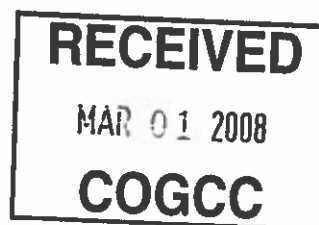




February 29, 2008

Mr. John Axelson  
Environmental Protection Specialist  
Colorado Oil and Gas Conservation Commission  
9203 East 155<sup>th</sup> Drive  
Brighton, Colorado 80602



RE: Site Investigation Results  
Jolly 41X-6 Produced Water Pit  
Woodrow, Colorado

Dear Mr. Axelson:

LT Environmental, Inc. (LTE) was retained by Markus Production, Inc. (Markus) to conduct a site investigation at the Jolly 41X-6 Produced Water Pit (Site) located in a rural area east of the intersection of County Road 18 and State Highway 71 in Woodrow, Colorado (Figure 1). The purpose of this investigation was to determine if soils, surface water and/or groundwater have been impacted by historical operation of the produced water pit. The investigation has been conducted in response to a Notice of Alleged Violation issued by the Colorado Oil and Gas Conservation Committee (COGCC) on December 20, 2007.

### Soil Boring Advancement

LTE advanced a total of five direct push soil borings (MW-1 through MW-5) on January 18, 2008. The soil boring locations are presented on Figure 2. Each soil boring was converted into a temporary groundwater monitoring well to allow for groundwater sample collection. The soil borings were installed using a direct-push rig owned and operated by High Plains Drilling of Denver, Colorado. Monitoring well locations MW-1, MW-2, MW-4, and MW-5 were installed downgradient and crossgradient of the produced water pit in an effort to indentify potential soil and groundwater impact. Monitoring well MW-3 was installed upgradient of the produced water pit to characterize background soil and groundwater conditions.

The soil borings were logged by an LTE geologist. The geologist inspected the soil for the presence or absence of petroleum hydrocarbon odor and/or staining. The soils were characterized by visually inspecting the soil samples collected in clear, acetate, four-foot long sampling tubes and screened using a photo-ionization detector (PID) to monitor the soil headspace for the presence of volatile organic vapors. Soil boring total depths ranged from 8 feet to 22 feet below ground surface (bgs). Soil boring logs are included in Attachment 1.

Soils identified at the Site were predominantly observed as a brown, fine-grained, silty sand that extended from the ground surface to approximately 6 feet to 9 feet bgs. Beneath the silty sand, a



brown weathered claystone was observed to the terminus of the boreholes. Monitoring well locations MW-3 and MW-4 were completed in different formations due to abrupt topographic changes across the Site.

### **Soil Sampling**

Each soil boring was advanced using the direct-push method and sampled using a continuous sampler. Soil samples were submitted for analysis based on the sample interval that exhibited visible soil staining or where the highest PID reading was detected. If soil impacts could not be detected, a soil sample was collected from the interval above the field-interpreted water table.

Soil samples were transferred into laboratory prepared 4-ounce, wide mouth glass jars. The soil samples were placed on ice and delivered with a completed chain-of-custody (COC) form to Origins Laboratory, Inc. of Denver, Colorado (Origins). The soil samples were submitted for analysis of Total Petroleum Hydrocarbons (TPH) by United States Environmental Agency (EPA) modified Method 8015. Results are reported as Gasoline Range Organics (GRO) and Diesel Range Organics (DRO). Soil samples were analyzed for pH by method 9045 and electrical conductivity (EC) by method NCR-13 No. 221. Samples were also analyzed for sodium adsorption ratio (SAR) using the United States Department of Agriculture Handbook 6.

### **Soil Analytical Results**

The COGCC has established an allowable concentration for TPH in sensitive areas of 1,000 milligrams per kilogram (mg/kg). Soil analytical results indicate that the TPH-GRO and TPH-DRO concentrations in soil were not detected above the laboratory method detection limits or the COGCC Sensitive Area Allowable Concentration in all soil samples.

Analytical results for SAR in soil were above the COGCC Allowable Level of 12, in all soil samples except MW-4 (18'-20). SAR values ranged from 24.9 at MW-3 (16'-18') to 103 at MW-1 (4'-6').

Soil pH values were elevated in all samples collected except MW-4 (18'-20). Soil pH values ranged from 9.37 at MW-5 (4'-6') to 9.45 at MW-2 (4'-6').

The soil analytical results are summarized in Table 1. Laboratory analytical reports are included in Attachment 2.

### **Temporary Groundwater Monitoring Well Installation**

Each direct-push soil boring was converted into a temporary groundwater monitoring well. The wells were constructed of 1-inch diameter poly-vinyl chloride (PVC) casing extending from the surface to depths ranging between 8 feet and 22 feet bgs. The lower five feet of each temporary well consisted of 0.010-inch factory slotted PVC well screen. Silica sand (size 10-20) was placed from the bottom of each well to approximately 1 foot to 2 feet above the well screen to



act as filter pack for the temporary groundwater wells. Bentonite chips were placed above the silica sand to the ground surface of each boring to provide a seal against surface contamination and precipitation run-off.

### **Groundwater Sampling**

Depth to groundwater below top of casing was measured in each temporary well on January 22, 2008 (Table 2). LTE personnel also surveyed the top of casing for each monitoring well. Relative groundwater elevations were then calculated to aid in the construction of a potentiometric surface map (Figure 3). Relative groundwater elevations ranged from 61.00 feet at monitoring well MW-4 to 80.69 feet at monitoring well MW-5. The local groundwater flow gradient is to the east, although hydraulic gradient varies across the Site due to the apparent influence of the produced water pit percolation.

On January 22, 2007, LTE purged each well until the well was dry. The groundwater was then allowed to recharge before collecting groundwater samples from all five temporary groundwater monitoring wells (MW-1 through MW-5). All samples were collected with a peristaltic pump.

Groundwater samples were collected in laboratory prepared containers. The groundwater samples were placed on ice and delivered with a complete COC form to Origins. The groundwater samples were submitted for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B. Groundwater samples were also analyzed for pH, EC, total dissolved solids (TDS), carbonate and bicarbonate alkalinity, major cations, and major anions.

### **Groundwater Analytical Results**

The COGCC has established allowable concentration levels for BTEX of 0.005 milligrams per liter (mg/L), 1.00 mg/L, 0.70 mg/L, and 10.00 mg/L, respectively. Groundwater analytical results indicate that BTEX concentrations were not detected above the COGCC Allowable Concentration Levels in all groundwater samples collected from the temporary monitoring wells. The groundwater sample collected at monitoring well MW-4 exhibited the only detection above the laboratory method detection limit, with toluene at 1.02 mg/L.

COGCC Allowable Concentration Levels for TDS, chloride, and sulfate are 1.25 times the background concentrations. LTE utilized data from MW-3 as the background concentration. Analytical results indicate TDS and chloride were detected above the allowable concentration in all monitoring wells. Sulfate was detected above allowable levels in monitoring well MW-4.

The Colorado Department of Public Health and Environment (CDPHE) Secondary Standards for groundwater, used to monitor the effects of aesthetics, taste, and odor, were exceeded in all monitoring wells, including background monitoring well MW-3. These results indicate that the overall water quality of the local shallow aquifer system is poor.



Groundwater analytical results are summarized in Table 3. Laboratory analytical reports are included in Attachment 2.

### **Summary and Conclusions**

A total of five soil borings (MW-1 through MW-5) were advanced at the Site. Petroleum hydrocarbon impacts were not observed during drilling or groundwater sampling activities. Soil analytical results indicate that TPH-GRO and TPH-DRO concentrations are in compliance with the COGCC Sensitive Area Allowable Concentrations.

Soil analytical results for pH and SAR are above the COGCC Allowable Levels in four of the five wells. Analytical results for pH, EC, and SAR in soil indicate the background values are elevated, as results from the background sample MW-3 (16'-18'), were not significantly different from the other samples. The soil sample collected from borehole MW-4 exhibited different analytical results from the other sample locations. As shown in the attached cross-section (Figure 4), this is likely a result of completing the well in a deeper formation than the other four boreholes.

Soil analytical results indicate the presence of elevated levels of salts as a result of produced water percolation beneath the produced water pit. Samples collected from boreholes MW-1, MW-2, and MW-5 show comparatively higher values for pH, EC, and SAR than those measured in monitoring wells MW-3 and MW-4.

Groundwater at the Site appears to be flowing to the east-southeast across the surface of the claystone layer identified in monitoring wells MW-1, MW-2, MW-3 and MW-5. This is evident at a seeping spring above the clay layer immediately south of the Site. Groundwater in the vicinity of the produced water pit is mounded as percolation is influencing the static water level. The groundwater in MW-4 doesn't appear to be the same water bearing zone identified in the other monitoring wells.

Groundwater analytical results indicate that BTEX concentrations are in compliance with the COGCC Allowable Concentration Levels at all monitoring wells. Groundwater parameters at all monitoring wells indicate an overall poor water quality in the local shallow aquifer system.

Concentrations of TDS and chloride were above the COGCC Allowable Concentrations in all monitoring wells, except monitoring well MW-3. Concentrations of TDS and chloride were above the CDPHE Secondary Standards for aesthetics, taste and odor in all monitoring wells. Analytical results for groundwater quality parameters such as pH, EC, TDS, and alkalinity were collectively elevated. In some cases, the background sample exhibited higher concentrations of dissolved metals and major anions than the samples surrounding the produced water pit.

Taking into consideration the remoteness of the Site, and the overall poor groundwater quality of the local shallow aquifer system, the groundwater impacts resulting from percolation of



produced water from the pit appear to be minimal. There was no discernable impact to vegetation at the surface in the vicinity of the monitoring wells with elevated groundwater quality parameters.

LTE is requesting, on behalf of Markus, that the COGCC reconsider its request to close the produced water pit pending a meeting to discuss existing site conditions, threats to receptors, and operational limitations.

Please call Markus at 303-295-6910 ext. 24 and/or LTE at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Brian Dodek', is positioned above the printed name.

Brian Dodek, P.G.  
Project Manager

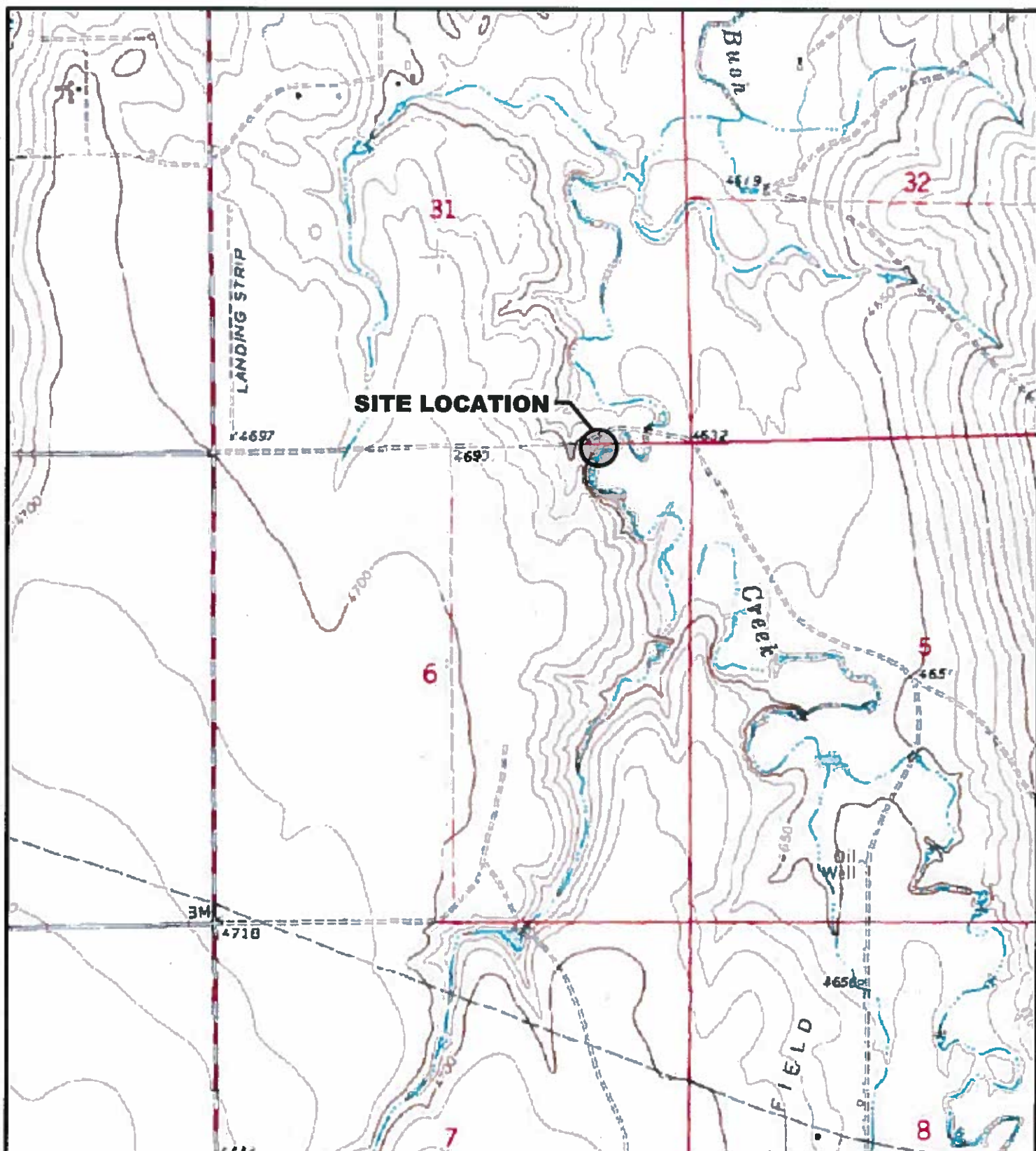
A handwritten signature in black ink, appearing to read 'John D. Peterson', is positioned above the printed name. There is a large, stylized flourish or mark to the right of the signature.

John D. Peterson, P.G.  
Senior Geologist

Attachments (4)

Cc: Mark E. Brown, Markus Production, Inc.

## FIGURES



# **LEGEND**



**SITE LOCATION**



0 375 750 1500  
FEET

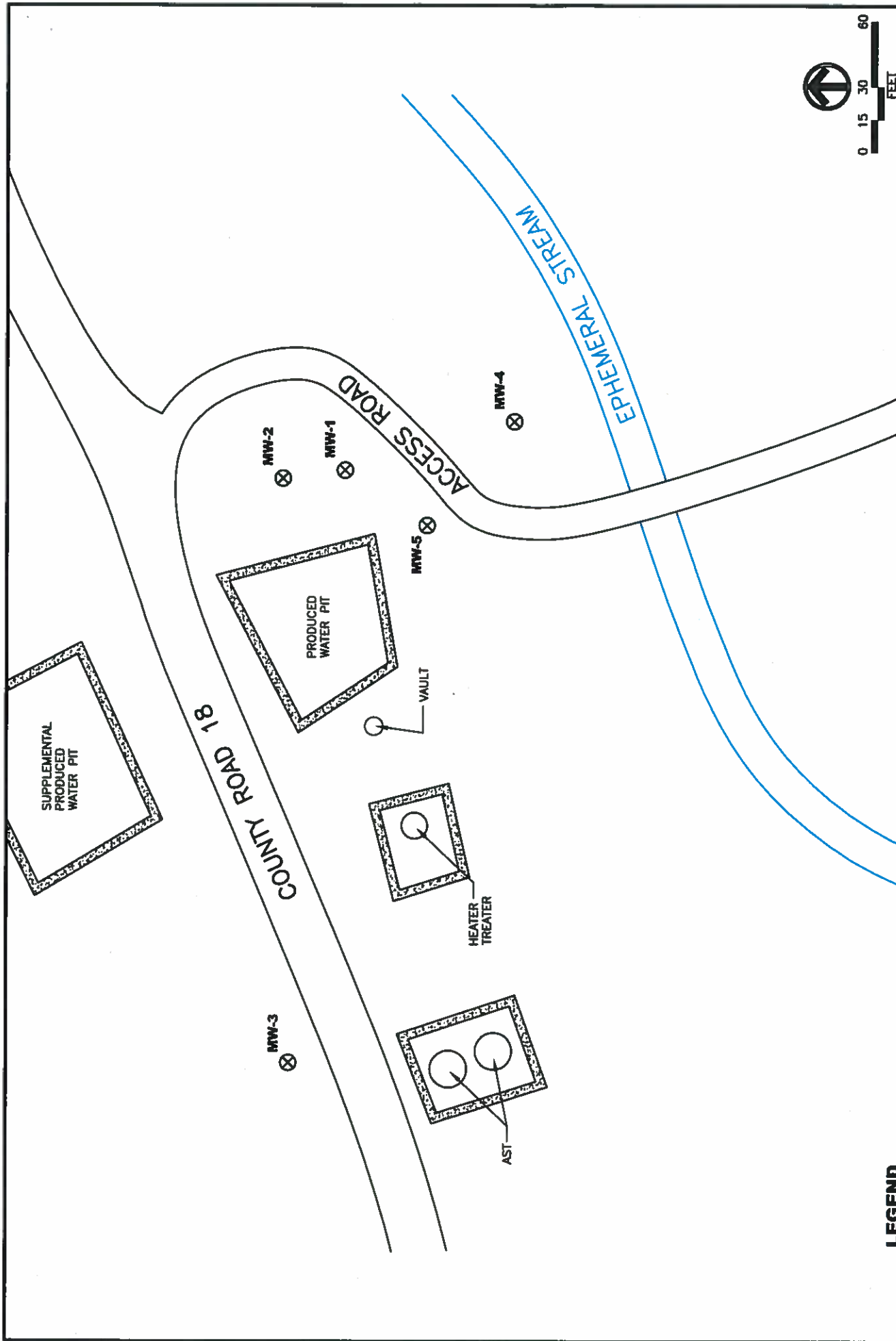
**FIGURE 1**  
**SITE LOCATION MAP**  
**JOLLY 41X-6 TANK BATTERY**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION INC.**

SOURCE: TOPOZONE.COM  
USGS 7.5' QUADRANGLE  
WOODLIN SCHOOL, CO 1973  
(NAD27)



MP1080101\_SL 2/08





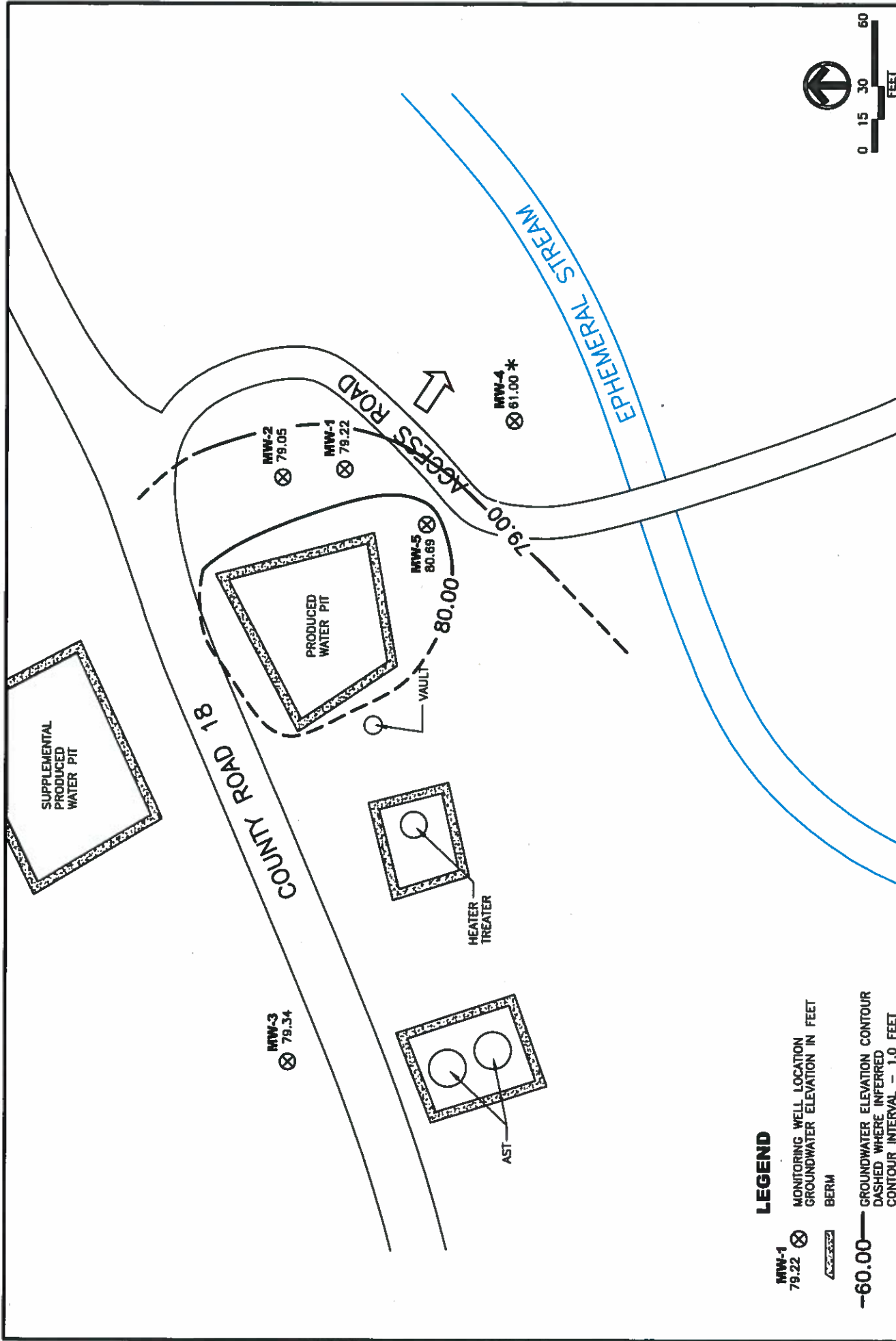
**LEGEND**

- MW-1 ⊗ MONITORING WELL LOCATION
- ▨ BERM

**FIGURE 2**  
**SITE MAP**  
**JOLLY 41X-6 TANK BATTERY**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION INC.**







# **LEGEND**

MW-1  
79.22

MONITORING WELL LOCATION  
GROUNDWATER ELEVATION IN FEET

BERM

-60.00— GROUNDWATER ELEVATION CONTOUR  
DASHED WHERE INFERRED  
CONTOUR INTERVAL - 1.0 FEET  
GRADIENT 0.00076 ft./ft.

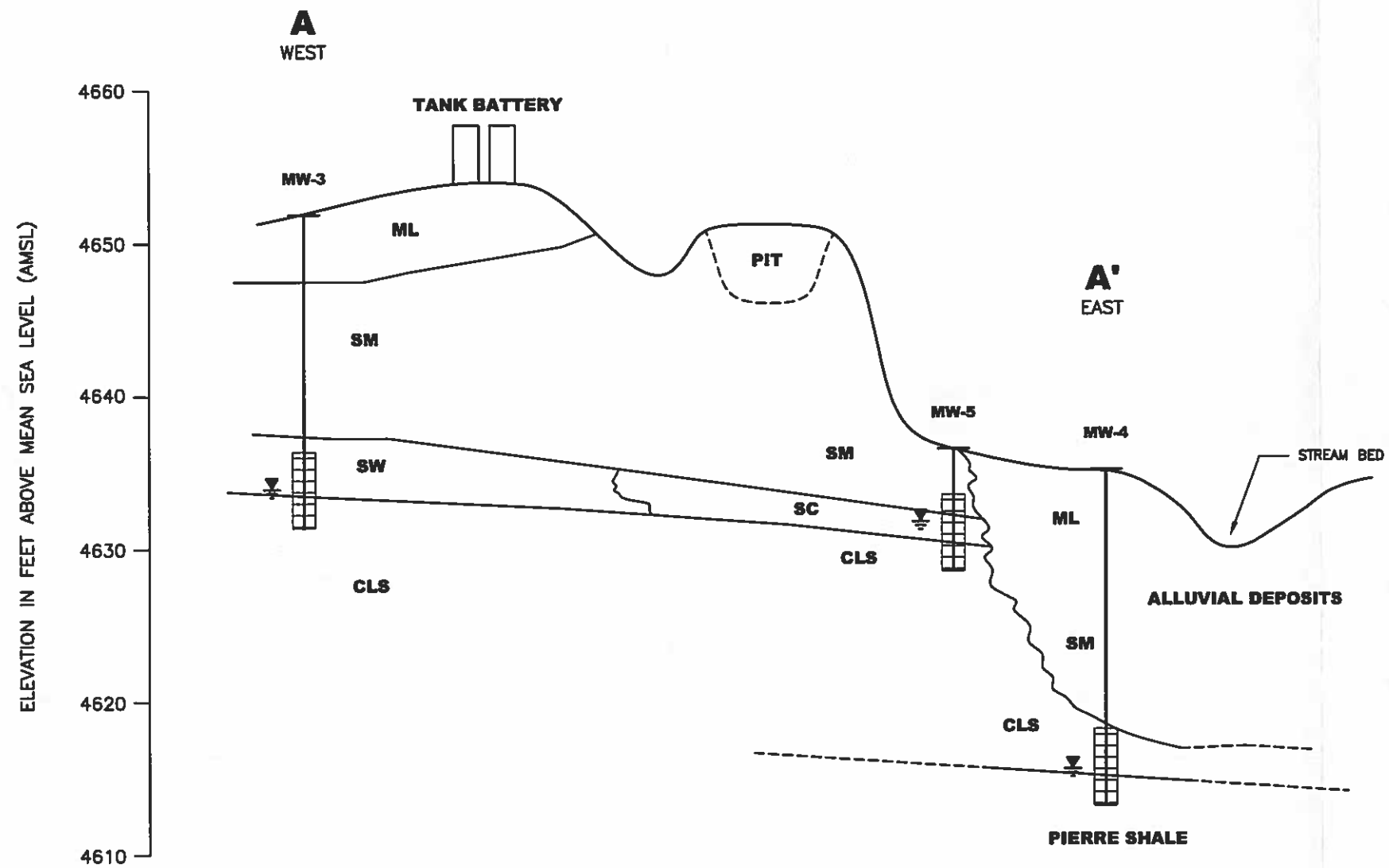
ESTIMATED GROUNDWATER FLOW DIRECTION

MEASUREMENT NOT USED IN CONSTRUCTION OF GROUNDWATER ELEVATION MAP

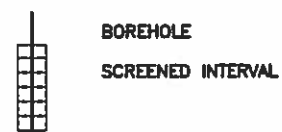
\*

**FIGURE 3**  
**GROUNDWATER ELEVATION MAP**  
**JOLLY 41X-6 TANK BATTERY**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION INC.**





- LEGEND**
- ML** SILT
- SM** SILTY SAND
- SW** WELL GRADED SAND
- SC** CLAYEY SAND
- CLS** WEATHERED CLAYSTONE
- GROUNDWATER ELEVATION
- GROUND SURFACE
- CONTACT LINE (DASHED WHERE INFERRED)



HORIZONTAL SCALE  
1" = 60'

VERTICAL SCALE  
1" = 10'

**FIGURE 4**  
**CONCEPTUAL CROSS SECTION A-A'**  
**JOLLY 41X-6 TANK BATTERY**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION INC.**



## TABLES

**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
**JOLLY 41X-6 PRODUCED WATER PIT**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION, INC.**

Sample ID	Date	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	pH (su)	EC (umhos/cm)	SAR (unitless)
MW-1 (4'-6')	1/18/2008	<50	<50	9.39	5.21	103
MW-2 (4'-6')	1/18/2008	<50	<50	9.45	3.38	67.2
MW-3 (16'-18')	1/18/2008	<50	<50	9.39	1.00	24.9
MW-4 (18'-20')	1/18/2008	<50	<50	8.61	1.52	8.6
MW-5 (4'-6')	1/18/2008	<50	<50	9.37	1.16	27.6
<b>COGCC Allowable Concentrations</b>		<b>combined to 1,000 mg/kg</b>		<b>6-9</b>	<b>&lt;4,000 or 2X Background</b>	<b>&lt;12</b>

**Notes:**

TPH - GRO - Total Petroleum Hydrocarbons - Gasoline Range Organics by EPA Method 8015M

TPH - DRO - Total Petroleum Hydrocarbons - Diesel Range Organics by EPA Method 8015M

pH by 9045

EC - Electrical Conductivity by NCR-13 NO.221

SAR - Sodium Adsorption Ratio by USDA Handbook 6

mg/kg - milligrams per kilogram

su- Standard units

umhos/cm - micromhos per centimeter

< - indicates less than the stated method detection limit

COGCC - Colorado Oil and Gas Conservation Commission



**TABLE 2**  
**GROUNDWATER ELEVATIONS**  
**JOLLY 41X-6 PRODUCED WATER PIT**  
**WOODROW, COLORADO**  
**MARKUS PRODUCTION, INC.**

<b>Well Name</b>	<b>Date</b>	<b>Well Depth (ft BTOC)</b>	<b>TOC Elevation</b>	<b>Depth to GW (ft BTOC)</b>	<b>GW Elevation (ft)</b>
MW-1	1/22/2008	12.32	85.88	6.66	79.22
MW-2	1/22/2008	13.48	86.45	7.40	79.05
MW-3	1/22/2008	22.15	99.79	20.45	79.34
MW-4	1/22/2008	24.45	84.52	23.52	61.00
MW-5	1/22/2008	9.92	86.71	6.02	80.69

**Notes:**

ft - feet

BTOC - below top of casing

GW - groundwater

All depths measured from northern top of inner well casing.



TABLE 3  
GROUNDWATER ANALYTICAL RESULTS  
JOLLY 41X-6 PRODUCED WATER PIT  
WOODROW, COLORADO  
MARKUS PRODUCTION, INC.

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethyl- benzene (ug/L)	Total Xylenes (ug/L)	pH (su)	EC (umhos/cm)	Total Dissolved Solids (mg/L)	Carbonate Alkalinity (mg/L)	Bicarbonate Alkalinity (mg/L)	Calcium (mg/L)	Iron (mg/L)	Manganese (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Nitrate as N (mg/L)	Nitrite as N (mg/L)
MW-1	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.64	4.800	2,560	7.78	1,900	30	0.623	0.0768	18.9	5.03	<0.03	1,230	549	6.14	284	<0.5	<0.5
MW-2	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.25	3.910	2,920	2.32	1,390	148	0.565	0.133	72.2	10.8	<0.03	778	555	6.28	398	<0.5	<0.5
MW-3	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.58	3.720	2,000	3.64	1,020	199	81.2	1.52	98.8	29.8	<0.03	832	408	3.8	718	1.72	<0.5
MW-4	1/22/2008	<1.00	1.02	<1.00	<2.00	7.5	5.190	3,730	4.06	1,370	230	99.2	0.829	215	34.7	<0.03	1,050	606	5.92	1,600	1.94	<0.5
MW-5	1/22/2008	<1.00	<1.00	<1.00	<2.00	8.16	3.940	2,670	27.5	2,020	18.6	7.56	0.0955	20	8.49	<0.03	1,260	647	5.46	272	2.33	<0.5
CGWQS Standards		5	1,000	700	1,400	6.5-8.5	--	500	--	--	--	0.3	0.05	--	--	--	--	250	--	250	10	1
COGCC Allowable Conc.		5	1,000	700	1,400	--	--	2500*	--	--	--	--	--	--	--	--	--	510*	--	897*	--	--

Notes:  
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B  
pH analyzed by SM4500HB  
EC - Electrical conductivity analyzed by EPA Method 120.1  
Total dissolved solids analyzed by EPA Method 160.1  
Bicarbonate and carbonate alkalinity analyzed by EPA Method SM4500CO2D  
All dissolved metals analyzed by EPA Method 6010B  
Chloride analyzed by EPA Method 325.2  
Bromide, Sulfate, Nitrate as N, and Nitrite as N analyzed by EPA Method 300  
ug/L - micrograms per liter  
su- standard units  
umhos/cm - micromhos per centimeter  
mg/L - milligrams per liter  
< - less than the stated method detection limit  
CGWQS - Colorado Groundwater Quality Standards  
COGCC Allowable Conc. - Colorado Oil and Gas Conservation Commission Allowable Concentration Levels  
\* - TDS, chloride, and sulfate are 1.25 X background concentrations from monitoring well MW-3

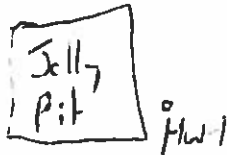


**ATTACHMENT 1**  
**SOIL BORING LOGS**





## Well Location Sketch:



Compliance · Engineering · Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: <b>MW-1</b>	Project: <b>Silly 41x2</b>
Date: <b>1-18-08</b>	Project Number: <b>MPE 080101</b>
Logged By: <b>BDD</b>	Drilled By: <b>High Plains</b>
Drilling Method: <b>Direct Push</b>	Sampling Method: <b>Continuous</b>
Seal: <b>Bentonite Chips</b>	Grout: <b>NA</b>
Casing Type: <b>3" 40 PVC</b>	Hole Diameter: <b>2"</b>
Screen Type: <b>3" 40 PVC</b>	Depth to Liquid: <b>~17'</b>
Slot: <b>0.010"</b>	Depth to Water: <b>~17'</b>
Diameter: <b>1"</b>	Total Depth: <b>17'</b>
Length: <b>9'</b>	
Diameter: <b>1"</b>	
Length: <b>5'</b>	

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
	Dry	0.1	N		2			SM	Sand, fg, silty, brown, trace gravel, no clay	
	Dry	0.2	N		4					
	Dry	0.2	N		6					
	Moist	0.2	N		8					
	Moist	0.3	N		10					
	Wet	0.3	N		12			CLS	Weathered clay stone, brown, orange staining, no clay	
	Wet	0.1	N		14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

## Well Location Sketch:

311g  
PIL  
MW-3  
MW-1  
N1



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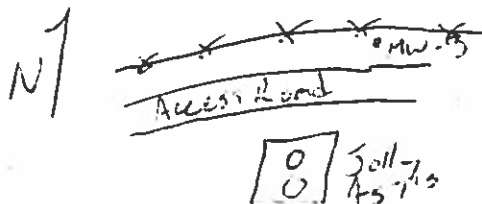
Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: MW-3	Project: 311g 41X-6
Date: 1-18-08	Project Number: MPJ080101
Logged By: BDD	Drilled By: High Plains
Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack: 10x20 CSST	Seal: Benbrite Chips
Casing Type: 3/4" 40 PL	Hole Diameter: 2"
Screen Type: 3/4" 40 PL	Grout: NA
Slot: 0.010"	Depth to Liquid: ~7'
Diameter: 1"	Length: 5'
Total Depth: 11.5'	Depth to Water: ~7'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
	Dry	0.0	N		2			SM	Sand, fg, silty, brown, no odor	
	Dry	0.0	N		4				fine gravel	
	Dry	0.0	N		6					
	Moist	0.0	N		8					
	Moist	0.0	N		10			CLS	Weathered claystone, brown, orange staining, no odor	
	Wet	0.1	N		12					
	Moist	0.0	N		14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:



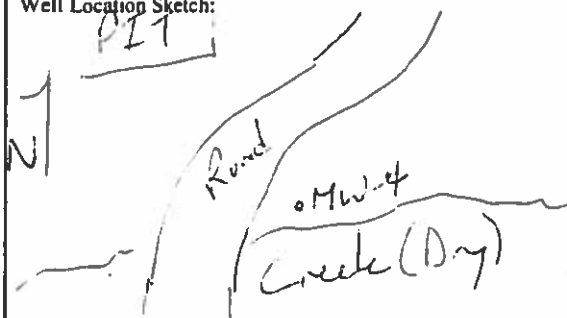
Compliance • Engineering • Remediation  
 LT Environmental, Inc.  
 4600 W. 60th Avenue  
 Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-3	Project: Tally 41K-6
Date: 1-18-08	Project Number: MPL 0201
Logged By: BDD	Drilled By: High Plains
Drilling Method: Direct Push	Sampling Method: Continuous
Seal: Bentonite	Grout: N/A
Diameter: 1" Length: 19'	Hole Diameter: 2" Depth to Liquid: 18'
Screen Type: Sch 40 PVC Slot: 0.010"	Total Depth: 20.5' Depth to Water: 18'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
	Dry	0.0	N		2		X	ML	Sand, silt, slightly sandy, lt brown, no odor	
	Dry	---	N		4		X	SM	Sand, fg, silty, trace gravel no odor	
	Dry	0.0	N		6		X			
	Dry	---	N		8		X			
	Dry	0.0	N		10		X			
	Dry	---	N		12		X			
	Dry	0.0	N		14		X			
	Dry	---	N		16		X	SW	Sand, w/ gravel, fg to sg, lt. brown, no odor	
	Dry	0.0	N		18		X			
	Wet Moist	0.0	N		20		X	CLS	Weathered clay stone, brown, no odor	
					22				TD-20.5'	
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:



Compliance · Engineering · Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

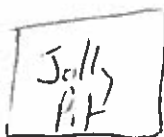
Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number	MW-4	Project	Trilling 4/x-6
Date	1-18-08	Project Number	MDI 0801.01
Logged By	BDD	Drilled By	High Plains
Drilling Method	Direct Push	Sampling Method	Continuous
Seal	Benlate Chlor	Grout	NA
Casing Type	Sch 40 PVC	Hole Diameter	2"
Screen Type	Sch 40 PVC	Total Depth	22'
Slot	0.00"	Depth to Water	~20'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
Dry	0.0		N		2			ML	Silt, slightly sandy, fg, lt brown, no odor	
Dry	0.0		N		4					
Dry	0.0		N		6					
Dry	0.0		N		8			SM	Sand, fg, silty, brown, no odor	
Moist	0.0		N		10					
Moist	0.0		N		12					
Moist	0.0		N		14					
Moist	0.0		N		16					
Moist	0.0		N		18			SC	Sand, lt to ag, clayey, trace gravel, brown, no odor	
Moist	0.0		N		20					
Wet	0.0		N		22			CL-3	Shale, grey, weathered,	
					24				TD-22	
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

Well Location Sketch:



MW-5

N



Compliance · Engineering · Remediation

LT Environmental, Inc.

4600 W. 60th Avenue

Arvada, Colorado 80003

## BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-5	Project: Jolly 41X-6
Date: 1-18-08	Project Number: MPI 0801.01
Logged By: BDD	Drilled By: High Plains
Drilling Method: Direct Push	Sampling Method: Continuous
Seal: Br. Granite Chips	Grout: NA
Diameter: 8.1"	Hole Diameter: 5.1"
Length: 3'	Depth to Liquid: 5'
Diameter: 1"	Total Depth: 8'
Length: 3'	Depth to Water: 5'

Elevation: 6551 10.20	Detector: Mini RAE 2000
Gravel Pack: C-551 10.20	Seal: Br. Granite Chips
Casing Type: Sch 40 PVC	Diameter: 8.1"
Screen Type: Sch 40 PVC	Slot: 0.010"
Diameter: 1"	Length: 3'
Total Depth: 8'	Depth to Water: 5'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion Diagram
					0					
	Dry 0.0		N		2			SM	Sand, f to cgl. w/ gravel, organic, dk brown, no odor, slightly silty	
	Moist 0.0		N		4			SC	Sand, clayey, w/ gravel, coarser, dk brown, no odor	
	Moist 0.0		N		6			CLS	Weakly cemented claystone, brown, orange staining, no odor	
	Wet 0.0		N		8					
					10				TD-8'	
					12					
					14					
					16					
					18					
					20					
					22					
					24					
					26					
					28					
					30					
					32					
					34					
					36					
					38					
					40					

**ATTACHMENT 2**  
**LABORATORY ANALYTICAL REPORTS**





4640 Pecos Street | Unit C | Denver, Colorado 80211  
303.433.1322 Phone 303.265.9645 Fax

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February 06, 2008

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

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

---

Attached are the analytical results for Jolly 41X-6 received by Origins Laboratory, Inc. 1/21/2008 1:45:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Laboratory Manager  
Noelle E Doyle

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. This laboratory report is intended solely for the above addressee and it is only to be used and or reproduced in its entirety.



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303.433.1322 | Laboratory  
303.265.9645 | Fax



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

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

#### CROSS REFERENCE REPORT

Laboratory ID	Sample ID	Matrix	Sampled	Date Received
MW-1 (4'-6')	X801046-01	Soil	1/18/2008 10:15:00AM	01/21/2008 13:45
MW-2 (4'-6')	X801046-02	Soil	1/18/2008 11:15:00AM	01/21/2008 13:45
MW-3 (16'-18')	X801046-03	Soil	1/18/2008 12:25:00PM	01/21/2008 13:45
MW-4 (18'-20')	X801046-04	Soil	1/18/2008 2:35:00PM	01/21/2008 13:45
MW-5 (4'-6')	X801046-05	Soil	1/18/2008 2:40:00PM	01/21/2008 13:45

Origins Laboratory, Inc.

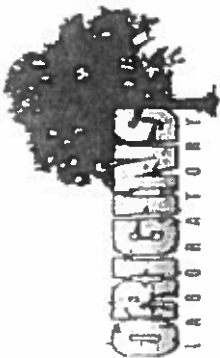
Noelle E Doyle, Laboratory Manager

*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.*



**Brian Dodek**  
**Project Number: MPI0801.01**  
**Project: Jolly 41X-6**

940108X



Project Manager	Dr. J. K. R.
Project Name	Dr. J. K. R.
Project Number	Dr. J. K. R.
Samples Collected by	Dr. J. K. R.

Client	Ch. Envisionment Inc.
Address	6000 1st St. N.E.
	Franklin, WI 53122
Telephone Number	414-761-1122
E-Mail Address	

Sample ID - Description	Date Sampled	Time Sampled	Preservative		Matrix	Analysis	Sample Instructions
			Reagent	Volume			
M-1 (4-6)	1/8/08	10:15					
M-2 (4-6)	1/15	11:15					
M-3 (4-18)	1/23	13:35					
M-4 (18-20)	4/15	4:45					
M-5 (4-6)	4/20	4:40					

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Page 3 of 11

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

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-1 (4'-6')

X801046-01 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by NCR-13 NO.221,

Conductivity	5.21		umhos	1	'[none]'	01/31/2008	01/28/2008
--------------	------	--	-------	---	----------	------------	------------

GRO/DRO by EPA 8015M

Gasoline (C6-C10)	ND	50	mg/kg	1	8A27002	01/27/2008	01/28/2008
-------------------	----	----	-------	---	---------	------------	------------

Diesel (C10-C28)	ND	50	"	"	"	"	"
------------------	----	----	---	---	---	---	---

pH by 9045

pH	9.39	0.1	units	1	1288PHA	01/28/2008	01/28/2008
----	------	-----	-------	---	---------	------------	------------

Sodium Absorption Ratio (SAR) by USDA HANDBOOK 6

SAR	103		ratio	1	'[none]'	01/31/2008	01/28/2008
-----	-----	--	-------	---	----------	------------	------------

Total Percent Solids by 160.3

Total Percent Solids	79.7		%	1	'[none]'	01/24/2008	01/28/2008
----------------------	------	--	---	---	----------	------------	------------

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-2 (4'-6')

X801046-02 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by NCR-13 NO.221,

Conductivity	3.38		umhos	1	"[none]"	01/31/2008	01/28/2008
--------------	------	--	-------	---	----------	------------	------------

GRO/DRO by EPA 8015M

Gasoline (C6-C10)	ND	50	mg/kg	1	8A27002	01/27/2008	01/28/2008
-------------------	----	----	-------	---	---------	------------	------------

Diesel (C10-C28)	ND	50	"	"	"	"	"
------------------	----	----	---	---	---	---	---

pH by 9045

pH	9.45	0.1	units	1	1288PHA	01/28/2008	01/28/2008
----	------	-----	-------	---	---------	------------	------------

Sodium Absorption Ratio (SAR) by USDA HANDBOOK 6

SAR	67.2		ratio	1	"[none]"	01/31/2008	01/28/2008
-----	------	--	-------	---	----------	------------	------------

Total Percent Solids by 160.3

Total Percent Solids	80.7		%	1	"[none]"	01/24/2008	01/28/2008
----------------------	------	--	---	---	----------	------------	------------

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Arvada CO 80003

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-3 (16'-18')

X801046-03 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by NCR-13 NO.221,

Conductivity	1		umhos	1	'[none]'	01/31/2008	01/28/2008
--------------	---	--	-------	---	----------	------------	------------

GRO/DRO by EPA 8015M

Gasoline (C6-C10)	ND	50	mg/kg	1	8A27002	01/27/2008	01/28/2008
-------------------	----	----	-------	---	---------	------------	------------

Diesel (C10-C28)	ND	50	"	"	"	"	"
------------------	----	----	---	---	---	---	---

pH by 9045

pH	9.39	0.1	units	1	1288PHA	01/28/2008	01/28/2008
----	------	-----	-------	---	---------	------------	------------

Sodium Absorption Ratio (SAR) by USDA HANDBOOK 6

SAR	24.9		ratio	1	'[none]'	01/31/2008	01/28/2008
-----	------	--	-------	---	----------	------------	------------

Total Percent Solids by 160.3

Total Percent Solids	88.3		%	1	'[none]'	01/24/2008	01/28/2008
----------------------	------	--	---	---	----------	------------	------------

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-4 (18'-20')  
X801046-04 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by NCR-13 NO.221,

Conductivity	1.52		umhos	1	'[none]'	01/31/2008	01/28/2008
--------------	------	--	-------	---	----------	------------	------------

GRO/DRO by EPA 8015M

Gasoline (C6-C10)	ND	50	mg/kg	1	8A27002	01/27/2008	01/28/2008
-------------------	----	----	-------	---	---------	------------	------------

Diesel (C10-C28)	ND	50	"	"	"	"	"
------------------	----	----	---	---	---	---	---

pH by 9045

pH	8.61	0.1	units	1	1288PHA	01/28/2008	01/28/2008
----	------	-----	-------	---	---------	------------	------------

Sodium Absorption Ratio (SAR) by USDA HANDBOOK 6

SAR	8.6		ratio	1	'[none]'	01/31/2008	01/28/2008
-----	-----	--	-------	---	----------	------------	------------

Total Percent Solids by 160.3

Total Percent Solids	84.3		%	1	'[none]'	01/24/2008	01/28/2008
----------------------	------	--	---	---	----------	------------	------------

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-5 (4'-6')

X801046-05 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by NCR-13 NO.221,

Conductivity	1.16		umhos	1	'[none]'	01/31/2008	01/28/2008
--------------	------	--	-------	---	----------	------------	------------

GRO/DRO by EPA 8015M

Gasoline (C6-C10)	ND	50	mg/kg	1	8A27002	01/27/2008	01/28/2008
-------------------	----	----	-------	---	---------	------------	------------

Diesel (C10-C28)	ND	50	"	"	"	"	"
------------------	----	----	---	---	---	---	---

pH by 9045

pH	9.37	0.1	units	1	1288PHA	01/28/2008	01/28/2008
----	------	-----	-------	---	---------	------------	------------

Sodium Absorption Ratio (SAR) by USDA HANDBOOK 6

SAR	27.6		ratio	1	'[none]'	01/31/2008	01/28/2008
-----	------	--	-------	---	----------	------------	------------

Total Percent Solids by 160.3

Total Percent Solids	82.2		%	1	'[none]'	01/24/2008	01/28/2008
----------------------	------	--	---	---	----------	------------	------------

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Noelle E Doyle, Laboratory Manager



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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

Extractable Petroleum Hydrocarbons by 8015M - Quality Control  
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8A27002 - EPA5031 - SVOCGC										
Blank (8A27002-BLK1)					Prepared: 01/27/2008 Analyzed: 01/27/2008					
Gasoline (C6-C10)	ND	50	mg/kg							
Diesel (C10-C28)	ND	50	"							
LCS (8A27002-B51)					Prepared: 01/27/2008 Analyzed: 01/27/2008					
Diesel (C10-C28)	130	50	mg/kg	200		62.9	60-140			
Matrix Spike (8A27002-MS1)					Source: X801054-01 Prepared: 01/27/2008 Analyzed: 01/27/2008					
Diesel (C10-C28)	130	50	mg/kg	200	ND	64.2	60-140			
Matrix Spike Dup (8A27002-MSD1)					Source: X801054-01 Prepared: 01/27/2008 Analyzed: 01/27/2008					
Diesel (C10-C28)	130	50	mg/kg	200	ND	63.6	60-140	0.821	25	

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

pH by 9045 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1288PHA -										
CHKSTD (1288PHA-1)					Prepared: 01/28/2008 Analyzed: 01/28/2008					
pH	ND	0.1	units							
DUP (1288PHA-2)					Source: L245671-1 Prepared: 01/28/2008 Analyzed: 01/28/2008					
pH	6.27	0.1	units		7.4			0		

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

### Notes and Definitions

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

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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# ORIGINS LABORATORY



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February 06, 2008

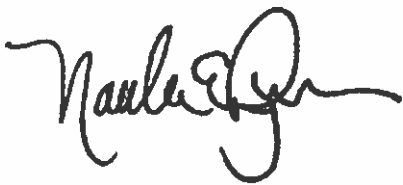
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LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

---

Attached are the analytical results for Jolly 41X-6 received by Origins Laboratory, Inc. 1/22/2008 5:10:00PM. Please let us know if you have any questions, or if we can help with anything at all.



Laboratory Manager  
Noelle E Doyle

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. This laboratory report is intended solely for the above addressee and it is only to be used and or reproduced in its entirety.

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303.433.1322 Laboratory  
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LT Environmental, Inc.  
4600 West 60th Avenue  
Arvada CO 80003

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

#### CROSS REFERENCE REPORT

Laboratory ID	Sample ID	Matrix	Sampled	Date Received
MW-1	X801051-01	Water	1/22/2008 12:10:00PM	01/22/2008 17:10
MW-2	X801051-02	Water	1/22/2008 11:50:00AM	01/22/2008 17:10
MW-3	X801051-03	Water	1/22/2008 11:30:00AM	01/22/2008 17:10
MW-4	X801051-04	Water	1/22/2008 12:30:00PM	01/22/2008 17:10
MW-5	X801051-05	Water	1/22/2008 12:20:00PM	01/22/2008 17:10

Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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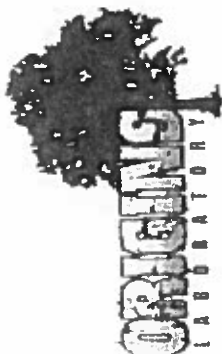
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Brian Dodek  
 Project Number: MPI0801.01  
 Project: Jolly 41X-6

1501051  
 page 1 of 1



originslaboratory.com

Project Manager: Brian Dodek  
 Project Name: Jolly 41X-6  
 Project Number: MPI0801.01  
 Samples Collected by: FLH

Client: LT Environmental  
 Address: 4600 W 60th  
 Telephone Number: 303.433.1322  
 E-Mail Address: O.E.L.

Sample ID - Description	Date Sampled	Time Sampled	Preservative			Matrix	Analysis
			Am - Ammonia Concentration	Soil	Water		
MW-1	1-27-08	10:00					Analysis - C, Fe, 2 Mn, Mg, K, Se, 3 Na, 4 Ammonia - C, 5 NH <sub>4</sub> , Br, 6 pH, EC, 7 BTEX, 8 H <sub>2</sub> O, 9 H <sub>2</sub> O, 10 H <sub>2</sub> O, 11 H <sub>2</sub> O, 12 H <sub>2</sub> O, 13 H <sub>2</sub> O, 14 H <sub>2</sub> O, 15 H <sub>2</sub> O, 16 H <sub>2</sub> O, 17 H <sub>2</sub> O, 18 H <sub>2</sub> O, 19 H <sub>2</sub> O, 20 H <sub>2</sub> O, 21 H <sub>2</sub> O, 22 H <sub>2</sub> O, 23 H <sub>2</sub> O, 24 H <sub>2</sub> O, 25 H <sub>2</sub> O, 26 H <sub>2</sub> O, 27 H <sub>2</sub> O, 28 H <sub>2</sub> O, 29 H <sub>2</sub> O, 30 H <sub>2</sub> O, 31 H <sub>2</sub> O, 32 H <sub>2</sub> O, 33 H <sub>2</sub> O, 34 H <sub>2</sub> O, 35 H <sub>2</sub> O, 36 H <sub>2</sub> O, 37 H <sub>2</sub> O, 38 H <sub>2</sub> O, 39 H <sub>2</sub> O, 40 H <sub>2</sub> O, 41 H <sub>2</sub> O, 42 H <sub>2</sub> O, 43 H <sub>2</sub> O, 44 H <sub>2</sub> O, 45 H <sub>2</sub> O, 46 H <sub>2</sub> O, 47 H <sub>2</sub> O, 48 H <sub>2</sub> O, 49 H <sub>2</sub> O, 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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-1  
X801051-01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Bicarbonate Alkalinity by SM4500CO2D

BICARBONATE ALKALINITY	1900	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
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Bromide by 300

BROMIDE	6.14	5	mg/l	10	01238ICC		01/24/2008
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BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	8A28001	01/28/2008	01/28/2008
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	98.6 %	65-135					
Surrogate: Toluene-d8	103 %	65-135					
Surrogate: 4-Bromofluorobenzene	124 %	65-135					

Carbonate Alkalinity by SM4500CO2D

CARBONATE ALKALINITY	7.78	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
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Chloride by 325.2

CHLORIDE	549	20	mg/l	20	01248CLC		01/24/2008 v
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Origins Laboratory, Inc.

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Noelle E Doyle, Laboratory Manager



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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-1

X801051-01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by 120.1

CONDUCTIVITY	4800	2	umhos/ cm	1	11248COND/	"	01/24/2008
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Metals by 6010B

IRON	0.623	0.1	mg/l	1	GW01248A	"	01/24/2008
MANGANESE	0.0768	0.015	"	"	"	"	"
POTASSIUM	5.03	1	"	"	"	"	"
SODIUM	1230	5	"	20	"	"	"
CALCIUM	30	0.2	"	1	"	"	" v
SELENIUM	ND	0.03	"	"	"	"	"
MAGNESIUM	18.9	0.2	"	"	"	"	"

Nitrate as N by 300

NITRATE (AS N)	ND	0.5	mg/l	10	01238ICC	"	01/24/2008
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Nitrite as N by 300

NITRITE (AS N)	ND	0.5	mg/l	10	01238ICC	"	01/24/2008
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pH by SM4500HB

PH LAB	7.64	0.1	units	1	01248PHA	"	01/24/2008
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Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-1

X801051-01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Sulfate by 300

SULFATE	284	10	mg/l	20	01248ICB	*	01/24/2008
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Total Dissolved Solids (TDS) by 160.1

TOTAL DISSOLVED SOLIDS	2560	100	mg/l	10	01248TDSA	*	01/24/2008
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Origins Laboratory, Inc.

Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-2

X801051-02 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Bicarbonate Alkalinity by SM4500CO2D

BICARBONATE ALKALINITY	1390	2	mg/l	1	12488ICA	01/23/2008	01/24/2008
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Bromide by 300

BROMIDE	6.28	5	mg/l	10	01238ICC	"	01/24/2008
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BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	8A28001	01/28/2008	01/28/2008
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	101 %	65-135			-	"	"
Surrogate: Toluene-d8	101 %	65-135			-	"	"
Surrogate: 4-Bromofluorobenzene	114 %	65-135			-	"	"

Carbonate Alkalinity by SM4500CO2D

CARBONATE ALKALINITY	2.32	2	mg/l	1	12488ICA	01/23/2008	01/24/2008
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Chloride by 325.2

CHLORIDE	555	20	mg/l	20	01248CLC	"	01/24/2008 v
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-2  
X801051-02 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by 120.1

CONDUCTIVITY	3910	2	umhos/cm	1	11248COND/	*	01/24/2008
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Metals by 60108

SODIUM	778	1.3	mg/l	5	GW01248A	*	01/24/2008
IRON	0.565	0.1	"	1	"	*	"
MAGNESIUM	72.2	0.2	"	"	"	*	"
MANGANESE	0.133	0.015	"	"	"	*	"
POTASSIUM	10.8	1	"	"	"	*	"
SELENIUM	ND	0.03	"	"	"	*	"
CALCIUM	148	0.2	"	"	"	*	" v

Nitrate as N by 300

NITRATE (AS N)	ND	0.5	mg/l	10	01238ICC	*	01/24/2008
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Nitrite as N by 300

NITRITE (AS N)	ND	0.5	mg/l	10	01238ICC	*	01/24/2008
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pH by SM4500HB

PH LAB	7.25	0.1	units	1	01248PHA	*	01/24/2008
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-2

X801051-02 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Sulfate by 300

SULFATE	398	10	mg/l	20	01248ICB			01/24/2008	
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Total Dissolved Solids (TDS) by 160.1

TOTAL DISSOLVED SOLIDS	2920	100	mg/l	10	01248TDSA			01/24/2008	
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-3

X801051-03 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Bicarbonate Alkalinity by SM4500CO2D

BICARBONATE ALKALINITY	1020	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
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Bromide by 300

BROMIDE	3.8	5	mg/l	10	01238ICC		01/24/2008
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BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	8A28001	01/28/2008	01/28/2008
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	102 %	65-135			"	"	"
Surrogate: Toluene-d8	105 %	65-135			"	"	"
Surrogate: 4-Bromofluorobenzene	115 %	65-135			"	"	"

Carbonate Alkalinity by SM4500CO2D

CARBONATE ALKALINITY	3.64	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
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Chloride by 325.2

CHLORIDE	408	10	mg/l	10	01248CLC		01/24/2008
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LABORATORY

LT Environmental, Inc.  
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Arvada CO 80003

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-3

X801051-03 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by 120.1

CONDUCTIVITY	3720	2	umhos/ cm	1	01248COND/	*	01/24/2008
--------------	------	---	--------------	---	------------	---	------------

Metals by 6010B

IRON	81.2	0.1	mg/l	1	GW01248A	*	01/24/2008
POTASSIUM	29.8	1	"	"	"	*	"
SELENIUM	ND	0.03	"	"	"	*	"
MANGANESE	1.52	0.015	"	"	"	*	"
MAGNESIUM	98.8	0.2	"	"	"	*	"
CALCIUM	199	0.2	"	"	"	*	" v
SODIUM	832	2.5	"	10	"	*	"

Nitrate as N by 300

NITRATE (AS N)	1.72	0.5	mg/l	10	01238ICC	*	01/24/2008
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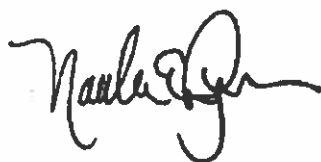
Nitrite as N by 300

NITRITE (AS N)	ND	0.5	mg/l	10	01238ICC	*	01/24/2008
----------------	----	-----	------	----	----------	---	------------

pH by SM4500HB

PH LAB	7.58	0.1	units	1	01248PHA	*	01/24/2008
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-3

X801051-03 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Sulfate by 300

SULFATE	718	25	mg/l	50	01248ICB	"	01/24/2008
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Total Dissolved Solids (TDS) by 160.1

TOTAL DISSOLVED SOLIDS	2000	100	mg/l	10	01248TDSA	"	01/24/2008
------------------------	------	-----	------	----	-----------	---	------------

Origins Laboratory, Inc.

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-4

X801051-04 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Bicarbonate Alkalinity by SM4500CO2D

BICARBONATE ALKALINITY	1370	2	mg/l	1	12488ICA	01/23/2008	01/24/2008
------------------------	------	---	------	---	----------	------------	------------

Bromide by 300

BROMIDE	5.92	5	mg/l	10	01238ICC	-	01/24/2008
---------	------	---	------	----	----------	---	------------

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	8A28001	01/28/2008	01/28/2008
Toluene	1.02	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	96.6 %	65-135					
Surrogate: Toluene-d8	100 %	65-135					
Surrogate: 4-Bromofluorobenzene	102 %	65-135					

Carbonate Alkalinity by SM4500CO2D

CARBONATE ALKALINITY	4.06	2	mg/l	1	12488ICA	01/23/2008	01/24/2008
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Chloride by 325.2

CHLORIDE	606	20	mg/l	20	01248CLC	-	01/24/2008 v
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-4  
X801051-04 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by 120.1

CONDUCTIVITY	5190	2	umhos/ cm	1	11248COND/	"	01/24/2008
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Metals by 6010B

SODIUM	1050	2.5	mg/l	10	GW01248A	"	01/24/2008
SELENIUM	ND	0.03	"	1	"	"	"
POTASSIUM	34.7	1	"	"	"	"	"
MANGANESE	0.829	0.015	"	"	"	"	"
MAGNESIUM	215	0.2	"	"	"	"	"
CALCIUM	230	0.2	"	"	"	"	"
IRON	99.2	0.1	"	"	"	"	"

Nitrate as N by 300

NITRATE (AS N)	1.94	0.5	mg/l	10	01238ICC	"	01/24/2008
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Nitrite as N by 300

NITRITE (AS N)	ND	0.5	mg/l	10	01238ICC	"	01/24/2008
----------------	----	-----	------	----	----------	---	------------

pH by SM4500HB

PH LAB	7.5	0.1	units	1	01248PHA	"	01/24/2008
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Noelle E Doyle, Laboratory Manager

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-4

X801051-04 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Sulfate by 300

SULFATE	1600	50	mg/l	100	01248ICB	*	01/24/2008
---------	------	----	------	-----	----------	---	------------

Total Dissolved Solids (TDS) by 160.1

TOTAL DISSOLVED SOLIDS	3730	100	mg/l	10	01248TDSA	*	01/24/2008
------------------------	------	-----	------	----	-----------	---	------------

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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-5

X801051-05 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Bicarbonate Alkalinity by SM4500CO2D

BICARBONATE ALKALINITY	2020	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
------------------------	------	---	------	---	----------	------------	------------

Bromide by 300

BROMIDE	5.46	5	mg/l	10	01238tCC		01/24/2008
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BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	8A28001	01/28/2008	01/28/2008
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	92.8 %	65-135			-	-	-
Surrogate: Toluene-d8	103 %	65-135			-	-	-
Surrogate: 4-Bromofluorobenzene	114 %	65-135			-	-	-

Carbonate Alkalinity by SM4500CO2D

CARBONATE ALKALINITY	27.5	2	mg/l	1	1248BICA	01/23/2008	01/24/2008
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Chloride by 325.2

CHLORIDE	647	20	mg/l	20	01248CLC		01/24/2008 v
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Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-5  
X801051-05 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Conductivity by 120.1

CONDUCTIVITY	3940	2	umhos/ cm	1	11248COND/	*	01/24/2008
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Metals by 6010B

IRON	7.56	0.1	mg/l	1	GW01248A	*	01/24/2008
MAGNESIUM	20	0.2	"	"	"	"	"
MANGANESE	0.0955	0.015	"	"	"	"	"
POTASSIUM	8.49	1	"	"	"	"	"
SELENIUM	ND	0.03	"	"	"	"	"
SODIUM	1260	5	"	20	"	"	"
CALCIUM	18.6	0.2	"	1	"	"	" v

Nitrate as N by 300

NITRATE (AS N)	2.33	0.5	mg/l	10	01238ICC	*	01/24/2008
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Nitrite as N by 300

NITRITE (AS N)	ND	0.5	mg/l	10	01238ICC	*	01/24/2008
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pH by SM4500HB

PH LAB	8.16	0.1	units	1	01248PHA	*	01/24/2008
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Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

MW-5

X801051-05 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

US BIOSYSTEMS

Sulfate by 300

SULFATE	272	10	mg/l	20	01248ICB	*	01/24/2008
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Total Dissolved Solids (TDS) by 160.1

TOTAL DISSOLVED SOLIDS	2670	100	mg/l	10	01248TDSA	*	01/24/2008
------------------------	------	-----	------	----	-----------	---	------------

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Project Number: MPI0801.01  
Project: Jolly 41X-6

Volatile Organic Compounds by EPA Method 8260B - Quality Control  
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 8A28001 - EPA 5030B</b>										
<b>Blank (8A28001-BLK1)</b>										
					Prepared: 01/28/2008 Analyzed: 01/28/2008					
Benzene	ND	1.00	ug/L							
Toluene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surrogate: 1,2-Dichloroethane-d4	65.4		"	62.5		105	65-135			
Surrogate: Toluene-d8	63.9		"	62.5		102	65-135			
Surrogate: 4-Bromofluorobenzene	71.2		"	62.5		114	65-135			
<b>LCS (8A28001-BS1)</b>										
					Prepared: 01/28/2008 Analyzed: 01/28/2008					
Benzene	45.1	1.00	ug/L	50.0		90.3	0-200			
Toluene	51.1	1.00	"	50.0		102	0-200			
Surrogate: 1,2-Dichloroethane-d4	66.5		"	62.5		106	65-135			
Surrogate: Toluene-d8	62.1		"	62.5		99.4	65-135			
Surrogate: 4-Bromofluorobenzene	72.8		"	62.5		117	65-135			
<b>Matrix Spike (8A28001-MS1)</b>										
			Source: X801051-01		Prepared: 01/28/2008 Analyzed: 01/28/2008					
Benzene	40.4	1.00	ug/L	50.0	ND	80.7	65-135			
Toluene	44.6	1.00	"	50.0	0.780	87.6	65-135			
Surrogate: 1,2-Dichloroethane-d4	58.1		"	62.5		93.0	65-135			
Surrogate: Toluene-d8	60.1		"	62.5		96.2	65-135			
Surrogate: 4-Bromofluorobenzene	69.1		"	62.5		111	65-135			
<b>Matrix Spike Dup (8A28001-MSD1)</b>										
			Source: X801051-01		Prepared: 01/28/2008 Analyzed: 01/28/2008					
Benzene	46.3	1.00	ug/L	50.0	ND	92.7	65-135	13.7	25	
Toluene	44.5	1.00	"	50.0	0.780	87.4	65-135	0.247	25	
Surrogate: 1,2-Dichloroethane-d4	59.6		"	62.5		95.4	65-135			
Surrogate: Toluene-d8	62.3		"	62.5		99.7	65-135			
Surrogate: 4-Bromofluorobenzene	68.6		"	62.5		110	65-135			

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Noelle E Doyle, Laboratory Manager

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

Brian Dodek  
Project Number: MPI0801.01  
Project: Jolly 41X-6

Bromide by 300 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01238ICC -										
BLANK (01238ICC-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
BROMIDE	ND	0.5	mg/l				90-110			
LCS (01238ICC-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
BROMIDE	5.17	0.5	mg/l	5		103	-			
LCSD (01238ICC-3)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
BROMIDE	5.33	0.5	mg/l	5		107	90-110			
MS (01238ICC-4)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
BROMIDE	23.1	5	mg/l	2.5	ND	92	90-110			
MSD (01238ICC-5)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
BROMIDE	23.3	5	mg/l	2.5	ND	93	90-110	0.9	20	

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Chloride by 325.2 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01248CLC -										
BLANK (01238ICC-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
CHLORIDE	0.0079	0.5	mg/l				90-110			I
LCS (01238ICC-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
CHLORIDE	5.02	0.5	mg/l	5		100	-			
LCSD (01238ICC-3)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
CHLORIDE	5.01	0.5	mg/l	5		100	90-110			
MS (01238ICC-4)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
CHLORIDE	211	5	mg/l	5	14		90-110			
MSD (01238ICC-5)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
CHLORIDE	214	5	mg/l	5	14		90-110			

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Conductivity by 120.1 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01248CONDA -										
BLANK (01248CONDA-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
CONDUCTIVITY	ND	2	umhos/cm							
LCS (01248CONDA-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
CONDUCTIVITY	1410	2	umhos/cm	1413		100				
DUP (01248CONDA-4)					Source: L245219-4 Prepared: 01/23/2008 Analyzed: 01/24/2008					
CONDUCTIVITY	1410	2	umhos/cm		400			190		

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Project: Jolly 41X-6

Metals by 6010B - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch GW01248A - 3010										
BLANK (GW01248A-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
MANGANESE	ND	0.015	mg/l							
MAGNESIUM	ND	0.2	"							
IRON	ND	0.1	"							
CALCIUM	0.175	0.2	"							IV
SODIUM	ND	0.25	"							
POTASSIUM	ND	1	"							
SELENIUM	ND	0.03	"							
LCS (GW01248A-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
IRON	4.99	0.1	mg/l	5		100	80-120			
SELENIUM	1.01	0.03	"	1		101	80-120			
MANGANESE	0.987	0.015	"	1		99	80-120			
SODIUM	24.4	0.25	"	25		97	80-120			
POTASSIUM	9.79	1	"	10		98	80-120			
MAGNESIUM	24.2	0.2	"	25		97	80-120			
CALCIUM	25	0.2	"	25		100	80-120			
MS (GW01248A-3)					Source: L245615-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
POTASSIUM	10.6	1	mg/l	10	2320	102	75-125			
SELENIUM	1.02	0.03	"	1	0.01	102.24	75-125			
SODIUM	31.9	0.25	"	25	ND	101	75-125			
MANGANESE	1.06	0.015	"	1	0.01	99	75-125			
CALCIUM	170	0.2	"	25	13000	126	75-125			8
MAGNESIUM	26.3	0.2	"	25	1.92	98	75-125			
IRON	14.4	0.1	"	5	7.3	110	75-125			
MSD (GW01248A-4)					Source: L245615-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
SELENIUM	1.02	0.03	mg/l	1	0.01	102.44	75-125	0.1954	20	

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Metals by 6010B - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch GW01248A - 3010										
MSD (GW01248A-4)		Source: L245615-1			Prepared: 01/23/2008 Analyzed: 01/24/2008					
IRON	13.9	0.1	mg/l	5	7.3	101	75-125	3.2	20	
POTASSIUM	10.4	1	"	10	2320	100	75-125	2.2	20	
MAGNESIUM	25.9	0.2	"	25	1.92	96	75-125		20	
MANGANESE	1.04	0.015	"	1	0.01	98	75-125	1.7	20	
SODIUM	31.2	0.25	"	25	ND	98	75-125	2.3	20	
CALCIUM	165	0.2	"	25	13000	104	75-125	3.3	20	8

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Project: Jolly 41X-6

Nitrate as N by 300 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01238ICC -										
BLANK (01238ICC-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRATE (AS N)	ND	0.05	mg/l				90-110			
LCS (01238ICC-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRATE (AS N)	2.49	0.05	mg/l	2.5		100	-			
LCSD (01238ICC-3)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRATE (AS N)	2.53	0.05	mg/l	2.5		101	90-110			
MS (01238ICC-4)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRATE (AS N)	25.7	0.5	mg/l	2.5	0.058	97	90-110			
MSD (01238ICC-5)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRATE (AS N)	25.9	0.5	mg/l	2.5	0.058	98	90-110	0.8	20	

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Project: Jolly 41X-6

Nitrite as N by 300 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01238ICC -										
BLANK (01238ICC-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRITE (AS N)	ND	0.05	mg/l				90-110			
LCS (01238ICC-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRITE (AS N)	2.38	0.05	mg/l	2.5		95				
LCSD (01238ICC-3)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRITE (AS N)	2.38	0.05	mg/l	2.5		95	90-110			
MS (01238ICC-4)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRITE (AS N)	26.5	0.5	mg/l	2.5	5	106	90-110			
MSD (01238ICC-5)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
NITRITE (AS N)	26.7	0.5	mg/l	2.5	5	107	90-110	0.8	20	

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pH by SM4500HB - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 01248PHA -									
CHKSTD (01248PHA-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008				
PH LAB	6.86	0.1	units			-			
DUP (01248PHA-2)					Source: X801051-02 Prepared: 01/23/2008 Analyzed: 01/24/2008				
PH LAB	7.24	0.1	units		7.4	-	0.138		

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Sulfate by 300 - Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01248ICB -										
BLANK (01238ICC-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
SULFATE	0.141	0.5	mg/l				90-110			1
LCS (01238ICC-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
SULFATE	10.1	0.5	mg/l	10		101	-			
LCSD (01238ICC-3)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
SULFATE	10.2	0.5	mg/l	10		102	90-110			
MS (01238ICC-4)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
SULFATE	119	5	mg/l	7.5	30	111	90-110			7
MSD (01238ICC-5)					Source: L245578-1 Prepared: 01/23/2008 Analyzed: 01/24/2008					
SULFATE	121	5	mg/l	7.5	30	113	90-110	1.7	20	7

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Total Dissolved Solids (TDS) by 160.1 – Quality Control  
US BIOSYSTEMS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 01248TDSA -										
BLANK (01248TDSA-1)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
TOTAL DISSOLVED SOLIDS	ND	10	mg/l							
LCS (01248TDSA-2)					Prepared: 01/23/2008 Analyzed: 01/24/2008					
TOTAL DISSOLVED SOLIDS	975	100	mg/l	1000		98				
DUP (01248TDSA-3)					Source: L245605-3 Prepared: 01/23/2008 Analyzed: 01/24/2008					
TOTAL DISSOLVED SOLIDS	437	10	mg/l		ND			3.82		

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### Notes and Definitions

V Analyte found in Method Blank.

IV Result value between MDL and RDL and Analyte found in Method Blank.

I Result value between MDL and RDL

8 Flag-MS and/or MSD recoveries outside control limits due to the high level of target analyte in the spiked sample. LCS and/or LCSD within limits. Data reported.

7 Flag-MS and/or MSD recoveries outside control limits. However, LCS and/or LCSD within limits. Data reported.

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

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