



February 13, 2012

Peabody Energy
701 Market Street
St. Louis, Mo 63101-1826

Attn.: Brian Yansen

NWCC Job Number: 11-8900

Subject: Monitoring Well Installation
Summary Report, Trout Creek Wetlands
Mapping, Trout Creek Ranch, Routt County,
Colorado.

Gentlemen:

NWCC, Inc. (NWCC) is pleased to submit this Summary Report for the Trout Creek Wetlands Mapping located within the Trout Creek Ranch in Routt County, Colorado. This report has been prepared to summarize the work completed as of this date for the Monitoring Well Installations that NWCC is under contract to complete for the client, Peabody Energy. This report and the monitoring well installations were completed in general conformance with the scope of work outlined in the proposal and contract prepared by NWCC and dated April 20, 2011.

As requested, thirty four (34) groundwater monitoring wells were installed in October 2011 at the subject sites. The depths of the wells generally ranged from 4 ½ to 19 feet in depth. In addition to the installation of the monitoring wells, a limited amount of laboratory testing was completed on subsurface soil samples obtained during the drilling of the wells. The approximate project site location is shown on Figure #1.

FIELD AND LABORATORY INVESTIGATIONS

The field investigation for this project was completed between October 18 and 27, 2011. The wells/test holes were drilled with an all-terrain drill rig using 8 ¼ - inch diameter hollow stem augers. The field investigation consisted of the drilling and installation of thirty four (34) monitoring wells/test holes in the predetermined locations provided by ERO Resources. Monitoring wells consisting of slotted and solid PVC casing were installed in each of the test holes so that the groundwater levels can be monitored through the different seasons. The approximate test hole/well locations are presented in Figure #2.

The subsurface conditions encountered in the test holes were highly variable and generally consisted of a layer of topsoil and organic materials overlying natural clays, sands and/or silts, which in turn were overlying natural gravels, claystone bedrock and sandstone bedrock to the maximum depth investigated, 19

feet. The logs of the test holes and details associated with construction of the completed wells are presented in Figures #3 through #6. The associated Legend and Notes presented in Figures #7 and #8, respectively.

The natural clays were sandy to very sandy to sands and clay, low to moderately plastic, soft to medium stiff, moist to wet and brown to gray with rust staining. Samples of the natural clays classified as CL to SC-CL soils in accordance with the Unified Soil Classification system.

The natural silts were sandy to very sandy, low to non-plastic, loose to medium dense, moist to wet and brown to gray in color. A sample of the natural silt classified as a ML soil in accordance with the Unified Soil Classification System.

The natural sands were clayey to very silty, fine to medium grained, low to non-plastic, loose to medium dense, moist to wet and brown to light brown in color. Samples of the natural sands classified as SM to SC soils in accordance with the Unified Soil Classification System.

The natural gravels were sandy to very sandy, fine to coarse grained with cobbles, non-plastic, dense, very moist to wet and brown in color. Samples of the natural gravels classified as GM to SM-GM soils in accordance with the Unified Soil Classification System.

The sandstone bedrock materials were clayey to silty, low to non-plastic, weathered to hard, slightly moist to light brown to gray in color. Samples of the sandstone bedrock materials classified as SM soils in accordance with the Unified Soil Classification System.

The claystone bedrock materials encountered were slightly sandy to sandy with occasional anthracite interbeds, low to moderately plastic, weathered to hard, slightly moist to moist and brown to gray in color.

Gradation/hydrometer test results conducted on samples of the clays are provided in Figures #9 and #10. All of the other laboratory test results are summarized in the attached Table 1.

Groundwater seepage was encountered in all of the test holes at depths ranging from at the existing ground surface to 6 feet below the existing ground surface. It should be noted that the groundwater conditions at the site can be expected to fluctuate considerably with changes in precipitation and runoff.

Once the test holes were drilled to the required depths, as per ERO directions, monitoring wells were installed in each of the test holes. The wells consisted of 2-inch diameter Schedule 40 PVC. The wells were constructed using 10 foot long slotted well screen sections (0.010 factory slotted, flush threaded) in the lower portions of the hole and solid PVC riser pipes in the upper portions of the test hole. The solid riser pipe sections all extend to approximately 3 feet above the existing ground surface. The amount and depth of the screened lengths was determined by ERO at the time of drilling.

Sand pack consisting of 10-20 silica sand was used to backfill the majority of the holes to at least six inches above the screened section in each well. Bentonite chips were placed and hydrated above the sand pack in all of the wells to the existing ground surface. A protective steel casing including locking lids and padlocks

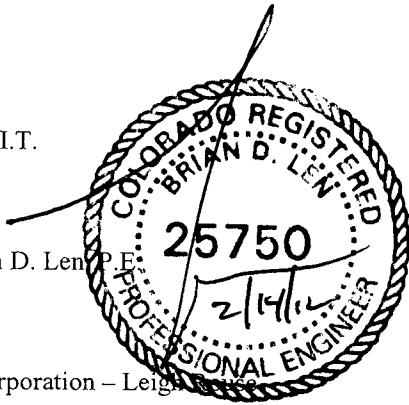
were placed over the solid riser pipe. A concrete surface seal was used the ground surface for all of the piezometers.

If you have any questions regarding this summary report, our observations or the laboratory test results please contact the undersigned.

Sincerely,
NWCC, INC.,

Josh P. Frappart, E.I.T.

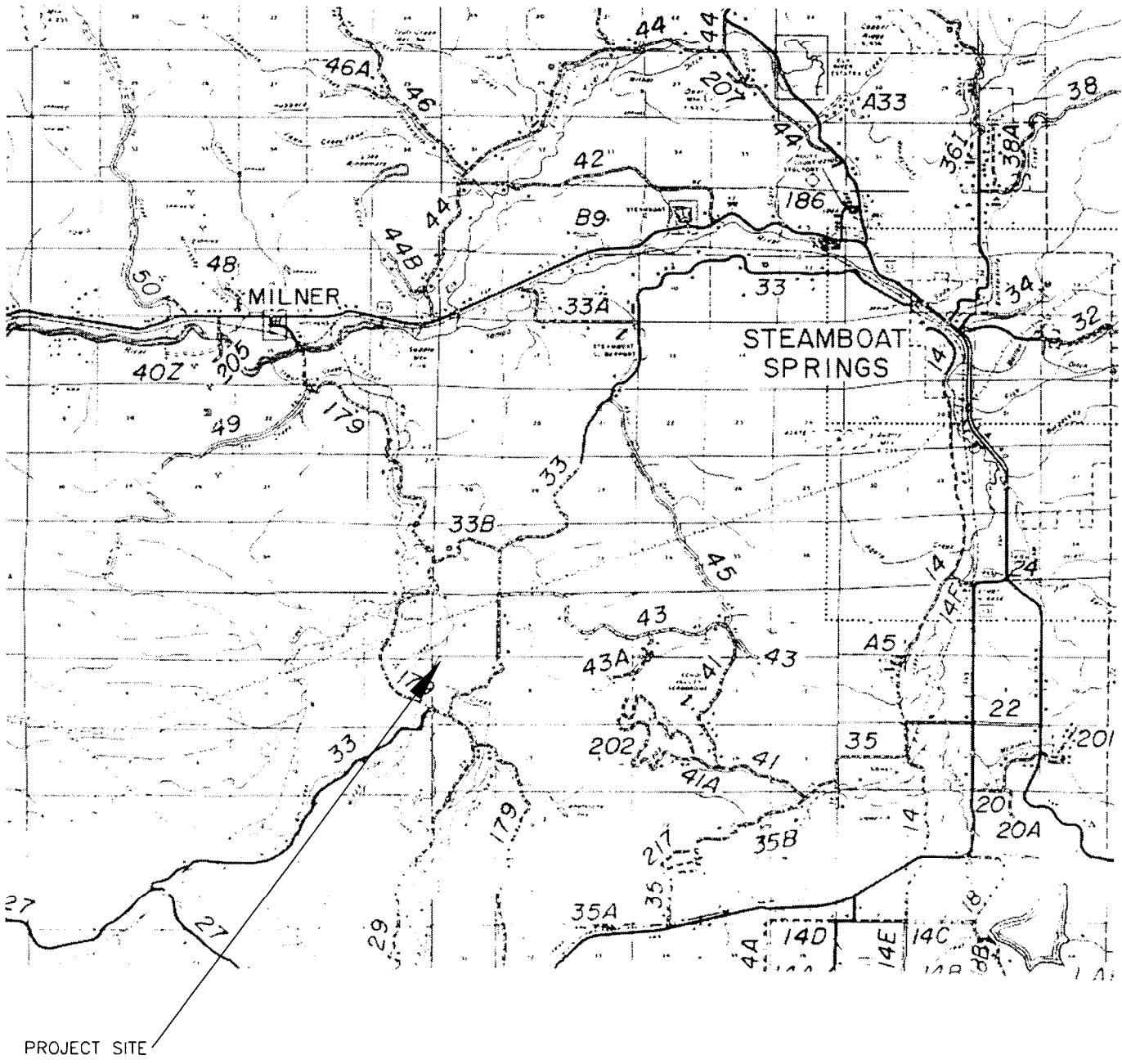
Reviewed by: Brian D. Lent



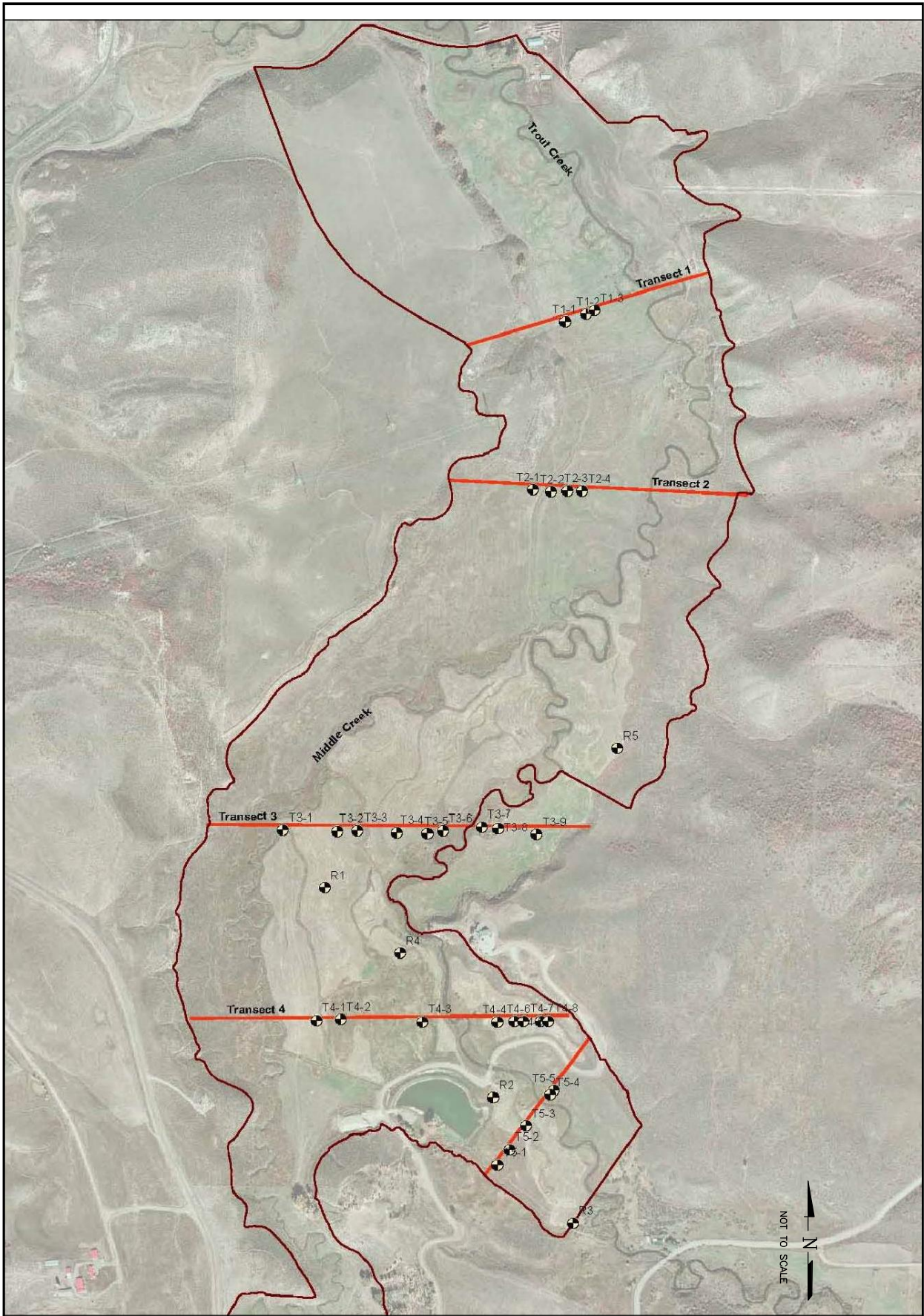
ERO Resources Corporation – Leigh



NOT TO SCALE



Title: VICINITY MAP		Date: 2/8/12	
Job Name: Trout Creek Wetlands Mapping		Job No. 11-8900	
Location: Trout Creek Ranch, Routt County, Colorado		Figure #1	



#2	Job No.	11-2800		
	Date	2/6/12		
	Drawn By	SK		
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	Sheet	N/A		
REV	REVISIONS	DATE	DRAWN BY	CHECKED BY

**TROUT CREEK
WETLANDS MAPPING
ROUTT COUNTY, CO**

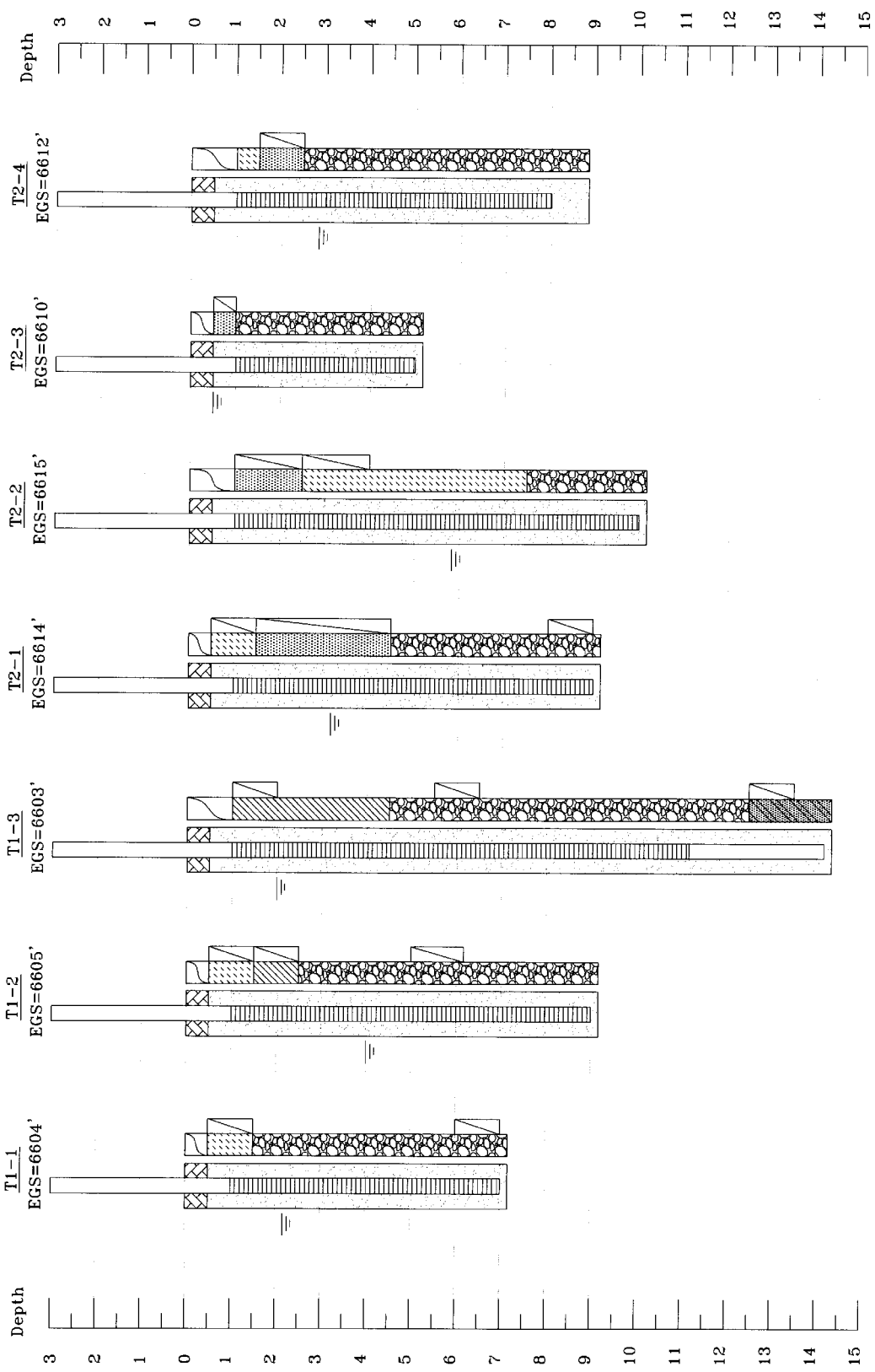
**SITE PLAN
WELL LOCATIONS**

NO.	DATE	SCALE	BY	DATE

Proj. No.	11-8892
Date:	2/7/72
Drawn	JP
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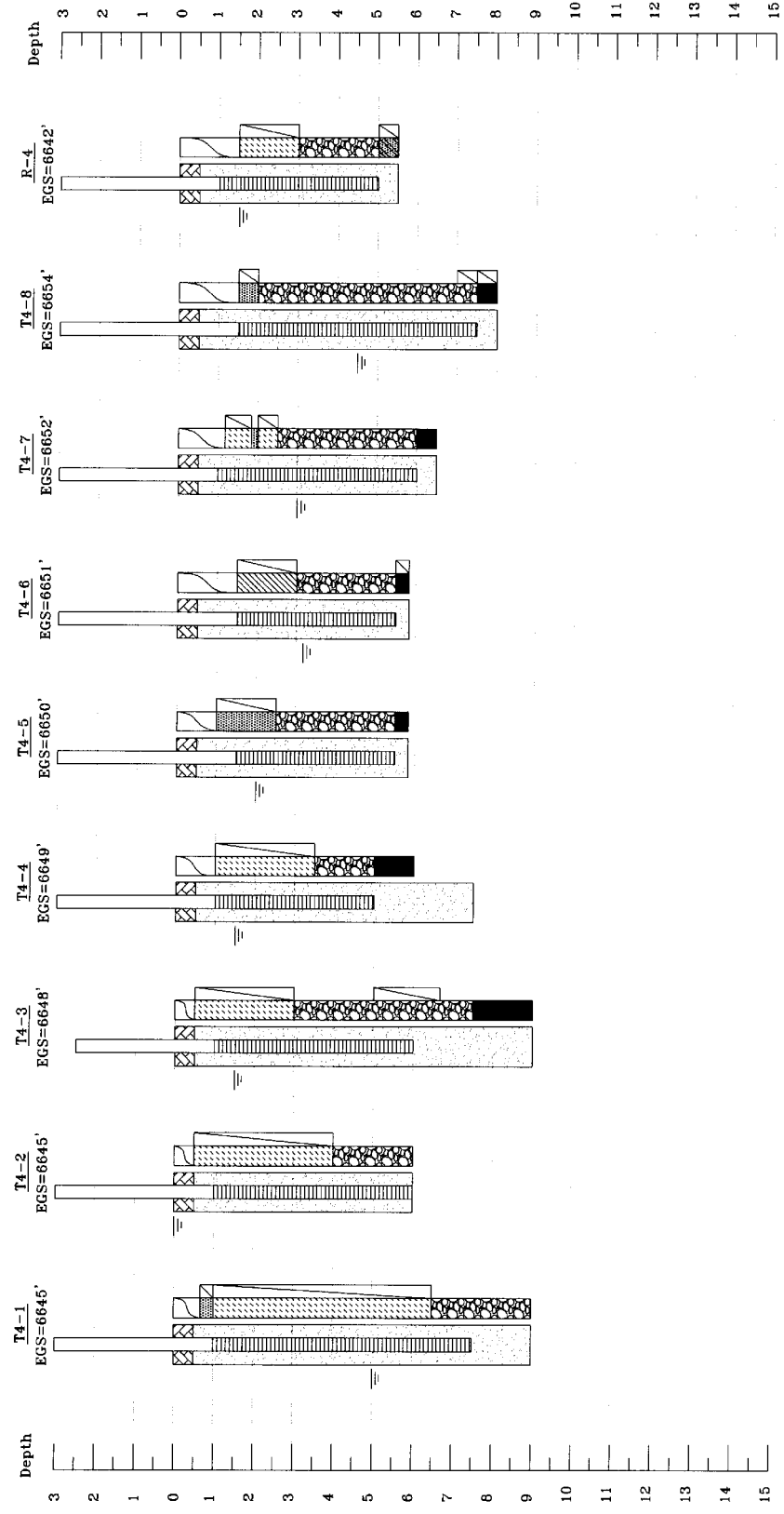
Figure

#3



EGS = Existing Ground Surface Elevation, determined by Dowling Land Surveyors

Job No.	11-8892
Date	7/8/12
Drawn	JF
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Scale	N/A
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Figure	



EGS = Existing Ground Surface Elevation, determined by Dowling Land Surveyors

LEGEND:



Topsoil and Organics:



CLAYS: Sandy to very sandy to sand and clay, low to moderately plastic, soft to medium stiff, moist to wet and brown to gray with rust staining.



SILTS: Sandy to very sandy, low to non-plastic, loose to medium dense, moist to wet and brown to gray in color.



SANDS: Slightly clayey to very silty, fine to medium grained, low to non-plastic, loose to medium dense, moist to wet and brown to light brown in color.



Gravels: Sandy to very sandy, fine to coarse grained, non-plastic, dense, very moist to wet and brown in color.



SANDSTONE BEDROCK: Clayey to silty, low to non-plastic, weathered to hard, slightly moist and light brown to gray in color.



CLAYSTONE BEDROCK: Slightly sandy to sandy with occasional anthracite interbeds, low to moderately plastic, weathered to hard, slightly moist to moist and brown to gray in color.



Well Sand Pack using 10-20 Silica Sand.



Well Seal using hydrated Bentonite Chips.



Depth of solid 2-inch diameter PVC pipe.



Depth of slotted (0.01-inch slot size) 2-inch diameter PVC pipe.



Continuous Split Spoon Sampler.



Indicates depth at which groundwater was encountered at the time of drilling.

Title: LEGEND	Date: 2/8/12	
Job Name: Trout Creek Wetlands Mapping	Job No. 11-8900	
Location: Trout Creek Ranch, Routt County, Colorado	Figure #7	

- 1) The test holes were drilled between October 18 and 27, 2011 with an all terrain-mounted drill rig using 8 1/4-inch diameter hollow stem augers.
- 2) Locations of the test holes were predetermined in the field by ERO Resources.
- 3) Elevations and test hole/well locations were determined by Dowling Land Surveyors.
- 4) The lines between materials shown on the logs represent the approximate boundaries between materials types and transitions may be general.
- 5) The water level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water levels will probably occur with time.


Title: NOTES	Date: 2/8/12	 <p>NWCC North West Colorado Consultants, Inc. Geotechnical / Environmental Engineering - Materials Testing (970)879-7886 • Fax (970)879-7891 2580 Copper Ridge Drive Steamboat Springs, Colorado 80487</p>
Job Name: Trout Creek Wetlands Mapping	Job No. 11-8900	
Location: Trout Creek Ranch, Routt County, Colorado	Figure #8	

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	ATTERBERG LIMITS		GRADATION		PERCENT PASSING No. 200 SIEVE	UNCONFINED COMPRESSIVE STRENGTH (psf)	SOIL or BEDROCK DESCRIPTION	UNIFIED SOIL CLASS.
TEST HOLE	DEPTH			LIQUID LIMIT (%)	PLASTICITY INDEX (%)	GRAVEL (%)	SAND (%)				
T1-1	6"-18"	39.1	-	44	23	0	28	72	-	Sandy Clay	CL
T1-1	6'-7'	10.4	-	NP	NP	58	34	8	-	Sandy Gravels	GM
T2-1	8'-9'	33.8	-	NP	NP	56	32	12	-	Sandy Gravels	GM
T2-3	6"-12"	32.7	-	NP	NP	0	63	37	-	Very Silty Sand	SM
T3-4	1'-3'	22.4	-	26	11	1	42	57	-	Very Sandy Clay	CL
T3-4	5'-7'	11.9	-	NP	NP	40	45	15	-	Silty Sands and Gravels	SM-GM
T3-6	1'-2'	16.1	-	NP	NP	32	55	13	-	Silty Gravelly Sands	SM
T3-8	2'-4.5'	54.3	-	NP	NP	0	32	68	-	Sandy Silt	ML
T4-2	6"-4'	28.4	-	28	15	1	42	57	-	Very Sandy Clay	CL
T4-3	6"-3'	28.7	-	30	9	1	50	49	-	Sand and Clay	SC-CL
T4-4	1'-1.5'	44.5	-	35	11	0	35	65	-	Sandy Clay	CL
T4-8	7'-7.5'	9.3	-	NP	NP	51	36	13	-	Sandy Gravels	GM
T4-5	1'-2.5'	26.8	-	NP	NP	3	64	33	-	Silty Sand	SM

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	ATTERBERG LIMITS		GRADATION		PERCENT PASSING No. 200 SIEVE	UNCONFINED COMPRESSIVE STRENGTH (psf)	SOIL or BEDROCK DESCRIPTION	UNIFIED SOIL CLASS.
TEST HOLE	DEPTH (feet)			LIQUID LIMIT (%)	PLASTICITY INDEX (%)	GRAVEL (%)	SAND (%)				
T5-2	10.5'-11'	11.8	-	30	17	1	12	87	-	Sandy Clay	CL
T5-3	8'-8.5'	17.6	-	NP	NP	17	53	30	-	Sands and Silts with Bedrock Fragments	SM
T5-4	4'-4.5'	15.7	-	NP	NP	0	70	30	-	Sandstone Bedrock	SM
R-3	4'-8'	11.9	-	NP	NP	46	43	11	-	Silty Sands and Gravels	SM-GM
R-3	18.5'-19'	6.4	-	22	7	7	59	34	-	Sandstone Bedrock	SM
R-4	1.5'-3'	36.6	-	31	11	0	37	63	-	Very Sandy Clay	CL
R-5	1'-3'	31.0	-	39	22	0	10	90	-	Slightly Sandy Clay	CL