



Whitelaw Property

*SOUTH EAST SEC. 01, TWP. 082, RGE. 01 W6M
Whitelaw, Alberta*

Interested parties please contact:

Mike Diachyshyn

Telephone: 780-691-7104

E-mail: sales@hammerstrap.com

AGGREGATE ASSESSMENT

SOUTH EAST SEC. 01, TWP. 082, RGE. 01 W6M
WHITELAW, ALBERTA



Prepared by:

Green Country Consulting Ltd.

Box 53 Brule, Alberta, Canada T0E 0C0

Ph. 780-876-0205



INTRODUCTION

In the summer of 2021, Green Country Consulting Ltd. was directed to conduct an analysis to determine the volume of probable gravel available for extraction from ¼ section within the property at LSD SE-1-82-1W6 owned and managed by Mike Diachyshyn & Hammerstrap Industries Ltd located approximately 6km southeast of Whitelaw, Alberta. The methodology, established within this report, will be used to determine volume to assist planning and development of the resource. This methodology was discussed with Mr. Mike Diachyshyn of Hammerstrap Industries Ltd in July 2021 at which time Green Country was instructed to determine the volume of gravel resources within the above noted property.

METHODOLOGY

This analysis only determines the estimated volume within the boundaries of said property. The study area was determined by identifying and confirming the property boundaries with Mr. Mike Diachyshyn. Testing was entirely done within the study area to determine the approximate potential gravel available for extraction from said property. Green Country was also asked to identify any potential deficiencies in reference to the Environmental Protection and Enhancement Act to be able to development a gravel pit.

STUDY AREA

The 69.13 hectare (160 acre) mostly treed (a mix of poplar and spruce) land study area is located all within ¼ section LSD SE-01-82-01-W6 near Whitelaw, Alberta. The site is located approximately 15.2 kilometers from the Peace River, is on the upper south-facing embankment and is a well-drained property. The fluvial deposit is at an approximate elevation of 661m down to 651m above sea level and approximately 87.5 m (287') above the Peace River. Main access to the site is 5.2 km east off Hwy 2 near Whitelaw via high-grade graveled all-weather Township Road 820 held under disposition by the county.

A plan of the Study area is provided in [Appendix 1 LOCATION PLAN](#) and a SITE PLAN provided in [Appendix 2](#) for an aerial photograph of the property and nearby county gravel pits.

EXISTING SITE CONDITIONS

Potential development of the pit is in the exploratory stage on a mostly treed parcel of land with vacant house, barn, sheds, and other small out buildings built on approximately 2.87 hectares near the south west corner of the property. Also entire ¼ section is fenced in with 3 wire barbed fencing other than two driveways near the house and buildings to access from the south bordering Twp Rd 820.

At time of sampling, the land was dry with no surface water ponding or pooling noted at or near any test hole location or anywhere else on the property.

TEST HOLE PROCEDURE

Green Country completed a traverse sampling method of the site and recorded elevations at station and side shot locations. The elevations were entered into an engineering program to compile the deposit volumes and profiles of the site. Cross section locations are identified on the TEST HOLE PLAN in [Appendix 2](#). Cross sectional profiles are provided in [Appendix 6](#).

Thirty Seven (37) test holes were excavated using a client supplied tracked excavator with a maximum excavating reach of 4.5 meters. All test holes were excavated, sampled and data compiled in the fall of 2021. Test holes were

excavated to the depth of the parent material (clay), the base of the gravel seam, or the limits of the excavator, whichever came first.

Test hole locations are identified on plan in [Appendix 3](#). Test hole results are summarized in [Appendix 4](#) which includes a summary and field tally sheets. Pictures of each test hole excavation is provided in [Appendix 5](#).

Where the bottom of the test hole still identified gravel, it is assumed that the material depth continues below the limits of the excavation equipment. Same with sand and clay. Test holes highlighted in ORANGE in the included data table, denoted locations where gravel depth was potentially greater than test hole depth. For more accurate results sampling to actual gravel bottoms would require a drill rig or open excavation.

DETERMINATION OF VOLUME

Volume calculations are calculated by Utilizing LiDar (Light Detection and Ranging) data provided by the Government of Alberta to create a spatially correct Digital Terrain Model (DTM) of the ground surface. A DTM was created for each subsurface horizon (topsoil, Overburden, Sand, and Gravel. DTM for subsurface horizons are based on the elevations extracted from the test hole depths recorded. DTM surfaces are merged and graded to calculate volume in cubic meters for each subsurface horizon. Only the probable volume of gravel (sand & gravel) is calculated. The total volume of pure sand to the pit floor is not included in the report as marketable volume. The calculated volumes are gross volume based on area.

Probable Gravel resources are based on the fact that adjacent pits to the north and south are excavated deeper than the test hole depths therefore the excavating equipment prevents the test holes from identifying the floor of the pit. A DTM for Probable Gravel was created based on a pit floor elevation at 646m in neighboring pits only where gravel was found in the bottom of the test hole. This DTM is 1m higher than the lowest excavated floor elevation within the north and south MD pits. Where test holes identified sand at the bottom of these test hole locations and gravel could not be validated, the volume was removed. DTM voided these areas thus the profiles show an uneven pit floor where volume was omitted. There could be gravel below the testing limits of the excavator and the sand volume was not included. [Appendix 7](#) provides a DIGITAL TERRAIN MODEL of the excavation area.

The total volume of aggregate within the study area was determined by excavating test holes to determine the depth and type of resource, then calculating the volume by multiplying the depth of the resource by the average area represented by test hole. All depths were recorded in metres. The following conversion factor was used to convert cubic yard volume to cubic metres (1 cubic meter = 1.308 cubic yards).

The subsurface horizons are graded at a 1:1 slope with property boundaries. See [Appendix 6](#) for a breakdown of volumes and site profiles.

RESULTS

The calculated gross volume of aggregate in the study area is 3,214,000 cubic meters (5,245,000 tonnes).

The table below summarizes the calculated volumes and totals for this site.

VOLUME CALCULATIONS SUMMARY (rounded to the nearest 1,000)

Subsoil Horizons	Volume (Gross) in m3	Volume (Gross) in tonnes
Topsoil /Subsoil	55,000	
Overburden	1,133,000	1,779,000
Sand	405,000	553,000
Gravel / Sand	957,000	1,562,000
Tested Gravel + Probable Gravel	3,214,000	5,245,000

Values in Green based on testhole data

Values in Red include predicted volume based on digital terrain data, as resources are untested

Due to the amount of fines in the gravel deposit we recommend that Gross Gravel Volumes be reduced by (25%).

The subsurface horizons are graded at a 1:1 slope with property boundaries. The expectation is that daylighting agreements would be put in place to allow for gravel extraction to the pit floor where boundaries are shared with the adjacent MD pits. Boundaries that are not adjacent to planned mining can also be negotiated for daylighting agreements.

Based on the composition of the tested gravels, the majority of gravel that would likely be manufactured from this site would be ½” road crush and in less volume ¾” road crush. There may also be a market for sand and clay fill which volumes are not provided for that would add valuation to the pit. Manufactured marketable products include washed sand, concrete mix, and pebble rock.

SUGGESTED MINING PLAN

Provided is a suggested mining plan for the site based on site conditions and surrounding activities. The focus on the mining plan is to suggest phases of development that would be operationally feasible, target premium gravel arras initially, minimize impact to adjacent landowners, and minimize reclamation / operational costs. Five mining phases are suggested. This would allow for mining areas between 10 and 13 ha in size and a common work space in the center to be utilized through the majority of the mining operation. Topsoil and overburden could be stored in the adjacent phases until mining is complete and reclamation of each phase could proceed while mining commences in the next phase. The recommended end-use for the site is agricultural or pasture lands. This is not an operational plan for permitting but a suggestion based on site evaluation and conditions. A final activity plan will need to be submitted and approved by the regulator prior to operating a pit larger than 5 ha.

CONCLUSIONS

Based on the results of this analysis the combined volume within the study area and factoring composition total Gross Extractable Gravel at **2,410,500 m³ (3,153,000 tonnes rounded to nearest thousand)**

If development of this property for gravel extraction is decided on, a development permit from the municipality to mine the lands would be required as well as an Authorization Permit from the Government of Alberta to extract gravel from an operational site larger than 5 hectares.

For the above permitting applications, the following information would be required:

1. Environmental:
 - a. Ground Water well reports for the area within 2km radius.
 - b. Diagram showing the area and wells is provided in the Appendix 8
 - c. Well reports are also provided in the Appendix 8
 - d. The formation logs (lithology data) indicate that gravel deposits could be deeper than 60 feet
 - e. Depth of static water level in reports. ~50'. Some are shallower
 - f. Not all water well reports have formation logs and have only included ones within the appendix.
 - g. Aquifer information (the reports are not specific but the formation logs show that the formation turns into a bedrock deposit SE outside of the Grimshaw aquifer and south of the land).
 - h. The land is located on the Whitelaw lobe of the Grimshaw aquifer
 - i. No ground water was found on property during sampling.
 - j. There are no watercourses impacted by the potential development. A fish and Wildlife species summary report was completed for the project area and found there are no species of concern or at risk within the project area. See report in the Appendix 9.
 - k. There is a Sharp Tailed grouse zone on the SE portion of the site that will have operating conditions for clearing the land during non-nesting periods.
 - l. An operational plan is included. See plan in Appendix 10
 - m. A reclamation plan would be required for permitting applications. Reclamation strategy included in Appendix 11.
2. Historical resources assessment – there are no historical resources registered to this property.
3. Public Impact Assessment which would be minimal as there are already developed gravel pits North, East and South adjacent of this property run by the municipality. The area is sparsely populated rural/farm land area with the nearest residence located approximately 1.0km west along Twp Rd 820.

SPECIAL CONSIDERATIONS AND DISCLAIMERS

This report is not a real estate value assessment or a gravel value assessment.

Sampling of gravel was only conducted to partial depth of strata therefore is subject to increased data inaccuracies, for more accurate results, testing to actual gravel bottoms would be required.

Green Country Consulting Ltd, any of its shareholders, directors, owners, managers, and/or authorized representatives assume no responsibility for any action taken or not taken associated with any details, comments, or recommendations noted in this document.



Emery Gorman
President
(780) 876-0205
emery@gcountry.ca



**APPENDIX 1
LOCATION PLAN**

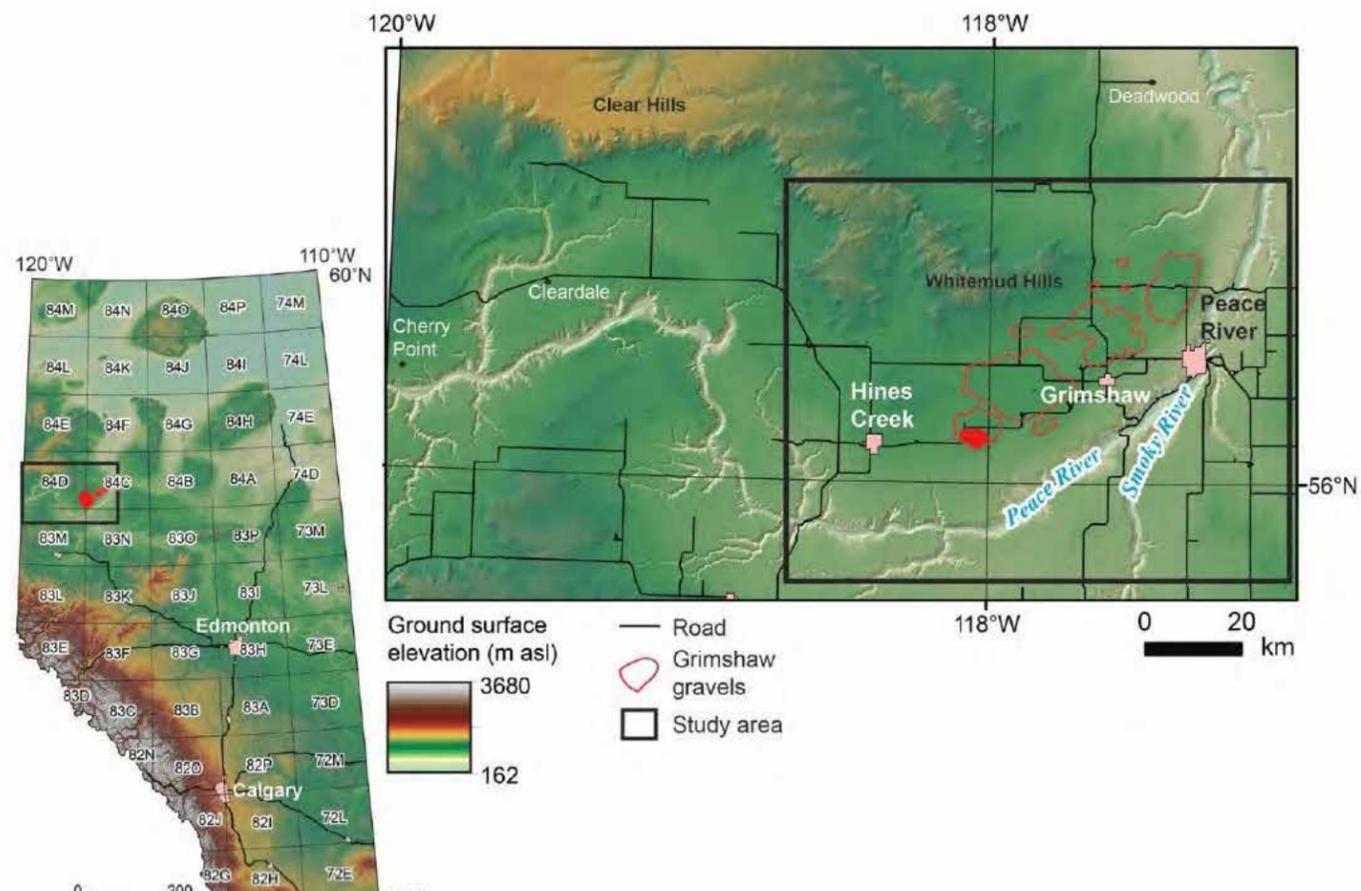


Figure 11. Sand and gravel deposits, including Paleogene preglacial fluvial deposits (dark pink; Green and Mellon, 1962; Prior et al., 2013) and aggregate materials (Edwards et al., 2004; Edwards and Budney, 2009), overlain on a hill-shaded DEM (data from AEP, 2015). Lakes are coloured in blue.

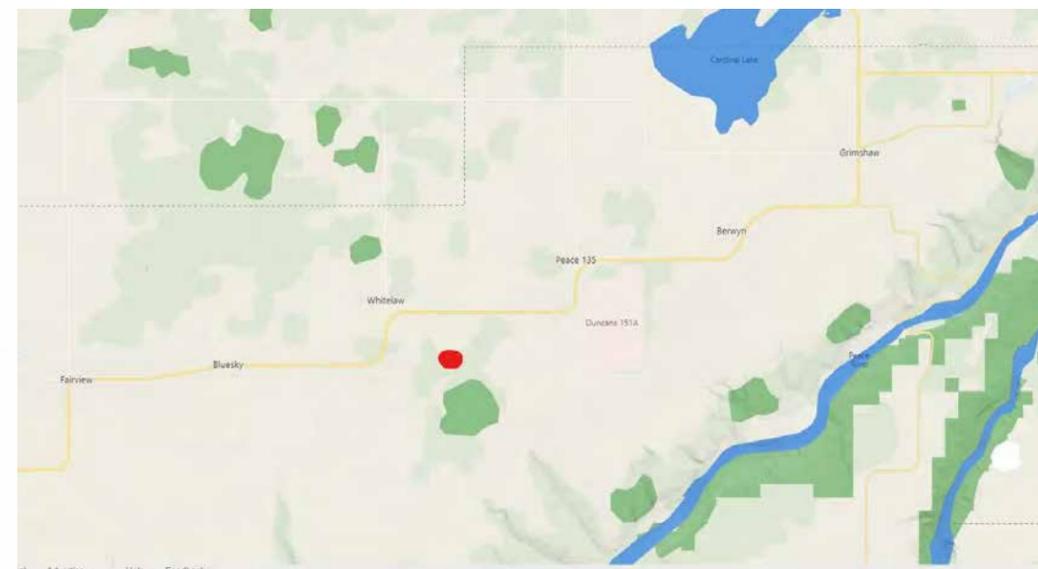


Figure 5. Surficial geology of the Grimshaw area from Paulen (2005) and Atkinson and Paulen (2010b), draped on a hill-shaded DEM (data from AEP, 2015). Lobes of the Grimshaw gravels (red) are labelled.



SE Sec.1, Twp. 82, Rng. 1
W6M
WHITELAW PIT
Location Plan

Legend

● Site Location

22/02/21

Scale as per plan.
Units in metres.

GCL Green Country Consulting Ltd.

**APPENDIX 2
SITE PLAN**



SE Sec.1, Twp. 82, Rng. 1
 W6M
 WHITELAW PIT
 Site Plan

Legend

- LUEKEN PIT MD F
- Property Boundary



22/02/21 Plan Scale 1:5000



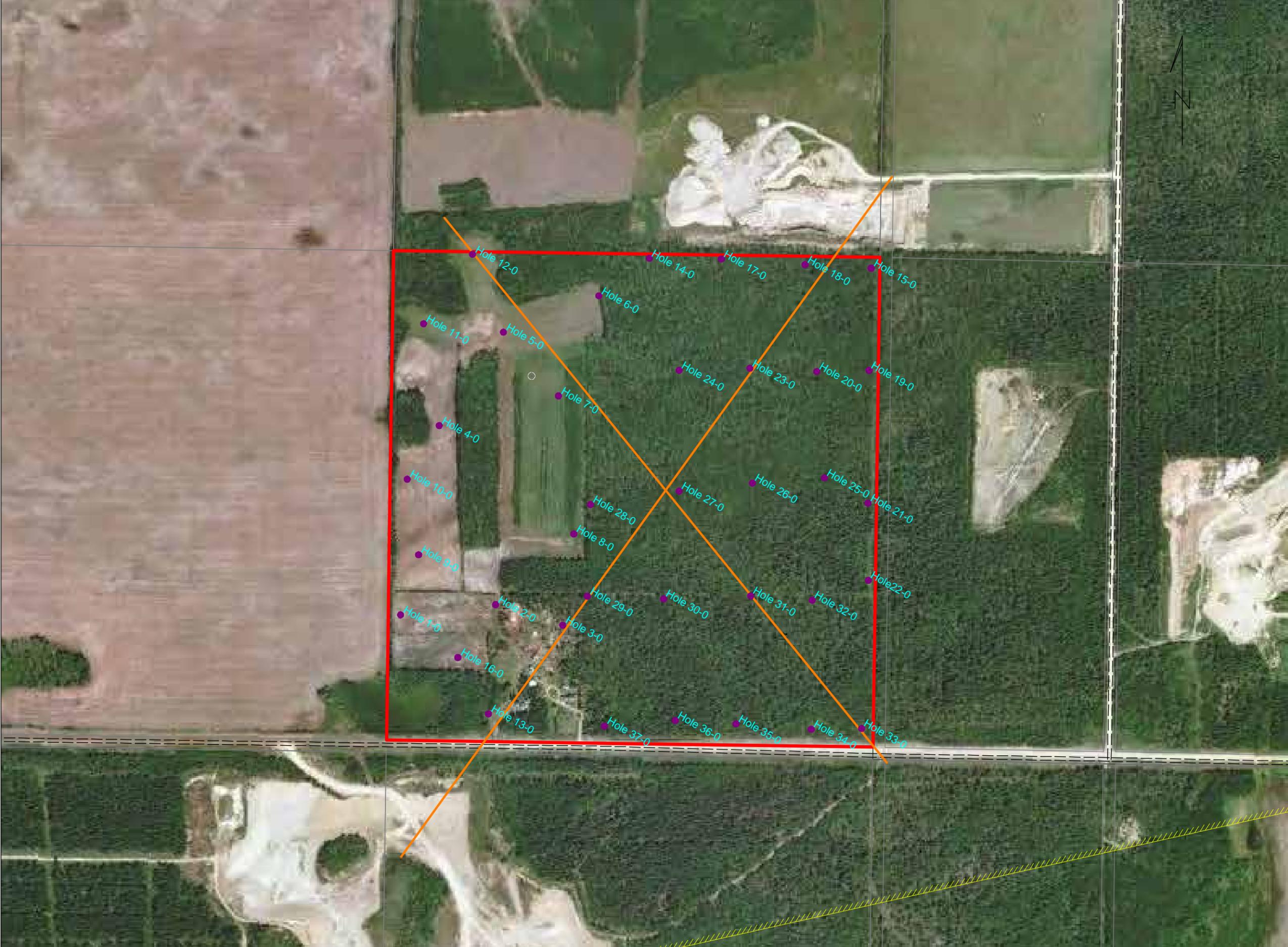
**APPENDIX 3
TEST HOLE PLAN**



SE Sec.1, Twp. 82, Rng. 1
 W6M
 WHITELAW PIT
 Testhole Plan

Legend

- Grimshaw Aquifer
- Property
- Test Hole Location
- ATS Grid
- Roads
- Cross Sections



22/03/29 Plan Scale 1:6000



APPENDIX 4
TEST HOLE PLAN
Summary

TESTHOLE SUMMARY

Borehole #	Easting	Northing	Surface Elev. (m)	Topsoil thickness (m)	Overburden Thickness (m)	Sand Thickness (m)	Gravel Thickness (m)	Total Depth (m)	Topsoil Layer Elev. (m)	Overburden Layer Elev (m)	Sand Layer Elev (m)	Gravel Layer Elev (m)	Potential Gravel Layer Elev (m)
BH-1	436943.04	6214845.87	656.90	0.1	1.2		2.0	3.3	656.80	655.60	655.60	653.60	646.00
BH-2	437099.70	6214862.61	656.87	0.1	1.6	1.6		3.3	656.77	655.17	653.57	653.57	653.57
BH-3	437210.68	6214828.82	656.88	0.1	1.5	2.1		3.7	656.78	655.28	653.18	653.18	653.18
BH-4	437006.87	6215156.95	660.67	0.1	2.6	0.5	1.1	4.3	660.57	657.97	657.47	656.37	656.37
BH-5	437112.89	6215310.69	662.12	0.1	3.1		0.5	3.7	662.02	658.92	658.92	658.42	658.52
BH-6	437270.20	6215370.39	661.02	0.1	2.2		1.8	4.1	660.92	658.72	658.72	656.92	646.00
BH-7	437203.68	6215205.84	659.78	0.1	2.1		2.0	4.2	659.68	657.58	657.58	655.58	646.00
BH-8	437229.06	6214978.71	657.13	0.1	1.5	0.4	2.2	4.2	657.03	655.53	655.13	652.93	646.00
BH-9	436972.75	6214944.73	658.54	0.1	1.7	0.4	2.0	4.2	658.44	656.74	656.34	654.34	646.00
BH-10	436953.37	6215068.78	659.34	0.1	1.5		2.5	4.1	659.24	657.74	657.74	655.24	646.00
BH-11	436981.12	6215324.53	661.03	0.1	2.8		1.0	3.9	660.93	658.13	658.13	657.13	646.00
BH-12	437061.79	6215438.78	661.26	0.1	3.5		0.4	4.0	661.16	657.66	657.66	657.26	646.00
BH-13	437088.02	6214683.01	656.45	0.1	1.4	0.5	2.0	4.0	656.35	654.95	654.45	652.45	646.00
BH-14	437353.56	6215443.64	661.51	0.1	2.4		1.5	4.0	661.41	659.01	659.01	657.51	646.00
BH-15	437719.80	6215427.10	658.40	0.1	2.5		1.4	4.0	658.30	655.80	655.80	654.40	646.00
BH-16	437037.64	6214775.80	656.40	0.1	1.6	1.6	1.0	4.3	656.30	654.70	653.10	652.10	651.10
BH-17	437472.56	6215442.47	662.22	0.1	2.9	0.5	1.3	4.8	662.12	659.22	658.72	657.42	657.42
BH-18	437610.61	6215432.89	659.41	0.1	2.3		2.0	4.4	659.31	657.01	657.01	655.01	646.00
BH-19	437725.27	6215247.78	657.43	0.1	2.0		2.4	4.5	657.33	655.33	655.33	652.93	646.00
BH-20	437629.87	6215245.94	657.68	0.1	2.1	1.0	1.1	4.3	657.58	655.48	654.48	653.38	646.00
BH-21	437723.54	6215029.63	655.38	0.1	1.5		2.4	4.0	655.28	653.78	653.78	651.38	646.00
BH-22	437715.10	6214902.52	654.56	0.1	2.2		2.0	4.3	654.46	652.26	652.26	650.26	646.00
BH-23	437519.52	6215251.10	659.14	0.1	2.9		1.8	4.8	659.04	656.14	656.14	654.34	646.00
BH-24	437402.87	6215247.90	658.84	0.1	1.3		3.1	4.5	658.74	657.44	657.44	654.34	646.00
BH-25	437642.50	6215071.20	657.20	0.1	2.0		2.7	4.8	657.10	655.10	655.10	652.40	646.00
BH-26	437523.81	6215062.69	657.77	0.1	1.8		2.9	4.8	657.67	655.87	655.87	652.97	646.00
BH-27	437402.91	6215049.42	657.42	0.1	2.0	0.4	2.4	4.9	657.32	655.32	654.92	652.52	652.52
BH-28	437256.41	6215027.18	657.36	0.1	2.0		2.7	4.8	657.26	655.26	655.26	652.56	646.00
BH-29	437251.41	6214876.53	657.37	0.1	2.1	0.4	2.3	4.9	657.27	655.17	654.77	652.47	652.47
BH-30	437376.92	6214872.03	657.62	0.1	2.3		2.4	4.8	657.52	655.22	655.22	652.82	646.00
BH-31	437520.99	6214876.95	656.47	0.1	2.1		2.6	4.8	656.37	654.27	654.27	651.67	646.00
BH-32	437622.36	6214870.02	655.10	0.1	2.2		2.5	4.8	655.00	652.80	652.80	650.30	646.00
BH-33	437704.10	6214659.12	652.97	0.1	0.9		3.8	4.8	652.87	651.97	651.97	648.17	646.00
BH-34	437620.78	6214657.88	654.35		1.5		3.3	4.8	654.35	652.85	652.85	649.55	646.00
BH-35	437496.64	6214666.58	655.76	0.1	2.2		2.5	4.8	655.66	653.46	653.46	650.96	646.00
BH-36	437396.42	6214672.16	654.63	0.1	1.5		3.2	4.8	654.53	653.03	653.03	649.83	646.00
BH-37	437279.42	6214663.07	654.87	0.1	0.5	1.9	2.3	4.8	654.77	654.27	652.37	650.07	646.00

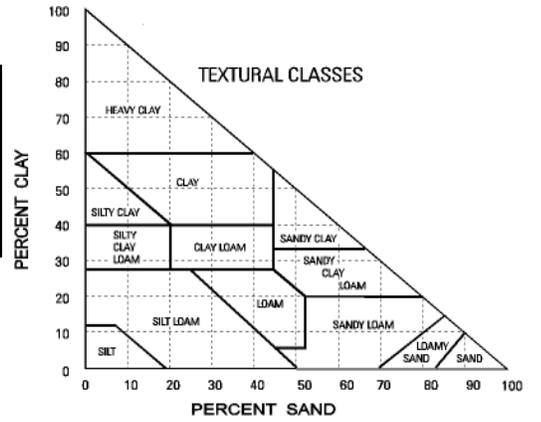
APPENDIX 4
TEST HOLE PLAN
Field Sheets

Hammerhead Whitelaw 1-82-1-W6M Property Testhole Summarized Data

Borehole #	Easting	Northing	Surface Elev. (m)	Topsoil thickness (m)	Overburden (Clay) Thickness (m)	Sand Thickness (m)	Gravel Thickness (m)	Total Depth (m)	Boulders	Cobble	Pebble	Fines	Rock %	Notes
BH-1	436943.04	6214845.87	656.90	0.1	1.2		2.0	3.3	2%		10%	88%	12%	Dry subsurface materials
BH-2	437099.70	6214862.61	656.87	0.1	1.6	1.6	0.0	3.3		2%	10%	88%	12%	Dry subsurface materials
BH-3	437210.68	6214828.82	656.88	0.1	1.5	2.1	0.0	3.7		2%		98%	2%	Dry subsurface materials
BH-4	437006.87	6215156.95	660.67	0.1	2.6	0.5	1.1	4.3	10%	20%	20%	50%	50%	Dry subsurface materials
BH-5	437112.89	6215310.69	662.12	0.1	3.1		0.5	3.7	5%	15%	25%	55%	45%	Dry subsurface materials
BH-6	437270.20	6215370.39	661.02	0.1	2.2		1.8	4.1	5%	20%	45%	30%	70%	Dry subsurface materials
BH-7	437203.68	6215205.84	659.78	0.1	2.1		2.0	4.2		20%	30%	50%	50%	Dry subsurface materials
BH-8	437229.06	6214978.71	657.13	0.1	1.5	0.4	2.2	4.2		5%	45%	50%	50%	Dry subsurface materials
BH-9	436972.75	6214944.73	658.54	0.1	1.7	0.4	2.0	4.2		3%	12%	85%	15%	Dry subsurface materials
BH-10	436953.37	6215068.78	659.34	0.1	1.5		2.5	4.1		15%	40%	45%	55%	Dry subsurface materials
BH-11	436981.12	6215324.53	661.03	0.1	2.8		1.0	3.9		15%	55%	30%	70%	Dry subsurface materials
BH-12	437061.79	6215438.78	661.26	0.1	3.5		0.4	4.0		5%	55%	40%	60%	Dry subsurface materials
BH-13	437088.02	6214683.01	656.45	0.1	1.4	2.5	0.5	4.5		5%	35%	60%	40%	Dry subsurface materials
BH-14	437353.56	6215443.64	661.51	0.1	2.4		1.5	4.0		20%	60%	20%	80%	Dry subsurface materials
BH-15	437719.80	6215427.10	658.40	0.1	2.5		1.4	4.0		15%	30%	55%	45%	Dry subsurface materials
BH-16	437037.64	6214775.80	656.40	0.1	1.6	1.6	1.0	4.3		5%	40%	55%	45%	Dry subsurface materials
BH-17	437472.56	6215442.47	662.22	0.1	2.9	0.5	1.3	4.8		10%	50%	40%	60%	Dry subsurface materials
BH-18	437610.61	6215432.89	659.41	0.1	2.3		2.0	4.4		15%	50%	35%	65%	Dry subsurface materials
BH-19	437725.27	6215247.78	657.43	0.1	2.0		2.4	4.5		15%	50%	35%	65%	Dry subsurface materials
BH-20	437629.87	6215245.94	657.68	0.1	2.1	1.0	1.1	4.3		5%	15%	80%	20%	Dry subsurface materials
BH-21	437723.54	6215029.63	655.38	0.1	1.5		2.4	4.0		5%	60%	35%	65%	Damp sand and gravel, no standing water
BH-22	437715.10	6214902.52	654.56	0.1	2.2		2.0	4.3	5%	15%	50%	30%	70%	Dry subsurface materials
BH-23	437519.52	6215251.10	659.14	0.1	2.9		1.8	4.8		5%	70%	25%	75%	Dry subsurface materials
BH-24	437402.87	6215247.90	658.84	0.1	1.3		3.1	4.5		5%	65%	30%	70%	Dry subsurface materials
BH-25	437642.50	6215071.20	657.20	0.1	2.0		2.7	4.8		10%	50%	40%	60%	Dry subsurface materials
BH-26	437523.81	6215062.69	657.77	0.1	1.8		2.9	4.8		10%	50%	40%	60%	Dry subsurface materials
BH-27	437402.91	6215049.42	657.42	0.1	2.0	0.4	2.4	4.9		5%	60%	35%	65%	Dry subsurface materials
BH-28	437256.41	6215027.18	657.36	0.1	2.0		2.7	4.8		4%	43%	53%	47%	Dry subsurface materials
BH-29	437251.41	6214876.53	657.37	0.1	2.1	0.4	2.3	4.9			10%	90%	10%	Dry subsurface materials
BH-30	437376.92	6214872.03	657.62	0.1	2.3		2.4	4.8			50%	50%	50%	Dry subsurface materials
BH-31	437520.99	6214876.95	656.47	0.1	2.1		2.6	4.8		5%	50%	45%	55%	Dry subsurface materials
BH-32	437622.36	6214870.02	655.10	0.1	2.2		2.5	4.8		4%	50%	46%	54%	Dry subsurface materials
BH-33	437704.10	6214659.12	652.97	0.1	0.9		3.8	4.8		10%	50%	40%	60%	Dry subsurface materials
BH-34	437620.78	6214657.88	654.35	0.0	1.5		3.3	4.8	3%	15%	50%	32%	68%	Sand at surface, dry subsurface materials
BH-35	437496.64	6214666.58	655.76	0.1	2.2		2.5	4.8		5%	40%	55%	45%	Dry subsurface materials
BH-36	437396.42	6214672.16	654.63	0.1	1.5		3.2	4.8		15%	60%	25%	75%	Dry subsurface materials
BH-37	437279.42	6214663.07	654.87	0.1	0.5	1.9	2.3	4.8		5%	50%	45%	55%	Dry subsurface materials
Orange highlighted cells signify strata at bottom of test hole.						AVERAGES:	1.9	4.4						

Hammerhead Whitelaw 1-82-1-W6M Property Testhole Summarized Data

SURFACE MATERIALS SIZE CLASSIFICATION								
GRAVEL				SAND			FINES	OVERBURDEN
BOULDERS	COBBLE	PEBBLE	FINES	COARSE	MEDIUM	FINE	SILT	CLAY
300 > 75mm	75 > 20mm	20 > 5mm	5 > 2mm	2mm > 400um	400 > 80um	80 > 2um	2um	



GRAVEL TESTING RESULTS							SME #					
CLIENT		Mike Diachyshyn					DATE	Oct 20, 2021				
Notes		Test hole excavation by rubber-tired backhoe - Mike Biegel					TESTER	André Parenteau				
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	Type LAYER CLASS	Desc. SOIL	% COMPOSITION OF ROCK					
							% ROCK	BOULDERS	COBLES	PEBBLES	FINES	OTHER
56.074626N 118.012903 W	3	0	0.1	0.1	TS	Top Soil						
		0.1	1.3	1.2	Clay/S.	Cl/S	2%			5%	93	
		1.3	3.3	2.0	Sand/S	Sand/S			10	90		
56.074764N 118.010717 W	4	0	0.1	0.1	TS	TS						
		0.1	1.7	1.6	Sub	Clay/S	2%			5%	93	
		1.7	3.3	1.6	Sand					100		
56.074458 N 118.008801 W	3	0	0.1	0.1	T.S	TS					100	
		0.1	1.6	1.5	Sub	Clay/S	2%			98		
		1.6	3.7	2.1	Sand	Sand				100		
56.077151N 118.012069 W	X3	0	0.1	0.1	T.S.	T.S						
		0.1	2.7	2.6	Sub	Clay	2%				98	
		2.7	3.8	1.1	G/S	G/S	10	25	25	35		
		3.8	4.3	0.5	S	S		5	15	80		
56.078806 N 118.010403 W	X5	0	0.1	0.1	T.S	T.S			5%			
		0.1	0.6	0.5	G	Gravel	5	15	25	45		
		0.6	1.7	1.0	G/S	C/S				15	85	
		1.7	3.7	2.0	Clay						100	

Very Dry Clay, Dry Sand

Dry Clay

Dry

Dry

Dry

Whitelaw

GRAVEL TESTING RESULTS							SME #					
CLIENT		Mike Diachyshyn					DATE	Oct 20, 2021				
Notes							TESTER	Andre Parenteau				
							% COMPOSITION OF ROCK					
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	LAYER CLASS	SOIL	% ROCK	BOULDERS	COBLES	PEBBLES	FINES	OTHER
56.079363N 118.007890	X6	0	0.1	0.1	T.S	TS						
		0.1	2.3	2.2	Sub C							
		2.3	4.1	3.8	G			5	20	45	30	
56.077865N 118.008868 W	X7	0	0.1	0.1	T.S	TS						
		0.1	2.2	2.1	Sub C			5				95
		2.2	2.7	0.5	G	S/G			20	40	40	
		2.7	4.2	1.5	S/G	S/G			10	30	60	
56.075912N 118.008700 W	X5	0	0.1	0.1	T.S	TS						
		0.1	0.5	0.4	Sand						100	
		0.5	2.0	1.5	Clay							
		2.0	4.2	2.2	G/S				5	45	50	
56.075500N 118.012568W	X2	0	0.1	0.1	TS	TS						
		0.1	0.5	0.4	S/G	S/G			5	15	80	
		0.5	2.2	1.7	C	C						
		2.2	4.2	2.0	S/G	S/G				10	90	
56.0766151N 118.012936W	X4	0	0.1	0.1	T.S	TS						
		0.1	1.6	1.5	Sub C							
		1.6	4.1	2.5	G/S	G/S				15	40	45

Dry

Dry

Dry

Orange
Grey

Dry.

GRAVEL TESTING RESULTS						SME #							
CLIENT		Mike Diachyshyn				DATE	Oct 30, 2021						
Notes						TESTER	André Parenteau						
						% COMPOSITION OF ROCK							
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	LAYER CLASS	SOIL	% ROCK	BOULDERS	COBLES	PEBBLES	FINES	OTHER	
⑪	x6	0	0.1	0.1	TS	TS							
		0.1	2.9	2.8	Sub	C							
		2.9	3.9	1.0	G	Gravel			15	55	30		
⑫	x5	0	0.1	0.1	TS	TS							
		0.1	3.6	3.5	Sub	C			2			98	
		3.6	4.0	0.4	G	G			5	55	40		
⑬	x5	0	0.1	0.1	TS	TS							
		0.1	0.6	0.5	G/S				10	45	45		
		0.6	2.0	1.4	G/G					10	10	80	
		2.0	4.0	2.0	S					10	90		
⑭	x7	0	0.1	0.1	TS								
		0.1	2.5	2.4	C								
		2.5	4.0	1.5	G				20	60	20		
⑮	x2	0	0.1	0.1	TS								
		0.1	0.6	0.5	G				10	50	40		
		0.6	2.6	2.0	C/G				5	10		85	
		2.6	4.0	1.4	G				15	55	30		

Dry

Clay Dry

Orange Clay Dry

Dry

Clay Dry

Whiteaw Land Assessment

200



GRAVEL TESTING RESULTS						SME #						
CLIENT		Mike Diachyshyn				DATE	Oct 21, 2020					
Notes		230 Exc.				TESTER	André Parenteau					
						% COMPOSITION OF ROCK						
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	LAYER CLASS	SOIL	% ROCK	BOULDERS	COBLES	PEBBLES	FINES	OTHER
SW	16	0.1	0.1	0.1	TS							
		0.1	1.7	1.6	C							
		1.7	2.7	1.0	G			5	50	45		
		2.7	4.3	2.6	S				5	95		
		x6										
		56.073973N 118.011435W										
NE	17	0.1	0.1	0.1	TS							
		0.1	3.0	2.9	C							
		3.0	4.3	1.3	G			10	55	35		
		4.3	4.8	0.5	S				15	85		
		x6										
		56.080000N 118.004578W										
NE	18	0.1	0.1	0.1	TS							
		0.1	2.4	2.3	C							
		2.4	4.4	2.0	G			15	50	35		
		x6										
		56.079907N 118.002531W										
EN	19	0.1	0.1	0.1	TS							
		0.1	2.1	2.0	C							
		2.1	4.5	2.4	G			15	50	35		
		x6										
		56.078054N 118.000543W										
EN(W)	20	0.1	0.1	0.1	TS							
		0.1	2.2	2.1	C							
		2.2	3.0	0.8	G			5	10	50	35	
		3.0	4.0	1.0	S/G				20	35	55	
		4.0	4.3	0.3	G			5	10	50	35	
		x9										
		56.078351N 118.002111W										

Dry
Dry

Dry
Dry

Dry

Dry

Dry
Dry
Dry

GRAVEL TESTING RESULTS					SME #							
CLIENT		Hammerstrap			DATE	Nov 1						
Notes		230 Exc Hitachi			TESTER	Andre Parenteau						
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	LAYER CLASS	SOIL	% ROCK	% COMPOSITION OF ROCK				
								BOULDERS	COBLES	PEBBLES	FINES	OTHER
28		0	0.1	0.1	TS							
		0.1	2.1	2.0	C							
		2.1	4.5	2.4	G				5	55	40	
		4.5	4.8	0.3	S/G				2	43	50	
29		0	0.1	0.1	TS							
		0.1	0.6	0.5	S/G					10	90	
		0.6	2.2	1.6	C							
		2.2	4.5	2.3	G					10	90	
		4.5	4.9	0.4	S						100	
30		0	0.1	0.1	TS							
		0.1	0.5	0.4	S					20	80	
		0.5	0.6	0.1	G					40	60	
		0.6	2.4	1.8	C							
		2.4	4.8	2.4	G					50	50	
31		0	0.1	0.1	T.S							
		0.1	2.2	2.1	C							
		2.2	2.4	0.2	G				2	73	25	
		2.4	4.8	2.4	G				5	50	45	
32		0	0.1	0.1	TS							
		0.1	2.3	2.2	C							
		2.3	2.5	0.2	G				10	10	55	35
		2.5	4.5	2.0	G				2	63	35	
		4.5	4.8	0.3	G				10	45	45	

56.076278
118.008031

56.074924
118.008076

56.074900
118.006059

56.074963
118.003746

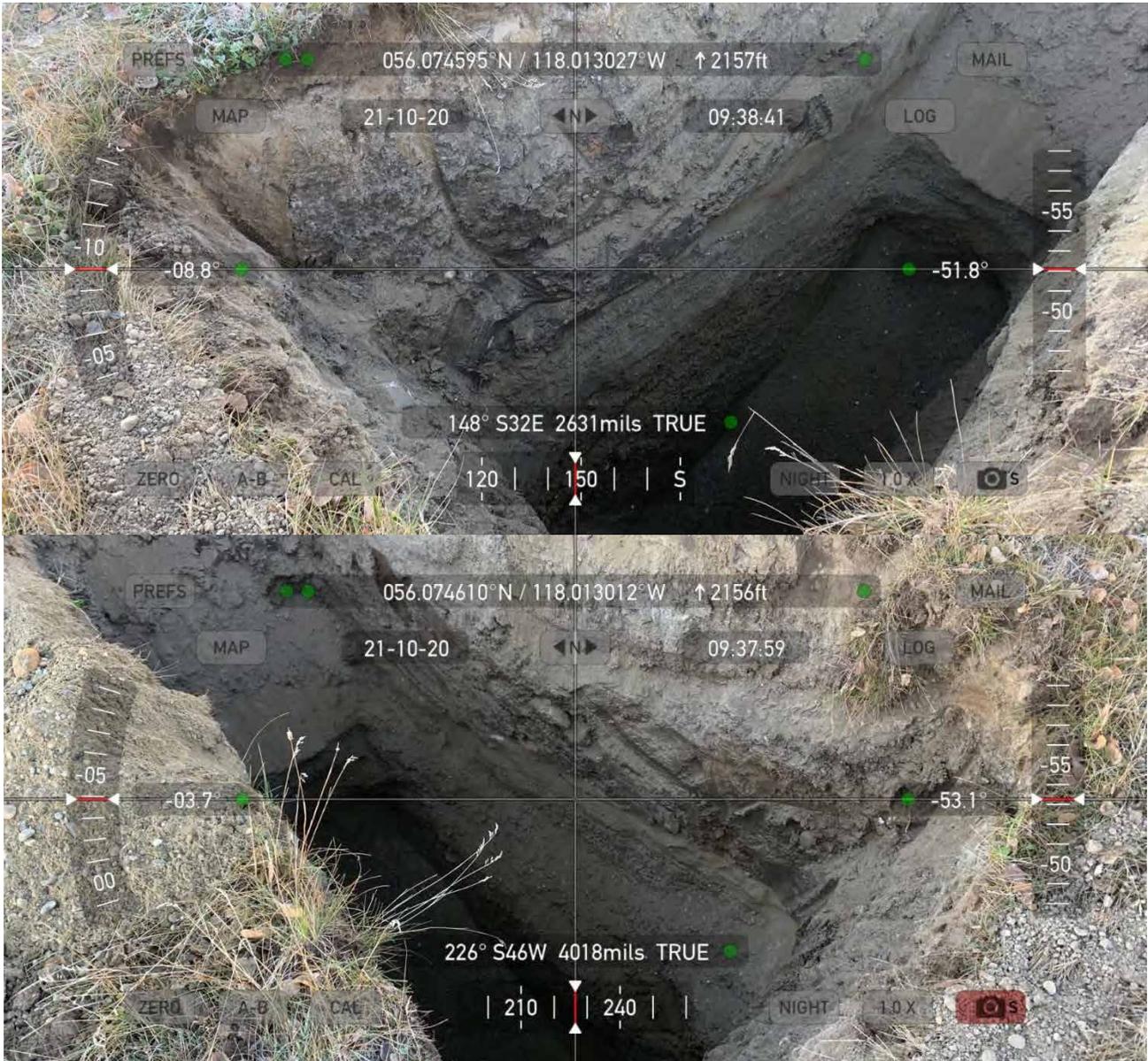
56.074914
118.008116

GRAVEL TESTING RESULTS						SME #	
CLIENT		Hammerstrap				DATE	Nov 4, 2021
Notes		230 Hitachi Excavator				TESTER	André Parenteau
							% COMPOSITION OF ROCK
HOLE #	PHOTO #	TOP DEPTH (m)	BOTTOM DEPTH (m)	LAYER DEPTH (m)	LAYER CLASS	SOIL	% ROCK
							BOULDERS
							COBLES
							PEBBLES
							FINES
							OTHER
33 56.073030 118.000754		0	0.1	0.1	TS		
		0.1	1.0	0.9	C		
		1.0	3.0	2.0	G		10 55 35
		3.0	4.0	1.0	G		- 80 20
		4.0	4.8	0.8	G		10 50 40
34 56.073008 118.002092		0	1.5	1.5	G/oy		
		1.5	4.8	3.3	G		3 15 50 32
35 56.073070 118.004088		0	0.1	0.1	TS		
		0.1	2.3	2.2	C		
		2.3	3.5	1.2	S/G		5 15 80
		3.5	4.8	1.3	G		5 60 35
36 56.073107 118.005699		0	0.1	0.1	T.S		
		0.1	1.6	1.5	C		
		1.6	4.8	3.2	G		15 60 25
37 56.073010 118.007576		0	0.1	0.1	TS		
		0.1	0.6	0.5	C		
		0.6	2.5	1.9	S		
		2.5	3.5	1.0	G		5 60 35
		3.5	4.8	1.3	S/G		5 35 60

T.S Stripped

**APPENDIX 5
TEST HOLE PICTURES**

Test Hole 1



Test Hole 2



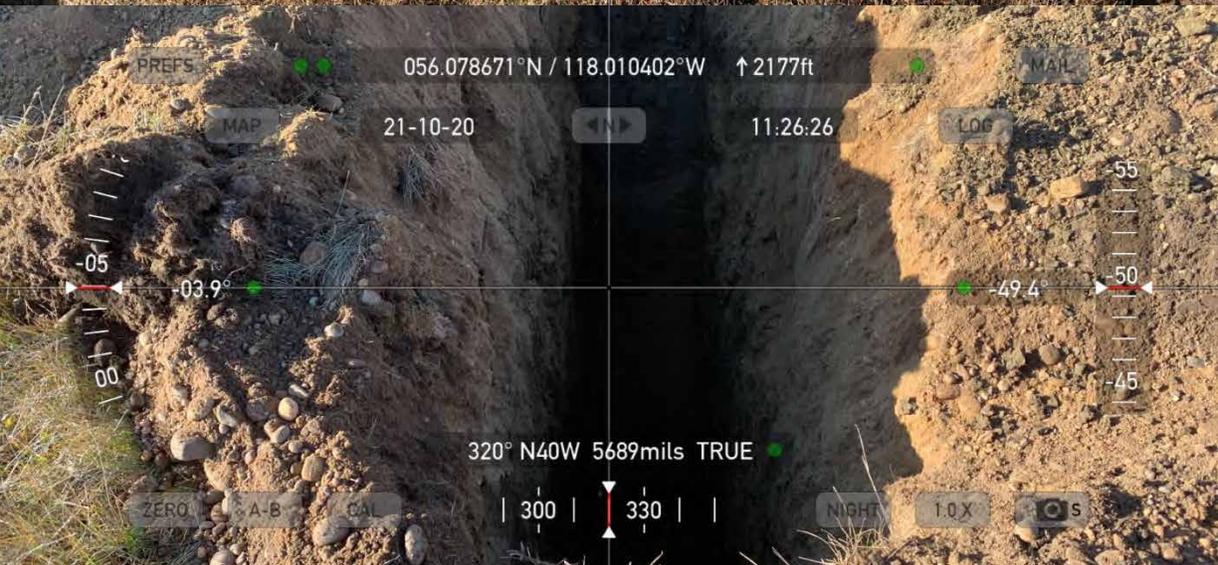
TEST HOLE 3



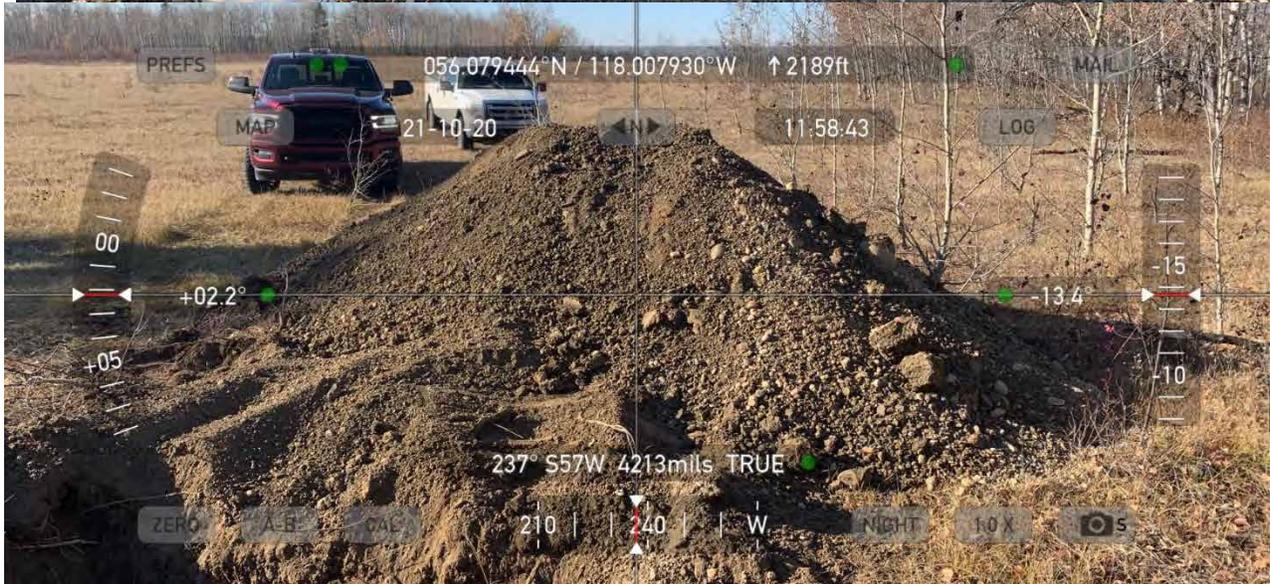
TEST HOLE 4



TEST HOLE 5



TEST HOLE 6



TEST HOLE 7



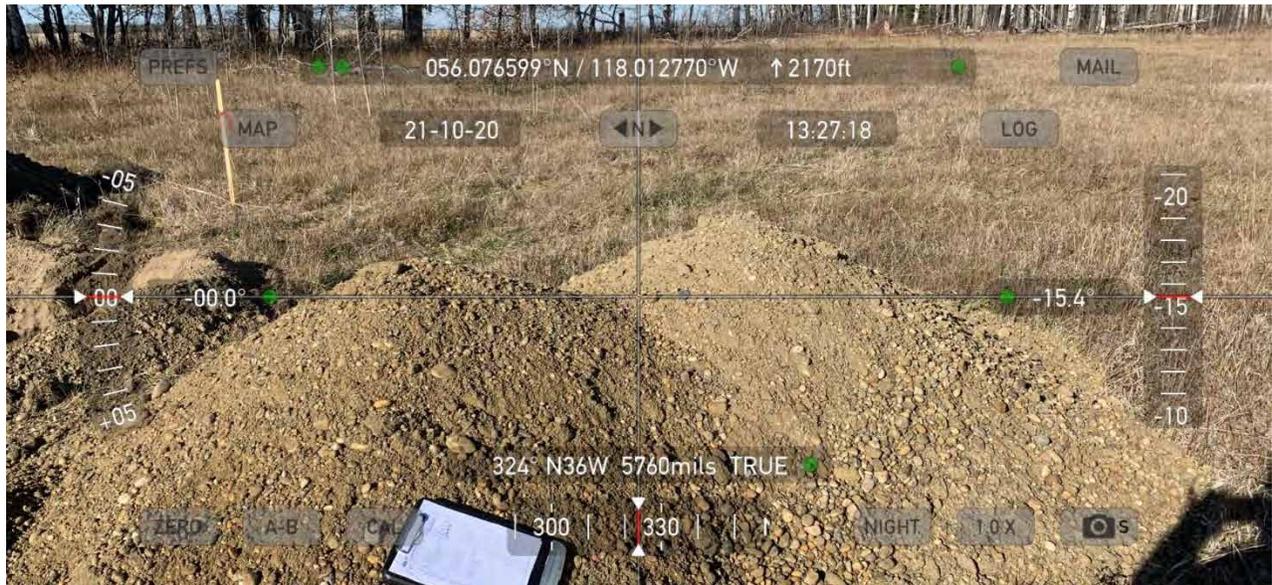
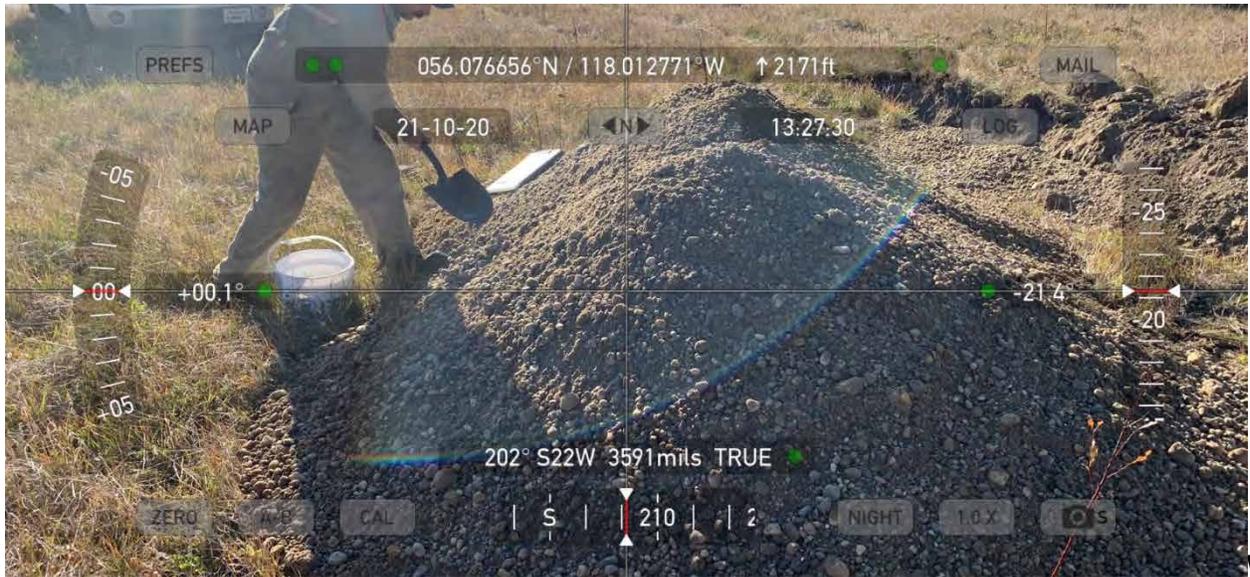
TEST HOLE 8



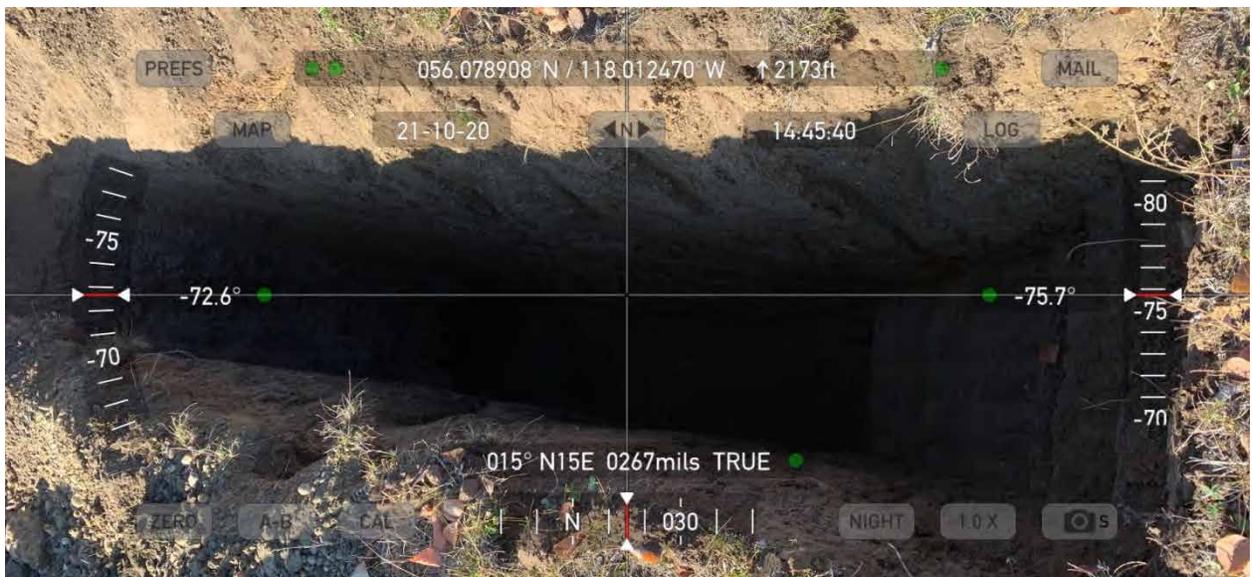
TEST HOLE 9



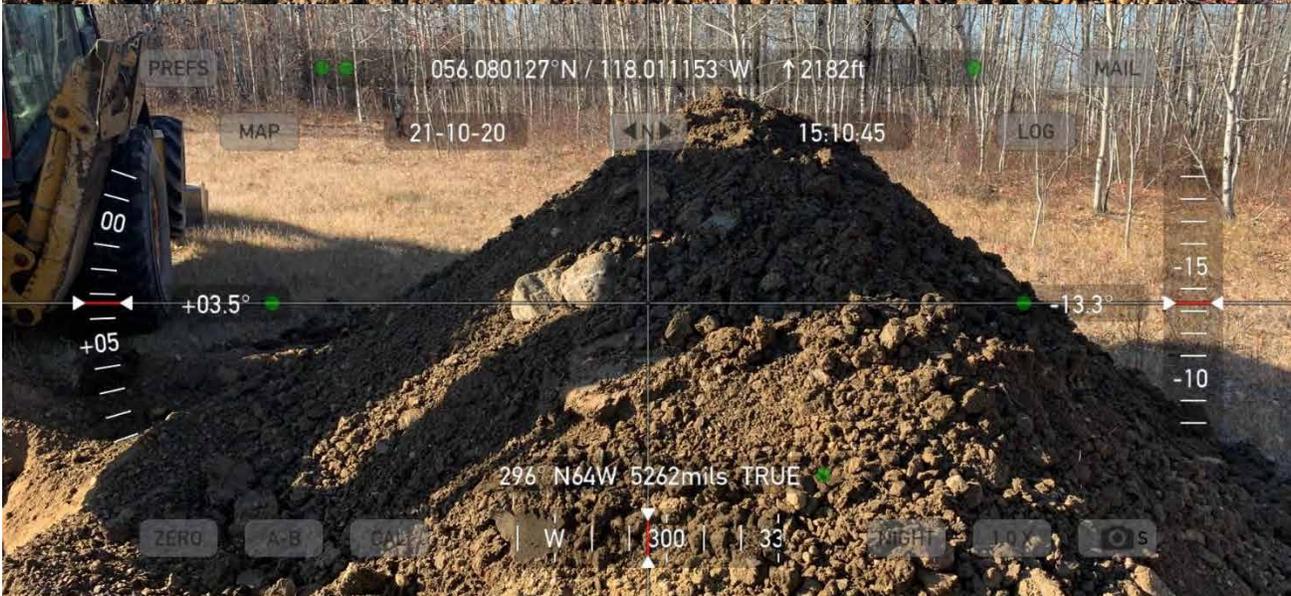
TEST HOLE 10



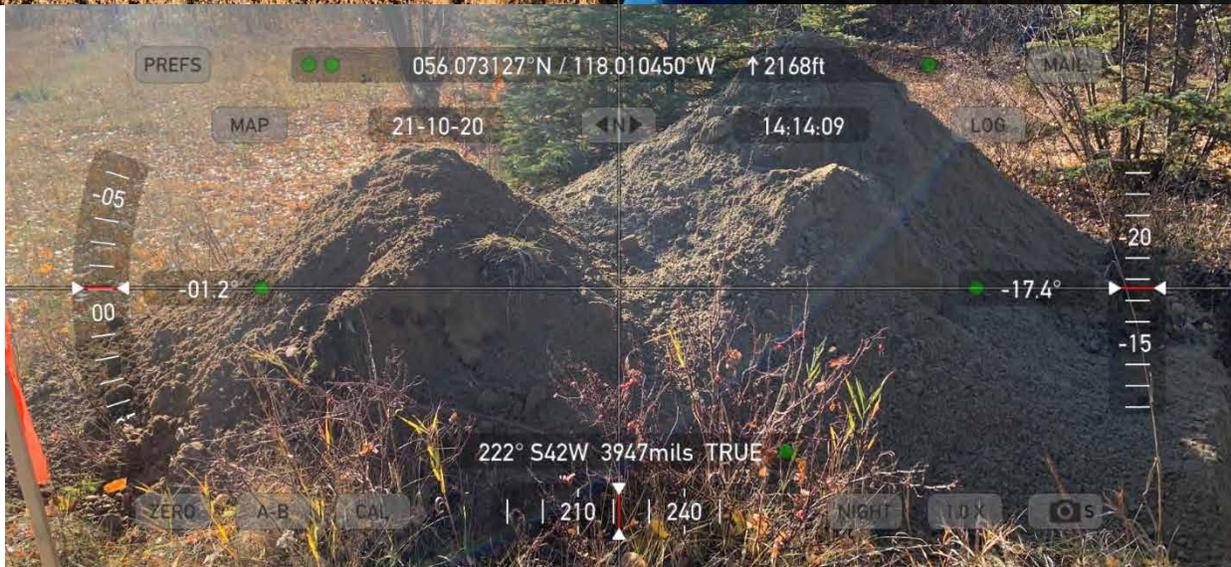
TEST HOLE 11



TEST HOLE 12



TEST HOLE 13



TEST HOLE 14



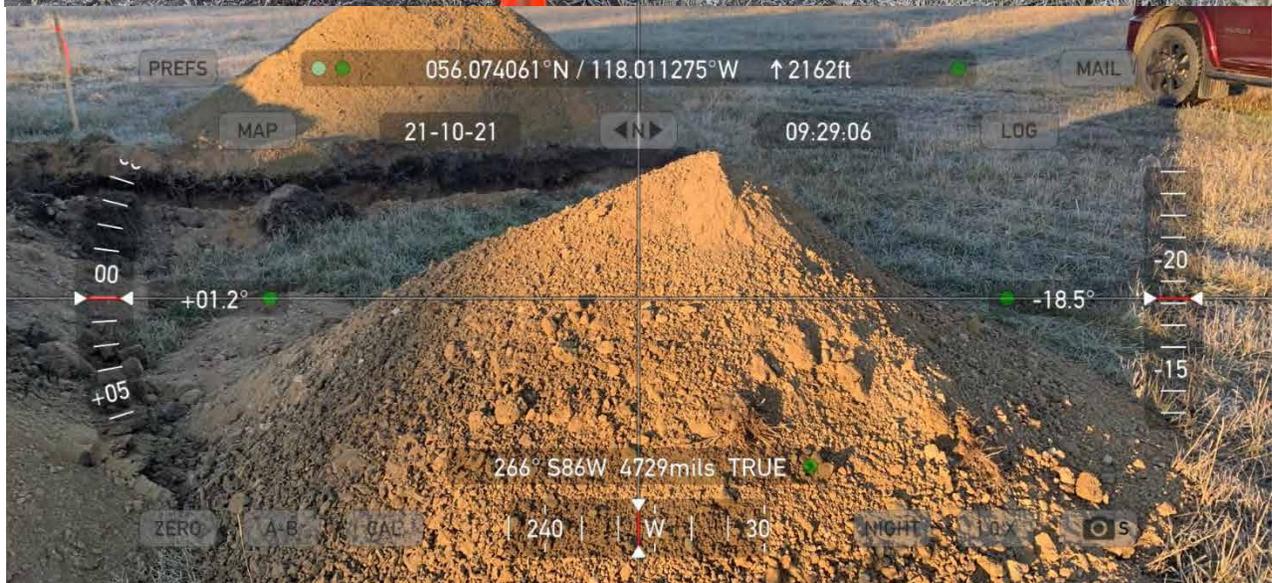
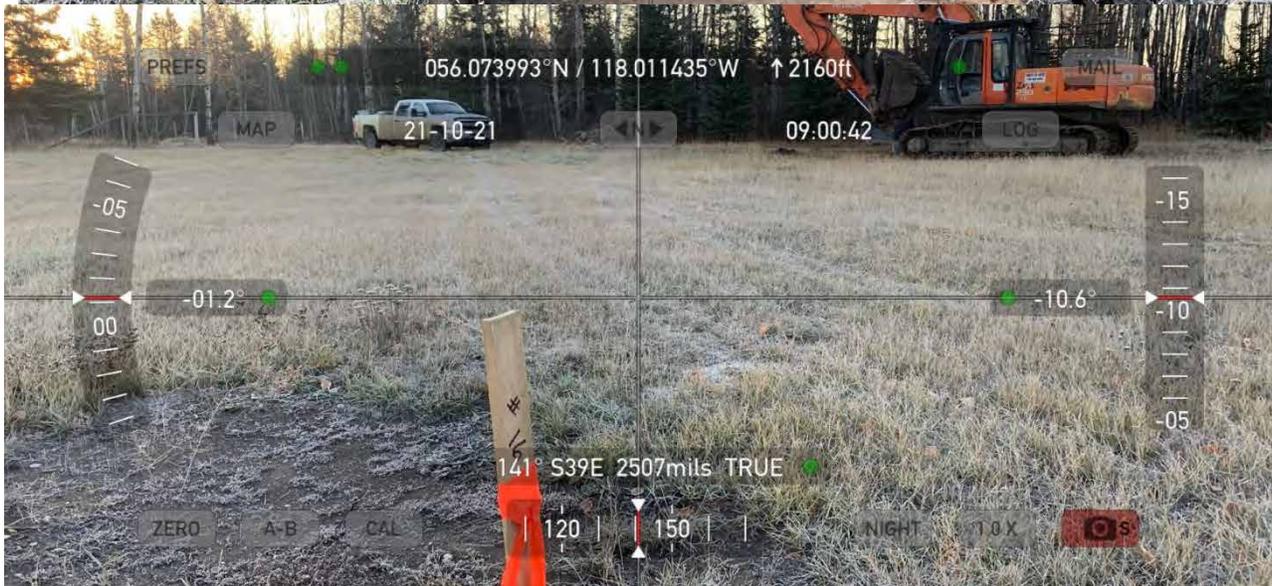
TEST HOLE 14 cont.



TEST HOLE 15



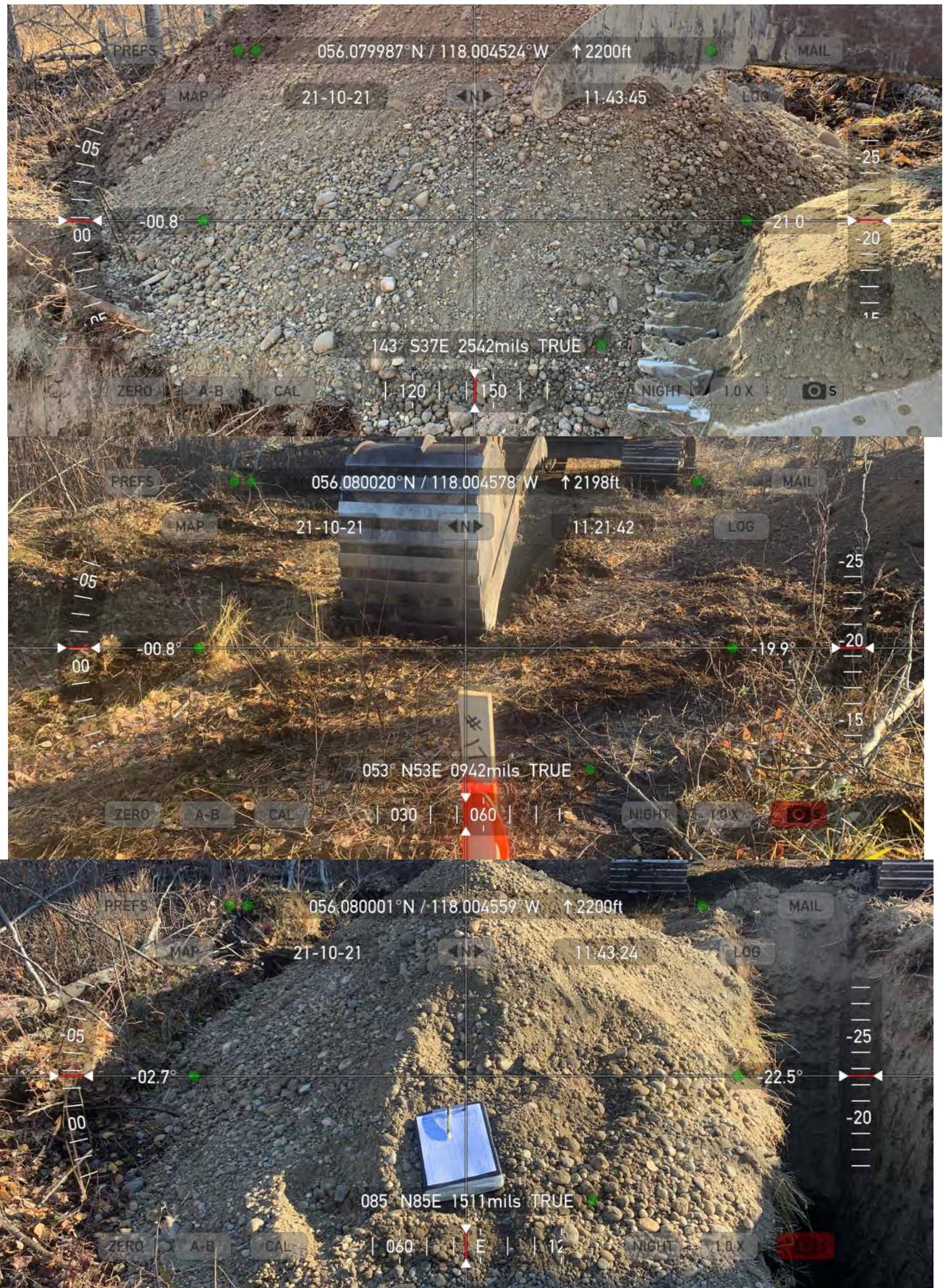
TEST HOLE 16



TEST HOLE 16 cont.



TEST HOLE 17



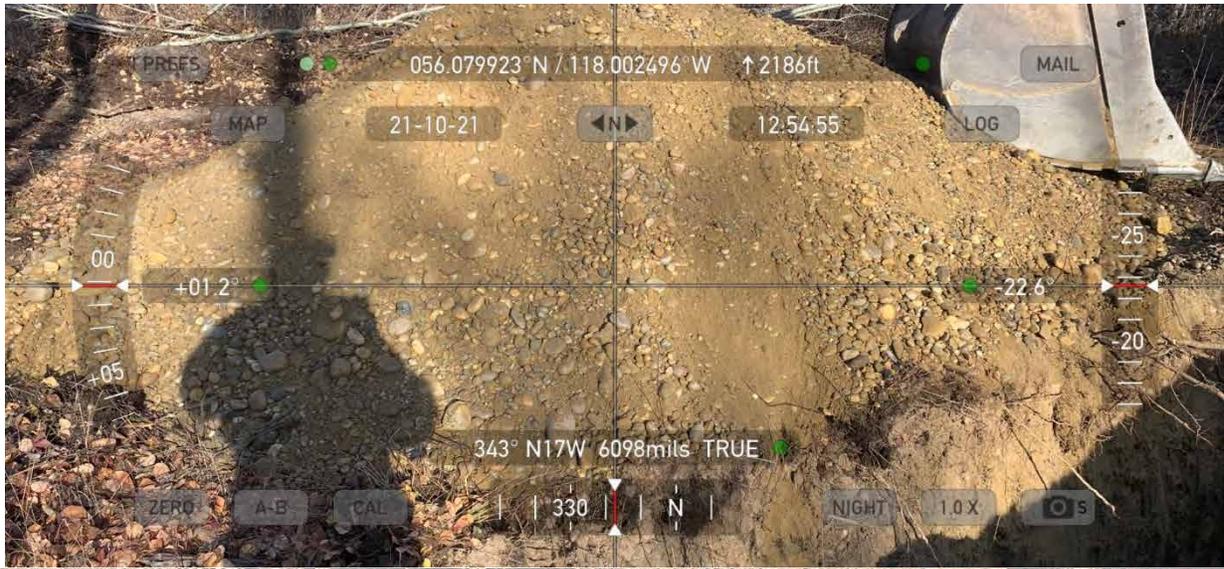
TEST HOLE 17 cont.



TEST HOLE 18



TEST HOLE 18 cont.



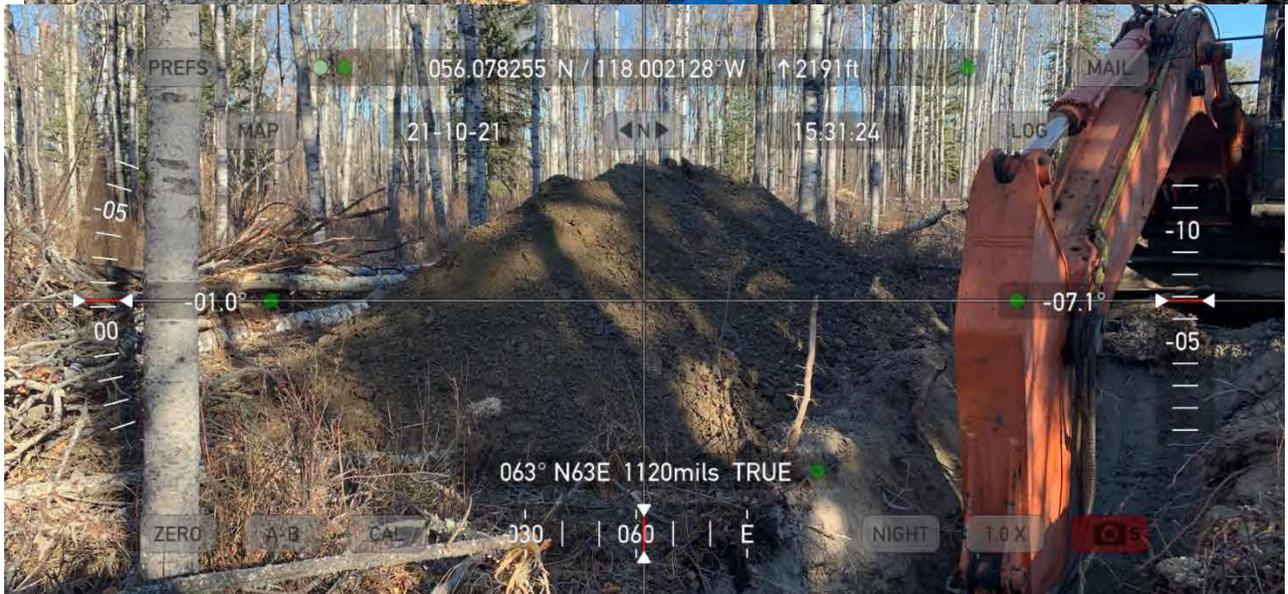
TEST HOLE 19



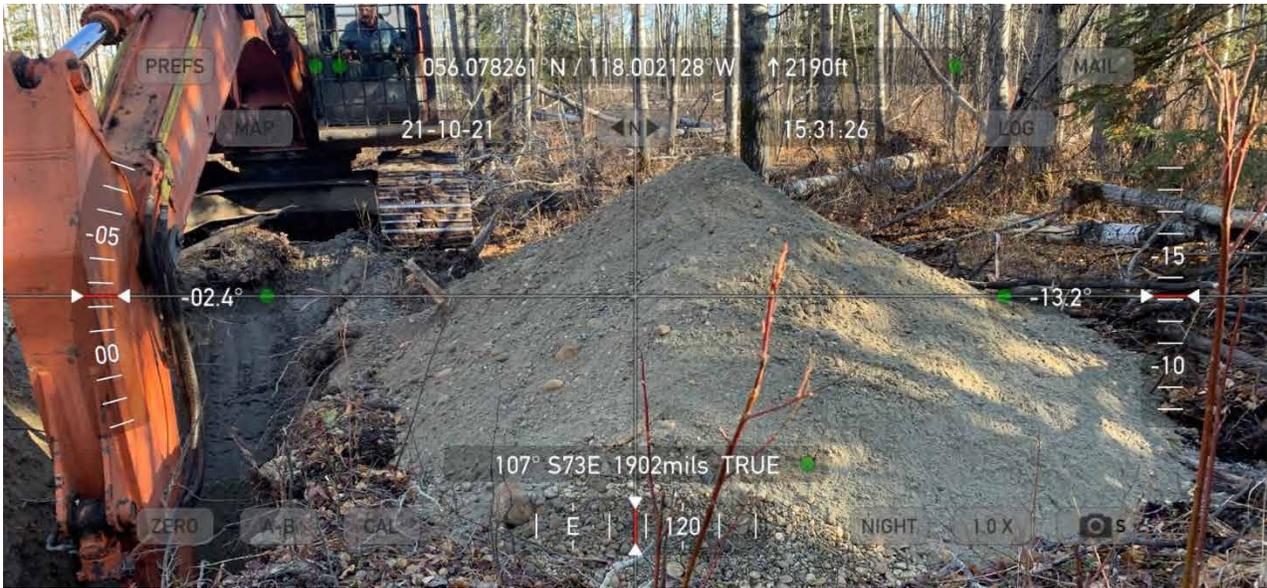
TEST HOLE 19 cont.



TEST HOLE 20



TEST HOLE 20 Cont.



TEST HOLE 21



TEST HOLE 21 cont.



TEST HOLE 22



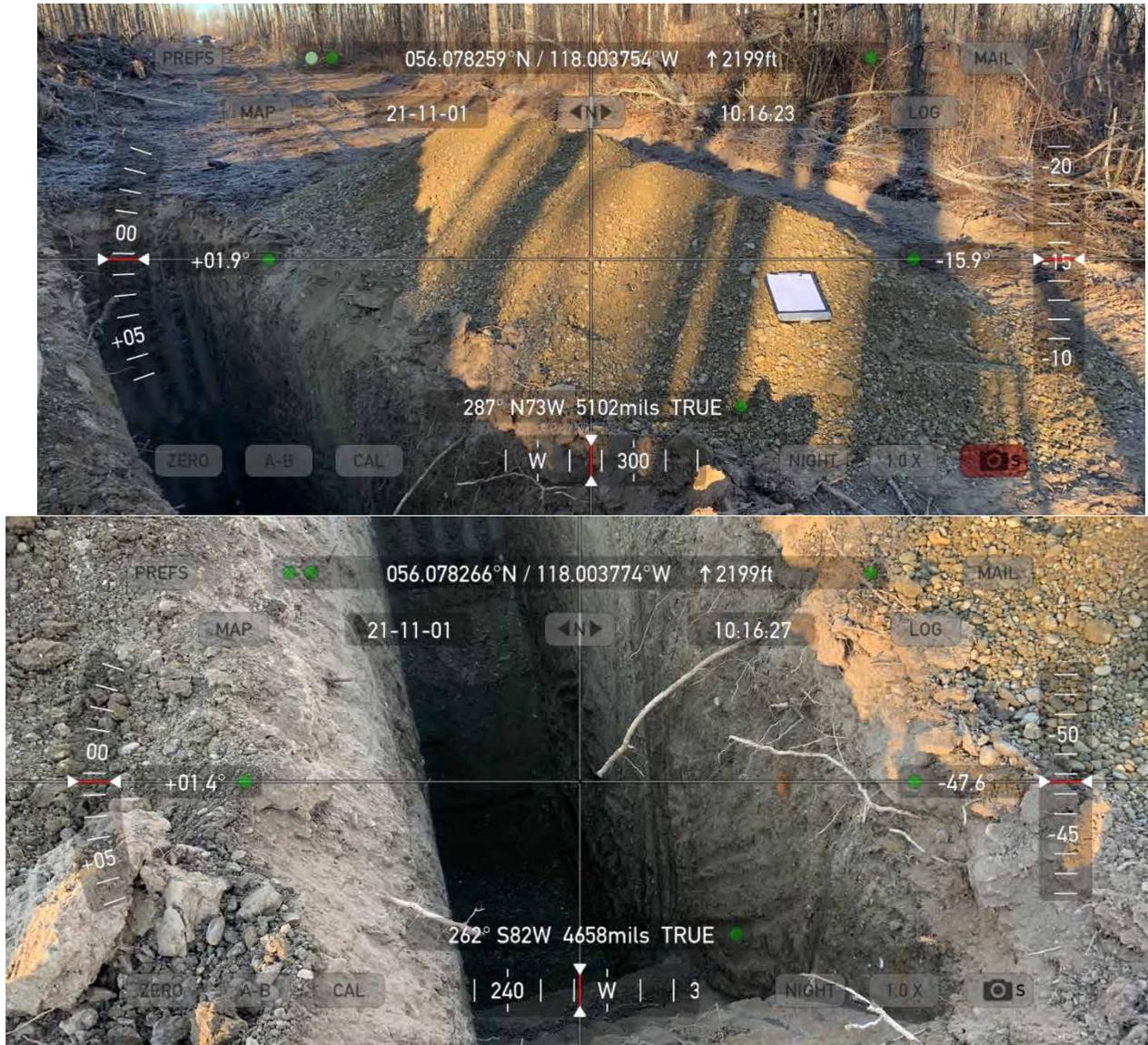
TEST HOLE 22 cont.



TEST HOLE 23



TEST HOLE 23 cont.



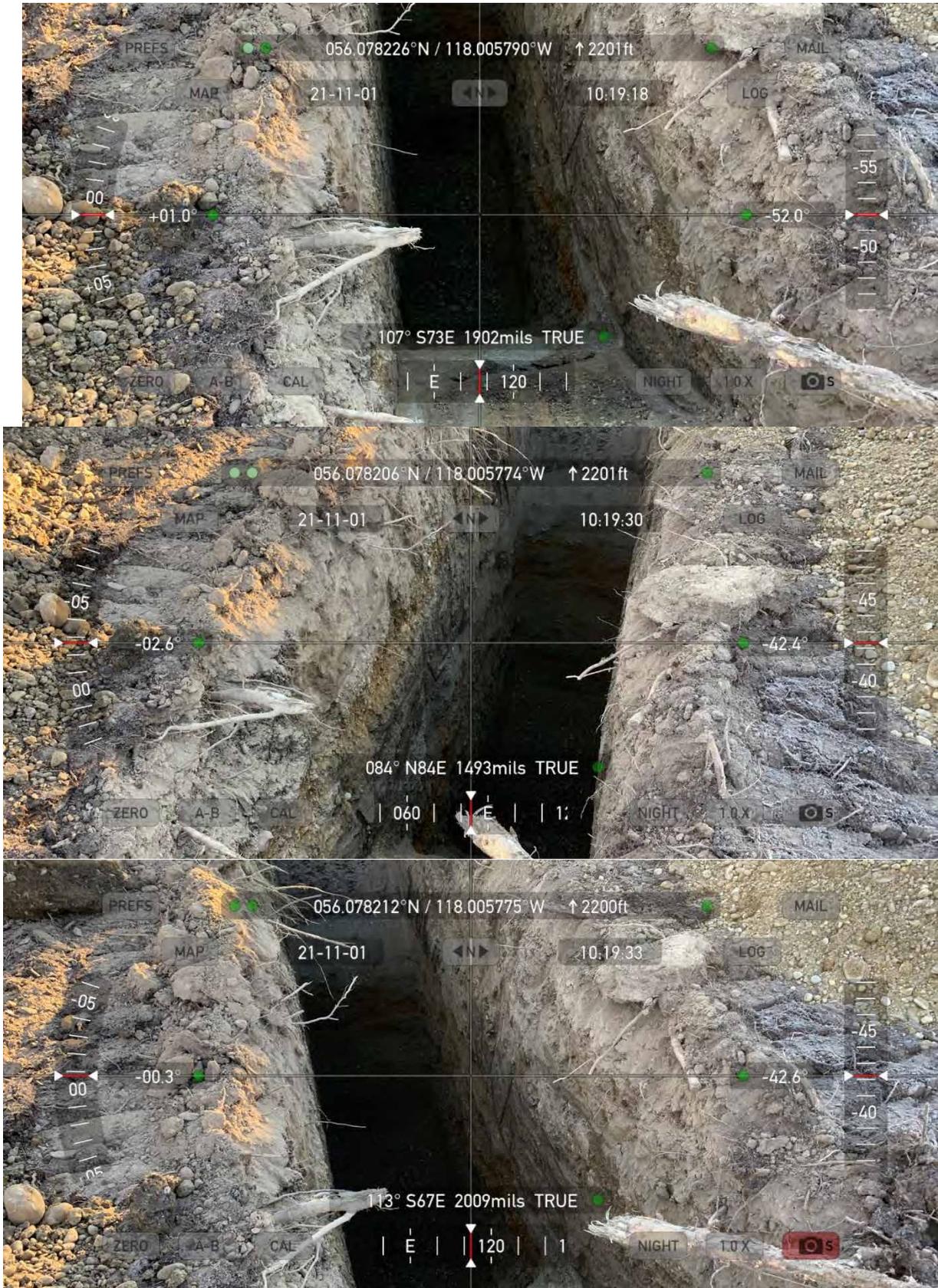
TEST HOLE 24



TEST HOLE 24 cont.



TEST HOLE 24 cont.



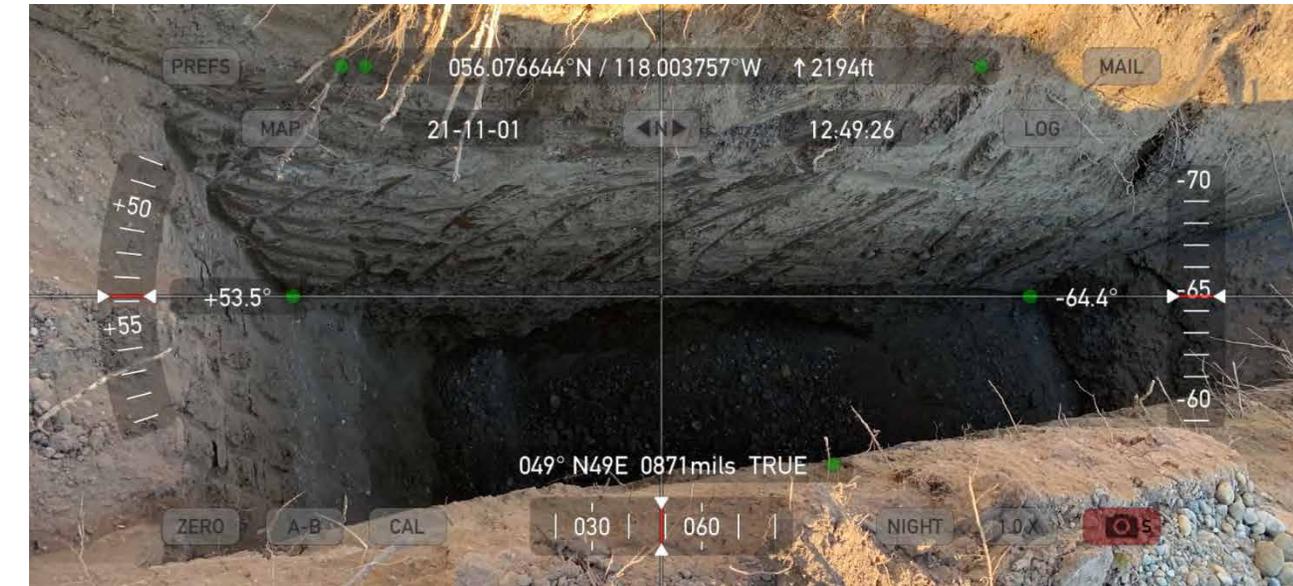
TEST HOLE 25



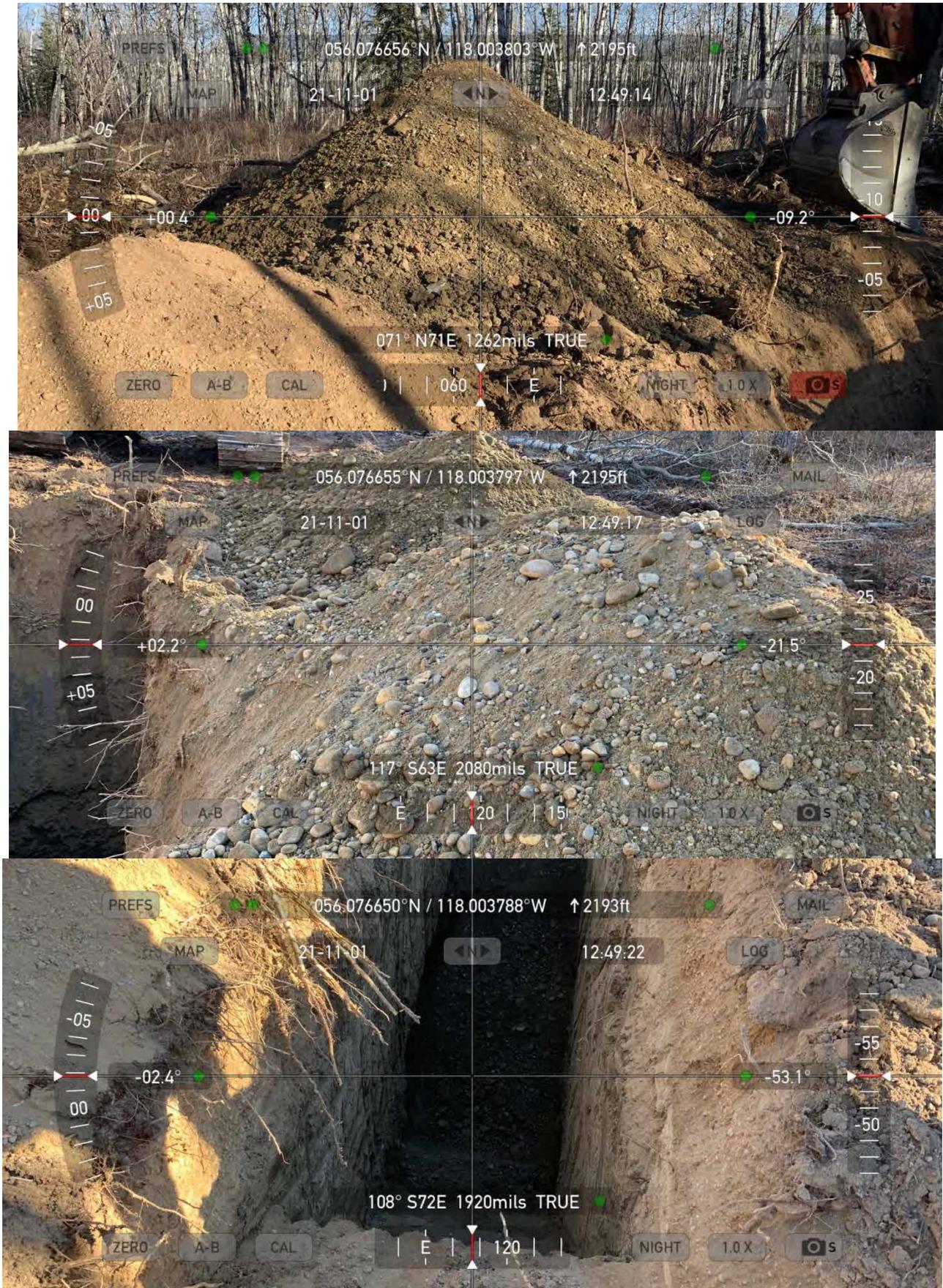
TEST HOLE 25 cont.



TEST HOLE 26



TEST HOLE 26 cont.



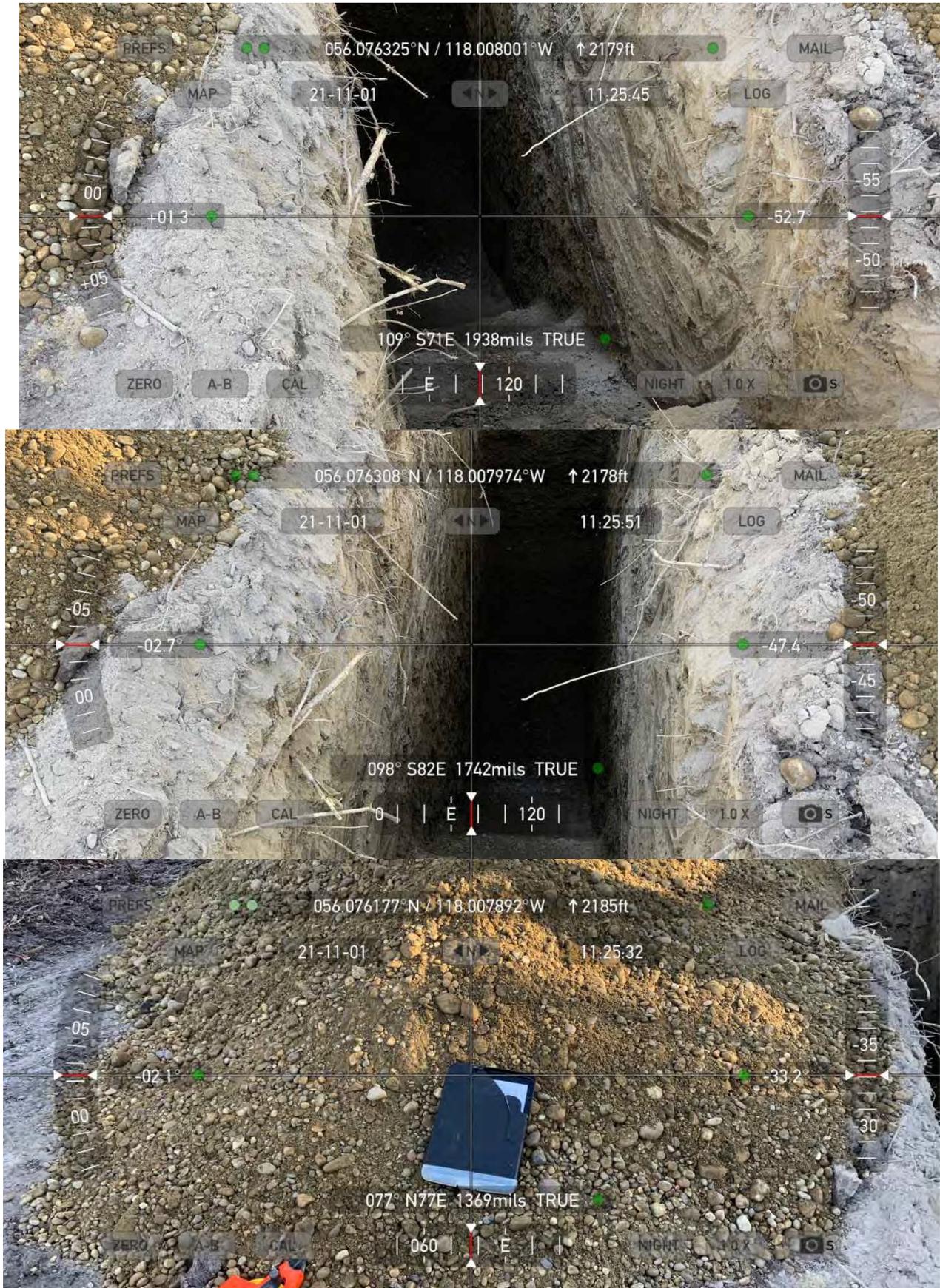
TEST HOLE 27



TEST HOLE 28



TEST HOLE 28 cont.



TEST HOLE 29



TEST HOLE 29 cont.



TEST HOLE 30



TEST HOLE 31



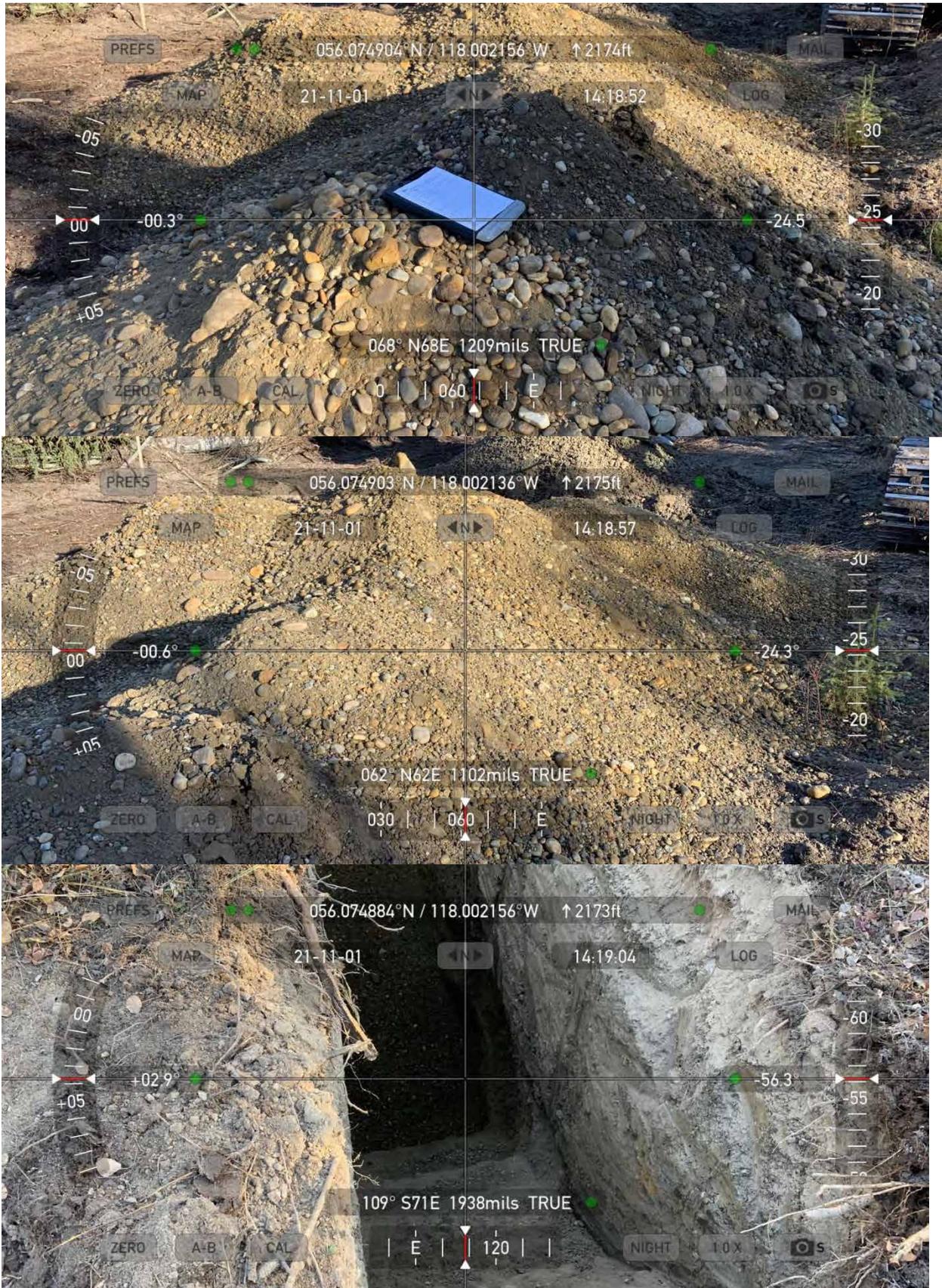
TEST HOLE 31 cont.



TEST HOLE 32



TEST HOLE 32 cont.



TEST HOLE 33



TEST HOLE 33 cont.



TEST HOLE 34



TEST HOLE 34 cont.



TEST HOLE 35



TEST HOLE 35 cont.



TEST HOLE 36



TEST HOLE 36 cont.



TEST HOLE 37



TEST HOLE 37 cont.



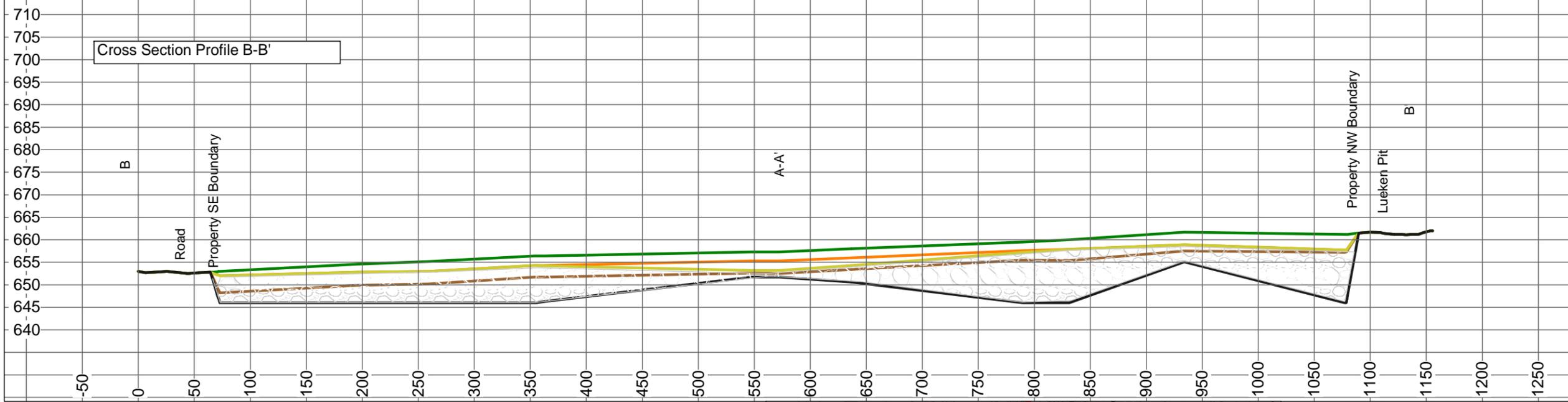
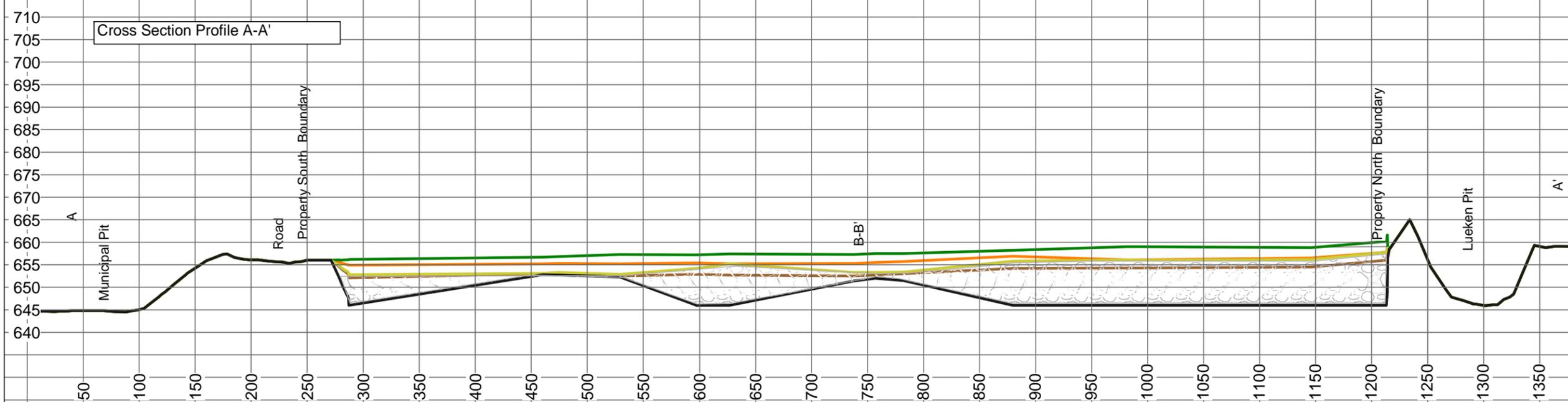
TEST HOLE 37 cont.



**APPENDIX 6
PROFILE PLAN**



**SE Sec.1, Twp. 82, Rng. 1
W6M
WHITELAW PIT
Profile Plans**



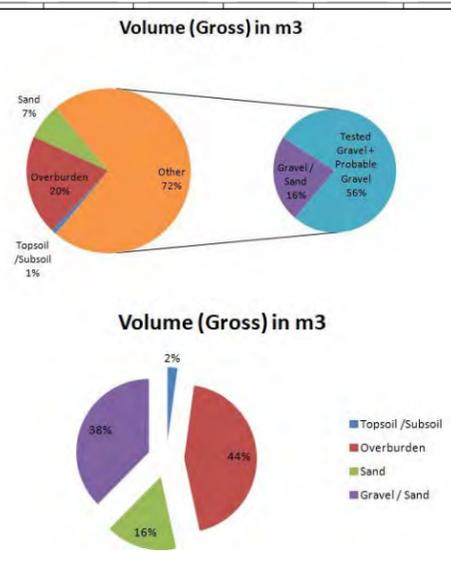
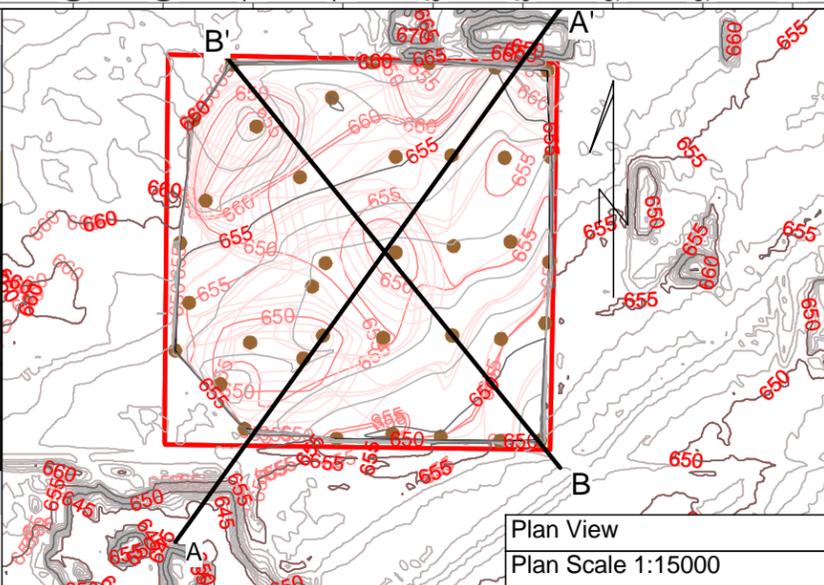
Legend

- Topsoil depth Elev
- Overburden Depth Elev
- Sand Depth Elev
- Gravel Depth Elev
- Probable Gravel Depth EI
- Gravel Zone

VOLUME CALCULATIONS SUMMARY (rounded to the nearest 1,000)

Subsoil Horizons	Volume (Gross) in m3	Volume (Gross) in tonnes
Topsoil /Subsoil	55,000	
Overburden	1,133,000	1,779,000
Sand	405,000	553,000
Gravel / Sand	957,000	1,562,000
Tested Gravel + Probable Gravel	3,214,000	5,245,000

values in Red are predicted only as resources are untested

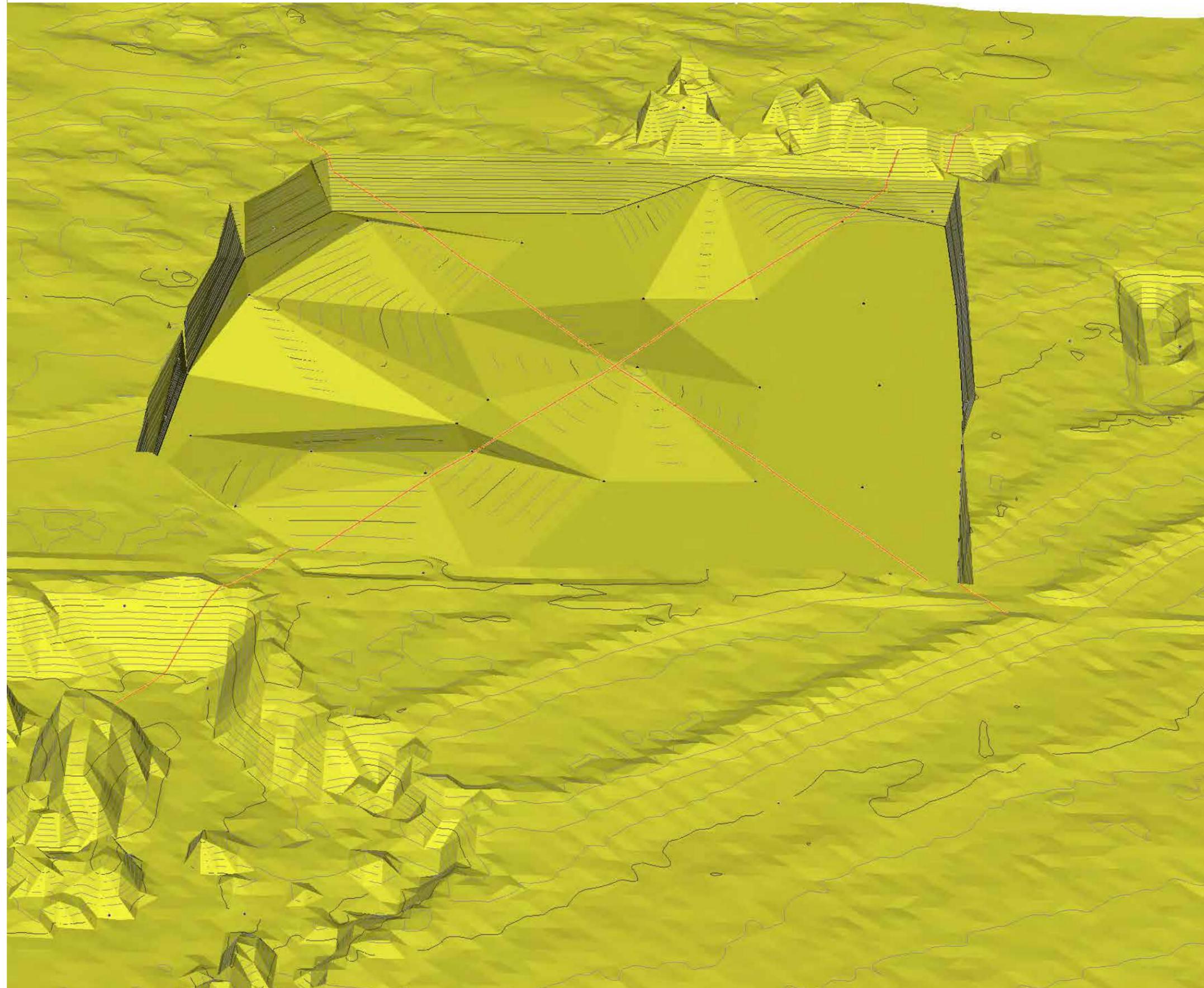


Profile Plan
22/02/21
Profile Vert Scale 1:1000
Profile Horz Scale 1:4000



**APPENDIX 7
TERRAIN MODEL**

3-D Surface Excavation Model. Digital Surface Model compiled from LiDar data. Elevation accuracy +/- 15cm



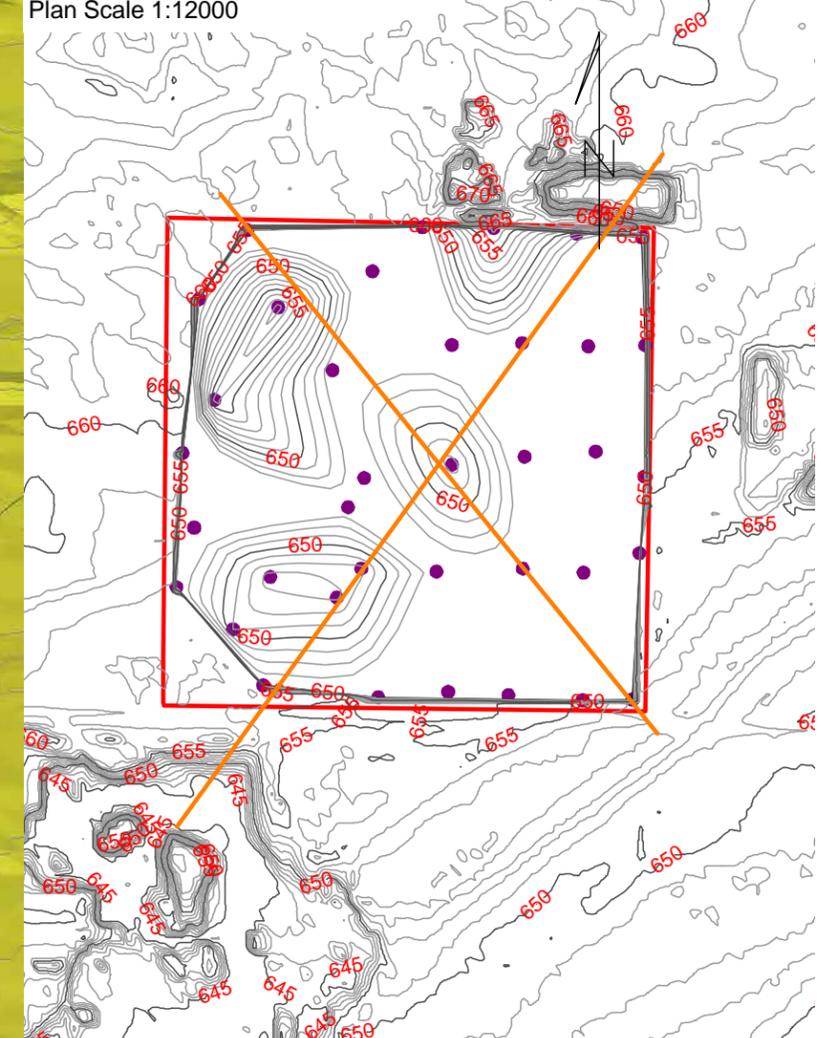
SE Sec.1, Twp. 82, Rng. 1
W6M
WHITELAW PIT
Digital Terrain Model
Plan

22/02/21

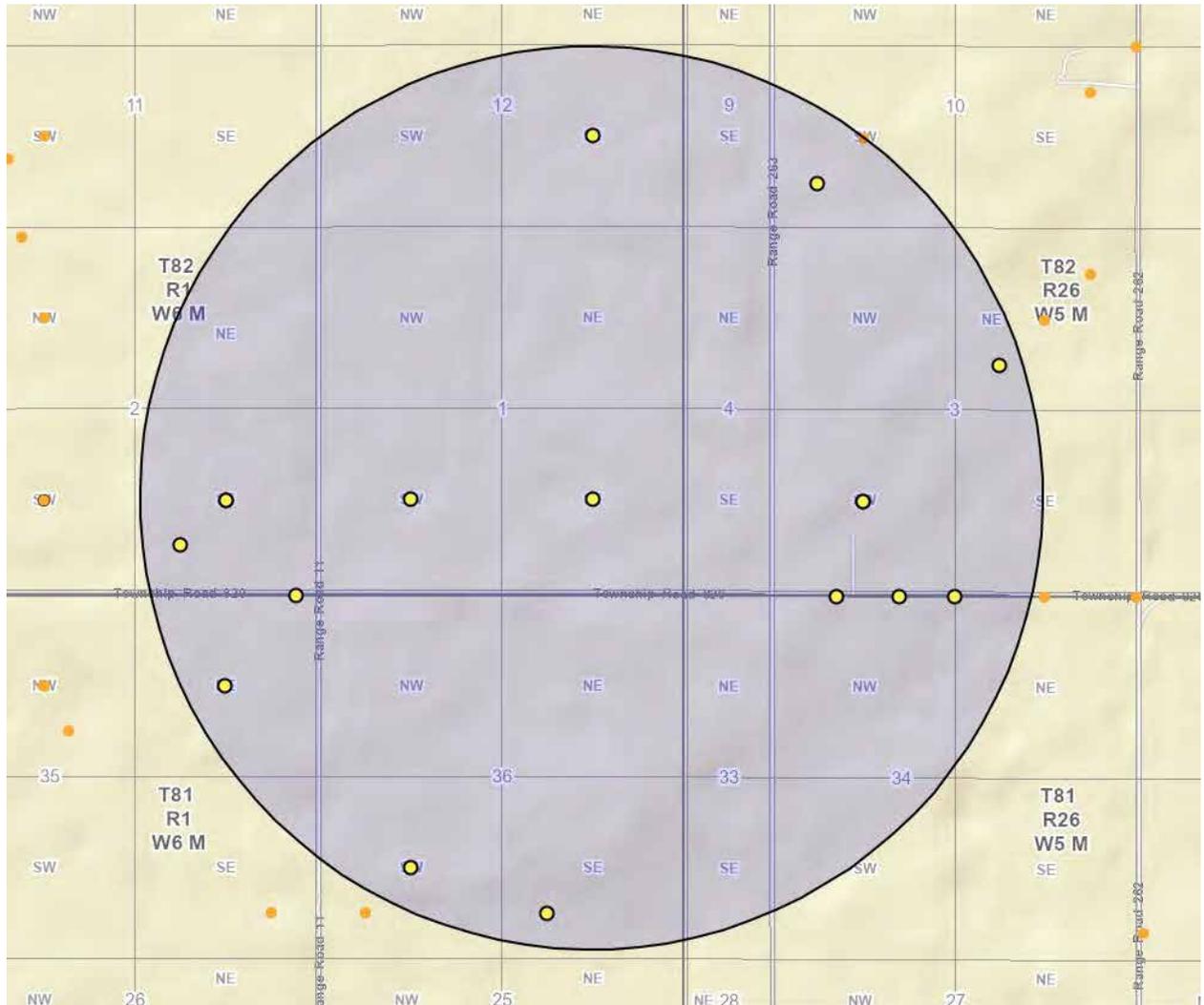
Scale as per plan.
Units in metres.

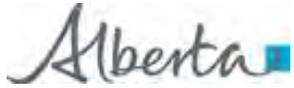


Contoured Plan View
Plan Scale 1:12000



APPENDIX 8 GROUNDWATER WELL REPORT





Reconnaissance Report

[View in Metric](#)

[Export to Excel](#)

Groundwater Wells

Please click the water Well ID to generate the Water Well Drilling Report.

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (ft)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (ft)	TEST RATE (igpm)	SC_DIA (in)
354857	SW	3	82	26	5	UNKNOWN DRILLER	1973-08-14	170.00	Test Hole			9		ALTA ENV #1040E			0.00
360443	SW	3	82	26	5	UNKNOWN DRILLER		0.00	Chemistry	Domestic & Stock	2			PEACE, MD OF			0.00
360445	10	3	82	26	5	UNKNOWN DRILLER		7.00	Well Inventory	Unknown	3	1			3.40	0.00	48.00
360448	4	10	82	26	5	UNKNOWN DRILLER		58.00	Well Inventory	Domestic	5	4		BOWNESS, ROBERT	56.00	0.00	0.00
360804	NE	35	81	1	6	UNKNOWN DRILLER		150.00	Chemistry	Unknown	1			SCOTT, G.P.			0.00
360805	2	36	81	1	6	UNKNOWN DRILLER	1986-12-18	25.00	Flowing Shot Hole	Industrial				CHEVRON CAN RES #1435X			0.00
360806	SW	36	81	1	6	UNKNOWN DRILLER		20.00	Chemistry	Domestic	1			WILSON, BRUCE			0.00
360808	SE	1	82	1	6	GRIMSHAW WATER WELL DRILLING LTD.	1980-07-08	56.00	New Well	Domestic	3	5		YOUNG, HAROLD	41.00	2.00	0.00
360809	SW	1	82	1	6	UNKNOWN DRILLER		65.00	Chemistry	Domestic	1			PRZYBYLSKI, NICK			0.00
360810	SE	2	82	1	6	BUFFALO LAKE DRILLING	1975-11-27	75.00	New Well	Domestic & Stock	2	3		WHITE, CARROLL	55.00	0.00	0.00
360810	SE	2	82	1	6	BUFFALO LAKE DRILLING	1975-11-27	75.00	New Well	Domestic & Stock	2	3		WHITE, CARROLL	60.00	15.00	0.00
360811	SE	2	82	1	6	UNKNOWN DRILLER		65.00	Chemistry	Domestic	1			WHITE, CARROLL	60.00	0.00	0.00
360812	2	2	82	1	6	WATER RESOURCES	1975-08-18	200.00	Test Hole	Unknown		6		ALTA ENV #1469E WHITE, C.			0.00
371626	13	34	81	26	5	UNKNOWN DRILLER		30.00	Seismic Shot Hole	Industrial		1					0.00
371627	14	34	81	26	5	UNKNOWN DRILLER		18.00	Seismic Shot Hole	Industrial		2					0.00
371628	14	34	81	26	5	UNKNOWN DRILLER		20.00	Seismic Shot Hole	Industrial		2					0.00
371669	16	35	81	1	6	UNKNOWN DRILLER		65.00	Seismic Shot Hole	Industrial		1					0.00
495471	SE	12	82	1	6	MCALLISTER WATERWELLS LTD.	1999-08-20	88.00	New Well	Domestic		4		LUEKEN, ED	58.00	4.90	5.00

**APPENDIX 9
SPECIES SUMMARY REPORT**

Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Date: 10-Feb-2022 13:24

Species present within the current extent

Fish Inventory

No Species Found in Search Extent

Wildlife Inventory

No Species Found in Search Extent

Stocked Inventory

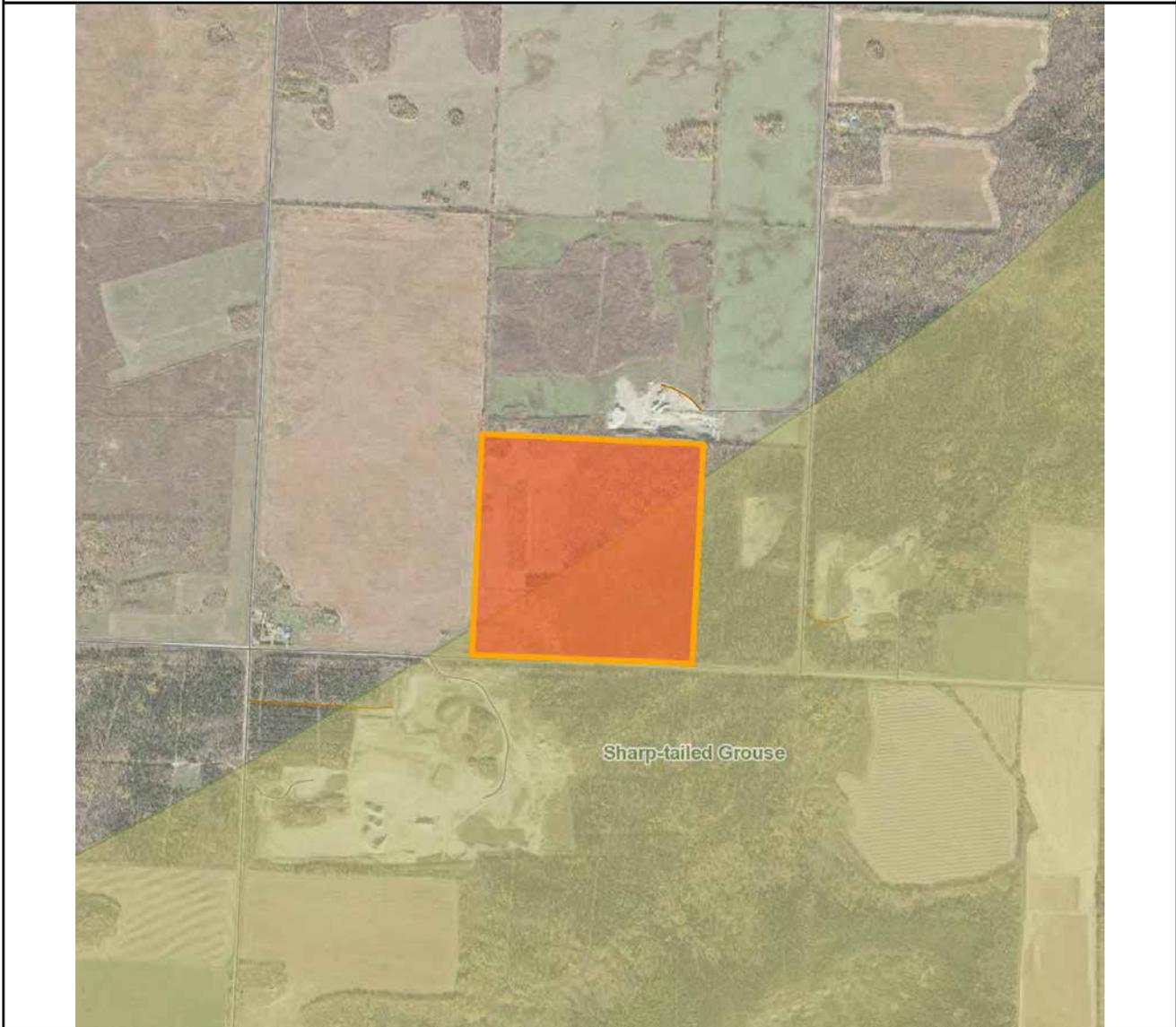
No Species Found in Search Extent

Buffer Extent

Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
312943, 6216172	10-TM AEP Forest	SE 1 82 1 6	843, 838 meters

Contact Information

For contact information, please visit:
<https://www.alberta.ca/fisheries-and-wildlife-management-contacts.aspx>



Display may contain: Base Map Data provided by the Government of Alberta under the Alberta Open Government Licence. Cadastral and Dispositions Data provided by Alberta Data Partnerships. © GeoEye, all rights reserved. Information as depicted is subject to change, therefore the Government of Alberta assumes no responsibility for discrepancies at time of use.

**APPENDIX 10
MINING PLAN**

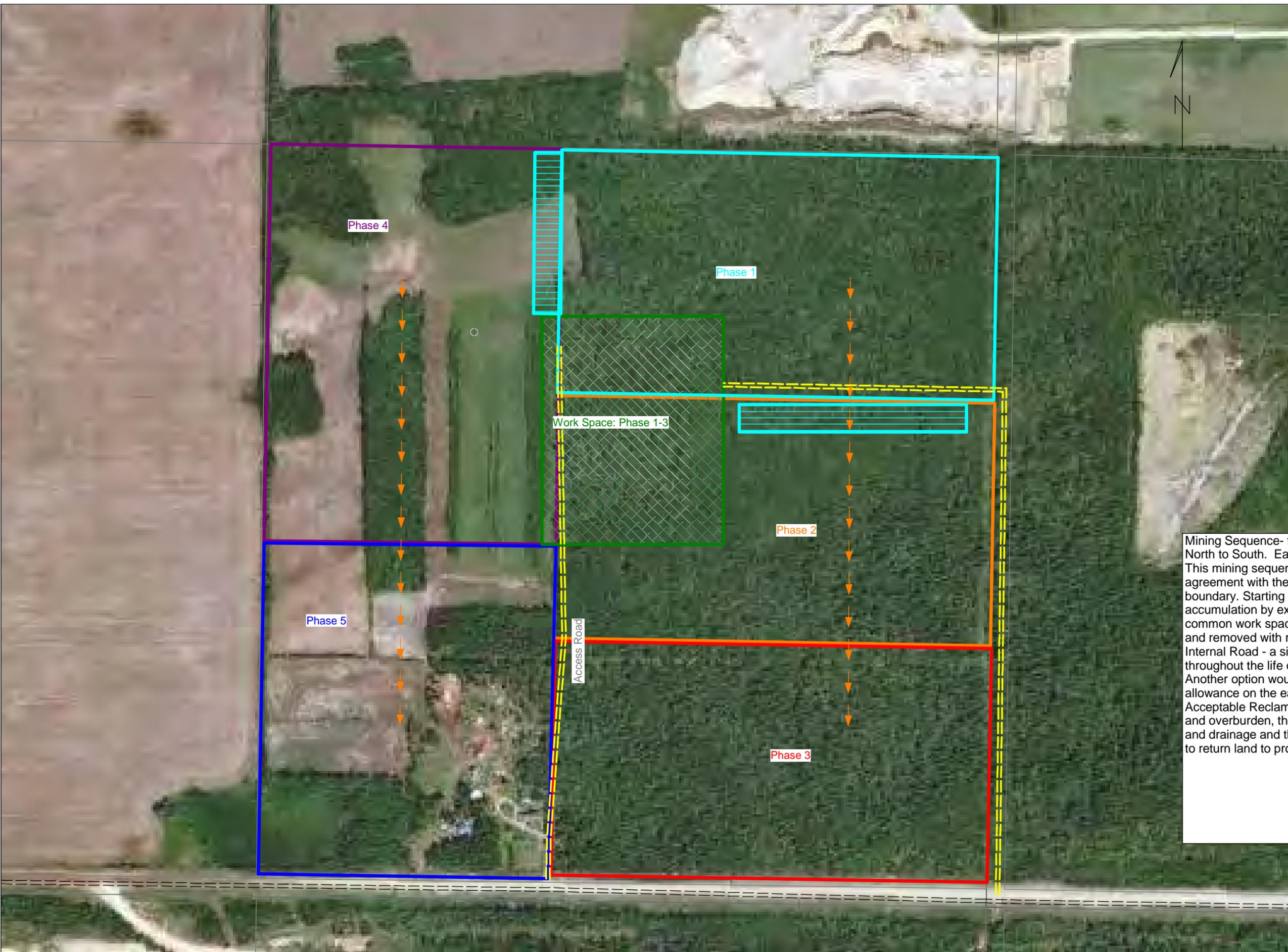


SE Sec.1, Twp. 82, Rng. 1
 W6M
 WHITELAW PIT
 Suggested Mining Plan

Legend

	Phase 1
	Phase 2
	Phase 3
	Phase 4
	Phase 5
	Work Space
	Overburden stockpile
	Internal Road
	Mining Direction

Mining Sequence- feasible to be mined in 5 Phases from North to South. Each Phase would be 11-13 ha in size. This mining sequence would facilitate a daylighting agreement with the municipal pit along the North and East boundary. Starting at the North would reduce surface water accumulation by excavating the deepest portion first. A common work space can be utilized to process all phases and removed with reclamation of Phase 4. Internal Road - a single internal road can access all phases throughout the life of the pit utilizing the existing approach. Another option would be to utilize the government road allowance on the east boundary. Acceptable Reclamation - after site is stripped of topsoils and overburden, the floor of the pit is landscaped for slopes and drainage and the overburden and topsoils are replaced to return land to productive agriculture or pasture lands



22/04/20 Plan Scale 1:4000





Active MD of Fairview No.136 Pit to the north on property line.



Pit to the East, Peace River MD



Active MD of Fairview No.136 Pit to the south

