United States Department of Agriculture



Natural Resources Conservation Service Geological Services Unit 501 Felix, Bldg. 49S Fort Worth, Texas 76115



Apr. 25, 2022

Subject: Lower Plum Creek Site 28, Caldwell County, Tx – Geologic Investigation

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The geology of Lower Plum Creek Site 28 was investigated in two phases. In December 2014, the right and left auxiliary spillways were investigated for sampling and Kh information. The design investigation was done in March and April of 2019. The investigations were performed to obtain information for the upgrade of the structure due to reclassification from low hazard to high hazard. A site visit was conducted on April 21, 2022, with two additional hand-augered borings taken. This is an update to the 2020 Geology report to reflect this field visit as well as to address comments from the 30% Design Review.

General Data

Watershed: Lower Plum Creek

County: Caldwell State: Texas

Structure Class: Low reclassified to High Type of Equipment: Mobile B-57, CME 45

Site Data

Drainage Area: 4691 acres (As-built 6/21/1962)

Type of Structure: Earthen

Purpose: Floodwater Retarding

Direction of Valley: NE to SW

Maximum Height of Fill: 28 ft. (As-built 6/21/1962)

Volume of Fill: 237,600 yrd³ (As-built 6/21/1962)

Length of Fill: 3 656 ft. (approximate)

Storage Capacity: 3283 Acre-ft. (As-built 6/21/1962)
Sediment pool: 199 Acre-ft. (Work Plan August 1960)
Floodwater Storage: 2892 Acre-ft. (Work Plan August 1960)

Top of Dam (elev.): 480.4 ft. (As-built 6/21/1962)

Auxiliary Spillway Crest (elev.): 474.5 ft. (As-built 6/21/1962) Auxiliary Spillway Width (Left): 100 ft. (As-built 6/21/1962) Auxiliary Spillway Width (Right): 400 ft. (As-built 6/21/1962) Principal Spillway Crest (elev.): 460.2 ft. (As-built 6/21/1962)

Surface Geology and Physiography

Physiographic Description:
Topography:
Attitude of Beds:
Post-Oak Savannah
Rolling Hills
Strike: NE-SW

Dip: $\sim 0^0$ to 2^0 SE

General

The majority of the site is underlain by the Eocene Wilcox Group (Ewi) mudstone and sandstone, with small portion of the watershed being underlain by the Eocene Carrizo Sand (Ec). A slight amount of Quaternary Alluvium, (Qal), is deposited in a channel incised into the (Ewi). Some regional faulting is in the immediate area as described on the Bureau of Economic Geology, Geologic Atlas of Texas, Austin and Seguin Sheets, 1974. No faulting is directly under the structure. Probabilistic ground motion values as measured in %g for this site indicate low seismicity.

Wilcox Group

The Wilcox Group is mostly comprised of claystone, with varying amounts of sandstone, lignite, and iron concretions. Claystone in the formation is massive to thin bedded, with some silt and very fine sand laminations. It is pale brown to yellowish-brown in color and weathers to yellowish-brown. Sandstone are mostly medium to fine grained, moderately well sorted, cross-bedded and occur in units 5 to 20 feet thick. Some lignite seams are present and the range in thickness from less than 1 to about 20 feet thick. Samples 250.6, 251.2, 252.2, 206.3, and 261.1 are representative of the weathered claystone material and samples 250.3, 250.4, 251.3 and 252.1 are representative of weathered silt and sandstone layers.

Carrizo Sand

The Carrizo Sand is comprised of medium to very coarse-grained sandstone. It tends to be thick bedded, light yellow to orange-brown in color and weathers to a yellowish brown. It can be locally banded with iron-oxide and ranges in thickness from 100 to 140 feet. No samples taken are from this unit.

Alluvial Deposits

The alluvium is deposited in the channel incised into the Ewi. The material obtains a thickness of up to 35 feet in hole 305. The material is comprised of moderately stiff, plastic clay, contain some fine-grained sand, with a grey to greenish-gray color. This was logged as CL, CH and SM

in the field in holes 305, 606, 607 and 608.

Cultural

Just south of the site is FM 713, running east to west, and FM 86 is to the west of the site, running northeast to southwest. Lower Plum Creek Site 29 is located approximately 1 mile to the southeast, and Lower Plum Creek Site 24 is located approximately 3 miles to the northwest.

Seismic

Probabilistic ground motion values as measured by %g indicates low seismicity for this site. (Note: the term "low" is used as a descriptive term and not a classification term). A map of all known seismic events with magnitudes (1811 to 2020) and faults within a 100km radius of the site was constructed (TR 210-60, Earth Dams and Reservoirs, March 2019). Seismic event locations are from published historic event, University of Texas Austin and the USGS Earthquake Hazards Program. Fault locations are from the Texas Geologic Outcrop mas, Bureau of Economic Geology. The Balcones fault zone is approximately 40km to the west of Lower Plum Site 28 and is comprised of an area of mostly normal faulting. The fault zone has been inactive for approximately 15 million years. No other significant, known faults are in the vicinity of Site 28.

Hazard curves attached are from the USGS Unified Hazard Tool program. Parameters used are from the Dynamic Conterminous U.S. 2014 (update)(v4.2.0) Edition, 760 m/s (B/C boundary) Site Class, Spectral Period is Peak Ground Acceleration with a time horizon return period of 2475 years. Peak Horizontal Ground Acceleration at this site is 0.025937407 g with an Exceedance rate of 0.00040208253 yr⁻¹.

The attached Total Deaggregation Plot (USGS) indicates the mean seismic contribution to the site is from several earthquakes of magnitude 4.8-5.1, 30 to 100 km from the site. The events are along the Balcones Fault to the northwest of the site.

The attached magnitude vs. distance vs. Papdopoulos and Lefkoppoulos (e-e') curve is from the deaggregation plot report mentioned above and the e-e' data from the Magnitude-Distance Relations for Liquefaction in Soil from Earthquakes, Bulletin of the Seismological Society of America, Vol. 83, June 1993. Magnitude/Distance points below and to the right of the e-e' curve are not considered susceptible to liquefaction. Points above and to the left of the e-e' may be subject to liquefaction. The figure included in this report is intended for informational purposes and should not be considered a complete seismic evaluation for design.

Site

Rehabilitation site plans consist of "constructing an impact basin for the Need of the Project existing principal spillway system; adding a new 30-inch hooded inlet principal spillway with an impact basin; widening the right auxiliary spillway 36 feet; lowering both auxiliary spillway

crests 0.4 feet; regrading the inlet and outlet channels of both auxiliary spillways; raising the top of the dam 0.9 feet; flattening the upstream and downstream slopes to 3:1; reconstructing an upstream wave berm and adding rock riprap for wave protection." From: FINAL SUPPLEMENTAL WATERSHED PLAN NO. VII and Environmental Evaluation for the Rehabilitation of Floodwater Retarding Structure No. 28 of the Lower Plum Creek Watershed Hays and Caldwell Counties, Texas. (May 2016)

Auxiliary Spillway

Eleven holes were drilled in the right Auxiliary Spillway to obtain samples for Kh determination in 2014 to assist in planning. All holes were drilled using a Mobil B-57 rig using hollow stem augers. All holes were drilled to at least existing Principal Spillway pipe invert elevation of 447 feet, to meet the "depth to valley floor" criteria in (TR 210-60, Earth Dams and Reservoirs, March 2019). A geologic profile of the right auxiliary spillway is in attachment 7.

Eight holes were drilled in the left Auxiliary Spillway for the same reasons in 2014 and 2015. These holes were also drilled using a Mobil B-57 rig with hollow stem augers and were also drilled to principal spillway pipe invert elevation. A geologic profile of the left auxiliary spillway is in attachment 7.

Auxiliary Spillway-Right

Sample No.	Depth	Location	Type of sample
250.5	20'-22'	~12+31 CL AS-R 157ft L	3" Push
251.2	10'-12.5'	~13+77 CL AS-R 158ft L	3" Push
252.1	5'-7'	~15+25 CL AS-R 157ft L	3" Push
253.1	5'-7.5'	~16+76 CL AS-R 160ft L	3" Push
253.2	10'-12.5'		3" Push
254.1	5'-7.5'	~18+26 CL AS-R 157ft L	3" Push
254.2	10'-12.5'		3" Push
255.1	5'-7.5'	~19+74 CL AS-R 156ft L	3" Push
256.1	5'-7.5'	~21+28 CL AS-R 158ft L	3" Push

Auxiliary Spillway-Left

Sample No.	Depth	Location	Type of sample
260.1	0'-2.5'	~10+27 CL AS-L 17ft R	3" Push
260.3	10'-12.5'		3" Push
260.5	20'-22.5'		3" Push
260.6	25'-27.5'		3" Push
261.1	5'-7.5'	~11+79 CL AS-L 20ft R	3" Push
261.2	10'-12.5'		3" Push
262.1	5'-7.5'	~13+29 CL AS-L 18ft R	3" Push
262.2	15'-17.5'		3" Push
263.2	10'-12.5'	~14+75 CL AS-L 21ft R	3" Push
264.1	5'-7.5'	~16+24 CL AS-L 18ft R	3" Push

Five additional holes were drilled in the outside cut of the right auxiliary spillway in 2019. These holes were drilled to investigate material for borrow use as well as to investigate lithology and slope stability in areas of proposed excavation for auxiliary spillway expansion.

Hole:	# Sample #	Depth	Location	Туре	Discussion
270	270.1	1'-5'	~11+50CL AS-R 275' RT	small	borrow
	270.2	7'-10'		small	borrow
	270.3	10'-12'		3" push	slope stability
	270.4	13.5'-15'		SPT	6+9+8/ slope
					stability
271	270.1	2'-5'	~10+80CL AS-R 295' RT	small	borrow
	270.2	5'-8'		small	borrow
	270.3	8'-9.5'		SPT	11+22+29/
					Slope stability
	270.4	13.5'-15'		SPT	12+20+25/
					Slope stability
272	272.1	2'-5'	~9+70CL AS-R 290' RT	small	borrow
	272.2	7'-10'		small	borrow
	272.3	13.5'-15.5'		3" push	slope stability
273	273.1	2'-5'	~8+80CL AS-R 265' RT	small	borrow
	273.2	10'-13.5'		small	borrow
	273.3	13.5'-15'		SPT	14+27+33/
					Slope stability
274	274.1	0-5'	~7+80CL AS-R 245' RT	small	borrow
	274.2	10'-11.5'		SPT	8+12+13/
					Slope stability

Current Dam

Two holes were drilled on the dam at the principal spillway in 2019 to obtain samples for pipe and inlet support, slope stability and foundation support characteristics. The follow table outlines these holes, samples taken, and purpose.

[‡] Sample #	Depth	Location	Type	Discussion
304.1	5'-7.5'	~20+95CL Dam	3" push	slope stability
304.2	10'-12.5'		3" push	slope stability
				Pipe support
304.3	15'-17.5'		3" push	slope stability
				Pipe support
304.4	30'-32.5'		3" push	slope stability
304.5	35'-37.5'		3" push	foundation
304.6	42.5'-44'		SPT	4+9+12
				Foundation
304.7	45'-46.5'		SPT	6+19+27
				Foundation
305.1	5'-7.5'	~20+90CL Dam 95'DS	3" push	Classification
	304.1 304.2 304.3 304.4 304.5 304.6 304.7	304.1 5'-7.5' 304.2 10'-12.5' 304.3 15'-17.5' 304.4 30'-32.5' 304.5 35'-37.5' 304.6 42.5'-44' 304.7 45'-46.5'	304.1 5'-7.5' ~20+95CL Dam 304.2 10'-12.5' 304.3 15'-17.5' 304.4 30'-32.5' 304.5 35'-37.5' 304.6 42.5'-44' 304.7 45'-46.5'	304.1 5'-7.5' ~20+95CL Dam 3" push 304.2 10'-12.5' 3" push 304.3 15'-17.5' 3" push 304.4 30'-32.5' 3" push 304.5 35'-37.5' 3" push 304.6 42.5'-44' SPT 304.7 45'-46.5' SPT

305.2 305.3 305.4	7.5'-10' 10'-11.5' 12.5'-15'	3" push SPT 3" push	pipe support pipe support pipe,
305.5	20'-21.5'	SPT	Impact basin 10+14+19 classification
305.6	28'-29.5'	SPT	15+26+35 classification
305.7	35'-36.5'	SPT	12+17+25 classification
305.8	45'-46.5'	SPT	29+42+46
305.9	50'-51'	SPT	classification 29+50 for 6" Classification

Downstream Toe

Eleven holes were drilled on the downstream toe of the dam in 2019. Samples were taken between 5' and 10' to investigate toe drain properties and foundation support material. Further samples were taken at lower depths primarily for classification purposes. The following table outlines this information, along with blow counts for SPT intervals.

Hole 7	# Depth	Location	Type	Discussion
601	5'-7.5'	~34+50CL Dam 93'DS	3" Push	Toe drain/foundation support
	7.5'-10'		3" Push	Toe drain/foundation support
	20'-21.5'		SPT	4+6+11, classification
	25'-26.5'		SPT	4+13+20, classification
	30'-31.5'		SPT	14+22+27, classification
	35'-36.5'		SPT	11+22+30, classification
	40'-41.5'		SPT	18+28+34, classification
602	5'-7.5'	~32+50CL Dam 95'DS	3" Push	Toe drain/foundation support
	7.5'-10'		3" Push	Toe drain/foundation support
	20'-21.5'		SPT	9+29+33, classification
	25'-26.5'		SPT	5+7+12, classification
	30'-31.5'		SPT	15+22+30, classification
	35'-36.5'		SPT	17+22+25, classification
	40'-41.5'		SPT	12+43+50 for 3", classific.
603	5'-7.5'	~30+50CL Dam 95'DS	3" Push	Toe drain/foundation support
	7.5'-10'		3" Push	Toe drain/foundation support
	20'-21.5		SPT	7+9+12, classification
	25'-26.5'		SPT	4+9+20, classification
	30'-31.5'		SPT	15+22+36, classification
	35'-36.5'		SPT	19+39+50 for 5.75", classif.
	40'-41.5'		SPT	20+21+50 for 4", classif.
604	5'-7.5'	~28+50CL Dam 95'DS	3" Push	Toe drain/foundation support
	7.5'-10'		3" Push	Toe drain/foundation support
	15'-16.5'		SPT	6+9+14, classification
	25'-26.5'		SPT	22+36+43, classification

605 5'-7.5' ~26+50CL Dam 95'DS 3" Push Toe drain/foundation support and a support a support a support and a support	ort
25'-26.5' SPT 12+24+50 for 6", classif. 30-31.5' SPT 22+31+40, classification	: ort
30-31.5' SPT 22+31+40, classification	ort
, and the second se	ort
	ort
35-36.5' SPT 15+25+50 for 5.5", classif.	
606 5'-7.5' ~24+50CL Dam 95'DS 3" Push Toe drain/foundation suppo	ort
7.5'-10' 3" Push Toe drain/foundation suppo	
25'-26.5' SPT 5+8+12, classification	
30'-31.5' SPT 17+26+27, classification	
35'-36.5' SPT 23+30+50 for 6", classif.	
40'-41.5' SPT 50 for 6", classification	
607 5'-7.5' ~22+45CL Dam 91'DS 3" Push Toe drain/foundation suppo	
7.5'-10' 3" Push Toe drain/foundation suppo	ort
25'-26.5' SPT 12+15+21, classification	
30'-31.5' SPT 30+43+39, classification	
35'-36.5' SPT 12+35+50 for 5", classif.	
40'-41.5' SPT 29+50 for 6", classification	
608 5'-7.5' ~19+50CL Dam 83'DS 3" Push Toe drain/foundation suppo	
7.5'-10' 3" Push Toe drain/foundation suppo	ort
35'-36.5' SPT 18+32+50 for 5", classif.	
40'-41.5' SPT 50 for 4.5", classification	
609 5'-7.5' ~17+58CL Dam 89'DS 3" Push Toe drain/foundation suppo	
7.5'-10' 3" Push Toe drain/foundation suppo	ort
40'-40.25' SPT 50 for 4", lignite	
610 5'-7.5' ~15+48CL Dam 90'DS 3" Push Toe drain/foundation suppo	
10'-12.5' 3" Push Toe drain/foundation suppo	ort
35'-36.5' SPT 17+32+47, classification	
40'-41.5' SPT 50 for 4", classification	
611 7.5'-10' ~13+42CL Dam 95'DS 3" Push Toe drain/foundation suppo	
10'-12.5' 3" Push Toe drain/foundation suppo	ort
40'-41.5' SPT 13+21+32, classification	

<u>Upstream Toe</u>
Six holes were drilled on the upstream toe in 2019. Samples were taken between 5' and 10' to investigate for foundation support characteristics. Deeper samples were taken mainly for classification purposes. The following table outlines this information.

Hole	# Depth	Location	Type	Discussion
701	5'-7.5'	~34+50CL Dam 82' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support
	15'-16.5'		SPT	6+10+16, classification
	20'-21.5'		SPT	4+8+12, classification
	25'-26.5'		SPT	6+9+12, classification

	30'-31.5' 35'-36.5'		SPT SPT	13+20+20, classification 15+23+29, classification
702	5'-7.5'	~32+50CL Dam 82' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support
703	5'-7.5'	~30+50CL Dam 82' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support
704	5'-7.5'	~28+50CL Dam 82' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support
	20'-21.5'		SPT	17+28+30, classification
705	5'-7.5'	~26+50CL Dam 82' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support
	10'-11.5'		SPT	6+9+13, classification
	20'-21.5'		SPT	16+23+36, classification
706	5'-7.5'	~9+45CL Dam 73' US	3" Push	foundation support
	7.5'-10'		3" Push	foundation support

<u>Penetrometer Readings</u>
Field penetrometer readings were obtained on most push tube samples. Readings were taken at the base of the sample with units in TSF (tons per square foot). The following table outlines this information.

Hole:	# Depth	Location	Material	TSF
304	7.5'	~20+95CL Dam	CL	4.5+
	12.5'		CL	2.25
	17.5		CL	2.25
	32.5		CL	3.75
	37.5		CH	1.5
305	7.5'	~20+90CL Dam 95'DS	CH	4.5+
	10'		SM	1.5
	15'		SM	4.5+
601	7.5'	~34+50CL Dam 93'DS	CL	4.5+
	10'		CL	4.5+
602	7.5'	~32+50CL Dam 95'DS	CL	1.75
	10'		SM	4.5+
603	7.5	~30+50CL Dam 95'DS	SM	4.5+
	10'		SM	4.5+
604	7.5'	~28+50CL Dam 95'DS	SC	2.5
	10'		SM	4.0
605	7.5'	~26+50CL Dam 95'DS	CL	4.0
	10'		SC	4.5+
606	7.5'	~24+50CL Dam 95'DS	CL	2.75
	10'		CL	4.5
607	7.5'	~22+45CL Dam 91'DS	CL	2.75
	10'		CL	3.0
608	7.5'	~19+50CL Dam 83'DS	SM	1.75
	10'		SM	0.75

609	7.5'	~17+58CL Dam 89'DS	SC	1.5
	10		SC	1.0
610	7.5'	~15+48CL Dam 90'DS	CH	4.0
	12.5'		CL	4.0
611	10'	~13+42CL Dam 95'DS	CL	2.5
	12.5'		CL	1.0
701	7.5'	~34+50CL Dam 82' US	CH	2.5
	10'		CH	2.25
702	7.5	~32+50CL Dam 82' US	CL	3.75
	10'		CL	2
703	7.5'	~30+50CL Dam 82' US	CL	3
	10'		CL	2.75
704	7.5'	~28+50CL Dam 82' US	SC	3
	10'		SC	4.5+
705	7.5'	~26+50CL Dam 82' US	SC	2.25
	10'		SC	4
706	7.5'	~9+45CL Dam 73' US	CH	0.25
	10'		CH	1.25

Water Levels

Water levels in most holes were recorded. The following table outlines water level and cave-in information that was collected during drilling, immediately after drilling, and at least 24 hours after drilling (if available). No water was introduced to during the drilling of any hole, and no precipitation occurred while holes were open.

Hole #	WL(drilling)	WL(0hrs)	CI(0hrs)	WL(24hrs)	CI(24hrs)
270	n/a	n/a	n/a	dry	9.3'
271	n/a	n/a	n/a	dry	9.0'
272	n/a	n/a	n/a	dry	9.2'
273	n/a	n/a	n/a	dry	8.8'
274	n/a	n/a	n/a	dry	7.0'
304	36'	n/a	n/a	n/a	n/a
305	9'	n/a	n/a	7.6'	10.2'
601	n/a	n/a	n/a	n/a	n/a
602	15'	n/a	n/a	n/a	n/a
603	15'	n/a	n/a	n/a	n/a
604	10'	n/a	n/a	n/a	n/a
605	22'	n/a	n/a	n/a	n/a
606	20'	9.6'	25.2'	8.6'	21.1'
607	20'	n/a	n/a	7.2'	18.2'
608	35'	n/a	n/a	5.4'	27.3'
609	20'	4.4'	30.6'	4.2'	27.2'
610	10'	4.4'	33.4'	3.3'	16.2'
611	10'	2.9'	37.2'	2.7'	31.0'
701	20.5'	n/a	n/a	n/a	n/a
702	15'	n/a	n/a	n/a	n/a

703	15'	n/a	n/a	n/a	n/a
704	12'	n/a	n/a	n/a	n/a
705	n/a	10.6'	14.0'	n/a	n/a
706	n/a	n/a	n/a	n/a	n/a

Borrow

Seven borrow sampling holes were drilled in 2019 on the west side of the permanent pool, as shown in attachment 2e. The five holes drilled on the outside cut of the right auxiliary spillway were additionally sampled for borrow material. Samples of each horizon were taken, and then combined into larger composite samples sent to the Soil Mechanics Laboratory for analysis. All holes drilled in the borrow area and on the outside cut of the right auxiliary spillway were backfilled with soil the day they were drilled. The following tables outline samples and estimated yardage of material. Volume is based on an estimate of 90% of an acre-ft being usable (approximately 1350 yds³/acre-ft usable). This conservative cubic yardage is used to account for waste during construction.

Hole #	Material	Sample	Volume	Description
176	CL	0'-7'	9450 yds^3	clay, stiff, slight coarse gravel, very
				Fine grained sand, gravel, slightly
				Moist, plastic, reddish brown
176	CL	7'-10'	4050 yds^3	Clay, stiff, organic brown- gray,
			_	Moist, plastic
176	CL	10'-15'	6750 yds^3	Clay, stiff, very fine grained sand,
				Light gray, moist to very moist,
				Plastic to slightly plastic
177	CH	0'-3'	4050 yds^3	Clay, silty, slightly moist, stiff,
				Moderately plastic to plastic,
			•	Dark brown
177	CL	3'-8'	6750 yds^3	Clay, silty, slight gravel, moist,
			•	Stiff, plastic, light brown
177	CL	8'-15'	9450 yds^3	Clay, very stiff, sandy, moist to
				Very moist, moderately plastic,
			2	Light gray
178	CH	0'-2'	2700 yds^3	clay, black, top soil, moist, stiff,
			2	Moderate to high plasticity
178	CL	3'-5'	2700 yds^3	Clay, brown, slight CaCO3, very
				Fine grained gravel, moist, stiff,
			2	Plastic
178	CL	5'-11'	8100 yds^3	Clay, stiff, light brown, moist,
			. 2	Moderately stiff, plastic
178	SC	11'-15'	5400 yds^3	Sand, clayey, very moist, plastic,
				Medium density, light brown to
				Light gray

179	СН	0'-4'	5400 yds^3	Clay, silty, stiff, slightly calcareous,
179	CL	4'-9'	6750 yds^3	Slightly moist to moist, dark brown Clay, silty, slight gravel, moist, stiff, Plastic, light brown
179	CL	9'-15'	8100 yds^3	Clay, Very fine grained sand, silty, Very moist, med. Density, light gray
180	CL	0'-2'	2700 yds ³	Dark brown, roots, clay, slight sand, Silty, slight CaCO3, slightly moist to Moist
180	CL	2'-6'	5400 yds^3	As above, becomes lighter brown With depth
180	CL	6'-10'	5400 yds^3	Clay, silty, moist, slightly sand, Calcareous, light brown/gray, stiff
180	СН	10'-15'	6750 yds ³	Clay with some very fine grained Sand and silt, very moist, plastic, Moderately stiff
181	SC	0'-5'	6750 yds ³	alternating thinly bedded very fine to Fine grained sand and sandy clay, Slightly moist, loose sand, stiff clay, Brown to gray-brown
181	СН	5'-11'	8100 yds^3	Clay, moist, stiff, brown to light Gray, plastic
181	CL	11'-15'	5400 yds ³	Clay, moist, moderately stiff, light Gray, very silty, some very fine Grained sand
182	CL	0'-1.5'	2025 yds^3	clay, silty, slightly moist, roots, Stiff, plastic, dark brown
182	CL	1.5'-10'	11475 yds ³	Clay, silty, calcareous, fine grained Gravel, moist, moderately stiff, Light brown, increase in coarseness Of gravel at 5'-8'
182	CL	10'-15'	6750 yds ³	Clay with silty light gray lamination, Moist to very moist, mod. Stiff, Light brown to light gray with Iron staining
183	СН	0'-2'	2700 yds^3	Clay, silty, slightly moist to moist, Roots, dark brown, stiff, plastic
183	CL	2'-7'	6750 yds^3	Clay, silty, sandy, calcareous gravel, Moist, stiff, light brown
183	SC	7'-10'	4050 yds ³	sand, clayey, moist, slightly muddy, Plastic, moderately dense, dark gray To brown
183	СН	10'-13'	4050 yds ³	Clay, silty, slight gray silt, slight Lignite, moist, plastic, light brown With some light gray
183	CL	13'-15'	2700 yds^3	clay, very silty, slight very fine

Grained sand, moist, mod. Stiff, Light gray

Total potential borrow, area east of permanent pool:

 $160,650 \text{ yds}^3$

Outside Cut of Right Auxiliary Spillway

Hole #	Material	Sample	Volume	Description
270	CL	0'-1'	1350 yds^3	Clay, fine, brown, slightly moist,
270	CL	1'-7'	8100 yds^3	Plastic, stiff, brown to reddish brown Clay, silty, moist, plastic, stiff, Reddish brown
270	CL	7'-10'	4050 yds^3	Clay, sandy, slightly moist to moist, Stiff, light brown
271	SC	0'-2'	2700 yds^3	sand and clay, slightly moist, stiff
271	CL	2'-5'	4050 yds^3	clay, silty, slightly moist to moist, Mod. Stiff, light gray/light brown
271	SC	5'-10'	6750 yds^3	Sand, silty, slight clay, slightly Moist, mod. Dense, slightly plastic
272	CL	0'-2'	2700 yds^3	Clay and sand, slightly moist, stiff, Roots, dark brown
272	CL	2'-7'	6750 yds ³	Clay, silty, slight very fine grained Calcareous gravel, slightly moist to Moist, stiff, light brown
272	SM	7'-10'	4050 yds^3	Very fine grained sand, silty, slightly Moist, mod. Dense, light brown
273	SC	0'-2'	2700 yds^3	Sand, slight clay, roots, slightly Moist, dark brown
273	CL	2'-9'	9450 yds^3	Clay, very silty, moist, plastic, Mod. Dense, light brown
274	SC	0'-7'	9450 yds ³	Very fine grained sand, silty, Slightly moist, very slightly to Slightly plastic clay, light brown, Moderately dense

Total potential borrow, outside cut right Aux. spillway: 68850 yds³

Resistivity

An electro-resistivity (ERI) survey was conducted during the investigation, due to a potential concern for loose sand near the core trench. The ERI survey was conducted by NRCS geologist Bryan Moffatt (PG) on Sept. 26, 2019. The equipment used as an Advanced Geosciences Incorporated SuperSting R8 IP, 8 channel Earth Resistivity and IP Meter. One line was done parallel across the dam, and the other was taken perpendicularly through it. Ten meter electrode spacings were used in each line. The perpendicular line was run through station 26+50 CL dam, next to hole 605. The results of these lines can be seen in Attachment 4.

Interpretations and Conclusions

Borrow material sampled in the area east of the permanent pool totals an estimated 160,650 yds³, and in the outside cut of the right auxiliary spillway totals an estimated 68,850 yds³. Total potential borrow material in all sampled areas totals 229,500 yds³. The Soil Mechanics Report contains information regarding the quality and suitability of sampled material. This report indicated some dispersive soils found in Borrow Grid C, and recommended against using that area for borrow. The following borrow quantities are available based on sampled holes:

Total for Grids A and B (15' sampled in each hole): 99,900 yd³ Top 5' of Grids A and B: 33,750 yd³ Top 10' of Grids A and B: 67,500 yd³

Additionally, on Apr. 21, 2022, two more holes were hand augered to investigate for further potential borrow areas. Hole 1101 was taken on the left of the pool area upstream of the dam. This hole contained CH/CL material suitable for borrow. Field testing for dispersion indicated no observable signs of dispersion in these soils. With this in mind, a minimum of another 6750 yd³(based on the hole being representative of approx. 1 acre, and 90% of 1 acre-ft.=~1350 yd³) of borrow material is available in this area, based on the top 5ft. of the sampled hole. More material is expected to be available in this area as well, should it be required. Hole 1102 was taken approximately 650 ft. directly downstream of the principal spillway. This borehole yielded predominately sandy soils and was not deemed a good source of borrow material.

Kh was derived from where Kh=Ms= 0.78(UCS in Mpa)^{1.09} for UCS< 10MPa, and Ms= UCS for UCS > 10Mpa. Note: UCS in psf (4.78803E-05) = UCS in MPa (Part 628 Dams, NEH, Chapter 52, 2001, Table 52-3, Material strength number, Ms, for cohesive soil). Also, from ASDSO, Guidance on the Selection of the Soil Erodibility Index, Kh for the NRCS/ARS Auxiliary Spillway Erosion Model, Danny K. McCook, 2005, where in soil material: Kh=Ms x Kb x Kd x Js, the factors Kb, Kd and Js are considered to be equal to 1, therefore Kh = Ms.

Ms values were calculated from laboratory shear test data. The following tables outline the hole locations, depth, type of sample and Kh, for samples from which Kh could be calculated. Where field notes indicated blocky soils (in left auxiliary spillway), a range was calculated for Kh values as Kb may be less than 1 in those materials.

Auxiliary Spillway-Right

Sample No.	Depth	Location	Kh
250.5	20'-22'	~12+31 CL AS-R 157ft L	0.45
251.1	0-2.5	~13+77 CL AS-R 158ft L	0.19
251.2	10'-12.5'		0.62
252.1	5'-7'	~15+25 CL AS-R 157ft L	0.26
253.1	5'-7.5'	~16+76 CL AS-R 160ft L	0.22
253.2	10'-12.5'		0.14
254.1	5'-7.5'	~18+26 CL AS-R 157ft L	0.33
254.2	10'-12.5'		0.26

255.1	5'-7.5'	~19+74 CL AS-R 156ft L	>1.66
256.1	5'-7.5'	~21+28 CL AS-R 158ft L	>1.66

Auxiliary Spillway-Left

Sample No.	Depth	Location	Kh
260.1	0'-2.5'	~10+27 CL AS-L 17ft R	0.04 - 0.07
260.3	10'-12.5'		0.34-0.67
260.5	20'-22.5'		0.26-0.52
260.6	25'-27.5'		0.15-0.29
261.1	5'-7.5'	~11+79 CL AS-L 20ft R	0.12-0.23
261.2	10'-12.5'		0.38-0.73
262.1	5'-7.5'	~13+29 CL AS-L 18ft R	0.11-0.22
262.2	15'-17.5'		0.45-0.90
263.2	10'-12.5'	~14+75 CL AS-L 21ft R	0.39-0.78
264.1	5'-7.5'	~16+24 CL AS-L 18ft R	0.24-0.48

In the 2016 soil mechanics report one auxiliary spillway sample tested as dispersive (sample 256.1, taken at a depth of 5-7.5 ft.) and one tested inconclusive (sample 260.2, also at a depth of 5-7.5 ft.). Sample 260.2 was recommended as being treated as dispersive as while the double hydrometer test did not indicate dispersion, the crumb test did. All other samples tested as non-dispersive.

A large rainfall event during the weekend of Oct. 16, 1998 resulted in auxiliary spillway flow for several hours. No information additional information regarding the flow was available. No damage to the spillways was observed following this event. There may have been some small amount of spillway flow during Aug. 2017, however this could not be confirmed. Since a majority of the soils are non-dispersive and considering that the site has been well maintained, with at least one flow event occurring with no noted damage, the presence of some areas of dispersive or possibly dispersive soils 5 ft. below the surface does not appear to be negatively affecting the auxiliary spillways.

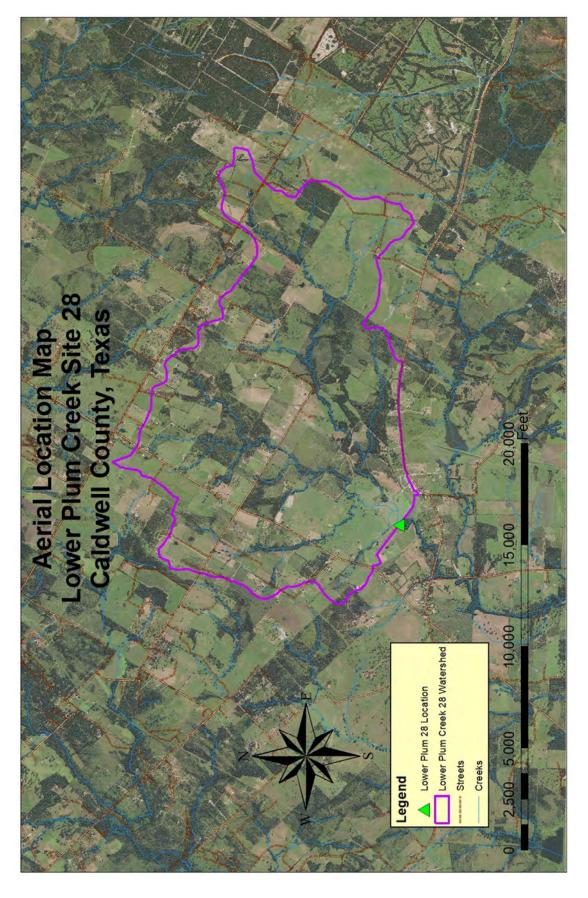
The ERI indicates that there is a relatively high resistivity anomaly, approx. 60 ft. below the crest of the dam. This anomaly is being interpreted as a sand bar. The perpendicular transect was run between holes 605 and 606, closer to 605. The anomaly is expected to be approximately 40 ft. beneath the surface at these holes, which were drilled to 36.5 ft. and 40.5 ft. respectively. Presence of water towards the bottom of these holes suggests that the presumed sand bar is saturated, however it is also possible there may be an additional confining layer between the bottom of the holes and the top of the anomaly. Both transects indicate this sand bar is not in direct contact with the pool.

Michael Jugle, Geologist, NRCS, Temple, Tx

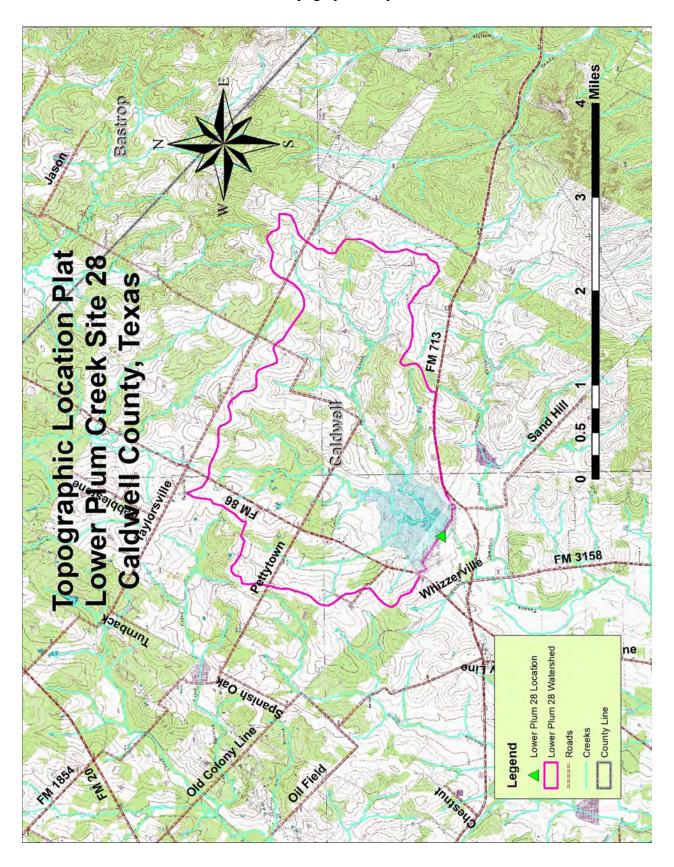
Attachments

- 1) Seismic
 - a. Hazard Curves and Input Data (2 pages).
 - b. Deaggregation Plot, Statistics and Contributors (3 pages).
 - c. Historical Earthquakes > Mw 2 and 100 km
 - d. Liquefaction Plot and Data (12 Pages)
- 2) Maps
 - a. Aerial Photo Location Map
 - b. Topographic Map
 - c. Geologic Outcrop Map
 - d. Soils Map and Properties (6 Pages)
 - e. Hole Location Maps (2 Pages)
 - f. Resistivity Transect Map
- 3) Sample Logs
 - a. Auxiliary Spillway, Right
 - b. Auxiliary Spillway, Left
 - c. Principal Spillway
 - d. Outside Cut, Right Auxiliary Spillway
 - e. Upstream Toe
 - f. Downstream Toe
 - g. Borrow
- 4) Resistivity Plots
 - a. Resistivity Line Parallel to CL Dam (2 Pages)
 - b. Resistivity Line Perpendicular to CL Dam
- 5) Sample Lists (7 Pages)
- 6) Photos
- 7) Geologic Profiles

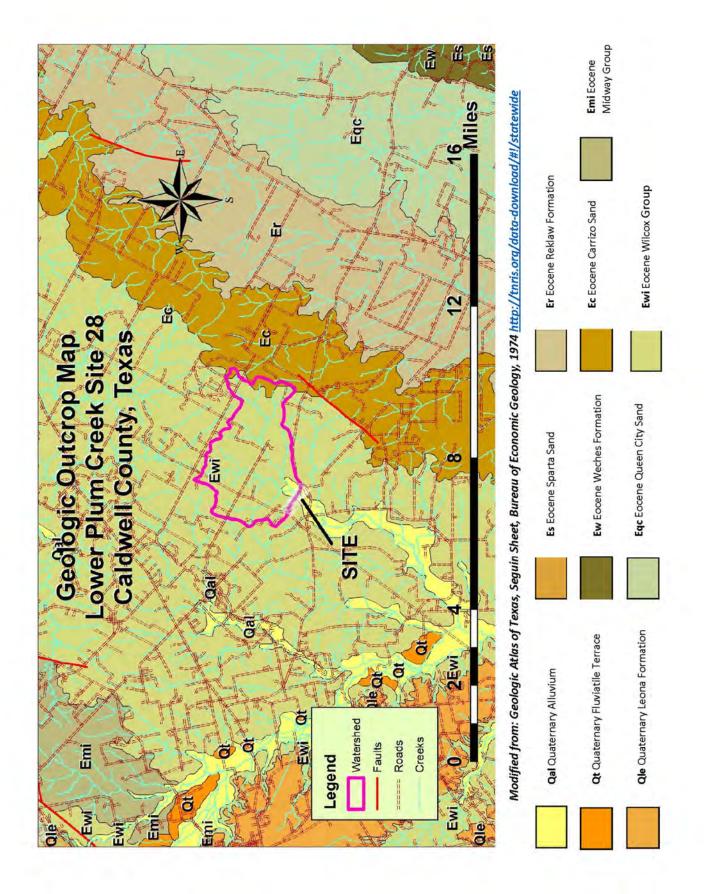
Attachment 2a
Aerial Location Map



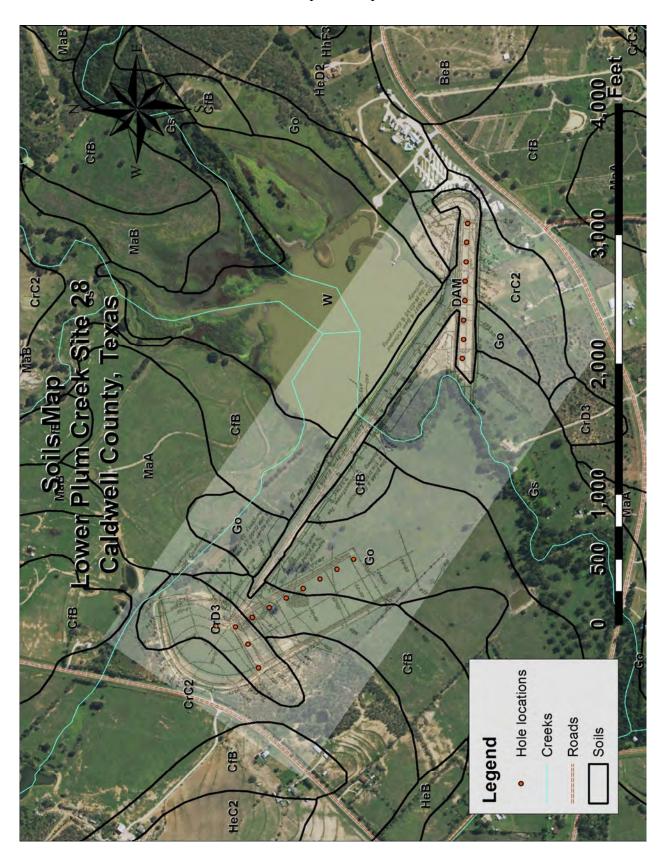
Attachment 2b
Topographic Map



Attachment 2c Geologic Outcrop Map



Attachment 2d, page 1
Soils Map and Properties



Attachment 2d, page 2 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

[Absence of an entry indicates that the data were not estimated]

No.			Classi	Classification	Fragments	nents	Perc	Percent passing sieve number	sieve numb	er-	1	1000
map symbol and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	Flasticity
	ul				Pct	Pct					Pct	
BeB:												
Behring	8-0	Clay loam	공 건	A-6, A-7-6	0	0	95-100	95-100	90-100	75-95	35-55	18-34
	8-24	Clay, silty clay	<u>ਝ</u> ਰ	A-7-6	0	0	95-100	95-100	90-100	75-95	45-65	25-40
	24-49	Clay, silty clay	<u>ਝ</u> ਹ	A-7-6	0	0	90-100	85-100	85-100	75-100	45-75	25-50
	49-60	Channery clay, silty clay, silty clay loam	ᆼ	A-7-6	0	0-5	85-100	85-100	80-100	75-100	51-75	30-20
CfB:												
Crockett	0-12	Fine sandy loam	CL. SM. SM.	A-6 A-6	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	12-18	Clay, clay loam, sandy clay	된 건	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	18-38	Clay, clay loam, sandy clay	<u>ਝ</u> ਹ	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	38-54	Clay, clay loam, sandy clay loam	공 당	A-6, A-7-6	0	0-5	90-100	85-100	75-100	20-90	30-60	15-40
	54-62	Clay loam	ਲੂ ਹ	A-7-6	0	0-5	90-100	90-100	90-100	66-02	45-71	27-52

USDA Natural Resources
Conservation Service

Attachment 2d, page 3 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

Man cumbol			Class	Classification	Fragr	Fragments	Perc	Percent passing sieve number-	sieve numb	er	Ţi.	Dischoity
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uJ				Pct	Pct					Pct	
CrC2:												
Crockett, eroded	0-7	Loam	S SC.,	A-6 4-6	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	7-12	Clay, clay loam, sandy clay	당	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	12-30	Clay, clay loam, sandy clay	뜻 건	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	30-48	Clay, clay loam, sandy clay loam	당 건	A-6, A-7-6	0	9-0	90-100	85-100	75-100	20-90	30-60	15-40
	48-62	Clay loam	ਲੂ ਹ <u>ੋ</u>	A-7-6	0	0-5	90-100	90-100	90-100	70-99	45-71	27-52
CrD3:												
Crockett, severely eroded	0-12	Fine sandy loam, loam	CL, SC, SC,	A. 4	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	12-18	Clay, clay loam, sandy clay	공 당	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	18-38	Clay, clay loam, sandy clay	된 건	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	38-54	Clay, clay loam, sandy clay loam	당 건	A-6, A-7-6	0	0-2	90-100	85-100	75-100	20-90	30-60	15-40
	54-60	Clay loam	당 건	A-7-6	0	0-5	90-100	90-100	90-100	66-02	45-71	27-52
DAM:												
Dams	ı	-	1	ı	ı	ı	ı	ı	1	1	1	1



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 4 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

Many			Classif	Classification	Fragments	ents	Perc	ent passing	Percent passing sieve number-	er		, ticitorio
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	ш				Pct	Pct					Pct	
Go: Gowen	0-50	Clay loam	ರ	A-6,	0	0	100	96-100	85-100	60-85	30-49	15-30
	20-62	Clay loam, loam, sandy clay loam	ರ	A-6, A-7-6	0	0	100	96-100	80-100	55-85	25-45	11-28
Unnamed, minor components	ı	I	ı	ı	I	ı	I	I	I	I	I	1
Unnamed, hydric minor components	ı	ı	ı	ı	ı	ı	I	ı	I	ı	I	ı
Ğ.												
Gowen	0-20	Clay loam	CL	A-6,	0	0	100	96-100	85-100	60-85	30-49	15-30
	20-62	Clay loam, loam, sandy clay loam	ರ	A-6, A-7-6	0	0	100	96-100	80-100	55-85	25-45	11-28
Unnamed, minor components	ı	ı	ſ	ı	ı	ı	ı	ı	I	ı	I	I
Unnamed, hydric minor components	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	I
HeB:	ć		-	4	c	c	400	007	9	96	9	0
	9-28	Clay eith clay	5 5	0-7-4	o c	o c	95-100	90-100	80-100	75.99	2 2 2	32-55
	26-54	Clay, silty clay	F 5 0	A-7-6	0 0	0 0	95-100	90-100	75-100	70-90	49-80	32-55
	54-62	Clay	유	A-7-6	0	0	92-100	92-100	85-100	20-90	49-80	32-55



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 5 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

			Classi	Classification	Fragn	Fragments	Perc	Percent passing sieve number-	sieve numk	JeC		
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uJ				Pct	Pct					Pct	
HeC2:												
Heiden, eroded	8-0	Clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	된 건	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	Б	A-7-6	0	0	92-100	92-100	85-100	70-90	49-80	32-55
HeD2:												
Heiden, eroded	8-0	Clay	당	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	곳 당	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	G, C	A-7-6	0	0	92-100	92-100	85-100	70-90	49-80	32-55
HhF3:												
Heiden, severely eroded	8-0	Clay	딩	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	S	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	당 건	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	ಕ್ರವ	A-7-6	0	0	92-100	92-100	85-100	20-90	49-80	32-55
Ferris, severely eroded	9-0	Clay	ᆼ	A-7-6	0	0	92-100	92-100	75-100	75-100	51-76	35-55
	6-54	Clay, silty clay	공	A-7-6	0	0	92-100	92-100	75-100	72-100	51-78	35-56
	54-62	Clay, silty clay	H.	A-7-6	0	0	92-100	92-100	85-100	75-100	61-100	42-75
Unnamed, minor components	ı	1	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 6 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

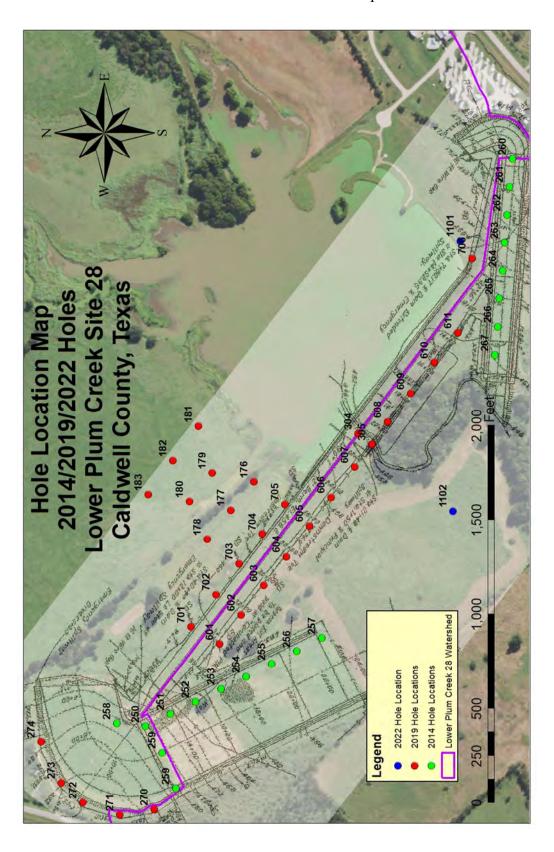
100			Classii	Classification	Fragn	Fragments	Perc	Percent passing sieve number	sieve numb	Je(1000
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uj				Pct	Pct					Pct	
MaA: Mabank	0-7	Loam	CL. SC, ML, SC, SM	A-6	0	0	95-100	95-100	80-98	40-70	19-32	4-15
	7-39	Clay, day loam	F 건		0	0	95-100	95-100	95-100	60-85	38-55	22-37
	39-76	Clay, clay loam, sandy clay	년 년	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
Unnamed, minor components	ı	ı	ı	ı	I	ı	ı	ı	I	ı	I	ı
Unnamed, hydric minor components	ı	ı	ı	ı	ı	I	ı	I	ı	I	I	I
MaB: Mabank	2-0	Loam	CL, CL-ML, SC, SC,	A4.	0	0	95-100	95-100	86-08	40-70	19-32	4-15
	7-39	Clay, day loam	유 건	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
	39-76	Clay, day loam, sandy clay	당 건	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
W: Water	I	I	ı	ı	I	I	I	1	ı	I	I	ı



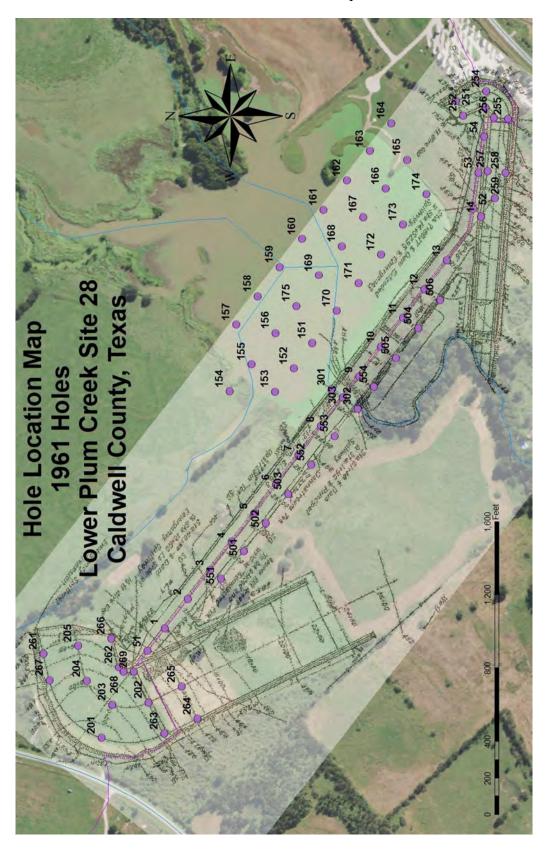
Page 5

Survey Area Version: 8 Survey Area Version Date: 12/12/2013

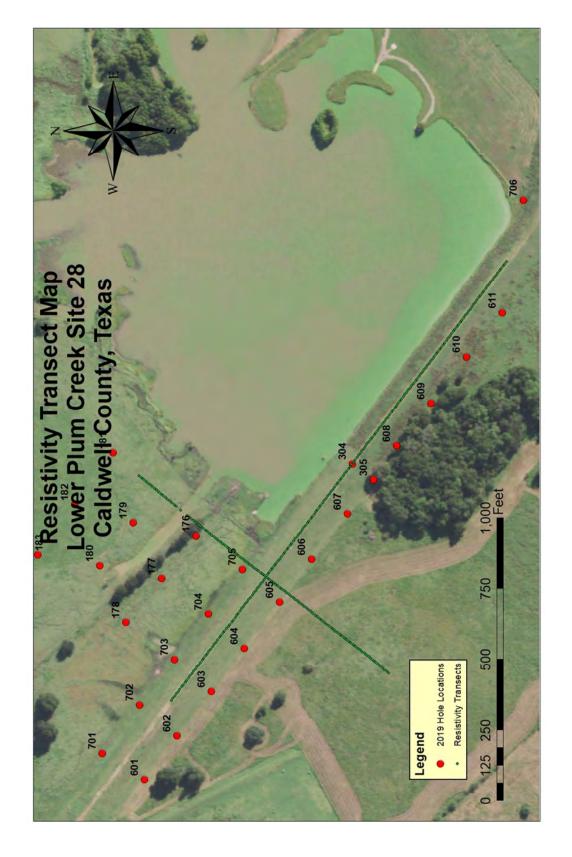
Attachment 2e
2014/2019 Hole Locations Map



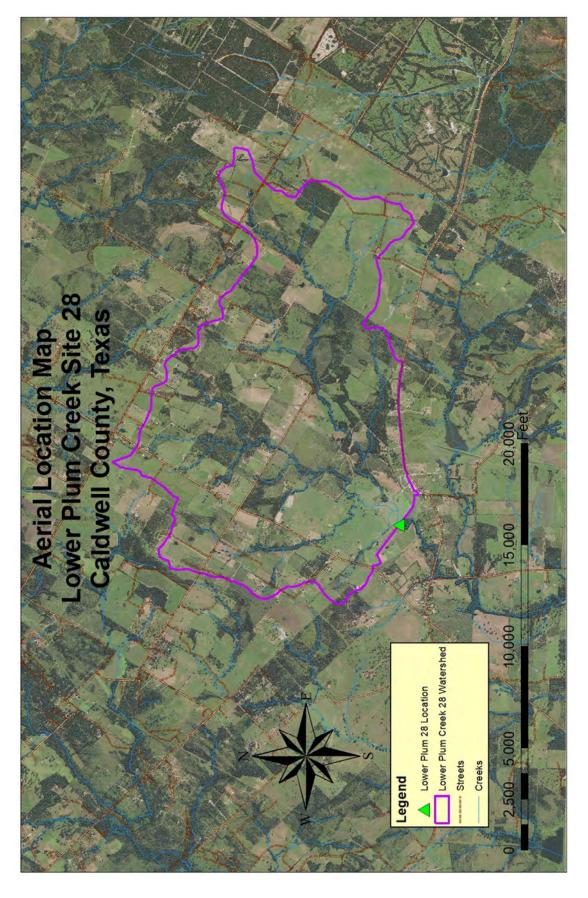
Attachment 2e
1961 Hole Locations Map



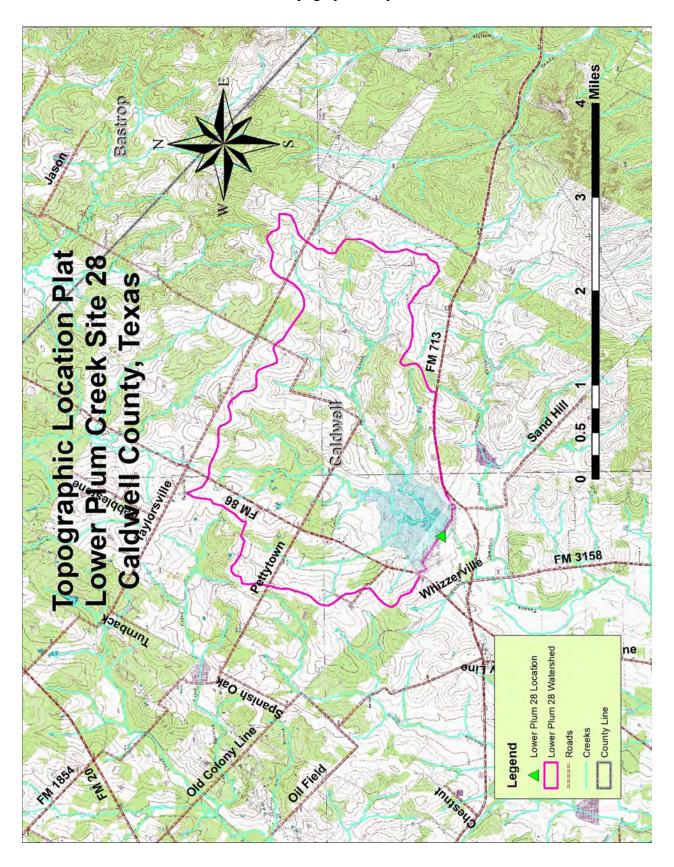
Attachment 2f Resistivity Transect Map



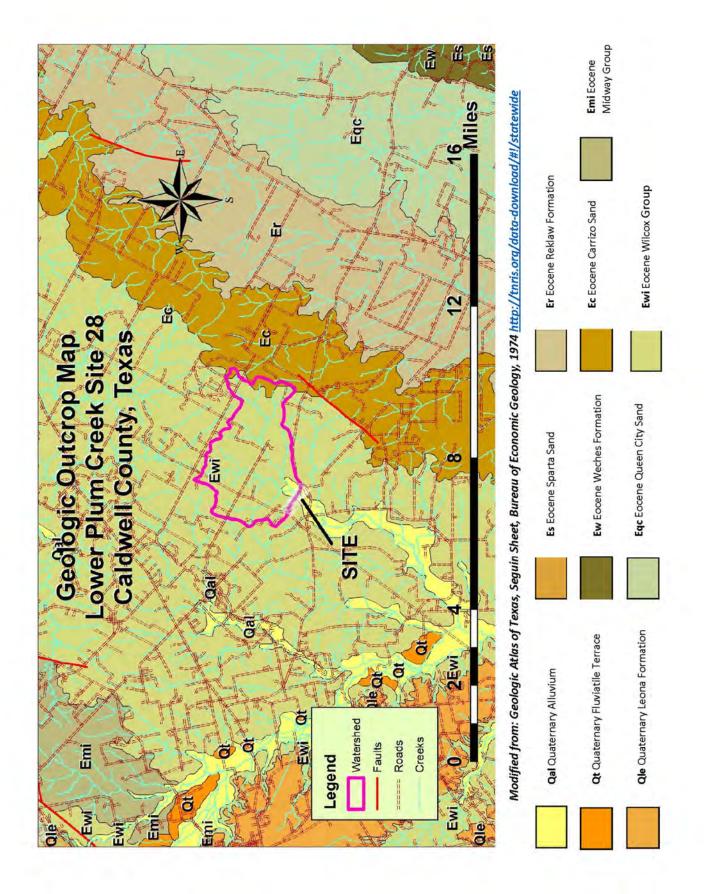
Attachment 2a
Aerial Location Map



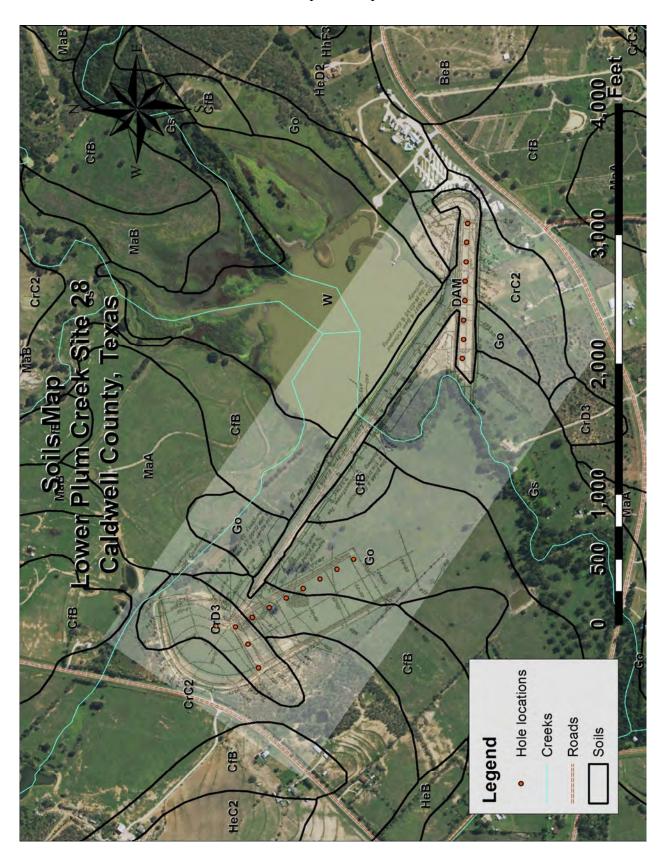
Attachment 2b
Topographic Map



Attachment 2c Geologic Outcrop Map



Attachment 2d, page 1
Soils Map and Properties



Attachment 2d, page 2 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

[Absence of an entry indicates that the data were not estimated]

No.			Classi	Classification	Fragments	nents	Perc	Percent passing sieve number	sieve numb	er	-	1
map symbol and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	Flasticity
	uj				Pct	Pct					Pct	
BeB:												
Behring	8-0	Clay loam	공 건	A-6, A-7-6	0	0	95-100	95-100	90-100	75-95	35-55	18-34
	8-24	Clay, silty clay	<u>ਝ</u> ਰ	A-7-6	0	0	95-100	95-100	90-100	75-95	45-65	25-40
	24-49	Clay, silty clay	<u>ਝ</u> ਹ	A-7-6	0	0	90-100	85-100	85-100	75-100	45-75	25-50
	49-60	Channery clay, silty clay, silty clay loam	ᆼ	A-7-6	0	0-5	85-100	85-100	80-100	75-100	51-75	30-20
CfB:												
Crockett	0-12	Fine sandy loam	CL. SM. SM.	A-6 A-6	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	12-18	Clay, clay loam, sandy clay	된 건	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	18-38	Clay, clay loam, sandy clay	<u>ਝ</u> ਹ	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	38-54	Clay, clay loam, sandy clay loam	공 당	A-6, A-7-6	0	0-5	90-100	85-100	75-100	20-90	30-60	15-40
	54-62	Clay loam	ਲੂ ਹ	A-7-6	0	0-5	90-100	90-100	90-100	66-02	45-71	27-52

USDA Natural Resources
Conservation Service

Attachment 2d, page 3 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

Man cumbol			Class	Classification	Fragr	Fragments	Perc	Percent passing sieve number-	sieve numb	er	Ţi.	Dischoity
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uJ				Pct	Pct					Pct	
CrC2:												
Crockett, eroded	0-7	Loam	S SC.,	A-6 4-6	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	7-12	Clay, clay loam, sandy clay	당	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	12-30	Clay, clay loam, sandy clay	뜻 건	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	30-48	Clay, clay loam, sandy clay loam	당 건	A-6, A-7-6	0	9-0	90-100	85-100	75-100	20-90	30-60	15-40
	48-62	Clay loam	ਲੂ ਹ <u>ੋ</u>	A-7-6	0	0-5	90-100	90-100	90-100	70-99	45-71	27-52
CrD3:												
Crockett, severely eroded	0-12	Fine sandy loam, loam	CL, SC, SC,	A. 4	0	0-5	98-100	94-100	89-100	40-96	15-35	3-15
	12-18	Clay, clay loam, sandy clay	공 당	A-6, A-7-6	0	0	89-100	75-100	75-100	86-09	35-59	23-42
	18-38	Clay, clay loam, sandy clay	된 건	A-6, A-7-6	0	0	89-100	75-100	75-100	65-98	35-59	23-42
	38-54	Clay, clay loam, sandy clay loam	당 건	A-6, A-7-6	0	0-2	90-100	85-100	75-100	20-90	30-60	15-40
	54-60	Clay loam	당 건	A-7-6	0	0-5	90-100	90-100	90-100	66-02	45-71	27-52
DAM:												
Dams	ı	-	1	ı	ı	ı	ı	ı	1	1	1	1



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 4 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

Many			Classif	Classification	Fragments	ents	Perc	ent passing	Percent passing sieve number-	er		, ticitor o
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit Imit	index
	ш				Pct	Pct					Pct	
Go: Gowen	0-50	Clay loam	ರ	A-6,	0	0	100	96-100	85-100	60-85	30-49	15-30
	20-62	Clay loam, loam, sandy clay loam	7	A-6, A-7-6	0	0	100	96-100	80-100	55-85	25-45	11-28
Unnamed, minor components	ı	I	ı	ı	I	ı	I	I	I	I	I	I
Unnamed, hydric minor components	ı	ı	ı	ı	ı	ı	I	ı	I	ı	I	ı
Ğ.												
Gowen	0-20	Clay loam	CL	A-6,	0	0	100	96-100	85-100	60-85	30-49	15-30
	20-62	Clay loam, loam, sandy clay loam	ರ	A-6, A-7-6	0	0	100	96-100	80-100	55-85	25-45	11-28
Unnamed, minor components	ı	ı	ı	ı	ı	ı	ı	ı	I	ı	ı	I
Unnamed, hydric minor components	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	I
HeB:	ć		-	4	c	c	400	007	9	96	9	9
	9-28	Clay eith clay	5 5	0-7-4	o c	o c	95-100	90-100	80-100	75.99	21.00	32.55
	26-54	Clay, silty clay	5 5 C	A-7-6	0 0	0 0	95-100	90-100	75-100	70-90	49-80	32-55
	54-62	Clay	유	A-7-6	0	0	92-100	92-100	85-100	20-90	49-80	32-55



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 5 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

			Classi	Classification	Fragn	Fragments	Perc	Percent passing sieve number-	sieve numk	JeC		
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uJ				Pct	Pct					Pct	
HeC2:												
Heiden, eroded	8-0	Clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	된 건	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	Б	A-7-6	0	0	92-100	92-100	85-100	70-90	49-80	32-55
HeD2:												
Heiden, eroded	8-0	Clay	당	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	ᆼ	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	곳 당	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	G, C	A-7-6	0	0	92-100	92-100	85-100	70-90	49-80	32-55
HhF3:												
Heiden, severely eroded	8-0	Clay	딩	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	8-26	Clay, silty clay	S	A-7-6	0	0	95-100	90-100	80-100	75-99	51-80	32-55
	26-54	Clay, silty clay	당 건	A-7-6	0	0	95-100	90-100	75-100	20-90	49-80	32-55
	54-62	Clay	ಕ್ರವ	A-7-6	0	0	92-100	92-100	85-100	20-90	49-80	32-55
Ferris, severely eroded	9-0	Clay	ᆼ	A-7-6	0	0	92-100	92-100	75-100	75-100	51-76	35-55
	6-54	Clay, silty clay	공	A-7-6	0	0	92-100	92-100	75-100	72-100	51-78	35-56
	54-62	Clay, silty clay	H.	A-7-6	0	0	92-100	92-100	85-100	75-100	61-100	42-75
Unnamed, minor components	ı	1	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı



Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2d, page 6 Soils Map and Properties

Engineering Properties

Caldwell County, Texas

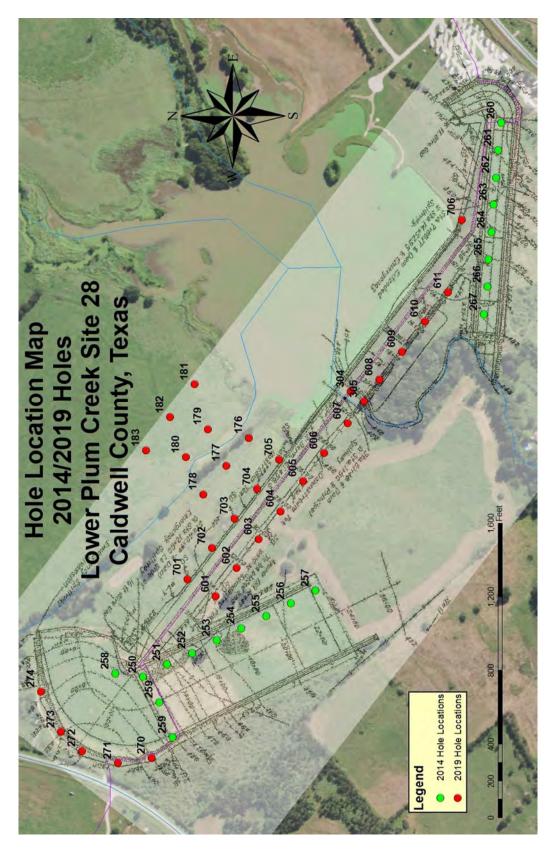
100			Classii	Classification	Fragn	Fragments	Perc	Percent passing sieve number	sieve numb	Je(1000
and soil name	Depth	USDA texture	Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200	limit	index
	uj				Pct	Pct					Pct	
MaA: Mabank	0-7	Loam	CL. SC, ML, SC, SM	A-6	0	0	95-100	95-100	80-98	40-70	19-32	4-15
	7-39	Clay, day loam	F 건		0	0	95-100	95-100	95-100	60-85	38-55	22-37
	39-76	Clay, clay loam, sandy clay	년 년	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
Unnamed, minor components	ı	ı	ı	ı	I	ı	ı	ı	I	ı	I	ı
Unnamed, hydric minor components	ı	ı	ı	ı	ı	I	ı	I	ı	I	I	I
MaB: Mabank	2-0	Loam	CL, CL-ML, SC, SC,	A4.	0	0	95-100	95-100	86-08	40-70	19-32	4-15
	7-39	Clay, day loam	유 건	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
	39-76	Clay, day loam, sandy clay	당 건	A-6, A-7-6	0	0	95-100	95-100	95-100	60-85	38-55	22-37
W: Water	I	I	ı	ı	I	I	I	1	ı	I	I	ı



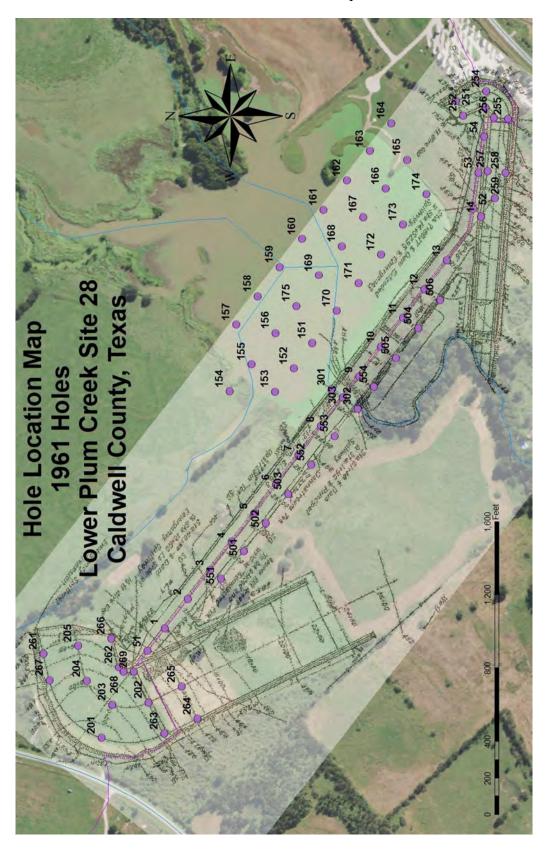
Page 5

Survey Area Version: 8 Survey Area Version Date: 12/12/2013

Attachment 2e
2014/2019 Hole Locations Map



Attachment 2e
1961 Hole Locations Map



LOG OF TEST HOLES

8 5	Istone and claystone below 17.5. Push 20'-22.5' dded to laminated Claystone/siltstone with abundant ock, moist, slight thin bedded siltstone/sandstone, CH, light brown mottled with slight light gray
<u>\$</u>	C au
100	ant CL
	THE STATE OF THE S
slightly weathers sand refusal at 20', Thin beriron stain at 22'. Claystone, silty, soff repressed down to sandy breaks down to sandy	
slight mica, silty, light brown. Few laminations claystone below 12.5', slight lime inclusions/streaks. Push 15'-17.5' refusal at 17'. Few streaks light gray slightly weathers sandstone and claystone below 17.5. Push 20'-22.5' refusal at 20', Thin bedded to laminated Claystone/siltstone with abundant iron stain at 22'. 27.5 Claystone, silty, soft rock, moist, slight thin bedded siltstone/sandstone, breaks down to sandy CH, light brown mottled with slight light gray	

LOG OF TEST HOLES

No Water @ 1551 12		3	Caldwell	=				_		70		
Моріве новетня мом то з з з з з з з з з з з з з з з з з з	DATE 12/09/2014	LAT/LONG N	29.8	964	N 29.859649 W -97.515965	7.51	5965	S	STATE	Texas	as	
Моbile ноде вретн ком то вретн 15 19 22.5		PROJECT: WP-07		*	WP-08		FP-03		P.L46	-46		
STA.& BEPTH BEPTH SURFACE ELEVATION FT FT T T T T T T T T T T T T T T T T		LOCTION OF HOLES	~ 150	, D	~ 150' Downstream Crest	eam	Crest					
SURFACE FROM TO					-			SAM	SAMPLES			
CL RT AS CL RT AS 158' Left 3 15 468.545 19 19 22.5	DESCRIPTION OF MATERIALS		z	000	USED N	ON	TYPE	FROM	T F	REC %	DISP	AMT
15 19 15 19 15 19 15 19 15 19 15 19 15 19 15 19 15 19 15 19 19 19 19 19 19 19 19 19 19 19 19 19	Clay, silty, very slight fine grain gravel, slight sand slightly moist to moist,	ightly moist to moist,		7	SH.	٠. ي	3"push	6	2.5'	100%		
19 15 19 15	medium constancy (rig foot sinks into ground), moderate plastic, brown	erate plastic, brown				2 3	3"push	10,	12.5	100%		
15 19 19 22.5	Claystone, few thin beds to laminations sandstone, silty, cuttings break	silty, cuttings break				6.	3"push	20, 2	22.5'	100%		
22.5	down to moderate plastic firm CL sandy, slight carbonate concretions,	mate concretions,										
22.5	light brown, increase in sand below 7'. Push 10'-12.5', breaks down to very	o, breaks down to very										
22.5	silty clay CL-ML to SC, fractures with slight carbonate at 12.5	e at 12.5										
22.5	Siltstone, very fine grain sand, streak of very fine grain gravel at 17', soft	in gravel at 17', soft										
52.5	down to ML sandy light brown becoming light gray slight	g light gray slight										
22.5	reddish brown at 19' with increase in clay											
moist, non-cemented moderately plastic SC Moderately plastic SC No Water @15:51 12	ine grain, silty, clay, soft rock slightly plastic, moist to very	astic, moist to very										
moderately plastic SC No Water @15.51 12	moist, non-cemented, slightly weathered, breaks down to slight to	wn to slight to										
No Water @15.51 12	moderately plastic SC, thin bedded to laminated, light gray with light brown.	nt gray with light brown.										
No Water @15:51 12												
	15:51 12/09/2014 CI 19.8											
Hole plugged 12/10/2014	10/2014											
DATE: 12/10/2014 TIME: 15:51 WAT	WATER LEVEL: No water	CAVE IN: 18.5					SHEET	1	OF	-	SH	SHEETS

Attachment 3a

LOG OF TEST HOLES

02	Q2	ower	Plum	Lower Plum Creek		COUNTY	Calc	Caldwell					SITE NO.	. 28		
		uxilia	ry Sp	Auxiliary Spillway Right	DATE 12/09/2014	LAT/LONG	N 2	9.85	9286	76- M	N 29.859286 W -97.515741	-	STATE	Texas	as	
	LOGGED BY M	Moffatt				PROJECT: WP	WP-07		WP-08		FP-03		I.	P.L46		ī
	DRILLING EQUIPMENT		Mob	Mobile B-57		LOCTION OF HOLES		300	Dowr	stre	~ 300' Downstream Crest	st				
	1		НОГЕ БЕРТН									Š	SAMPLES			
	SIA. & SURFACE ELEVATION	FROM	01 17		DESCRIPTION OF MATERIALS			z z	BIT	ON	TYPE	FROM	TA	REC %	DISP	AMT
	~ 15+25	0	~	Sand, clayey,	roots, topsoil, moist, loose to medium, dark brown	, dark brown		SM	HS	7.	3"push	5.	7.5	%08		
	CL RT AS	2	4		Sand, (sandstone weathered to a soil), very fine grained to fine grained,	ined to fine grained		SM	H	2	3"push	15'	17.5'	100%		
	157' Left			silty, slight clay balls, lo	sity, slight clay balls, loose to medium, non-plastic, moist, dark reddish	moist, dark reddish										
	463.789			brown												
		4	=		Sand, (sandstone weathered to a soil), very fine grained to fine grained,	ined to fine grained		သွ	E S							
				silty, slight clay, loose to	silty, slight clay, loose to medium, non-plastic manganese stain, iron stain,	anese stain, iron sta	Jin,									
				dark reddish brown with	dark reddish brown with slight gray. Push 5' to 7.5', bottom 6" sample fell	bottom 6" sample fe	=									
				out of tube, increase in clay below 8'.	clay below 8'.											
		11	17.5		Clay (claystone weathered to a soil), silty, very sandy, very fine to fine	ly, very fine to fine		ರ	HS.							
				grained, moist, medium	grained, moist, medium consistency, light brown to light gray with iron stain	ight gray with iron s	tain									
				Hole plugged 12/10/2014	14											
	DATE: 12/10/2014		TIME	TIME: 8:14 WATE	WATER LEVEL: No water	CAVE IN: 11.6'	.9				SHI	SHEET	1 0F		S	SHEETS

Attachment 3a

LOG OF TEST HOLES

	ĺ				AMT	Aux 	xilia 	i ry \$	Spil	lwa	y R	igh	t, h	ole 2	253				
	as				DISP A														
. 28	Texas	P.L46			REC %														
SITE NO.	STATE	l P.L		SAMPLES	TO TA	7.5'	12.5'												
			#	S'	FROM	5.	10,												l
	N 29.858927 W -97.515507	FP-03	450' Downstream Crest		TYPE	3"push	3"push												l
	-97.5		trean		ON	7.	2,												1
	27 W	WP-08	owns	TVBE	BIT	완		HS.		HS.									1
well	8589		50' D	50	o O o	SM		끙		သွ									
Caldwell	N 29.		1		z					yle	_								
		WP-07	HOLES			, dark		contact		oderate	th depth								
COUNTY	LAT/LONG	PROJECT:	LOCTION OF HOLES			edium, roots		ush 5'-7.5' o		, slight to m	rain size wi								
	DATE 12/09/2014				DESCRIPTION OF MATERIALS	Sand, silty, clay, moist, very slightly plastic, loose to medium, roots, dark	soil)	Clay, silty, moist, moderate plastic, shiny, stiff, black. Push 5-7.5' contact		Sand (sandstone weathered to a soil), very silty, clayey, slight to moderately	plastic, moist, moderate to dense, brown. Increase in grain size with depth				4				
reek	Auxiliary Spillway Right		B-57			Sand, silty, clay, moist, v	brown to brown (fill - topsoil)	Clay, silty, moist, modera	with below in push tube	Sand (sandstone weathe	plastic, moist, moderate	at 10' iron stain at 12.5'.			Hole plugged 12/10/2014				
nm C	Spill		Mobile B-57	3.5	TO	2		7		12.5									1
Lower Plum Creek	ciliary	fatt		НОГЕ ВЕРТН	FROM	0		2		7									
100		BY Moffatt	DRILLING EQUIPMENT	9 415	SURFACE	~ 16+76	CL RT AS	160' Left	460.83										
WATERSHED	LOCATION	LOGGED BY	DRILLING	<u> </u>	NO.	253													

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

wer	Lower Plum Creek	reek		COUNTY	Cal	Caldwell	_				SITE NO.	o. 28		
y Spil		Auxiliary Spillway Right	DATE 12/09/2014	LAT/LONG	N 2	9.858	3566 W	1-97	N 29.858566 W -97.515289	6	STATE		Texas	
				PROJECT: V	WP-07		WP-08		FP-03		=	P.L46		Ī
Mobil	· ·	Mobile B-57		LOCTION OF HOLES		.009	Down	strea	~ 600' Downstream Crest	st				
НОСЕ DEPTH							-			s s	SAMPLES			
FROM TO			DESCRIPTION OF MATERIALS		2006	N C N	BIT	NO	TYPE	FROM	5 F	REC %	DISP	AMT
1	4	Clay, silty, sandy, moist	Clay, silty, sandy, moist, stiff, highly plastic, black			공	I	۲.	3"push	5	7.5'			
	12.5		Clay, silty, sandy , moist, stiff, highly plastic, slight gypsum at 7.5 brown to	ypsum at 7.5 brov	wn to	CL-		2	3"push	10,	12.5'			
		light brown. Push 10' - 12	light brown. Push 10' - 12.5' SL sandy at base of sample brown light gray	mple brown light g	gray	SC	O							
_														
		Plug hole 12/10/2014												
-														
_														
_														
TIME: 8:26	E.		WATER LEVEL: No water	CAVE IN: 8.6'	9	2			SH	SHEET	1 0F	-		SHEETS

Attachment 3a

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	Ξ	E	reek		28	Caldwell						2		
LOCATION		Auxili	iary	Spill	Auxiliary Spillway Right 12/09/2014	4 LAT/LONG	N 25	3.85	3203	76- W	N 29.858203 W -97.515063	53	STATE		Texas	
LOGGED BY		Moffatt	Ħ			PROJECT: W	WP-07		WP-08		FP-03	13	=	P.L46		ī
DRILLI	DRILLING EQUIPMENT	PMENT	ž	Mobile B-57	B-57	LOCTION OF HOLES		750	Dow	nstre	~ 750' Downstream Crest	set				
			НОГЕ БЕРТН	ωF				-	-	-			SAMPLES			
NO.	STA. & SURFACE		FROM	TO	DESCRIPTION OF MATERIALS	ALS		Z	BIT		\vdash	-	ТО	REC	DISP	AMT
	ELEVAID		F	FT				4	\rightarrow	ON O	TYPE	E	F	%	E	
255	~ 19+74		0	7.5	Sand, very fine grained, silty, clayey, moderately plastic, medium to dense,	ly plastic, medium to de	ense,	S	SH C	۲.	3"push	.5	7.5'			
	CL RT AS	48			moist, brown											
	156' Left	#														
	456.494	4														
					Hole plugged 12/10/2014											
			-													
PATE: 12/10/2014	00/01/01	3		6.0		•	2	2								

Attachment 3a

NRCS-ENG-53

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

		Lower Plum Creek		Creek			Ca	Caldwell	_					24		
LOCATION		Auxilia	ry Spi	Auxiliary Spillway Right	DATE 12/09/2014	LAT/LONG	N 2	9.85	7845	76- W	N 29.857845 W -97.514831	72	STATE	Texas	as	
LOGGED BY		Moffatt				PROJECT:	WP-07		WP-08	90	FP-03	93		P.L46		ī
DRILLI	DRILLING EQUIPMENT		Mobile B-57	9 B-57		LOCTION OF HOLES		00. D	own	strear	900' Downstream Crest	+				
			НОГЕ БЕРТН						-				SAMPLES			
NO.	SURFACE SURFACE	1	1 TO		DESCRIPTION OF MATERIALS			z	C BIT		\vdash	FROM	TO	REC	DISP	AMT
	ELEVALIO	FT	FT						_	ON	TYPE	FT	FT	%	E	
256	~ 21+28	0	ო	Clay, silty, slight sand, r	Clay, silty, slight sand, moist, medium dense, gray - brown	brown		O	CL HS	1.	3"push	.s	7.5'	100%		
	CL RT AS	ري دي	7.5		Clay, silty, medium grained carbonate sand, moist; medium stiff, light brown	nedium stiff, ligh	nt brown									
	158' Left	-		to brown												
	455.498	_														
				Hole plugged 12/10/2014	14											
T.	12/10/2014	4	8:36		natew ON	7 4 7	7							1 ,		

Attachment 3a

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED L	ower	Plum	Lower Plum Creek		COUNTY	Calc	Caldwell	_				SITE NO.	o. 28		
LOCATION		uxilia	ry Sp	Auxiliary Spillway Right	DATE 12/09/23014	LAT/LONG	N 25	9.85	1486	76- N	N 29.857486 W -97.514595	2	STATE		Texas	
LOGG	LOGGED BY N	Moffatt	54.5			PROJECT: WP-07	-07		WP-08		FP-03	·	<u>-</u>	P.L46		ī
DRILI	DRILLING EQUIPMENT		Mob	Mobile B-57		LOCTION OF HOLES		kit A	uxilia	ry Sp	Exit Auxiliary Spillway Right	Right				
			НОГЕ БЕРТН					-	-	L			SAMPLES			
NO.	STA. & SURFACE ELEVATION	FT	TT TO		DESCRIPTION OF MATERIALS		100	z z	BIT	ON O	TYPE	FROM	OT TA	REC	DISP	AMT
257	~ 22+79	0	2		Clay, silty, slight sand, moist, slight medium grained carbonate sand, black	carbonate sand, bla	ack ack	공	H H							
	CL RT AS	(A)		to dark brown. No push	to dark brown. No push sample taken. See sample 256.1	56.1		겁								
	161' Left															
	455.226			Hole plugged after drilling	after drilling 12/09/2014. Cave in at 4.5'											
																7
DATE		2	TIME		WATER LEVEL:	CAVE IN:	9	9	5		SH	SHEET	1 OF	<u>Le</u>	s	SHEETS

Attachment 3a

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	Jum (Creek		COUNTY	Cal	Caldwell			-		SITE NO.	O. 28	_	
LOCATION		ıxiliar	y Spi	Auxiliary Spillway Right	TE 12/10/2014	LAT/LONG	1	1 29.8	3604	~ N 29.860420 W -97.516151	97.51	6151	STATE		Texas	
LOGGED BY		Moffatt				PROJECT:	WP-07		WP-68	68	-	FP-03	<u>.</u>	P.L46		Ī
DRILLI	DRILLING EQUIPMENT		Nobile	Mobile B-57		LOCTION OF HOLES		oreb	ay A	uxilia	ry Sp	Forebay Auxiliary Spillway Right	Right			
1	5	DE	НОГЕ ВЕРТН							307			SAMPLES			
NO.	SIA. & SURFACE ELEVATION	FROM	01 F	DESCI	DESCRIPTION OF MATERIALS			z	000	BIT USED NO	O TYPE	FROM FT FT	5 F	REC %	DISP	P AMT
258	~ 8+50	0	2	Clay, silty, moderately to highly plastic, moist, stiff, iron stain, brown to	y plastic, moist, stiff, in	on stain, brown	to	0	겁	완						
	CL RT AS			light gray					_							
	153' Left	5	80	Sandstone, very fine to fine grain, soft rock, non-cemented, thin bedded to	ain, soft rock, non-cen	nented, thin bed	ded to	U)	SS	R						
	~ 474			laminated, iron stain, breaks down to non-plastic SM to ML sandy, silty	lown to non-plastic SM	to ML sandy, s	ilty									
				light brown												
		80	10	Sandstone, very fine grain, silty, clay, soft to medium soft rock, moist coarse	ty, clay, soft to medium	soft rock, mois	st coarse	v)	SS	R						
				grain carbonate sand at 10', light brown	ght brown				_							
		10	14.5	Claystone, soft rock, silty abundant iron stain 10' to 12', slight very fine	ndant iron stain 10' to	12', slight very fi	ne	J	겁	R						
				grained sand, breaks down to	breaks down to moderately plastic stiff CL, light brown	f CL, light brown	_									
		14.5	19	Sandstone, very fine to fine grain, silty, moist, thin bedded to laminated with	ain, silty, moist, thin be	edded to lamina	ted with	v)	SS	R R						
				claystone, soft rock, breaks down to dense non-plastic sand, light brown	own to dense non-plas	tic sand, light br	rown									
		19	20	Claystone, very silty, slightly sa	y silty, slightly sandy, moist iron stained light brown	ed light brown		0	겁	R					1	
				Hole plugged12/10/2014 at 10:35 no water.):35 no water.											
DATE:			TIME:	WATER LEVEL:	št.	CAVE IN:	2		,			SHEET	1 OF		_	SHEETS

Attachment 3a

NRCS-ENG-5

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED	Lower Plum Creek	Plum	Creek		COUNTY	Cal	Caldwell	_				SITE NO.	O. 28	m	
LOCATION		Auxilia	ry Spi	Auxiliary Spillway Right	DATE 12/10/2014	LAT/LONG	N	9.85	9746	N 29.859746 W -97.516612	7.516	512	STATE		Texas	0000
LOGGED BY		Moffatt				PROJECT:	WP-07		WP-08	80		FP-03	اً	P.L46		Ī
DRILL	DRILLING EQUIPMENT		Mobil	Mobile B-57		LOCTION OF HOLES		L C	est	Auxilia	ary S	oillway	CL Crest Auxiliary Spillway Right			
100			НОГЕ DEPTH							50			SAMPLES			
NO.	SIA. & SURFACE ELEVATION	FROM	01 E		DESCRIPTION OF MATERIALS			z	e S C S	BIT USED NO	O TYPE	FROM FT FT	M TO	REC %	DISP	P AMT
259	~ 12+50	0	80	Claystone, silty, clay a	Claystone, silty, clay slightly moist, soft rock, breaks down to moderate	down to modera	ate	0	SS	완						\vdash
	CL RT AS	ν _γ		plastic ML to CL, light	CL, light brown, increasing silt below 5'				_							
	17' Right	8	13	Siltstone, slight very f	ht very fine grain sand, slight clay soft rock, slightly moist,	ock, slightly mo	ist,	(V)	Slst	HS						
	475.814	_		light brown, Increase	light brown, Increase in sand below 10' with slight carbonate gravel streak	rbonate gravel	streak									
				11' - 12'. Breaks dowr	iks down to non-plastic ML											
		13	18	Sandstone, very fine	Sandstone, very fine to fine grained, silty, slight clay, non-plastic, soft to	non-plastic, soi	ft to	0)	SS	R R						
				medium soft rock, bre	medium soft rock, breaks down to SM, dark brown to light gray, slight very	o light gray, sligh	nt very		_							
				fine grain carbonate gravel at 14'	gravel at 14'											
		18	20	Claystone, silty, soft t	Claystone, silty, soft to medium soft rock, moist, breaks down to moderate	aks down to mod	derate	0	CS	R						
				to highly plastic clay,	to highly plastic clay, weathered, slight iron stain, brown	nwc										_
				Plugged after drilling 12/10/2014	12/10/2014											-
DATE.			TIME.	TAW	WATER LEVEL:	CAVE IN:	2	2				Laans	100	9	_	опадио

Attachment 3a

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	lum C	reek		COUNTY	Cal	Caldwell	_				SITE NO. 28	°. 28		
LOCATION		xiliar	y Spil	Auxiliary Spillway Right	DATE 12/10/2014	LAT/LONG	N 2	9.85	524	W -97	N 29.859524 W -97.517197	7	STATE		Texas	
LOGGED BY		Moffatt				PROJECT: WF	WP-07		WP-08	88	FP-03	3	P.	P.L46		1
DRILI	DRILLING EQUIPMENT		Mobile B-57	B-57		LOCTION OF HOLES		utsic	le Cı	ıt of C	Outside Cut of Crest Auxiliary Spillway Right	uxilia	ry Spi	illwa	/ Rig	뀰
1		HC	но <u>ге</u> рертн					-	⊩	L,			SAMPLES			
NO.	STA. & SURFACE ELEVATION	FROM	TI	DESC	DESCRIPTION OF MATERIALS			N C W	BIT	N NO	TYPE	FROM	TO	REC %	DISP	AMI
259A	~ 12+31	0	9	Claystone, silty, increasing si	by, increasing silt with depth, clayey, slightly moist, soft rock,	ightly moist, soft roo	- ×	SS	SH CO	(0						
	CL RT AS			Breaks down to moderately p	to moderately plastic CL, light brown											
	205' Right	9	16	Sandstone, very fine to fine grained, very slity, slight clay, soft rock, slight	grained, very silty, slight	t clay, soft rock, slig	Ħ	SS	SH RS	(0						
	476.109			carbonate streaks, breaks do	eaks, breaks down to non-plastic SM, light brown	ight brown										
		16	20	Claystone, very silty, soft rock, moist, weathered, iron stain streaks, breaks	k, moist, weathered, iro	n stain streaks, bre	aks	CS	HS HS	(0						
				down to moderately plastic clay, light brown	ay, light brown											
				Hole plugged after drilling 12/10/2014	/10/2014											
DATE		ົ	TIME:	WATER LEVEL:	EL:	CAVE IN:					HS	SHEET	1 OF	- E	, s	SHEETS

Attachment 3a

LOG OF TEST HOLES

		viliar										CT A TIP			
DRILLING E HOLE SU NO. ELE			y spil	Auxiliary Spillway Left DATE 12/10/2014	4 LAT/LONG	N 29.	8549	W 066	97.	N 29.854990 W -97.506473	~	SIAIE	Texas	tas	
HOLE S NO. SU ELE	FOLIPME	Moffatt			PROJECT: WP-07	97		WP-08		FP-03		P.1	P.L46		Ţ
			lobile	Mobile B-57	LOCTION OF HOLES		st A	uxilia	ry Sp	Crest Auxiliary Spillway Left	Left				
		HC	НОГЕ БЕРТН				50	TVBC			S	SAMPLES			
H	SIA. & SURFACE ELEVATION	FROM	T F	DESCRIPTION OF MATERIALS	ALS	z	0 C 0	BIT	ON	TYPE	FROM	TO TA	REC %	DISP	AMT
2007	~ 10+27	0	S	Sand, sandstone weathered to a soil, very fine to fine grained, silty, clayey,	to fine grained, silty, claye	ey,	S	HS	₹.	3"push	6	2.5'	100%		
ਰ	CL LT AS			moist, slight to moderately plastic, iron stain, light brown	tht brown				2	3"push	5,	7.5'	100%		
17	17" Right	2	27.5	Claystone, silty, soft rock, fractured, blocky in parts, iron stain along bedding	arts, iron stain along bedo	ding	cs	HS	ω	3"push	10.	12.5'	100%		
47	474.973			planes and fractures, some manganese stain, light brown and light gray.	ight brown and light gray.	955			4.	3"push	15'	17.5'	100%		
				Becoming less blocky below 15', more light gray mottling below 15', mostly	y mottling below 15', mos	tly			ς.	3"push	20,	22.5'	100%		
				gray below 20'.					ø.	3"push	25'	27.5'	100%		
				Plugged 12/11/2014											
DATE: 12/11/2014	1/2014		TIME: 7:32	7:32 WATER LEVEL: No water	CAVE IN: 23.7	9				SHEET		1 OF	-	SH	SHEETS

Attachment 3b

LOG OF TEST HOLES

					AMT	A	A u:	xili	ary	Spi	llwa	ay I	Left,	, ho	le 2	61				
28	Texas				C DISP		100%	%0		_								5.		
SITE NO. 2		P.L46		CES	TO REC	\neg	7.5' 100	12.5' 100%												
SIT	STATE			SAMPLES	2	+	5' 7.	10' 12		_									_	
	941	FP-03	st		\vdash															
	7.506		m Cre		TYPE	\neg	3"push	.2 3"push												
	N 29.855019 W -97.506941	80	150' Downstream Crest	-	BIT USED NO	-	HS 1.				HS.									
=	5019	WP-08	Jown		S C S		E E				CS	Sist								
Caldwell	29.85		120,		z	+	0				0	S								
ပိ	z	WP-07						astic clay,	tht brown		eak down	down to	, moist,	rumbled						
COUNTY	LAT/LONG	PROJECT:	LOCTION OF HOLES				_	to highly pla	soft rock, lig	epth	ill cuttings br	one) breaks	ML, soft rock	2.1' sample c						
	DATE 04/06/2015				DESCRIPTION OF MATERIALS		Clay, silty, moist, highly plastic, stiff, roots, dark brown	Claystone, silty, blocky, moist, fractured, breaks down to highly plastic clay,	thin bedded to laminated, iron and manganese stain, soft rock, light brown	with some light gray becoming more light gray with depth	Claystone, thin bedded to laminated with siltstone, drill cuttings break down	clay, push tube material (claystone) breaks down to	stiff plastic clay, siltstone breaks down to non-plastic ML, soft rock, moist,	ay. Push 20' - 22.5', refusal at 22.1' sample crumbled						
reek	Auxiliary Spillway Left		B-57				Clay, silty, moist, highly p	Claystone, silty, blocky, n	thin bedded to laminated	with some light gray becc	Claystone, thin bedded to	to moderately plastic clay	stiff plastic clay, siltstone	light brown to light gray. I	no recovery.		Hole plugged 04/07/2015			
nm C	Spill		Mobile B-57	TH	01	E	2	10			20									
Lower Plum Creek	kiliary	Moffatt		HOLE	FROM	=	0	2			10									
			DRILLING EQUIPMENT	9 145	SIA. & SURFACE ELEVATION		~ 11+79	CL LT AS	20' Right	470.969										
WATERSHED	LOCATION	LOGGED BY	DRILLIN	-	NO.	+	261	<u> </u>	100											

LOG OF TEST HOLES

						A	uxi	iar	y S	pi	llwa	ay I	∠eft _:	, ho	le 2	62			
					AMT			1	1										SHEFTS
	Texas				DISP	+		_	1										
. 28		P.L46			REC %	80%	,	_	1										
SITE NO.	STATE	4		SAMPLES	TO	7 2	17.5												,
				, s	FROM	: [û	5.												
	N 29.855035 W -97.507414	FP-03	300' Downstream Crest		TYPE	dei na	3"Dish												Laans
	-97.		eam		ON	•	: ^												
	35 W	WP-08	vnstr	JAAL	BIT	Ä	E S				HS								
vell	8550		. Do	50	o o o	ō	S		1		Sist								
Caldwell	1 29.8		300		z	_	+		\downarrow	_			_		_				,
O	2	WP-07	F HOLES			-	a soft	5'-75'			breaks	sample							4.7
COUNTY	LAT/LONG	PROJECT:	LOCTION OF HOLES			Tong	lant iron stain	ht gray Diet			ist, soft rock,	- 17.5', top of	ple tube.						CAVE IN. 14.7
	DATE 04/06/2015				DESCRIPTION OF MATERIALS	moderately plastic etiff roots brown Tonsoil	highly weathered blocky abundant iron stain soft	eliff clav light brown mottled light gray. Bush 5' - 7 5'		recovered 1.5 feet, part of sample fell out of tube.	Siltstone, slightly weathered, fractured, iron stain, moist, soft rock, breaks	down to slight to non-plastic ML, light gray. Push 15' - 17.5', top of sample	claystone bottom of sample siltstone. Contact in sample tube.			5			wareb rever. No Water
reek	Auxiliary Spillway Left		B-57			Clay you cilly majet m	Claystone very silty hig			recovered 1.5 feet, part	Siltstone, slightly weathe	down to slight to non-pla	claystone bottom of sam			Hole plugged 04/07/2015			
o mn	Spill		Mobile B-57	e E	01 T		1 6				17.5								TIME. 13:55
Lower Plum Creek	iliary	fatt		HOLE	FROM	: 0	, ,				16								F
		Y Moffatt	DRILLING EQUIPMENT	3 15	SURFACE	13+20	CLITAS	18' Richt		466.813									37/2015
WATERSHED	LOCATION	LOGGED BY	DRILLING	⊩—	NO. SE	26.2	-	=		4									DATE: 04/07/2015

LOG OF TEST HOLES

					AMT	Au	xili	ary 	Spi	llw:	ay I 	_eft _;	, ho 	le 2	63		1		
	as				DISP A	+	7												
. 28	Texas	P.L46			REC %	%09													
SITE NO.	STATE	P.L		SAMPLES	T7	7.5'													1
				S	FROM	5													1
	N 29.855060 W -97.507878	FP-03	450' Downstream Crest		TYPE	3"push													
	-97.5		am (ON	7.													
	× 0	WP-08	nstre	JAN	BIT	HS.	S.												
le l	5506	3	Dow	-	၈ ၁ ၈	귕	SS												
Caldwell	29.8		450		z														
0	_	WP-07	LOCTION OF HOLES			soil	highly	ay											
Ľ	SNC	: тэ	ON OF			n. Tops	olocky,	light gr											
COUNTY	LAT/LONG	PROJECT:	гост			iff, brow	stain, t	mottled											
	DATE 04/06/2015				DESCRIPTION OF MATERIALS	Clay, silty, moist, moderate to highly plastic, roots, stiff, brown. Topsoil	Claystone, silty, moist, thin bedded to laminated, iron stain, blocky, highly	weathered, breaks down to stiff clay CL, light brown mottled light gray	and light gray with depth.			10							
reek	Auxiliary Spillway Left		B-57			Clay, silty, moist, modera	Claystone, silty, moist, th	weathered, breaks down	becoming less blocky an			Hole plugged 04/07/2015							
nm C	Spill		Mobile B-57	ωE	TA	2	12.5												
Lower Plum Creek	ciliary	fatt		НОГЕ ВЕРТН	FROM	0	2												
		BY Moffatt	DRILLING EQUIPMENT	3	SURFACE	~ 14+75	CL LT AS	21' Right	462.566										
WATERSHED	LOCATION	LOGGED BY	DRILLIN	-	NO.	263													

LOG OF TEST HOLES

							Au	xili	ary	Spi	llw	ay I	Left	, ho	le 2	64			
			,			AMT													SHEETS
		Texas				DISP		2											SH
	58		P.L46			REC %	%02												-
SITE NO.		STATE	 		SAMPLES	TO TA	7.5'												1 OF
					S	FROM	5.												
		N 29.855073 W -97.508347	FP-03	rest		TYPE	3"push												SHEET
		97.50		am C		ON	4.												
		3 W	WP-08	600' Downstream Crest	482	BIT	SH.		S.										
:	e	5507	W	Dow	- 0		M	귕	H.	SS									
	Caldwell	29.8		.009		z													
	ပ	z	WP-07	HOLES			, dark		stain,	sample									
À		SNG		LOCTION OF HOLES			e to stiff		ff, iron	part of									N: 4.7
COUNTY		LAT/LONG	PROJECT:	LOCTIC			n dense		ıstic, sti	5' - 7.5'									CAVE IN: 4.7
		15				IALS	mediur		ghly pla	Push (
		04/07/2015				DESCRIPTION OF MATERIALS	Silt, clayey, moist, slight to moderately plastic, medium dense to stiff, dark		Clay, (claystone weathered to a soil), moist, highly plastic, stiff, iron stain,	brown mottled light gray. Push 5' - 7.5' part of sample	11.75								ater
						PTION O	erately		soil), n	ttled lig	pulled out of tube by suction, recovered 1.75'								WATER LEVEL: No water
		DATE				DESCRI	to mod		ed to a	om nw	ion, re								LEVEL
							slight		eather	ight bro	by suc			7/201					VATER
		L					, moist,	soil.	stone w	onate, I	of tube			ed 04/0					
	¥	y Lef		25			clayey	brown, topsoil.	y, (clay	slight carbonate, light	ed out			Hole plugged 04/07/2015					
	Cree	illwa		le B-			Silt,	bro		slig	Ind		_	위					TIME: 14:38
	Plum	ry Sp		Mobile B-57	НОГЕ БЕРТН	TA FT	2		7.5										TIME
	Lower Plum Creek	Auxiliary Spillway Left	Moffatt			FROM	0		2										
		ΑF		DRILLING EQUIPMENT		SURFACE ELEVATION	~ 16+24	CL LT AS	18' Right	458.075									7/2015
WATERSHED		LOCATION	LOGGED BY	LINGE			-	ರ	18,	45			_						DATE: 04/07/2015
WAT		LOC	FOG	DRIL	3	NO.	264												DATE

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

		Lower Fluin Creek		reek			Sal	Caldwell						70		
LOCATION		uxiliar	y Spil	Auxiliary Spillway Left	DATE 04/07/2015	LAT/LONG	N	9.85	1101	۷ -97	N 29.855101 W -97.508816	9	STATE		Texas	
LOGGED BY		Moffatt				PROJECT: W	WP-07		WP-08		FP-03	3	1	P.L46		ī
RILLIN	DRILLING EQUIPMENT		Mobile B-57	B-57		LOCTION OF HOLES	OLES 7	30. D	owns	trean	750' Downstream Crest					
-			НОГЕ ВЕРТН					20	-			s	SAMPLES			
NO.	SURFACE	1	TO		DESCRIPTION OF MATERIALS			z	BIT		\vdash	-	TO	REC	DISP	AMT
	SLEVALIO	H	H					α .	-	ON NO	TYPE	E	FI	%	E	
265	~ 17+77	2	7.5	Clay (alluvium), silty, sligh	, silty, slight sand, fine to coarse grained, slight very fine	ned, slight very fin	e e	S	H HS	۲.	3"push	.5	7.5'	20%		
	CL LT AS			chert gravel, moist, stiff, h	chert gravel, moist, stiff, highly plastic, black. Push 5' to 7.5' recovered 0.5'	of to 7.5' recovered	10.5									
1.3	22' Right			sample pulled out of tube by suction.	by suction.											
	455.956															
				Hole plugged 04/07/2015 after drilling, No water.	after drilling, No water.											
DATE.			TIME.	. I GATERI I BAEL		CAVE IN:	2						-			

Attachment 3b

NRCS-ENG-5

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

		Lower Fluin Creek		Clear			2	Caldwell	=				_		70		
LOCATION		Vuxilia	ry Spi	Auxiliary Spillway Left	DATE 04/07/2015	LAT/LONG	N	9.85	5106	N 29.855106 W -97.509285	7.50	3285	S	STATE	Texas	as	
LOGGED BY		Moffatt	52%			PROJECT:	WP-07		WP	WP-08		FP-03		P.L.	P.L46		T
DRILL	DRILLING EQUIPMENT	MENT	Mobil	Mobile B-57		LOCTION OF HOLES		1.00	Jowr	900' Downstream Crest	E C	est					
			НОГЕ ВЕРТН						-				SAM	SAMPLES			
HOLE NO.	STA. & SURFACE	FROM	4 TO		DESCRIPTION OF MATERIALS			z	S O	BIT	\vdash	\vdash	FROM	TO	REC	DISP	AMT
	ELEVATIO	E	F								NO T	TYPE	FT	H	%	E	
266	~ 19+26	0	က	Clay, silty, moist, highly	Clay, silty, moist, highly plastic, stiff, black, alluvium, Push 0' - 2.5',	Push 0' - 2.5',			공	HS.	 	3"push	6	2.5'	%09		
	CL LT AS	S		recovered 1.25', sample fell out of tube	e fell out of tube						.2 3"	3"push	5	7.5'	20%		
	18' Right	3	7.5		Clay, silty, slight sand, very fine grained, moist, highly plastic, stiff, brown to	ly plastic, stiff, b	rown to		H	HS							
	453.716			dark brown , alluvium. F	dark brown , alluvium. Push 5' - 7.5' recovered 1.25', sample fell out of tube	, sample fell out	of tube										
				Hole plugged after drilling	after drilling 04/07/2015. No water.												
T. C.						1							. 15		,		

Attachment 3b

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	um,	Creek			Cal	Caldwell						79		
LOCATION		ıxiliar	y Spi	Auxiliary Spillway Left	DATE 04/07/2015	LAT/LONG	N 2	9.85	1138	76- N	N 29.855138 W -97.509758	8	STATE		Texas	
LOGGED BY		Moffatt				PROJECT: WI	WP-07		WP-08	_	FP-03	3	=	P.L46		T
DRILL	DRILLING EQUIPMENT		Aobile	Mobile B-57		LOCTION OF HOLES		Exit								
1	- 400	DE	ноге рертн					-		-		8	SAMPLES			
NO.	SURFACE SURFACE ELEVATION	FROM	01 F		DESCRIPTION OF MATERIALS		2006	z z	BIT	ON O	TYPE	FROM	01 FI	REC %	DISP	AMT
267	~ 20+73	0	2	Clay, silty, moist, stiff, rc	Clay, silty, moist, stiff, roots, highly plastic, black, alluvium	uvium		- 등	포 모	7.	3"push	6	2.5'	100%		
	CL LT AS	2	7.5	Clay, silty, slight carbon	Clay, silty, slight carbonate sand, very fine to fine grained, moist, stiff, roots,	ained, moist, stiff, r	oots,	- 등	H HS	2.	3"push	2,	7.5'	20%		
	21' Right			highly plastic, slight very	slight very fine grained chert gravel, brown, alluvium. Push	rown, alluvium. Pu.	hs									
	452.66			5' - 7.5' recovered 1.25',	5' - 7.5' recovered 1.25', sample fell out of tube.											
										_						
				Hole plugged after drillir	after drilling 04/07/2015. No water.											
																,
DATE:		0	TIME.	WATE	WATER LEVEL:	CAVE IN:	2	?			3	CHEFT	1	-	,	0000000

Attachment 3b

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	lum (Sreek		COUNTY	Caldwell	le					SITE NO. 28	. 28		
LOCATION		CL Dam			DATE 4/9/2019	LAT/LONG	N29.8	570	N29.857074 W-97.511188	97.5	1188		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	7		WP-08		FP-03		P.T	P.L46		1
DRILL	DRILLING EQUIPMENT		CME 45	.5		LOCTION OF HOLES		new PS								
alon	9 1.15	HC	HOLE DEPTH					Þ	adat			SA	SAMPLES			
NO.	SURFACE ELEVATION	FROM	T9		DESCRIPTION OF MATERIALS		Z	n O o	BIT	NO	TYPE	FROM	TO	REC %	DISP	AMT
304	20+95	0	2	clay, sand, stiff, roots, to	clay, sand, stiff, roots, topsoil, slightly moist, brown			苬		7.	3"push	2	7.5	100%		
	CL dam	2	16	clay, sandy, some very f	clay, sandy, some very fine grained gravel, slightly moist, stiff to very stiff	noist, stiff to very stiff		겁		2	3"push	10	12.5	100%		
	elev:480.51			light brown/dark gray cla	light brown/dark gray clay with increase in moisture @ 7.5/12.5, as above	@ 7.5/12.5, as above	0			ω	3"push	15	17.5	100%		
		16	17	silt, moist, slightly plastic	silt, moist, slightly plastic, moderately dense, light brown clay as above @15	own clay as above @	315	Ŋ		4.	3"push	30	32.5	100%		
		17	36	clay, dark brown to black, moist plastic, stiff	k, moist plastic, stiff			ರ		5.	3"push	35	37.5	75%		
		36	43	sand, saturated, loose, v	sand, saturated, loose, very fine grained to fine grained, silty, gray	ned, silty, gray		공		9.	spt	42.5	44			
				SPT 42.5-44' blows=4+9	blows=4+9+12, recovered 6" sand 12" clay	clay				7.	spt	45	46.5			
		43	46	clay, moderately stiff to	clay, moderately stiff to stiff, saturated, plastic, slight lignite, dark gray	: lignite, dark gray		딩								
				SPT 45-46.5' blows=6+19+27	19+27											
		46	46.5		very fine grained sand, very moist to saturated, dense, light brown	se, light brown		SM								
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:					SHEET	ET 1	1 OF	-	SE	SHEETS

Attachment 3c

Principal Spillway, hole 304

NRCS-ENG-53

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	lum C	reek		COUNTY	Caldwell	We					SITE NO.	. 28		
LOCATION		PS left DS toe	S toe		DATE 3/20/19	LAT/LONG	N29.	8268	M 69	-97.5	N29.856869 W-97.511326	T	STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	07		WP-08		FP-03		P.I.	P.L46		L
DRILI	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES	ES									
HOLE	4 47	HC	но <u>ге</u> рертн					Þ	TV DE			S.	SAMPLES			
NO.	SURFACE	FROM	TO		DESCRIPTION OF MATERIALS		z	o c	BIT USED	ON	TYPE	FROM	TI	REC %	DISP	AMT
305	20+90 CL	0	2	clay, sandy, silty, moder	clay, sandy, silty, moderate to very stiff, plastic, roots, slight fine grained	s, slight fine grained		겁		₹.	3"push	0	2.5	100%		
	Dam 95' DS			gravel, brown to light brown	nwo					ci	3"push	2.5	2	%09		
	elev:454.42'	5	o	clay, silty, reddish gray,	ddish gray, brown, moist, silty, sandy, plastic	lastic		공		ω	3"push	5	7.5	40%		
		6	20	sand, clayey, moist, fine	moist, fine grained, silty, making water, spt 10-11.5'	; spt 10-11.5'		SM		4.	3"push	7.5	10	40%		
				blows=2+3+7, push 12.5	blows=2+3+7, push 12.5-15', fine grained sand, saturated, loose/very loose	ırated, loose/very lo	ese			ιĊ	spt	10	11.5			
				fine grained sand@15', so sample @15'	so sample @15', drill to 20',	drill to 20', SPT 20-21.5ft				ø.	3"push	12.5	15	100		
				blows=10+14+19, half clay half sand	lay half sand					7.	spt	20	21.5			
		20	20.5	clay, saturated, fine grained sand, saturated	ned sand, saturated			겁		ω.	spt	28	29.5			
		20.5	35	clay, medium grained sa	grained sand, loose, clay plastic, moderately stiff, gray to 25'	erately stiff, gray to	25'	딩		<u>ග</u>	spt	35	36.5			
				above=3/20/2019, below=3/21/2019	v=3/21/2019					.10	spt	45	46.5			
				push 25-27.5, no recove	push 25-27.5, no recovery, cut to 28' for SPT @28-29.5ft blows=15+26+35	9.5ft blows=15+26+	-35			.11	spt	90	51			
				grayish green clayey sa	grayish green clayey sand, non-plastic to slightly plastic	stic										
		35	40	SPT 35-36.5' blows=124	blows=12+17+25, clay, silty, sandy, saturated, few lignite spec	turated, few lignite	pads	苬								
				stiff, dark greenish gray,	stiff, dark greenish gray, push@40' no recovery, sand	ld										
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:		- [SHI	SHEET	1 OF	2	SH	SHEETS

Attachment 3c

Principal Spillway, hole 305

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED .		;			COUNTY						SITE NO.	3		
	Lower	PI	Lower Plum Creek									28		
	PS left DS toe	DS	toe	DATE 3/21/2019	LAT/LONG						STATE	ĭ		
LOGGED BY	Moffatt				PROJECT: WP-07		*	WP-08	F	FP-03	L.	P.L46		l n
EQUI	DRILLING EQUIPMENT	S	CME 45		LOCTION OF HOLES									
4		HOLE DEPTH					⊢	adAL			SAMPLES			
SURFACE ELEVATION	E FROM DN FT	\perp	TO	DESCRIPTION OF MATERIALS		z	, U s	BILL	NO TYPE	E FT	OI II	REC %	DISP	AMT
			10:00am augers	10:00am augers separated in hole, crew went to Austin to get retrieval screw	istin to get retrieval screw									
			back on site @1	back on site @13:00, augers separated @10', successfully retrieved augers	essfully retrieved augers									
	40		51 @13:35, SPT 48	45-46.5, blows=29+42+46, fine grained sand, saturated, silty	ed sand, saturated, silty		SM							
			soft, greenish gr	gray, SPT 50-51 blows=29+50 for 6". alternating thin bedded	alternating thin bedded									
			laminations of sa	sand with silty clayey sand and slight lignite seams	t lignite seams									
							\vdash							
DATE: 3/27/2019		TIM	TIME: 9:02	WATER LEVEL: 7.6ft	CAVE IN: 10.2ft					SHEET	2 OF	. 2		SHEETS

Attachment 3c

Principal Spillway, hole 305

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

					O	ut	side	e Cı	ıt, A	Aux	ilia	ry S	pill	wa	y, h	ole :	270			
		ĺ.			AMT															SHEETS
						FT														SHE
78	ř	P.L46			REC	%			75%											-
SITE NO. 28	STATE	P.T.		SAMPLES	TO	FT	2	10	12	15										OF
S	s			SAI	FROM	H	_	7	10	13.5										17
	565	FP-03			\vdash	TYPE	sm	sm	3"/P	spt										SHEET
	7.517					NO NO	Ψ.	2	w.	4.										
	N29.859845 W-97.517565	WP-08			BILL															
=	984	M		\vdash	, ,	_	귕	겁	귕	SM						\vdash				
Caldwell	29.8				Z															
O	z	WP-07	HOLES				_			ssive										#
ΓY	SNC	CT:	LOCTION OF HOLES				h browr			ompres										CAVE IN: 9.3ft
COUNTY	LAT/LONG	PROJECT:	LOCT				reddis			nfined o		pui								CAVE
	6				SIALS		rown to		orown	loo poo		9+7, sa								i i
	4/10/2019				DESCRIPTION OF MATERIALS		ntly moist, plastic, stiff, brown to reddish brown	clay, silty, moist, plastic, stiff, reddish brown	clay, sandy, slightly moist to moist, stiff, light brown	sand, very fine grained to fine grained, silty, good confined compressive		test: 13.5-15, blows =6+9+7, sand								water
	DATE 4				SCRIPTIO		ist, plas	f, reddis	moist,	ne grain	slightly moist	3.5-15, 1								WATER LEVEL: no water
					DE		htly mo	stic, stiff	noist to	ed to fir	slightly									TER LE
							wn, slig	ist, plas	lightly r	e grain	brown,	etration								WA
							clay, fine, brown, sligh	ilty, mo	andy, s	very fin	strength, light brown,	standard penetration								0
reek	S						clay, fi	clay, s	clay, s	sand,	streng	standa								2:40
Lower Plum Creek	Outside Cut AS		CME 45	TH	TO	FT	~	7	7	15										TIME: 12:40
ver PI	side	fatt		HOLE	FROM	FT	0	-	7	11										I
		BY Moffatt	DRILLING EQUIPMENT	0 7 4.0	SURFACE SURFACE	PERMITTON	11+50 CL	AD 275' RT	elev:490.52											11/19
WATERSHED	LOCATION	LOGGED BY	DRILLIN	\vdash	NO.		270	4	ē											DATE: 4/11/19

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

Attachment 3d

NRCS-ENG-

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

SITE NO. 28	STATE TX	P.L46		SAMPLES	TO REC DISP AMT FT % FT	2	10	15.5 80%								
S		03		SAN	FROM	2	7	13.5								
	51749	FP-03			TYPE	sm	sm	3"push								
	N29.860877 W-97.517497	WP-08		ada	BIT USED NO	7.	2	ω			,		,			
e e	30877	M		⊩	200	귆	귕		SM							
Caldwell	29.86				N											
		T: WP-07	LOCTION OF HOLES				noist		light brown							
COUNTY	LAT/LONG	PROJECT:	LOCTIO			E	el, slightly m		tely dense,							
	DATE 4/10/2019				DESCRIPTION OF MATERIALS	clay and sand, slightly moist, stiff, roots, dark brown	clay, silty, slight very fine grained calcareous gravel, slightly moist		very fine grained sand, silty, slightly moist, moderately dense, light brown							
reek	S					clay and sand, slightly m	clay, silty, slight very fine	to moist, stiff, light brown	very fine grained sand, s							
J I	ut A		CME 45	a H	TO	7	7		15.5							
Lower Plum Creek	Outside Cut AS	fatt		HOLE	FROM	0	7		7							
		D BY Moffatt	DRILLING EQUIPMENT	4 1 2	SURFACE ELEVATION	9+70 CL	AS 290' RT	elev:497.25'								
WATERSHED	LOCATION	LOGGED BY	DRILLI	alon	NO.	272										

Attachment 3d

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

105	WATERSHED LO	Lower Plum Creek	E MIN	Creek		COUNTY	Caldwell	le N					SITE NO. 28	. 28		
	LOCATION Ou	Outside Cut AS	Cut /	AS	DATE 4/10/2019	LAT/LONG	N29.8	611	N29.861174 W-97.517182	97.51	7182		STATE	ř		
(32)	LOGGED BY Mo	Moffatt				PROJECT: WP-07	0.0		WP-08		FP-03		P.T	P.L46		
15	DRILLING EQUIPMENT		CME 45	5		LOCTION OF HOLES	ES									
_	STA 8	но реі	HOLE DEPTH					p.,	TVBE			S.	SAMPLES			
	SURFACE	FROM	TO		DESCRIPTION OF MATERIALS		z	o o	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMI
	8+80 CL	0	2	sand, slight clay, roots,	sand, slight clay, roots, slightly moist, dark brown			ပ္တ		7	sm	2	5			
_	AS 265' RT	2	တ	clay, very silty, moist, pl	clay, very silty, moist, plastic, moderately dense, light brown	ıt brown		겁		2.	sm	10	13.5			
_	elev:492.77	0	9.5	sandstone, slightly mois	sandstone, slightly moist, very hard organic gravel with lime cement	ith lime cement		SS		ω	spt	13.5	15			
		9.5	15	very fine grained to fine	very fine grained to fine grained sand, silty, slightly moist, moderately dense	noist, moderately de	esue	SM								
				light brown												
				standard penetration tes	etration test: 13.5-15' blows = 14+27+33	Ω										
	DATE: 4/11/19		TIME: 11:05		WATER LEVEL: no water	CAVE IN: 8.8ft					SHEET		1 OF	-	SH	SHEETS
	- Co	1	Á				9									

Attachment 3d

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

		Wer		Lower Plum Creek		COUNTY	Calc	Caldwell					SHEN	. 28			SITE NO. 28
CA	LOCATION OL	Outside Cut AS	Cut	AS	DATE 4/10/2019	LAT/LONG	N29	.861	513 \	N-97	N29.861513 W-97.516475		STATE	ř			
990	LOGGED BY MC	Moffatt				PROJECT: WP-07	0.2		WP-08	8	FP	03	a.	L46			FP-03 P.L46
SIL.I	DRILLING EQUIPMENT		CME 45	45		LOCTION OF HOLES	ES										
HOLE	STA. &	Jan San	HOLE DEPTH) o c	⊩—	Ψ,		MOGA	SAMPLES	344	asid		asiu Jaa
o.	SURFACE		\perp		DESCRIPTION OF MATERIALS			N C	USED	D NO	TYPE	_		%	FT	AMI	FT FT % FT
274	7+80 CL	0	7		very fine grained sand, silty, slightly moist, very slightly to slightly plastic clay	tly to slightly plastic	clay	SC	()	1.	sm	0	5				0
	AS 245' RT			light brown, moderately dense	/ dense					Ci.	spt	9	11.5				9
	elev: 482.77	7 7	თ	sandstone, very dense				SS	(0								
		o	11.5		loose sand, moist, silty, very fine grained to fine grained, light gray	ned, light gray		SM	5								
				standard penetration te	standard penetration test: 10-11.5' blows=8+12+13												
										-							
										-							
TE:	DATE: 4/11/19		TIME:	TIME: 10:58 WATE	WATER LEVEL: no water	CAVE IN: 7.0ft					s	SHEET	1 OF	F-		SHEETS	

Attachment 3d

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	J mn	reek		COUNTY	Calc	Caldwell	_				SITE NO.	. 28		
LOCATION		US Toe			DATE 4/3/2019	LAT/LONG	N29	.859	407 V	V-97.	N29.859407 W-97.514493		STATE			
LOGGED BY		Moffatt				PROJECT: W	WP-07		WP-08	_	FP-03	83	P.I	P.L46		l
DRILL	DRILLING EQUIPMENT		CME 45	5		LOCTION OF HOLES	OLES									
HOLE	STA &		НОГЕ DEPTH					-	⊢	p			SAMPLES			
NO.	SURFACE	FROM	TI		DESCRIPTION OF MATERIALS			N C C	BIL	ON	TYPE	FROM	OI II	REC %	DISP	AMI
701	34+50	0	0.5	sand, silty, clayey, roots,	sand, silty, clayey, roots, slightly moist, brown to light brown	t brown		SC	O	₹.	3"push	0	2.5	100%		
	CL Dam	0.5	2.5	clay, silty, sandy, slight r	ndy, slight moist to moist, stiff to medium stiff	n stiff		겁	ن	ci	3"push	2.5	2	100		
	82' US	2.5	2	clay, silty, moist, plastic,	clay, silty, moist, plastic, moderately stiff, dark brown to black	to black		공	I	ω	3"P	5	7.5	100		
	elev:464.78	2	10	clay, moist, stiff, plastic,	clay, moist, stiff, plastic, brown to orange brown, slightly sandy	htly sandy		공	I	4.	3"P	7.5	10	100		
		10	20.5		sand, silty, slightly clayey, moist, fine grained, light grey and orange brown	rey and orange b	rown	SM	5	75	3"P	10	12.5	100		
				slight fine grained grave	slight fine grained gravel, slight streaks of lignite, spt 15-16.5'=6-10-16	15-16.5'=6-10-16	9			9.	spt	15	16.5			
				thin streaks of iron staini	thin streaks of iron staining @ 16.5', spt 20-21.5'=4-8-12	8-12				7.	spt	20	21.5			
		20.5	36.5		clay, silty, moist to saturated, plastic, stiff, brown and gray brown to	gray brown to		공	I	∞.	spt	25	26.5			
				orange brown, few very	orange brown, few very fine grained sand particles					ග.	spt	30	31.5			
				spt 25-26.5'=6-9-12, as	spt 25-26.5'=6-9-12, as above with a few lignite laminations	nations				.10	spt	35	36.5			
				spt 30-31.5'=13-20-25 a	spt 30-31.5'=13-20-25 as above, dark gray- brown with no lignite	ith no lignite				-						
				spt 35-36.5' as above												
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:					SH	SHEET	1 OF	-	SH	SHEETS

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	lum C	reek		COUNTY	Caldwell	Vell					SITE NO. 28	. 28			
LOCATION		US Toe			DATE 4/3-4/4/2019	LAT/LONG	N29.8	290	N29.859054 W-97.513935	97.51	3935		STATE	ř			
LOGGED BY		Moffatt				PROJECT: WP-07			WP-08		FP-03		P.T	P.L46		l	
DRILL	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES											ī
alon	1.15	HC	но <u>ге</u> рертн					Þ	20,72			SA	SAMPLES				
NO.	SIA. & SURFACE ELEVATION	FROM	TO T		DESCRIPTION OF MATERIALS		z	လပ	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT	
702	32+50 CL	0	2	clay, silty, slightly moist to	clay, silty, slightly moist to moist, plastic, roots to 2, dark brown to black	dark brown to black		苬		7	3"push	0	2.5	65			
	Dam 82' US	14-		2-4' slightly very fine grained gravel 4/3/2019	led gravel 4/3/2019					6	3"push	2.5	2	75			
	elev:460.94	2	15	4/4/19, clay, sandy, slightl	4/4/19, clay, sandy, slightly to moderately plastic, moist, some gravel,	sist, some gravel,		겁		ω	3"P	5	7.5	100			
				light brown to gray						4.	3"P	7.5	10	100			
		15	20	alternating thin bedded ve	bedded very fine grained silty sand and silty clay, saturated	nd silty clay, saturated	g	သင		75.	3"P	10	12.5	100			
				to very moist, sand lamina	to very moist, sand laminations orange brown and light gray	tht gray				6	3"P	15	17.5	100			
		20	22.5	fine grained sa	nd, loose, saturated, light gray			SC		7.	3"P	20	22.5	100			
DATE:			TIME:	WATER LEVEL:	SEVEL:	CAVE IN:					SHEET		1 OF	-	SE	SHEETS	ı

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

							C	1			,						
		١,			AMT												SHEETS
					DISP												SH
. 28	ř	P.L46			REC %	100	100	100	100	100	100	100					-
SITE NO. 28	STATE	P.I		SAMPLES	TO	2.5	2	7.5	10	12.5	17.5	22.5					OF
				SA	FROM	0	2.5	2	7.5	10	15	20					ET 1
	3427	FP-03			TYPE	3"P	3"P	3"P	3"P	3"P	3"P	3"P					SHEET
	12.76				ON	Ψ.	ci	ω	4.	ιų	ø.	7.					
	N29.858699 W-97.513427	WP-08		TVDE	BIL												
le le	2869	^		Þ	ာပေ	苬	귕	귕		S D	겁						
Caldwell	29.8				Z												
COUNTY	LATLONG	PROJECT: WP-07	LOCTION OF HOLES					ned sand, specks of		rown	o orange brown with						CAVE IN:
	DATE 4/4/2019				DESCRIPTION OF MATERIALS	slightly moist, very stiff	nd, plastic, gray brown	fine grained sandy, slight coarse grained sand, specks of	e brown	sand, saturated, fine grained, loose, gray to orange brown	rticles, thin bedded laminations, gray to orange brown with						LEVEL:
reek						clay, sand, silty, slightly n	clay, silty, moist, slight sand, plastic, gray brown	clay, slight very fine grain	lignite, light gray to orange brown	sand, saturated, fine graii	clay with silt particles, thi	thin beds of dark gray					WATER LEVEL:
D Em			CME 45	H	TO	-	10	15		16	22.5						TIME:
Lower Plum Creek	US Toe	fatt		HOLE	FROM	0	-	10		15	16						F
		ED BY Moffatt	DRILLING EQUIPMENT	era e	SURFACE	30+50 CL	Dam 82' US	elev:460.33									
WATERSHED	LOCATION	LOGGED BY	DRILL	AJOH	NO.	703											DATE:

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LC	Lower Plum Creek	Jum C	reek		COUNTY	Calc	Caldwell	_				SITE NO. 28	. 28		
LOCATION		US Toe			DATE 4/4/2019	LAT/LONG	N29	858	402 W	-97.	N29.858402 W-97.512921		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WF	WP-07		WP-08		FP-03	3	L'A	P.L46		1
DRILI	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES	LES									
101	0 1440		но <u>ге</u> рертн					p.,	⊢			S.	SAMPLES			
NO.	SIA. & SURFACE ELEVATION	FROM	TI		DESCRIPTION OF MATERIALS			N C N	BIT	ON	TYPE	FROM	TI	REC %	DISP	AMI
704	28+50	0	~	clay, silty, sandy, slightly n	clay, silty, sandy, slightly moist, roots, moderately plastic, dark brown-black	astic, dark brown-b	lack	귕	ļ.,	77	3"push	0	2.5	40		
	CL Dam	-	2	clay, silty, very stiff, moist, plastic, dark gray-brown	, plastic, dark gray-brown			ರ	_	,	3"push	2.5	2	80		
	82' Us	S	10.5	fine grained sand, modera	fine grained sand, moderately loose, slight clay, silty, slightly plastic,	, slightly plastic,		S	()	ω	3"P	2	7.5	100		
	elev:460.36	15		orange brown to gray, fine	to gray, fine grained below 8', increasing moisture	ing moisture				4.	3"P	7.5	10	100		
		10.5	12	clay, silty, plastic, gypsum streak @12, moist, stiff	streak @12', moist, stiff			ರ		ιċ	3"P	10	12.5	100		
		12	21.5	fine sand with	few thin bedded clay laminations, moist to saturated, loose,	st to saturated, loo	se,	SC	()	φ.	3"P	15	17.5	100		
				gray to orange brown, spt 20-21.5'=17-28-30	20-21.5'=17-28-30					7.	spt	20	21.5			
										-						
DATE			TIME:	WATER LEVEL:	LEVEL:	CAVE IN:		,			SH	SHEET	1 OF	-	2	SHEETS

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		wer P	Lower Plum Creek	reek		COUNTY	Calc	Caldwell					SITE NO. 28	. 28		
LOCATION		US Toe			DATE 4/4/2019	LAT/LONG	N29.	858	M 901	-97.5	N29.858106 W-97.512383		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP	WP-07		WP-08		FP-03		P.I.	P.L46		1
DRILL	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES	LES									
alon	CTA E	H DE	но <u>ге</u> рертн					Þ	TVBE			Š	SAMPLES			
NO.	SURFACE	FROM	TI II		DESCRIPTION OF MATERIALS		z	, O o	BIT	ON	TYPE	FROM	TI	REC %	DISP	AMI
705	26+50 CL	0	-	sand, silty, roots, very slig	sand, silty, roots, very slight clay, non plastic, slightly moist, brown-gray	moist, brown-gray		SM	_	₹.	3"push	0	2.5	70		
	Dam 82' Us	-	2.5	clay, reddish brown, plastic, moist, moderately stiff	ic, moist, moderately stiff			ರ		4	3"push	2.5	2	75		
	elev:459.95	2.5	21.5	sand, clayey, silty, moist,	sand, clayey, silty, moist, slightly plastic, moderately dense, reddish brown,	dense, reddish bro	wn,	SC		ωi	3"P	5	7.5	65		
				slighty gravel, grayish below 5'	ow 5'					4.	3"P	7.5	10	100		
				spt 10-11'=6-9-13, thin bedded clay 15'-15.25',	dded clay 15'-15.25',					ιč	spt	10	11.5			
				spt 20-21.5'=16-23-36						φ.	3"P	15	17.5	100		
										7.	spt	20	21.5			
							,									
DATE: 4/4/19	4/4/19		TIME: 13:15		WATER LEVEL: 10.6'	CAVE IN: 14.0'					SHI	SHEET	1 OF	-	SE	SHEETS

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	Jum C	reek		COUNTY	Caldwell	well					SITE NO.	78		
LOCATION		US Toe			DATE 4/2-4/3/2019	LAT/LONG	N29.	8555	N29.855518 W-97.508164	97.50	8164		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	7		WP-08		FP-03		P.T	P.L46		
DRILL	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES	So									
alon	3 7.1.5	HC	HOLE DEPTH					Þ	TVBE			S.	SAMPLES			
NO.	SURFACE ELEVATION	FROM	TO	A	DESCRIPTION OF MATERIALS.		Z	, O .	BIL	ON	TYPE	FROM	TI	REC %	DISP	AMT
902	9+45'	0	ю	clay, moist, silty, thin bedded with fine grained soft sand, brown/gray/orange	ed with fine grained soft s	and, brown/gray/oran	ge	귕		7	3"push	0	2.5	80		
	CL dam			-brown, few pieces of gravel	<u></u>					ci	3"push	2.5	2	100		
	73, NS	е	7.5	alluvium? clay, silty, sandy	, silty, sandy, brown, moist, plastic, moderately dense	oderately dense		공		ω	3"P	5	7.5	06		
	elev:461.06'	7.5	10.5	clay, silty, moist, plastic, brown, stiff	own, stiff			공		4.	3"P	7.5	10			
		10.5	37.5	clay, silty, thin	bedded gravel @11.5, iron staining, light gray/orange brown	ight gray/orange brow	Ę	苬		75.	3"P	10	12.5	100		
				push 15-17.5' 4/2/19,						9.	3"P	15	17.5	100		
				4/3/19, push 20-22.5' as above, push 25-27.5' as above, transitioning to	ove, push 25-27.5' as ab	ove, transitioning to				7.	3"P	20	22.5	100		
				dark gray, push 30-32.5' as above, transition to thin bedded laminations	s above, transition to thin	bedded laminations				ω.	3b	25	27.5	100		
				with silt partings, iron staining, laminations with plant fossil imprints,	ing, laminations with plant	t fossil imprints,				<u>ල</u>	3"P	30	32.5	100		
				push 35-37.5' refusal @37'	refusal @37' as above, almost all gray					.10	3b	35	37.5	80		
DATE:			TIME:	WATER LEVEL:	EVEL:	CAVE IN:		-			SHEET		1 OF	-	SE	SHEETS

Attachment 3e

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	lum,	Sreek		COUNTY	Caldwell	le N					SITE NO. 28	. 28		
LOCATION		DS toe			DATE 4/2/2019	LAT/LONG	N29.8	289	N29.858968 W-97.514756	97.51	4756		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	7		WP-08		FP-03		P.T	P.L46		l
DRILI	DRILLING EQUIPMENT		CME 45	Š		LOCTION OF HOLES	s									
alon		HC	HOLE DEPTH					Þ	TVBE			S	SAMPLES			
NO.	STAL & SURFACE ELEVATION	FROM	TO		DESCRIPTION OF MATERIALS		Z	n O s	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT
601	34+50 CL	0	9	clay, silty, slightly sandy,	clay, silty, slightly sandy, roots, slightly moist to moist, stiff, sandier in first 1'	st, stiff, sandier in first	-	귕		₹.	3"P	0	2.5	100		
	Dam 93' DS			dark brown, no roots belo	dark brown, no roots below 3', 5-7.5' sandier than above, 7.5-10' less sand	ove, 7.5-10' less san	ъ			2	3"P	2.5	2	100		
	elev:460.31			becoming brown to light brown, more moisture	prown, more moisture					ω	3"P	5	7.5	100		
		10	14.75		clay, slity, slight to trace course grained sand, very fine grained gravel	ine grained gravel		겁		4.	3"P	7.5	10	100		
				silt/sand orange brown/light gray, stiff	ght gray, stiff					5.	3"P	10	12.5	100		
		14.75	20	fine grained sand, saturat	fine grained sand, saturated, loose, few thin beds, clay, stiff, slight gravel	lay, stiff, slight gravel		SC		9.	3"P	15	17.5	100		
				orange brown						7.	spt	20	21.5			
		20	41.5	clay, silty, thin	bedded laminations, saturated, brown to dark gray	to dark gray		Ъ		8.	spt	25	26.5			
				spt 2526.5'=4+13+20, c	spt 2526.5'=4+13+20, clay dark gray with silt particles	sək				6.	spt	30	31.5			
				spt 30-31.5'=14-22-27 as above	above					.10	spt	35	36.5			
				spt 35-36.5'=11-22-30 cla	1-22-30 clay as above					.11	spt	40	41.5			
				spt 40-41.5'=18-28-34 cla	8-28-34 clay as above											
DATE:			TIME:	WATER LEVEL:	LEVEL:	CAVE IN:					SHI	SHEET	1 oF	-	SH	SHEETS

Attachment 3f

Downstream Toe, hole 601

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED L	ower	- Plum	Lower Plum Creek		COUNTY	Caldwell	well					SITE NO.	. 28		
LOCATION		DS toe	40		DATE 4/1-4/2/2019	LAT/LONG	N29.	3586	N29.858675 W-97.514279	97.51	4279		STATE	ř		
LOGGED BY		Moffatt	يو			PROJECT: WF	WP-07		WP-08		FP-03		P.I	P.L46		l
DRILL	DRILLING EQUIPMENT	MENT	CME 45	45		LOCTION OF HOLES	LES									
101	1		HOLE DEPTH					Þ				Si.	SAMPLES			
NO.	SIA. & SURFACE ELEVATION	FROM	M TO	0 1	DESCRIPTION OF MATERIALS		Z	o O o	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT
602	4/1/2019	0	3.5		clay, silty, sandy, slightly moist to moist, roots plastic, dark brown	c, dark brown		귕		₹.	3"P	0	2.5	100		
		3.5	5 7.5		clay, silty, sandy, moist, stiff, dark grayish brown, very sandy@10	ry sandy@10'		겁		2	3"P	2.5	5	100		
	32+50 CL	7.5	11	fine grained	sand, silty, clayey, moist, moderately dense, orange-brown	ense, orange-brown		S		ω	3"P	2	7.5	100		
	Dam 95'DS	11	1 20	clay, silty, th	inly bedded fine grained sand, moist, stiff, orange-brown and	iff, orange-brown a	pu	苬		4.	3"P	7.5	10	100		
	elev:459.55'	ξΩ		light gray, push 15-17	ight gray, push 15-17.5 saturaed thinly bedded sand	g				ιĊ	3"P	10	12.5	100		
	4/1/2019	_		spt 20-21.5'=9-29-33	spt 20-21.5'=9-29-33 because of sand and saturated sand	d sand				9.	3"P	15	17.5	100		
	4/2/2019	30	0 25.5	fine grained	sand, saturated, loose, gray to orange-brown	brown		SM		7.	spt	20	21.5			
		25.5	.5 41.5		clay, silty, lignite, dark brown to orange-brown, very moist to saturated	moist to saturated		딩		ω.	spt	25	26.5			
				plastic, stiff						<u>ල</u>	spt	08	31.5			
				spt 30-31.5'=15-22-3(spt 30-31.5'=15-22-30, saturated clay as above					.10	spt	32	36.5			
				spt 35-36.5'=17-22-25	5					.11	spt	40	41.5			
				spt 40-41.5'= as abov	as above with lignite											
DATE:			TIME:		WATER LEVEL:	CAVE IN:					SHI	SHEET	1 OF	-	1 28	SHEETS

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED	Lower Dlum Crook	- mile	Crook		COUNTY	Lawole	10/10/					SITE NO.	. 20		
1001		5	5	Oleen	N 4 mm	ONO BELL	000					1	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	3		
LOCATION		DS toe			DAIE 4/1/2019	LAI/LONG	N29.	858	358 W	-97.5	N29.858358 W-97.513785		SIAIE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	-07		WP-08		FP-03	3	I.4	P.L46		1
DRILI	DRILLING EQUIPMENT		CME 4	45		LOCTION OF HOLES	,ES									
AIOH	4 47		HOLE DEPTH					Þ	TVBE			S	SAMPLES			
NO.	SURFACE SURFACE ELEVATION	FROM	O II		DESCRIPTION OF MATERIALS		z	, O s	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT
603	30 +50 CL	0	ю	clay, silty, sandy, roots,	clay, silty, sandy, roots, slightly moist to moist, plastic, push 0-2.5' core stuck	ic, push 0-2.5' core	stuck	겁		₹.	3"P	0	2.5	100%		
	Dam 95' DS	(A)		in tube, hammer out sai	in tube, hammer out sample, no penetration, dark brown	uwo.				ci	3"P	2.5	2	100%		
	elev:459.06	e e	S	clay, silty, slight coarse	ht coarse grained sand, slight very fine grained sand, moist,	e grained sand, mois	st,	공		ω	3"P	5	7.5	100		
				plastic, stiff						4.	3"P	7.5	10	100		
		2	16.5		fine grained sand, dense, moist, silty, slight clay, brown to orange-brown	wn to orange-brown	c	SM	_	3.	3"P	10	12.5	100		
				becoming more moist w	becoming more moist with depth, more clay @11', gray with light brown	ray with light brown				9.	3"P	15	17.5	100		
				10-12.5 water in push tu	in push tube, 15-17.5' saturated sand 15.5-16.5'	15.5-16.5'				7.	spt	20	21.5			
		16.5	21.25	clay, silty, thin	bedded laminations with silt particles, iron staining to light	iron staining to ligh		겁		∞.	spt	25	26.5			
				gray with some orange-	gray with some orange-brown, moist, stiff to very stiff, SPT 20-21.5	ff, SPT 20-21.5				ග.	spt	30	31.5			
				thin bedded sand @21.25	25					.10	spt	35	36.5			
		21.25	30	very fine grained sand,	very fine grained sand, thin bedded laminations with silt, gray to light brown	silt, gray to light bro	nwo	SM		.11	spt	40	41.5			
				with heavy iron staining	n staining, soft to moderately dense, spt 25-26.5'=4-9-20,	pt 25-26.5'=4-9-20,										
				spt 30-31.5'=15-22-30												
		30	41.5		clay with thin bedded lignite, plastic moist, very stiff, laminations, platy dark	laminations, platy d	lark	- 당	_							
				gray to black, spt 35-36	spt 35-36.5'= 19-39-50 for 5 3/4",spt 40-41.5'=20-21-50 for 4"	10-41.5'=20-21-50 fo	or 4"									
DATE:			TIME:	WATE	WATER LEVEL:	CAVE IN:	1	,			SH	SHEET	1 OF	-	SH	SHEETS

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED	ower	Plum	Lower Plum Creek		COUNTY	Caldwell	Ve					SITE NO.	. 28		
LOCATION		DS toe			DATE 3/28//2019	LAT/LONG	N29.8	3580	N29.858054 W-97.513252	97.51	3252	T	STATE	ř		
LOGGED BY		Moffatt	_			PROJECT: WP.	WP-07		WP-08		FP-03	_	P.I	P.L46		
DRILL	DRILLING EQUIPMENT	MENT				LOCTION OF HOLES	ES									
	0	- 1	N S	. 45												
alon	24.12		HOLE DEPTH					Þ	TVBE			s	SAMPLES			
NO.	SURFACE ELEVATION	r FROM	M TO	0 1	DESCRIPTION OF MATERIALS		z	o o o	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT
604	28+50 CL	۰	m		clay, silty, sandy, plastic, slightly moist-moist, stiff, dark brown to black, roots	ark brown to black,	roots	ಠ		7.	3"P	0	2.5	09		
	Dam 95' DS	DS 3	2		clay, silty, sandy, slight fine grained gravel, moist, stiff, light brown on bottom	iff, light brown on bo	ottom	ರ		2.	3"P	2.5	2	80		
	elev: 458.87	87		gray brown on top						ω	3"P	2	7.5	40		
		Ω.	15	very fine grair	ned sand, slight clay, silty, moist, slightly to moderately plastic	ly to moderately pla	stic			4.	3"P	7.5	10	100		
				moderately stiff, brown	iff, brown to light brown, slight course grained sand with depth	grained sand with d	epth	သိ		τċ.	3"P	10	12.5	100		
				10-12,5' course grained	10-12,5' course grained sand (SM) saturated, no clay	<u> </u>				9.	spt	15	16.5			
		15	5 17		clay, silty, saturated to very moist, plastic, gray and mottled light brown	mottled light brown		ರ		7.	3"P	20	22.5	06		
				stiff, SPT 15-16.5'=6-9-14	-14					∞.	spt	25	26.5			
		17		30.5 sand with thin bedded	bedded clayey sand, saturated, soft, gray	gray		SC		6.	spt	30	31.5			
				SPT 25-26.5'=22-36-43	SPT 25-26.5'=22-36-43, thin bedded laminations with sand, iron staining	h sand, iron stainin	D			.10	spt	35	36.5			
				no clay, SPT 30-31.5'=	30-31.5'=12-30-36					.11	spt	40	41.5			
		30.5	.5 35		clay, sandy, very silty, saturated, slightly to moderately plastic, moderately	ely plastic, moderat	ely	귕								
				stiff, brownish gray, SP	gray, SPT 35-36.5 50 for 6"											
		35	36	6 lignite												
		36		41.5 clay, silty, moderately s	clay, silty, moderately stiff, very moist to saturated, moderate to high plasticit	noderate to high pla	asticit	겁								
DATE:			TIME:		WATER LEVEL:	CAVE IN:					SHI	SHEET	1 OF	-	SE	SHEETS

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED LO	Lower Plum Creek	Jum C	Sreek	COUNTY	Caldwell	=					SITE NO. 28	. 28		
LOCATION		DS toe		DATE 3/27/2019	LATLONG	N29.857727 W-97.512731	5772	7 W-5	97.51	2731		STATE	ř		
LOGGED BY		Moffatt			PROJECT: WP-07		^	WP-08		FP-03		P.I	P.L46		n
DRILL	DRILLING EQUIPMENT		CME 45	9	LOCTION OF HOLES										
101	0 1 440	HC	НОГЕ DEPTH				þ.	30.73			S	SAMPLES			
NO.	SURFACE SURFACE ELEVATION	FROM	TO	DESCRIPTION OF MATERIALS		Z	n O o	BIT	ON	TYPE	FROM	TO	REC %	DISP	AMIT
605	26+50 CL	0	ю	clay, silty, sandy, plastic, slightly moist to moist, stiff, slight fine grained	tiff, slight fine grained		귕		Ψ.	3"P	0	2.5	70		
	Dam 95' DS			gravel, dark brown					4	3"P	2.5	5	22		
	elev:458.32	е	7.5	as above, becoming light brown and mottle gray, slight organics	slight organics		ರ		ω	3"P	5	7.5	75		
		7.5	10.5	fine grained sand, moist, dense, light brown and mottled gray	nottled gray		SC		4.	3"P	7.5	10	100		
		10.5	17	clay, silty, slight course grained sand, plastic, moist, stiff, light brown and	st, stiff, light brown and		딩		ιč	3"P	10	12.5	80		
				mottled light gray becoming gray with depth,					9.	3"P	15	17.5	55		
		17	18	very fine grained sand, soft to medium, moist, light gray	ıt gray		SC		7.	3"P	20	22.5	80		
		18	22	clay, silty, slight very fine grained sand, moist, very stiff, light gray to gray	y stiff, light gray to gray		ರ		ω.	spt	25	26.5			
		22	36.5	very fine grained to fine grained sand, saturated, soft, silty, brownish gray	soft, silty, brownish gray		SM		<u>ල</u>	spt	30	31.5			
				SPT 25-26.5=12-24-50 for 6", SPT 30-31.5'=22-31-40	1-40				.10	spt	35	36.5			
				SPT 35-36.5'=15-25-50 for 5.5", thin bedded to laminated with lignite and	minated with lignite and										
				clay											
DATE:			TIME:	WATER LEVEL:	CAVE IN:					SHE	SHEET	1 OF	-	SH	SHEETS

Attachment 3f

LOG OF TEST HOLES

								Do	wns	trea	am '	Toe	, ho	le 6	606					
					AMI															SHEETS
					DISP	ы														SH
78	ř	P.L46			REC	%	30	35	100	100	06	80	65							-
SITE NO. 28	STATE	P.L		SAMPLES	OI	FT	2.5	5	7.5	10	12.5	17.5	22.5	26.5	31.5	36.5	41.5			OF
				SA	FROM	FT	0	2.5	5	7.5	10	15	20	25	30	35	40			ET 1
	2238	FP-03				LYPE	3"P	3"P	3"P	3"P	3"P	3"P	3"P	spt	spt	spt	spt			SHEET
	7.51				3	NO	7	Ci	ω	4.	ιų	ø.	7.	80.	ō.	.10	.11			
	N29.857453 W-97.512238	WP-08		adat	BILL	770														
e e	5745	^		Þ	n 0 v	2	귕		겁	겁		겁	SM		딩		SM			
Caldwell	29.8				z				Ļ											#
COUNTY	LAT/LONG	PROJECT: WP-07	LOCTION OF HOLES				oist to moist, roots		moist, plastic, dark bro	astic, gypsum, moist	lignite seams, moist	and streaks	le making water, soft		o very moist, gray to		5'=17-26-27, jight brov			CAVE IN: 25.2ft & 21.1ft
	DATE 3/27/2019				DESCRIPTION OF MATERIALS		clay, silty, slight sand, moderately dense, slightly moist to moist, roots		ht fine grained gravel, slightly moist, plastic, dark browr	clay, silty, brown to light brown and mottled gray, plastic, gypsum, moist	clay, silty, slight sand, dark gray to gray, light brown lignite seams, moist	as above, gray to brownish gray with fine grained sand streaks	very fine grained to fine grained sand, saturated, hole making water, soft	light brown streaks	ht iron staining, plastic, moist to very moist, gray to	'=5-8-12	moderately dense, spt 30-31.5'=17-26-27, jight brown	-36.5'=23-30-50 for 6"		WATER LEVEL: 9.6ft & 8.6ft
reek							clay, silty, slight sand, mo	plastic, dark brown	clay, silty, sandy, slight fi	clay, silty, brown to light	clay, silty, slight sand, da	as above, gray to brownis	very fine grained to fine g	gray to light gray with ligh	clay, silty, lignite, slight ir	gray-brown, SPT 25-26.5'=5-8-12	sand, silty, saturated, mo	to grayish brown, SPT 35-36.5'=23-30-50 for 6"		TIME: 18:13 &9:06 WATER
O III			CME 45	H.	TO	FT	2		2	10		20	25.5		30		40.5			ME: 18
Lower Plum Creek	toe	fatt		HOLE	FROM	FT	0		2	2		10	20		25.5		30			
	ION DS toe	D BY Moffatt	DRILLING EQUIPMENT	9 113	SURFACE		24+50 CL	Dam 95' DS	elev:457.67											DATE: 3/27&3/28/2019
WATERSHED	LOCATION	LOGGED BY	DRILLI	alon	NO.		909													DATE:

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

DATE STATE TAXABLAR DATE STATE DATE STATE TAXABLAR TAXA	DCATION DGGED B		1									ĺ				
The part	OCCED B		e01				29.85	712	7 W-9	7.51	1715		STATE	ř		
The filter form The filte	RILLING		ffatt					W	P-08		FP-03		P.T	-46		
No. 1979 1		EQUIPME	43	ME 4	9	LOCTION OF HOLES										
Strict Press Free		W. 5.000	HO	E .				-	an as			VS	MPLES			
22+45 0 2 clay, silfy, sight sand, plastic, moderate density, dark brown, notis to 2° CL dam .2 3°P 7.5 10 CL dam slightly moist to moist or moist .2 3°P 7.5 10 91*DS 2 20 clay, silfy, sandy, plastic, moderate density, brown to light brown, moist .4 3°P 7.5 10 12.5 elev,455.48° push 5.75' recovered 100%, push 7.5-10' recovered 100% increase in sand .4 3°P 15 17.5 CL-SC light brown mottled gray, 3/21/2019 Sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% .6 spt 20 25 sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% .7 spt 30 31.5 20 25 sand, silfy, saturated, gray to light brown, soft iron staining, few thin clay SM .9 spt 40 41.5 1 lignite streak @25 28 clay, silfy, stiff, dark gray to brownish gray with single lignite streak@25° CL .2 2 .2 .2 .2 .2 .2 .2 .2 <td< td=""><td></td><td>URFACE</td><td>FROM</td><td>TO</td><td>DESCRIPTION OF MATERIALS</td><td></td><td>z</td><td></td><td>BIL</td><td>ON</td><td>TYPE</td><td>FROM</td><td>TO</td><td>REC %</td><td>DISP</td><td>AMT</td></td<>		URFACE	FROM	TO	DESCRIPTION OF MATERIALS		z		BIL	ON	TYPE	FROM	TO	REC %	DISP	AMT
2 20 clay, sifty, sandy, plastic, moderate density, brown to light brown, moist 2 20 clay, sifty, sandy, plastic, moderate density, brown to light brown, moist 2 20 clay, sifty, sandy, plastic, moderate density, brown to light brown, moist 2 2 20 clay, sifty, saturated 100%, push 7.5-10′ recovered 100% increase in sand 2 2 2 2 2 2 clay, sifty, saturated, sight sand, very hard drilling starting @28′ stop drilling @29′, spt 50 blows for 2″. 2 2 2 2 2 2 clay, sifty, stiff, dark gray to brownish gray with single lignite streak@25′ clay, sifty, stiff, saturated, sight sand, very hard drilling starting @28′ stop drilling @29′, spt 50 blows for 2″.	14	22+45	0	2	clay, silty, slight sand, plastic, moderate density, dark	k brown, roots to 2'		귱		-	3"P	5		100%		
2 20 clay, silty, sandy, plastic, moderate density, brown to light brown, moist CL 3 ° 7° 10 12.5 push 5-7.5' recovered 100%, push 7.5-10' recovered 100% increase in sand .4 3° 7° 15 17.5 CL-SC light brown mottled gray, 3/21/2019 .5 3° 7° 20 22.5 3/22/2019, push 10-12.5' recovered 100% few thin very fine to fine grain .6 spt 25 26.5 sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% .7 spt 30 31.5 20 25 sandy laminations, few gravel ignite streak as it become darker gray with depth .8 spt 40 41.5 20 25 sand, silty, saturated, gray to light brown, soft iron staining, few thin clay SM .9 spt 40 41.5 ignite streak @25 sand, silty, stiff, dark gray to brownish gray with single lignite streak@25 CL . <	J	'L dam	Д		slightly moist to moist					ci	3"P	7.5	10	100%		
Dush 5-7.5' recovered 100%, push 7.5-10' recovered 100% increase in sand and bush 5-7.5' recovered 100%, push 7.5-10' recovered 100% increase in sand and push 10-12.5' recovered 100% few thin very fine to fine grain as above with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as it become darker gray with depth as a sabove with single lignite streak as a sabove as a sabove with single lignite streak as a sabove with single lignite streak as a sabove with single lignite streak as a sabove with sabove soft to 25. The sand stream as a sabove sab	7,57	91,DS	2	20	clay, silty, sandy, plastic, moderate density, brown to	light brown, moist		귕		ωi	3"P	9	12.5	100		
CL-SC light brown mottled gray, 3/21/2019 .5 3"P 20 22.5 3/22/2019, push 10-12.5' recovered 100% few thin very fine to fine grain .6 spt 25 26.5 sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% .7 spt 30 31.5 25 sandy laminations, few gravel, iron staining, push 15-17.5' recovered 40% soft to 25', spt 25-26.5'=12-15-21 .8 spt 40 41.5 1aminations, push 20-22.5 recovered 80% soft to 25', spt 25-26.5'=12-15-21 CL .9 spt 40 41.5 1ginite streak @25' Ignite streak @25' CL .9 spt 40 41.5 28 clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' CL .0	ele	v:455.48°			push 5-7.5' recovered 100%, push 7.5-10' recovered	1 100% increase in sand				4.	3"P	15	17.5	100		
3/22/2019, push 10-12.5' recovered 100% few thin very fine to fine grain sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% as above with single lignite streak as it become darker gray with depth 25 sand, silty, saturated, gray to light brown, soft iron staining, few thin clay SM SM SP					CL-SC light brown mottled gray, 3/21/2019					ιči	3"P	20	22.5	100		
sandy laminations, few gravel, iron staining, push 15-17.5' recovered 100% as above with single lignite streak as it become darker gray with depth 25 sand, silty, saturated, gray to light brown, soft iron staining, few thin clay Imminations, push 20-22.5 recovered 80% soft to 25', spt 25-26.5'=12-15-21 Ignite streak @25' Ignite s					3/22/2019, push 10-12.5' recovered 100% few thin ve	ery fine to fine grain				9.	spt	52	26.5			
as above with single lignite streak as it become darker gray with depth 25 sand, silty, saturated, gray to light brown, soft iron staining, few thin clay 1 laminations, push 20-22.5 recovered 80% soft to 25', spt 25-26.5'=12-15-21 1 lignite streak @25' 28 clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' 29 plastic, moist to saturated, slight sand, very hard drilling starting @28' stop drilling @29', spt 50 blows for 2'' 1 stop drilling @29', spt 50 blows for 2''					sandy laminations, few gravel, iron staining, push 15-	5-17.5' recovered 100%				7.	spt	93	31.5			
25 sand, silty, saturated, gray to light brown, soft iron staining, few thin clay laminations, push 20-22.5 recovered 80% soft to 25', spt 25-26.5=12-15-21 lignite streak @25' lignite streak @25' clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' plastic, moist to saturated, slight sand, very hard drilling starting @28' stop drilling @29', spt 50 blows for 2''					as above with single lignite streak as it become darke	er gray with depth				ωį	spt	35	36.5			
laminations, push 20-22.5 recovered 80% soft to 25', spt 25-26.5'=12-15-21 lignite streak @25' 28 clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' plastic, moist to saturated, slight sand, very hard drilling starting @28' stop drilling @29', spt 50 blows for 2''			20	25	sand, silty, saturated, gray to light brown, soft iron sta	aining, few thin clay		SM		o.	spt	40	41.5			
lignite streak @25' 28 clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' plastic, moist to saturated, slight sand, very hard drilling \$28' stop drilling @29', spt 50 blows for 2''					laminations, push 20-22.5 recovered 80% soft to 25',	, spt 25-26.5'=12-15-21										
clay, silty, stiff, dark gray to brownish gray with single lignite streak@25' plastic, moist to saturated, slight sand, very hard drilling starting @28' stop drilling @29', spt 50 blows for 2"					lignite streak @25'											
plastic, moist to saturated, slight sand, very hard drilling @28' stop drilling @29', spt 50 blows for 2"			25	28		e lignite streak@25'		귕								
stop drilling @29', spt 50 blows for 2"					plastic, moist to saturated, slight sand, very hard drillin	ling starting @28'										
					stop drilling @29', spt 50 blows for 2"											

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED	-	2	1	300	COUNTY							SITE NO. 20	5		
		N C	Lower Fluin Cleek											07		
LOCATION	TION	DS toe	oe		DATE 3/21-22/2019	LAT/LONG							STATE	ř		
LOGGED BY	ED BY	Moffatt	att			PROJECT: WP-07		M	WP-08		FP-03		P.L46	46		
DRILL	DRILLING EQUIPMENT	IPMEN.		CME 45	2	LOCTION OF HOLES										
alon	5	\vdash	HOLE	a H				⊢	ad A.L			S	SAMPLES			
NO.	SURFACE SURFACE ELEVATION		FROM	TO	DESCRIPTION OF MATERIALS		z	n 0 s	BIT	ON	TVPE	FROM	TO	REC 1	DISP	AMI
		\dashv		1			1	+	1			2	+	+		
209			28	30	sandstone, hardness 4-5, very fine grained, gray-green, well cemented	en, well cemented		SS								
					spt 30-31.5'=30-43-39											
			30	41.5	sandstone, cemented, silty, Fe-Mg inclusions, loose, greenish-gray	, greenish-gray		SS								
					spt 35-36.5' 12-35-50 for 5", flowing sand @35', spt 40-41.5=29-50 for 6"	40-41.5'=29-50 for 6"										
					stopped drilling											
DATE:	DATE: 3/27/2019	19	Ē	TIME: 08:56	8:56 WATER LEVEL: 7.2 ft	CAVE IN: 18.2 ft					SHEET		2 OF	2	SHE	SHEETS
								ľ								

Attachment 3f

LOG OF TEST HOLES

								Do	wns	trea	am '	Toe	, ho	le 6	808						
					AMT																SHEETS
					DISP	H															SE
78	ř	P.L46			REC	%	90	90	100	100	100	100	100	100	60						-
SITE NO. 28	STATE	P.I.		SAMPLES	TO	FT	2.5	5	7.5	10	12.5	15	17.5	22.5	27.5	36.5	41.5				1 oF
				S.	FROM	H	0	2.5	5	7.5	10	12.5	15	20	25	35	40				SHEET
	N29.856667 W-97.510939	FP-03				TYPE	3"P	3"P	3"P	3"P	3"P	3"P	3"P	3"P	3"P	spt	spt				SHI
	97.51					ON	₹.	2	ω	4.	ιú	9.	7.	ω.	<u>ල</u>	.10	.11				
	W-2	WP-08		an AL	BIL	OSED															
le le	9999			p.	, O a	n	ರ	S		သွ		ರ		SC	Lig			SM		Lig	
Caldwell	29.8				Z																
COUNTY	LATLONG	PROJECT: WP-07	LOCTION OF HOLES				dium, dark brown	, slight clay, non-plast		c, brown and mottle gra		rts, plastic, moist, light	sing sand to SC 18-21		e sand	taining		ense, greenish gray			CAVE IN: 27.3 ft
	DATE 3/19/2019				DESCRIPTION OF MATERIALS		from 2-2.5', plastic, soft to medium, dark brown	very fine to fine grained sand, loose, saturated, silty, slight clay, non-plastic	base of alluvium	silty, slight clay, slightly plastic, brown and mottle gray		clay, silty, slight sand, soft to very stiff, blocky in parts, plastic, moist, light	gray, slight sand @16' increasing sand to SC 18-21.5'	ignitic clay	lignite with thin bedded lignitic laminations and loose sand	push 25-27 recovered 60%, lignite with some iron staining	r 6"	very fine to fine grained sand, moist to saturated, dense, greenish gray	14.5"		WATER LEVEL: 5.4 ft
reek							clay, silty, slight sand fror	very fine to fine grained s	brown, gravel @11', base	medium sand, loose, silty	iron staining	clay, silty, slight sand, so	brown & mottled light gra	alternating sand and ligni	lignite with thin bedded li	push 25-27 recovered 60	spt 35-36.5'=18-32-50 for 6"	very fine to fine grained s	spt 40-41.5'=50 blows for 4.5"	lignite	
S III	s left		CME 45	E	TO	FT	5	7		12.5		21.5		22	35			37		40.5	TIME: 09:16
Lower Plum Creek	DS toe PS left	fatt		HOLE	FROM	FT	0	2		7		12.5		21.5	22			35		37	
		BY Moffatt	DRILLING EQUIPMENT	0 7 4.00	SURFACE SURFACE	ELEVATION	19+50	CL Dam	83, DS	elev:	453.45'										27/2019
WATERSHED	LOCATION	LOGGED BY	DRILLIN	\vdash	NO.		809														DATE: 3/27/2019

Attachment 3f

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	Plum	Creek		COUNTY	Cal	Caldwell	_				SITE NO.	. 28		
LOCATION		DS Toe	- 44		DATE 3/19/2019	LAT/LONG	N29	9.856	326 V	V-97.	N29.856326 W-97.510465		STATE	ř		
LOGGED BY		Moffatt				PROJECT:	WP-07		WP-08		FP-03	5	P.T	P.L46		l
DRILL	DRILLING EQUIPMENT		CME 45	12		LOCTION OF HOLES	OLES									
alon	STA B		но <u>ге</u> рертн					-	⊩—			s	SAMPLES			
NO.	SURFACE ELEVATION	FT FT	TI TO		DESCRIPTION OF MATERIALS			N C o	USED	o _N	TYPE	FROM	TO	REC %	DISP	AMI
609	17+58	0	c)	Clay, silty, slight sand, m	Clay, silty, slight sand, moist, soft to medium, dark brown	rown		0	귱	Ψ.	3"push	0	2.5	100		
	CL Dam	co.	10.5		Very fine grained sand, silty, clayey, moist to saturated, soft to medium,	ed, soft to mediu	Ę.	S	O	2	3"push	2.5	2	20		
	89, DS			dark brown, becomes more coarse with depth	ore coarse with depth					ω	3"P	S	7.5	100		
	elev:452.8'	8' 10.5	20	Clay, silty, sandy, slight	Clay, silty, sandy, slight very fine to fine grained gravel, iron staining,	vel, iron staining,		0	ರ	4.	3"P	7.5	10	100		
				light brown mottled with	led with gray, becomes sandier with depth	depth				ιĊ	3"P	10	12.5	100		
		20	29	sand and clay lamination	sand and clay laminations, sand is greenish gray glaucanitic, moist to	ucanitic, moist to		SC	0	φ.	3"P	12.5	15	100		
				saturated, very fine grained.	led. push 22.5-25' recovery 10%	,10%				7.	3"P	22.5	25	10		
		29	40.3	lignite, thin bed	ded to laminated with very fine grained sand, greenish gray,	ed sand, greenisl	h gray,	·=	lig	80.	3"P	30	32.5	90		
				moist, greenish gray to d	gray to dark brown-black, push 35-37.5' recover 1' as above	7.5' recover 1' as	sabove			o.	3"P	35	37.5	40		
				spt 40-41.5' 50 blows for 4",	4",					.10	spt	40	40.25			
DATE:	DATE: 3/20/19 & 3/27/19	3/27/19	TIME:	TIME: 08:38 & 09:16 WATER	WATER LEVEL: 4.4ft & 4.2ft	CAVE IN: 30.6ft & 27.2ft	ft & 27.2ft			-	SE	SHEET	1 OF	-		SHEETS

Attachment 3f

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	Jum (Creek		COUNTY	Caldwell	Well					SITE NO.	78		
LOCATION		DS Toe		DATE 3/18/2019		LAT/LONG	N29.8	3560	29 W.	97.50	N29.856029 W-97.509959		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP-07	7		WP-08		FP-03		P.T.	P.L46		1
DRILL	DRILLING EQUIPMENT		CME 45	9:		LOCTION OF HOLES	SS									
alon	15		HOLE DEPTH					Þ	74.07			S.	SAMPLES			
NO.	SURFACE ELEVATION	FROM	01	DESCRIPTION OF MATERIALS	MATERIALS		Z	, O s	BIT	ON	TYPE	FROM	TO	REC %	DISP	AMT
610	15+48	0	-	top soil, brown-black clay				귕		7	3"push	0	2.5	100%		
	CL Dam	-	2	clay, sandy, moist, moderately stiff, dark brown, few pieces of gravel	brown, few pi	eces of gravel		겁		4	3"push	2.5	2	40		
	90, DS	ß	9	clay, very fine grained sandy, moist, moderately plastic, brown	lerately plastic	c, brown		공		ω	3"P	4	7.5	100		
	elev:452.6'	70		attempt push 7.5-10', no recovery, mottled light gray	ed light gray					4.	3"P	10	12.5	75		
		9	20.5	alternating clay with thin beds of clayey sand, saturated, push 15-17.5' as	and, saturate	d, push 15-17.5' as	v	ರ		τċ	3"P	12.5	15	100		
				above, drill to 20, push 20-22.5'						ø.	3"P	15	17.5	100		
		20.5	29	clay, thin bed laminations with very fine grained sandy, lignitic, moist	rained sandy,	, lignitic, moist		ರ		7.	3"P	20	22.5	100		
				push 25-27.5', push 30-32.5' refusal at 30.25'	0.25					∞.	3"P	30	30.25	13		
		59	33.5	lignite				lig		<u>ه</u>	spt	35	36.5			
		33.5	40.5	spt 35-36.5'=17-32-47, thinly bedded clay and silt, with some very fine grain	y and silt, with	n some very fine gr	ain	ರ		.10	spt	40	40.25			
				sand, gray to dark brown/black												
DATE:	DATE: 3/20/19 & 3/27/19		TIME:	TIME: 16:29 & 09:21 WATER LEVEL; 4.4ff & 3.3ff		CAVE IN: 33.4ft & 16.2ft	16.2ft				SHEET		1	-] =	SHEETS

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

Table Part			Lower Plum Creek	E	Creek		Caldwell	2						2		
Table PROJECTT: WP-dn P	OCA		Toe	(J.)		LAT/LONG	N29.8	556	89 W-	97.50	9435		STATE	ř		
No. Table No. No. No	990		ffatt				7		WP-08		FP-03		P.I	46		
Park	RILL	ING EQUIPME		ME 4	45	LOCTION OF HOLE	S									
Second 10 13 10 10 10 10 10 10	2,0	4 7.15	HC	N.E.				Þ.	TVBE			Š	AMPLES			
13442 0 1 top soil, Clay, sandy, moist, moderately plastic, dark brownblack, roots, stiff CL 2. 2 3°push 6 7.5 Clay, sity, sandy, some fine gravel, moist, moderately stiff, dark brown 3 3°push 5 7.5 10 leav.453.22 and slightly motted gray 1.5 15 15 Clay, sity, sandy, moist to very moist, saturated@10, soft to medium, brown CL 5 3°p 10 12.5 10 clay, sity, sandy, moist to very moist, saturated@10, soft to medium, brown CL 6 3°p 17.5 10 iron staining 1.5 19 clay with sand, sity, saturated, soft, light brown becoming light gray @17° CL 6 3°p 17.5 20 iron staining 1.6 19 clay with sand, sity, saturated, soft, light brown becoming light gray @17° CL 8 3°p 17.5 20 iron staining 1.6 19 clay with sity particles, becoming less weathered, dark gray-black, some CL 8 3°p 17.5 20 iron staining 2.9 very fine grained sand laminations @22.5-25 37-39 17-5 20 iron staining 37-39 ignite, spt 40-41.5=13-21-32, 35-41.5 clay with sand particles 2.9 M. 37-2 Cl 3/19/19@08:57, 2.8 M. 21.3 Cl 3/19/19@08:25 2.8 M. 21.3 Cl 3/19/19@08:25 2.8 M. 21.3 Cl 3/19/19@08:29, 2.8 M. 2	ó	SURFACE ELEVATION .	FE		DESCRIPTION OF MATER	RIALS	z	o o	BIL	ON	TYPE	FROM	TO	REC %	DISP	AMI
17.5 clay, silty, sandy, some fine gravel, moist, moderately stiff, dark brown CL 2 7.5 18. day, silty, sandy, some fine gravel, moist to very moist sabove, 7.5-10 becoming brown CL 3 3°push 5 7.5 10 7.5 15 clay, silty, sandy, moist to very moist, saturated@10°, soft to medium, brown CL .6 3°P 7.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 10 12.5 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 17.5 20 18 41.5 17.5 20 18 40 41.5 17.5 20 18 40 41.5 18 40 41.5 18 40 41.5 40 41.5 40	1	13+42	0	-		c, dark brown/black, roots, si	慧	苬		7	3"push		2.5	35		
and slightly mottled gray 7.5 15 clay, silty, sandy, moist to very moist, saturated@10', soft to medium, brown 7.6 19 clay with sand, silty, saturated, soft, light brown becoming light gray @17		CL Dam		7.5		derately stiff, dark brown		귕		4						
and slightly motited gray 2.5 15 clay, silty, sandy, moist to very moist, saturated@10', soft to medium, brown 3.5 15 clay, silty, sandy, moist to very moist, saturated@10', soft to medium, brown 3.7 3"P 17.5 10 3.7 3"P 17.5 20 3.8 41.5 clay with sand, silty, saturated, soft, light brown becoming light gray@17" 4.15 clay with sand, silty, saturated, soft, light brown becoming light gray@17" 4.15 clay with sand saturated, soft, light brown becoming light gray@17" 4.15 clay with silt particles, becoming less weathered, dark gray-black, some 4.16 clay with silt particles, becoming less weathered, dark gray-black, some 4.17 3"P 17.5 20 4.18 4.19 4.15 clay with silt particles, becoming less weathered, dark gray-black, some 4.19 4.15 clay with silt particles, becoming less weathered, dark gray-black, some 4.10 3.7-30', thin bedded laminations 28-30', softer drill cuttings are lignitic 4.10 4.15 are a silt of the standard laminations 28-30', softer drill cuttings are lignitic 4.10 4.15 are a silt of the standard laminations 28-30', softer drill cuttings are lignitic 4.10 4.10 are a silt of the si		95' DS			push with spt 7.5-9.5 recovered 100% as abov	ive, 7.5-10 becoming brown				ωi	3"push		7.5	100		
15 clay, silty, sandy, moist to very moist, saturated@10, soft to medium, brown 19 clay with sand, silty, saturated, soft, light brown becoming light gray @17*		elev:453.22'			and slightly mottled gray					4.	3"P	7.5	10	100		
19 clay with sand, silty, saturated, soft, light brown becoming light gray @17" CL 6 3"P 17.5 20 iron staining 41.5 clay with silt particles, becoming less weathered, dark gray-black, some CL 8 3"P 22.5 25 very fine grained sand laminations @22.5-25 drill cuttings are lignitic drill 25-30", thin bedded laminations 28-30", softer drill cuttings are lignitic 37-39" lignite, spt 40-41.5"=13-21-32, 35-41.5" clay with sand particles 37-39" lignite, spt 40-41.5"=13-21-32, 35-41.5" clay with sand particles 2.9WL 37.2 Cl 3/19/19@08:57, 2.8WL 21.3 Cl 3/19/19@08:50, 2.8WL 21.3 Cl 3/19/19@08:50, 2.8WL 21.3 Cl 3/19/19@08:50, 2.8WL 21.3 Cl 3/27/19@08:25			7.5	15		ed@10', soft to medium, bro	nwo	귕		ιĊ	3"P	10	12.5	100		
iron staining 41.5 clay with silt particles, becoming less weathered, dark gray-black, some CL 3 "P 40.5 25 25 40. 41.5 40. 41.5 4			15	19	clay with sar	vn becoming light gray @17'		귕		ø.	3"P	15	17.5	100		
41.5 clay with sift particles, becoming less weathered, dark gray-black, some CL 8 3"P 22.5 25 very fine grained sand laminations @22.5-25' 37-38' lignite, spt 40-41.5=13-21-32, 35-41.5' clay with sand particles 37-38' lignite, spt 40-41.5=13-21-32, 35-41.5' clay with sand particles 2.9WL 37.2 Cl 3/19/19@08:57, 2.8WL 30.6Cl 3/19/19@08:25					iron staining					7.	3"P	17.5	20	100		
ofter drill cuttings are lignitic clay with sand particles 3/19/19@16:20 3/27/19@09:25			19	41.5	clay with silt	red, dark gray-black, some		ರ		ωį	3"P	22.5	25	100		
drill 25-30', thin bedded laminations 28-30', softer drill cuttings are lignitic 37-39' lignite, spt 40-41.5'=13-21-32, 35-41.5' clay with sand particles 2.9ML 37.2 Cl 3/19/19@08:57, 2.8ML 30.6Cl 3/19/19@16:20 2.7ML 31.0Cl 3/20/19@08:30, 2.8ML 21.3Cl 3/27/19@09:25					very fine grained sand laminations @22.5-25					o.	spt	40	41.5			
37-39' lignite, spt 40-41.5'=13-21-32, 35-41.5' clay with sand particles 2.9ML 37.2 Cl 3/19/19@08:57, 2.8ML 30.6Cl 3/19/19@16:20 2.7ML 31.0Cl 3/20/19@08:30, 2.8ML 21.3Cl 3/27/19@09:25					drill 25-30', thin bedded laminations 28-30', so	ofter drill cuttings are lignitic										
2.9WL 37.2 CI 3/19/19@08:57, 2.8WL 30.6CI 3/19/19@16:20 2.7WL 31.0CI 3/20/19@08:30, 2.8ML 21.3CI 3/27/19@09:25					37-39' lignite, spt 40-41.5'=13-21-32, 35-41.5'	clay with sand particles										
2.9WL 37.2 CI 3/19/19@08:57, 2.8WL 30.6CI 3/19/19@16:20																
2.7WL 31.0Cl 3/20/19@08:30, 2.8WL 21.3Cl 3/27/19@09:25						13/19/19@16:20										
					2.7WL 31.0Cl 3/20/19@08:30, 2.8WL 21.3Cl ;	3/27/19@09:25										
		1														

Attachment 3f

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATE	WATERSHED	I ower Plum Creek	mil.	Crook		COUNTY	5	Caldwell	_				SITE	SITE NO. 28	28		
LOCATION		Grid A			DATE 4/4/2019	LAT/LONG	N	9.85	8562	W-9.	N29.858562 W-97.512009	60	STATE	TE	ř		
LOGGED BY		Moffatt			-	PROJECT:	WP-07		W	WP-08		FP-03		P.L46	9		١,
DRILL	DRILLING EQUIPMENT		CME 45	15		LOCTION OF HOLES	HOLES										
АТОН	a VE		HOLE DEPTH						⊩—	Y DE			₩.	ES			
NO.	SURFACE	FROM	TO		DESCRIPTION OF MATERIALS			z	200	BIL	NO I	TYPE FT	FROM TO	\vdash	REC I	PT	AMT
176	Grid A	0	7	Clay, stiff, SL/CG, Sand	Clay, stiff, SL/CG, Sand very fine grained, Gravel				겁		rs s	small	0	2			
	24+00			SL/moist, plastic, reddish brown	h brown						.2 sr	small 7	7 10	10			
	Elev. 461.67	37.									ε. P	small 1	10	15 3b	3bags		
		7	10	Clay, stiff, organic brown, gray, moist, plastic	n, gray, moist, plastic				귕								
		10	15	Clay, stiff, very fine grair	Clay, stiff, very fine grained sand, light gray, moist to very moist	very moist			귕								
				plastic to SL/PL													
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:						SHEET	-	OF	-	SHE	SHEETS

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		Lower Dlum Creek	Jun (rook		COUNTY	2	Caldwell	_				SITE NO. 28	0. 20		
			3			A COMPANY	5	5					100	3		
LOCATION		Grid A		D.	DATE 4/5/2019	LAT/LONG	N29	.858	888	V-97	N29.858888 W-97.512516	9	STATE	ř		
LOGGED BY		Moffatt				PROJECT: WI	WP-07		WP-08	~	FF	FP-03	<u>م</u>	P.L46		1
DRILLI	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES	TES									
HOLE	4 47	H DE	HOLE DEPTH					-	┝				N. S.	ll .		ll .
NO.	SURFACE	FROM	TI	DES	DESCRIPTION OF MATERIALS			N C o	USED	ON O	TYPE	FROM	O II	REC %	DISP	AMT
177	Grid A	0	ю	Clay, silty, SL/moist, stiff, mo	moist, stiff, moderately plastic to plastic, dark brown	ic, dark brown		공	I	₹.	sm	0	ო			
	26+00									2	sm	2	80	2bags		
	elev:461.77	е	80	clay, silty, SL/gravel, moist, stiff, plastic, light brown	stiff, plastic, light brown			겁		ω.	sm	10	15	2bags		
		00	15	clay, very stiff, sandy, moist t	sandy, moist to very moist, moderately plastic, light gray	ly plastic, light gray	>	겁								
DATE:			TIME:	WATER LEVEL:	VEL:	CAVE IN:			1	1	S	SHEET	1 OF	F 1	,	SHEETS

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED	Lower Plum Creek	r Plu	J III	reek		COUNTY	ပီ	Caldwell	<u>=</u>),	SITENC	SITE NO. 28		
1	Grid A	A			DATE 4/9/2019	LAT/LONG	N	9.85	9213	N29.859213 W-97.513040	7.513	040	0.7	STATE	ř		
l	Moffatt	Ħ				PROJECT: W	WP-07		W	WP-08		FP-03		P.I	P.L46		1
15	DRILLING EQUIPMENT	ဦ	CME 45			LOCTION OF HOLES		nost	wes	most western hole	hole						
۽ ا	\vdash	HOLE	н						\vdash	V DE			SA	SAMPLES			l
FA	SURFACE FR	FROM	TO		DESCRIPTION OF MATERIALS			z		USED	ON	TYPE	FROM	TO	REC %	DISP	AMT
Grid A		0	7	black, clay, top soil, mois	soil, moist, stiff, moderate to high plasticity	sticity			공		+	ms	m	2	2bags		
28+00	9										Vi	sm	2	10	2bags		
46,	elev:462.16	m	2	clay, brown, SL/CaCo3,	clay, brown, SL/CaCo3, very fine grained gravel, moist, stiff, plastic	ist, stiff, plastic			귕		ω	us.	=	15	2bags		
		2	7	clay, stiff, light brown, mo	brown, moist, moderately stiff, plastic				겁								
		11	15	sand, clayey, very moist,	sand, clayey, very moist, plastic, medium dense, light brown/light gray	it brown/light gray		0)	SC								
l																	
l																	
l																	
		I	TIME:	WATER	WATER LEVEL:	CAVE IN:						SHEET	T. 1	OF	-		SHEETS

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		Lower Dlum Creek	ull (rook		COUNTY	Je S	Caldwell	_				SITE NO. 28	0. 28		
		ואכו		CICCA			2	2						3		
LOCATION		Grid B			DATE 4/9/2019	LAT/LONG	N29	.859	195 V	1-97.	N29.859195 W-97.511890	_	STATE	ř		
LOGGED BY		Moffatt				PROJECT: WF	WP-07		WP-08		FP-03	03	P.	P.L46		1
DRILLE	DRILLING EQUIPMENT		CME 45	2		LOCTION OF HOLES		ost e	most eastern	Ę						
⊩—	4 A P	HC	HOLE DEPTH					D 0	⊩—				NA.			
NO.	SURFACE	FROM	TI		DESCRIPTION OF MATERIALS			N C o	USED	ON O	TYPE	FROM	TI II	REC %	DISP	AMT
179	Grid B	0	4	clay, silty, stiff, slightly ca	slightly calcareous, slightly moist to moist, dark brown	noist, dark brown		공	т	7	sm	0	ю			
	27+00									2	Sm	4	80	2bags		
	elev:463.10	4	o	clay, silty, slight gravel, r	ht gravel, moist, stiff, plastic, light brown	W.		겁	_1	ω	sm	10	15	2bags		
		თ	15	very fine grained sand, c	very fine grained sand, clay, silty, very moist, medium dense, light gray	m dense, light gray		ರ	_1							
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:					S	SHEET	1 OF	-	S	SHEETS

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

WATERSHED		Lower Plum Creek	Jum (Sreek		COUNTY	Calc	Caldwell	_				SITE NO. 28	· 28		
LOCATION		Grid B			DATE 4/10/2019	LAT/LONG	N29	.859	506 V	V-97.5	N29.859506 W-97.512413		STATE	ř		
LOGGED BY		Moffatt				PROJECT: WP	WP-07		WP-08		FP-03	03		P.L46		
DRILLI	DRILLING EQUIPMENT		CME 45	5		LOCTION OF HOLES		Borrow	2							
HOLE	447		HOLE DEPTH					D 0	⊩—				SAMPLES			ll .
NO.	SURFACE	FROM	TO		DESCRIPTION OF MATERIALS			N C N	USED	o _N	TYPE	FROM	TI II	REC %	DISP	AMT
180	Grid B	0	2	dark brown, roots, slight	dark brown, roots, slight sand, silty, slightly calcareous, slightly moist to	us, slightly moist to	_	귱	_1	-	sm	7	2			
	29+00			moist, clay						2.	sm	9	10			
	elev:462.48	~								ω	S	9	15			
		4	9	As above, moist, become	As above, moist, becomes lighter brown with depth			겁	-1							
		9	9	clay, silty, moist, slightly	clay, silty, moist, slightly sandy, calcareous, light brown/gray, stiff	wn/gray, stiff		겁								
		10	15	clay with some very fine	clay with some very fine grained sand and silt, very moist, plastic	noist, plastic		ᆼ	т							
				moderately stiff						-						
DATE:			TIME:	WATER LEVEL:	LEVEL:	CAVE IN:						SHEET	1 OF	-		SHEETS

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

								В	orro	ow,	hol	e 18	81				
					AMT												SHEETS
					DISP												SH
. 28	ř	P.L46			REC %												-
SITE NO. 28	STATE	P.T		SAMPLES	TO	5	œ	15									OF
				SA	FROM	m	2	9									LT 1
	146	FP-03			TYPE	Es S	Es.	Es									SHEET
	7.511				ON	7	ci	ω									
	N29.859421 W-97.511146	WP-08		40.2	BILL												
=	9421	W	ΜO	⊢	200	SC			공		占						
Caldwell	29.85		Borrow		z												
COUNTY	LATLONG	PROJECT: WP-07	LOCTION OF HOLES			ined sand and sandy	ay brown				ne very fine grain sand						CAVE IN: 14.5 ft
	DATE 4/10/2019				DESCRIPTION OF MATERIALS	led very fine grained to fine grained sand and sandy	clay, slightly moist, loose sand, stiff clay, brown to gray brown		light gray, plastic		clay, moist, moderately stiff, light gray, very silty, some very fine grain sand						WATER LEVEL: no water
reek						alternating thinly bedded v	clay, slightly moist, loose		clay, moist, stiff, brown to light gray, plastic		clay, moist, moderately sti						
S III			CME 45	H	TO	5			7		15						TIME: 09:56
Lower Plum Creek	ပ	fatt		HOLE	FROM	0			Ω.		=						H
	TON Grid C	^{ED BY} Moffatt	DRILLING EQUIPMENT	CTA E	SURFACE	Grid C	24+00	elev:462.17									DATE: 4/10/19
WATERSHED	LOCATION	LOGGED BY	DRILL	alon	NO.	181											DATE:

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

									В	orro	ow,	hol	e 18	2				
					AMT													SHEETS
					DISP	1.1												SE
. 28	ř	P.L46			REC 04	20												-
SITE NO. 28	STATE	P.I		SAMPLES	TO	FT	4	8	15									1 OF
				S.	FROM	FT	1.5	5	10									
	1735	FP-03			AAAA	TILE	sm	sm	S.									SHEET
	7.51				9	P. P.	-	2.	ω									
	N29.859759 W-97.511735	WP-08		TVBE	BIL													
<u>=</u>	5975	#	WO	\vdash	, U s	\dashv	귕		귕			겁						
Caldwell	29.8		borrow		Z													
O	Z	WP-07																
COUNTY	LAT/LONG	PROJECT:	LOCTION OF HOLES				LA.		derately stiff			ist	ining					CAVE IN:
	DATE 4/10/2019				DESCRIPTION OF MATERIALS		st, roots, stiff, plastic, dark brown		clay, silty, calcareous, fine grained gravel, moist, moderately stiff	in coarseness of gravel at 5'-8'		clay with silty light gray laminations, moist to very moist	brown to light gray with iron staining					WATER LEVEL:
reek							clay, silty, slightly moist, ı		clay, silty, calcareous, fin	light brown, increase in c		clay with silty light gray la	moderately stiff, light brow					WATER
S Em			CME 45	E TH	TO	FT	1.5		10			15						TIME:
Lower Plum Creek	၁	fatt		HOLE	FROM	FT	0		1.5			9						F
	TON Grid C	D BY Moffatt	DRILLING EQUIPMENT	STA B	SURFACE		Grid C	26+00	elev:465.22'									
WATERSHED	LOCATION	LOGGED BY	DRILL	alon	NO.		182											DATE:

Attachment 3g

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

LOG OF TEST HOLES

									В	orro	ow,	hol	e 18	3				
					AMT													SHEETS
					DISP	:												
. 28	ř	P.L46			REC %													(T.
SITE NO. 28	STATE	P.]		SAMPLES	TO	2	2	9	5									1 OF
				S	FROM	=	7	7	10									
	2308	FP-03			TYPE		sm	sm	sm									SHEET
	N29.860096 W-97.512308				ON	\dashv	√.	Ci	ω									
	9 W-9	WP-08		80.2	BIT													
 	9009	W	wo	⊢	, U s	\dashv	공	귕	သ		공		귕					
Caldwell	29.86		borrow		Z													
Ö	Ž	WP-07	FHOLES															
COUNTY	LAT/LONG	PROJECT:	LOCTION OF HOLES				stiff, plastic	brown	ely dense,									CAVE IN:
	DATE 4/10/2019				DESCRIPTION OF MATERIALS		clay, silty, slightly moist to moist, roots, dark brown, stiff, plastic	clay, silty, sandy, calcareous gravel, moist, stiff, light brown	sand, clayey, moist, slightly muddy, plastic, moderately dense,		silt, slight lignite, moist, plastic	ht gray	very fine grained sand, moist					WATER LEVEL:
reek							clay, silty, slightly moist to	clay, silty, sandy, calcare	sand, clayey, moist, sligh	dark gray to brown	Clay, silty, slight gray silt,	light brown with some light gray	clay, very silty, slight very	moderately stiff, light gray				WATER
O III			CME 45	E H	TO	Ħ	7	7	10		13		15					TIME:
Lower Plum Creek	2	fatt		HOLE	FROM	1	0	2	7		10		13					II
	ION Grid C	D BY Moffatt	DRILLING EQUIPMENT	4.15	SURFACE SURFACE ELEVATION		Grid C	28+00	elev:464.05									
WATERSHED	LOCATION	LOGGED BY	DRILLI	alon	NO.		183											DATE:

Attachment 3g

LOG OF TEST HOLES

Jugle QUIPMENT Hand Auger RATION FT FT RATION TO 3 3.5 Larger (1-3in.) gravel, otherwi sandstone. 3.5 5 Slightly sandies Denser materi 1.5ft. no disper		COUNTY	Caldwell	=				SITE NO. 28	10. 28		
Hand Auger Hand Auger		LAT/LONG	.855	N69	29.85569N 97.50782W	782W		STATE	T.		
Hand Auger		PROJECT: WP-07		W	WP-08	F	FP-03	a l	P.L46		1
FROM TO S Clay, silty, sorr Brown to dark I 3 3.5 Larger (1-3in.) gravel, otherwi sandstone. C Slightly sandier Denser materi I 5ft: no disper 3ft: no disperial control of the control of		LOCTION OF HOLES									
SURFACE FILEVATION O 3 Clay, silty, sorr Brown to dark 3.5 Larger (1-3in.) gravel, otherwi sandstone. 3.5 5 Slightly sandie Denser materi 1.5ft. no disper 5ft. no disper				⊢	Ja A			SAMPLES			
Brown to dark 3 3.5 Larger (1-3in.) 3 3.5 Larger (1-3in.) gravel, otherwi sandstone. 3.5 5 Slightly sandie Tield test for di 1.5ft: no disper 3ft: no disper 5ft: no disper	DESCRIPTION OF MATERIALS		Z	, ,	H	\vdash	FROM	4 TO	REC	DISP	AMT
Brown to dark 3 3.5 Larger (1-3in.) gravel, otherwi sandstone. 3.5 5 Slightly sandiel Denser materi Field test for di Field test for di 5ft: no disper				_		NO TYPE	E FT	FT	%	FT	
Brown to dark 3.5 Larger (1-3in.) gravel, otherwi sandstone. 5 Slightly sandiel Denser materi Tield test for di 1.5ft. no disper 5ft. no disper	some gravel. Slightly moist.	Plastic.		당	겁						
3.5 Larger (1-3in.) gravel, otherwi sandstone. 5 Slightly sandiel Denser materi Denser materi 1.5ft. no disper 3ft. no disper	brown. Increasing moisture with depth.	ب									
un la	stones start to appear, as well as increasing amounts of	reasing amounts of		공	겁						
w w	as above. Gravel/stones mo	ostly limestone and									
uo uo											
Denser material. Less moisture than b Field test for dispersion: (after approx. 2 1.5ft. no dispersion observed 3ft: no dispersion observed 5ft: no dispersion observed	ft, still mostly clay and same a	as above.		SE	ರ						
Field test for dispersion: (after approx. 2 1.5ft. no dispersion observed 3ft. no dispersion observed 5ft. no dispersion observed	ial. Less moisture than below about 3.5 feet.	3.5 feet.									
Field test for dispersion: (after approx. 2 1.5ft. no dispersion observed 3ft. no dispersion observed 5ft. no dispersion observed											
1.5ft. no dispersion observed 3ft. no dispersion observed 5ft. no dispersion observed	n: (after approx. 20 minutes in	n distilled water)									
	served										
no dispe	served										
	served										
DATE: TIME: WATER LEVEL:	R LEVEL:	CAVE IN:					SHEET	-	OF 1		SHEETS

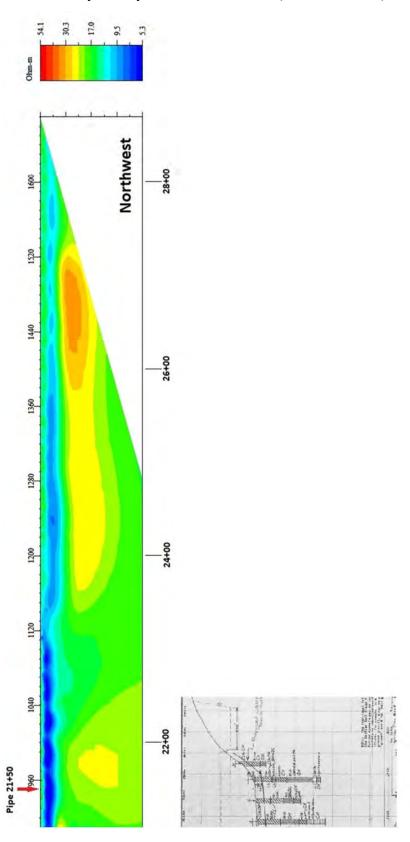
Attachment 3g

LOG OF TEST HOLES

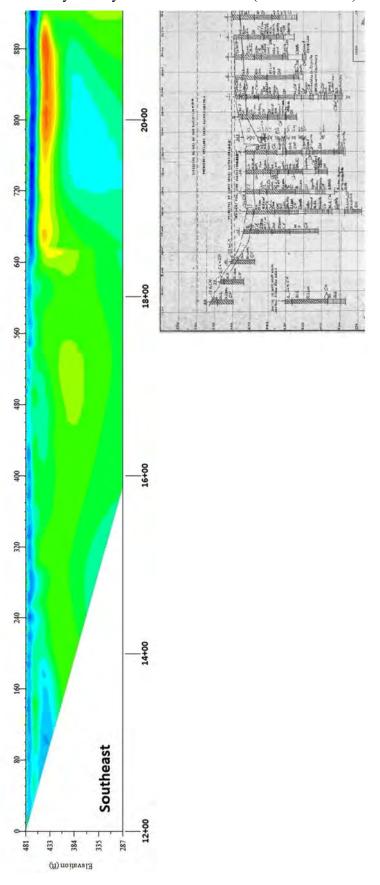
WATERSHED		Lower Plum Creek	Jum	Creek		COUNTY	Cal	Caldwell	_				IS	SITE NO. 28	78		
LOCATION		otentia	al DS	Potential DS Borrow Area	DATE Apr. 21 2022	LAT/LONG	29.8	3556	8N 9	29.85568N 97.51239W	39W		ST	STATE	ř		
LOGGED BY		Jugle				PROJECT:	WP-07		WP-08	80-		FP-03		P.L46	46		,
DRILLI	DRILLING EQUIPMENT		land	Hand Auger		LOCTION OF HOLES	HOLES										
A JOH	3 475		HOLE DEPTH					-	⊢	L A			SAM	SAMPLES			
NO.	SURFACE ELEVATION	FROM FT	OI II		DESCRIPTION OF MATERIALS			z	S C B B	BILL	VI ON	TYPE FR	FROM	170 171	REC %	DISP	AMT
1102		0	1.5	Sand, silty. No moisture	No moisture, roots, brown. Some clay with depth	with depth		S	SM		_						
		1.5	4	Clay, very sandy. Brown	ndy. Brown to Reddish brown. Some gravel.	gravel.		S	SC/	٦ 2							
				Moderately plastic. Iron	Moderately plastic. Iron staining. More gravel w/ depth.	pth.											
		4	ς,	Sand, clay-ey. Some gr	Some gravel. Brown to light brown. Iron staining.	Iron staining.		S	သင္တ								
				Gets sandier with depth.													
									_	-							
										,							
DATE:			TIME:	WATER	WATER LEVEL:	CAVE IN:						SHEET	-	OF	-	SHI	SHEETS

Attachment 3g

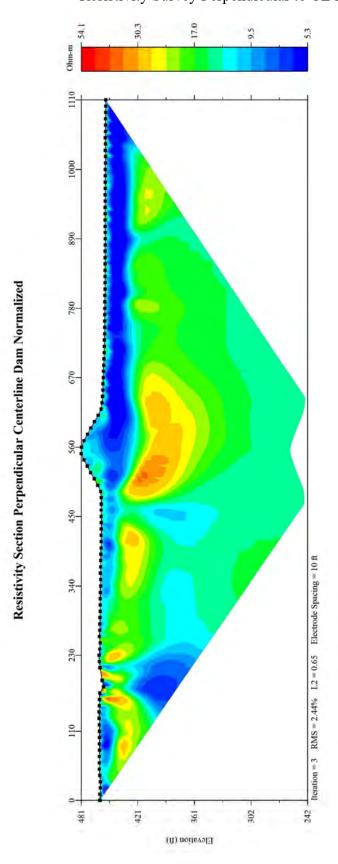
Attachment 4a Resistivity Survey Parallel to CL Dam (Northwest Half)



Attachment 4a Resistivity Survey Parallel to CL Dam (Southeast Half)



Attachment 4b Resistivity Survey Perpendicular to CL Dam



Attachment 5
Sample List (Page 1)

Index Tests = gradation, water content, LL, PI, Crumb, Double Hydrometer, Gs CONTACT PERSON: Bryan Moffatt, Geologist PHONE! 817.233.6267

	er Field s Sample No.	on 250.1	ton 250.2	ion 250.3	ton 250.4	ion 250.5	one 250.6	nk 251.1	the 251.2	ted 251.3	5'- 252.1	ere 252.2	on 253.1	ton 253.2
	Other Tests or Other Notes	Sandston e,	Sandston e, grain	Sandston e with	Sandston e, Push	Sandston e with	Claystone TB to	Rig sunk into	Hi/weathe	Non- cemented	Push 5'- 7.5', lost	Weathere	Claystone	Sandston
	ЯвS		1		h II II									
	əloriniq													
þ	spear	×	×	×	×	×	×	×	×	×	×	×	×	×
Tests Requested	Con-sol.													
Te	esdej-jog													
	мпа	×	×	×	×	×	×	×	×	×	×	×	×	×
	хәриј	×	×	×	×	×	×	×	×	×	×	×	×	×
	Field Grund													
	Sample Size/Type	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push	3" Push
	Depth (ft)	2.5'-5'	5'-7.5'	10	15'-17'	20'-22'	25-	0'-2.5'	10	20'-	5'-7.5'	15'- 17.5'	5-7.5	10'-
	Field Description Sample No. or Location	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar	Auxiliar
	Field Sample No.	250.1	250.2	250.3	250.4	250.5	250.6	251.1	251.2	251.3	252.1	252.2	253.1	253.2
	ab Sample No.													

SAMPLE LIST FOR SOIL MECHANICS LABORATORY

Caldwell

STATE: TX COUNTY: C.
SITE: Lower Plum Creek 28
PROJECT Dam PROGRAM
TYPE: Rehab Funds):

Attachment 5
Sample List (Page 2)

| 254.2 | 255.1 | 256.1 | 260.1

 | 260.2 | 260.3 | 260.4 | 260.5 | 260.6
 | 261.1
 | 261.2 | 261.3 | 262.1
 | 262.2 | 263,1
 | 263.2 | 264.1 | 265.1 | 266.1 | 266.2
 |
|---------|-------------------------|--
--
--
--|--|--|--|---
--
--
--|--|---
--
---|--|--|---|---
---|---|---|
| gyp | slight fine
grained | clay very sandy, | Claystone , sandy

 | Claystone
, blocky, | Claystone
, blocky, | Claystone
, Breaks | Claystone
, Breaks | Claystone
, Breaks
 | Claystone
, blocky,
 | TB to
Lam | Refusal at
22.1" No | Push 5'-
7.5', Rec
 | Siltstone /
Claystone | Push 5'-
7.5', Rec
 | Claystone
, Breaks | Push 5'-
7.5', Rec | Push 5'-
7.5', Rec | Push 0'-
2.5', Rec | Push 5'-
 |
| × | × | × | ×

 | × | × | × | × | ×
 | ×
 | × | | ×
 | × | ×
 | × | × | × | × | ×
 |
| × | × | × | ×

 | × | × | × | × | ×
 | ×
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 | | | | | 266.2 Auxiliar 5'-7.5'
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Attachment 5 Sample List (Page 3)

267.1	Auxiliar	0'-2.5'	3" Push	×	×	×	Clay Alluvium,	267.1
267.2	Auxiliar	5'-7.5'	3" Push	×	×	*	Clay	267.2
	Hole							

Sample List (Page 4)

Sample to Lincoln									•		6/5/2019			•	6/5/2019				6/5/2019	6/5/2019	6/5/2019			6/5/2019	6/5/2019						6/4/2000	6/5/2019				
Date	5/23/2019	5/23/2019	5/23/2019	\$/23/2019	5/23/2019	5/23/2019	5/23/2019			5/28/2019	5/22/2019	5/28/2019	5/22/2019	5/22/2019	5/22/2019		5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/24/2019	5/22/2019	5/22/2019	5/22/2019	5/24/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019
To Lab	×	×	×	×	×	×	×			×	× ×			××	×		×			×)		× ×	5					× ×			5		2 of 2		××	×
Composite Sample Notes	Made up of 176.1, 177.1, 178.2 (2 Bags)	Made up of 176.2, 177.2 (2 Bags),, 178.2 (2Bags)	Made up of 176.3 (3 bags), 177.3 (2 bags), 178.3 (2 bags)	Made up of 179.1, 179.2 (2 Bags), 180.1, 180.2	Made up of 179.3 (2 Bags), 180.3	Made up of 181.1 (2 bags), 181.2, 183.1, 182.2	Made up of 181.3, 182.3, 183.2, 183.3			Made up of 270.1, 2711 (2 Bags), 272.1		Made up of 270.2, 272.2, 274.1		Made up of 272.2 and 273.2																						
Composite Large Sample Number	GridA, 1	GridA, 2	GridA, 3	Grid B, 1	Grid B, 2	Grid G 1	Grid C, 2			AS 1		AS 2		AS 3																						
Notes	Part of Borrow Composite Sample Part of Borrow Composite Sample	Part of Borrow Composite Sample, 3 Bags Part of Borrow Composite Sample Part of Borrow Composite Sample, 2 Bags	Part of Borrow Composite Sample, 28ags Part of Borrow Composite Sample, 28ags part of Borrow Composite Sample, 28aec	Part of Borrow Composite Sample, 2 Bags Part of Borrow Composite Sample	Part of Borrow Composite Sample, 28ags Part of Borrow Composite Sample, 28ags Part of Borrow Composite Sample	Part of Borrow Composite Sample	Part of Borrow Composite Sample Part of Borrow Composite Sample	Part of Borrow Composite Sample Part of Borrow Composite Sample Part of Borrow Composite Sample	Part of Borrow Composite Sample Part of Borrow Composite Sample	Part of Borrow Composite Sample Part of Borrow Composite Sample	Slope Stability Slove stability	Part of Borrow Composite Sample	Slope Stability	Slope Stability Part of Borrow Composite Sample	Part of Borrow Composite Sample Slope Stability	Part of Borrow Composite Sample Part of Borrow Composite Sample	Slope Stability Part of Borrow Composite Sample	Slope Stability	Slope Stability Slope Stability, Pipe Support	Slope Stability, Pipe Support	Foundation Support	Foundation Support	Classification, 2 Bags	Classification, 2 Bags Classification	Pipe Support	Pipe Support Pipe, Impact Basin	Classification	Classification	Classification	Classification 2 8 ags	Classification, 2 Bags	Toe Drain, Foundation Support	Classification, 2 Bags Classification, 2 Bags	Classification	Classification	Classification
Small Sample Interval	7-10	0.3	3'-5'	0.3	2'-5'	3.5	15.4	10'-15'	7-10'	7-10		7 1	,	2.5	7-10	2.5	15.00																			
Blows											87079		11+22+29	12+20+25			14+27+33	8+12+13				4+9+12				24.34.7	10+14+19	15426435	29+42+46	2950fer6				4+6+11	14+22+27	11+22+30
SPT											185'-15'		9. 9.5	13.5 - 15			13.5-15	10-115				425'-44'				10'-11.5	20' - 21.5'	28 - 29.5	45.46.5	5051				20 - 21.5	30 - 31.5	35' - 36.5'
% Recovery											R				8				100	100	8 8		100	9 9	0#	100				100	100	100	100			
Tube (T) % Extruded Recovery (Ex)											Ē.				E			9		E.F			۵	ă ⊢	E	ă				۵	۵,	F	ă ă	i		
Push Tube Interval											10,-12				135'-155'			1	10-125	15'-17.5'	35'- 37.5'		0'-2.5'	5.5.5	7.5'- 10'	12.5'-15'				0'-2.5'	2.5.5	7.5'- 10'	15'-125'			
Old Field Push Tube Sample Interval No																								305.1	305.2	305.3	305.5	305.6	305.6	302.9	. 102	601.2		601.8	601.5	601.6
Sample No.	176.1	177.1	177.3	178.3	179.3	180.3	182.1	182.3	183.2	270.1	270.3	271.1	271.3	272.1	272.2	273.1	273.3	274.2	304.1	304.3	304.5	304.6	305.1	305.2	305.4	305.5	305.7	805.8	305.10	305.11	601.2	601.4	601.5	601.7	601.9	601.10
Date	4/4/2019	4/4/2019 4/5/2019	4/4/2019 4/9/2019 4/9/2019	4/9/2019	4/9/2019	4/10/2019 4/10/2019 4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/10/2019	4/9/2019	4/9/2019	4/9/2019	4/9/2019	3/20/2019	3/20/2019	3/20/2019	3/20/2019	3/20/2019	3/21/2019	3/21/2019	3/20/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019	4/2/2019
Total Depth Drilled	15	15	15	15	15	15	15	15		15		6		15.5		15	11.5		46.5				51.5							41.5						
Location	GridA	Grid A	GridA	Grid B	g pug	Grid C	Grid C	Grido		Outside Out AS		Outside Out AS		Outside Out AS		Outside Out AS	Outside Out AS		New PS				New PS							Downstream Toe						
										0		6		8		8	ō													å						

Lower Plum Creek Site 28
Caldwell County, Texas
Bore Hole and Sample Information
Drilled March and April 2019

Attachment 5

Sample List (Page 5)

6102/\$/9	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6/5/2019	6102/5/9 6102/5/9
\$24/2019 \$524/2019 \$524/2019 \$524/2019 \$524/2019 \$524/2019 \$524/2019	\$/24/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019	\$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019 \$\72\7019	\$/23/2019 \$/23/2019 \$/22/2019 \$/22/2019 \$/23/2019 \$/23/2019 \$/23/2019 \$/22/2019	\$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019	\$72/2019 \$72/2019 \$72/2019 \$72/2019 \$72/2019 \$72/2019 \$72/2019 \$72/2019	\$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019 \$/22/2019
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67 - 41.5 Ex 100 1 100 Ex 100 Ex 100 Ex 100 Ex 30 - 21.5 35 - 36.5 35 - 36.5 36 - 36.5 36 - 36.5 37 - 36.5 37 - 36.5 38	66 100 40 - 41 S Ex 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 1 100 1	66 40 41.5 60 40 41.5 60 60 60 60 60 60 60 60 60 60 60 60 60	F F F F F F F F F F F F F F F F F F F	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 1100 1 1000 Ex 1100 Ex 1100 Ex 1000 575-58.5 597-81.5 597	1 1 100 EV 100 E
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6017 0°-25 Ex 100 40°-41.5 6021 5°-75 Ex 100 6021 5°-75 T 100 10°-125 Ex 100 10°-125 Ex 100 10°-125 Ex 100 6023 15°-175 Ex 100 6024 20°-125 Ex 100 6024 20°-125 Ex 100 6025 8028 80°-125 6028 80°-12	6027 0.25 Et 100 40-415 6031 25-5 Et 100 6031 25-5 Et 100 6032 275-10 1 100 6033 15-175 Et 100 6033 6034 6035 6035 6035	0337 0'-25 Ex 60 40-44.5 0441 5'-55 E E 80 60 40-44.5 6042 7.5-10 T 100 10'-125' Ex 100 10'-125' Ex 100 15'-165' Ex 100 15'-16	0°.25	0.25 Ex 30 25.5 Ex 30 6061 5.75 T 100 6062 75.10 T 100 10.125 Ex 90 10.225 Ex 60 70.225 Ex 60 10.444 444 10.444 444 10.444 444	7.5.75 T 1100 7.5.10 E 1100 10.125 E 1100 20.725 E 1100 20.725 E 200 20.525 E 200 2	6081 \$5.7\$ 1 100 6082 7.5-10 1 1 100 6082 7.5-10 1 1 100 10.7-125' Ex 100 125-15' Ex 100 20.7-25' Ex 100 20.7-25' Ex 100 20.7-25' Ex 100 6091 \$5.75' 1 100 6092 7.5-10 1 100 125-15' Ex 100 225-25' Ex 100 225-25' Ex 100 225-25' Ex 100
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4/2/2019 601.11 601.7 0'-2.5 tc. 100 4/1/2019 602.1 0'-2.5 tc. 100 4/1/2019 602.3 602.1 5'-7.5 t. 100 4/1/2019 602.4 602.2 75-10' T 100 4/1/2019 602.4 602.2 15'-10' tc. 100 4/1/2019 602.5 10'-125' tc. 100 20'-115' 4/1/2019 602.5 10'-125' tc. 100 20'-115' 4/1/2019 602.5 602.1 15'-175' tc. 100 20'-115' 4/1/2019 602.5 602.1 602.5 602.1 57'-56' 100 20'-115' 4/1/2019 602.0 602.1 602.1 57'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' 58'-56' <td< td=""><td>4/2/2019 602.11 602.7 67.2S p. 40.4L/S 4/1/2019 603.1 02S p. 100 40.4L/S 4/1/2019 603.3 603.1 255 p. 100 40.4L/S 4/1/2019 603.5 603.1 7510 T 100 77.5 100 40.4L/S 4/1/2019 603.5 15'-17S' p. 100 20'-12S' 40.4L/S 20'-12S' 40.4L/S 20'-12S' 40'-12S' 40'-12S'</td><td>4/4/2019 604.1 604.7 6°.25 Ek 60 40.41.5 74.2 Ek 70 60 40.41.5 75.7 T 1 100 40.4 74.2 71.5 Ek 100 40.4 74.2 75.2 Ek 70 60.4 60.4 80.4 60.4 80.4 75.2 Ek 70 60.4 60.4 80.4 75.2 Ek 70 60.4 75.2 Ek 70 60.4 80.4 80.4 80.4 80.4 80.4 80.4 80.4 8</td><td>4/27/2019 665.1 0°-2.5 E 70 4/27/2019 665.3 25-5 E 70 4/27/2019 665.4 605.2 75-10 1 100 4/27/2019 665.4 605.2 75-10 1 100 4/27/2019 665.5 10'-12.5 E 60 4/27/2019 665.7 10'-12.5 E 80 4/27/2019 665.7 20'-22.5 E 80 4/27/2019 665.9 25'-26.5 87-26.5</td><td>9/27/2019 666.1 0.2.55 E. 30 9/27/2019 666.3 606.1 25.75 E. 35 9/27/2019 666.3 606.1 57.75 F. 100 9/27/2019 666.5 10.12.5 E. 90 9/27/2019 666.5 15'.11/5 E. 90 9/27/2019 666.7 30'.225 E. 90 9/27/2019 666.3 16'.11/5 E. 90 9/27/2019 666.3 30'.31/5 90'.31/5 9/27/2019 666.1 30'.31/5 90'.31/5</td><td>\$\(\pi\)_{\text{21/2019}}\$ 6071 \$\(\pi\)_{\text{21/2019}}\$ \$\(\pi\)_{21/20</td><td>\$\(\phi\c)\(\phi</td></td<>	4/2/2019 602.11 602.7 67.2S p. 40.4L/S 4/1/2019 603.1 02S p. 100 40.4L/S 4/1/2019 603.3 603.1 255 p. 100 40.4L/S 4/1/2019 603.5 603.1 7510 T 100 77.5 100 40.4L/S 4/1/2019 603.5 15'-17S' p. 100 20'-12S' 40.4L/S 20'-12S' 40.4L/S 20'-12S' 40'-12S'	4/4/2019 604.1 604.7 6°.25 Ek 60 40.41.5 74.2 Ek 70 60 40.41.5 75.7 T 1 100 40.4 74.2 71.5 Ek 100 40.4 74.2 75.2 Ek 70 60.4 60.4 80.4 60.4 80.4 75.2 Ek 70 60.4 60.4 80.4 75.2 Ek 70 60.4 75.2 Ek 70 60.4 80.4 80.4 80.4 80.4 80.4 80.4 80.4 8	4/27/2019 665.1 0°-2.5 E 70 4/27/2019 665.3 25-5 E 70 4/27/2019 665.4 605.2 75-10 1 100 4/27/2019 665.4 605.2 75-10 1 100 4/27/2019 665.5 10'-12.5 E 60 4/27/2019 665.7 10'-12.5 E 80 4/27/2019 665.7 20'-22.5 E 80 4/27/2019 665.9 25'-26.5 87-26.5	9/27/2019 666.1 0.2.55 E. 30 9/27/2019 666.3 606.1 25.75 E. 35 9/27/2019 666.3 606.1 57.75 F. 100 9/27/2019 666.5 10.12.5 E. 90 9/27/2019 666.5 15'.11/5 E. 90 9/27/2019 666.7 30'.225 E. 90 9/27/2019 666.3 16'.11/5 E. 90 9/27/2019 666.3 30'.31/5 90'.31/5 9/27/2019 666.1 30'.31/5 90'.31/5	\$\(\pi\)_{\text{21/2019}}\$ 6071 \$\(\pi\)_{\text{21/2019}}\$ \$\(\pi\)_{21/20	\$\(\phi\c)\(\phi

Attachment 5

Sample List (Page 6)

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5/22/2019	5/22/2019	5/22/2019	5/22/2019		5/22/2019	5/22/2019	5/22/2019	5/22/2019	6707 67 6	5/22/2019		5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	5/22/2019	5/22/2019	5/24/2019	5/24/2019	5/24/2019	5/24/2019	000000000000000000000000000000000000000		
	2 of 2				××°				ĸ	×				× >		2062							8	K)				2						2 of 2					2012						5		2012				1 of			2 of 2					2 of 2				
	345	-	Support		Support	Sile	sile	usal at 30.25	(en a)			- S' bush	Trube	Surport	No.	200	1 at 24.5'	ic day	5 3 6	ste.	to	ort	s2e					STR	sile	ort	ort	570	Sur Sur	538	ste	ort	ort	sale i	520	offp.	346	ort	ort	sile	sile		STR ST	can also	to	ort	ste.		ste	sile	ort	ort	526	s#s	520	office affice	ion 2 Bars	1017 - 410	
Classification	Lignite Classification, 2 Bars	Classification	Toe Drain, Foundation Support	No Recovery	Toe Drain, Foundation Support	Classification, 2 Bags	Classification, 2 Bags	Ugnite, Push 30' - 32.5' Refusal at 30.25'	Classification	Classification	No Recovery	Ream Sample from 2.5' - 5' push	Push Sample with SPT Tube	Toe Drain Foundation Support	Classification 2 Bass	Classification, 2 Bars	Push 225' - 25', refusal at 24.5'	Classification, Lignitic Clay	Classification, 2 Bags	Classification, 2 Bags	Foundation Support	Foundation Support	Classification, 2 Bags	Classification	Classification	Classification	Classification	Classification, 2 Bags	Classification, 2 Bags	Foundation Support	Foundation Support	Classification, 2 Bags Classification, 2 Bass	Classification, 2 Bars	Classification, 2 Bags	Classification, 2 Bags	Foundation Support	Foundation Support	Classification, 2 bags	Classification, 2 bags Classification, 2 bags	Classification	Classification 2 Bars	Foundation Support	Foundation Support	Classification, 2 Bags	ssification, 28	Classification	Classification, 2 Bags	Classification, 2 bags Foundation Support	Foundation Support	Foundation Support	Classification, 2 Bags	Classification	Classification, 2 Bags	Classification, 2 Bags	Foundation Support	Foundation Support	Classification, 2 Bags	Classification, 2 Bags	Classification, 2 Bags	Classification, 2 bags Classification, 2 bases	Refusal @ 37 Chastification 2 hars	100	
	Ö	3	Toe Dra		Toe Dr	5 5	Ö	Ugnite, Push	COS			Ream St	Push	1000	5	5 0	Push 23	Class	ō	Ö	Fc	F	Ö					Ö	Ö	Pe	F.	5 0	0	ō	ō	ĭ	7 (5 0	50	3	Ö	Fe	Fe	ō	Ö	ŧ	5 0	5 4	P. P.	2	Ö		Ö	Ö	Fc	F	Ö	ö	0 1	3 6	Refucial of	-	
												2.5-5																																																			
	4" for 50							17490447	4" for 50									13+21+32						9110119	64412	13420425	15+23+29																			17+28+30				649413		16+23+36											
	40'- 40.25' 4" for 50							7440471 1740747										40' - 41 5' 13+21+32									35'- 36.5' 15+23+29																			20' - 21.5' 17+28+30				10'-115' 6+9+13		20' - 21.5' 16+23+36											
		40	100	0	K 8	100	100	13 96 - 136			0		100	901	100	100	100	40' - 41.5'		100	100	100							K	100	100	88 88	100	100	100	100	100	100	100	40	2 8	100	100	100		20' - 21.5'	RX	5 P	100	10'-11.5'		20 - 21.5		100	8		100	100	100	88 88	000	Ī	
	40' - 40.25'		1 100			100		13 96 - 136			0		NA 100				Ex 100	40' - 41.5'	100									98	85	T 100		88 88 88 88				T 100			100				T 100	Ex 100		20'-215'	R #		T 100	10'-11.5'		20' - 21.5'	08	Ex 100	٦ %				100		8		
8 3	40'- 40.25'	1 25		MA		که ک	۵	13		88		3	NA,	- 6	- 2	5 2	۵	40' - 41.5"	Ex 100		-	-	100					98	۵	i.	-	2 4	3 20		۵	-	- 4	8 3		5 2	2 2	-	E	ă	Ex 100	20'-215	X 2		-	10.115	100	20' - 21.5'	. Ex		-	-	ă	ă		5 4	5 2	ś	
25 St	40'- 40.25'	1 25	-	7.5' - 10' NA	- 2	که ک	ă	13		88				10,-125	15'-175' Fv	5 2	۵	40' - 41.5"	Ex 100	2.5°-5°	-	7.5' - 10' T	10'-125' Ex 100	19 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -		15 15		0'-2.5' Ex 65	۵	i.	7.5'-10' T	2 4	3 20	۵	2.5°-5'	-	7.5-10	8 3	5 3	5 2	2 2	1 2 2 3	E	10'-125' Ex	15'-175' Ex 100	20'-215	X 2	5. 5.5	-	10'-115'	15'-17.5' Ex 100	20' - 21.5'	. Ex	2.5°-5" Ex	-	7.5° - 10° T	ă	ă	ă.	5 4	5 2	ś	
30' - 32.5 Ex 5:0 35' - 37.5 Ex 4:0	40'- 40.25'	25.5	6101 5'-75' T	7.5" - 10" NA	10°-125° T	15'-17.5' Ex	610.7 20'- 22.5' Ex	610.8 30.25 Ex 13	610 10	611.1 0'-2.5' Ex 35	2.5" - 5"	611.2	611.3 611.1 S'-7' NA	6115 6119 10'-125' T	6116 15'-175' FV	611.7 17.55.20' Ex	611.8 225"- 245" Ex	611.9	701.1 0'-2.5' Ex 100	701.2 2.5°-5° Ex	701.3 701.1 S'- 7.5' T	701.4 701.2 7.5'-10' T	701.5 10'-125' Ex 100	201 - 210 - 2	701. 701.4 701.8 701.8 70.34.34.34.34.34.34.34.34.34.34.34.34.34.	201 5 2	701.10 701.7	702.1 0'-2.5' Ex 65	702.2 2.5°-5° Ex	702.3 702.1 S'-7.5 T	702.4 702.2 7.5'-10" T	702.5 10:125 EX	702.7 20°- 225° Ex	703.1 0'-2.5' Ex	703.2 2.5°-5' Ex	703.3 703.1 S'-7.5 T	703.4 703.2 7.5 - 10° T	703.5 10 - 125 EX	703.6 15 17.5 EX	7041	704.2	704.3 704.1 5'-7.5' T	704.4 704.2 7.5'-10" T	704.5 to'-125' Ex	704.6 15'-17.5' Ex 100	704.7 704.3	705.1 0°-2.5 Ex	705 3 705 1 51-75 1	705.4 705.2 7.5'-10' T	705.5 705.3	705.6 15'-17.5' Ex 100	705.7 705.4 20' - 21.5'	706.1 0'-2.5' Ex 80	706.2 2.5"-5" Ex	706.3 706.1 S'- 7.5' T	706.4 706.2 7.5'-10" T	10'-125' Ex	15'-17.5' Ex	20°- 225° Ex	73 577 67	5 2	5	
30' - 32.5 Ex 5:0 35' - 37.5 Ex 4:0	609.10 40'-40.25' Ex 100	610.2 2.5°-5° Ex	610.3 610.1 5'-75' T	7.5' - 10' NA	610.2 10°-125° T	610.6 15'-17.5' Ex	610.7 20'- 22.5" Ex	610.8 30.25 Ex 13	610 10	611.1 0'-2.5' Ex 35	2.5" - 5"	611.2	611.3 611.1 S'-7' NA	6115 6119 10'-125' T	6116 15'-175' FV	611.7 17.55.20' Ex	611.8 225"- 245" Ex	611.9	701.1 0'-2.5' Ex 100	701.2 2.5°-5° Ex	701.3 701.1 S'- 7.5' T	701.4 701.2 7.5'-10' T	701.5 10'-125' Ex 100	201 - 210 - 2	701. 701.4 701.8 701.8 70.34.34.34.34.34.34.34.34.34.34.34.34.34.	201 5 2	701.10 701.7	702.1 0'-2.5' Ex 65	702.2 2.5°-5° Ex	702.3 702.1 S'-7.5 T	702.4 702.2 7.5'-10" T	702.5 10:125 EX	702.7 20°- 225° Ex	703.1 0'-2.5' Ex	703.2 2.5°-5' Ex	703.3 703.1 S'-7.5 T	703.4 703.2 7.5 - 10° T	703.5 10 - 125 EX	703.6 15 17.5 EX	7041	704.2	704.3 704.1 5'-7.5' T	704.4 704.2 7.5'-10" T	704.5 to'-125' Ex	704.6 15'-17.5' Ex 100	704.7 704.3	705.1 0°-2.5 Ex	705 3 705 1 51-75 1	705.4 705.2 7.5'-10' T	705.5 705.3	705.6 15'-17.5' Ex 100	705.7 705.4 20' - 21.5'	706.1 0'-2.5' Ex 80	706.2 2.5"-5" Ex	706.3 706.1 S'- 7.5' T	706.4 706.2 7.5'-10" T	706.5 Ex	706.6 15'- 17.5' Ex	20°- 225° Ex	706.9	706.10 SS'- 32'- Fx	0.00	
609.8 30°-32.5 Ex 50 609.9 35°-37.5 Ex 40	609.10 40'-40.25' Ex 100	3/18/2019 610.2 2.5'-5' Ex	610.3 610.1 5'-75' T	7.5' - 10' NA	610.4 610.2 10°-12.5 T	610.6 15'-17.5' Ex	610.7 20'- 22.5' Ex	610.8 30.25 Ex 13	610.10	611.1 0'-2.5' Ex 35	2.5" - 5"	611.2	611.3 611.1 S'-7' NA	6115 6119 10'-125' T	6116 15'-175' FV	611.7 17.55.20' Ex	611.8 225"- 245" Ex	3/19/2019 611.9	701.1 0'-2.5' Ex 100	701.2 2.5°-5° Ex	701.3 701.1 S'- 7.5' T	701.4 701.2 7.5'-10' T	701.5 10'-125' Ex 100	201 - 210 - 2	701. 701.4 701.8 701.8 70.34.34.34.34.34.34.34.34.34.34.34.34.34.	201 5 2	701.10 701.7	702.1 0'-2.5' Ex 65	4/3/2019 702.2 2.5"-5" Ex	702.3 702.1 S'-7.5 T	702.4 702.2 7.5'-10" T	702.5 10:125 EX	702.7 20°- 225° Ex	703.1 0'-2.5' Ex	4/4/2019 703.2 2.5'-5' Ex	703.3 703.1 S'-7.5 T	703.4 703.2 7.5 - 10° T	703.5 10 - 125 EX	703.6 15 17.5 EX	7041	4/4/2019 2042 25°-5° Ex	704.3 704.1 5'-7.5' T	704.4 704.2 7.5'-10" T	704.5 to'-125' Ex	704.6 15'-17.5' Ex 100	4/4/2019 704.7 704.8	705.1 0°-2.5 Ex	705 3 705 1 51-75 1	705.4 705.2 7.5'-10' T	705.5 705.3	705.6 15'-17.5' Ex 100	4/4/2019 705.7 705.4 20 - 21.5	706.1 0'-2.5' Ex 80	706.2 2.5"-5" Ex	706.3 706.1 S'- 7.5' T	706.4 706.2 7.5'-10" T	706.5 Ex	706.6 15'- 17.5' Ex	706.7 20°- 225° Ex	706.9	706.10 SS'- 32'- Fx	0.00	5 9 5 5
609.8 30°-32.5 Ex 50 609.9 35°-37.5 Ex 40	3/19/2019 609.10 40*-40.25 3/18/2019 610.1 0*-2.5 Ex 100	3/18/2019 610.2 2.5°-5° Ex	610.3 610.1 5'-75' T	7.5' - 10' NA	610.4 610.2 10°-12.5 T	610.6 15'-17.5' Ex	610.7 20'- 22.5' Ex	610.8 30.25 Ex 13	610.10	3/18/2019 611.1 0'-2.5' Ex 35	2.5" - 5"	611.2	611.3 611.1 S'-7' NA	6115 6119 10'-125' T	6116 15'-175' FV	611.7 17.55.20' Ex	611.8 225"- 245" Ex	3/19/2019 611.9	4/3/2019 701.1 0'-2.5' Ex 100	4/3/2019 701.2 2.5"-5" Ex	701.3 701.1 S'- 7.5' T	701.4 701.2 7.5'-10' T	701.5 10'-125' Ex 100	201 - 210 - 2	701. 701.4 701.8 701.8 70.34.34.34.34.34.34.34.34.34.34.34.34.34.	201 5 2	701.10 701.7	4/3/2019 702.1 0'-2.5' Ex 65	4/3/2019 702.2 2.5"-5" Ex	702.3 702.1 S'-7.5 T	702.4 702.2 7.5'-10" T	702.5 10:125 EX	702.7 20°- 225° Ex	4/4/2019 703.1 0'-25' Ex	4/4/2019 703.2 2.5°-5' Ex	703.3 703.1 S'-7.5 T	703.4 703.2 7.5 - 10° T	703.5 10 - 125 EX	703.6 15 17.5 EX	4/4/2019 2041 07:25	4/4/2019 704.2 25°-5° FY	704.3 704.1 5'-7.5' T	704.4 704.2 7.5'-10" T	704.5 to'-125' Ex	704.6 15'-17.5' Ex 100	4/4/2019 704.7 704.3	4/4/2019 705.1 0°-2.5 Ex	705 3 705 1 51-75 1	705.4 705.2 7.5'-10' T	705.5 705.3	705.6 15'-17.5' Ex 100	4/4/2019 705.7 705.4 20 - 21.5	4/2/2019 706.1 0'- 2.5' Ex 80	706.2 2.5"-5" Ex	706.3 706.1 S'- 7.5' T	706.4 706.2 7.5'-10" T	706.5 Ex	706.6 15'- 17.5' Ex	706.7 20°- 225° Ex	706.9	706.10 SS'- 32'- Fx	0.00	Total Footnee 879.5

Attachment 5
Sample List (Page 7)

	Field Sample No.	Grid A, 1	Grid A, 2	Grid A, 3	Grid B, 1	Grid B, 2	Grid C, 1	Grid C, 2	AS 1	AS 2	000
	Other Tests or Other Notes	Made up of 176.1,	Made up of 176.2,	Made up of 176.3	Made up of 179.1,	Made up of 179.3	Made up of 181.1	Made up of 181.3,	Made up of 270.1,	Made up of 270.2,	Made up
	шөд										
	unsdAg										
	HES										
	əlodni9										
þ	Shear										
Tests Requested	Josenoo	×	×	×	×	×	×	×	×	×	
Te	əsdeş-jog										
	мла										
	хәриј	×	×	×	×	×	×	×	×	×	
	Field										
	Size/Type	Large	Large	Large	Large	Large	Large	Large	Large	Large	0.00
-	Depth (11)										
	Field Description Sample No. or Location Depth (ft)	Borrow Grid A	Borrow Grid A	Borrow Grid A	Borrow Grid B	Borrow Grid B	Borrow Grid C	Borrow Grid C	Outside	Outside	Outside
	Field Sample No.	Grid A,	Grid A,	Grid A,	Grid B,	Grid B,	Grid C,	Grid C, 2	AS 1	AS2	
	b Sample No.				1 "		r T			14.	

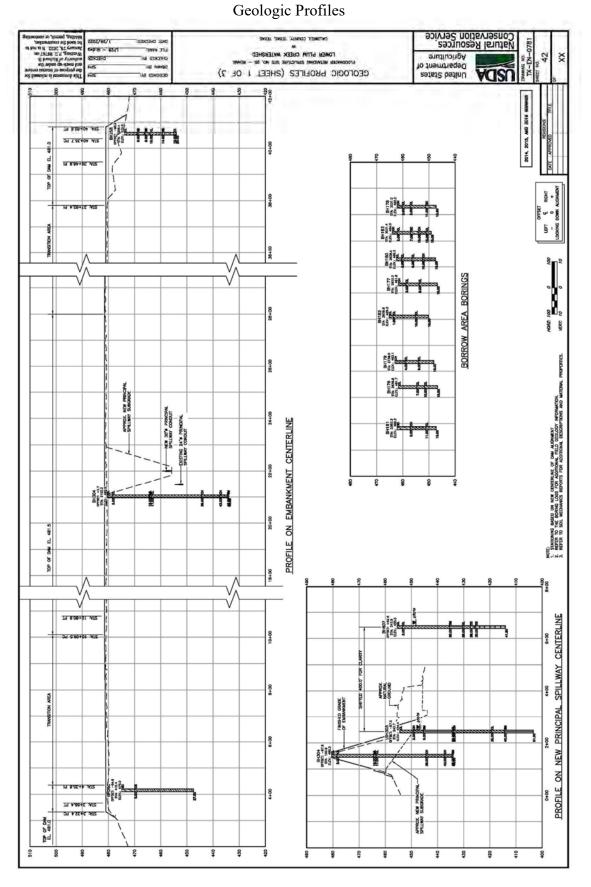
Index Tests = gradation, water content, LL, PI, Crumb, Double Hydrometer, Gs

SAMPLE LIST FOR SOIL MECHANICS LABORATORY

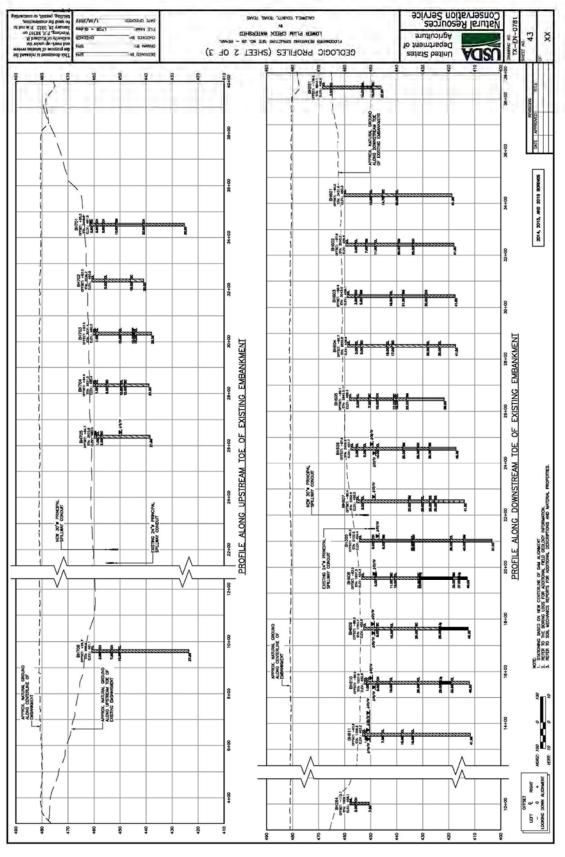
STATE: TX COUNTY:

PROJECT TYPE: Rehab

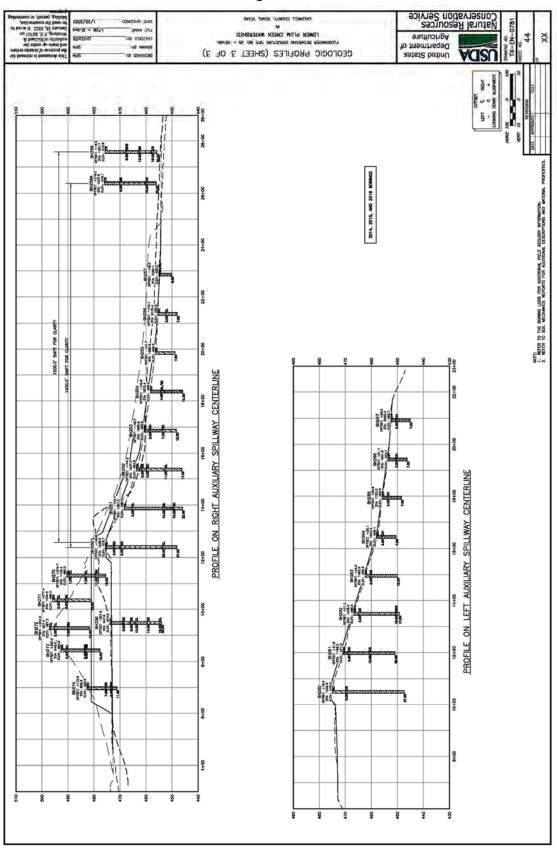
CONTACT Bryan S. Moffatt PHONE/ 817.233.6268



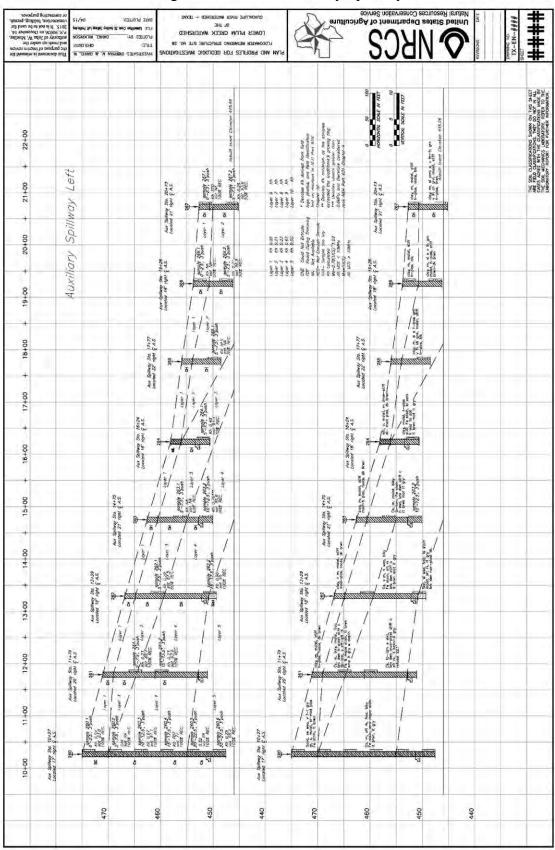
Geologic Profiles



Geologic Profiles



Attachment 7 Geologic Profiles, Left Auxiliary Spillway



Attachment 7
Geologic Profiles, Right Auxiliary Spillway

