



Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202
720-929-6000 Fax 720-929-7000

April 30, 2014

Mr. Alex Fischer
Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

**Re: Centralized E&P Waste Management Facility Application
DFMF #2 Strear Farms
Weld County, Colorado
SW Section 23-T2N-R67W**

Dear Mr. Fischer:

Enclosed please find a Form 28 application for a *Centralized E&P Waste Management Facility Permit* proposed for the above-referenced location. Kerr-McGee Oil & Gas Onshore LP plans to utilize the subject property as a facility designed to accept land-application of water-based bentonitic drilling fluids and drill cuttings generated by Kerr-McGee, per the Colorado Oil and Gas Conservation Commission (COGCC) Rules.

Feel free to contact me at 720-929-6368 if you have any questions regarding this information.

Sincerely,

Kerr-McGee Oil & Gas Onshore LP

A handwritten signature in blue ink, appearing to read 'Mike Dinkel', written over a horizontal line.

Mike Dinkel
Senior EHS Representative

Attachments

cc John Axelson, COGCC
Chris Canfield, COGCC



State of Colorado Oil and Gas Conservation Commission



1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax: (303) 894-2109

CENTRALIZED E&P WASTE MANAGEMENT FACILITY PERMIT

Submit this Form and accompanying documents for each facility per Rule 908. Financial Assurance in the amount of \$50,000 is required to operate each facility.

FOR OGCC USE ONLY

Surety ID: _____

OGCC Operator Number: 47120		Contact Name and Telephone:	
Name of Operator: Kerr-McGee Oil & Gas Onshore LP		Mike Dinkel	
Address: 1099 18th Street, Suite 1800		No: 720-929-6368	
City: Denver State: CO Zip: 80202		Fax: 720-929-7368	
Surface Owner (if different than above): NA			
Address: _____			
City: _____ State: _____ Zip: _____ Phone: _____			
Facility Name: DFMF #2 - STREAR FARMS		Location (QtrQtr, Sec, Twp, Rng, Mer):	
Address: WCR 18 and WCR 21		SW SEC 23-T2N-R67W	
City: Fort Lupton State: CO Zip: 80621		Latitude: 40° 07' 11" N	
Phone: _____ Fax: _____		Longitude: 104° 51' 44" W	

	Oper	OGCC
Site description (topo, geol, hydro)		
Adjacent land use description		
Topographic map		
Site drainage map with structures		
Scaled drawing and survey map		
Facility design & engineering		
Operating plan		
Water analysis report		
Financial assurance		
Closure plan		
Local gov't zoning compliance		
Local gov't permits and notices		

1. Is the site in a sensitive area? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	2. What are the average annual precipitation and evaporation rates for the site? Precipitation: 14.4 inches/year Evaporation: 41.04 inches/year
3. Has a description of the site's general topography, geology and hydrology been attached? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
4. Has a description of the adjacent land use been attached? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	5. Has a 1:24,000 topographic map showing the site location been attached? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
6. Has a site plan showing drainage patterns, diversion or containment structures, roads, fencing, tanks, pits, buildings and any other pertinent construction details been attached? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
7. If site is not owned by the operator, is written authorization of the surface owner attached? <input type="checkbox"/> Y <input type="checkbox"/> N NA	8. Has a scaled drawing and survey showing the entire section(s) containing the proposed facility been attached? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
9. What measures have been implemented to limit access to the facility by wildlife, domestic animals or by members of the public? Briefly explain. A fence will be constructed around the facility to limit access by wildlife. A locking gate will be installed to prevent unauthorized vehicular traffic and unauthorized dumping.	
10. Is there a planned firelane of at least 10 feet in width around the active treatment areas and within the perimeter fence? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	11. Is there an additional buffer zone of at least 10 feet within the perimeter firelane? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
12. Have surface water diversion structures been constructed to accommodate a 100-year, 24-hour event? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	13. Has a waste profile been calculated according to Rule 908.b.6? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
14. Has facility design and engineering been provided as required by Rule 908.b.7? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	15. Has an operating plan been completed as required by Rule 908.b.8? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
16. Has ground water monitoring for the site been provided? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N ***Attach Water Analysis Report, Form 25, for each monitoring well installed.***	
17. Has financial assurance been provided as required by Rule 704? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	18. Has a closure plan been provided? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
19. Have local government requirements for zoning and construction been complied with? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	20. Have permits and notifications required by local governments and other agencies been provided? <input type="checkbox"/> Y <input type="checkbox"/> N NA

Print Name: Mike Dinkel

Signed: [Signature] Title: Sr. HSE Representative Date: 4-30-14

OGCC Approved: _____ Title: _____ Date: _____

CONDITIONS OF APPROVAL, IF ANY:

Facility Number: 437129



Centralized Exploration and Production Waste Management Facility Permit Application

Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) is providing this attachment to fulfill the requirements of the Colorado Oil and Gas Conservation Commission (COGCC) for the permitting of a Centralized E&P Waste Management Facility. The property is currently owned by:

Anadarko E&P Company LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

Upon receipt of an approved Form 28 permit from the COGCC, Kerr-McGee will utilize the property as a facility designed to accept land application of water-based bentonitic drilling fluids and associated drill cuttings (fluids/cuttings) generated by Kerr-McGee.

Site Description

The site occupies approximately 150 acres in the southwestern quarter of Section 23, Township 2 North, Range 67 West, in Weld County, Colorado. Average elevation on the property is approximately 4,900 feet above mean sea level, and the landform consists of relatively flat topography typical of the Western Great Plains ecoregion (Bailey et. al. 1994). The location of the site is depicted on Figure 1 and the Site Map on Figure 2.

Adjacent Land Use

Residential homes are located adjacent northeast and southwest of the property line, beyond Weld County Roads (WCR) 21 and WCR 18, respectively, and adjoining the northern property line. Irrigated agricultural land is located adjoining the west and southwest sides of the property, beyond WCR 21. A canal is located approximately 800 feet east and northeast of the site, which flows into Sand Hill Lake located approximately 1,700 feet west of the site. A topographic map and aerial of the surrounding area are presented on Figures 1 and 2, respectively.

Surface Soil Characterization

The surface soil characterization of the site was conducted by LT Environmental, Inc. (LTE). There are three soil series within the property: Valent sand, Voma loamy sand, and Loup Boel loamy sand. Valent sand comprises a majority of the acreage and dominates the entire southern half, central, and northwestern portions of the property. Valent sand consists of very deep excessively drained soils that formed from mixed eolian sands. The western and northeastern portions of the property are composed of Voma loamy sand, which consists of very well to somewhat excessively drained soils that formed in eolian or partly wind reworked alluvial materials. The southeastern corner of the property is composed of Loup Boel loamy sand and consists of very deep, poorly drained, and very poorly drained, rapidly permeable soils formed in sandy eolian deposits on swales on interdunes on sandhills (NRCS 2013). The soil types are illustrated on Figure 3.



The property currently is graded and dominated by weeds due to turkey farm abandonment. Valent sand soils are used principally as native rangeland with native vegetation dominated by yucca, sage, cactus, sand dropseed, sand reedgrass, big bluestem, little bluestem, sideoats grama, and sand bluestem. Vona loamy sand soils are used as dry and irrigated cropland, as well as native pastureland. Typical native vegetation found in Bona loamy sand soils consist of short and tall grass associations consisting of big bluestem, sand bluestem, little bluestem, prairie sandreed, sideoats grama, blue grama, sagebrush, and yucca. Loup Boel loamy sand soils are used for livestock grazing and haying. Typical native vegetation found in Loup Boel loamy sand soils consist of big bluestem, prairie cordgrass, switchgrass, and yellow indiangrass (NRCS 2013).

Baseline Soil Conditions

To characterize baseline conditions, representative soil samples were collected from the three soil series present in the land application site on October 15, 2013. The locations of the soil samples are presented on Figure 3. Soil samples were collected from each soil series at depths of 0.0 inches to 6 inches and 6 inches to 12 inches. A total of 8 samples were submitted to Summit Scientific in Golden, Colorado, for physical and chemical analysis. In addition, sample cores were collected from each soil series at 6 inches to 10 inches and submitted to Advanced Terra Testing, Inc. in Lakewood, Colorado, for permeability analysis. The analytical and geotechnical results are presented in Tables 1 and 2, respectively. The Summit Scientific laboratory analytical report is included as Attachment 1, and the Advanced Terra Testing, Inc. laboratory analytical report is included as Attachment 2.

The objective of characterizing baseline soil conditions is to establish pre-application concentrations of analytes. Many of these analytes are not subject to current COGCC regulations of allowable concentrations, but are presented in the baseline soil analytical results table to document baseline conditions for future evaluation of potential cropland application scenarios.

Subsurface Characterization

LTE installed five soil borings (MW01 through MW05) at the site on September 20 and 23, 2013, to evaluate geological conditions. The borings were completed using a direct-push drilling rig and were completed as monitoring wells to determine the depth to groundwater table. Soil samples were collected from the soil borings using a 5-foot long stainless steel split-spoon sampler equipped with disposable clear polyvinyl chloride (PVC) inner liners. Soil samples indicated that subsurface soil at the site generally consists of fine grained sand to a depth of approximately 10 feet to 16 feet below ground surface (bgs), underlain by sandy clay, and gravelly clay and claystone to the total depth drilled of 25 feet bgs. Soil boring logs for the site are included as Attachment 3.

Groundwater was encountered at the site at depths of approximately 11.04 feet bgs toward the center of the site (MW01), 10.27 feet bgs on the north side (MW02), 7.50 feet bgs on the east side (MW04), 7.11 feet bgs on the south side (MW05), and 9.55 feet bgs on the west side (MW03). The monitoring wells were sampled on December 5, 2013. A total of 5 samples were



submitted to Origins Laboratory, Inc. in Denver, Colorado, for chemical analysis and to Mountain States Accutest Laboratories (Accutest), in Wheat Ridge, Colorado, for biological activity reaction tests (BART). The results of these analyses are presented in Table 3. The Origins laboratory analytical report is included as Attachment 4 and the Accutest laboratory analytical report is included as Attachment 5.

On April 9, 2014, the groundwater monitoring wells were surveyed to determine the groundwater flow direction at the site. The survey confirmed the groundwater gradient is 0.012 feet/foot and the flow direction is to the southeast. A site map depicting the locations of the on-site monitoring wells and the groundwater elevation contours is presented on Figure 2.

An offsite water well database search was performed for permitted water wells within a one-mile radius of the property. A list of well depths, screen intervals, depths to water, yields, and aquifers the wells were completed in are presented in Table 4. An offsite water well location map is presented on Figure 4.

Waste Profile

The site is designed to accept water-based bentonitic drilling fluids and associated drill cuttings (drilling fluids and cuttings) generated by Kerr-McGee. The drilling fluids and cuttings will be Resource Conservation and Recovery Act (RCRA) exempt exploration and production (E&P) waste. The amount of drilling fluids and cuttings to be received and managed by the proposed facility will be dependent on the varying scope and extent of the Kerr-McGee drilling program; however, only a portion of Kerr-McGee's drilling fluids and cuttings will be land-applied on a monthly basis. It is estimated that approximately 4,167 cubic yards of drilling fluids and cuttings will be land-applied on a monthly basis (50,000 cubic yards/year). The volume of drilling fluids and cuttings will be tracked using internal Kerr-McGee manifesting procedures.

Facility Design and Engineering

A fence will surround the perimeter of the site. A swale will be located along the northern property boundary line and will divert run-on to the site. This swale has been designed to accommodate a 25-year, 24-hour storm event, as defined by the National Oceanic and Atmospheric Administration (NOAA) Atlas 2 Precipitation Frequency for 11 Western States. On the eastern end of the swale, rip rap will be installed to disperse surface flows prior to leaving the site. The site generally slopes to the south and east; therefore, an earthen berm will surround the downslope perimeter of the facility. Due to the activities at the cuttings containment area and the liquids handling center, a berm will fully surround these facilities. Berm and swale layout details are provided on Figure 5. Flow calculations for the swale and berm capacity, including runoff calculations are included as Attachment 6.

Operating Plan

In accordance with standard dry-land farming practices, the property will be managed by dividing it into four strips. After one strip has received a full application of drilling fluids and cuttings, the adjacent strip will be passed over (allowing it to remain fallow), and the drilling fluids will be applied to the next closest strip. Drilling fluids and cuttings will be transported to



the facility in trucks. The drilling fluids and cuttings will be spread to a thickness of no more than three inches (as allowed under COGCC Rules). The drilling fluids and cuttings will be incorporated into the sandy soils as soon as practicable using a coulter-style disk. After the soils have been worked sufficiently, dry-land crops such as wheat, triticale, sunflowers, or dry-land grasses will be planted. As with typical standard farming practices, the crops will be harvested at the end of the growing season. Operations/farming activities will be conducted by Kerr-McGee.

Soil sampling will be conducted at the facility on an annual basis, and the sampling will be initiated after one full year of land application. One discrete soil sample will be collected from an interval of 0.0 inches to 6 inches bgs from each approximate 10 acres where drilling fluids and cuttings have been applied. This will result in the collection and analysis of approximately five to six samples per year. Soil samples will not be collected from areas where it has been at least one year since drilling fluids have been applied. At a minimum, soil samples will be analyzed for total petroleum hydrocarbons (TPH) by EPA Method 8015 modified, electrical conductivity (EC), sodium adsorption ratio (SAR), pH, and total metals by EPA Method 3050 (excluding Louisiana Department of Natural Resources (LDNR) true total barium and hot water soluble boron) to ensure compliance with the allowable concentrations and levels in COGCC Table 910-1.

Annual operating reports will be submitted to the COGCC following receipt of the laboratory analytical results from the soil sample analysis. The report will detail the quantities of drilling fluids and cuttings land-applied at the facility, and will indicate where the drilling fluids and cuttings have been applied within the facility. In addition, the report will include information detailing the location and type of crops planted and grown at the facility. Laboratory analytical data from the soil sampling activities will be summarized in the report, and the laboratory report will be attached.

Soil loading limits for subsequent drilling fluid and cuttings applications will be determined after the initial application has been completed and the soil sample data have been evaluated. Prior to successive applications of drilling fluids and cuttings at the facility, Kerr-McGee will provide the COGCC with analytical data indicating that the subsequent application will be considered a beneficial soil amendment, and COGCC's concurrence will be requested.

Groundwater Monitoring

Site conditions, coupled with the nature of the drilling fluid and cuttings application, minimize the risk of groundwater impacts at this location. It is anticipated that vertical migration of drilling fluid materials will be limited due to the subsurface soils and the immobility of the drilling fluids and cuttings given their elevated bentonitic content. In addition, it is anticipated that the drilling fluids and cuttings will be devoid of appreciable constituents that could potentially impact groundwater (i.e., petroleum hydrocarbons and/or metals). Finally, the moderate application of bentonitic drilling fluids and cuttings materials to native soil (3-inch thick lifts) will provide adequate mixing and subsequent adhesion with native soils. Kerr-McGee proposes quarterly groundwater monitoring of the existing monitoring wells for benzene, toluene, ethylbenzene, and total xylenes.



Financial Assurance

Upon approval of the permit and prior to construction, Kerr-McGee will submit financial assurance per Rule 704.

Closure Plan

Upon closure of the facility, the soil conditions are anticipated to have improved sufficiently such that the property can be used solely for agricultural purposes. At that time, the storm water controls will be removed.

References

Bailey, R.G., Avers, P.E., King, T., and McNab, W.H., eds., 1994, Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by McNab, W.H., and Bailey, R.G.): Washington, D.C., USFS, scale 1:7,500,000. [Online WWW]. Available URL: http://www.epa.gov/wed/pages/ecoregions/co_eco.htm [Accessed 3 December 2013].

NRCS (Natural Resources Conservation Service) Soil Survey Staff, United States Department of Agriculture. Soil Series Classification Database [Online WWW]. Available URL: <https://soilseries.sc.egov.usda.gov/osdname.asp>. [Accessed 3 December 2013]. USDA-NRCS, Lincoln, NE.

Figures

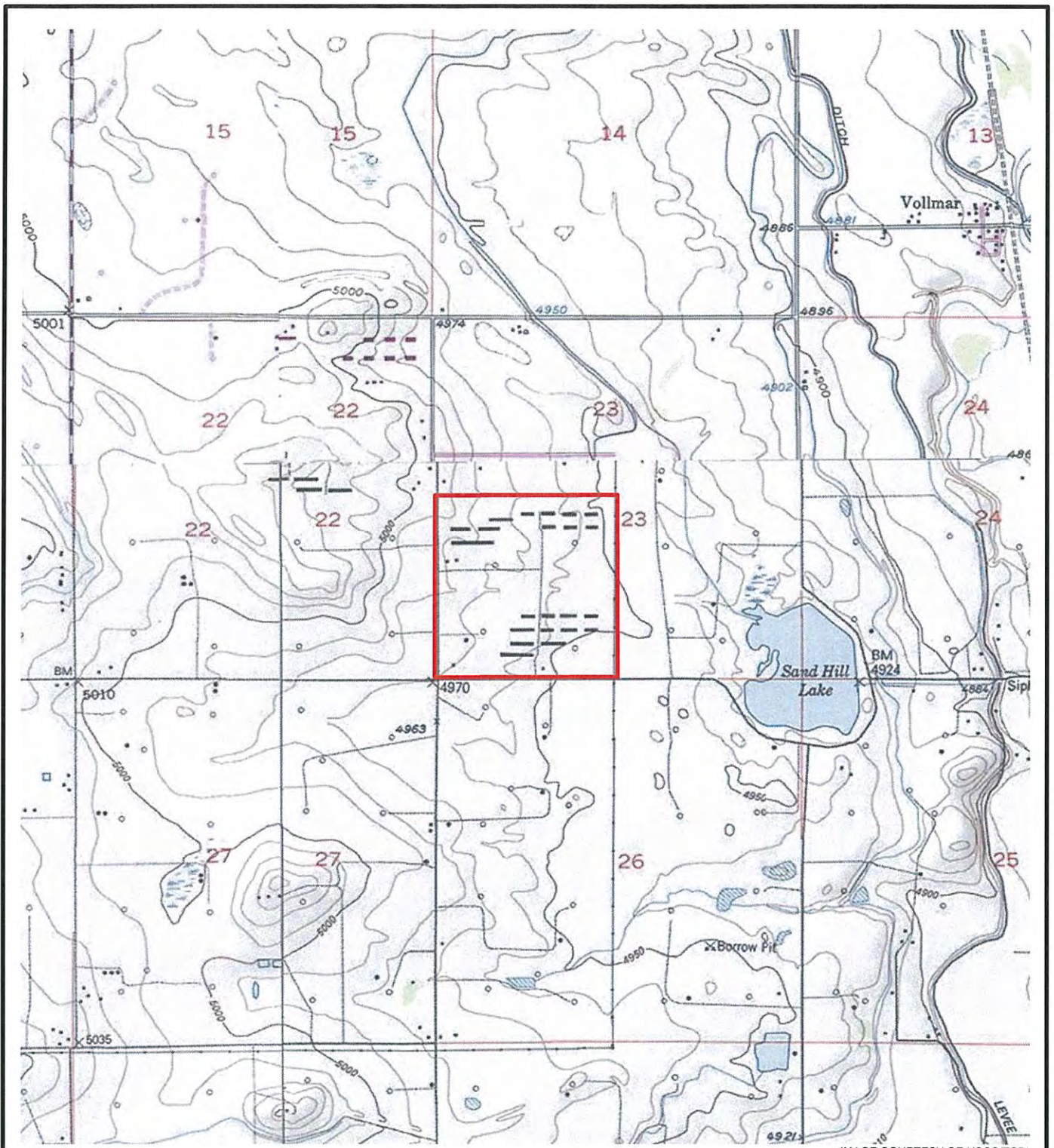



IMAGE COURTESY OF USGS/ESRI

LEGEND

 SITE BOUNDARY

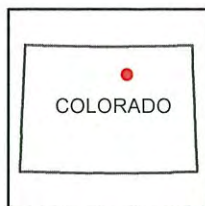
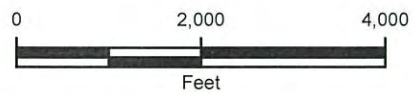
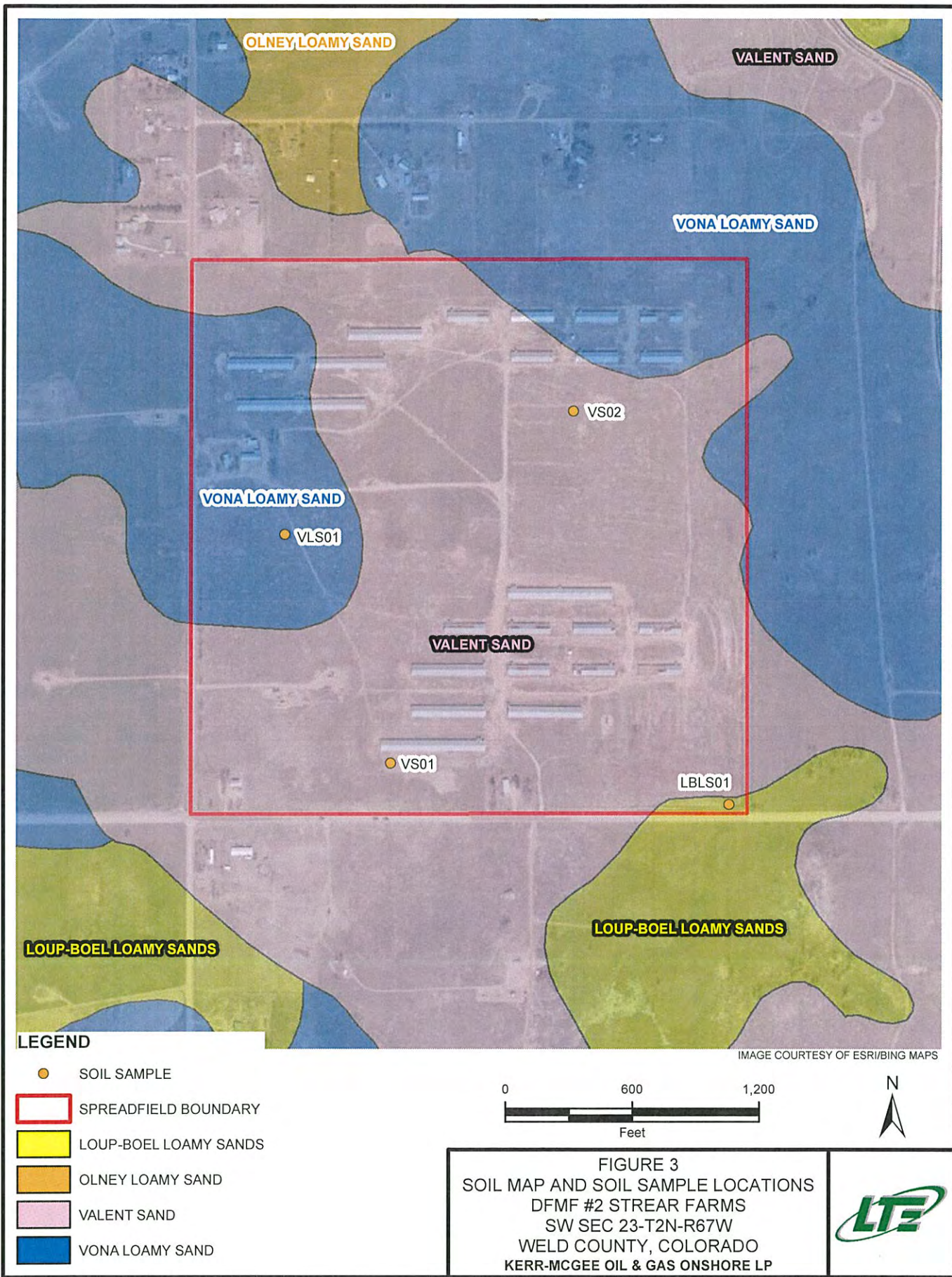
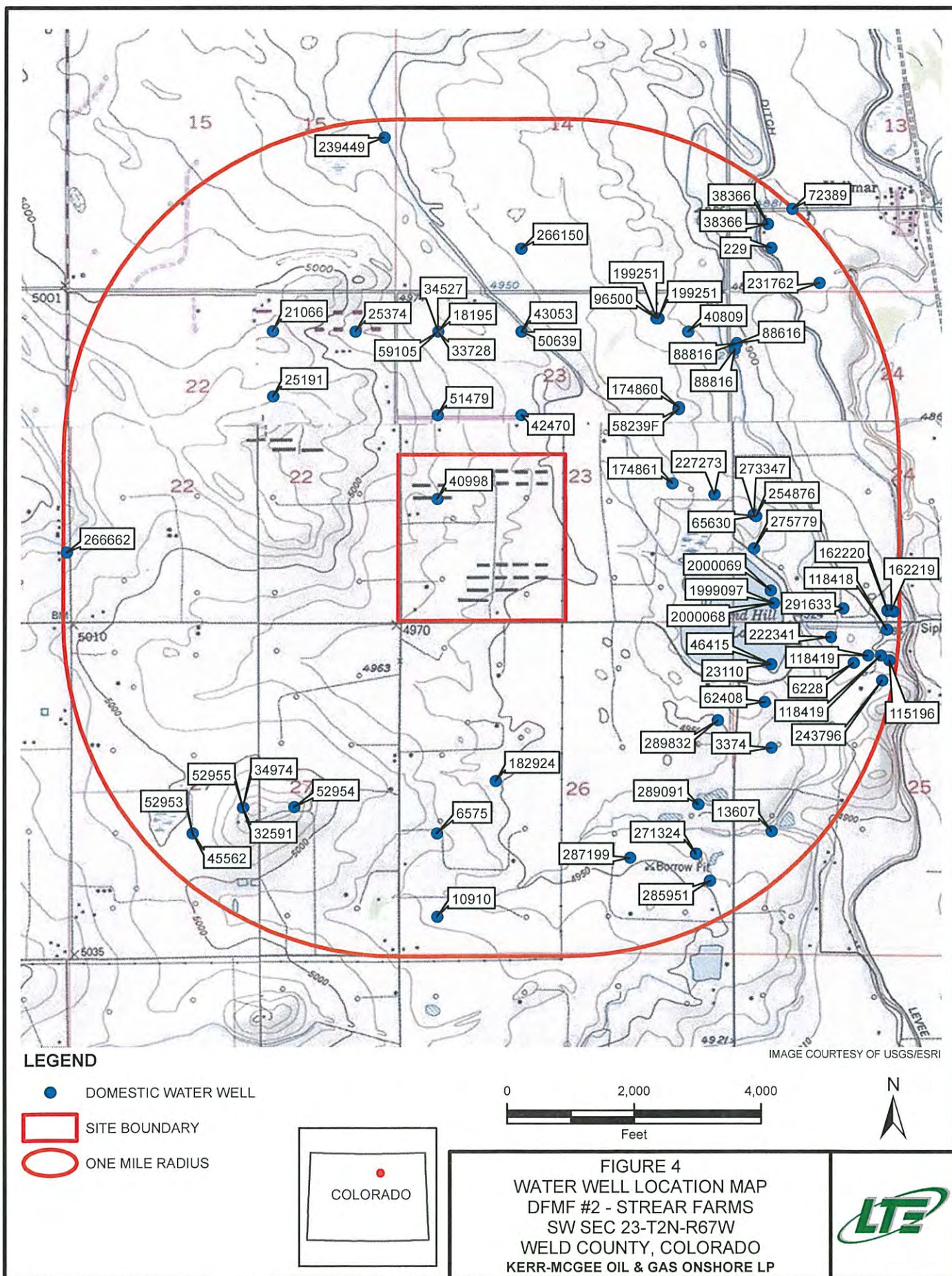


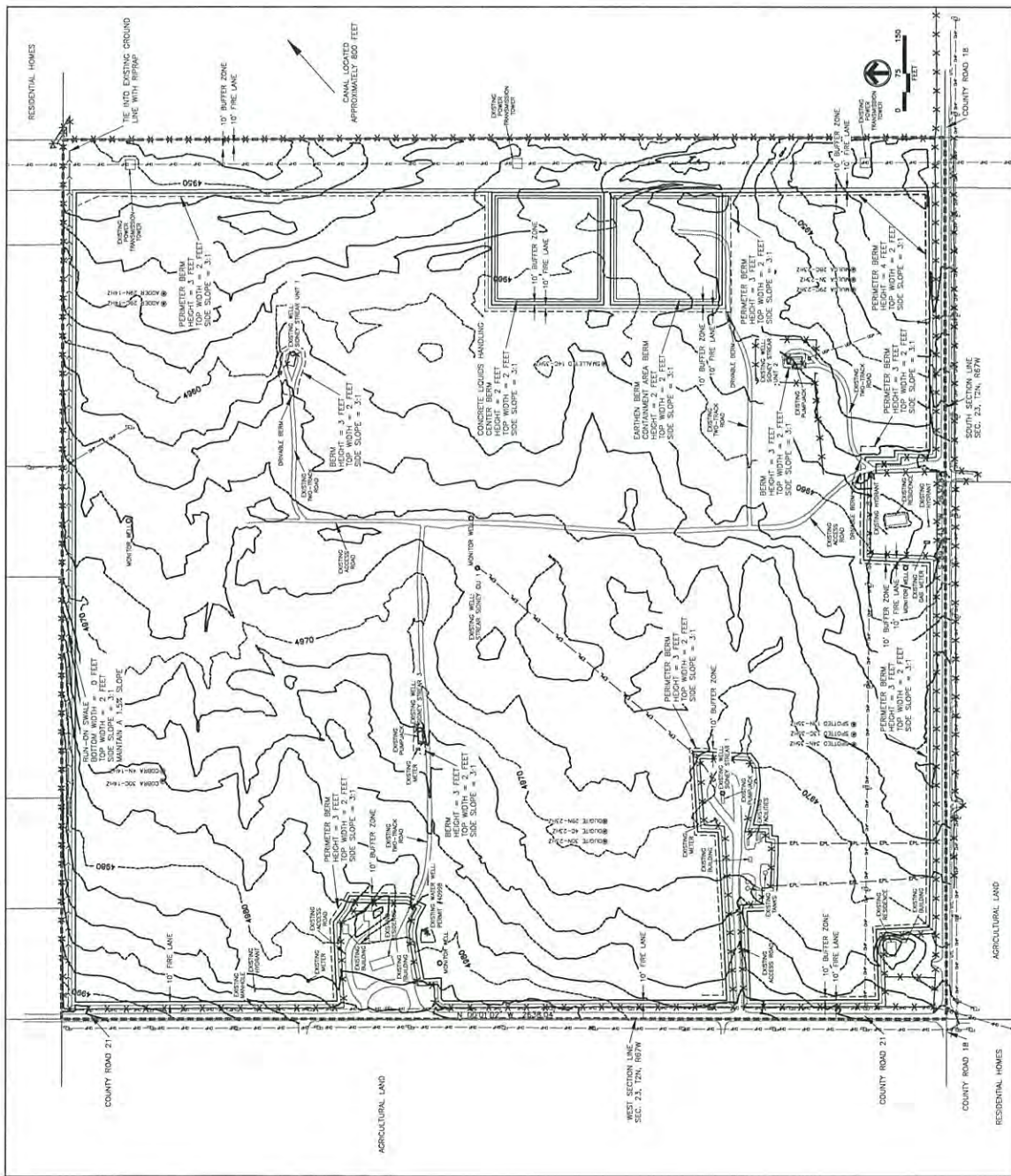
FIGURE 1
SITE LOCATION MAP
DFMF #2 - STEAR FARMS
SW SEC 23-T2N-R67W
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



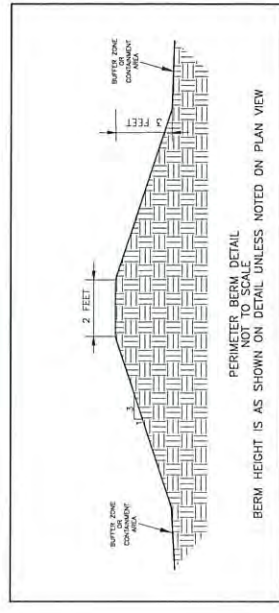
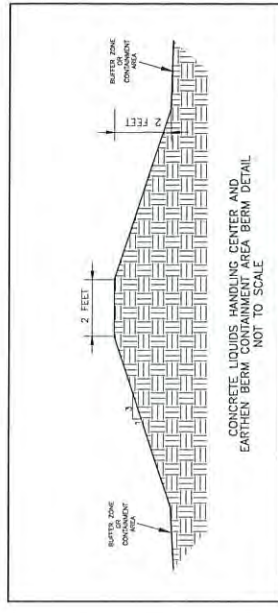
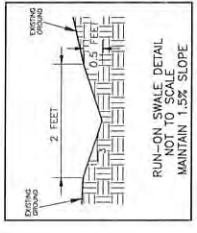








NOTE:
 1. ELEVATION BASED ON NAVD83 (GEOID09)
 2. BASIS OF BEARING DERIVED FROM COLORADO COORDINATE SYSTEM 1983 NORTH ZONE.
 3. SURVEY COMPLETED BY GOS CONSULTING, LLC.



- LEGEND**
- EXISTING WELL LOCATION
 - PROPOSED WELL LOCATION
 - EXISTING POWER POLE
 - EXISTING CONTOURS (2' INTERVAL)
 - FIRE LANE BOUNDARY
 - EXISTING PIPELINE
 - PROPOSED FENCE
 - EXISTING OVERHEAD POWER LINE
 - EXISTING BURIED POWER LINE
 - EXISTING BURIED TELEPHONE LINE
 - EXISTING BURIED FIBER OPTIC LINE
 - BUFFER ZONE BOUNDARY
 - PERIMETER BERM
 - FLOW DIRECTION

FIGURE 5
BERM AND SWALE PLAN
 DFMF #2 STREAR FARMS
 SW SEC 23 T2N, R67W, 6TH P.M.
 WELD COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP

Tables

TABLE 1
SOIL ANALYTICAL RESULTS
DFMP #2 STREAR FARMS
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Sample ID	Sample Date	NRC's Soil Type	TPH (mg/kg)	BTEX				pH	EC (mmhos/cm)	SAR	Metals											
				Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Xylenes (mg/kg)				Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium III (mg/kg)	Chromium VI (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
VS01@0-6"	10/15/2013	Valent Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	5.99	0.2750	0.34	0.736	26.8	< 0.0791	4.97	< 1.04	12.4	3.86	< 0.0390	3.76	< 0.0395	< 0.0791	22.9
VS01@6-12"	10/15/2013	Valent Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	6.33	0.0602	0.34	0.660	21.9	< 0.0771	3.96	< 1.07	8.27	4.02	< 0.0394	3.06	< 0.0386	< 0.0771	15.1
VL01@0-6"	10/15/2013	Vona Loamy Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	6.32	0.0378	0.24	0.653	20.0	< 0.0820	4.26	< 1.10	5.66	4.33	< 0.0416	3.39	< 0.0410	< 0.0820	13.5
VL01@6-12"	10/15/2013	Vona Loamy Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	7.26	0.0621	0.19	0.775	25.3	< 0.0837	5.06	< 1.11	3.72	3.24	< 0.0427	3.93	< 0.0418	< 0.0837	12.8
VS02@0-6"	10/15/2013	Valent Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	6.92	0.6040	0.13	0.762	59.0	0.1350	6.87	< 1.39	120	5.47	< 0.0517	7.74	0.2410	< 0.1060	156
VS02@6-12"	10/15/2013	Valent Sand	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	6.36	1.9900	0.41	0.823	44.9	0.1120	6.45	< 1.11	91.2	4.15	< 0.0411	6.24	0.2240	< 0.0832	116
LBL01@0-6"	10/15/2013	Loup-Boel Loamy Sands	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	6.96	1.3600	1.12	0.808	66.9	0.4250	7.12	< 1.40	446	4.62	< 0.0536	9.79	1.2700	< 0.1060	505
LBL01@6-12"	10/15/2013	Loup-Boel Loamy Sands	< 50	< 0.0020	< 0.0050	< 0.0050	< 0.0050	7.28	1.0400	1.10	0.707	32.0	< 0.0893	5.51	< 1.22	79.0	5.80	< 0.0455	4.39	0.1850	< 0.8093	87.4
Table 910-1 Allowable Concentrations			500	0.17	85	100	175	6-9	< 4	< 12	0.39	15,000	70	120,000	23	3,100	400	23	1,600	390	390	23,000

Notes:
< - Less than
mg/kg - milligrams per kilogram
mmhos/cm - millimhos per centimeter
SAR - Specific Absorption Rate
Bold numbers indicate result equaled or exceeded standard.



TABLE 2
GEOTECHNICAL RESULTS
DFMF #2 STREAR FARMS
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Sample ID	Sample Date	NRCS Soil Type	Porosity (%)	Permeability (cm/sec)	Moisture Content (%)	Organic Matter Content (%)	Soil Grain Size Distribution (by percentage)					
							2.000mm to > .850mm	.850mm to > .425mm	.425mm to > .250mm	.250mm to > .150mm	.150mm to > .075mm	Particles < .075mm
VS01@6-12"	10/15/2013	Valent Sand	34.155	0.0016	5.5	0.7	5.5	15.8	20.9	23.7	21.4	12.7
VLS01@6-12"	10/15/2013	Vona Loamy Sand	34.507	0.0015	6.4	0.4	1.6	9.2	23.2	27.6	23.1	15.3
VS02@6-12'	10/15/2013	Valent Sand	43.318	0.0017	1.4	6.5	4.2	14.5	21.3	21.8	18.4	19.8
LBLS01@6-12"	10/15/2013	Loup-Boel Loamy Sands	25.260	0.0014	0.4	1.3	3.3	13.6	19.3	23.6	22.1	18.1

Notes: < - less than
 > - greater than
 cm/sec - centimeters per second
 mm - millimeter
 % - percent

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
DFMF #2 STREAR FARMS
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Sample ID	Sample Date	BTEX					pH	Temp (°C)	S.C. (µS/cm-1)	Anions					Metals										
		Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Bromide (mg/L)				Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Ortho- phosphate (mg/L)	Sulfate (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Selenium (mg/L)	Silver (mg/L)	Mercury (mg/L)
MW01	12/5/2013	<1.0	<1.0	<1.0	<1.0	7.66	11.19	1841	0.247	38.3	2.40	25.0	0.0632	0.348	153	<0.03	0.0300	<0.005	53.0	<0.005	<0.01	26.4	0.0222	<0.005	<0.0002
MW02	12/5/2013	<1.0	<1.0	<1.0	<1.0	7.81	10.57	2117	0.339	50.0	2.58	133	0.0432	0.0848	246	0.00767	0.494	<0.005	285.0	0.0170	<0.01	85.7	0.0159	0.00103	0.0641
MW03	12/5/2013	<1.0	<1.0	<1.0	<1.0	7.83	11.78	1769	0.796	80.6	5.06	45.4	<0.100	<0.200	486	<0.03	0.0382	<0.005	91.1	0.00201	<0.01	42.4	0.0365	0.00108	<0.0002
MW04	12/5/2013	<1.0	<1.0	<1.0	<1.0	--	--	--	3.08	1150	<20.0	1.92	<2.00	6.53	2180	0.0274	0.267	0.00277	2270.0	1.04	<0.1	1040.0	0.176	0.0106	<0.0002
MW05	12/5/2013	<1.0	<1.0	<1.0	<1.0	7.77	9.96	2389	1.08	223.0	1.60	134	<0.100	<0.200	312	<0.03	0.0952	<0.005	196.0	0.00128	<0.01	87.2	0.367	0.00174	<0.0002
Table 910-1 Allowable Concentrations		5	1000	700	1400																				

Sample ID	Sample Date	BART									
		Nitrogen, Nitrate/Nitrite (mg/L)	Alkalinity, Total as CaCO ₃ (mg/L)	Bicarbonate alkalinity (CaCO ₃) (mg/L)	Carbonate alkalinity (CaCO ₃) (mg/L)	Total Dissolved Solids (mg/L)	Total Hardness as CaCO ₃ (mg/L)	Turbidity (NTU)	Iron Reducing Bacteria (CFU/ml)	Silica Forming Bacteria (CFU/ml)	Sulfate Reducing Bacteria (CFU/ml)
MW01	12/5/2013	17.2	336	336	<1.00	1240	241	884	74500	350000	700000
MW02	12/5/2013	122	526	526	<1.00	2350	1060	157	74500	350000	700000
MW03	12/5/2013	43.9	416	416	<1.00	1490	402	11.9	74500	350000	700000
MW04	12/5/2013	94.5	14600	14600	<10.0	11400	9940	1150	>140000	>350000	>700000
MW05	12/5/2013	127	310	310	<1.00	1810	847	29.1	74500	350000	700000

Notes:
 < - less than
 > - greater than
 C - Celsius
 CFU/ml - colony-forming units per milligram
 mg/L - milligram per liter
 NTU - Nephelometric Turbidity Unit
 Bold numbers indicate result equaled or exceeded standard.



TABLE 4
WATER WELLS WITHIN 1-MILE RADIUS OF SITE BOUNDARY
DFMF #2 STREAR FARMS
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Permit #	Permit Date	Distance From Property Line	Well Depth	Top of Screen	Bottom of Screen	Pump Rate	Static GW Level	Formation	Legals	Coordinates (x,y)
42470	8/10/1970	0.12 miles	400					ALL UNNAMED AQUIFERS	SENE Sec 23 T2N R67W	511887.9, 4441677.3
51479	2/2/1972	0.12 miles	750					ALL UNNAMED AQUIFERS	SWNW Sec 23 T2N R67W	511487.7, 4441678.8
174861	11/29/1993	0.32 miles	600	395	585	7	150	LARAMIE FOX HILLS	NESE Sec 23 T2N R67W	512612.4, 4441345.3
58239F	9/3/2002	0.36 miles	590	395	565	25	140	LARAMIE FOX HILLS	SENE Sec 23 T2N R67W	512644.6, 4441701.8
174860	11/29/1993	0.36 miles	590	395	565	25	140	LARAMIE FOX HILLS	SENE Sec 23 T2N R67W	512644.7, 4441711.3
34527	7/12/1968	0.37 miles	460			15	132	ALL UNNAMED AQUIFERS	NWNW Sec 23 T2N R67W	511491.3, 4442079.8
50639	1/11/1972	0.37 miles	432			14	90	ALL UNNAMED AQUIFERS	NENW Sec 23 T2N R67W	511891.0, 4442078.3
25374	9/17/1965	0.39 miles	382			4	70	ALL UNNAMED AQUIFERS	NENE Sec 22 T2N R67W	511092.1, 4442082.8
25191-F	2/13/1981	0.42 miles	516			20		LARAMIE FOX HILLS	SWNE Sec 22 T2N R67W	510694.1, 4441774.0
227273	7/17/2000	0.44 miles	75					ALL UNNAMED AQUIFERS	NESE Sec 23 T2N R67W	512813.4, 4441292.3
182924	10/31/1994	0.47 miles	52	414	521	15	191	LARAMIE FOX HILLS	SENE Sec 26 T2N R67W	511757.3, 4439924.3
199251	10/30/1996	0.5 miles	360			15		ALL UNNAMED AQUIFERS	NENE Sec 23 T2N R67W	512549.2, 4442138.3
40809	4/6/1970	0.52 miles	414			10	15	ALL UNNAMED AQUIFERS	NENE Sec 23 T2N R67W	512690.5, 4442074.8
289832	11/20/2012	0.54 miles	500					LARAMIE FOX HILLS	SENE Sec 26 T2N R67W	512825.0, 4440210.0
21066	8/6/1964	0.54 miles	475			20	148	ALL UNNAMED AQUIFERS	NWNE Sec 22 T2N R67W	510692.8, 4442087.3
273347	4/19/2007	0.56 miles	50					ALL UNNAMED AQUIFERS	NWSW Sec 24 T2N R67W	513001.9, 4441195.0
254876	1/22/2004	0.57 miles	415	305	415	12	94	LARAMIE FOX HILLS	NWSW Sec 24 T2N R67W	513012.5, 4441185.8
88816-A	12/29/1980	0.60 miles	527			13	160	ALL UNNAMED AQUIFERS	NWNW Sec 24 T2N R67W	512614.2, 4441987.0
266150	10/21/2005	0.61 miles	520	336	520	15	213	ALL UNNAMED AQUIFERS	SESW Sec 14 T2N R67W	511889.3, 4442486.5
88816	3/11/1977	0.61 miles						ALL UNNAMED AQUIFERS	NWNW Sec 24 T2N R67W	512924.1, 4442017.0
6575	8/3/1960	0.61 miles	475			12	96	ALL UNNAMED AQUIFERS	NWSW Sec 26 T2N R67W	511474.3, 4439675.3
23110	3/24/1965	0.62 miles	40			6	18	ALL UNNAMED AQUIFERS	NWNW Sec 25 T2N R67W	513082.1, 4440477.3
52954-F	12/3/1999	0.62 miles	600	450	600	30	325	LARAMIE FOX HILLS	NWSE Sec 27 T2N R67W	510786.3, 4439805.3
62408	6/10/1972	0.64 miles	508	425	508	14	100	ALL UNNAMED AQUIFERS	NWNW Sec 25 T2N R67W	513049.9, 4440296.3
289091	8/8/2012	0.67 miles	670					LARAMIE FOX HILLS	NESE Sec 26 T2N R67W	512728.4, 4439807.5
52955-F	2/3/1999	0.71 miles	620	435	620	15	286	LARAMIE FOX HILLS	NWSE Sec 27 T2N R67W	510542.4, 4439804.8
3374-AD	11/4/1972	0.72 miles	50					ALL UNNAMED AQUIFERS	SWNW Sec 25 T2N R67W	513081.1, 4440077.3
287199	12/6/2011	0.73 miles	520	400	520	14	330	LARAMIE FOX HILLS	NWSE Sec 26 T2N R67W	512399.9, 4439553.0
271324	10/25/2006	0.79 miles	480	410	480	9	250	LARAMIE FOX HILLS	NESE Sec 26 T2N R67W	512716.7, 4439571.0
222341-A	5/20/2008	0.8 miles	60	17	60	7	40	ALL UNNAMED AQUIFERS	NENW Sec 23 T2N R67W	513370.9, 4440605.0
291633	6/12/2013	0.83 miles	52	32	52	4	40	ALL UNNAMED AQUIFERS	SESW Sec 24 T2N R67W	513432.0, 4440742.0
10910-F	prior to 5/25/1966	0.86 miles	100			1400	27	ALL UNNAMED AQUIFERS	SWSW Sec 26 T2N R67W	511472.7, 4439275.3
229-AD	7/6/1966	0.87 miles	45					ALL UNNAMED AQUIFERS	SWSW Sec 13 T2N R67W	513092.5, 4442473.3
6228	6/23/1960	0.87 miles	100					ALL UNNAMED AQUIFERS	NENW Sec 23 T2N R67W	513481.0, 4440482.3
52953-F	12/3/1999	0.87 miles	610	405	610	30	205	LARAMIE FOX HILLS	NESW Sec 27 T2N R67W	510302.3, 4439682.3
13607-F	prior to 12/30/1968	0.88 miles	20			750	2	ALL UNNAMED AQUIFERS	NWSW Sec 25 T2N R67W	513080.3, 4439676.8
285951	6/16/2011	0.88 miles	518	438	518	11	370	LARAMIE FOX HILLS	SESE Sec 26 T2N R67W	512783.3, 4439442.0
118419-A	6/13/1983	0.91 miles	58	48	58		38	ALL UNNAMED AQUIFERS	NENW Sec 25 T2N R67W	513552.0, 4440516.0
38366-A	5/17/2004	0.92 miles	55	15	55	15	25	ALL UNNAMED AQUIFERS	SWSW Sec 13 T2N R67W	513075.4, 4442587.8
231762	2/23/2001	0.92 miles	45				30	ALL UNNAMED AQUIFERS	SESW Sec 13 T2N R67W	516624.2, 4442304.8
239449	12/1/2007	0.95 miles	415					LARAMIE FOX HILLS	NESE Sec 15 T2N R67W	511236.0, 4443013.4
118418	2/26/1981	0.96 miles	300					ALL UNNAMED AQUIFERS	NENW Sec 25 T2N R67W	513642.8, 4440639.3
243796	9/5/2002	0.97 miles	600	380	600	42	273	LARAMIE FOX HILLS	NENW Sec 25 T2N R67W	513618.7, 4440396.8
115196-A	10/18/1983	0.98 miles	58	40	60		38	ALL UNNAMED AQUIFERS	NENW Sec 25 T2N R67W	513654.0, 4440493.0
72389	11/8/1973	1.0 mile	60				30	ALL UNNAMED AQUIFERS	SWSW Sec 13 T2N R67W	513194.5, 4442660.0
40998	4/27/1970	on property	434	326	370	15	140	ALL UNNAMED AQUIFERS	NWSW Sec 23 T2N R67W	511484.0, 4441127.3

Attachment 1
Summit Scientific Laboratory Report - Soil

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 21, 2013

John Cocroft

LT Environmental, Inc.

4600 West 60th Avenue

Arvada, CO 80003

RE: KMG - DFMF #2 Strear Farms

Enclosed are the results of analyses for samples received by Summit Scientific on 10/15/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'JME' or similar, with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury For Joseph J Egry IV
Laboratory Director



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
US01@0-6"	R310149-01	Soil	10/15/13 11:00	10/15/13 17:00
US01@6-12"	R310149-02	Soil	10/15/13 11:05	10/15/13 17:00
ULS01@0-6"	R310149-03	Soil	10/15/13 11:30	10/15/13 17:00
ULS01@6-12"	R310149-04	Soil	10/15/13 11:35	10/15/13 17:00
US02@0-6"	R310149-05	Soil	10/15/13 12:00	10/15/13 17:00
US02@6-12"	R310149-06	Soil	10/15/13 12:05	10/15/13 17:00
LBLS01@0-6"	R310149-07	Soil	10/15/13 12:20	10/15/13 17:00
LBLS01@6-12"	R310149-08	Soil	10/15/13 12:25	10/15/13 17:00

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

S₂

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms

Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

R310149
Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Client: LTF
Address:
City/State/Zip:
Phone:
Project Manager: John Cocroft
E-Mail: jcocroft@summit-sc.com
Project Name: DFMF #2 Strear Farms
Project Number: 0142-13242

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative	Matrix	Analyze For:	Special Instructions
US0106-1 ^A	10/15	1100	2	HCl	Soil	TPH pH BTEX PC SAR 910-1 MCLs	
US0106-1 ^B	10/15	1105	2	None	Groundwater		
US0106-1 ^C	10/15	1130	2	None	Other (Specify)		
US0106-1 ^D	10/15	1135	2	None	Air - Canister Serial #		
US0106-1 ^E	10/15	1300	2	None			
US0106-1 ^F	10/15	1305	2	None			
US0106-1 ^G	10/15	1320	2	None			
US0106-1 ^H	10/15	1335	2	None			

Received by:	Date/Time:	Received by:	Date/Time:	Notes
John Cocroft	10/15/13 1700	John Cocroft	10/15/13 1700	
John Cocroft	10/15/13 1700	John Cocroft	10/15/13 1700	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@0-6"
R310149-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/17/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		100 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.736	0.0791	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@0-6"
R310149-01 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Barium	26.8	0.0791	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A
Cadmium	ND	0.0791	"	"	"	"	"	"
Chromium	6.01	0.395	"	"	"	"	"	"
Copper	12.4	0.395	"	"	"	"	"	"
Lead	3.86	0.0791	"	"	"	"	"	"
Nickel	3.76	0.0791	"	"	"	"	"	"
Selenium	ND	0.0395	"	"	"	"	"	"
Silver	ND	0.0791	"	"	"	"	"	"
Zinc	22.9	7.91	"	"	"	"	"	"

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0390	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.04	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	4.97	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@0-6"
R310149-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	8.63	8.42 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)
Magnesium	10.6	4.21	"	"	"	"	"
Sodium	6.38	4.21	"	"	"	"	"

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.340		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.275	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	5.99	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 11:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	96.0		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@6-12"
R310149-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.660	0.0771	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	21.9	0.0771	"	"	"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@6-12"
R310149-02 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	ND	0.0771	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Chromium	5.03	0.386	"	"	"	"	"	"	
Copper	8.27	0.386	"	"	"	"	"	"	
Lead	4.02	0.0771	"	"	"	"	"	"	
Nickel	3.06	0.0771	"	"	"	"	"	"	
Selenium	ND	0.0386	"	"	"	"	"	"	
Silver	ND	0.0771	"	"	"	"	"	"	
Zinc	15.1	7.71	"	"	"	"	"	"	

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0394	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.07	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	3.96	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US01@6-12"
R310149-02 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	ND	8.50 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	6.39	4.25	"	"	"	"	"	
Sodium	4.34	4.25	"	"	"	"	"	

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.340		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.0602	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.33	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 11:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	93.8		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@0-6"
R310149-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.1 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.653	0.0820	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	20.0	0.0820	"	"	"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@0-6"
R310149-03 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	ND	0.0820	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Chromium	5.36	0.410	"	"	"	"	"	"	
Copper	5.66	0.410	"	"	"	"	"	"	
Lead	4.33	0.0820	"	"	"	"	"	"	
Nickel	3.39	0.0820	"	"	"	"	"	"	
Selenium	ND	0.0410	"	"	"	"	"	"	
Silver	ND	0.0820	"	"	"	"	"	"	
Zinc	13.5	8.20	"	"	"	"	"	"	

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0416	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.10	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	4.26	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@0-6"
R310149-03 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	ND	8.85 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	4.87	4.43	"	"	"	"	"	"
Sodium	ND	4.43	"	"	"	"	"	"

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.240		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.0378	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.32	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	90.9		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@6-12"
R310149-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.6 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.775	0.0837	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	25.3	0.0837	"	"	"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@6-12"
R310149-04 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	ND	0.0837	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Chromium	6.17	0.418	"	"	"	"	"	"	
Copper	3.72	0.418	"	"	"	"	"	"	
Lead	3.24	0.0837	"	"	"	"	"	"	
Nickel	3.93	0.0837	"	"	"	"	"	"	
Selenium	ND	0.0418	"	"	"	"	"	"	
Silver	ND	0.0837	"	"	"	"	"	"	
Zinc	12.8	8.37	"	"	"	"	"	"	

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0427	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	1.11	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium+3 Calculated	5.06	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

ULS01@6-12"
R310149-04 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	9.49	8.71 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	14.7	4.35	"	"	"	"	"	"
Sodium	ND	4.35	"	"	"	"	"	"

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.190		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.0621	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.26	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 11:35

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	89.7		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@0-6"
R310149-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.4 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.762	0.106	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	59.0	0.106	"	"	"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@0-6"
R310149-05 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	0.135	0.106 mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A
Chromium	8.84	0.528 "	"	"	"	"	"
Copper	120	0.528 "	"	"	"	10/18/13	"
Lead	5.47	0.106 "	"	"	"	10/17/13	"
Nickel	7.74	0.106 "	"	"	"	"	"
Selenium	0.241	0.0528 "	"	"	"	"	"
Silver	ND	0.106 "	"	"	"	"	"
Zinc	156	10.6 "	"	"	"	"	"

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0517	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.39	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	7.45	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@0-6"
R310149-05 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	59.1	10.9 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	35.9	5.47	"	"	"	"	"	
Sodium	ND	5.47	"	"	"	"	"	

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.130		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.604	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.92	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 12:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	71.8		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@6-12"
R310149-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.823	0.0832	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	44.9	0.0832	"	"	"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@6-12"
R310149-06 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	0.112	0.0832 mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A
Chromium	6.87	0.416 "	"	"	"	"	"
Copper	91.2	0.416 "	"	"	"	10/18/13	"
Lead	4.15	0.0832 "	"	"	"	10/17/13	"
Nickel	6.24	0.0832 "	"	"	"	"	"
Selenium	0.224	0.0416 "	"	"	"	"	"
Silver	ND	0.0832 "	"	"	"	"	"
Zinc	116	8.32 "	"	"	"	"	"

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0411 mg/kg dry		1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.11 mg/kg dry		1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	5.76	1.00 mg/kg		1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

Summit Scientific

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Project Manager: John Cocroft

Reported:
10/21/13 15:49

US02@6-12"
R310149-06 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	97.4	8.91 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	72.5	4.46	"	"	"	"	"	
Sodium	22.1	4.46	"	"	"	"	"	

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.410		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.99	0.0100 mmhos/cm	I	3101705	10/17/13	10/17/13	SM 2510B		

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.36	0.100 pH Units	"	3101704	10/17/13	10/17/13	EPA 9045		

Date Sampled: 10/15/13 12:05

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	90.1		%	"	3101707	10/17/13	10/18/13	% calculation	

Summit Scientific

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Project: KMG - DFMF #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

LBLS01@0-6"
R310149-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		97.1 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Arsenic	0.808	0.106	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	66.9	0.106	"	"	"	"	"	"	

Summit Scientific

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Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

LBLS01@0-6"
R310149-07 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	0.425	0.106 mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A
Chromium	8.52	0.531 "	"	"	"	"	"
Copper	446	0.531 "	"	"	"	10/19/13	"
Lead	4.62	0.106 "	"	"	"	10/17/13	"
Nickel	9.79	0.106 "	"	"	"	"	"
Selenium	1.27	0.0531 "	"	"	"	"	"
Silver	ND	0.106 "	"	"	"	"	"
Zinc	505	10.6 "	"	"	"	"	"

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Mercury	ND	0.0536 mg/kg dry		1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	1.40 mg/kg dry		1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium+3 Calculated	7.12	1.00 mg/kg		1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

LBLS01@0-6"
R310149-07 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	61.3	11.4 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	67.9	5.71	"	"	"	"	"	
Sodium	53.6	5.71	"	"	"	"	"	

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.12		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.36	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	6.96	0.100	pH Units	"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	71.3		%	"	3101707	10/17/13	10/18/13	% calculation	

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Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

LBLS01@6-12"
R310149-08 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3101712	10/17/13	10/18/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		94.6 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	3101711	10/17/13	10/18/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Total Metals by EPA Method 6020 - Dry Weight Basis

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.707	0.0893	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Barium	32.0	0.0893	"	"	"	"	"	"	

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Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

LBS01@6-12"
R310149-08 (Soil)

Summit Scientific

Total Metals by EPA Method 6020 - Dry Weight Basis

Cadmium	ND	0.0893	mg/kg dry	1	3101603	10/16/13	10/17/13	EPA 6020A	
Chromium	6.73	0.447	"	"	"	"	"	"	
Copper	79.0	0.447	"	"	"	"	10/19/13	"	
Lead	5.80	0.0893	"	"	"	"	10/17/13	"	
Nickel	4.39	0.0893	"	"	"	"	"	"	
Selenium	0.185	0.0447	"	"	"	"	"	"	
Silver	ND	0.0893	"	"	"	"	"	"	
Zinc	87.4	8.93	"	"	"	"	"	"	

Total Mercury by EPA Method 7471/7470/245.1

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Mercury	ND	0.0455	mg/kg dry	1	3101701	10/17/13	10/17/13	EPA 7471	

Hexavalent Chromium by EPA 7196

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium, Hexavalent	ND	1.22	mg/kg dry	1	3101706	10/17/13	10/18/13	EPA 7196	

Calculated Analytes

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chromium+3 Calculated	5.51	1.00	mg/kg	1	3102106	10/21/13	10/21/13	Calculation	

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						

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Reported:
10/21/13 15:49

LBL01@6-12"
R310149-08 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis

Calcium	57.7	9.57 mg/kg dry	1	3101602	10/16/13	10/16/13	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	57.2	4.78	"	"	"	"	"	
Sodium	49.4	4.78	"	"	"	"	"	

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.10		units	"	3101607	10/16/13	10/16/13	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.04	0.0100 mmhos/cm		1	3101705	10/17/13	10/17/13	SM 2510B	

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.28	0.100 pH Units		"	3101704	10/17/13	10/17/13	EPA 9045	

Date Sampled: 10/15/13 12:25

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	82.2		%	"	3101707	10/17/13	10/18/13	% calculation	

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Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting			Spike Level	Source		%REC		RPD		Notes
		Limit	Units	Result		%REC	Limits	RPD	Limit			

Batch 3101712 - EPA 3550A

Blank (3101712-BLK1)

Prepared: 10/17/13 Analyzed: 10/18/13

C10-C28 (TEPH-DRO)	ND	50	mg/kg
C28-C36 (TEPH-ORO)	ND	50	"

LCS (3101712-BS1)

Prepared: 10/17/13 Analyzed: 10/18/13

C10-C28 (TEPH-DRO)	495	50	mg/kg	501	98.8	73-134
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LCS Dup (3101712-BSD1)

Prepared: 10/17/13 Analyzed: 10/18/13

C10-C28 (TEPH-DRO)	527	50	mg/kg	501	105	73-134	6.33	11
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Matrix Spike (3101712-MS1)

Source: R310149-01

Prepared: 10/17/13 Analyzed: 10/18/13

C10-C28 (TEPH-DRO)	464	50	mg/kg	501	ND	92.5	50-148
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Matrix Spike Dup (3101712-MSD1)

Source: R310149-01

Prepared: 10/17/13 Analyzed: 10/18/13

C10-C28 (TEPH-DRO)	456	50	mg/kg	501	ND	91.1	50-148	1.58	13
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Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101711 - EPA 5030 Soil MS

Blank (3101711-BLK1)

Prepared & Analyzed: 10/17/13

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0430		"	0.0397	108	23-173				
Surrogate: Toluene-d8	0.0390		"	0.0400	97.6	20-170				
Surrogate: 4-Bromofluorobenzene	0.0418		"	0.0400	104	21-167				

LCS (3101711-BS1)

Prepared: 10/17/13 Analyzed: 10/18/13

Benzene	0.0839	0.0020	mg/kg	0.100	83.9	58-130				
Toluene	0.0953	0.0050	"	0.100	95.3	61-134				
Ethylbenzene	0.116	0.0050	"	0.100	116	74-139				
m,p-Xylene	0.221	0.010	"	0.200	111	73-137				
o-Xylene	0.117	0.0050	"	0.100	117	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0430		"	0.0397	108	23-173				
Surrogate: Toluene-d8	0.0382		"	0.0400	95.6	20-170				
Surrogate: 4-Bromofluorobenzene	0.0405		"	0.0400	101	21-167				

LCS Dup (3101711-BSD1)

Prepared: 10/17/13 Analyzed: 10/18/13

Benzene	0.0859	0.0020	mg/kg	0.100	85.9	58-130	2.33	13		
Toluene	0.0976	0.0050	"	0.100	97.6	61-134	2.39	16		
Ethylbenzene	0.118	0.0050	"	0.100	118	74-139	2.33	12		
m,p-Xylene	0.225	0.010	"	0.200	113	73-137	1.92	14		
o-Xylene	0.118	0.0050	"	0.100	118	73-141	1.22	12		
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0397	108	23-173				
Surrogate: Toluene-d8	0.0381		"	0.0400	95.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400	101	21-167				

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Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101711 - EPA 5030 Soil MS

Matrix Spike (3101711-MS1) Source: R310149-01 Prepared: 10/17/13 Analyzed: 10/18/13

Benzene	0.0880	0.0020	mg/kg	0.100	ND	88.0	30-131		
Toluene	0.0992	0.0050	"	0.100	ND	99.2	30-134		
Ethylbenzene	0.118	0.0050	"	0.100	ND	118	22-153		
m,p-Xylene	0.225	0.010	"	0.200	ND	113	10-159		
o-Xylene	0.119	0.0050	"	0.100	ND	119	31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0446		"	0.0397		112	23-173		
Surrogate: Toluene-d8	0.0383		"	0.0400		95.8	20-170		
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	21-167		

Matrix Spike Dup (3101711-MSD1) Source: R310149-01 Prepared: 10/17/13 Analyzed: 10/18/13

Benzene	0.0875	0.0020	mg/kg	0.100	ND	87.5	30-131	0.615	34
Toluene	0.0994	0.0050	"	0.100	ND	99.4	30-134	0.272	30
Ethylbenzene	0.119	0.0050	"	0.100	ND	119	22-153	0.152	24
m,p-Xylene	0.225	0.010	"	0.200	ND	112	10-159	0.227	68
o-Xylene	0.119	0.0050	"	0.100	ND	119	31-151	0.0759	38
Surrogate: 1,2-Dichloroethane-d4	0.0445		"	0.0397		112	23-173		
Surrogate: Toluene-d8	0.0387		"	0.0400		96.7	20-170		
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	21-167		

Summit Scientific

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Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control
Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD	
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit	Notes

Batch 3101603 - EPA 3050B

Blank (3101603-BLK1)

Prepared: 10/16/13 Analyzed: 10/17/13

Arsenic	ND	0.100	mg/kg wet
Barium	ND	0.100	"
Cadmium	ND	0.100	"
Chromium	ND	0.500	"
Copper	ND	0.500	"
Lead	ND	0.100	"
Nickel	ND	0.100	"
Selenium	ND	0.0500	"
Silver	ND	0.100	"
Zinc	ND	10.0	"

LCS (3101603-BS1)

Prepared: 10/16/13 Analyzed: 10/17/13

Arsenic	2.51	0.100	mg/kg wet	2.48	101	80-120
Barium	231	0.100	"	223	104	80-120
Cadmium	0.867	0.100	"	0.994	87.2	80-120
Chromium	11.1	0.500	"	9.94	112	80-120
Copper	21.5	0.500	"	19.8	108	80-120
Lead	7.00	0.100	"	7.46	93.9	80-120
Nickel	15.9	0.100	"	14.9	107	80-120
Selenium	1.23	0.0500	"	1.24	99.0	80-120
Silver	0.239	0.100	"	0.248	96.5	80-120
Zinc	7.71	10.0	"	7.46	103	80-120

LCS Dup (3101603-BSD1)

Prepared: 10/16/13 Analyzed: 10/17/13

Arsenic	2.56	0.100	mg/kg wet	2.51	102	80-120	1.82	20
Barium	236	0.100	"	226	105	80-120	2.29	20
Cadmium	0.873	0.100	"	1.01	86.9	80-120	0.727	20
Chromium	11.3	0.500	"	10.1	112	80-120	1.41	20
Copper	21.4	0.500	"	20.1	107	80-120	0.300	20
Lead	7.11	0.100	"	7.54	94.3	80-120	1.47	20
Nickel	16.0	0.100	"	15.1	106	80-120	0.451	20
Selenium	1.25	0.0500	"	1.26	99.2	80-120	1.35	20
Silver	0.245	0.100	"	0.251	97.7	80-120	2.33	20
Zinc	7.80	10.0	"	7.54	103	80-120	1.17	20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Total Metals by EPA Method 6020 - Dry Weight Basis - Quality Control

Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101603 - EPA 3050B

Matrix Spike (3101603-MS1)

Source: R310149-01

Prepared: 10/16/13

Analyzed: 10/17/13

Arsenic	2.41	0.0790	mg/kg dry	1.98	0.736	84.6	75-125			
Barium	213	0.0790	"	178	26.8	105	75-125			
Cadmium	0.757	0.0790	"	0.792	0.0594	88.1	75-125			
Chromium	13.9	0.395	"	7.92	6.01	99.3	75-125			
Copper	32.6	0.395	"	15.8	12.4	128	75-125			QM-07
Lead	8.94	0.0790	"	5.94	3.86	85.5	75-125			
Nickel	15.7	0.0790	"	11.9	3.76	100	75-125			
Selenium	0.837	0.0395	"	0.990	0.0239	82.2	75-125			
Silver	0.171	0.0790	"	0.198	0.0288	72.1	75-125			QM-07
Zinc	27.5	7.90	"	5.94	22.9	77.8	75-125			

Matrix Spike Dup (3101603-MSD1)

Source: R310149-01

Prepared: 10/16/13

Analyzed: 10/17/13

Arsenic	2.38	0.0792	mg/kg dry	1.98	0.736	83.0	75-125	1.20	25	
Barium	214	0.0792	"	178	26.8	105	75-125	0.386	25	
Cadmium	0.750	0.0792	"	0.793	0.0594	87.1	75-125	0.958	25	
Chromium	14.4	0.396	"	7.93	6.01	105	75-125	3.44	25	
Copper	30.3	0.396	"	15.8	12.4	114	75-125	7.25	25	
Lead	9.16	0.0792	"	5.95	3.86	89.2	75-125	2.48	25	
Nickel	15.9	0.0792	"	11.9	3.76	102	75-125	1.28	25	
Selenium	0.837	0.0396	"	0.991	0.0239	82.0	75-125	0.0608	25	
Silver	0.168	0.0792	"	0.198	0.0288	70.3	75-125	1.96	25	QM-07
Zinc	28.6	7.92	"	5.95	22.9	95.9	75-125	3.87	25	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Total Mercury by EPA Method 7471/7470/245.1 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101701 - EPA 7471A

Blank (3101701-BLK1)

Prepared & Analyzed: 10/17/13

Mercury ND 0.0500 mg/kg wet

LCS (3101701-BS1)

Prepared & Analyzed: 10/17/13

Mercury 0.410 0.0500 mg/kg wet 0.400 103 80-120

LCS Dup (3101701-BSD1)

Prepared & Analyzed: 10/17/13

Mercury 0.406 0.0500 mg/kg wet 0.400 102 80-120 0.979 20

Matrix Spike (3101701-MS1)

Source: R310149-01

Prepared & Analyzed: 10/17/13

Mercury 0.321 0.0400 mg/kg dry 0.320 0.0109 96.9 80-120

Matrix Spike Dup (3101701-MSD1)

Source: R310149-01

Prepared & Analyzed: 10/17/13

Mercury 0.301 0.0392 mg/kg dry 0.313 0.0109 92.5 80-120 6.62 20

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Hexavalent Chromium by EPA 7196 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101706 - General Preparation

Blank (3101706-BLK1)

Prepared: 10/17/13 Analyzed: 10/18/13

Chromium, Hexavalent ND 1.00 mg/kg wet

LCS (3101706-BS1)

Prepared: 10/17/13 Analyzed: 10/18/13

Chromium, Hexavalent 113 1.25 mg/kg wet 117 96.4 85-115

LCS Dup (3101706-BSD1)

Prepared: 10/17/13 Analyzed: 10/18/13

Chromium, Hexavalent 111 1.25 mg/kg wet 118 94.0 85-115 1.83 20

Duplicate (3101706-DUP1)

Source: R310149-01 Prepared: 10/17/13 Analyzed: 10/18/13

Chromium, Hexavalent ND 1.04 mg/kg dry ND 20

Matrix Spike (3101706-MS1)

Source: R310149-01 Prepared: 10/17/13 Analyzed: 10/18/13

Chromium, Hexavalent 34.4 1.04 mg/kg dry ND 85-115 QM-05

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFME #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Soluble Nutrients by EPA 6020/Mod. USDA60 6(2, 3A) - Dry Weight Basis - Quality Control

Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 3101602 - General Preparation

Blank (3101602-BLK1)

Prepared & Analyzed: 10/16/13

Calcium	ND	10.0	mg/kg wet							
Magnesium	ND	5.00	"							
Sodium	ND	5.00	"							

LCS (3101602-BS1)

Prepared & Analyzed: 10/16/13

Calcium	383	10.0	mg/kg wet	399		95.9	80-120			
Magnesium	198	5.00	"	200		98.9	80-120			
Sodium	524	5.00	"	499		105	80-120			

LCS Dup (3101602-BSD1)

Prepared & Analyzed: 10/16/13

Calcium	380	10.0	mg/kg wet	400		95.0	80-120	0.745	20	
Magnesium	195	5.00	"	200		97.1	80-120	1.64	20	
Sodium	518	5.00	"	500		104	80-120	1.11	20	

Matrix Spike (3101602-MS1)

Source: R310149-01

Prepared & Analyzed: 10/16/13

Calcium	327	8.45	mg/kg dry	338	8.63	94.4	75-125			
Magnesium	179	4.22	"	169	10.6	99.6	75-125			
Sodium	444	4.22	"	422	6.38	104	75-125			

Matrix Spike Dup (3101602-MSD1)

Source: R310149-01

Prepared & Analyzed: 10/16/13

Calcium	320	8.44	mg/kg dry	337	8.63	92.3	75-125	2.43	25	
Magnesium	172	4.22	"	169	10.6	95.7	75-125	3.95	25	
Sodium	437	4.22	"	421	6.38	102	75-125	1.70	25	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 3101704 - General Preparation

LCS (3101704-BS1)

Prepared & Analyzed: 10/17/13

pH	8.04	0.100	pH Units	8.00	100	0-200
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Duplicate (3101704-DUP1)

Source: R310149-01

Prepared & Analyzed: 10/17/13

pH	6.05	0.100	pH Units	5.99	0.997	20
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Batch 3101705 - General Preparation

Blank (3101705-BLK1)

Prepared & Analyzed: 10/17/13

Specific Conductance (EC)	ND	0.0100	mmhos/cm
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Duplicate (3101705-DUP1)

Source: R310149-01

Prepared & Analyzed: 10/17/13

Specific Conductance (EC)	0.269	0.0100	mmhos/cm	0.275	2.39	20
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Batch 3101707 - General Preparation

Duplicate (3101707-DUP1)

Source: R310149-01

Prepared: 10/17/13 Analyzed: 10/18/13

% Solids	94.1		%	96.0	2.00	20
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Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

S₂

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: KMG - DFMM #2 Strear Farms
Project Number: 0142-13242
Project Manager: John Cocroft

Reported:
10/21/13 15:49

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The associated LCS and/or LCSD were within acceptance limits, therefore the data are considered valid.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Attachment 2
Advanced Terra Testing Laboratory Report - Soil

Moisture & Organic Content Determinations
ASTM D 2974

CLIENT: LT Environmental
LOCATION: DFMF #2 Strear Forms

JOB NO.: 2247-62

BORING	-	-
SAMPLE DEPTH	6-10"	6-10"
SAMPLE NO.	VLS01	VS01
DATE SAMPLED	10/15/13	10/15/13
DATE TESTED	10/24/13 CAL	10/24/13 CAL
PROJECT NO.	0142-13242	0142-13242

MOISTURE DETERMINATIONS

Wt. Wet Soil & Dish (gms)	348.98	350.29
Wt. Dry Soil & Dish (gms)	335.42	337.94
Net Loss of Moisture (gms)	13.56	12.35
Wt. of Dish (gms)	121.91	111.65
Wt. of Dry Soil (gms)	213.51	226.29
Moisture Content (%)	6.4	5.5

ORGANIC CONTENT DETERMINATIONS

Wt. Dry Soil & Dish (gms)	335.42	337.94
Wt. Ash & Dish (gms)	334.48	336.36
Wt. Organic Matter [A] (gms)	0.94	1.58
Wt. of Dish (gms)	121.91	111.65
Wt. of Ash [B] (gms)	212.57	224.71
Organic Matter Content (%)	0.4	0.7

$\% \text{ Organic Matter} = [A/(A+B)] * 100$

Data entered by:
Data checked by: TMR
FileName:

DAW
Date: 11/7/13
LTO0610V.WK4

Date: 11/07/2013



Moisture & Organic Content Determinations
ASTM D 2974

CLIENT: LT Environmental, Inc.
LOCATION: DFMF #2 Strear Forms

JOB NO.: 2247-62

BORING	-	-
SAMPLE DEPTH	6-10"	6-10"
SAMPLE NO.	LBLS01	VS02
DATE SAMPLED	-	10/15/13
DATE TESTED	10/21/13 TMR	10/21/13 TMR
SOIL DESCRIPTION	-	-

MOISTURE DETERMINATIONS

Wt. Wet Soil & Dish (gms)	309.91	297.23
Wt. Dry Soil & Dish (gms)	309.14	295.18
Net Loss of Moisture (gms)	0.77	2.05
Wt. of Dish (gms)	135.16	145.24
Wt. of Dry Soil (gms)	173.98	149.94
Moisture Content (%)	0.4	1.4

ORGANIC CONTENT DETERMINATIONS

Wt. Dry Soil & Dish (gms)	309.14	295.18
Wt. Ash & Dish (gms)	306.93	285.38
Wt. Organic Matter [A] (gms)	2.21	9.80
Wt. of Dish (gms)	135.16	145.24
Wt. of Ash [B] (gms)	171.77	140.14
Organic Matter Content (%)	1.3	6.5

% Organic Matter = $[A/(A+B)] \times 100$

Data entered by:
Data checked by: TMR
FileName:

DAW
Date: 11/7/13
LTO0L610.WK4

Date: 11/07/2013



Particle Size Analysis of Soils ASTM D 422

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VLS01
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 75.11
Weight of Dry Soil & Pan (g): 74.94
Weight of Water (g): 0.17
Weight of Pan (g): 3.02
Weight of Dry Soil (g): 71.92
Moisture (%): 0.2

General Sample Data

Total Wet Weight of Sample (g): 579.78
Total Dry Weight of Sample (g): 578.41
Calculated Weight Plus #200 (g): 489.95
Moisture of Total Sample (%): 0.2
Percent Retained #200 Sieve (%): 84.7

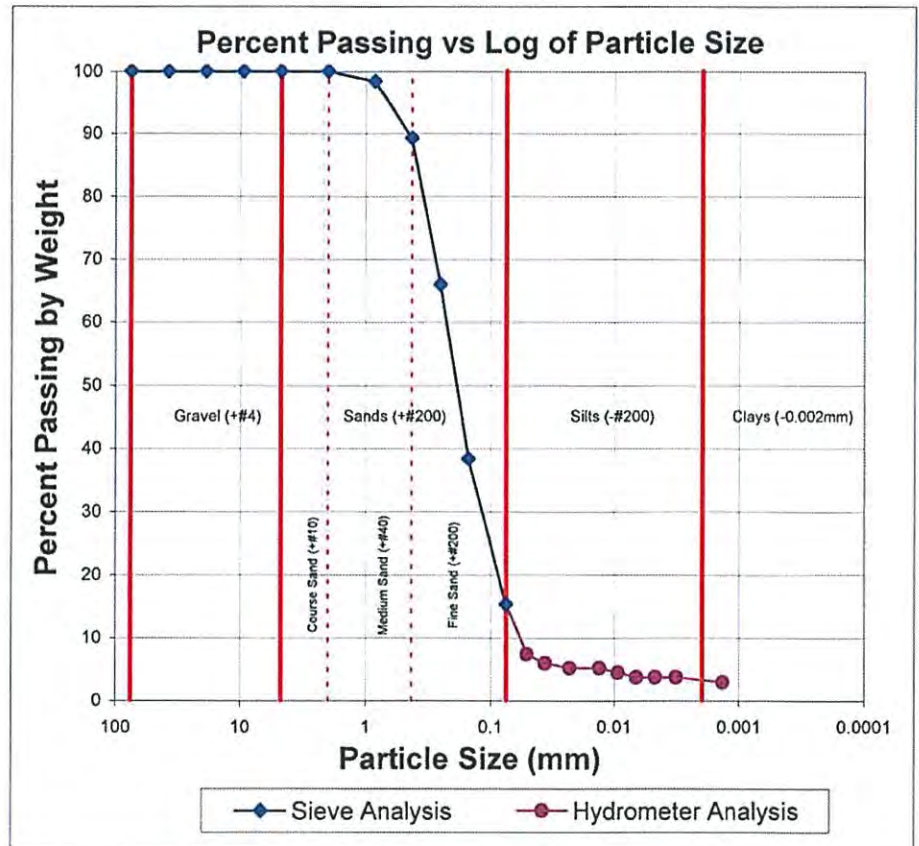
Plus Split Data

Original Weight of + #10 (g): 0.01
Calculated Weight of + #10 (g): 0.02

Minus Split Data

Original Weight of - #10 (g): 579.77
Calculated Dry Weight of - #10 (g): 578.39

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.02	0.00	0.02	0.02	100.0
68.209g split out of -#10 material.						
#20	0.850	4.20	3.10	1.11	9.40	98.4
#40	0.425	9.20	2.99	6.21	52.80	89.2
#60	0.250	18.90	3.05	15.85	134.72	66.0
#100	0.150	21.91	3.13	18.78	159.63	38.4
#200	0.075	18.90	3.21	15.69	133.38	15.3



Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_1.xls

Checked By: TMR
Date: 11/7/13

Particle Size Analysis of Soils **ASTM D 422**

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VLS01
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H	Total Wet Weight of Sample (g): 579.78
Specific Gravity: 2.65	Total Dry Weight of Sample (g): 578.41
Deflocculant: Sodium Hexametaphosphate	Wet Weight of Sub-Sample (g): 68.209
Deflocculant Correction: 5.0	Dry Weight of Sub-Sample (g): 68.048
Specific Gravity Correction Factor - α : 1.00	Corrected Dry Weight of Sub-Sample - W(g): 68.048

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
1	10.0	5.0	22.3	0.0133	14.65	0.0510	7.4	42.56	7.4
2	9.0	4.0	22.3	0.0133	14.82	0.0363	5.9	34.05	5.9
5	8.5	3.5	22.3	0.0133	14.90	0.0230	5.2	29.79	5.2
15	8.5	3.5	22.4	0.0133	14.90	0.0133	5.2	29.79	5.2
30	8.0	3.0	22.4	0.0133	14.98	0.0094	4.4	25.53	4.4
60	7.5	2.5	22.6	0.0133	15.06	0.0067	3.7	21.28	3.7
120	7.5	2.5	22.9	0.0133	15.06	0.0047	3.7	21.28	3.7
250	7.5	2.5	23.2	0.0132	15.06	0.0032	3.7	21.28	3.7
1443	7.0	2.0	22.1	0.0133	15.15	0.0014	2.9	17.02	2.9

Data Entered By: DAW
Date: 11/7/2013
File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_1.xls

Checked By: TJK
Date: 11/7/13

Particle Size Analysis of Soils **ASTM D 422**

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VS02
Sampled Date: 10/15/13
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 217.88
Weight of Dry Soil & Pan (g): 215.05
Weight of Water (g): 2.83
Weight of Pan (g): 6.55
Weight of Dry Soil (g): 208.50
Moisture (%): 1.4

General Sample Data

Total Wet Weight of Sample (g): 556.20
Total Dry Weight of Sample (g): 548.75
Calculated Weight Plus #200 (g): 440.14
Moisture of Total Sample (%): 1.4
Percent Retained #200 Sieve (%): 80.2

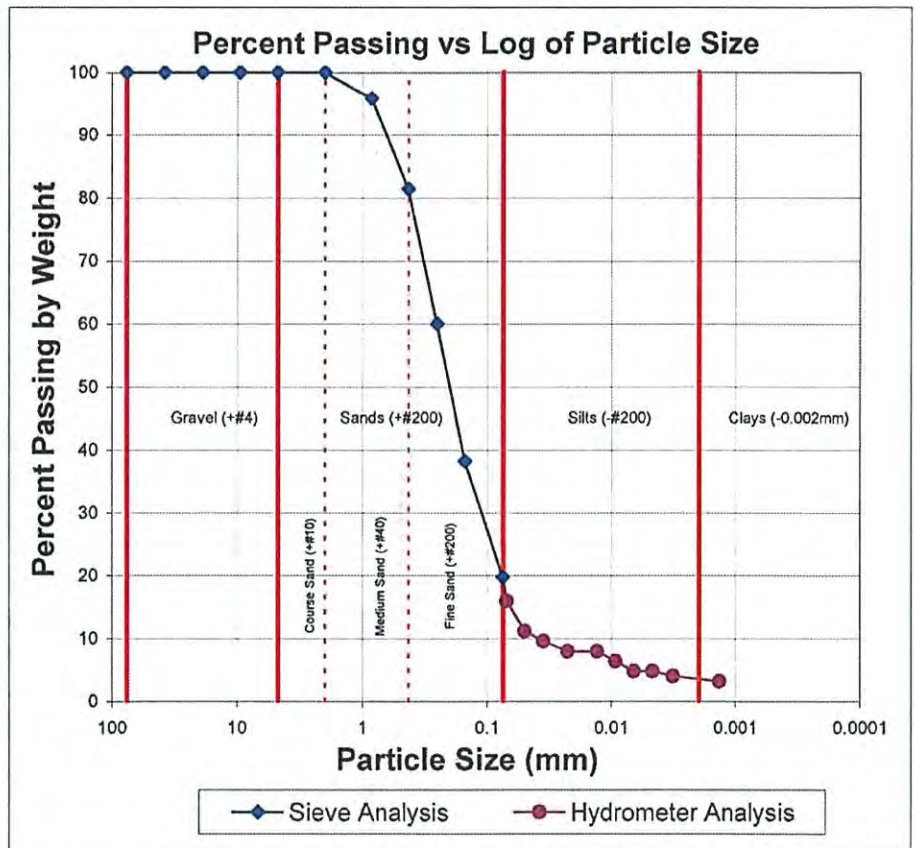
Plus Split Data

Original Weight of + #10 (g): 0.00
Calculated Weight of + #10 (g): 0.00

Minus Split Data

Original Weight of - #10 (g): 556.20
Calculated Dry Weight of - #10 (g): 548.75

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.00	0.00	0.00	0.00	100.0
63.74g split out of -#10 material.						
#20	0.850	5.67	3.02	2.65	23.14	95.8
#40	0.425	12.08	2.99	9.10	79.36	81.3
#60	0.250	16.64	3.21	13.43	117.17	60.0
#100	0.150	16.76	3.06	13.70	119.56	38.2
#200	0.075	14.63	3.07	11.57	100.92	19.8



Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_0.xls

Checked By: TAR

Date: 11/7/13



Particle Size Analysis of Soils ASTM D 422

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VS02
Sampled Date: 10/15/13
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α : 1.00

Total Wet Weight of Sample (g): 556.20
Total Dry Weight of Sample (g): 548.75
Wet Weight of Sub-Sample (g): 63.740
Dry Weight of Sub-Sample (g): 62.886
Corrected Dry Weight of Sub-Sample - W(g): 62.886

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	15.0	10.0	22.4	0.0133	13.83	0.0701	15.9	87.38	15.9
1	12.0	7.0	22.4	0.0133	14.33	0.0504	11.1	61.17	11.1
2	11.0	6.0	22.4	0.0133	14.49	0.0359	9.6	52.43	9.6
5	10.0	5.0	22.4	0.0133	14.65	0.0228	8.0	43.69	8.0
15	10.0	5.0	22.4	0.0133	14.65	0.0132	8.0	43.69	8.0
30	9.0	4.0	22.5	0.0133	14.82	0.0094	6.4	34.95	6.4
60	8.0	3.0	22.6	0.0133	14.98	0.0067	4.8	26.21	4.8
120	8.0	3.0	22.9	0.0133	14.98	0.0047	4.8	26.21	4.8
250	7.5	2.5	23.2	0.0132	15.06	0.0032	4.0	21.84	4.0
1440	7.0	2.0	22.1	0.0133	15.15	0.0014	3.2	17.48	3.2

Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_0.xls

Checked By: TWR
Date: 11/7/13

Particle Size Analysis of Soils **ASTM D 422**

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VS01
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 54.44
Weight of Dry Soil & Pan (g): 54.30
Weight of Water (g): 0.14
Weight of Pan (g): 3.16
Weight of Dry Soil (g): 51.14
Moisture (%): 0.3

General Sample Data

Total Wet Weight of Sample (g): 408.89
Total Dry Weight of Sample (g): 407.77
Calculated Weight Plus #200 (g): 356.15
Moisture of Total Sample (%): 0.3
Percent Retained #200 Sieve (%): 87.3

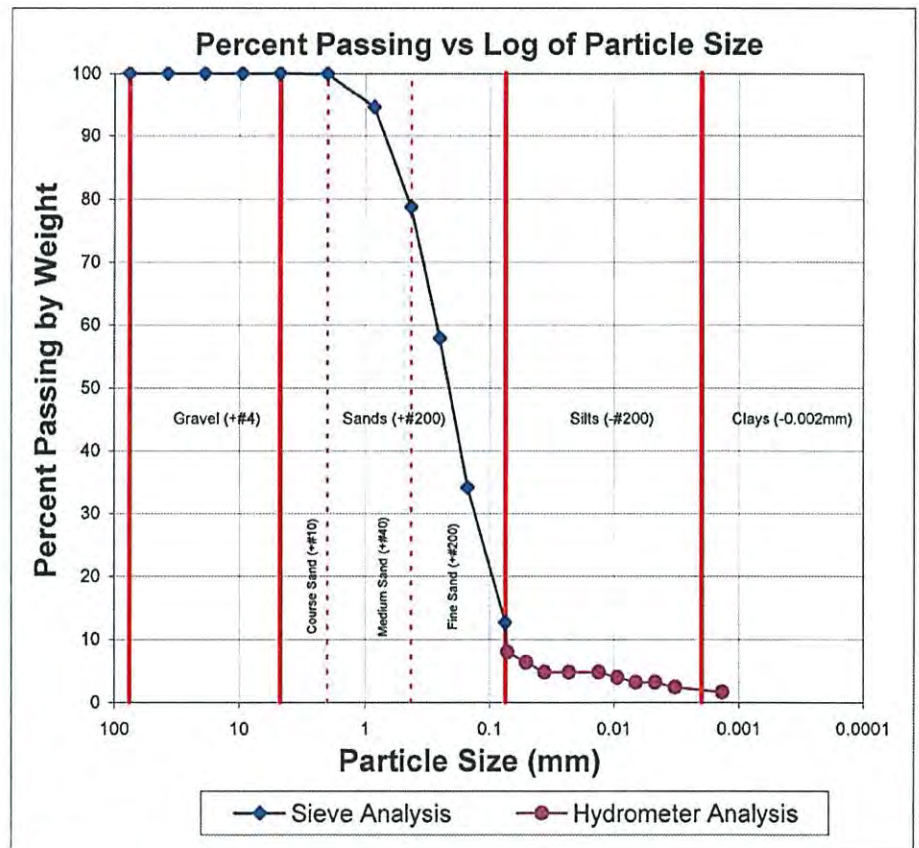
Plus Split Data

Original Weight of + #10 (g): 0.17
Calculated Weight of + #10 (g): 0.15

Minus Split Data

Original Weight of - #10 (g): 408.72
Calculated Dry Weight of - #10 (g): 407.62

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.15	0.00	0.15	0.15	100.0
63.362g split out of -#10 material.						
#20	0.850	5.24	1.78	3.47	22.35	94.5
#40	0.425	11.78	1.77	10.00	64.53	78.7
#60	0.250	14.92	1.75	13.17	84.96	57.8
#100	0.150	16.79	1.79	15.00	96.75	34.1
#200	0.075	15.33	1.78	13.55	87.41	12.7



Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_2.xls

Checked By: TAP

Date: 11/7/13

Particle Size Analysis of Soils **ASTM D 422**

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: VS01
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H	Total Wet Weight of Sample (g): 408.89
Specific Gravity: 2.65	Total Dry Weight of Sample (g): 407.77
Deflocculant: Sodium Hexametaphosphate	Wet Weight of Sub-Sample (g): 63.362
Deflocculant Correction: 5.0	Dry Weight of Sub-Sample (g): 63.189
Specific Gravity Correction Factor - α : 1.00	Corrected Dry Weight of Sub-Sample - W(g): 63.189

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	10.0	5.0	22.5	0.0133	14.65	0.0721	7.9	32.31	7.9
1	9.0	4.0	22.5	0.0133	14.82	0.0513	6.3	25.85	6.3
2	8.0	3.0	22.5	0.0133	14.98	0.0365	4.8	19.39	4.8
5	8.0	3.0	22.5	0.0133	14.98	0.0231	4.8	19.39	4.8
15	8.0	3.0	22.5	0.0133	14.98	0.0133	4.8	19.39	4.8
30	7.5	2.5	22.8	0.0133	15.06	0.0094	4.0	16.16	4.0
60	7.0	2.0	22.8	0.0133	15.15	0.0067	3.2	12.92	3.2
120	7.0	2.0	23.0	0.0132	15.15	0.0047	3.2	12.92	3.2
250	6.5	1.5	23.2	0.0132	15.23	0.0033	2.4	9.69	2.4
1440	6.0	1.0	22.2	0.0133	15.31	0.0014	1.6	6.46	1.6

Data Entered By: DAW
Date: 11/7/2013
File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_2.xls

Checked By: TMP
Date: 11/7/13

Particle Size Analysis of Soils ASTM D 422

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: LBL501
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Grain Size Data

Hygroscopic Moisture of Fines

Weight of Wet Soil & Pan (g): 159.18
Weight of Dry Soil & Pan (g): 158.52
Weight of Water (g): 0.66
Weight of Pan (g): 6.47
Weight of Dry Soil (g): 152.05
Moisture (%): 0.4

General Sample Data

Total Wet Weight of Sample (g): 790.50
Total Dry Weight of Sample (g): 787.08
Calculated Weight Plus #200 (g): 644.32
Moisture of Total Sample (%): 0.4
Percent Retained #200 Sieve (%): 81.9

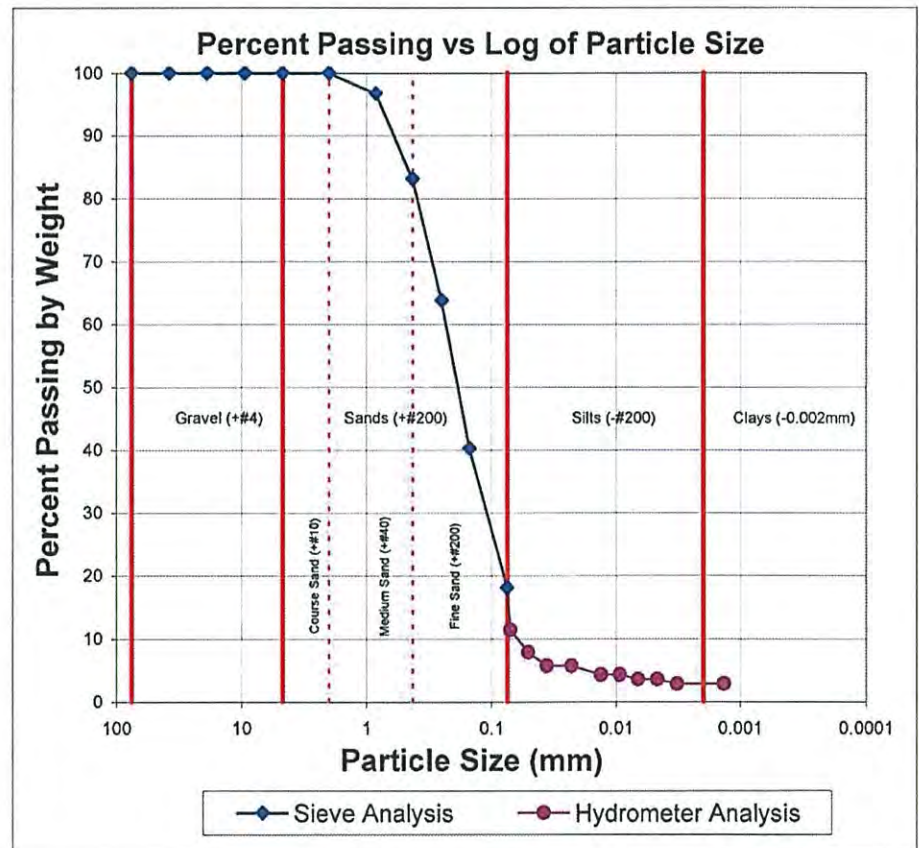
Plus Split Data

Original Weight of + #10 (g): 0.00
Calculated Weight of + #10 (g): 0.00

Minus Split Data

Original Weight of - #10 (g): 790.50
Calculated Dry Weight of - #10 (g): 787.08

Sieve Number	Sieve Size (mm)	Weight of Retained Soil & Pan (g)	Weight of Pan (g)	Weight of Retained Soil (g)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
3"	76.2	0.00	0.00	0.00	0.00	100.0
1.5"	38.10	0.00	0.00	0.00	0.00	100.0
3/4"	19.05	0.00	0.00	0.00	0.00	100.0
3/8"	9.525	0.00	0.00	0.00	0.00	100.0
#4	4.750	0.00	0.00	0.00	0.00	100.0
#10	2.000	0.00	0.00	0.00	0.00	100.0
70.64g split out of -#10 material.						
#20	0.850	4.14	1.79	2.35	26.25	96.7
#40	0.425	11.34	1.77	9.56	106.99	83.1
#60	0.250	15.37	1.78	13.59	152.06	63.8
#100	0.150	18.31	1.76	16.55	185.19	40.2
#200	0.075	17.29	1.76	15.53	173.82	18.1



Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_3.xls

Checked By: TWR
Date: 11/7/13

Particle Size Analysis of Soils ASTM D 422

Client: LT Environmental Inc.
Job Number: 2247-62
Project: --
Location: DFMF #2 Strear Forms
Project Number: 0142-13242

Boring Number: --
Depth: 6-10"
Sample Number: LBLS01
Sampled Date: --
Test Date: 10/26/13

Sampled By: --
Technician: SKL

Hydrometer Data

Test Configuration

Hydrometer Type: 152H
Specific Gravity: 2.65
Deflocculant: Sodium Hexametaphosphate
Deflocculant Correction: 5.0
Specific Gravity Correction Factor - α : 1.00

Total Wet Weight of Sample (g): 790.50
Total Dry Weight of Sample (g): 787.08
Wet Weight of Sub-Sample (g): 70.640
Dry Weight of Sub-Sample (g): 70.335
Corrected Dry Weight of Sub-Sample - W(g): 70.335

Elapsed Time (min)	Hydrometer Reading	Corrected Hydrometer Reading	Temperature (°C)	Temperature Coefficient (K)	Effective Depth (L)	Grain Diameter (mm)	Percent in Suspension (%)	Calculated Weight of Retained Soil (g)	Percent Passing by Weight (%)
0	-	-	-	-	-	-	-	-	-
0.5	13.0	8.0	22.4	0.0133	14.16	0.0709	11.4	89.65	11.4
1	10.5	5.5	22.4	0.0133	14.57	0.0508	7.8	61.63	7.8
2	9.0	4.0	22.4	0.0133	14.82	0.0363	5.7	44.82	5.7
5	9.0	4.0	22.5	0.0133	14.82	0.0229	5.7	44.82	5.7
15	8.0	3.0	22.5	0.0133	14.98	0.0133	4.3	33.62	4.3
30	8.0	3.0	22.6	0.0133	14.98	0.0094	4.3	33.62	4.3
60	7.5	2.5	22.7	0.0133	15.06	0.0067	3.6	28.01	3.6
120	7.5	2.5	23.0	0.0132	15.06	0.0047	3.6	28.01	3.6
250	7.0	2.0	23.3	0.0132	15.15	0.0032	2.8	22.41	2.8
1440	7.0	2.0	22.1	0.0133	15.15	0.0014	2.8	22.41	2.8

Data Entered By: DAW

Date: 11/7/2013

File Name: 2247_62_hydrometer-ASTM-D422-R0.xls_3.xls

Checked By: TMR
Date: 11/7/13

PERMEABILITY DETERMINATION
FALLING HEAD
FIXED WALL

CLIENT LT Environmental Inc.

JOB NO. 2247-62

BORING NO.	-	SAMPLED	10/15/13
DEPTH	6-10"	TEST STARTED	10/18/13 DPM
SAMPLE NO.	VS02	TEST FINISHED	10/18/13 DPM
SOIL DESCR.	0142-13242	SETUP NO.	#6
LOCATION	DFMF#2 Strear Forms	SURCHARGE (psf)	500 PSF

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Wet Soil & Ring(s) (g)	623.9	655.3	
Wt. Ring(s) (g)	497.8	497.8	
Wt. Wet Soil (g)	126.1	157.4	
Wt. Dry Soil & Pan (g)	123.8	123.8	
Wt. Lost Moisture (g)	9.0	40.3	
Wt. of Pan Only (g)	6.7	6.7	
Wt. of Dry Soil (g)	117.1	117.1	
Moisture Content %	7.7	34.4	
Sample Diameter	in	1.938	cm 4.923
Initial Height	in	2.000	cm 5.080
Final Height	in	1.926	cm 4.892
Sample Area	sq. in	2.950	sq. cm 19.031
Wet Density PCF		81.4	105.6
Dry Density PCF		75.6	78.5

Porosity (%) 43.318

ELAPSED TIME (MIN)	BURETTE READING h1 (CC)	BURETTE READING h2 (CC)	PERCOLATION RATE FT/YEAR	CM/SEC
	60.8			
2	60.8	92.6	1633.20	1.6E-03
2	57.9	94.1	1730.25	1.7E-03
2	60.5	92.8	1765.65	1.7E-03
2	59.4	94.5	1769.09	1.7E-03
2		93.3	1736.41	1.7E-03

Average Last 4 values 1.7E-03

NOTES: Fines washed out of the sample.
Permeability is close to the capacity of the pemeameter pore stones.

Data Entered By: TWR DPM/CAL Date: 11/07/2013
Date Checked By: TWR Date: 11/7/13
Filename: LTF0US02



PERMEABILITY DETERMINATION
FALLING HEAD
FIXED WALL

CLIENT LT Environmental Inc.

JOB NO. 2247-62

BORING NO. -
DEPTH 6-10"
SAMPLE NO. LBLS01
SOIL DESCR. 0142-13242
LOCATION DFMF#2 Strear Forms

SAMPLED 10/15/13
TEST STARTED 10/18/13 DPM
TEST FINISHED 10/18/13 DPM
SETUP NO. #1
SURCHARGE (psf) 500PSF

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Wet Soil & Ring(s) (g)	688.3	692.5
Wt. Ring(s) (g)	487.1	487.1
Wt. Wet Soil (g)	201.3	205.4
Wt. Dry Soil & Pan (g)	188.9	188.9
Wt. Lost Moisture (g)	20.6	24.7
Wt. of Pan Only (g)	8.2	8.2
Wt. of Dry Soil (g)	180.7	180.7
Moisture Content %	11.4	13.7

Sample Diameter	in	1.938	cm	4.923
Initial Height	in	2.000	cm	5.080
Final Height	in	1.992	cm	5.060
Sample Area	sq. in	2.950	sq. cm	19.031

Wet Density PCF	130.0	133.2
Dry Density PCF	116.7	117.2

Porosity (%) 25.620

ELAPSED TIME (MIN)	BURETTE READING h1 (CC)	BURETTE READING h2 (CC)	PERCOLATION RATE	
			FT/YEAR	CM/SEC
	2.2			
30	12.9	12.9	19.62	1.9E-05
60	29.3	29.3	16.59	1.6E-05
61	43.0	43.0	15.38	1.5E-05
91	59.8	59.8	14.56	1.4E-05
60	69.4	69.4	14.48	1.4E-05
60		77.8	14.10	1.4E-05

NOTE: The fines are washing out of the sample.

Data Entered By: DPM/DAW Date: 11/07/2013
Date Checked By: TWR Date: 11/7/13
Filename: LTF0LS01.WK4



PERMEABILITY DETERMINATION
FALLING HEAD
FIXED WALL

CLIENT LT Environmental Inc.

JOB NO. 2247-62

BORING NO. -
DEPTH 6-10"
SAMPLE NO. VL501
SOIL DESCR. 0142-13242
LOCATION DFMF#2 Strear Forms

SAMPLED -
TEST STARTED 10/23/13 CAL
TEST FINISHED 10/23/13 CAL
SETUP NO. #4
SURCHARGE (psf) 500PSF

MOISTURE/DENSITY DATA		BEFORE TEST	AFTER TEST	
Wt. Wet Soil & Ring(s) (g)		661.5	682.9	
Wt. Ring(s) (g)		488.1	488.1	
Wt. Wet Soil (g)		173.3	194.8	
Wt. Dry Soil & Pan (g)		175.6	175.6	
Wt. Lost Moisture (g)		11.5	33.0	
Wt. of Pan Only (g)		13.8	13.8	
Wt. of Dry Soil (g)		161.8	161.8	
Moisture Content %		7.1	20.4	
Sample Diameter	in	1.938	cm	4.923
Initial Height	in	2.000	cm	5.080
Final Height	in	1.976	cm	5.019
Sample Area	sq. in	2.950	sq. cm	19.031
Wet Density PCF		111.9		127.3
Dry Density PCF		104.5		105.8

Porosity (%) 34.507

ELAPSED TIME (MIN)	BURETTE READING h1 (CC)	BURETTE READING h2 (CC)	PERCOLATION RATE FT/YEAR	CM/SEC
	68.0			
1	78.0	86.4	1932.86	1.9E-03
1	78.0	93.2	1793.92	1.7E-03
1	78.0	92.4	1688.69	1.6E-03
1	78.0	92.0	1636.60	1.6E-03
1	78.0	91.4	1559.09	1.5E-03
1	79.0	91.4	1559.09	1.5E-03
1		92.2	1556.25	1.5E-03
Average last 4 values				1.5E-03

NOTE: The fines are washing out of the sample.

Data Entered By: CAL/DAW Date: 11/07/2013
Date Checked By: TMR Date: 11/13/13
Filename: LTFHP-3



PERMEABILITY DETERMINATION
FALLING HEAD
FIXED WALL

CLIENT LT Environmental Inc.

JOB NO. 2247-62

BORING NO.	-	SAMPLED	-
DEPTH	6-10"	TEST STARTED	10/24/13 CAL
SAMPLE NO.	VSO1	TEST FINISHED	10/24/13 CAL
SOIL DESCR.	0142-13242	SETUP NO.	#4
LOCATION	DFMF#2 Strear Forms	SURCHARGE (psf)	500PSF

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST	
Wt. Wet Soil & Ring(s) (g)	660.3	684.4	
Wt. Ring(s) (g)	487.9	487.9	
Wt. Wet Soil (g)	172.3	196.4	
Wt. Dry Soil & Pan (g)	177.5	177.5	
Wt. Lost Moisture (g)	8.6	32.7	
Wt. of Pan Only (g)	13.8	13.8	
Wt. of Dry Soil (g)	163.7	163.7	
Moisture Content %	5.3	20.0	
Sample Diameter	in	1.938	cm 4.923
Initial Height	in	2.000	cm 5.080
Final Height	in	1.983	cm 5.037
Sample Area	sq. in	2.950	sq. cm 19.031
Wet Density PCF		111.3	127.9
Dry Density PCF		105.7	106.6

Porosity (%) 34.155

ELAPSED TIME (MIN)	BURETTE READING h1 (CC)	BURETTE READING h2 (CC)	PERCOLATION RATE FT/YEAR	CM/SEC
	77.0			
1	77.0	95.1	2162.15	2.1E-03
1	77.0	94.2	2039.59	2.0E-03
1	77.0	93.4	1932.21	1.9E-03
1	77.0	93.0	1879.06	1.8E-03
1	77.0	92.4	1799.99	1.7E-03
1	77.0	92.0	1747.71	1.7E-03
1	77.0	91.8	1721.70	1.7E-03
1	77.0	91.4	1669.93	1.6E-03
1	77.0	91.4	1669.93	1.6E-03
1		92.0	1747.71	1.7E-03

Average last 4 values 1.6E-03

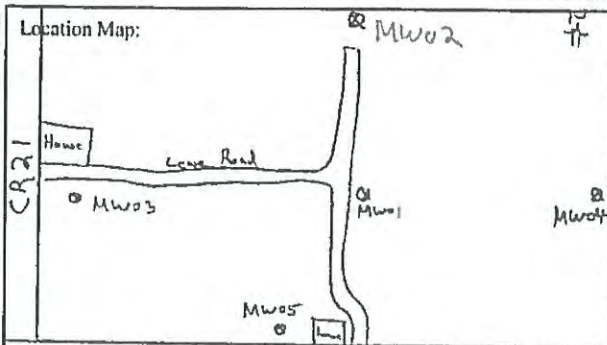
NOTE: The fines are washing out of the sample.

Data Entered By: CAL/DAW Date: 11/07/2013
Date Checked By: TWR Date: 11/7/13
Filename: LTFHP-4



Attachment 3
Soil Boring Logs

Location Map:



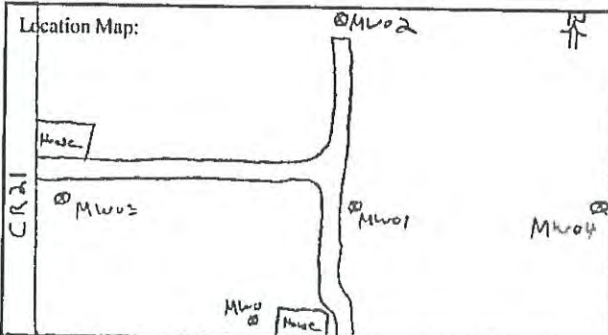
Compliance | Engineering | Remediation
 LT Environmental, Inc.
 4400 West 46th Ave.
 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	MW01	Project:	DFMF #2 Strear
Date:	9/20/2013	Project Number:	14213242
Logged By:	Jeremy Espinoza	Drilled By:	ACI
Drilling Method:	Direct Push	Sampling Method:	Continuous
Seal:	bentonite	Grout:	Cement
Casing Type:	PVC	Diameter:	1"
Screen Type:	PVC	Length:	10'
Slot:	0.01	Hole Diameter:	3"
		Total Depth:	25'
		Depth to Liquid:	16'
		Depth to Water:	16'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-7 Potholed, not logged	
					2				
					4				
					6				
	Moist	0.0	None	NA	8	5/5	SP	7-15' Fine sand, med brown, moist, no stain, no odor	
		0.0			10			15'-21' Sandy clay, grey, moist, low cohesion, med plasticity, no stain, no odor	
		0.0			12			- Wet at 16'	
		0.0			14	5/5	CL	- 1' stringer of med sand from 19-20'	
					16				
					18				
					20	4/4			
					22				
					24				
					26				
					28				
					30				

Location Map:



Compliance, Engineering, Remediation
 LT Environmental, Inc.
 4400 West 46th Ave.
 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

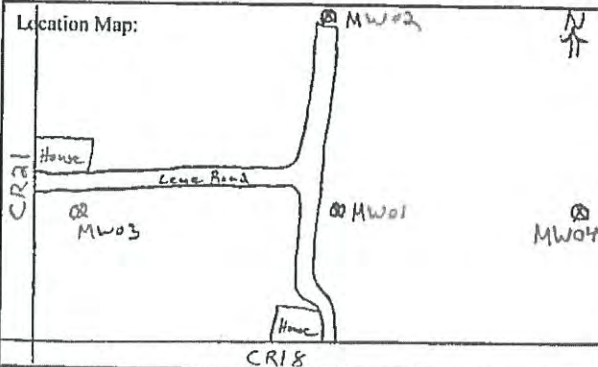
Boring/Well Number:	MW02	Project:	DFMF #2 Strear
Date:	9/20/2013	Project Number:	14213242
Logged By:	Jeremy Espinoza	Drilled By:	ACI
Drilling Method:	Direct Push	Sampling Method:	Continuous
Seal:	bentonite	Grout:	Cement
Casing Type:	PVC	Diameter:	1"
Screen Type:	PVC	Length:	15'
Gravel Pack:	silica sand	Hole Diameter:	3"
Elevation:		Total Depth:	85'
Detector:	MiniRae 2000 PID	Depth to Liquid:	
Slot:	0.01	Depth to Water:	16'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-7' Patholed, not logged	
					2				
					4			7-10' fine sand, med brown, moist, no skin, no odor	
					6				
	moist	0.0	None	NA	8		SP	10'-20' Sandy clay, med brown moist, med cohesion, med plasticity, no skin, no odor 16'	
					10	5/5			
					12				
					14	5/5	CL	20'-25' Claystone, grey, wet, blocky, no skin, no odor	
					16				
					18	4/4			
					20				
					22	4/4			
					24				
					26				
					28				
					30				

<p>Location Map:</p>		<p>Compliance, Engineering, Remediation LT Environmental, Inc. 4400 West 46th Ave. Denver, Colorado 80212</p>	
BORING LOG/MONITORING WELL COMPLETION DIAGRAM			
Boring/Well Number: MW03		Project: DFMF #2 Strear	
Date: 9/20/2013		Project Number: 14213242	
Logged By: Jeremy Espinoza		Drilled By: ACI	
Drilling Method: Direct Push		Sampling Method: Cuttings	
Elevation: CR1X		Seal: bentonite	
Detector: MiniRae 2000 PID		Grout: Cement	
Gravel Pack: silica sand		Diameter: 1"	
Casing Type: PVC		Length: 10'	
Screen Type: PVC		Hole Diameter: 3"	
Slot: 0.01		Depth to Liquid: —	
Diameter: 1"		Total Depth: 25'	
Length: 15'		Depth to Water: 18'	

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-7' Potholed, not logged	
					2				
					4			7-10' Fine sand, med brown, moist, no stain, no odor	
					6				
	Moist	0.0	None	NA	8	5	SP	10'-15' Sandy clay, med brown, moist, high cohesion, med plasticity, no stain, no odor	
					10	5	CL		
		0.0			12				
					14	4	SP	15'-25' Fine sand, med brown to grey, wet at 18', no stain, no odor	
		0.0			16	4			
	Wet	0.0			18	3		- 6" Stringer of clay at 17'	
					20	3		- 6" Stringer of sandy clay at 20' and 22'	
		0.0			22	3			
					24	3			
		0.0			26				
					28			25'-25' Claystone, grey, blocky, wet, no stain, no odor	
					30				

Location Map:



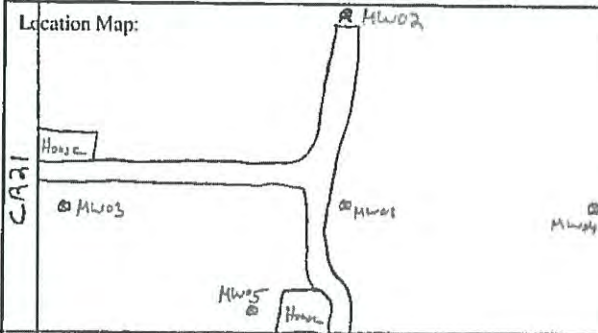
Compliance, Engineering, Remediation
 LT Environmental, Inc.
 4400 West 46th Ave.
 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	MW04	Project:	DFMF #2 Strear
Date:	9/20/2013	Project Number:	14213242
Logged By:	Jeremy Espinoza	Drilled By:	ACI
Drilling Method:	Direct Push	Sampling Method:	Continuous
Seal:	bentonite	Grout:	Cement
Casing Type:	PVC	Diameter:	1"
Screen Type:	PVC	Length:	10'
Slot:	0.01	Hole Diameter:	3"
		Total Depth:	25'
		Depth to Liquid:	> 7'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-7' Potholed, not logged	
					2				
					4				
					6			7-10' fine sand, black, wet, organics, odor	
	wet	138.1	Black	NA	8	5	SP	10-13' fine sand, med brown, wet, no skin, odor	
			None		10	5			
					12			13'-20' Sandy clay, med brown, wet, med cohesion, high plasticity	
		0.0			14	5	CH		
					16	5			
		0.0			18			20'-25' Claystone, grey, blocky, wet, no skin, no odor	
					20	5			
		0.0			22				
					24	3			
					26	3			
					28				
					30				

Location Map:



Compliance, Engineering, Remediation
 LT Environmental, Inc.
 4400 West 46th Ave.
 Denver, Colorado 80212

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number:	MW05	Project:	DFMF #2 Stream
Date:	4/23/2013 9/20/2013	Project Number:	14213242
Logged By:	Jeremy Espinoza	Drilled By:	ACI
Drilling Method:	Direct Push	Sampling Method:	Continuous
Seal:	bentonite	Grout:	Cement
Casing Type:	PVC	Diameter:	1"
Screen Type:	PVC	Length:	15'
Slot:	0.01	Hole Diameter:	3"
Gravel Pack:	silica sand	Total Depth:	25'
Elevation:		Depth to Liquid:	
Detector:	MiniRae 2000 PID	Depth to Water:	12'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run Accuracy	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-7' Patholed, no logged	
					2				
					4				
					6				
	Moist		None	NA	8	5/5	SP	7-16' Fine sand, med brown, moist, no stain, no odor	
	↓	0.0			10	5/5		- wet at 12'	
	wet				12			- 1' stringer of sandy clay at 13'	
		0.0			14	5/5	CL	16'-25' Sandy clay, med brown, wet, mod cohesion, mod plasticity, no stain, no odor	
					16				
		0.0			18	4/4			
					20	4/4			
		0.0			22	4/4	ML	23'-25' Gravelly clay, med brown, wet, high cohesion, low plasticity, no stain, no odor	
					24				
					26				
					28				
					30				

Attachment 4
Origins Laboratory Report – Groundwater



December 18, 2013

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - DFMF #2 Strear Farms

Project Number - 014213242

Attached are your analytical results for KMG - DFMF #2 Strear Farms received by Origins Laboratory, Inc. December 06, 2013. This project is associated with Origins project number X312065-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	X312065-01	Water	December 5, 2013 12:00	12/06/2013 17:08
MW02	X312065-02	Water	December 5, 2013 10:00	12/06/2013 17:08
MW03	X312065-03	Water	December 5, 2013 11:45	12/06/2013 17:08
MW04	X312065-04	Water	December 5, 2013 11:15	12/06/2013 17:08
MW05	X312065-05	Water	December 5, 2013 10:30	12/06/2013 17:08

Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

ORIGINS

LABORATORY, INC

www.originslabo

page

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Client:

LTE

Project Manager:

John Cocciotti

Address:

4600 W 60th Ave, Arvada

Project Name:

DFWP #2 Street Tunnels

Telephone Number:

Project Number:

014213242

Email Address:

jcocciotti@lta-inc.com

Samples Collected By:

Kris Shepherd

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis					Sample Ins
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa Canister #	Other	Feasibility	Dis Solids	Hardness	Interfering	Other
M1201	12:00	12/5/13	10				X					X	X	X	X	X
M1202	10:00	12/5/13	10				X					X	X	X	X	X
M1203	11:45	12/5/13	10				X					X	X	X	X	X
M1204	11:15	12/5/13	10				X					X	X	X	X	X
M1205	10:30	12/5/13	10				X					X	X	X	X	X
Relinquished By:	<i>[Signature]</i>	Date: 12/6/13	Time: 1400	Received By:				Date:			Time:	Turnover				
Relinquished By:	<i>[Signature]</i>	Date: 12/6/13	Time: 1708	Received By: <i>[Signature]</i>				Date: 12/6/13			Time: 1708	Standard <input checked="" type="checkbox"/> 48 Hr <input type="checkbox"/> Same Day <input type="checkbox"/>				

Date Results Needed

Origins Laboratory, Inc.

Naucke

Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFME #2 Stear Farms

Sample Receipt Checklist

Origins Work Order X312065

Client LTE

Client Project ID: DFME #2 Stear Farms

Checklist Completed by: Jose Smith

Shipped Via H/D

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12/13/13 9:15

Airbill #: NA

Matrix(s) Received (Check all that apply):

Soil/Solid

☒ Water

Other

(Describe)

Cooler Number/Temperature

14.1 °C

1 °C

1 °C

1 °C

Thermometer ID: TR02

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)(pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<input checked="" type="checkbox"/>			
Additional Comments (if any):				<u>Arden, Diss, NCHB</u> <u>HCL, H₂SO₄, H₂SO₄</u>

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

12-13-13 9:15
Date/Time Reviewed

Origins Laboratory, Inc.

Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW01
12/5/2013 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-01 (Water)

Anions by EPA 300.0

Bromide	0.247	0.0002	mg/L	1	1352198		12/07/2013	
Chloride	38.3	1.00	"	5	"	"	12/08/2013	
Fluoride	2.40	0.100	"	1	"	"	12/07/2013	
Nitrate	25.0	2.00	"	20	"	"	12/09/2013	H
Nitrite	0.0632	0.100	"	1	"	"	12/07/2013	HJ
Ortho-phosphate	0.348	0.200	"	"	"	"	"	H
Sulfate	153	8.00	"	20	"	"	12/09/2013	

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3L11011	12/11/2013	12/12/2013	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121			"	"	"	
Surrogate: Toluene-d8	98.2 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	91.8 %	84-114			"	"	"	

Metals by SW846 3005A/6010C

Arsenic	ND	0.03	mg/L	1	1352416	12/11/2013	12/11/2013	U
Barium	0.0300	0.005	"	"	"	"	"	
Cadmium	ND	0.005	"	"	"	"	"	U

Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW01
12/5/2013 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-01 (Water)

Metals by SW846 3005A/6010C

Calcium	53.0	0.2	mg/L	1	1352416	12/11/2013	12/11/2013	
Chromium	ND	0.005	"	"	"	"	"	U
Lead	ND	0.01	"	"	"	"	"	U
Magnesium	26.4	0.3	"	"	"	"	"	
Selenium	0.0222	0.03	"	"	"	"	"	J
Silver	ND	0.005	"	"	"	"	"	U

Metals by SW846 7470A

Mercury	ND	0.0002	mg/L	1	1352323	12/09/2013	12/10/2013	U
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Nitrate/Nitrite as Nitrogen by EPA 353.2 Low Level

Nitrogen, Nitrate/Nitrite	17.2	2.00	mg/L	100	1352283		12/09/2013	
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Total Alkalinity by SM 2320B

Alkalinity, Total as CaCO ₃	336	1.00	mg/L	1	1352616	"	12/10/2013	
Bicarbonate alkalinity (CaCO ₃)	336	1.00	"	"	"	"	"	
Carbonate alkalinity (CaCO ₃)	ND	1.00	"	"	"	"	"	U

Total Dissolved Solids by SM 2540C

Total Dissolved Solids	1240	62.5	mg/L	1	1352255	"	12/09/2013	
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Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW01

12/5/2013 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
X312065-01 (Water)

Total Hardness by Calculation by SM18-2340B

Hardness as CaCO ₃	241	1.24	mg/L	1	1353573	12/09/2013	12/12/2013
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Turbidity by EPA 180.1

Turbidity	884	8.00	NTU	40	1352194		12/07/2013	H
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Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW02
12/5/2013 10:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-02 (Water)

Anions by EPA 300.0

Bromide	0.339	0.0002	mg/L	1	1352198		12/07/2013	
Chloride	50.0	1.00	"	5	"	"	12/08/2013	
Fluoride	2.58	0.100	"	1	"	"	12/07/2013	
Nitrate	133	5.00	"	50	"	"	12/09/2013	H
Nitrite	0.0432	0.100	"	1	"	"	12/07/2013	HJ
Ortho-phosphate	0.0848	0.200	"	"	"	"	"	HJ
Sulfate	246	20.0	"	50	"	"	12/09/2013	

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3L11011	12/11/2013	12/12/2013	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	99.0 %	84-121			"	"	"	
Surrogate: Toluene-d8	100 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	93.2 %	84-114			"	"	"	

Metals by SW846 3005A/6010C

Arsenic	0.00767	0.03	mg/L	1	1352416	12/11/2013	12/11/2013	J
Barium	0.494	0.005	"	"	"	"	"	
Cadmium	ND	0.005	"	"	"	"	"	U

Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW02
12/5/2013 10:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
X312065-02 (Water)

Metals by SW846 3005A/6010C

Calcium	285.0	0.2	mg/L	1	1352416	12/11/2013	12/11/2013	
Chromium	0.0170	0.005	"	"	"	"	"	
Lead	ND	0.01	"	"	"	"	"	U
Magnesium	85.7	0.3	"	"	"	"	"	
Selenium	0.0159	0.03	"	"	"	"	"	J
Silver	0.00103	0.005	"	"	"	"	"	J

Metals by SW846 7470A

Mercury	0.0641	4.00	mg/L	20	1352323	12/09/2013	12/10/2013	
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Nitrate/Nitrite as Nitrogen by EPA 353.2 Low Level

Nitrogen, Nitrate/Nitrite	122	10.0	mg/L	500	1352283		12/09/2013	
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Total Alkalinity by SM 2320B

Alkalinity, Total as CaCO ₃	526	1.00	mg/L	1	1352616	"	12/10/2013	
Bicarbonate alkalinity (CaCO ₃)	526	1.00	"	"	"	"	"	
Carbonate alkalinity (CaCO ₃)	ND	1.00	"	"	"	"	"	U

Total Dissolved Solids by SM 2540C

Total Dissolved Solids	2350	14.3	mg/L	1	1352255	"	12/09/2013	
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Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: 014213242

Project: KMG - DFME #2 Strear Farms

MW02

12/5/2013 10:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC

X312065-02 (Water)

Total Hardness by Calculation by SM18-2340B

Hardness as CaCO ₃	1060	1.24	mg/L	1	1353573	12/09/2013	12/12/2013
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Turbidity by EPA 180.1

Turbidity	157	0.800	NTU	4	1352194		12/07/2013	H
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Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW03
12/5/2013 11:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
X312065-03 (Water)

Anions by EPA 300.0

Bromide	0.796	0.0002	mg/L	1	1352198		12/07/2013	
Chloride	80.6	10.0	"	50	"	"	12/09/2013	
Fluoride	5.06	0.500	"	5	"	"	12/08/2013	
Nitrate	45.4	2.00	"	20	"	"	12/09/2013	H
Nitrite	ND	0.100	"	1	"	"	12/07/2013	HU
Ortho-phosphate	ND	0.200	"	"	"	"	"	HU
Sulfate	486	20.0	"	50	"	"	12/09/2013	

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3L11011	12/11/2013	12/12/2013	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121			"	"	"	
Surrogate: Toluene-d8	100 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	92.3 %	84-114			"	"	"	

Metals by SW846 3005A/6010C

Arsenic	ND	0.03	mg/L	1	1352416	12/11/2013	12/11/2013	U
Barium	0.0382	0.005	"	"	"	"	"	
Cadmium	ND	0.005	"	"	"	"	"	U

Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW03
12/5/2013 11:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
X312065-03 (Water)

Metals by SW846 3005A/6010C

Calcium	91.1	0.2	mg/L	1	1352416	12/11/2013	12/11/2013	
Chromium	0.00201	0.005	"	"	"	"	"	J
Lead	ND	0.01	"	"	"	"	"	U
Magnesium	42.4	0.3	"	"	"	"	"	
Selenium	0.0365	0.03	"	"	"	"	"	
Silver	0.00108	0.005	"	"	"	"	"	J

Metals by SW846 7470A

Mercury	ND	0.0002	mg/L	1	1352323	12/09/2013	12/10/2013	U
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Nitrate/Nitrite as Nitrogen by EPA 353.2 Low Level

Nitrogen, Nitrate/Nitrite	43.9	10.0	mg/L	500	1352283		12/09/2013	
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Total Alkalinity by SM 2320B

Alkalinity, Total as CaCO ₃	416	1.00	mg/L	1	1352616	"	12/10/2013	
Bicarbonate alkalinity (CaCO ₃)	416	1.00	"	"	"	"	"	
Carbonate alkalinity (CaCO ₃)	ND	1.00	"	"	"	"	"	U

Total Dissolved Solids by SM 2540C

Total Dissolved Solids	1490	14.3	mg/L	1	1352255	"	12/09/2013	
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Origins Laboratory, Inc.



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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: 014213242

Project: KMG - DFMF #2 Strear Farms

MW03

12/5/2013 11:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC

X312065-03 (Water)

Total Hardness by Calculation by SM18-2340B

Hardness as CaCO ₃	402	1.24	mg/L	1	1353573	12/09/2013	12/12/2013
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Turbidity by EPA 180.1

Turbidity	11.9	0.200	NTU	1	1352194		12/07/2013	H
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFME #2 Strear Farms

MW04
12/5/2013 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-04 (Water)

Anions by EPA 300.0

Bromide	3.08	0.004	mg/L	20	1352198		12/08/2013	J
Chloride	1150	40.0	"	200	"	"	12/09/2013	
Fluoride	ND	20.0	"	"	"	"	"	U
Nitrate	1.92	2.00	"	20	"	"	12/08/2013	HJ
Nitrite	ND	2.00	"	"	"	"	"	HU
Ortho-phosphate	6.53	4.00	"	"	"	"	"	H
Sulfate	2180	80.0	"	200	"	"	12/09/2013	

BTEX by EPA 8260C

Benzene	ND	4.0	ug/L	4	3L11011	12/11/2013	12/13/2013	
Toluene	ND	4.0	"	"	"	"	"	
Ethylbenzene	ND	4.0	"	"	"	"	"	
Xylenes, total	ND	4.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	101 %	84-121		"	"	12/12/2013	
Surrogate: Toluene-d8	99.7 %	85-115		"	"	"	
Surrogate: 4-Bromofluorobenzene	92.0 %	84-114		"	"	"	

EPA 180.1 Turbidity

Turbidity	1150	20.0	NTU	100	1352194		12/07/2013	H
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Metals by SW846 3005A/6010C

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW04

12/5/2013 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC

X312065-04 (Water)

Metals by SW846 3005A/6010C

Arsenic	0.0274	0.03	mg/L	1	1352416	12/11/2013	12/11/2013	J
Barium	0.267	0.005	"	"	"	"	"	
Cadmium	0.00277	0.005	"	"	"	"	"	J
Calcium	2270.0	2.0	"	10	"	"	"	
Chromium	1.04	0.05	"	"	"	"	"	
Lead	ND	0.1	"	"	"	"	"	U
Magnesium	1040.0	3.0	"	"	"	"	"	
Selenium	0.176	0.03	"	1	"	"	"	
Silver	0.0106	0.05	"	10	"	"	"	J

Metals by SW846 7470A

Mercury	ND	0.0002	mg/L	1	1352323	12/09/2013	12/10/2013	U
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Nitrate/Nitrite as Nitrogen by EPA 353.2 Low Level

Nitrogen, Nitrate/Nitrite	94.5	10.0	mg/L	500	1352283		12/09/2013	
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Total Alkalinity by SM 2320B

Alkalinity, Total as CaCO3	14600	10.0	mg/L	1	1352616	"	12/10/2013	
Bicarbonate alkalinity (CaCO3)	14600	10.0	"	"	"	"	"	
Carbonate alkalinity (CaCO3)	ND	10.0	"	"	"	"	"	U

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW04

12/5/2013 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-04 (Water)

Total Dissolved Solids by SM 2540C

Total Dissolved Solids	11400	71.4	mg/L	1	1352255	"	12/09/2013
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Total Hardness by Calculation by SM18-2340B

Hardness as CaCO ₃	9940	12.4	mg/L	1	1353573	12/09/2013	12/12/2013
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW05
12/5/2013 10:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-05 (Water)

Anions by EPA 300.0

Bromide	1.08	0.0002	mg/L	1	1352198		12/08/2013	
Chloride	223	10.0	"	50	"	"	12/09/2013	
Fluoride	1.60	0.100	"	1	"	"	12/08/2013	
Nitrate	134	5.00	"	50	"	"	12/09/2013	H
Nitrite	ND	0.100	"	1	"	"	12/08/2013	HU
Ortho-phosphate	ND	0.200	"	"	"	"	"	HU
Sulfate	312	20.0	"	50	"	"	12/09/2013	

BTEX by EPA 8260C

Benzene	ND	1.0	ug/L	1	3L11011	12/11/2013	12/13/2013	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	
Xylenes, total	ND	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	100 %	84-121		"	"	12/12/2013	
Surrogate: Toluene-d8	99.2 %	85-115		"	"	"	
Surrogate: 4-Bromofluorobenzene	91.7 %	84-114		"	"	"	

Metals by SW846 3005A/6010C

Arsenic	ND	0.03	mg/L	1	1352416	12/11/2013	12/11/2013	U
Barium	0.0952	0.005	"	"	"	"	"	
Cadmium	ND	0.005	"	"	"	"	"	U

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW05
12/5/2013 10:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-05 (Water)

Metals by SW846 3005A/6010C

Calcium	196.0	0.2	mg/L	1	1352416	12/11/2013	12/11/2013	
Chromium	0.00128	0.005	"	"	"	"	"	J
Lead	ND	0.01	"	"	"	"	"	U
Magnesium	87.2	0.3	"	"	"	"	"	
Selenium	0.367	0.03	"	"	"	"	"	
Silver	0.00174	0.005	"	"	"	"	"	J

Metals by SW846 7470A

Mercury	ND	0.0002	mg/L	1	1352323	12/09/2013	12/10/2013	U
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Nitrate/Nitrite as Nitrogen by EPA 353.2 Low Level

Nitrogen, Nitrate/Nitrite	127	10.0	mg/L	500	1352283		12/09/2013	
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Total Alkalinity by SM 2320B

Alkalinity, Total as CaCO ₃	310	1.00	mg/L	1	1352616	"	12/10/2013	
Bicarbonate alkalinity (CaCO ₃)	310	1.00	"	"	"	"	"	
Carbonate alkalinity (CaCO ₃)	ND	1.00	"	"	"	"	"	U

Total Dissolved Solids by SM 2540C

Total Dissolved Solids	1810	14.3	mg/L	1	1352255	"	12/09/2013	
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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

MW05

12/5/2013 10:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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GEL Laboratories, LLC
X312065-05 (Water)

Total Hardness by Calculation by SM18-2340B

Hardness as CaCO ₃	847	1.24	mg/L	1	1353573	12/09/2013	12/12/2013	
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Turbidity by EPA 180.1

Turbidity	29.1	0.200	NTU	1	1352194		12/07/2013	H
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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3L11011 - EPA 5030B (Water)

Blank (3L11011-BLK1)

Prepared: 12/11/2013 Analyzed: 12/11/2013

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5	101		84-121			
Surrogate: Toluene-d8	62		"	62.5	99.3		85-115			
Surrogate: 4-Bromofluorobenzene	58		"	62.5	92.6		84-114			

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3L11011 - EPA 5030B (Water)

LCS (3L11011-BS1)

Prepared: 12/11/2013 Analyzed: 12/11/2013

Benzene	44.2	1.0	ug/L	50.0	88.3	74-130
Toluene	45.4	1.0	"	50.0	90.8	76-128
Ethylbenzene	46.6	1.0	"	50.0	93.2	78-130
m,p-Xylene	93.9	2.0	"	100	93.9	75-134
o-Xylene	46.4	1.0	"	50.0	92.7	76-129
Surrogate: 1,2-Dichloroethane-d4	58		"	62.5	92.7	84-121
Surrogate: Toluene-d8	62		"	62.5	99.7	85-115
Surrogate: 4-Bromofluorobenzene	58		"	62.5	92.7	84-114

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3L11011 - EPA 5030B (Water)

Matrix Spike (3L11011-MS1)		Source: X312073-04			Prepared: 12/11/2013 Analyzed: 12/11/2013					
Benzene	47.7	1.0	ug/L	50.0	ND	95.3	74-130			
Toluene	50.0	1.0	"	50.0	ND	99.9	73-131			
Ethylbenzene	51.3	1.0	"	50.0	ND	103	76-132			
m,p-Xylene	103	2.0	"	100	ND	103	69-139			
o-Xylene	50.6	1.0	"	50.0	ND	101	74-131			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		95.1	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.6	84-114			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3L11011 - EPA 5030B (Water)

Matrix Spike Dup (3L11011-MSD1)		Source: X312073-04			Prepared: 12/11/2013 Analyzed: 12/11/2013					
Benzene	45.8	1.0	ug/L	50.0	ND	91.7	74-130	3.89	20	
Toluene	47.3	1.0	"	50.0	ND	94.6	73-131	5.43	20	
Ethylbenzene	48.7	1.0	"	50.0	ND	97.5	76-132	5.10	20	
m,p-Xylene	97.0	2.0	"	100	ND	97.0	69-139	5.54	20	
o-Xylene	48.0	1.0	"	50.0	ND	96.1	74-131	5.17	20	
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		94.5	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.9	85-115			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		92.0	84-114			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Anions by EPA 300.0 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1352198 -

BLANK (1203000376-BLK)

Prepared: Analyzed: 12/07/2013

Sulfate	ND	0.133	mg/L		0	-				U
Ortho-phosphate	ND	0.067	"		0	-				U
Nitrite	ND	0.038	"		0	-				U
Nitrate	ND	0.033	"		0	-				U
Fluoride	ND	0.033	"		0	-				U
Bromide	ND	0.067	"		0	-				U
Chloride	ND	0.067	"		0	-				U

DUP (1203000377 D)

Source: 338847002

Prepared: Analyzed: 12/09/2013

Sulfate	3060	33.3	mg/L		3060	0-20	0.109	20		
Bromide	6.55	0.335	"		6.47	0-20	1.21	20		
Nitrate	19.3	0.165	"		19.3	0-20	0.204	20		
Fluoride	2.50	0.165	"		2.51	0-20	0.419	20		
Nitrite	0.427	0.038	"		0.418	0-20	2.06	20		
Ortho-phosphate	ND	0.067	"		<0.067	0-20	0.00	20		U
Chloride	342	6.70	"		343	0-20	0.549	20		

PS (1203000378 S)

Source: 338847002

Prepared: Analyzed: 12/09/2013

Sulfate	5880	33.3	mg/L	10.0	3060	113	90-110			
Bromide	13.1	0.335	"	1.25	6.47	106	90-110			
Chloride	885	6.70	"	5.00	343	108	90-110			
Fluoride	15.0	0.165	"	2.50	2.51	99.8	90-110			

Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Anions by EPA 300.0 - Quality Control GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1352198 -

PS (1203000378 S)		Source: 338847002			Prepared: Analyzed: 12/07/2013			
Nitrate	33.4	0.165	mg/L	2.50	19.3	113	90-110	U
Ortho-phosphate	ND	0.067	"	1.25	<0.067	0	90-110	
Nitrite	2.99	0.038	"	2.50	0.418	103	90-110	
LCS (1203000379-BKS)					Prepared: Analyzed: 12/07/2013			
Chloride	4.79	0.067	mg/L	5.00	0	95.9	90-110	
Bromide	1.29	0.067	"	1.25	0	103	90-110	
Fluoride	2.41	0.033	"	2.50	0	96.5	90-110	
Nitrate	2.49	0.033	"	2.50	0	99.7	90-110	
Nitrite	2.46	0.038	"	2.50	0	98.6	90-110	
Ortho-phosphate	1.29	0.067	"	1.25	0	103	90-110	
Sulfate	9.97	0.133	"	10.0	0	99.7	90-110	

Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Metals by SW846 3005A/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1352416 - SW846 3005A

BLANK (1203000940-BLK)

Prepared: 12/11/2013 Analyzed: 12/11/2013

Selenium	ND	6.00	ug/L		0	-				U
Calcium	ND	50.0	"		0	-				U
Silver	ND	1.00	"		0	-				U
Magnesium	ND	110	"		0	-				U
Lead	ND	3.30	"		0	-				U
Chromium	ND	1.00	"		0	-				U
Barium	ND	1.00	"		0	-				U
Arsenic	ND	5.00	"		0	-				U
Cadmium	ND	1.00	"		0	-				U

LCS (1203000941-BKS)

Prepared: 12/11/2013 Analyzed: 12/11/2013

Cadmium	452	1.00	ug/L	500	0	90.5	80-120			
Arsenic	450	5.00	"	500	0	90	80-120			
Selenium	450	6.00	"	500	0	90	80-120			
Barium	459	1.00	"	500	0	91.7	80-120			
Calcium	4520	50.0	"	5000	0	90.4	80-120			
Magnesium	4680	110	"	5000	0	93.7	80-120			
Lead	467	3.30	"	500	0	93.3	80-120			
Chromium	463	1.00	"	500	0	92.6	80-120			
Silver	453	1.00	"	500	0	90.5	80-120			

DUP (1203000942 D)

Source: X312065-01

Prepared: 12/11/2013 Analyzed: 12/11/2013

Silver	ND	1.00	ug/L		<1.00	0-20	84.6	20		U
Chromium	1.29	1.00	"		<1.00	0-20	54.4	20		J
Arsenic	ND	5.00	"		<5.00	0-20	83.6	20		U
Barium	31.6	1.00	"		30.0	0-20	5.17	20		
Cadmium	ND	1.00	"		<1.00	0-20	NR	20		U

Origins Laboratory, Inc.



Noelle E Doyle, President

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Metals by SW846 3005A/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1352416 - SW846 3005A

DUP (1203000942 D)		Source: X312065-01			Prepared: 12/11/2013 Analyzed: 12/11/2013					
Calcium	55700	50.0	ug/L		53000		0-20	5.10	20	
Lead	ND	3.30	"		<3.30		0-20	73.8	20	U
Magnesium	27900	110	"		26400		0-20	5.56	20	
Selenium	32.6	6.00	"		22.2		0-20	38.0	20	

MS (1203000943 S)		Source: X312065-01			Prepared: 12/11/2013 Analyzed: 12/11/2013					
Barium	531	1.00	ug/L	500	30.0	100	75-125			
Silver	494	1.00	"	500	<1.00	98.7	75-125			
Cadmium	488	1.00	"	500	<1.00	97.6	75-125			
Calcium	63200	50.0	"	5000	53000	205	75-125			
Chromium	506	1.00	"	500	<1.00	101	75-125			
Lead	493	3.30	"	500	<3.30	98.6	75-125			
Selenium	529	6.00	"	500	22.2	101	75-125			
Magnesium	33900	110	"	5000	26400	151	75-125			
Arsenic	506	5.00	"	500	<5.00	101	75-125			

FLT B (338844006-BLK)		Prepared: 12/11/2013 Analyzed: 12/11/2013								
Selenium	ND	6.00	ug/L		0		-			U
Arsenic	ND	5.00	"		0		-			U
Barium	ND	1.00	"		0		-			U
Cadmium	ND	1.00	"		0		-			U
Calcium	ND	50.0	"		0		-			U
Chromium	1.20	1.00	"		0		-			J
Magnesium	ND	110	"		0		-			U
Silver	ND	1.00	"		0		-			U
Lead	ND	3.30	"		0		-			U

FLT B (338847003-BLK)		Prepared: 12/11/2013 Analyzed: 12/11/2013								
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Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: 014213242

Project: KMG - DFMF #2 Strear Farms

Metals by SW846 3005A/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1352416 -

Cadmium	ND	1.00	ug/L		0	-				U
Silver	ND	1.00	"		0	-				U
Selenium	ND	6.00	"		0	-				U
Magnesium	ND	110	"		0	-				U
Lead	ND	3.30	"		0	-				U
Calcium	ND	50.0	"		0	-				U
Chromium	ND	1.00	"		0	-				U
Arsenic	ND	5.00	"		0	-				U
Barium	ND	1.00	"		0	-				U

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Metals by SW846 7470A - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1352323 - SW846 7470A Prep										
BLANK (1203000695-BLK)					Prepared: 12/09/2013 Analyzed: 12/10/2013					
Mercury	ND	0.067	ug/L		0	-				U
LCS (1203000696-BKS)					Prepared: 12/09/2013 Analyzed: 12/10/2013					
Mercury	2.04	0.067	ug/L	2.00	0	102	80-120			
LCSD (1203000706-BKSD)					Prepared: 12/09/2013 Analyzed: 12/10/2013					
Mercury	1.98	0.067	ug/L	2.00	0	99.2	80-120	2.74	20	
FLTB (338844006-BLK)					Prepared: 12/09/2013 Analyzed: 12/10/2013					
Mercury	ND	0.067	ug/L		0	-				U

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Total Alkalinity by SM 2320B - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1352616 -

BLANK (1203001485-BLK)

Prepared: Analyzed: 12/10/2013

Alkalinity, Total as CaCO ₃	ND	0.725	mg/L		0	-				U
Bicarbonate alkalinity (CaCO ₃)	ND	0.725	"		0	-				U
Carbonate alkalinity (CaCO ₃)	ND	0.725	"		0	-				U

LCS (1203001486-BKS)

Prepared: Analyzed: 12/10/2013

Alkalinity, Total as CaCO ₃	51.8	0.725	mg/L	50.0	0	104	90-110			
--	------	-------	------	------	---	-----	--------	--	--	--

BLANK (1203001604-BLK)

Prepared: Analyzed: 12/10/2013

Alkalinity, Total as CaCO ₃	ND	0.725	mg/L		0	-				U
Bicarbonate alkalinity (CaCO ₃)	ND	0.725	"		0	-				U
Carbonate alkalinity (CaCO ₃)	ND	0.725	"		0	-				U

LCS (1203001605-BKS)

Prepared: Analyzed: 12/10/2013

Alkalinity, Total as CaCO ₃	48.9	0.725	mg/L	50.0	0	97.8	90-110			
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Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014213242
Project: KMG - DFMF #2 Strear Farms

Turbidity by EPA 180.1 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1352194 -

BLANK (1203000363-BLK)

Prepared: Analyzed: 12/07/2013

Turbidity	ND	0.100	NTU		0		-			U
-----------	----	-------	-----	--	---	--	---	--	--	---

LCS (1203000364-BKS)

Prepared: Analyzed: 12/07/2013

Turbidity	10.1	0.100	NTU	10.0	0	101	90-110			
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DUP (1203000365 D)

Source: X312065-01

Prepared: Analyzed: 12/07/2013

Turbidity	856	4.00	NTU		884		0-15	3.22	15	H
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Origins Laboratory, Inc.



Noelle E Doyle, President

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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: 014213242

Project: KMG - DFMF #2 Strear Farms

Notes and Definitions

- U Result not detected above the detection limit
- J Greater than the detection limit but less than the reporting limit
- HU Holding time exceeded. Non detect.
- HJ Holding time exceeded. Value is estimated.
- H Holding time exceeded
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference

Origins Laboratory, Inc.



Noelle E Doyle, President

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Attachment 5
Accutest Laboratory Report – Groundwater



02/05/14

Technical Report for

LT Environmental

DFMF #2 Strear Farms

014213242

Accutest Job Number: D53234

Sampling Date: 12/05/13

Report to:

LT Environmental


plang@ltenv.com

ATTN: Paloma Lang

Total number of pages in report: **14**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.


Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

LT Environmental

Job No: D53234

DFMF #2 Strear Farms

Project No: 014213242

Sample Number	Collected Date	Time By	Received	Matrix Code Type	Client Sample ID
D53234-1	12/05/13	13:30 KS	12/09/13	AQ Ground Water	MW01
D53234-2	12/05/13	10:00 KS	12/09/13	AQ Ground Water	MW02
D53234-3	12/05/13	11:45 KS	12/09/13	AQ Ground Water	MW03
D53234-4	12/05/13	11:15 KS	12/09/13	AQ Ground Water	MW04
D53234-5	12/05/13	10:30 KS	12/09/13	AQ Ground Water	MW05



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: LT Environmental

Job No D53234

Site: DFMF #2 Strear Farms

Report Date 12/18/2013 11:28:37 A

On 12/09/2013, 5 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 1.6 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D53234 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ	Batch ID: MB293
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SLYM-BART

Matrix AQ	Batch ID: MB294
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SRB-BART

Matrix AQ	Batch ID: MB295
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Page 1 of 1

Job Number: D53234
Account: LT Environmental
Project: DFME #2 Strear Farms
Collected: 12/05/13



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D53234-1 MW01						
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		700000	200		CFU/ml	HACH SRB-BART
D53234-2 MW02						
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		700000	200		CFU/ml	HACH SRB-BART
D53234-3 MW03						
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		700000	200		CFU/ml	HACH SRB-BART
D53234-4 MW04						
Iron Reducing Bacteria		> 140000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		> 350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		> 700000	200		CFU/ml	HACH SRB-BART
D53234-5 MW05						
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		350000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		700000	200		CFU/ml	HACH SRB-BART



Sample Results

Report of Analysis

Report of Analysis

Page 1 of 1

Client Sample ID: MW01
Lab Sample ID: D53234-1
Matrix: AQ - Ground Water
Project: DFMF #2 Strear Farms

Date Sampled: 12/05/13
Date Received: 12/09/13
Percent Solids: n/a

4.1
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	12/10/13	MM	HACH IRB-BART
Slime Forming Bacteria	350000	500	CFU/ml	1	12/10/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	700000	200	CFU/ml	1	12/10/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: MW02
Lab Sample ID: D53234-2
Matrix: AQ - Ground Water
Project: DFMF #2 Strear Farms

Date Sampled: 12/05/13
Date Received: 12/09/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	12/10/13	MM	HACH IRB-BART
Slime Forming Bacteria	350000	500	CFU/ml	1	12/10/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	700000	200	CFU/ml	1	12/10/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: MW03
Lab Sample ID: D53234-3
Matrix: AQ - Ground Water
Project: DFMF #2 Strear Farms

Date Sampled: 12/05/13
Date Received: 12/09/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	12/10/13	MM	HACH IRB-BART
Slime Forming Bacteria	350000	500	CFU/ml	1	12/10/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	700000	200	CFU/ml	1	12/10/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: MW04
Lab Sample ID: D53234-4
Matrix: AQ - Ground Water
Project: DFMF #2 Strear Farms

Date Sampled: 12/05/13
Date Received: 12/09/13
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	> 140000	25	CFU/ml	1	12/10/13	MM	HACH IRB-BART
Slime Forming Bacteria	> 350000	500	CFU/ml	1	12/10/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	> 700000	200	CFU/ml	1	12/10/13	MM	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: MW05
Lab Sample ID: D53234-5
Matrix: AQ - Ground Water
Project: DFMF #2 Strear Farms

Date Sampled: 12/05/13
Date Received: 12/09/13
Percent Solids: n/a

4.5
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron Reducing Bacteria	74500	25	CFU/ml	1	12/10/13	MM	HACH IRB-BART
Slime Forming Bacteria	350000	500	CFU/ml	1	12/10/13	MM	HACH SLYM-BART
Sulfate Reducing Bacteria	700000	200	CFU/ml	1	12/10/13	MM	HACH SRB-BART

RL = Reporting Limit



Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.aaculast.com

FED-EX Tracking #	Bottle Order Control #
Accounted Quota #	Account Job # 153234

Client / Reporting Information			Project Information										Requested Analysis (see TEST CODE sheet)													Matrix Codes
Company Name LT Environmental Street Address 4600 West 60th Ave City Arvada State CO			Project Name: DFMF #2 Strear Farms Street Billing Information (If different from Report to) Company Name LT Environmental Project # 014213242 Client Purchase Order # City Attention: 										Cations (SW 200.7/200.8 *See note) Anions (300.1) TDS (Method 2540C) pH (SM 4500-HB) Specific Conductance (Method 2510B) Alkalinity (HC3 & CO3) (Method 2320B) Phosphorus (EPA 365.4) Dissolved Methane, Ethane, Propane (RSK 175) BTX & TPH-GRO (Method 8260B) DRO (8015B) BART (S04BAC, SFBAC, IRBAC)													DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED-Sediment CI - Oil LIQ - Other Liqu AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB- Rinse Blank TB-Trip Blank
Arvada Project Contact 720.556.7159 Sample(s) Name(s) Kris Shepherd			Project Manager John Cocroft																							
Actual Sample #			Collection										Number of preserved bottles													LAB USE ONLY
Field ID / Point of Collection			MED-HDI Val #										Date Time Sampled by Matrix # of bottles HCl NaOH HNO3 H2SO4 H3PO4 HClO4 HNO2 HNO3 H2O2 H2O MCH CHCONE													
MW01																										X 01
MW02																										X 02
MW03																										X 03
MW04																										X 04
MW05																										X 05
Turnaround Time (Business days)			Approved By (Account PM) / Date:										Data Deliverable Information Comments / Special Instructions													
<input type="checkbox"/> Std. 15 Business Days <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day Emergency <input type="checkbox"/> 2 Day Emergency <input type="checkbox"/> 1 Day Emergency <input type="checkbox"/> Emergency & Rush TIA data available VIA Lablink			<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> COMMIN <input type="checkbox"/> COMMIN+ Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial EN = Results/QC/Intative (+ = chromatograms)										<input type="checkbox"/> State Forms Required <input type="checkbox"/> Send Forms to State <input type="checkbox"/> Report by Fax <input checked="" type="checkbox"/> Report by PDF <input checked="" type="checkbox"/> EDD Format													Cations - barium, boron, calcium, iron, magnesium, manganese, potassium, phosphorus, selenium, sodium, strontium Anions - Bromide, Chloride, Fluoride, Nitrate as N, Nitrite as N Sulfate 200.8* Test for Iron and Selenium only
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12/9 10:20 Date Time: Date Time:										Received By: 1 Received By: 3 Received By: 5													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date Time: 12-9-13 Date Time: Date Time:										Received By: 2 Received By: 4 Received By: 4													Date Time: Date Time: Date Time:
Requisitioned by: 1 Requisitioned by: 3 Requisitioned by: 5			Date																							

5.1

D53234: Chain of Custody

Page 1 of 2



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D53234 Client: LT Environmental Immediate Client Services Action Required: Yes
Date / Time Received: 12/9/2013 10:30:00 AM Delivery Method:
Project: DFME #2 Strear Farms No. Coolers: Airbill #'s: hd

Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

3. COC Present: ☒ ☐
4. Smpl Dates/Time OK ☒ ☐

Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: Infrared gun
3. Cooler media: Ice (bag)

Quality Control Preservation

Y N N/A

1. Trip Blank present / cooler: ☐ ☐
2. Trip Blank listed on COC: ☐ ☐
3. Samples preserved properly: ☒ ☐
4. VOCs headspace free: ☐ ☐ ☒

Comments

MW01 COC time is 1200 bottle time is 1330. MW05 COC time is 000 bottle time is 1030

Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☐ ☒

Sample Integrity - Condition

Y or N

1. Sample rec'd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

Sample Integrity - Instructions

Y N N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume rec'd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

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D53234: Chain of Custody
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Attachment 6
Run-off Calculations

Attachment 6
Flow Calculations

Site Runoff Coefficient, C (Cultivated Land, Sand & Gravel) =	0.25
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Site Rainfall Intensity, i =	0.144 in/hr	25-yr, 24-hour	From NOAA
Site Rainfall Intensity, i =	0.196 in/hr	100-yr, 24-hour	From NOAA
Site Rainfall Depth =	3.46 in	25-yr, 24-hour	From NOAA
Site Rainfall Depth =	4.69 in	100-yr, 24-hour	From NOAA

Northern Run-On Swale

Drainage Basin Area, A	3.6 acres
$Q_{25} = CIA =$	0.13 cfs
Northern Run-On Swale bottom width =	0 ft
Northern Run-On Swale top width =	2 ft
Northern Run-On Swale side slope =	3 to 1
Northern Run-On Swale depth =	0.33 ft
Northern Run-On Swale slope (from survey data) =	0.015 ft/ft
Northern Run-On Swale coefficient, n =	0.022
Northern Run-On Swale flow depth =	0.20 ft
Northern Run-On Swale velocity =	1.14 ft/s

10 Acre Pods - Slope up to 1.5% to the Southeast within each pod

Drainage Basin Area, A	10 acres
Rainfall Volume =	170,247 cubic feet
Berm Height =	3 ft
Berm Width =	660 ft
Berm Length =	660 ft
Berm Containment =	261,360 cubic feet
Excess Containment =	91,113 cubic feet

* Berm only along south and east of each pod, assumed only 1/5 of pod area would be used to contain water

Concrete Liquids Handling Center

Drainage Basin Area, A	90,000 square feet
Rainfall Volume =	35,175 cubic feet
Berm Height =	2 ft
Berm Width =	300 ft
Berm Length =	300 ft
Berm Containment =	180,000 cubic feet
Excess Containment =	144,825 cubic feet

Earthen Berm Containment Area

Drainage Basin Area, A	90,000 square feet
Rainfall Volume =	35,175 cubic feet
Berm Height =	2 ft
Berm Width =	300 ft
Berm Length =	300 ft
Berm Containment =	180,000 cubic feet
Excess Containment =	144,825 cubic feet

Attachment 6
Flow Calculations

Northern Run-On Swale

1. $Q_p =$ 0.13 cfs
2. Channel width (B) = 0 ft at bottom; 2 ft at top (trapezoidal) side slope 1 (Z_1) is 3 to 1
side slope 2 (Z_2) is 3 to 1
which gives an average slope of 3 to 1

3. Assume uniform flow in channel to get water depth, y_o

Use Mannings equation.

$v = Rh^{2/3} S_o^{1/2} / n$, where S_o is assumed to be 0.015 from the survey information

$n =$ 0.022 for earth channel, straight and uniform with short grass, few weeds

and $P =$ wetted perimeter $= B + 2y_o \sqrt{1+Z^2}$; $A = (B + Zy_o) y_o$ for trapezoidal channel of side slope $ZH:1V$; $Rh = A/P$.

Solve for y_o for specified Q using iterative approach.

- Calculate Rh for assumed y_o
- Calculate v from Mannings equation
- Calculate new y_o from quad eqn: $y_o = (-B \pm v \pm \sqrt{(B \pm v)^2 + 4 \cdot v \cdot Z \cdot Q}) / (2 \cdot v \cdot Z)$
- Continue until absolute value of $y(n+1) - y_n < 0.001$

Solving y_o

$Q = 0.130$

						y_o (new)		$y(n+1)-y(n)$	<0.001
Iteration	y_o (ft)	A (ft ²)	P (ft)	Rh (ft)	v_o (ft/s)	+ root	- root		
1	0.193	0.111747	1.220639	0.091547938	1.1308074	0.195757	-0.1957567	0.002756738	no
2	0.195757	0.1149621	1.238074	0.092855574	1.14155	0.194833	-0.1948335	-0.00092326	yes
3	0.194833	0.11388025	1.232235	0.092417633	1.1379578	0.195141	-0.1951407	0.000307269	yes
4	0.195141	0.11423973	1.234178	0.092563383	1.139154	0.195038	-0.1950383	-0.000102477	yes
5	0.195038	0.11411978	1.23353	0.092514774	1.1387551	0.195072	-0.1950724	3.41529E-05	yes
6	0.195072	0.11415975	1.233746	0.092530974	1.1388881	0.195061	-0.195061	-1.1385E-05	yes
7	0.195061	0.11414642	1.233674	0.092525574	1.1388437	0.195065	-0.1950648	3.79491E-06	yes
Check: for $y_o = 0.19506483$ ft; $Q =$						0.130	cfs	OK	

Flow depth = 0.195 ft

Check overtopping: vertical depth = 0.333333 ft

Freeboard = 0.138 ft - should be of order 0-1ft

Velocity = 1.14 ft/s OK if <5ft/s

OK

OK