2815, subpart 14, item Q. Item Q requires to report to identify recent and long term trends in water elevations and concentrations of monitored constituents. The report should also evaluate the effect the Camp Ripley Closed Mixed Municipal Landfill (landfill) is having on groundwater and surface water quality, and any recommendations for changes to the system.

The closed landfill occupies approximately 11 acres and is located within the Camp Ripley Training Facility. More specifically, the landfill is located in the Northeast ¼ of the Northwest ¼ of Section 5, Township 130 North, Range 29 West, Green Prairie Township, Morrison County, Minnesota. The location of the closed landfill is shown on the attached Figure 1.

The Minnesota Pollution Control Agency (MPCA) issued a Letter of Closure to the Camp Ripley Closed Mixed Municipal Landfill on January 29, 1988. Since closure, the landfill's groundwater monitoring network has been sampled and monitored as required. In 2009, the MPCA requested the installation of two new monitoring wells, one along the east border of the landfill and the other on the southeast border. Consequently, monitoring wells MMLF-7 and MMLF-8 were install during the fall of 2009. This report summarizes the sampling events and results for 2014.

The site is located within the central glacial drift region of Minnesota. The topography of the surrounding area consists of rolling hills and lowlands generally ranging in elevation from 1,140 ft above mean sea level (MSL) to 1,275 ft MSL. Original ground elevation across the landfill varies from approximately 1,160 ft MSL to 1,155 ft MSL from west to east.

In December 2006, J.J. Quinn of the Environmental Science Division of the Argonne National Laboratory published a paper titled Delineation of a Wellhead Protection Zone and Determination of Flow Paths from Potential Groundwater Contaminant Source Areas at Camp Ripley, Little Falls, Minnesota. The following glacial geological summary for the region is an excerpt from this paper:

> "The geology and topography of the Camp Ripley property and its vicinity are the result of a complex glacial depositional history involving three ice lobes that deposited drifts of various characters and colors. These lobes were thought to have been concurrently active in central Minnesota; however, a detailed geologic characterization of the site by UMD (2002) suggests new, previously unrecognized possibilities for the juxtapositioning of the ice lobes and for the

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> nature of the St. Croix moraine at Camp Ripley. The lobes appear to have been present in the Camp Ripley vicinity concurrently, depositing well-sorted sands into an ice-bounded lacustrine basin. Occasional ice advances deposited discontinuous till units in the basin at various elevations."

On site geological information has been collected during the installation of the various landfill monitoring wells. Well installation field logs indicate the soil profile consists primarily of fine sand. Previous reports document bedrock varies from 20 feet below ground surface (BGS) to over 100 feet BGS in the area of the closed landfill. Monitoring wells on the west side of the landfill were installed up to 53 feet BGS and did not encounter bedrock; however, monitoring well installations on the east side of the landfill encountered bedrock as shallow as 28 feet BGS.

The site is located within the Mississippi River watershed. Area waterways include the Mississippi River located approximately 2,000 feet east of the landfill, the Crow Wing River located approximately 13 miles north of the landfill, and the Little Elk River located approximately four miles southwest of the landfill. Green Prairie Fish Lake lies approximately three miles southwest of the landfill.

The groundwater table beneath the landfill is approximately 30 feet BGS. A regional groundwater model reported by Quinn (2006) describes the regional groundwater flow direction as southeast. Historically, groundwater elevation measurements from the landfill monitoring wells and the related flow maps document the local groundwater flow direction is also to the southeast.

Included in this report are the analytical results of the 2014 fall quarter sampling events for the closed landfill's groundwater-monitoring network. The groundwater monitoring network consists of monitoring wells MW-3(MMLF-3), MW-7(MMLF-7), and MW-8(MMLF-8). The well locations are displayed on the groundwater contour map included as Figure 2. The fall sampling event was conducted on November 12, 2014, by Widseth Smith Nolting's (WSN) environmental technician, Mike Bogart.

In 2014, the analytical schedule required samples from the three wells to be analyzed for the Minnesota Department of Health method 468 volatile organic compounds (VOCs), dissolved metals, and general chemistry parameters. A complete list of the VOCs and the inorganics (metals and general chemistry parameters) is included in Table 1. The analytical results for the 2014 fall sampling event are summarized in Table 2 through Table 7. The tables include analytical data back to the October 2009 sampling event. Copies of the 2014 analytical reports are included in Appendix A.

The inorganic results for the up gradient sample from monitoring well MW-3, are summarized in Table 2. The table shows the concentrations detected in 2014 are similar to what was identified the last time a sample from MW-3 was required to be analyzed for inorganics, which was in 2012. The results indicate the only analyte exceeding an intervention limit (IL) was manganese. The metal was detected at a concentration of 80.8 micrograms per liter (ug/L). The IL for manganese has been established by the MPCA at 25 ug/L. No other metals exceeded their respective IL. As indicated in the tables, not all of the metals tested for have an IL.

The inorganic results for samples collected from the two down gradient monitoring wells, MW-7 and MW-8, are listed in Table 3 and Table 4, respectively. When comparing the 2014 results to previous results some of the analytes are higher and some are lower. There is not an identifiable trend for any one analyte. Only one dissolved metal exceeded the established IL in the two down gradient samples. Manganese was detected in the sample from monitoring well MW-7 at a concentration of 593 ug/L. Manganese was not detected above the IL in MW-8.

The VOC results for the three monitoring well samples are included in Tables 5, 6, and 7. The three tables indicate no VOCs were identified above the laboratory's reporting limits.

Depths to water measurements from the three monitoring wells were recorded prior to sample collection. The fall groundwater elevations are listed in Table 8 and the associated groundwater flow map is attached as Figure 2. The elevations in Table 8 indicate a water table elevation increase of approximately two feet when compared to the fall of 2013. As shown, the groundwater flow direction is consistent with the historical flow direction, which is to the southeast.

Well stabilization parameters were measured and recorded prior to sample collection. A HydroLab Data Sonde 4A water quality multi-probe and a flow through cell were used to measure the stabilization parameters. The well stabilization forms are attached as Appendix B.

In 2015, the analysis schedule specifies samples from the groundwater monitoring network at the closed landfill be analyzed only for method 465 F VOCs. Because there are no identifiable trends for the inorganic or the organic analytes, and considering past analytical results, the owner requests groundwater sampling be discontinued at the closed landfill.

For the past two years, only one dissolved metal exceeded its established IL in a down gradient monitoring well. Manganese was detected in a sample from MW-7 at a concentration of 593 ug/L. Furthermore, since 2009, only one VOC has exceeded its respective IL. Vinyl chloride was found in the 2009 sample collected from MW-7. The analyte was detected at a concentration of 0.59 ug/L. Since the date of the exceedance, vinyl chloride has not been identified in either down gradient well above the IL of 0.5 ug/L.

Please let me know if there is any other information that you might need. My direct telephone number is 218.316.3623 or you can send an email to Greg.Smith@wsn.us.com.

Sincerely,

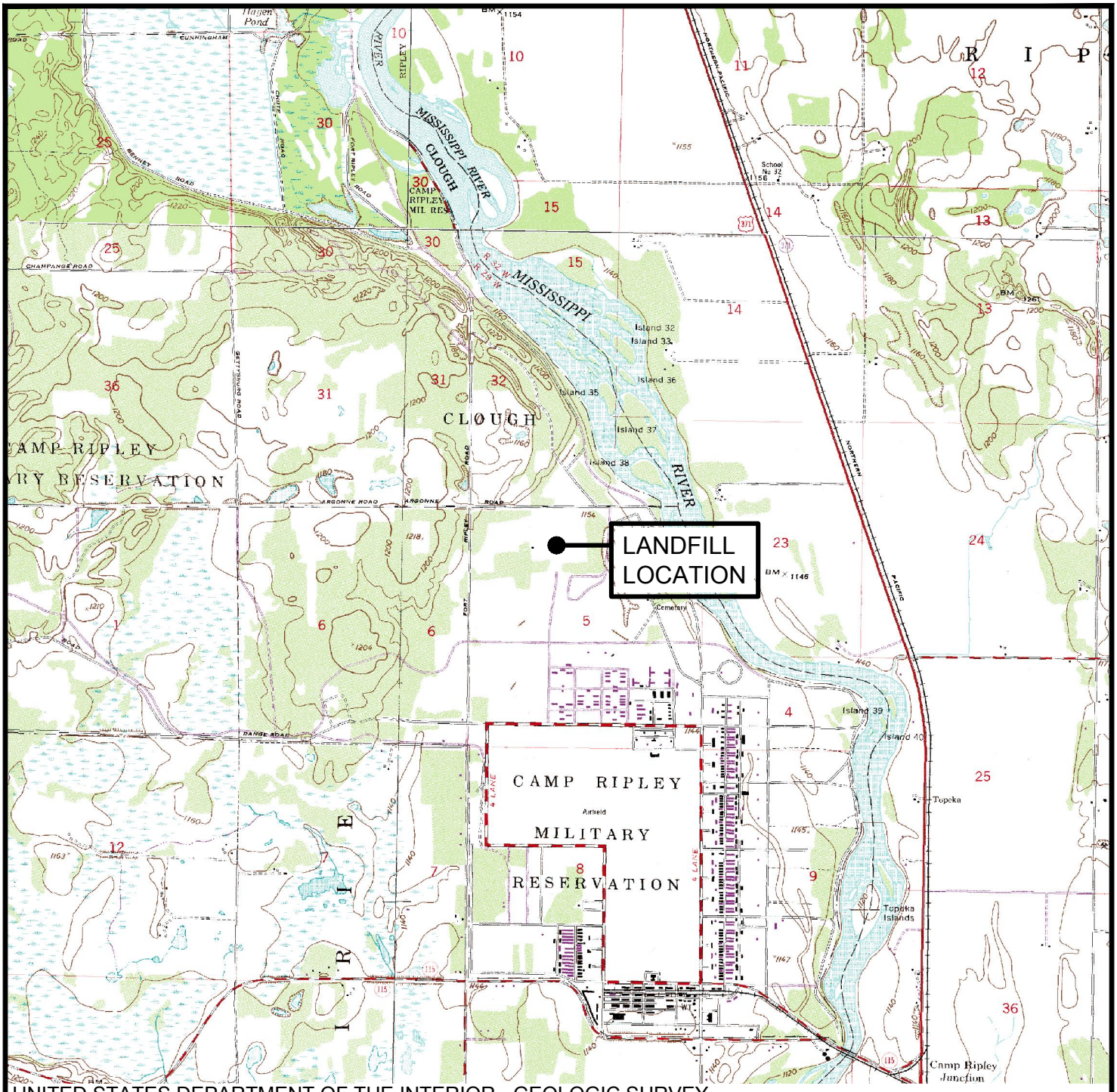
WIDSETH SMITH NOLTING

Gregory W. Smith

Gregory W. Smith, P.G.

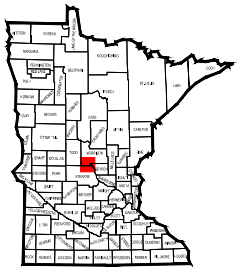
Cc: Mr. Mark Erickson, Facilities Management Office, Minnesota Army National Guard

FIGURES



UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGIC SURVEY

AREA LOCATION



NORTH

0 1000m 2000m

SCALE (IN METERS)

U.S.G.S. QUADRANGLE MAPS:
BELLE PRAIRIE, BELL PRAIRIE NW, FORT RIPLEY, RANDALL EAST
PUBLISHED: 1956, 1956, 1956, 1956
PHOTOREVISED: 1979, 1979, NA, 1979

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CLOSED MMSW LANDFILL - 2014 G.W. MONITORING
CAMP RIPLEY MILITARY RESERVATION
LITTLE FALLS, MN

SITE LOCATION MAP

DATE: JANUARY 2015

JOB No. 0283B0009.014

FIGURE 01

LEGEND

MMLF — DENOTES MONITORING WELL

1126.00 — DENOTES GROUNDWATER SURFACE MAJOR CONTOUR LINE

1125.50 — DENOTES GROUNDWATER SURFACE MINOR CONTOUR LINE

(1125.05) — DENOTES GROUNDWATER ELEVATION AT LOCATION

DENOTES GROUNDWATER FLOW DIRECTION

DENOTES GRAVEL ROAD SURFACE

EDGE OF IN-PLACE FILL

(1137.61) MMLF-3

(1127.37) MMLF-7

(1127.37) MMLF-8

1156 1158 1160 1160 1158 1156 1154 1152

1137.00 1136.50 1136.00 1135.50 1135.00 1134.50 1134.00 1133.50 1133.00 1132.50 1132.00 1131.50 1131.00 1130.50 1130.00 1129.50 1129.00 1128.50 1128.00 1127.50

0 50m 100m

SCALE (IN METERS)

REFERENCE NOTE:

HORIZONTAL COORDINATES ARE SHOWN IN GRID METERS BASED ON UTM COORDINATES, ZONE 15 NORTH, NAD83 DATUM. VERTICAL CONTOURS AND ELEVATIONS ARE SHOWN IN FEET BASED ON NAVD.

BASE CONTROL POINT COORDINATES AND ELEVATIONS PROVIDED BY MN DEPT. OF MILITARY AFFAIRS.

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NORTH

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CAMP RIPLEY MILITARY RESERVATION
LITTLE FALLS, MN

GROUNDWATER ELEVATIONS ON 11-12-14

DATE: JANUARY 2015

JOB No. 0283B0009.014

FIGURE 02

TABLES

Table 1

Parameters for Analysis

Inorganics
Alkalinity, total as calcium carbonate
Ammonia Nitrogen
Arsenic, dissolved
Barium, dissolved
Boron, dissolved
Cadmium, dissolved
Chloride
Chromium, total dissolved
Copper, dissolved
Iron, dissolved
Lead, dissolved
Manganese, dissolved
Mercury, dissolved
Nitrate+Nitrite as Nitrogen
Sodium, dissolved
Sulfate
Suspended Solids, total
Appearance (field and lab)
Dissolved Oxygen (field)
pH (field and lab)
Specific Conductance (field and lab)
Temperature (field and lab)
Turbidity (field)
Static Water Elevation

468 List
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1,2-Trichlorotrifluoroethane
1,1-Dichloroethane
1,1-Dichloroethylene (Vinylidene chloride)
1,2-Dichloropropane
trans-1,2-Dichloroethylene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Bromomethane; (Ethylene dibromide); EDB
1,2-Dichlorobenzene (orth)
1,2-Dichloroethane
1,2-Dichloroethylene (cis)
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene (meta-)
1,3-Dichloropropane
1,3-Dichloropropane (cis + trans)
1,4-Dichlorobenzene (para)
2,2-Dichloropropane
2-Chlorotoluene (ortho-)
4-Chlorotoluene (para-)
Acetone
Allyl chloride; (3-Chloropropene)
Benzene
Bromobenzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dichlorobromomethane)
Bromoform
Bromomethane (Methyl chloride)
Carbon tetrachloride
Chlorobenzene (monochlorobenzene)
Chlorodibromomethane; (Dibromochloromethane)
Chloroethane
Chloroform
Chloromethane; (Methyl chloride)
Cumene; (Isopropylbenzene)
Dibromochloropropane; (DBCP)
Dibromomethane; Methylene bromide)

Dichlorodifluoromethane
Dichlorofluoromethane
Dichloromethane (methylene chloride)
Ethyl benzene
Ethyl ether
Hexachlorobutadiene
Methyl ethyl ketone (MEK)
Methyl isobutyl ketone; (4-Methyl-2-pentanone)
Methyl tertiary-butyl ether (MTBE)
Naphthalene
n-Butyl benzene
n-Propyl benzene
p-Isopropyltoluene
sec-Butyl benzene
Styrene
tert-Butyl benzene
Tetrachloroethylene; (Perchloroethylene)
Tetrahydrofuran
Toluene
Trichloroethylene; (TCE)
Trichlorofluoromethane
Vinyl Chloride
Xylenes (mixture of o, m, p)

Table 2

Summary of Inorganic Groundwater Quality - MMLF-3
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-3* 10/26/2009	MMLF-3* 11/11/2009	MMLF-3* 12/10/2009	MMLF-3* 11/8/2010	MMLF-3* 11/1/2012	MMLF-3 10/25/2013	MMLF-3 11/12/2014
Alkalinity	mg/L	NL	NA	NA	NA	120	128	NA	330
Ammonia Nitrogen	mg/L	NL	NA	NA	NA	<0.01	<0.1	NA	<0.10
Arsenic (dissolved)	ug/L	2.5	NA	NA	NA	<1.6	<2.5	NA	<2.0
Barium (dissolved)	mg/L	0.5	NA	NA	NA	0.027	0.0343	NA	0.0303
Boron (disolved)	ug/L	250	NA	0.23	0.39	0.17	0.26	NA	<100
Cadmium (dissolved)	ug/L	1.0	NA	NA	NA	18	<1	NA	<0.80
Calcium (dissolved)	mg/L	NL	NA	NA	NA	39	46.1	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	1.6	NA	NA
Chloride	mg/L	NL	NA	NA	NA	2	19.8	NA	2.1
Chromium	ug/L	25.0	NA	NA	NA	<5	<5	NA	<5.0
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA
Chromium, Hexavalent	ug/L	NL	NA	NA	NA	<4	<10	NA	NA
Conductance (Field)	umhos/cm	NL	NA	NA	NA	239	266.5	260	224
Conductance (Lab)	umhos/cm	NL	NA	NA	NA	260	360	NA	276
Copper (dissolved)	ug/L	250	NA	NA	NA	<10	<5	NA	<5.0
Dissolved Oxygen (Field)	mg/L	NL	NA	NA	NA	NA	3.39	0.68	3.37
Eh (Lab)	mV	NL	NA	NA	NA	150	159	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	532	61	243
Iron (dissolved)	mg/L	NL	NA	NA	NA	0.048	<0.05	NA	<50.0
Lead (dissolved)	ug/L	1.25	NA	NA	NA	<0.4	<2.5	NA	<2.0
Magnesium (dissolved)	mg/L	NL	NA	NA	NA	11	12.6	NA	NA
Manganese (dissolved)	mg/L	0.025	NA	NA	NA	0.098	0.0825	NA	0.0808
Mercury (dissolved)	ug/L	0.5	NA	NA	NA	<0.1	<0.20	NA	<0.20
Nitrate/Nitrite as N	mg/L	2.5	NA	NA	NA	NA	NA	NA	0.12
Nitrate as N	mg/L	NL	NA	NA	NA	<0.05	0.15	NA	NA
Nitrite as N	mg/L	NL	NA	NA	NA	<0.05	<0.1	NA	NA
pH (Field)	Standard Units	NL	NA	NA	NA	7.91	8.17	9.2	7.82
pH (Lab)	Standard Units	NL	NA	NA	NA	8	7.7	NA	8.0
Potassium (dissolved)	mg/L	NL	NA	NA	NA	1	1	NA	NA
Sodium (dissolved)	mg/L	NL	NA	NA	NA	3.4	NA	NA	3.2
Sulfate	mg/L	NL	NA	NA	NA	13	15.9	NA	15.3
Temp (Field)	oC	NL	NA	NA	NA	9.3	8.95	9.62	8.6
Total Dissolved Solids (TDS)	mg/L	NL	NA	NA	NA	160	195	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	NA	NA	NA	30	404	NA	9.2
Turbidity	NTU	NL	NA	NA	NA	24	38	83	29.4
Zinc (dissolved)	ug/L	500	NA	NA	NA	<5	<10	NA	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 3

Summary of Inorganic Groundwater Quality - MMLF-7
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-7* 10/26/2009	MMLF-7* 11/11/2009	MMLF-7* 12/10/2009	MMLF-7* 11/8/2010	MMLF-7* 11/1/2012	MMLF-7 10/25/2013	MMLF-7 11/12/2014
Alkalinity	mg/L	NL	360	280	330	340	416	NA	121
Ammonia Nitrogen	mg/L	NL	0.83	0.52	0.33	0.42	1.1	NA	0.19
Arsenic (dissolved)	ug/L	2.5	<1	<1	<1	<1.6	<2.5	NA	<2.0
Barium (dissolved)	mg/L	0.5	72	<40	64	NA	NA	NA	0.335
Boron (disolved)	ug/L	250	0.23	0.39	0.17	0.26	0.44	NA	<100
Cadmium (dissolved)	ug/L	1.0	<0.2	<0.2	<0.2	<2	<1	NA	<0.80
Calcium (dissolved)	mg/L	NL	120	86	100	98	128	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	1.3	NA	NA
Chloride	mg/L	NL	19	19	20	24	21	NA	3.4
Chromium	ug/L	25.0	<5	4	<5	<5	<5	NA	<5.0
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA
Chromium, Hexavalent	ug/L	NL	<3	<3	<3	<4	<10	NA	NA
Conductance (Field)	umhos/cm	NL	624	490	574	599	802	850	630
Conductance (Lab)	umhos/cm	NL	750	580	690	690	900	NA	656
Copper (dissolved)	ug/L	250	<10	<10	<10	<10	<5	NA	<5.0
Dissolved Oxygen (Field)	mg/L	NL	140	130	130	140	0.88	3.72	4.35
Eh (Lab)	mV	NL	NA	NA	NA	NA	165	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	584	144	257
Iron (dissolved)	mg/L	NL	0.02	<0.01	0.04	0.038	0.051	NA	<0.050
Lead (dissolved)	ug/L	1.25	<0.4	<0.4	<0.4	<0.4	<2.5	NA	<2.0
Magnesium (dissolved)	mg/L	NL	28	23	24	25	28.7	NA	NA
Manganese (dissolved)	mg/L	0.025	3.4	2.6	2.2	2.3	2.24	NA	0.593
Mercury (dissolved)	ug/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.20	NA	<0.20
Nitrate/Nitrite as N	mg/L	2.5	NA	0.64	NA	NA	NA	NA	1.5
Nitrate as N	mg/L	NL	0.76	NA	0.43	0.38	<0.1	NA	NA
Nitrite as N	mg/L	NL	<0.05	NA	<0.05	<0.05	<0.1	NA	NA
pH (Field)	Standard Units	NL	6.83	6.83	6.9	7.07	7.19	8.16	7.14
pH (Lab)	Standard Units	NL	7.2	7.1	7.2	7.1	7	NA	7.4
Potassium (dissolved)	mg/L	NL	2.1	1.6	1.8	2.2	2.9	NA	NA
Sodium (dissolved)	mg/L	NL	16	11	15	13	NA	NA	4.5
Sulfate	mg/L	NL	12	7.8	9.6	9.7	6.3	NA	5.2
Temp (Field)	oC	NL	8.3	8.7	7.1	10.6	9.27	8.28	9.5
Total Dissolved Solids (TDS)	mg/L	NL	440	340	400	400	501	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	6	8	2	16	4	NA	3.2
Turbidity	NTU	NL	8.2	4	2	2	0.8	40.1	12.5
Zinc (dissolved)	ug/L	500	8	<5	<5	8	<10	NA	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 4

Summary of Inorganic Groundwater Quality - MMLF-8
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-8* 10/26/2009	MMLF-8* 11/11/2009	MMLF-8* 12/10/2009	MMLF-8* 11/8/2010	MMLF-8* 11/1/2012	MMLF-8 10/25/2013	MMLF-8 11/12/2014
Alkalinity	mg/L	NL	160	150	170	170	163	NA	337
Ammonia Nitrogen	mg/L	NL	<0.01	<0.01	<0.01	<0.01	<0.1	NA	<0.10
Arsenic (dissolved)	ug/L	2.5	<1	<1	<1	<1.6	<2.5	NA	<2.0
Barium (dissolved)	mg/L	0.5	0.072	<0.04	0.064	NA	NA	NA	0.0339
Boron (disolved)	ug/L	250	0.044	0.035	0.029	0.023	0.03	NA	<100
Cadmium (dissolved)	ug/L	1.0	<0.2	<0.2	<0.2	<2	<1	NA	<0.80
Calcium (dissolved)	mg/L	NL	54	53	49	52	55.3	NA	NA
Cation/Anion Balance	%	NL	NA	NA	NA	NA	0.58	NA	NA
Chloride	mg/L	NL	13	21	17	17	20.6	NA	14.4
Chromium	ug/L	25.0	<5	5.2	<5	<5	<5	NA	<5.0
Chromium, Trivalent	ug/L	NL	NA	NA	NA	NA	<10	NA	NA
Chromium, Hexavalent	ug/L	NL	<3	<3	<3	<4	<10	NA	NA
Conductance (Field)	umhos/cm	NL	308	326	316	339	384	310	407
Conductance (Lab)	umhos/cm	NL	350	370	380	370	410	NA	420
Copper (dissolved)	ug/L	250	<10	<10	<10	<10	<5	NA	<5.0
Dissolved Oxygen (Field)	mg/L	NL	NA	NA	NA	NA	8.75	NA	9.31
Eh (Lab)	mV	NL	150	140	190	140	154	NA	NA
Eh (Field)	mV	NL	NA	NA	NA	NA	514	155	307
Iron (dissolved)	mg/L	NL	<0.01	<0.01	<0.01	<0.01	<0.05	NA	<0.050
Lead (dissolved)	ug/L	1.25	<0.4	<0.4	<0.4	<0.4	<2.5	NA	<2.0
Magnesium (dissolved)	mg/L	NL	13	14	12	13	14.2	NA	NA
Manganese (dissolved)	mg/L	0.025	0.081	0.03	0.006	<0.005	<0.01	NA	<0.010
Mercury (dissolved)	ug/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.20	NA	<0.20
Nitrate/Nitrite as N	mg/L	2.5	NA	1.1	NA	NA	NA	NA	0.55
Nitrate as N	mg/L	NL	0.65	NA	0.73	0.67	0.48	NA	NA
Nitrite as N	mg/L	NL	<0.05	NA	<0.05	<0.05	<0.1	NA	NA
pH (Field)	Standard Units	NL	7.51	7.05	7.08	7.84	8.44	9.09	7.63
pH (Lab)	Standard Units	NL	7.9	7.8	7.9	7.8	7.7	NA	8
Potassium (dissolved)	mg/L	NL	0.6	0.8	0.4	0.75	0.64	NA	NA
Sodium (dissolved)	mg/L	NL	2.6	3.1	2.5	2.8	NA	NA	2.8
Sulfate	mg/L	NL	7.4	7.6	7.4	7.4	6.9	NA	5.3
Temp (Field)	oC	NL	8.3	8.7	7.1	10.6	7.97	8.34	8
Total Dissolved Solids (TDS)	mg/L	NL	200	200	220	390	235	NA	NA
Total Suspended Solids (TSS)	mg/L	NL	4	4	8	6	5.5	NA	6.4
Turbidity	NTU	NL	6.8	2.7	10	3.8	1.4	46.7	14.9
Zinc (dissolved)	ug/L	500	<5	<5	<5	<5	10.1	NA	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 5

Summary of Organic Groundwater Quality Data - MMLF-3
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-3* 10/26/2009	MMLF-3* 11/11/2009	MMLF-3* 12/10/2009	MMLF-3* 11/8/2010	MMLF-3* 11/1/2012	MMLF-3 10/25/2013	MMLF-3 11/12/2014
Acetone	ug/L	175	NA	NA	NA	<4	<25.0	<20.0	<20.0
Allylchloride	ug/L	7.5	NA	NA	NA	<0.16	<4.0	<4.0	<4.0
Benzene	ug/L	2.5	NA	NA	NA	<0.2	<1.0	<1.0	<1.0
Bromobenzene	ug/L	NL	NA	NA	NA	<0.12	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	NA	NA	NA	<0.12	<1.0	<1.0	<1.0
Bromoform	ug/L	10	NA	NA	NA	<0.13	<4.0	<4.0	<4.0
Bromomethane	ug/L	3	NA	NA	NA	<0.16	<4.0	<4.0	<4.0
Methyl Ethyl Ketone (MEK)	ug/L	1000	NA	NA	NA	<1.0	<4.0	<5.0	<5.0
n-Butylbenzene	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	NA	NA	NA	<0.16	<1.0	<1.0	<1.0
Carbontetrachloride	ug/L	0.75	NA	NA	NA	<0.28	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	25	NA	NA	NA	<0.20	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	NA	NA	NA	<0.24	<1.0	<4.0	<1.0
Chloroform	ug/L	15	NA	NA	NA	<0.20	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	NA	NA	NA	<0.20	<4.0	<4.0	<4.0
2-Chlorotoluene	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0
Dibromochloropropane	ug/L	NL	NA	NA	NA	<0.23	<4.0	<4.0	<4.0
Dibromochloromethane	ug/L	13	NA	NA	NA	<0.13	<1.0	<1.0	<1.0
1,2-Dibromoethane (EDB)	ug/L	0.001	NA	NA	NA	<0.11	<1.0	<1.0	<1.0
Dibromomethane	ug/L	--	NA	NA	NA	<0.10	<4.0	<4.0	<4.0
1,2-Dichlorobenzene	ug/L	150	NA	NA	NA	<0.096	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	150	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	NA	NA	NA	<0.084	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	NA	NA	NA	<0.23	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	17.5	NA	NA	NA	<0.20	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
1,1-Dichloroethylene	ug/L	1.5	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	ug/L	17.5	NA	NA	NA	<0.10	<1.0	<1.0	<1.0
trans-1,2-Dichloroethylene	ug/L	1.5	NA	NA	NA	<0.23	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	1.25	NA	NA	NA	<0.19	<4.0	<4.0	<4.0
1,3-Dichloropropane	ug/L	NL	NA	NA	NA	<0.14	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	NA	NA	NA	<0.36	<4.0	<4.0	<4.0
1,1-Dichloropropene	ug/L	NL	NA	NA	NA	<0.21	<1.0	<1.0	<1.0

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 5 (con't)

Summary of Organic Groundwater Quality Data - MMLF-3
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-3* 10/26/2009	MMLF-3* 11/11/2009	MMLF-3* 12/10/2009	MMLF-3* 11/8/2010	MMLF-3* 11/1/2012	MMLF-3 10/25/2013	MMLF-3 11/12/2014
cis-1,3-Dichloropopene	ug/L	0.5	NA	NA	NA	<0.21	<4.0	<4.0	<4.0
trans-1,3-Dichloropropene	ug/L	0.5	NA	NA	NA	<0.16	<4.0	<4.0	<4.0
Diethyl Ether (Ethyl Ether)	ug/L	250	NA	NA	NA	<0.14	<4.0	<4.0	<4.0
Ethyl Benzene	ug/L	175	NA	NA	NA	<0.15	<1.0	<1.0	<1.0
Hexachloro-1,3-butadiene	ug/L	NL	NA	NA	NA	<0.20	<5.0	<1.0	<1.0
Isopropylbenzene (Cumene)	ug/L	NL	NA	NA	NA	<0.20	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
Methylene Chloride	ug/L	0.25	NA	NA	NA	<0.20	<4.0	<4.0	<4.0
4-Methyl-2-Pentanone(MIBK)	ug/L	75	NA	NA	NA	<0.18	<4.0	<5.0	<5.0
Methyl-tert-butyl-ether	ug/L	NL	NA	NA	NA	<0.13	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	NA	NA	NA	<0.20	<4.0	<4.0	<4.0
n-Propylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
Styrene	ug/L	25	NA	NA	NA	<0.15	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	NA	NA	NA	<0.13	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	NA	NA	NA	<0.10	<1.0	<1.0	<1.0
Tetrachloroethylene	ug/L	7	NA	NA	NA	<0.29	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	NA	NA	NA	<1.0	<10.0	<10.0	<10.0
Toluene	ug/L	250	NA	NA	NA	<0.20	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	NA	NA	NA	<0.12	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	10	NA	NA	NA	<0.15	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	NA	NA	NA	<0.11	<1.0	<1.0	<1.0
Trichloroethylene	ug/L	NL	NA	NA	NA	<0.19	<1.0	<0.40	<0.40
Trichlorofluoromethane	ug/L	500	NA	NA	NA	<0.19	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	NA	NA	NA	<0.17	<4.0	<4.0	<4.0
1,1,2-Trichlorotrifluoroethane	ug/L	50	NA	NA	NA	<0.27	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	NA	NA	NA	<0.18	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	NA	NA	NA	<0.17	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.5	NA	NA	NA	<0.20	<0.40	<0.40	<0.40
m,p&o-Xylene (Xylene Total)	ug/L	75	NA	NA	NA	<0.32	<3.0	<3.0	<3.0
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 6

Summary of Organic Groundwater Quality Data - MMLF-7
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-7* 10/26/2009	MMLF-7* 11/11/2009	MMLF-7* 12/10/2009	MMLF-7* 11/8/2010	MMLF-7* 11/1/2012	MMLF-7 10/25/2013	MMLF-7 11/12/2014
Acetone	ug/L	175	<4	<4	<4	<4	<25.0	<20.0	<20.0
Allylchloride	ug/L	7.5	<0.042	<0.042	<0.042	<0.16	<4.0	<4.0	<4.0
Benzene	ug/L	2.5	0.36	0.43	0.47	0.33	<1.0	<1.0	<1.0
Bromobenzene	ug/L	NL	<0.17	<0.17	<0.17	<0.12	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	<0.082	<0.082	<0.082	<0.18	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	<0.086	<0.086	<0.086	<0.12	<1.0	<1.0	<1.0
Bromoform	ug/L	10	<0.16	<0.16	<0.16	<0.13	<4.0	<4.0	<4.0
Bromomethane	ug/L	3	<0.060	<0.060	<0.060	<0.16	<4.0	<4.0	<4.0
Methyl Ethyl Ketone (MEK)	ug/L	1000	<1.0	<1.0	<1.0	<1.0	<4.0	<5.0	<5.0
n-Butylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.18	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	NL	<0.087	<0.087	<0.087	<0.17	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	<0.15	<0.15	<0.15	<0.16	<1.0	<1.0	<1.0
Carbontetrachloride	ug/L	0.75	<0.074	<0.074	<0.074	<0.28	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	25	0.58	<0.14	0.56	0.63	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	<0.089	<0.089	<0.089	<0.24	<1.0	<4.0	<1.0
Chloroform	ug/L	15	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	<0.068	<0.068	<0.068	<0.20	<4.0	<4.0	<4.0
2-Chlorotoluene	ug/L	NL	<0.080	<0.080	<0.080	<0.13	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	<0.11	<0.11	<0.11	<0.13	<1.0	<1.0	<1.0
Dibromochloropropane	ug/L	NL	<0.12	<0.12	<0.12	<0.23	<4.0	<4.0	<4.0
Dibromochloromethane	ug/L	13	<0.12	<0.12	<0.12	<0.13	<1.0	<1.0	<1.0
1,2-Dibromoethane (EDB)	ug/L	0.001	<0.12	<0.12	<0.12	<0.11	<1.0	<1.0	<1.0
Dibromomethane	ug/L	--	<0.15	<0.15	<0.15	<0.10	<4.0	<4.0	<4.0
1,2-Dichlorobenzene	ug/L	150	<0.10	<0.10	<0.10	<0.096	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	150	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	0.61	<0.10	0.53	0.54	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	2	0.56	2.6	2	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	17.5	0.12	0.2	0.19	<0.20	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0
1,1-Dichloroethylene	ug/L	1.5	<0.12	<0.12	<0.12	<0.17	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	ug/L	17.5	6.1	7	8.1	7.2	6.2	8.7	<1.0
trans-1,2-Dichloroethylene	ug/L	1.5	<0.053	0.068	<0.053	<0.23	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	1.3	1.4	2.1	1.1	2.5	2.0	<1.0
1,2-Dichloropropane	ug/L	1.25	<0.055	<0.055	<0.055	<0.19	<4.0	<4.0	<4.0
p1,3-Dichloropropane	ug/L	NL	<0.091	<0.091	<0.091	<0.14	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	<0.063	<0.063	<0.063	<0.36	<4.0	<4.0	<4.0
1,1-Dichloropropene	ug/L	NL	<0.081	<0.081	<0.081	<0.081	<1.0	<1.0	<1.0

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 6 (con't)

Summary of Organic Groundwater Quality Data - MMLF-7
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-7* 10/26/2009	MMLF-7* 11/11/2009	MMLF-7* 12/10/2009	MMLF-7* 11/8/2010	MMLF-7* 11/1/2012	MMLF-7 10/25/2013	MMLF-7 11/12/2014
cis-1,3-Dichloropopene	ug/L	0.5	<0.089	<0.089	<0.089	<0.21	<4.0	<4.0	<4.0
trans-1,3-Dichloropropene	ug/L	0.5	<0.098	<0.098	<0.098	<0.16	<4.0	<4.0	<4.0
Diethyl Ether (Ethyl Ether)	ug/L	250	12	15	17	18	14.7	14.8	<4.0
Ethyl Benzene	ug/L	175	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0
Hexachloro-1,3-butadiene	ug/L	NL	<0.12	<0.12	<0.12	<0.20	<5.0	<1.0	<1.0
Isopropylbenzene (Cumene)	ug/L	NL	<0.096	<0.096	<0.096	<0.20	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	<0.055	<0.055	<0.055	<0.17	<1.0	<1.0	<1.0
Methylene Chloride	ug/L	0.25	<0.20	<0.20	<0.20	<0.20	<4.0	<4.0	<4.0
4-Methyl-2-Pentanone(MIBK)	ug/L	75	<0.13	<0.13	<0.13	<0.18	<4.0	<5.0	<5.0
Methyl tertbutylether	ug/L	NL	0.11	0.12	0.15	<0.13	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	<0.13	<0.13	<0.13	<0.20	<4.0	<4.0	<4.0
n-Propylbenzene	ug/L	NL	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0
Styrene	ug/L	25	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	<0.099	<0.099	<0.099	<0.13	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.094	<0.094	<0.094	<0.10	<1.0	<1.0	<1.0
Tetrachloroethylene	ug/L	7	<0.12	<0.12	<0.12	<0.29	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	<1.0	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0
Toluene	ug/L	250	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	<0.12	<0.12	<0.12	<0.12	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	10	<0.073	<0.073	<0.073	<0.15	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	<0.076	<0.076	<0.076	<0.17	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	<0.11	<0.11	<0.11	<0.11	<1.0	<1.0	<1.0
Trichloroethylene	ug/L	NL	<0.16	<0.16	<0.16	<0.19	<1.0	<0.40	<0.40
Trichlorofluoromethane	ug/L	500	<0.095	<0.095	<0.095	<0.19	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	<0.092	<0.092	<0.092	<0.17	<4.0	<4.0	<4.0
1,1,2-Trichlorotrifluoroethane	ug/L	50	<0.074	<0.074	<0.074	<0.27	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	<0.042	<0.042	<0.042	<0.18	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.5	0.18	0.27	0.59	<0.20	<0.40	<0.40	<0.40
m,p&o-Xylene (Xylene Total)	ug/L	75	<0.20	<0.20	<0.20	<0.32	<3.0	<3.0	<3.0
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 7

Summary of Organic Groundwater Quality Data - MMLF-8
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-8* 10/26/2009	MMLF-8* 11/11/2009	MMLF-8* 12/10/2009	MMLF-8* 11/8/2010	MMLF-8* 11/1/2012	MMLF-8 10/25/2013	MMLF-8 11/12/2014
Acetone	ug/L	175	<4	<4	<4	<4	<25.0	<20.0	<20.0
Allylchloride	ug/L	7.5	<0.042	<0.042	<0.042	<0.16	<4.0	<4.0	<4.0
Benzene	ug/L	2.5	<0.069	<0.069	<0.069	<0.2	<1.0	<1.0	<1.0
Bromobenzene	ug/L	NL	<0.17	<0.17	<0.17	<0.12	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	NL	<0.082	<0.082	<0.082	<0.18	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	2	<0.086	<0.086	<0.086	<0.12	<1.0	<1.0	<1.0
Bromoform	ug/L	10	<0.16	<0.16	<0.16	<0.13	<4.0	<4.0	<4.0
Bromomethane	ug/L	3	<0.060	<0.060	<0.060	<0.16	<4.0	<4.0	<4.0
Methyl Ethyl Ketone (MEK)	ug/L	1000	<1.0	<1.0	<1.0	<1.0	<4.0	<5.0	<5.0
n-Butylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.18	<1.0	<1.0	<1.0
sec-Butylbenzene	ug/L	NL	<0.087	<0.087	<0.087	<0.17	<1.0	<1.0	<1.0
tert-Butylbenzene	ug/L	NL	<0.15	<0.15	<0.15	<0.16	<1.0	<1.0	<1.0
Carbontetrachloride	ug/L	0.75	<0.074	<0.074	<0.074	<0.28	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	25	<0.14	<0.14	<0.14	<0.20	<1.0	<1.0	<1.0
Chloroethane	ug/L	NL	<0.089	<0.089	<0.089	<0.24	<1.0	<4.0	<1.0
Chloroform	ug/L	15	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0
Chloromethane	ug/L	NL	<0.068	<0.068	<0.068	<0.20	<4.0	<4.0	<4.0
2-Chlorotoluene	ug/L	NL	<0.080	<0.080	<0.080	<0.13	<1.0	<1.0	<1.0
4-Chlorotoluene	ug/L	NL	<0.11	<0.11	<0.11	<0.13	<1.0	<1.0	<1.0
Dibromochloropropane	ug/L	NL	<0.12	<0.12	<0.12	<0.23	<4.0	<4.0	<4.0
Dibromochloromethane	ug/L	13	<0.12	<0.12	<0.12	<0.13	<1.0	<1.0	<1.0
1,2-Dibromoethane (EDB)	ug/L	0.001	<0.12	<0.12	<0.12	<0.11	<1.0	<1.0	<1.0
Dibromomethane	ug/L	--	<0.15	<0.15	<0.15	<0.10	<4.0	<4.0	<4.0
1,2-Dichlorobenzene	ug/L	150	<0.10	<0.10	<0.10	<0.096	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	150	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	2.5	<0.10	<0.10	<0.10	<0.084	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	250	<0.084	<0.084	<0.084	<0.23	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	17.5	<0.077	<0.077	<0.077	<0.20	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	1	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0
1,1-Dichloroethylene	ug/L	1.5	<0.12	<0.12	<0.12	<0.17	<1.0	<1.0	<1.0
cis-1,2-Dichloroethylene	ug/L	17.5	<0.081	<0.081	<0.081	<0.10	<1.0	<1.0	<1.0
trans-1,2-Dichloroethylene	ug/L	1.5	<0.053	<0.053	<0.053	<0.23	<1.0	<1.0	<1.0
Dichlorofluoromethane	ug/L	NL	<0.097	<0.097	<0.097	<0.17	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	1.25	<0.055	<0.055	<0.055	<0.19	<4.0	<4.0	<4.0
p1,3-Dichloropropane	ug/L	NL	<0.091	<0.091	<0.091	<0.14	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	NL	<0.063	<0.063	<0.063	<0.36	<4.0	<4.0	<4.0
1,1-Dichloropropene	ug/L	NL	<0.081	<0.081	<0.081	<0.081	<1.0	<1.0	<1.0

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit
mg/L = milligrams per liter = parts per million
ug/L = micrograms per liter = parts per billion
NL = Not listed

Table 7 (con't)

Summary of Organic Groundwater Quality Data - MMLF-8
Camp Ripley Closed Mixed Municpal Landfill
State of Minnesota Department of Military Affairs

Parameter	Units	IL	MMLF-8* 10/26/2009	MMLF-8* 11/11/2009	MMLF-8* 12/10/2009	MMLF-8* 11/8/2010	MMLF-8* 11/1/2012	MMLF-8 10/25/2013	MMLF-8 11/12/2014
cis-1,3-Dichloropopene	ug/L	0.5	<0.089	<0.089	<0.089	<0.21	<4.0	<4.0	<4.0
trans-1,3-Dichloropropene	ug/L	0.5	<0.098	<0.098	<0.098	<0.16	<4.0	<4.0	<4.0
Diethyl Ether (Ethyl Ether)	ug/L	250	<0.041	<0.041	<0.041	<0.14	<4.0	<4.0	<4.0
Ethyl Benzene	ug/L	175	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0
Hexachloro-1,3-butadiene	ug/L	NL	<0.12	<0.12	<0.12	<0.20	<5.0	<1.0	<1.0
Isopropylbenzene (Cumene)	ug/L	NL	<0.096	<0.096	<0.096	<0.20	<1.0	<1.0	<1.0
p-Isopropyltoluene	ug/L	NL	<0.055	<0.055	<0.055	<0.17	<1.0	<1.0	<1.0
Methylene Chloride	ug/L	0.25	<0.20	<0.20	<0.20	<0.20	<4.0	<4.0	<4.0
4-Methyl-2-Pentanone(MIBK)	ug/L	75	<0.13	<0.13	<0.13	<0.18	<4.0	<5.0	<5.0
Methyl tertbutylether	ug/L	NL	<0.044	<0.044	<0.044	<0.13	<1.0	<1.0	<1.0
Naphthalene	ug/L	75	<0.13	<0.13	<0.13	<0.20	<4.0	<4.0	<4.0
n-Propylbenzene	ug/L	NL	<0.13	<0.13	<0.13	<0.17	<1.0	<1.0	<1.0
Styrene	ug/L	25	<0.079	<0.079	<0.079	<0.15	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	17.5	<0.099	<0.099	<0.099	<0.13	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.094	<0.094	<0.094	<0.10	<1.0	<1.0	<1.0
Tetrachloroethylene	ug/L	7	<0.12	<0.12	<0.12	<0.29	<1.0	<1.0	<1.0
Tetrahydrofuran	ug/L	25	<1.0	<1.0	<1.0	<1.0	<10.0	<10.0	<10.0
Toluene	ug/L	250	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/L	NL	<0.12	<0.12	<0.12	<0.12	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	10	<0.073	<0.073	<0.073	<0.15	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	150	<0.076	<0.076	<0.076	<0.17	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	0.75	<0.11	<0.11	<0.11	<0.11	<1.0	<1.0	<1.0
Trichloroethylene	ug/L	NL	<0.16	<0.16	<0.16	<0.19	<1.0	<0.40	<0.40
Trichlorofluoromethane	ug/L	500	<0.095	<0.095	<0.095	<0.19	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	10	<0.092	<0.092	<0.092	<0.17	<4.0	<4.0	<4.0
1,1,2-Trichlorotrifluoroethane	ug/L	50	<0.074	<0.074	<0.074	<0.27	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/L	NL	<0.042	<0.042	<0.042	<0.18	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/L	NL	<0.10	<0.10	<0.10	<0.17	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	0.5	<0.10	<0.10	<0.10	<0.20	<0.40	<0.40	<0.40
m,p&o-Xylene (Xylene Total)	ug/L	75	<0.20	<0.20	<0.20	<0.32	<3.0	<3.0	<3.0
m&p-Xylene	ug/L	NL	NA	NA	NA	NA	<2.0	<2.0	NA
o-Xylene	ug/L	NL	NA	NA	NA	NA	<1.0	<1.0	NA

NA = Not Analyzed
*Data obtained from previous reports
IL = Intervention Limit

mg/L = milligrams per liter = parts per million

ug/L = micrograms per liter = parts per billion

NL = Not listed

Table 8

Groundwater Elevations
Camp Ripley Closed Mixed Municipal Landfill
State of Minnesota Department of Military Affairs

	MMLF-3	MMLF-7	MMLF-8
Unique Well Number	250125	774333	773250
Top of Casing Elevation (ft MSL)*	1158.24	1153.51	1156.39
Well Depth (ft)	47	37	40

Date of Data Collection	MMLF-3	MMLF-7	MMLF-8
1982-2007*	1127.96-1136-65	NA	NA
11/1/2012	1133.08 ft.	1122.9 ft.	1122.86 ft.
10/25/2013	1135.06 ft.	1125.07 ft.	1125.88 ft.
11/12/2014	1137.61 ft.	1127.37 ft.	1127.63 ft.

*Data from Camp Ripley

NA = Not Available

APPENDIX A

ANALYTICAL REPORTS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

December 03, 2014

Greg Smith
Widseth, Smith & Nolting
7804 Industrial Park Road
PO Box 2720
Baxter, MN 56425

RE: Project: Camp Ripley MMLF
Pace Project No.: 1241152

Dear Greg Smith:
Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Melisa M Woods
melisa.woods@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

CERTIFICATIONS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792
Alaska Certification #: UST-078
Alaska Certification #MN01084
Arizona Department of Health Certification #AZ0785
Minnesota Dept of Health Certification #: 027-137-445
North Dakota Certification: # R-203
Wisconsin DNR Certification # : 998027470
WA Department of Ecology Lab ID# C1007

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE SUMMARY

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1241152001	**MW-3**	Water	11/12/14 12:55	11/13/14 18:52
1241152002	**MW-7**	Water	11/12/14 14:05	11/13/14 18:52
1241152003	**MW-8**	Water	11/12/14 15:05	11/13/14 18:52
1241152004	**FLD DUP**	Water	11/12/14 00:00	11/13/14 18:52
1241152005	**Trip Blank**	Water	11/12/14 00:00	11/13/14 18:52

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE ANALYTE COUNT

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1241152001	**MW-3**	EPA 200.7	MAR	7	PASI-V
		EPA 200.8	KAH	3	PASI-V
		EPA 245.1	KAH	1	PASI-V
		EPA 8260	AJC	70	PASI-M
		SM 2320B	BEM	1	PASI-V
		SM 2510B	JK1	1	PASI-V
		SM 4500-H+B	JK1	1	PASI-V
		USGS I-3765	JK1	1	PASI-V
		EPA 300.0	DMB	2	PASI-V
		EPA 350.1	JJH	1	PASI-V
		EPA 353.2	JJH	1	PASI-V
1241152002	**MW-7**	EPA 200.7	MAR	7	PASI-V
		EPA 200.8	KAH	3	PASI-V
		EPA 245.1	KAH	1	PASI-V
		EPA 8260	AJC	70	PASI-M
		SM 2320B	BEM	1	PASI-V
		SM 2510B	JK1	1	PASI-V
		SM 4500-H+B	JK1	1	PASI-V
		USGS I-3765	JK1	1	PASI-V
		EPA 300.0	DMB	2	PASI-V
		EPA 350.1	JJH	1	PASI-V
		EPA 353.2	JJH	1	PASI-V
1241152003	**MW-8**	EPA 200.7	MAR	7	PASI-V
		EPA 200.8	KAH	3	PASI-V
		EPA 245.1	KAH	1	PASI-V
		EPA 8260	AJC	70	PASI-M
		SM 2320B	BEM	1	PASI-V
		SM 2510B	JK1	1	PASI-V
		SM 4500-H+B	JK1	1	PASI-V
		USGS I-3765	JK1	1	PASI-V
		EPA 300.0	DMB	2	PASI-V
		EPA 350.1	JJH	1	PASI-V
		EPA 353.2	JJH	1	PASI-V
1241152004	**FLD DUP**	EPA 200.7	MAR	7	PASI-V
		EPA 200.8	KAH	3	PASI-V
		EPA 245.1	KAH	1	PASI-V
		EPA 8260	AJC	70	PASI-M

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

SAMPLE ANALYTE COUNT

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	BEM	1	PASI-V
		SM 2510B	JK1	1	PASI-V
		SM 4500-H+B	JK1	1	PASI-V
		USGS I-3765	JK1	1	PASI-V
		EPA 300.0	DMB	2	PASI-V
		EPA 350.1	JJH	1	PASI-V
		EPA 353.2	JJH	1	PASI-V
1241152005	**Trip Blank**	EPA 8260	AJC	70	PASI-M

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-3 **Lab ID: 1241152001** Collected: 11/12/14 12:55 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	**30.3**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:13	7440-39-3	
Boron, Dissolved	ND	ug/L	100	1	11/18/14 10:16	11/19/14 11:13	7440-42-8	
Chromium, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:13	7440-47-3	
Copper, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:13	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	11/18/14 10:16	11/19/14 11:13	7439-89-6	
Manganese, Dissolved	**80.8**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:13	7439-96-5	
Sodium, Dissolved	**3.2**	mg/L	0.50	1	11/18/14 10:16	11/19/14 11:13	7440-23-5	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 18:52	7440-38-2	
Cadmium, Dissolved	ND	ug/L	0.80	4	11/18/14 10:16	11/18/14 18:52	7440-43-9	
Lead, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 18:52	7439-92-1	
245.1 Mercury, Dissolved	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury, Dissolved	ND	ug/L	0.20	1	11/17/14 11:36	11/18/14 13:43	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		11/23/14 11:44	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/23/14 11:44	107-05-1	
Benzene	ND	ug/L	1.0	1		11/23/14 11:44	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/23/14 11:44	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/23/14 11:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/23/14 11:44	75-27-4	
Bromoform	ND	ug/L	4.0	1		11/23/14 11:44	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/23/14 11:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/23/14 11:44	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/23/14 11:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/23/14 11:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/23/14 11:44	67-66-3	
Chloromethane	ND	ug/L	4.0	1		11/23/14 11:44	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 11:44	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 11:44	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/23/14 11:44	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		11/23/14 11:44	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/23/14 11:44	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		11/23/14 11:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/23/14 11:44	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/23/14 11:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/23/14 11:44	107-06-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-3 **Lab ID: 1241152001** Collected: 11/12/14 12:55 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,1-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:44	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 11:44	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 11:44	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		11/23/14 11:44	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 11:44	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		11/23/14 11:44	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 11:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 11:44	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/23/14 11:44	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/23/14 11:44	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/23/14 11:44	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		11/23/14 11:44	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		11/23/14 11:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/23/14 11:44	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/23/14 11:44	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		11/23/14 11:44	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	103-65-1	
Styrene	ND	ug/L	1.0	1		11/23/14 11:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 11:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 11:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/23/14 11:44	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/23/14 11:44	109-99-9	
Toluene	ND	ug/L	1.0	1		11/23/14 11:44	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:44	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/23/14 11:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/23/14 11:44	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/23/14 11:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 11:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/23/14 11:44	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/23/14 11:44	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 11:44	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/23/14 11:44	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/23/14 11:44	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	75-125	1		11/23/14 11:44	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1		11/23/14 11:44	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		11/23/14 11:44	460-00-4	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**330**	mg/L	20.0	2		11/24/14 07:46		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-3 **Lab ID: 1241152001** Collected: 11/12/14 12:55 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510B							
Specific Conductance	**276**	umhos/cm	10.0	1		11/20/14 10:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH	**8.0**	Std. Units	0.10	1		11/14/14 15:21		H6
USGS I-3765 TSS	Analytical Method: USGS I-3765							
Total Suspended Solids	**9.2**	mg/L	1.0	1		11/14/14 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**2.1**	mg/L	1.0	1		11/20/14 23:58	16887-00-6	
Sulfate	**15.3**	mg/L	2.0	1		11/20/14 23:58	14808-79-8	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 Preparation Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.10	1	11/20/14 11:38	11/21/14 14:35	7664-41-7	
353.2 Nitrate + Nitrite pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.12**	mg/L	0.10	1		11/24/14 12:29		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-7 **Lab ID: 1241152002** Collected: 11/12/14 14:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	**335**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:17	7440-39-3	
Boron, Dissolved	ND	ug/L	100	1	11/18/14 10:16	11/19/14 11:17	7440-42-8	
Chromium, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:17	7440-47-3	
Copper, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:17	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	11/18/14 10:16	11/19/14 11:17	7439-89-6	
Manganese, Dissolved	**593**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:17	7439-96-5	
Sodium, Dissolved	**4.5**	mg/L	0.50	1	11/18/14 10:16	11/19/14 11:17	7440-23-5	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 18:57	7440-38-2	
Cadmium, Dissolved	ND	ug/L	0.80	4	11/18/14 10:16	11/18/14 18:57	7440-43-9	
Lead, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 18:57	7439-92-1	
245.1 Mercury, Dissolved	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury, Dissolved	ND	ug/L	0.20	1	11/17/14 11:36	11/18/14 13:45	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		11/23/14 11:58	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/23/14 11:58	107-05-1	
Benzene	ND	ug/L	1.0	1		11/23/14 11:58	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/23/14 11:58	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/23/14 11:58	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/23/14 11:58	75-27-4	
Bromoform	ND	ug/L	4.0	1		11/23/14 11:58	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/23/14 11:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/23/14 11:58	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/23/14 11:58	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/23/14 11:58	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/23/14 11:58	67-66-3	
Chloromethane	ND	ug/L	4.0	1		11/23/14 11:58	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 11:58	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 11:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/23/14 11:58	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		11/23/14 11:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/23/14 11:58	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		11/23/14 11:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/23/14 11:58	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/23/14 11:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/23/14 11:58	107-06-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-7 **Lab ID: 1241152002** Collected: 11/12/14 14:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,1-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 11:58	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 11:58	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 11:58	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		11/23/14 11:58	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 11:58	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		11/23/14 11:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 11:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 11:58	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/23/14 11:58	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/23/14 11:58	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/23/14 11:58	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		11/23/14 11:58	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		11/23/14 11:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/23/14 11:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/23/14 11:58	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		11/23/14 11:58	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	103-65-1	
Styrene	ND	ug/L	1.0	1		11/23/14 11:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 11:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 11:58	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/23/14 11:58	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/23/14 11:58	109-99-9	
Toluene	ND	ug/L	1.0	1		11/23/14 11:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 11:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/23/14 11:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/23/14 11:58	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/23/14 11:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 11:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/23/14 11:58	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/23/14 11:58	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 11:58	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/23/14 11:58	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/23/14 11:58	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	75-125	1		11/23/14 11:58	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1		11/23/14 11:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		11/23/14 11:58	460-00-4	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**121**	mg/L	20.0	2		11/24/14 07:55		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-7 **Lab ID: 1241152002** Collected: 11/12/14 14:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510B							
Specific Conductance	**656**	umhos/cm	10.0	1		11/20/14 10:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH	**7.4**	Std. Units	0.10	1		11/14/14 15:21		H6
USGS I-3765 TSS	Analytical Method: USGS I-3765							
Total Suspended Solids	**3.2**	mg/L	1.0	1		11/14/14 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**3.4**	mg/L	1.0	1		11/21/14 00:21	16887-00-6	
Sulfate	**5.2**	mg/L	2.0	1		11/21/14 00:21	14808-79-8	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 Preparation Method: EPA 350.1							
Nitrogen, Ammonia	**0.19**	mg/L	0.10	1	11/20/14 11:38	11/21/14 14:34	7664-41-7	
353.2 Nitrate + Nitrite pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.5**	mg/L	0.10	1		11/24/14 12:34		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-8 **Lab ID: 1241152003** Collected: 11/12/14 15:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	**33.9**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:33	7440-39-3	
Boron, Dissolved	ND	ug/L	100	1	11/18/14 10:16	11/19/14 11:33	7440-42-8	
Chromium, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:33	7440-47-3	
Copper, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:33	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	11/18/14 10:16	11/19/14 11:33	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:33	7439-96-5	
Sodium, Dissolved	**2.8**	mg/L	0.50	1	11/18/14 10:16	11/19/14 11:33	7440-23-5	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 19:03	7440-38-2	
Cadmium, Dissolved	ND	ug/L	0.80	4	11/18/14 10:16	11/18/14 19:03	7440-43-9	
Lead, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 19:03	7439-92-1	
245.1 Mercury, Dissolved	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury, Dissolved	ND	ug/L	0.20	1	11/17/14 11:36	11/18/14 13:47	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		11/23/14 15:20	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/23/14 15:20	107-05-1	
Benzene	ND	ug/L	1.0	1		11/23/14 15:20	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/23/14 15:20	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/23/14 15:20	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/23/14 15:20	75-27-4	
Bromoform	ND	ug/L	4.0	1		11/23/14 15:20	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/23/14 15:20	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/23/14 15:20	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/23/14 15:20	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/23/14 15:20	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/23/14 15:20	67-66-3	
Chloromethane	ND	ug/L	4.0	1		11/23/14 15:20	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 15:20	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 15:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/23/14 15:20	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		11/23/14 15:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/23/14 15:20	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		11/23/14 15:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/23/14 15:20	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/23/14 15:20	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/23/14 15:20	107-06-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-8 **Lab ID: 1241152003** Collected: 11/12/14 15:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,1-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:20	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 15:20	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 15:20	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		11/23/14 15:20	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 15:20	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		11/23/14 15:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 15:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 15:20	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/23/14 15:20	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/23/14 15:20	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/23/14 15:20	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		11/23/14 15:20	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		11/23/14 15:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/23/14 15:20	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/23/14 15:20	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		11/23/14 15:20	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	103-65-1	
Styrene	ND	ug/L	1.0	1		11/23/14 15:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 15:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 15:20	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/23/14 15:20	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/23/14 15:20	109-99-9	
Toluene	ND	ug/L	1.0	1		11/23/14 15:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/23/14 15:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/23/14 15:20	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/23/14 15:20	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 15:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/23/14 15:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/23/14 15:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 15:20	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/23/14 15:20	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/23/14 15:20	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	75-125	1		11/23/14 15:20	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1		11/23/14 15:20	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1		11/23/14 15:20	460-00-4	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**337**	mg/L	20.0	2		11/24/14 08:01		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: MW-8 **Lab ID: 1241152003** Collected: 11/12/14 15:05 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510B							
Specific Conductance	**420**	umhos/cm	10.0	1		11/20/14 10:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH	**8.0**	Std. Units	0.10	1		11/14/14 15:21		H6
USGS I-3765 TSS	Analytical Method: USGS I-3765							
Total Suspended Solids	**6.4**	mg/L	1.0	1		11/14/14 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**14.4**	mg/L	1.0	1		11/21/14 00:44	16887-00-6	
Sulfate	**5.3**	mg/L	2.0	1		11/21/14 00:44	14808-79-8	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 Preparation Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.10	1	11/20/14 11:38	11/21/14 14:41	7664-41-7	
353.2 Nitrate + Nitrite pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.55**	mg/L	0.10	1		11/24/14 12:35		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: FLD DUP **Lab ID: 1241152004** Collected: 11/12/14 00:00 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Dissolved	**351**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:37	7440-39-3	
Boron, Dissolved	ND	ug/L	100	1	11/18/14 10:16	11/19/14 11:37	7440-42-8	
Chromium, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:37	7440-47-3	
Copper, Dissolved	ND	ug/L	5.0	1	11/18/14 10:16	11/19/14 11:37	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	11/18/14 10:16	11/19/14 11:37	7439-89-6	
Manganese, Dissolved	**633**	ug/L	10.0	1	11/18/14 10:16	11/19/14 11:37	7439-96-5	
Sodium, Dissolved	**4.6**	mg/L	0.50	1	11/18/14 10:16	11/19/14 11:37	7440-23-5	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Arsenic, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 19:08	7440-38-2	
Cadmium, Dissolved	ND	ug/L	0.80	4	11/18/14 10:16	11/18/14 19:08	7440-43-9	
Lead, Dissolved	ND	ug/L	2.0	4	11/18/14 10:16	11/18/14 19:08	7439-92-1	
245.1 Mercury, Dissolved	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury, Dissolved	ND	ug/L	0.20	1	11/17/14 11:36	11/18/14 13:54	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		11/23/14 15:34	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/23/14 15:34	107-05-1	
Benzene	ND	ug/L	1.0	1		11/23/14 15:34	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/23/14 15:34	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/23/14 15:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/23/14 15:34	75-27-4	
Bromoform	ND	ug/L	4.0	1		11/23/14 15:34	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/23/14 15:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/23/14 15:34	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/23/14 15:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/23/14 15:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/23/14 15:34	67-66-3	
Chloromethane	ND	ug/L	4.0	1		11/23/14 15:34	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 15:34	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 15:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/23/14 15:34	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		11/23/14 15:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/23/14 15:34	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		11/23/14 15:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/23/14 15:34	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/23/14 15:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/23/14 15:34	107-06-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: FLD DUP **Lab ID: 1241152004** Collected: 11/12/14 00:00 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,1-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 15:34	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 15:34	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 15:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		11/23/14 15:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 15:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		11/23/14 15:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 15:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 15:34	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/23/14 15:34	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/23/14 15:34	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/23/14 15:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		11/23/14 15:34	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		11/23/14 15:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/23/14 15:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/23/14 15:34	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		11/23/14 15:34	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	103-65-1	
Styrene	ND	ug/L	1.0	1		11/23/14 15:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 15:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 15:34	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/23/14 15:34	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/23/14 15:34	109-99-9	
Toluene	ND	ug/L	1.0	1		11/23/14 15:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 15:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/23/14 15:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/23/14 15:34	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/23/14 15:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 15:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/23/14 15:34	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/23/14 15:34	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 15:34	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/23/14 15:34	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/23/14 15:34	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	75-125	1		11/23/14 15:34	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1		11/23/14 15:34	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125	1		11/23/14 15:34	460-00-4	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**188**	mg/L	20.0	2		11/24/14 08:08		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: FLD DUP **Lab ID: 1241152004** Collected: 11/12/14 00:00 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2510B Specific Conductance	Analytical Method: SM 2510B							
Specific Conductance	**654**	umhos/cm	10.0	1		11/20/14 10:45		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH	**7.5**	Std. Units	0.10	1		11/14/14 15:21		H6
USGS I-3765 TSS	Analytical Method: USGS I-3765							
Total Suspended Solids	**1.2**	mg/L	1.0	1		11/14/14 13:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**3.4**	mg/L	1.0	1		11/21/14 01:52	16887-00-6	
Sulfate	**5.1**	mg/L	2.0	1		11/21/14 01:52	14808-79-8	
350.1 Ammonia, Distilled	Analytical Method: EPA 350.1 Preparation Method: EPA 350.1							
Nitrogen, Ammonia	**0.41**	mg/L	0.10	1	11/20/14 11:38	11/21/14 14:38	7664-41-7	
353.2 Nitrate + Nitrite pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.5**	mg/L	0.10	1		11/24/14 12:32		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: Trip Blank **Lab ID: 1241152005** Collected: 11/12/14 00:00 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		11/23/14 10:46	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		11/23/14 10:46	107-05-1	
Benzene	ND	ug/L	1.0	1		11/23/14 10:46	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		11/23/14 10:46	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		11/23/14 10:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/23/14 10:46	75-27-4	
Bromoform	ND	ug/L	4.0	1		11/23/14 10:46	75-25-2	
Bromomethane	ND	ug/L	4.0	1		11/23/14 10:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/23/14 10:46	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		11/23/14 10:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/23/14 10:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/23/14 10:46	67-66-3	
Chloromethane	ND	ug/L	4.0	1		11/23/14 10:46	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 10:46	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		11/23/14 10:46	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		11/23/14 10:46	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		11/23/14 10:46	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		11/23/14 10:46	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		11/23/14 10:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		11/23/14 10:46	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/23/14 10:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/23/14 10:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/23/14 10:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 10:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/23/14 10:46	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 10:46	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 10:46	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		11/23/14 10:46	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		11/23/14 10:46	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		11/23/14 10:46	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 10:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		11/23/14 10:46	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		11/23/14 10:46	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		11/23/14 10:46	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		11/23/14 10:46	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		11/23/14 10:46	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		11/23/14 10:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/23/14 10:46	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		11/23/14 10:46	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

ANALYTICAL RESULTS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Sample: Trip Blank **Lab ID: 1241152005** Collected: 11/12/14 00:00 Received: 11/13/14 18:52 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
Naphthalene	ND	ug/L	4.0	1		11/23/14 10:46	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	103-65-1	
Styrene	ND	ug/L	1.0	1		11/23/14 10:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 10:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/23/14 10:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/23/14 10:46	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		11/23/14 10:46	109-99-9	
Toluene	ND	ug/L	1.0	1		11/23/14 10:46	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		11/23/14 10:46	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/23/14 10:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/23/14 10:46	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		11/23/14 10:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/23/14 10:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		11/23/14 10:46	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		11/23/14 10:46	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		11/23/14 10:46	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		11/23/14 10:46	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		11/23/14 10:46	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		11/23/14 10:46	17060-07-0	
Toluene-d8 (S)	101	%.	75-125	1		11/23/14 10:46	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125	1		11/23/14 10:46	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: MERP/1639 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176215 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	11/18/14 13:28	

LABORATORY CONTROL SAMPLE: 176216

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	2	1.9	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176217 176218

Parameter	Units	1241151001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	2	2	2.0	2.0	100	100	70-130	1	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
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(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: MPRP/4808 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176366 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium, Dissolved	ug/L	ND	10.0	11/19/14 10:38	
Boron, Dissolved	ug/L	ND	100	11/19/14 10:38	
Chromium, Dissolved	ug/L	ND	5.0	11/19/14 10:38	
Copper, Dissolved	ug/L	ND	5.0	11/19/14 10:38	
Iron, Dissolved	ug/L	ND	50.0	11/19/14 10:38	
Manganese, Dissolved	ug/L	ND	10.0	11/19/14 10:38	
Sodium, Dissolved	mg/L	ND	0.50	11/19/14 10:38	

LABORATORY CONTROL SAMPLE: 176367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium, Dissolved	ug/L	500	511	102	85-115	
Boron, Dissolved	ug/L	500	545	109	85-115	
Chromium, Dissolved	ug/L	500	516	103	85-115	
Copper, Dissolved	ug/L	500	527	105	85-115	
Iron, Dissolved	ug/L	10000	10300	103	85-115	
Manganese, Dissolved	ug/L	500	521	104	85-115	
Sodium, Dissolved	mg/L	20	20.1	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176368 176369

Parameter	Units	1241151001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	ND	500	500	511	509	101	100	70-130	0	20	
Boron, Dissolved	ug/L	ND	500	500	541	552	103	105	70-130	2	20	
Chromium, Dissolved	ug/L	ND	500	500	510	508	102	101	70-130	1	20	
Copper, Dissolved	ug/L	ND	500	500	518	515	104	103	70-130	1	20	
Iron, Dissolved	ug/L	ND	10000	10000	10300	10200	102	102	70-130	0	20	
Manganese, Dissolved	ug/L	ND	500	500	509	506	101	100	70-130	1	20	
Sodium, Dissolved	mg/L	2.1	20	20	22.3	22.4	101	102	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176370 176371

Parameter	Units	1241159002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium, Dissolved	ug/L	140	500	500	629	648	98	102	70-130	3	20	
Boron, Dissolved	ug/L	ND	500	500	552	586	104	110	70-130	6	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176370 176371

Parameter	Units	1241159002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Dissolved	ug/L	ND	500	500	505	521	101	104	70-130	3	20	
Copper, Dissolved	ug/L	ND	500	500	523	543	104	108	70-130	4	20	
Iron, Dissolved	ug/L	ND	10000	10000	10200	10400	102	104	70-130	2	20	
Manganese, Dissolved	ug/L	ND	500	500	504	526	101	105	70-130	4	20	
Sodium, Dissolved	mg/L	3.3	20	20	23.8	23.9	103	103	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: MPRP/4809 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176372 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	ND	0.50	11/18/14 17:49	
Cadmium, Dissolved	ug/L	ND	0.20	11/18/14 17:49	
Lead, Dissolved	ug/L	ND	0.50	11/18/14 17:49	

LABORATORY CONTROL SAMPLE: 176373

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	500	503	101	85-115	
Cadmium, Dissolved	ug/L	500	497	99	85-115	
Lead, Dissolved	ug/L	500	489	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176374 176375

Parameter	Units	1241151001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	ND	500	500	508	511	101	102	70-130	1	20	
Cadmium, Dissolved	ug/L	ND	500	500	518	512	104	102	70-130	1	20	
Lead, Dissolved	ug/L	ND	500	500	499	500	100	100	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176376 176377

Parameter	Units	1241159002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	ND	500	500	502	501	100	100	70-130	0	20	
Cadmium, Dissolved	ug/L	ND	500	500	503	507	101	101	70-130	1	20	
Lead, Dissolved	ug/L	ND	500	500	491	488	98	98	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: MSV/29471 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 465 W
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004, 1241152005

METHOD BLANK: 1850779 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004, 1241152005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1-Dichloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,1-Dichloroethene	ug/L	ND	1.0	11/23/14 10:31	
1,1-Dichloropropene	ug/L	ND	1.0	11/23/14 10:31	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
1,2,3-Trichloropropane	ug/L	ND	4.0	11/23/14 10:31	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	11/23/14 10:31	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	11/23/14 10:31	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	11/23/14 10:31	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
1,2-Dichloroethane	ug/L	ND	1.0	11/23/14 10:31	
1,2-Dichloropropane	ug/L	ND	4.0	11/23/14 10:31	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	11/23/14 10:31	
1,3-Dichlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
1,3-Dichloropropane	ug/L	ND	1.0	11/23/14 10:31	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
2,2-Dichloropropane	ug/L	ND	4.0	11/23/14 10:31	
2-Butanone (MEK)	ug/L	ND	5.0	11/23/14 10:31	
2-Chlorotoluene	ug/L	ND	1.0	11/23/14 10:31	
4-Chlorotoluene	ug/L	ND	1.0	11/23/14 10:31	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/23/14 10:31	
Acetone	ug/L	ND	20.0	11/23/14 10:31	
Allyl chloride	ug/L	ND	4.0	11/23/14 10:31	
Benzene	ug/L	ND	1.0	11/23/14 10:31	
Bromobenzene	ug/L	ND	1.0	11/23/14 10:31	
Bromochloromethane	ug/L	ND	1.0	11/23/14 10:31	
Bromodichloromethane	ug/L	ND	1.0	11/23/14 10:31	
Bromoform	ug/L	ND	4.0	11/23/14 10:31	
Bromomethane	ug/L	ND	4.0	11/23/14 10:31	
Carbon tetrachloride	ug/L	ND	1.0	11/23/14 10:31	
Chlorobenzene	ug/L	ND	1.0	11/23/14 10:31	
Chloroethane	ug/L	ND	1.0	11/23/14 10:31	
Chloroform	ug/L	ND	1.0	11/23/14 10:31	
Chloromethane	ug/L	ND	4.0	11/23/14 10:31	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/23/14 10:31	
cis-1,3-Dichloropropene	ug/L	ND	4.0	11/23/14 10:31	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

METHOD BLANK: 1850779 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004, 1241152005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	11/23/14 10:31	
Dibromomethane	ug/L	ND	4.0	11/23/14 10:31	
Dichlorodifluoromethane	ug/L	ND	1.0	11/23/14 10:31	
Dichlorofluoromethane	ug/L	ND	1.0	11/23/14 10:31	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	11/23/14 10:31	
Ethylbenzene	ug/L	ND	1.0	11/23/14 10:31	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	11/23/14 10:31	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	11/23/14 10:31	
Methyl-tert-butyl ether	ug/L	ND	1.0	11/23/14 10:31	
Methylene Chloride	ug/L	ND	4.0	11/23/14 10:31	
n-Butylbenzene	ug/L	ND	1.0	11/23/14 10:31	
n-Propylbenzene	ug/L	ND	1.0	11/23/14 10:31	
Naphthalene	ug/L	ND	4.0	11/23/14 10:31	
p-Isopropyltoluene	ug/L	ND	1.0	11/23/14 10:31	
sec-Butylbenzene	ug/L	ND	1.0	11/23/14 10:31	
Styrene	ug/L	ND	1.0	11/23/14 10:31	
tert-Butylbenzene	ug/L	ND	1.0	11/23/14 10:31	
Tetrachloroethene	ug/L	ND	1.0	11/23/14 10:31	
Tetrahydrofuran	ug/L	ND	10.0	11/23/14 10:31	
Toluene	ug/L	ND	1.0	11/23/14 10:31	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/23/14 10:31	
trans-1,3-Dichloropropene	ug/L	ND	4.0	11/23/14 10:31	
Trichloroethene	ug/L	ND	0.40	11/23/14 10:31	
Trichlorofluoromethane	ug/L	ND	1.0	11/23/14 10:31	
Vinyl chloride	ug/L	ND	0.40	11/23/14 10:31	
Xylene (Total)	ug/L	ND	3.0	11/23/14 10:31	
1,2-Dichloroethane-d4 (S)	%.	99	75-125	11/23/14 10:31	
4-Bromofluorobenzene (S)	%.	100	75-125	11/23/14 10:31	
Toluene-d8 (S)	%.	100	75-125	11/23/14 10:31	

LABORATORY CONTROL SAMPLE: 1850780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.0	110	75-125	
1,1,1-Trichloroethane	ug/L	20	22.4	112	73-125	
1,1,2,2-Tetrachloroethane	ug/L	20	21.8	109	74-125	
1,1,2-Trichloroethane	ug/L	20	23.0	115	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.9	105	56-133	
1,1-Dichloroethane	ug/L	20	22.1	111	75-125	
1,1-Dichloroethene	ug/L	20	22.6	113	70-125	
1,1-Dichloropropene	ug/L	20	22.7	113	73-125	
1,2,3-Trichlorobenzene	ug/L	20	22.2	111	75-125	
1,2,3-Trichloropropane	ug/L	20	21.6	108	75-125	
1,2,4-Trichlorobenzene	ug/L	20	22.2	111	75-125	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

LABORATORY CONTROL SAMPLE: 1850780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	22.6	113	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.7	111	70-125	
1,2-Dibromoethane (EDB)	ug/L	20	22.3	112	75-125	
1,2-Dichlorobenzene	ug/L	20	21.9	109	75-125	
1,2-Dichloroethane	ug/L	20	21.9	109	75-125	
1,2-Dichloropropane	ug/L	20	22.3	112	75-125	
1,3,5-Trimethylbenzene	ug/L	20	22.5	112	75-125	
1,3-Dichlorobenzene	ug/L	20	21.9	110	75-125	
1,3-Dichloropropane	ug/L	20	21.9	109	75-125	
1,4-Dichlorobenzene	ug/L	20	21.6	108	75-125	
2,2-Dichloropropane	ug/L	20	22.2	111	66-130	
2-Butanone (MEK)	ug/L	100	112	112	64-126	
2-Chlorotoluene	ug/L	20	22.5	113	73-125	
4-Chlorotoluene	ug/L	20	22.1	111	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	117	117	71-125	
Acetone	ug/L	100	108	108	66-131	
Allyl chloride	ug/L	20	21.3	107	70-129	
Benzene	ug/L	20	21.5	108	75-125	
Bromobenzene	ug/L	20	22.1	111	75-125	
Bromochloromethane	ug/L	20	22.0	110	75-125	
Bromodichloromethane	ug/L	20	21.9	109	75-125	
Bromoform	ug/L	20	20.5	103	70-125	
Bromomethane	ug/L	20	18.9	94	30-150	
Carbon tetrachloride	ug/L	20	20.8	104	68-129	
Chlorobenzene	ug/L	20	21.1	105	75-125	
Chloroethane	ug/L	20	21.4	107	68-133	
Chloroform	ug/L	20	22.2	111	75-125	
Chloromethane	ug/L	20	23.7	118	57-140	
cis-1,2-Dichloroethene	ug/L	20	22.0	110	75-125	
cis-1,3-Dichloropropene	ug/L	20	22.5	112	75-125	
Dibromochloromethane	ug/L	20	20.4	102	75-125	
Dibromomethane	ug/L	20	21.1	106	75-125	
Dichlorodifluoromethane	ug/L	20	22.2	111	50-134	
Dichlorofluoromethane	ug/L	20	23.0	115	74-125	
Diethyl ether (Ethyl ether)	ug/L	20	21.1	106	75-125	
Ethylbenzene	ug/L	20	20.6	103	75-125	
Hexachloro-1,3-butadiene	ug/L	20	24.7	124	74-128	
Isopropylbenzene (Cumene)	ug/L	20	22.9	114	73-125	
Methyl-tert-butyl ether	ug/L	20	22.4	112	75-125	
Methylene Chloride	ug/L	20	20.2	101	75-125	
n-Butylbenzene	ug/L	20	23.4	117	73-125	
n-Propylbenzene	ug/L	20	23.3	116	72-125	
Naphthalene	ug/L	20	21.8	109	74-125	
p-Isopropyltoluene	ug/L	20	23.5	117	74-125	
sec-Butylbenzene	ug/L	20	23.8	119	74-125	
Styrene	ug/L	20	22.9	115	75-125	
tert-Butylbenzene	ug/L	20	22.4	112	74-125	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

LABORATORY CONTROL SAMPLE: 1850780

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	ug/L	20	19.1	96	71-125	
Tetrahydrofuran	ug/L	200	218	109	70-125	
Toluene	ug/L	20	21.7	108	75-125	
trans-1,2-Dichloroethene	ug/L	20	22.5	112	73-125	
trans-1,3-Dichloropropene	ug/L	20	22.2	111	75-125	
Trichloroethene	ug/L	20	21.3	106	75-125	
Trichlorofluoromethane	ug/L	20	24.8	124	70-128	
Vinyl chloride	ug/L	20	20.6	103	70-130	
Xylene (Total)	ug/L	60	66.1	110	75-125	
1,2-Dichloroethane-d4 (S)	%.			104	75-125	
4-Bromofluorobenzene (S)	%.			101	75-125	
Toluene-d8 (S)	%.			100	75-125	

MATRIX SPIKE SAMPLE: 1850781

Parameter	Units	1241151001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.1	96	74-131	
1,1,1-Trichloroethane	ug/L	ND	20	19.2	96	73-139	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.2	96	72-125	
1,1,2-Trichloroethane	ug/L	ND	20	19.4	97	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	18.1	91	68-150	
1,1-Dichloroethane	ug/L	ND	20	18.9	95	73-132	
1,1-Dichloroethene	ug/L	ND	20	20.8	104	71-142	
1,1-Dichloropropene	ug/L	ND	20	18.3	92	73-139	
1,2,3-Trichlorobenzene	ug/L	ND	20	18.9	95	70-129	
1,2,3-Trichloropropane	ug/L	ND	20	19.8	99	74-125	
1,2,4-Trichlorobenzene	ug/L	ND	20	18.8	94	70-129	
1,2,4-Trimethylbenzene	ug/L	ND	20	19.5	98	72-136	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	49.0	98	66-127	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20.7	103	75-125	
1,2-Dichlorobenzene	ug/L	ND	20	18.1	91	75-125	
1,2-Dichloroethane	ug/L	ND	20	18.3	92	68-128	
1,2-Dichloropropane	ug/L	ND	20	20.1	101	74-131	
1,3,5-Trimethylbenzene	ug/L	ND	20	18.4	92	75-131	
1,3-Dichlorobenzene	ug/L	ND	20	17.5	87	73-125	
1,3-Dichloropropane	ug/L	ND	20	19.6	98	75-125	
1,4-Dichlorobenzene	ug/L	ND	20	17.6	88	73-125	
2,2-Dichloropropane	ug/L	ND	20	19.7	99	58-150	
2-Butanone (MEK)	ug/L	ND	100	104	104	56-140	
2-Chlorotoluene	ug/L	ND	20	18.2	91	70-130	
4-Chlorotoluene	ug/L	ND	20	18.1	90	73-126	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	110	110	69-128	
Acetone	ug/L	ND	100	104	104	57-143	
Allyl chloride	ug/L	ND	20	20.8	104	65-146	
Benzene	ug/L	ND	20	20.9	104	75-129	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

MATRIX SPIKE SAMPLE: 1850781

Parameter	Units	1241151001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromobenzene	ug/L	ND	20	19.3	97	74-125	
Bromochloromethane	ug/L	ND	20	20.3	102	75-126	
Bromodichloromethane	ug/L	ND	20	20.1	101	75-128	
Bromoform	ug/L	ND	20	19.2	96	66-130	
Bromomethane	ug/L	ND	20	19.8	99	30-150	
Carbon tetrachloride	ug/L	ND	20	19.1	96	69-148	
Chlorobenzene	ug/L	ND	20	18.9	94	75-125	
Chloroethane	ug/L	ND	20	19.2	96	71-143	
Chloroform	ug/L	ND	20	20.8	104	75-126	
Chloromethane	ug/L	ND	20	21.6	108	55-150	
cis-1,2-Dichloroethene	ug/L	ND	20	20.2	101	75-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.4	92	72-129	
Dibromochloromethane	ug/L	ND	20	18.7	93	73-129	
Dibromomethane	ug/L	ND	20	19.2	96	75-125	
Dichlorodifluoromethane	ug/L	ND	20	18.7	93	70-150	
Dichlorofluoromethane	ug/L	ND	20	21.8	109	75-135	
Diethyl ether (Ethyl ether)	ug/L	ND	20	19.6	98	72-126	
Ethylbenzene	ug/L	ND	20	17.3	86	75-128	
Hexachloro-1,3-butadiene	ug/L	ND	20	22.4	112	65-144	
Isopropylbenzene (Cumene)	ug/L	ND	20	19.6	98	75-131	
Methyl-tert-butyl ether	ug/L	ND	20	20.3	101	74-128	
Methylene Chloride	ug/L	ND	20	18.4	92	69-125	
n-Butylbenzene	ug/L	ND	20	19.6	98	70-137	
n-Propylbenzene	ug/L	ND	20	18.9	94	72-131	
Naphthalene	ug/L	ND	20	19.2	96	70-132	
p-Isopropyltoluene	ug/L	ND	20	18.7	94	73-133	
sec-Butylbenzene	ug/L	ND	20	20.6	103	74-133	
Styrene	ug/L	ND	20	20.0	100	75-128	
tert-Butylbenzene	ug/L	ND	20	18.0	90	74-130	
Tetrachloroethene	ug/L	ND	20	16.2	81	68-140	
Tetrahydrofuran	ug/L	ND	200	211	106	65-131	
Toluene	ug/L	ND	20	19.2	96	75-129	
trans-1,2-Dichloroethene	ug/L	ND	20	20.2	101	70-136	
trans-1,3-Dichloropropene	ug/L	ND	20	19.4	97	71-125	
Trichloroethene	ug/L	ND	20	17.4	87	72-135	
Trichlorofluoromethane	ug/L	ND	20	23.8	119	75-150	
Vinyl chloride	ug/L	ND	20	17.8	89	73-150	
Xylene (Total)	ug/L	ND	60	54.5	91	75-129	
1,2-Dichloroethane-d4 (S)	%.				101	75-125	
4-Bromofluorobenzene (S)	%.				102	75-125	
Toluene-d8 (S)	%.				101	75-125	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

SAMPLE DUPLICATE: 1850782

Parameter	Units	1241151002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	.73J		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	.47J		30	
Diethyl ether (Ethyl ether)	ug/L	ND	2.5J		30	
Ethylbenzene	ug/L	ND	ND		30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

SAMPLE DUPLICATE: 1850782

Parameter	Units	1241151002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	102	100	1		
4-Bromofluorobenzene (S)	%.	99	98	1		
Toluene-d8 (S)	%.	100	100	0		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WET/15741 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 177268 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	10.0	11/24/14 07:27	

LABORATORY CONTROL SAMPLE: 177269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	52.6	105	90-110	

SAMPLE DUPLICATE: 177270

Parameter	Units	1241151001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	73.3			

SAMPLE DUPLICATE: 177271

Parameter	Units	1241126004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	755	768	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
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(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WET/15692 Analysis Method: SM 2510B
QC Batch Method: SM 2510B Analysis Description: 2510B Specific Conductance
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176904 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Specific Conductance	umhos/cm	ND	10.0	11/20/14 10:45	

LABORATORY CONTROL SAMPLE: 176905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Specific Conductance	umhos/cm	1413	1454	103	90-110	

SAMPLE DUPLICATE: 176906

Parameter	Units	1241295001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	900	902	0	20	

SAMPLE DUPLICATE: 176907

Parameter	Units	1241152001 Result	Dup Result	RPD	Max RPD	Qualifiers
Specific Conductance	umhos/cm	276	277	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
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QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WET/15634 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

LABORATORY CONTROL SAMPLE: 176099

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH	Std. Units	7	7.0	100	98-102	H6

SAMPLE DUPLICATE: 176100

Parameter	Units	1241150001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.1	7.1	0	10	H6

SAMPLE DUPLICATE: 176101

Parameter	Units	1241152003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	8.0	8.0	0	10	H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
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(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WET/15629 Analysis Method: USGS I-3765
QC Batch Method: USGS I-3765 Analysis Description: USGS I-3765 Total Suspended Solids
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176068 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	11/14/14 13:31	

LABORATORY CONTROL SAMPLE: 176069

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	239	234	98	80-120	

SAMPLE DUPLICATE: 176070

Parameter	Units	1241093002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	106	110	4	10	

SAMPLE DUPLICATE: 176071

Parameter	Units	1241137001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	160	172	7	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WETA/9992 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176913 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/20/14 20:54	
Sulfate	mg/L	ND	2.0	11/20/14 20:54	

LABORATORY CONTROL SAMPLE: 176914

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.3	99	90-110	
Sulfate	mg/L	50	48.6	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176915 176916

Parameter	Units	1241237005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	500	500	501	501	99	99	90-110	0	20	
Sulfate	mg/L	1040	500	500	1520	1520	95	95	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176917 176918

Parameter	Units	1241152004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.4	50	50	53.6	53.6	100	100	90-110	0	20	
Sulfate	mg/L	5.1	50	50	54.4	54.4	99	99	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WETA/9988 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia Distilled
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 176857 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	11/21/14 14:04	

LABORATORY CONTROL SAMPLE: 176858

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176859 176860

Parameter	Units	1241213002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	<0.10	10	10	9.7	9.4	97	94	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 176861 176862

Parameter	Units	1241247002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.18	10	10	9.9	9.5	98	93	90-110	4	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
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(218) 742-1042

QUALITY CONTROL DATA

Project: Camp Ripley MMLF
Pace Project No.: 1241152

QC Batch: WETA/10022 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

METHOD BLANK: 177320 Matrix: Water
Associated Lab Samples: 1241152001, 1241152002, 1241152003, 1241152004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	11/24/14 11:20	

LABORATORY CONTROL SAMPLE: 177321

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 177322 177323

Parameter	Units	1241040001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2	2	2.0	2.0	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 177324 177325

Parameter	Units	1241151002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.11	2	2	2.1	2.1	100	101	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALIFIERS

Project: Camp Ripley MMLF
Pace Project No.: 1241152

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis
PASI-V	Pace Analytical Services - Virginia

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA recommended holding time.

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1241152001	**MW-3**	EPA 200.7	MPRP/4808	EPA 200.7	ICP/3850
1241152002	**MW-7**	EPA 200.7	MPRP/4808	EPA 200.7	ICP/3850
1241152003	**MW-8**	EPA 200.7	MPRP/4808	EPA 200.7	ICP/3850
1241152004	**FLD DUP**	EPA 200.7	MPRP/4808	EPA 200.7	ICP/3850
1241152001	**MW-3**	EPA 200.8	MPRP/4809	EPA 200.8	ICPM/3443
1241152002	**MW-7**	EPA 200.8	MPRP/4809	EPA 200.8	ICPM/3443
1241152003	**MW-8**	EPA 200.8	MPRP/4809	EPA 200.8	ICPM/3443
1241152004	**FLD DUP**	EPA 200.8	MPRP/4809	EPA 200.8	ICPM/3443
1241152001	**MW-3**	EPA 245.1	MERP/1639	EPA 245.1	MERC/2046
1241152002	**MW-7**	EPA 245.1	MERP/1639	EPA 245.1	MERC/2046
1241152003	**MW-8**	EPA 245.1	MERP/1639	EPA 245.1	MERC/2046
1241152004	**FLD DUP**	EPA 245.1	MERP/1639	EPA 245.1	MERC/2046
1241152001	**MW-3**	EPA 8260	MSV/29471		
1241152002	**MW-7**	EPA 8260	MSV/29471		
1241152003	**MW-8**	EPA 8260	MSV/29471		
1241152004	**FLD DUP**	EPA 8260	MSV/29471		
1241152005	**Trip Blank**	EPA 8260	MSV/29471		
1241152001	**MW-3**	SM 2320B	WET/15741		
1241152002	**MW-7**	SM 2320B	WET/15741		
1241152003	**MW-8**	SM 2320B	WET/15741		
1241152004	**FLD DUP**	SM 2320B	WET/15741		
1241152001	**MW-3**	SM 2510B	WET/15692		
1241152002	**MW-7**	SM 2510B	WET/15692		
1241152003	**MW-8**	SM 2510B	WET/15692		
1241152004	**FLD DUP**	SM 2510B	WET/15692		
1241152001	**MW-3**	SM 4500-H+B	WET/15634		
1241152002	**MW-7**	SM 4500-H+B	WET/15634		
1241152003	**MW-8**	SM 4500-H+B	WET/15634		
1241152004	**FLD DUP**	SM 4500-H+B	WET/15634		
1241152001	**MW-3**	USGS I-3765	WET/15629		
1241152002	**MW-7**	USGS I-3765	WET/15629		
1241152003	**MW-8**	USGS I-3765	WET/15629		
1241152004	**FLD DUP**	USGS I-3765	WET/15629		
1241152001	**MW-3**	EPA 300.0	WETA/9992		
1241152002	**MW-7**	EPA 300.0	WETA/9992		
1241152003	**MW-8**	EPA 300.0	WETA/9992		
1241152004	**FLD DUP**	EPA 300.0	WETA/9992		
1241152001	**MW-3**	EPA 350.1	WETA/9988	EPA 350.1	WETA/10007
1241152002	**MW-7**	EPA 350.1	WETA/9988	EPA 350.1	WETA/10007
1241152003	**MW-8**	EPA 350.1	WETA/9988	EPA 350.1	WETA/10007
1241152004	**FLD DUP**	EPA 350.1	WETA/9988	EPA 350.1	WETA/10007
1241152001	**MW-3**	EPA 353.2	WETA/10022		
1241152002	**MW-7**	EPA 353.2	WETA/10022		
1241152003	**MW-8**	EPA 353.2	WETA/10022		

Pace Analytical Services, Inc.
315 Chestnut Street
Virginia, MN 55792
(218) 742-1042

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Camp Ripley MMLF
Pace Project No.: 1241152

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1241152004	**FLD DUP**	EPA 353.2	WETA/10022		

CHAIN-OF-CUSTODY RECORD

WIDSETH SMITH NOLTING

ALEXANDRIA
610 Fillmore St.
Alexandria, MN 56308-1028
TEL: 320.762.8149
FAX: 320.762.0263

BEMIDJI
315 5th St. NW
Bemidji, MN 56601
TEL: 218.444.1859
FAX: 218.444.1860

BRAINERD/BAXTER
7804 Industrial Park Rd.
Baxter, MN 56425
TEL: 218.829.5117
FAX: 218.829.2517

ENGINEERING ARCHITE[illegible] [illegible]CES

WO#: 1241152

PM: MMW Due Date: 12/02/14

CLIENT: WSN

PROJECT NUMBER	PROJECT NAME
0283B00C9.014	Camp Ripley MMLF
	LOCATION: Randall, MN

SAMPLERS: (Signature) Gregory W. Smith for MICHAEL BOCARD

SAMPLERS: (Print) MICHAEL BOCARD

SAMPLE DESCRIPTION	DATE	TIME	COMP	GRAB	SAMPLE MATERIAL	NUMBER OF CONTAINERS	ANALYSES REQUEST: See Attached List	MMH 465 List				REMARKS
												Metals are Filtered
MW-3	11/12/14	12:55		X	H_2O	7	X					001
MW-7	11/12/14	14:05		X	H_2O	7	X					002
MW-8	11/12/14	15:05		X	H_2O	7	X					003
Fld Dup	11/12/14	—		X	H_2O	7	X					004
Trip Blank	11/12/14	—		X	H_2O	2		X				005

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Gregory W. Smith	11/13/14 1500				
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Report To:	
	11/13/14 1852		11/14 0800	GREG SMITH, WSN	
				Bill To: WSN	

Distribution: White – Accompanies Shipment; Pink – Project File; Yellow – Laboratory

№ 6437 1.8°C

CAMP RIPLEY MMLF

- Brief reiteration (one or two paragraphs) for each of the following topics:
  - Hydrology;
  - Geology;
  - Hydrogeology;
  - Geochemistry.
- Description of historical and current groundwater flow directions;
- Discussion of the analysis performed (including field parameters);
- Discussion of any exceedances of performance standards;
- Discussion of trends (if any);
- Description of any problems that may have been encountered;
- Summary;
- Conclusions;
- Recommendations;
- Figures (including survey information described in Sections 2.1 through 2.4);
- Attachments:
  - Laboratory analytical results;
  - Field data sheets;
- Tables:
  - Required analytes and sampling frequency;
  - Measured field parameters;
  - Static water elevations (in MSL);
  - Summary of monitoring well information.

Additionally, the Contractor will complete and provide to DMA for submittal, the MPCA's Solid Waste Land Disposal Facility Annual Report (W-SW7-02). One MPCA Solid Waste Land Disposal Annual Report shall be completed for the MMLF and on MPCA Solid Waste Land Disposal Annual Report shall be completed for the DDLF for each reporting year; they are to be submitted to DMA no later than 15 January of the year proceeding the reporting year.

2.4 Groundwater Scope of Work

Groundwater sampling, laboratory analysis and groundwater reporting work described under Section 2 "Groundwater Sampling/Analysis and Annual Report" is to be completed in Calendar Year 2013, Calendar Year 2014, Calendar Year 2015 and Calendar Year 2016 with deliverables being submitted concurrent with survey work in the calendar year immediately proceeding the sample event.

Parameter Lists for Sampling of Ground Water Monitoring Network

MDH 468 List (Organics)

Analytes

1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene

1,1,2-Trichloroethane
1,1,2-Trichlorotrifluoroethane
1,1-Dichloroethane
1,1-Dichloroethylene (Vinylidene chloride)
1,1-Dichloropropene
1,2-Dichloroethylene (trans)

Organics (con't.)

1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene (meta-)
1,3-Dichloropropane
1,3-Dichloropropene (cis + trans)
1,4-Dichlorobenzene (para-)
2,2-Dichloropropane
2-Chlorotoluene (ortho-)
4-Chlorotoluene (para-)
Acetone
Allyl chloride (3 chloropropene)
Benzene
Bromobenzene
Bromochloromethane (Chlorobromomethane)
Bromodichloromethane (Dichlorobromomethane)
Bromoform
Bromomethane (Methyl bromide)
Carbon tetrachloride
Chlorobenzene (monochlorobenzene)
Chlorodibromomethane (Dibromochloromethane)
Chloroethane
Chloroform
Chloromethane (Methyl chloride)
Cumene (Isopropylbenzene)
Dibromochloropropane (DBCP)
Dibromomethane (Methylene bromide)
Dichlorodifluoromethane
Dichlorofluoromethane
Dichloromethane (Methylene chloride)
Ethyl benzene
Ethyl ether
Hexachlorobutadiene
Methyl ethyl ketone (MEK)
Methyl isobutyl ketone (4-Methyl-2-pentanone)
Methyl tertiary-butyl ether (MTBE)
Naphthalene
1,2,4-Trimethylbenzene
1,2-Dibromoethane (Ethylene dibromide or EDB)
1,2-Dichlorobenzene (orth-)
1,2-Dichloroethane
1,2-Dichloroethylene (cis-)
n-Butyl benzene
n-Propyl benzene
p-Isopropyltoluene
sec-Butyl benzene
Styrene
tert-Butyl benzene
Tetrachloroethylene (Perchloroethylene)
Tetrahydrofuran
Toluene
Trichloroethylene (TCE)
Trichlorofluoromethane
Vinyl chloride (chloroethene)
Xylenes (mixture of o, m, p)

Inorganics

Alkalinity, total as calcium carbonate
Ammonia Nitrogen
Arsenic, dissolved
Barium, dissolved
Boron, dissolved
Cadmium, dissolved
Chloride
Chromium, total dissolved
Copper, dissolved
Iron, dissolved
Lead, dissolved
Manganese, dissolved
Mercury, dissolved
Nitrate + Nitrite, as N
Sodium, dissolved
Sulfate
Suspended Solids, total
Appearance (b);
Dissolved Oxygen, field
pH (a)
Specific Conductance (a)
Temperature (a)
Turbidity, field
Water Elevation

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Document Revised: 05May2014 Page 1 of 1
	Document No.: F-VM-C-001-Rev.07	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: WSN

Project #: WO#: 1241152

1241152

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☐Commercial ☒Pace ☐Other:_____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☐No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐Bubble Wrap ☒Bubble Bags BL 11/13/14 ☒None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer Used: ☒ 122639828 **Type of Ice:** ☒Wet ☐Blue ☐None ☒Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.6 **Cooler Temp Corrected °C:** 1.8 **Biological Tissue Frozen?** ☐Yes ☐No ☒NA

Temp should be above freezing to 6°C Correction Factor: +0.2 **Date and Initials of Person Examining Contents:** 11/13/14 BL

Comments: 11/14/14 TK

Chain of Custody Present?	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☒Yes	☐No	☐N/A	3.
Sampler Name and Signature on COC?	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☒Yes	☐No	☐N/A	6. pH
Rush Turn Around Time Requested?	☐Yes	☒No	☐N/A	7.
Sufficient Volume?	☒Yes	☐No	☐N/A	8.
Correct Containers Used?	☒Yes	☐No	☐N/A	9.
-Pace Containers Used?	☒Yes	☐No	☐N/A	
Containers Intact?	☒Yes	☐No	☐N/A	10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☐N/A	11.
Sample Labels Match COC?	☒Yes	☐No	☐N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☒Yes	☐No	☐N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐Yes	☐No	☒N/A	13.
Headspace in VOA Vials (>6mm)?	☐Yes	☐No	☒N/A	14.
Trip Blank Present?	☐Yes	☐No	☒N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased): _____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: _____ **Date:** 11-14-14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APPENDIX B

WELL STABILIZATION FORMS

WIDSETH SMITH NOLTING

ALEXANDRIA	BEMIDJI	BRAINERD/BAXTER	CROOKSTON	GRAND FORKS	RED WING	ROCHESTER
Phone & Fax	Phone & Fax	Phone & Fax	Phone & Fax	Phone & Fax	Phone & Fax	Phone & Fax
320-762-8149	218-444-1859	218-829-5117	218-281-6522	701-795-1975	651-388-2443	507-292-8743
320-762-0263	218-444-1860	218-829-2517	218-281-6545	701-795-1978	651-388-5236	507-292-8746

ENGINEERING ARCHITECTURE LAND SURVEYING ENVIRONMENTAL SERVICES

DATE: 11/12/14

PROJECT NAME: Camp Ripley PROJECT NUMBER: 0283B0009.014

LOCATION: Randall, MN WEATHER: Overcast

TEMP. MIN. 18°F TEMP. MAX. 24°F ENGINEER PERSONNEL: MB

CONTRACTOR(S):

SUBCONTRACTOR WORKING:

WORK DONE BY ENGINEER: Fall Sampling Event

DAILY PROGRESS (Contractors & Subcontractors): Checked in @ Range Control @ 9:00. Tim at Range Control asked me to sample the Demolition Landfill first because the person who needed to get me the key for the closed landfill was busy. Got to Demolition Landfill and located the wells. Did not have a key for the Monitoring wells so I had to get ahold of Mark Erickson. He brought one out to me. Sampled DDLF-4 & DDLF5 and checked Static water level in DDLF-1, DDLF-2, DDLF-3. On the way back to range control I found MW-3 and sampled that. Found Tim at Range Control and got the key for the closed landfill area. Could not find MW-7 because it was an at-grade so I sampled MW-8 and called Mark Erickson to see if he could help me find MW-7. Located MW-7 and sampled that as well. MW-7 was FD. Took Equip Blank at 13:20. Returned to Range control and turned in the keys and my range pass.

SWL DDLF 2 - 19.03
DDLF 3 - 26.34
DDLF 1 - 29.98

Samples will be sent to Pace Virginia tomorrow.

REMARKS:

SIGNED: MB DATE SIGNED: 11/12/14

(If more space is required, use other side)

WIDSETH SMITH NOLTING & ASSOCIATES

MONITORING/TEST WELL STABILIZATION FORM

WIDSETH SMITH NOLTING
Engineering
Architecture
Surveying
Environmental

SITE: Camp Ripley
DATE: 11/12/12
TIME:
SAMPLE DESIGNATION: MW-3
WEATHER CONDITIONS: Overcast
PERSONNEL: MB
PUMP RATE (GPM): .50
WELL DEPTH: 47.00
STATIC LEVEL: 20.63
WELL VOLUME (GAL): 4.21

LOCK:	YES	X	NO	
WELL LABEL:	YES	X	NO	

CONDITION OF WELL: Good
PURGE METHOD: Waterra
SAMPLE METHOD: Waterra
APPEARANCE: Clear

FIELD DUPLICATE
YES ☐
NO ☒

FLOW CELL USED
YES ☒
NO ☐

EXCEPTIONS TO PROTOCOL: NONE ☐

TIME	TEMP. FAHRENHEIT (+/- 0.5)	SPECIFIC CONDUCTANCE (mS/cm +/- 5%)	DISSOLVED OXYGEN (+/- 0.5 mg/l)	Ph (+/- 0.04 SU)	ORP (mv)	TURBIDITY (+/- 10 NTU)	VOL. REMOVED (gal.)
12:31	47.9	.222	2.91	7.77	278	45.4	4.50
12:42	47.8	220	3.49	7.80	253	38.2	9.00
12:53	47.6	.224	3.37	7.82	243	29.4	13.50
INITIAL							
2nd RECHARGE							
3rd RECHARGE							

COMMENTS:
TIME SAMPLED 12:55

WIDSETH SMITH NOLTING & ASSOCIATES

MONITORING/TEST WELL STABILIZATION FORM

SITE: Camp Ripley
DATE: 11/12/14
TIME:
SAMPLE DESIGNATION: MW-07
WEATHER CONDITIONS: Overcast
PERSONNEL: MS
PUMP RATE (GPM):
WELL DEPTH: 37
STATIC LEVEL: 26.14
WELL VOLUME (GAL): 1.74

LOCK:	YES	X	NO	
WELL LABEL:	YES	X	NO	

CONDITION OF WELL: Good
PURGE METHOD: Whale
SAMPLE METHOD: Whale
APPEARANCE:

WIDSETH SMITH NOLTING
Engineering
Architecture
Surveying
Environmental

FIELD DUPLICATE
YES ☐
NO ☐

FLOW CELL USED
YES ☐
NO ☐

EXCEPTIONS TO PROTOCOL: NONE ☐

TIME	TEMP. FAHRENHEIT (+/- 0.5)	SPECIFIC CONDUCTANCE (mS/cm +/- 5%)	DISSOLVED OXYGEN (+/- 0.5 mg/l)	Ph (+/- 0.04 SU)	ORP (mv)	TURBIDITY (+/- 10 NTU)	VOL. REMOVED (gal.)
14:45	49.3	.627	4.46	7.15	255	14.0	2.0
14:50	49.2	.637	4.35	7.14	256	12.9	4.0
15:00	49.2	.630	4.35	7.14	257	12.5	6.8
INITIAL							
2nd RECHARGE							
3rd RECHARGE							

COMMENTS:
TIME SAMPLED 15:05

Equip Blank 13:20

WIDSETH SMITH NOLTING & ASSOCIATES

MONITORING/TEST WELL STABILIZATION FORM

SITE: Camp Ripley

DATE: 11/2/14

TIME:

SAMPLE DESIGNATION: MW-8

WEATHER CONDITIONS: Overcast

PERSONNEL: MB

PUMP RATE (GPM):

WELL DEPTH: 40

STATIC LEVEL: 28.76

WELL VOLUME (GAL): 1.86

LOCK: YES X NO

WELL LABEL: YES X NO

CONDITION OF WELL: Good

PURGE METHOD: Whale

SAMPLE METHOD: Whale

APPEARANCE: Clear

WIDSETH SMITH NOLTING

Engineering
Architecture
Surveying
Environmental

FIELD DUPLICATE

YES ☐

NO ☒

FLOW CELL USED

YES ☒

NO ☐

EXCEPTIONS TO PROTOCOL: NONE ☐

TIME	TEMP. FAHRENHEIT (+/- 0.5)	SPECIFIC CONDUCTANCE (mS/cm +/- 5%)	DISSOLVED OXYGEN (+/- 0.5 mg/l)	Ph (+/- 0.04 SU)	ORP (mv)	TURBIDITY (+/- 10 NTU)	VOL. REMOVED (gal.)
13:52	46.4	.409	9.38	7.61	304	18.3	2.00
13:56	46.5	.404	9.33	7.62	306	16.1	4.00
14:00	46.5	.407	9.31	7.63	307	14.9	6.00
INITIAL							
2nd RECHARGE							
3rd RECHARGE							

COMMENTS:

TIME SAMPLED 14:05