

Technical Summary

February 2024

Pit Name: Carmi Pit

Provincial Pit Number: 0964

Location: Carmi Pit is approximately 4km north of Beaverdell on Highway 33 (Figure 1). Access to the pit can be made from Beacon Road.

Legal Land Description: The site is currently a Section 16 Map Reserve (LF# 4410585) held by the British Columbia Ministry of Transportation and Infrastructure (BC MoTI). The legal description of the Map Reserve is “those parts of District Lot 1253s and District Lot 2358, Similkameen Division of Yale District, containing 16.2 hectares, more or less”. The layout of the Map Reserve boundary is shown in the legal plan (Figure 2).

Subsurface Investigation: Subsurface investigations at Carmi Pit were carried out in 2023 and 2010 by Ministry of Transportation & Infrastructure.

In 2023 nine (9) test pits were excavated to depths ranging from 3.0 to 4.5m and in 2010, forty (40) test pits were excavated to depths ranging from 5.7 to 7.5m. During the test pitting, subsurface soil and groundwater conditions were logged and representative samples of the granular materials were collected for laboratory testing and future reference. Laboratory testing was carried out on fifty-two (52) of these samples to assess the gradation and durability characteristics. The tests completed were wet sieve analysis, micro deval, sand equivalent, relative density, and absorption.

Based on the results of the 2023 and 2010 investigations, one (1) granular area was defined (Figure 3). The detailed results of the subsurface testing are provided in the Test Pit Summaries and test pit locations are shown on the Pit Development Plan (Figure 3).

Material Gradation: Table 1 shows the gradation as a percentage by weight of the fines (silts and clays), sand and gravel components as well as the Unified Soil Classification (USC [included after test pit summary]) for the samples tested.

Table 1: Pit Run Gradation

Test Pit	Depth (m)	Fines (%)* <0.075mm	Sand (%)* 0.075- 4.75mm	Gravel (%)* 4.75-75mm	USC
2023					
TP23-01	0-4.4	3.0	24.0	73.0	GW
TP23-02	0-4.5	2.0	36.0	62.0	GP
TP23-03	0-3.6	4.1	40.9	55.0	GP
TP23-04	0-4	1.9	36.1	62.0	GP
TP23-05	0-3.5	3.6	45.4	51.0	GP
TP23-07	0-4.3	1.6	49.4	49.0	SP
TP23-08	0-3.5	1.5	50.5	48.0	SP
TP23-09	0-3.5	1.8	59.2	39.0	SP
2023 Averages		2.4	42.7	54.9	-

Test Pit	Depth (m)	Fines (%)* <0.075mm	Sand (%)* 0.075- 4.75mm	Gravel (%)* 4.75-75mm	USC
2010					
10-01a	0.3-6.8	1.6	30.8	67.6	GP
10-02a	0.4-3.9	1.1	49.0	49.9	GP
10-02b	3.9-6.8	4.3	29.4	66.3	GP
10-03a	0.3-7.1	1.9	24.8	73.4	GW
10-04a	0.0-6.5	2.8	23.1	74.1	GW
10-05a	0.0-6.6	3.0	35.2	61.8	GP
10-06a	0.0-2.7	0.6	31.2	68.3	GP
10-06b	2.7-4.9	1.3	79.6	19.0	SP
10-06c	4.9-6.5	1.2	31.0	67.8	GP
10-07a	0.6-6.7	2.8	26.9	70.3	GP
10-08a	0.3-5.1	1.1	26.4	72.4	GW
10-08b	5.1-6.9	0.8	70.7	28.5	SP
10-09a	0.3-5.7	1.8	29.1	69.1	GP
10-10a	0.4-6.5	1.4	34.3	64.2	GP
10-11a	0.4-6.5	1.1	32.3	66.6	GP
10-12a	0.4-7.0	2.0	34.7	63.3	GP
10-13a	0.3-6.9	1.3	33.8	64.9	GP
10-14a	0.4-6.8	2.0	36.5	61.4	GP
10-15a	0.4-7.0	1.1	31.3	67.7	GP
10-16a	0.4-6.7	1.2	32.3	66.5	GP
10-17a	0.4-6.4	1.3	29.2	69.5	GP
10-18a	0.4-6.9	1.1	31.6	67.3	GP
10-19a	0.4-6.1	2.3	44.2	53.5	GP
10-20a	0.4-4.7	2.3	17.8	79.9	GP
10-20b	4.7-6.5	0.8	70.8	28.4	SP
10-21a	0.4-6.7	0.8	27.0	72.2	GW

10-22a	0.4-6.8	0.6	32.4	67.1	GP
10-23a	0.4-7.5	1.6	32.5	65.9	GP
10-24a	0.5-6.9	0.8	27.3	71.9	GP
10-25a	0.5-6.1	0.8	25.4	73.8	GW
10-26a	0.4-7.0	1.2	29.7	69.0	GP
10-27a	0.0-6.8	2.0	31.6	66.4	GP
10-28a	0.3-6.7	3.0	32.8	64.2	GP
10-29a	0.3-6.9	1.5	22.7	75.8	GW
10-30a	0.4-6.9	1.1	26.7	72.2	GP
10-31a	0.4-4.6	1.7	19.3	79.0	GW
10-31b	4.6-7.0	2.5	56.0	41.5	SP
10-32a	0.3-6.9	1.4	27.7	70.9	GP
10-33a	0.3-6.8	1.5	25.5	73.0	GW
10-34a	0.4-3.5	6.1	35.3	58.6	GP-GM
10-35a	0.4-4.4	17.9	36.8	45.3	GM1
10-35b	4.4-6.6	8.3	27.3	64.4	GP-GM
10-36a	0.4-6.2	11.9	45.5	42.6	SW-SM
10-39a	0.4-6.0	2.9	22.7	74.4	GW
2010 Averages		3.1	33.4	63.6	-

*See photos for historical plan with 2010 test pit locations.

Material Durability: Table 2 shows the results of the durability tests as well as the specifications as required in the Standard Specifications for Highway Construction.

Table 2: Durability Test Results

Test Pit	Sand Equiv. (%)	Micro Deval (%)		Absorption		Relative Density	
		Coarse	Fine	Coarse	Fine	Coarse	Fine
2023							
TP23-01	73.00	8.20	12.5	1.0	2.7	2.59	2.49
2010							
TP10-02a	77.38	8.38	-	-	-	-	-
TP10-05a	69.05	8.71	-	-	-	-	-
TP10-10a	69.62	9.00	-	-	-	-	-
TP10-14a	79.02	8.17	-	-	-	-	-
TP10-18a	89.61	9.71	-	-	-	-	-
TP10-22a	81.03	7.89	-	-	-	-	-
TP10-27a	81.82	8.65	-	-	-	-	-
TP10-32a	73.49	10.45	-	-	-	-	-

BC MoTI Specifications	
Sand Equivalent	≥40 for base coarse and fine asphalt mix aggregate ≥20 for surfacing, sub-base and bridge end fill aggregates
Micro Deval	≤30% for sub-base and bridge end fill aggregates ≤25% for surfacing & base course aggregates ≤18% for Class 1 Pavement asphalt mix aggregates ≤20% for Class 2 Pavement asphalt mix aggregates
Absorption	<2.0% for coarse paving aggregates ≤1.0% for coarse and ≤1.5% for fine graded aggregate seals
Relative Density	~2.65 for all aggregate products

Material Suitability: Based on the 2023 and 2010 investigation results, the material is judged to be suitable for the following purposes:

Table 3: Suitability

	Pit Run	Crush
Carmi Pit Suitability Area	SGSB BEF	25mm WGB Asphalt Mix Aggregates

The samples tested meet the gradation, sand equivalent, and micro-deval specifications for base course, subbase course, bridge end fill and asphalt mix aggregate. Based on the absorption results the samples meet the specification for paving aggregates.

Sulphate and Chloride Testing

Table 4 shows the sulphate and chloride test results for select samples from the suitability area. These results are provided for information and have not been considered for material suitability.

Table 4: Sulphate and Chloride Test Results

Test Pit	Water-Soluble Sulphate	Water-Soluble Chloride
TP23-02	0.00	0.001

Volume Estimates: Table 5 shows the volume estimates that can be expected for gravel from the proposed suitability area. This is based on the measured depths encountered during the subsurface investigation. The potential volumes

of granular material were calculated by averaging the total thickness of granular material encountered in test pits and multiplying by the estimated surface area.

Table 5: Volume Estimates

Suitability Area ~1.0Ha.	Granular Material
Average Layer Thickness (m)	4.0
Volume (m ³)	40,000

Pit Development Notes

- All development must be carried out in accordance with the Health, Safety, and reclamation Code for Mines in British Columbia, BC Ministry of Energy, Mines and Low Carbon Innovation (2022, or later edition), the Standard Specifications for Highway Construction, BC Ministry of Transportation and Infrastructure (2020, or later edition) and the Aggregate Operators Best Management Practices Handbook for BC.
- All trees, vegetation, and overburden are to be removed within 2m of the top of the pit faces. Topsoil, overburden, and aggregate cannot be removed within five meters of the reserve boundary.
- The processing area is recommended to be located on the pit floor as identified on the Pit Development Plan (near TP23-03), with mining proceeding in a southeastern direction as indicated.
- There is limited space to stockpile processed aggregate in this pit.
- Due to a high percentage of oversize rock contained within the deposit the use of a primary crusher is required during aggregate production.
- No dumping of debris or petroleum products will be permitted, and the site must be left in a clean and safe condition.
- At the completion of the pit development operations, but prior to the depletion of the pit, the sides of the pit faces, waste piles, and overburden stockpiles must be trimmed to a 1.5H:1V slope. Active pit faces must be reshaped with native granular materials.
- Upon depletion of the pit, all disturbed areas are to be reclaimed. The minimum reclamation procedure should include re-sloping of the pit faces

and waste piles to a 2H:1V slope, contouring the area for appropriate drainage, spreading of overburden followed by topsoil, and seeding.

- Should any of the above conditions conflict with the Health, Safety, and Reclamation Code for Mines in British Columbia, then the Code will prevail.

Closure

The findings of this report and the soil conditions noted above are inferred from the extrapolation of limited surface and subsurface data collected during the site investigation. It should be noted that different and possibly poorer soil conditions may exist between the test pit locations and volume estimates may vary from those reported in this report.

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Reviewed by:

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Enclosures

Figures:

Figure 1 - Location Plan

Figure 2 - Legal Plan

Figure 3 – Pit Development Plan

Test Pit Summaries

Test Pit Logs (2023 & 2010)

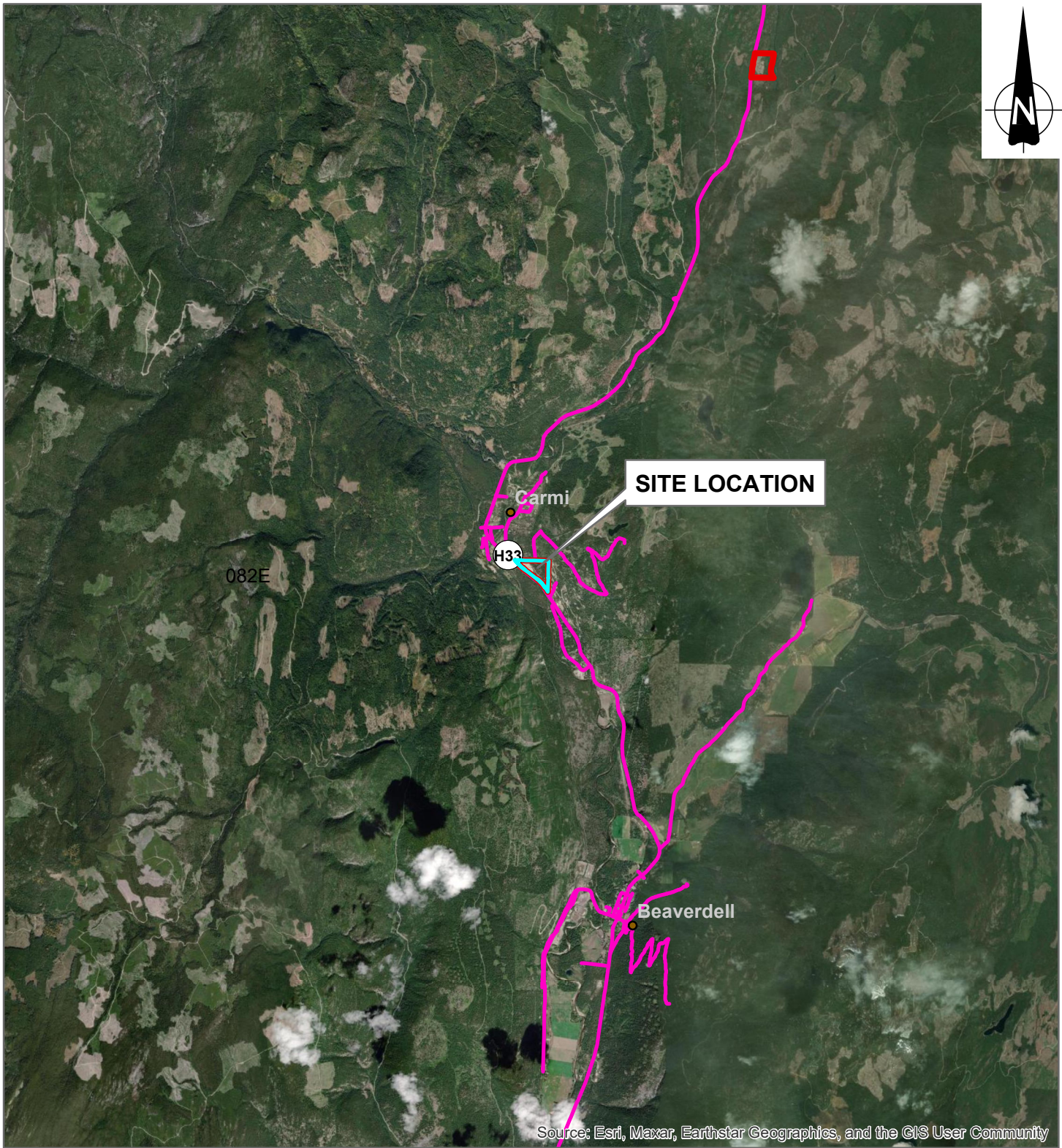
Wet Sieve Analysis Charts

Aggregate Gradation Charts

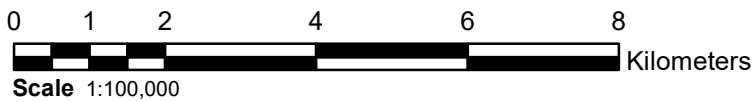
USC Legend

Photos



Figures

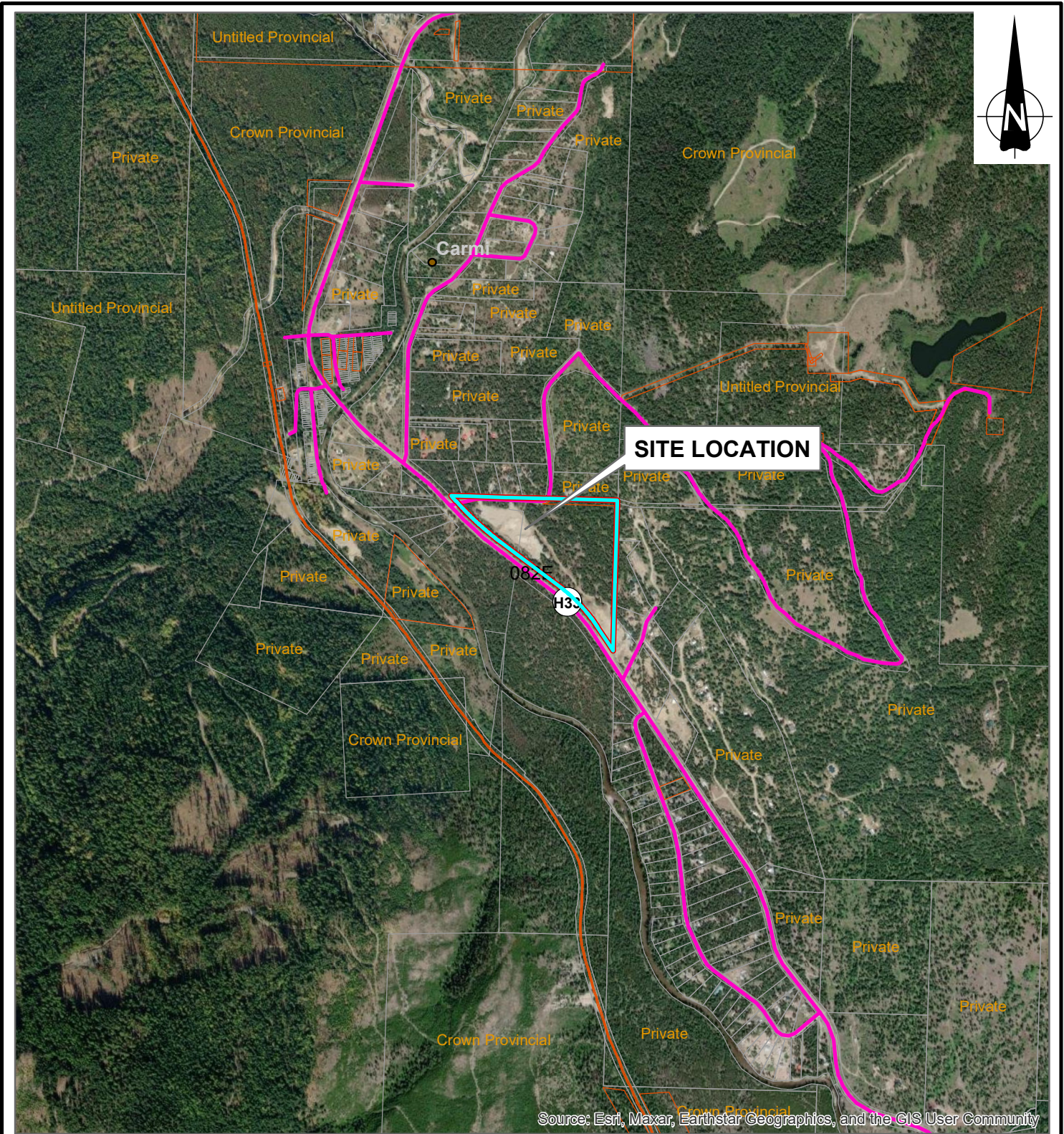


Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

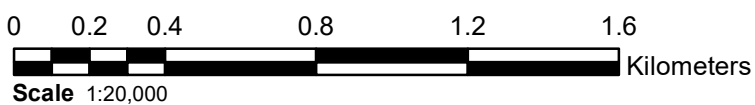


This drawing was originally produced in colour.



 Ministry of Transportation and Infrastructure Geotechnical and Materials Branch		
LOCATION PLAN (2023) Carmi Pit No. 0964 SA 09 - WEST KOOTENAY DISTRICT		
DRAWN BY: LACOURTE	PROJECTION: NAD 1983 UTM Zone 11N	SCALE: As Shown
CHECKED BY: A. Mitchell	DATUM: NAD 1983 UTM Zone 11N	DATE: 2023-08-28
FileName: GISTemplate_Gravel_R2_AVENZA_2021-11-18	Geotech Project No: 2	Drawing No: FIGURE 1

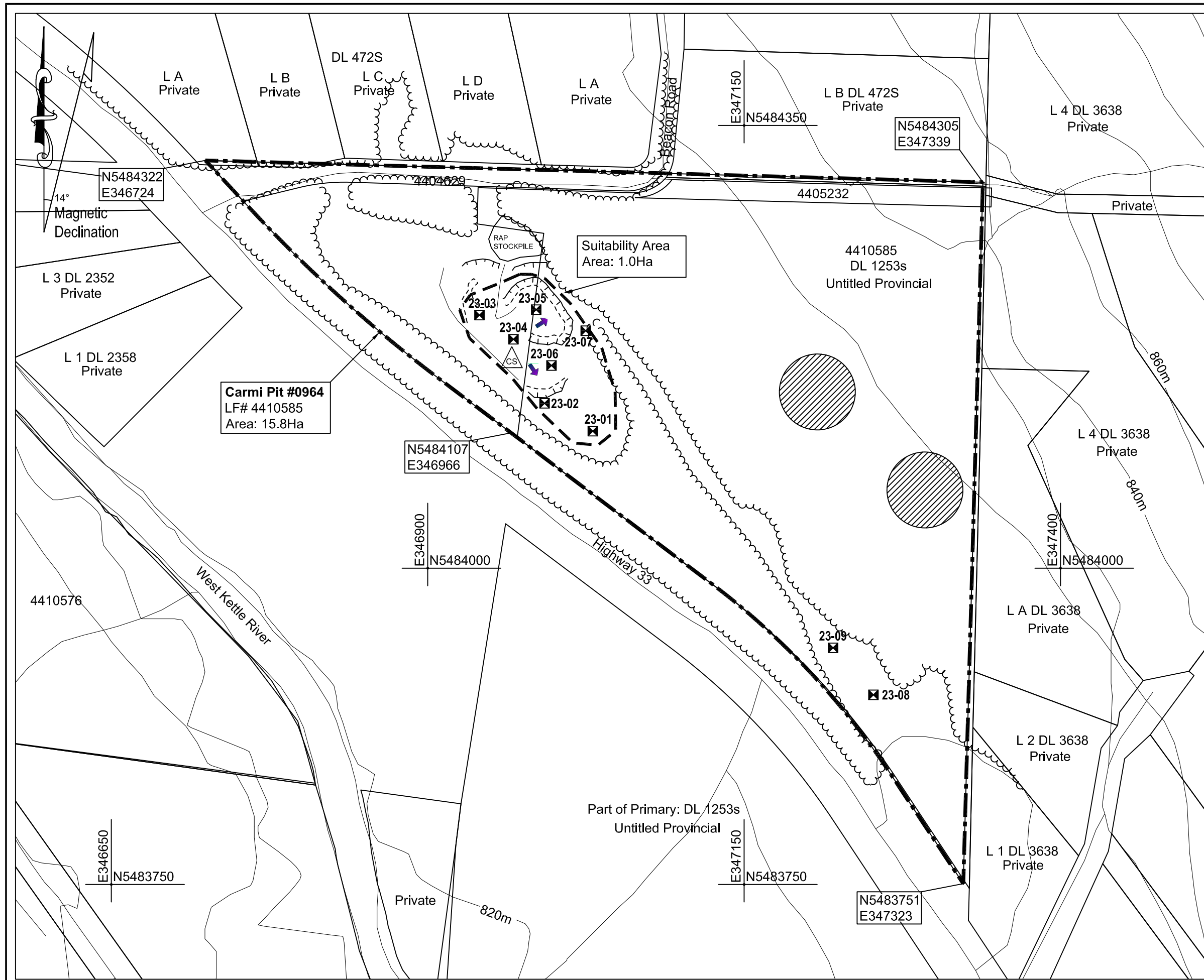


Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



This drawing was originally produced in colour.

 Ministry of Transportation and Infrastructure Geotechnical and Materials Branch			
LEGAL PLAN (2023) Carmi Pit No. 0964 SA 09 - WEST KOOTENAY DISTRICT			
DRAWN BY: LACOURTE	PROJECTION: NAD 1983 UTM Zone 11N	SCALE: As Shown	
CHECKED BY: A. Mitchell	DATUM: NAD 1983 UTM Zone 11N	DATE: 2023-08-28	
File Name: GISTemplate_Gravel_R2_AVENZA_2021-11-18	Geotech Project No: 	Reg: 2	
		Drawing No: FIGURE 2	

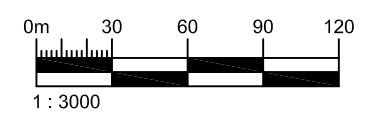


PIT DEVELOPMENT LEGEND

	NATURAL EMBANKMENT		TREELINE
	PIT FACE		CONTOURS
	TEST PIT		BUILDING (symbolic)
	TEST HOLE		IRON PIN
	TEST PIT (DEPLETED)		SWAMP
	ROAD		STOCKPILE
	CREEK		NO DISTURBANCE
	TRAIL		DEVELOPMENT ARROW
	CADASTRE		CRUSHER
	TANTALIS		
	GRAVEL RESERVE BOUNDARY		
	PROPOSED GRAVEL RESERVE BOUNDARY		
	GRAVEL RESERVE TO BE DELETED		
	OCCUPATIONAL LICENSE TO CUT AREA		

- ### DRAWING NOTES:
1. Base data provided from Trim Map 82E.045, (20m Contours)
 2. Cadastre and Tantalus Lines were provided from online sources.
 3. Some testpits and/or testholes may not be representative of current conditions due to development and excavation done after testing.
 4. Some extraction may have occurred since the last GPS survey of the pit was undertaken, therefore pit faces and stockpiles may not be representative of current conditions.

- ### PIT DEVELOPMENT NOTES:
1. Pit development must be carried out in accordance with the Health, Safety, and Reclamation Code for Mines in BC, the current Standard Specifications for Highway Construction, and the Aggregate Operators Best Management Practices Handbook for BC.
 2. The contractor must ensure that all materials passing through 375mm x 450mm slotted openings shall be used in the production of the crushed aggregates.
 3. Pit excavation must not take place to within a minimum distance of 2m from the edge of cleared & stripped areas.
 4. When the contractor discontinues operations in the pit, all working pit faces and stockpiles must be trimmed to 1.5H to 1V slope. Working pit faces must be reshaped with native granular materials. All other permanent slopes must be re-sloped to no steeper than 2H to 1V.
 5. No dumping of debris or petroleum products is permitted. The pit must be left in a clean and safe condition.



Ministry of Transportation and Infrastructure
 Southern Interior Region
 Geotechnical and Materials Branch

PIT DEVELOPMENT PLAN

CARMİ PIT #0964

SA09 -WEST KOOTENAY DISTRICT

DRAWN BY: S.Rutz	PROJECTION: UTM Zone	SCALE: AS SHOWN
CHECKED BY: A.Mitchell	DATUM: NAD83	DATE: 21 February 2024
FILE NAME: carmi_0964_pitplan_2024-02-21.dwg	REG: 2	DRAWING NUMBER: FIGURE 3

Test Pit Summaries

AGGREGATE LOG

PROJECT: Carmi Pit
PIT #: 964
DISTRICT: SA09 - Kootenay Boundary

SAMPLED BY: Steven Lee
METHOD: Excavator
DATE: 12-Oct-23

TEST PIT NO.	DEPTH		SAMPLE BAG NO.	SOILS CLASS	ESTIMATED GRADATION			ESTIMATED ROCK 75mm				SAND TYPE F M C	REMARKS				
	FROM	TO			G	S	F	MAX SIZE	75mm - 150mm	150mm - 375mm	>375mm						
TP23-01	0	4.4	TP23-01	GP	65	32	3	550	5	8	3	C	Southern corner of pit, high point				
				GW	73	24	3										
TP23-02	0	4.5	TP23-02	GP	65	34	2	900	8	8	3	C	Bottom of floor, north end				
				GP	62	36	2										
TP23-03	0	3.6	TP23-03	GP	65	34	2	800	7	6	2	C	Sluffing				
				GP	55	41	4.1										
TP23-04	0	4	TP23-04	GP	60	37	3	800	5	4	2	C					
				GP	62	36	1.9										
TP23-05	0	3.5	TP23-05	GP	50	45	5	1200	5	7	5	C	Sluffing, bottom of floor				
				GP	51	45	3.6										
TP23-06	0	3	N/S	SP	40	55	5	1000	10	15	10	M	Top of nob in center of pit. Primarily reject oversize, interspersed with gravelly sand. No sample taken.				
TP23-07	0	4.3	TP23-07	GP	50	48	2	1400	6	6	6	C					
				SP	49	49	1.6										
TP23-08	0	2	TP23-08	GP	55	43	2	350	3	2	0	M	Sluffing				
	2	3.2		SP	10	88	2							0	0	0	M
	3.2	3.5		GP	50	48	2							300	2	1	0
TP23-09	0	0.2	TP23-09	OB									Sluffing				
	0.2	1.4		GP	50	48	2										
	1.4	2.1		SP	5	93	2										
	2.1	3.5		GP	50	48	2							500	3	2	1
				SP	39	59	1.8										

AGGREGATE LOG

PROJECT: Carmi Pit
PIT #: 964
DISTRICT: West Kootenays

SAMPLED BY: Wayne Miller
METHOD: Excavator
DATE: 12-Apr-10

TH / TP	DEPTH (m)		SAMPLE BAG No.	SOILS CLASS	ESTIMATED GRADUATION			ESTIMATED ROCK 75mm				SAND TYPE F M C	REMARKS
	FROM	TO			G	S	F	MAX SIZE	75mm - 150mm	150mm - 375mm	375mm		
10-17	0.0	0.4		TS									
	0.4	6.4	10-17a	GP	60	37	3	410	15	10	2	C	Photos: 988 & 989
		End											
10-18	0.0	0.4		TS									
	0.4	6.9	10-18a	GP	63	34	3	390	15	15	1	C	Photos: 990 & 991
10-19	0.0	0.4		TS									
	0.4	6.1	10-19a	GP-SP	48	47	3	260	10	3	0	M	Interbedded layers of sand & gravel. Sloughing. Photos: 992 & 993
		End											
10-20	0.0	0.4		TS									
	0.4	4.7	10-20a	GP	63	34	3	460	20	10	1	C	Sand at 4.7m
	4.7	6.5	10-20b	SP	4	55	3	140	5	0	0	M	Photos: 994 & 995
		End											
10-21	0.0	0.4		TS									
	0.4	6.7	10-21a	GP	65	32	3	550	20	15	5	C	Photos: 996 & 997
		End											
10-22	0.0	0.4		TS									
	0.4	6.8	10-22a	GP	65	32	3	520	20	15	5	C	Less o/s with depth Photos: 998 & 999
		End											
10-23	0.0	0.4		TS									
	0.4	7.5	10-23a	GP	65	32	3	540	20	20	10	C	Photos: 1001 & 1002
		End											
10-24	0.0	0.5		TS									0.5m of sandy topsoil
	0.5	6.9	10-24a	GP	65	32	3	540	20	20	10	C	
		End											Photos: 1003 & 1004
10-25	0.0	0.5	NS	TP-SP									0.5m of sandy topsoil
	0.5	6.1	10-25a	GP	65	32	3	500	20	10	3	C	Less o/s; boulders below 3.9m
		End											Photos: 1005 & 1006

**PROJECT REPORT OF
 SIEVE ANALYSIS SUMMARIES**

PERCENT PASSING

Project: Carmi Test Pitting
 Sample Source: Carmi Pit #0964
 Material: PIT RUN

Project No.: 0
 Client: 0
 Date: 2023-10-12

Sample Information			Percent Passing														
Test Pit	Depth (m)	Bag #	Pit Run Sieve Sizes (mm)														
			75	63	50	37.5	25	19	12.5	9.5	4.75	2.36	1.18	0.6	0.3	0.15	0.075
23-01	0-4.4	23-01	96.0	96.0	87.0	78.0	64.0	55.0	40.0	35.0	27.0	21.0	14.0	8.0	5.0	4.0	3.0
23-02	0-4.5	23-02	100.0	100.0	86.0	76.0	68.0	61.0	51.0	48.0	38.0	32.0	24.0	13.0	6.0	3.0	2.0
23-03	0-3.6	23-03	96.0	96.0	82.0	77.0	68.0	63.0	57.0	52.0	45.0	37.0	24.0	12.0	7.0	5.0	4.1
23-04	0-4	23-04	100.0	100.0	89.0	77.0	62.0	54.0	47.0	44.0	38.0	30.0	18.0	7.0	3.0	2.0	1.9
23-05	0-3.5	23-05	100.0	100.0	92.0	84.0	76.0	69.0	61.0	57.0	49.0	39.0	25.0	14.0	7.0	5.0	3.6
23-07	0-4.3	23-07	100.0	100.0	85.0	81.0	72.0	66.0	61.0	58.0	51.0	41.0	24.0	9.0	4.0	2.0	1.6
23-08	0-3.5	23-08	100.0	100.0	90.0	82.0	71.0	67.0	61.0	58.0	52.0	46.0	32.0	13.0	4.0	2.0	1.5
23-09	0-3.5	23-09	100.0	100.0	88.0	84.0	77.0	73.0	68.0	66.0	61.0	54.0	40.0	18.0	6.0	3.0	1.8
MAX			100	100.0	92.0	84.0	77.0	73.0	68.0	66.0	61.0	54.0	40.0	18.0	7.0	5.0	4.1
MIN			96	96.0	82.0	76.0	62.0	54.0	40.0	35.0	27.0	21.0	14.0	7.0	3.0	2.0	1.5
SD			1.85164	1.85	3.11	3.27	5.31	6.63	9.11	9.72	10.55	10.13	7.99	3.62	1.49	1.28	0.99
MEAN			99	99.0	87.4	79.9	69.8	63.5	55.8	52.3	45.1	37.5	25.1	11.8	5.3	3.3	2.4
MEAN-2SD			95	95.3	81.1	73.3	59.1	50.2	37.5	32.8	24.0	17.2	9.1	4.5	2.3	0.7	0.5
MEAN+2SD			100	100.0	93.6	86.4	80.4	76.8	74.0	71.7	66.2	57.8	41.1	19.0	8.2	5.8	4.4

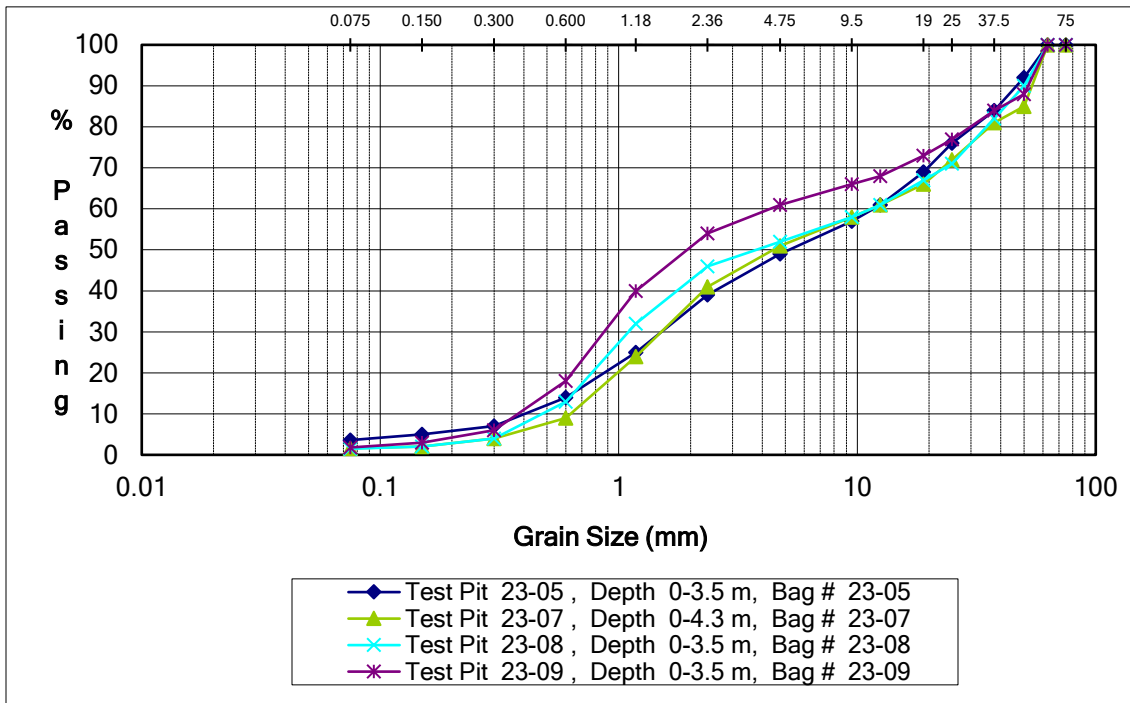
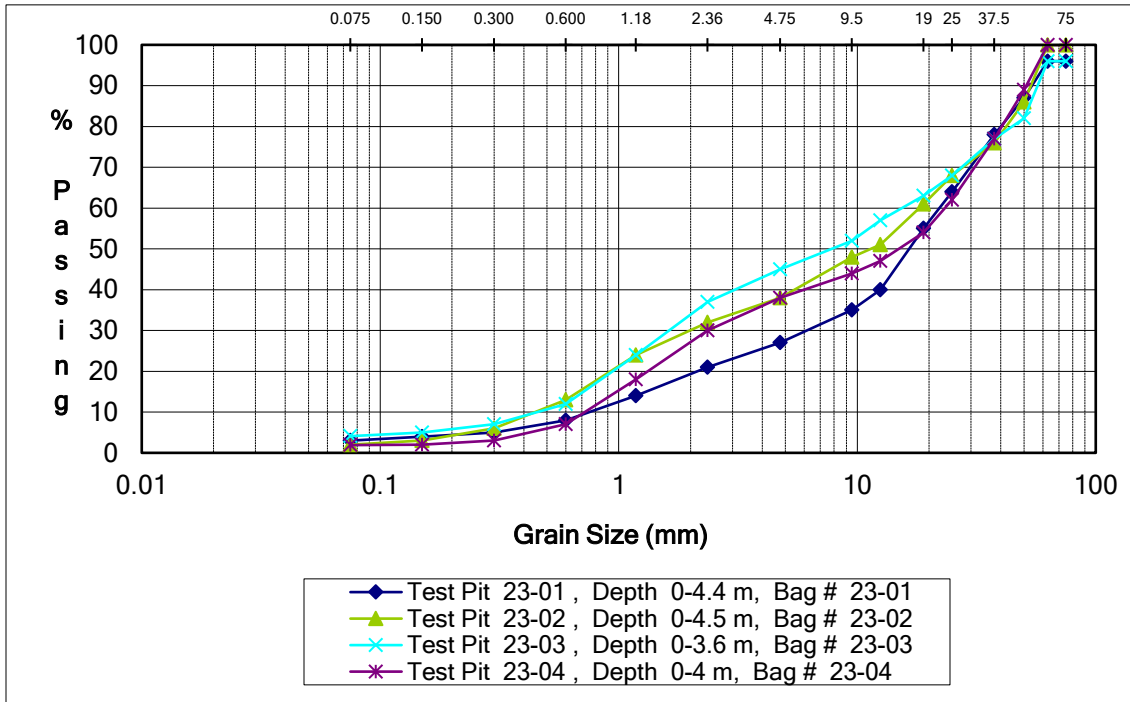
**PROJECT REPORT OF
 SIEVE ANALYSIS SUMMARIES**

PERCENT PASSING

Project: Carmi Pit Investigation No. 964
 Sample Source: Carmi Pit No. 964
 Material: PIT RUN

Project No.: 0
 Client: Sitkum Consulting
 Date: April 20/10

Sample Information			Percent Passing														
Test Pit	Depth (m)	Bag #	Pit Run Sieve Sizes (mm)														
			75	63	50	37.5	25	19	12.5	9.5	4.75	2.36	1.18	0.6	0.3	0.15	0.075
10-01	10-01a	0.3-6.8	100.0	91.3	69.7	64.0	49.0	45.1	40.2	38.0	32.4	26.1	14.9	6.2	3.2	2.2	1.6
10-02	10-02a	0.4-3.9	100.0	100.0	87.0	75.7	70.8	66.7	60.9	57.3	50.1	42.5	25.3	8.3	3.7	2.7	1.1
10-02	10-02b	3.9-6.8	90.5	73.7	71.0	63.5	52.5	48.6	44.1	40.9	33.7	26.4	15.8	8.9	6.2	5.1	4.3
10-03	10-03a	0.3-7.1	82.9	68.5	65.7	55.1	46.7	42.4	35.5	32.7	26.6	20.6	11.9	5.7	3.4	2.4	1.9
10-04	10-04a	0.0-6.5	76.1	65.6	57.3	52.1	42.0	38.7	33.6	30.9	25.9	22.0	16.3	9.7	5.3	3.6	2.8
10-05	10-05a	0.0-6.6	93.5	84.2	81.8	75.2	62.0	56.3	49.3	45.4	38.2	32.4	23.0	11.9	6.3	4.1	3.0
10-06	10-06a	0.0-2.7	76.5	62.8	57.4	51.6	47.0	43.9	39.0	36.6	31.7	26.1	16.7	6.1	1.9	1.0	0.6
10-06	10-06b	2.7-4.9	100.0	100.0	100.0	94.4	92.0	90.2	87.8	86.1	81.0	71.2	45.3	15.2	3.6	1.9	1.3
10-06	10-06c	4.9-6.5	72.9	67.4	55.3	49.1	41.6	39.0	36.8	35.3	32.2	27.4	18.1	7.6	3.0	1.7	1.2
10-07	10-07a	0.6-6.7	88.7	84.1	70.3	57.9	47.4	43.8	38.7	35.7	29.7	24.1	15.5	7.4	4.4	3.4	2.8
10-08	10-08a	0.3-5.1	75.0	65.6	54.1	47.0	41.7	37.6	33.7	31.4	27.6	23.4	15.1	6.1	2.3	1.5	1.1
10-08	10-08b	5.1-6.9	100.0	95.4	89.7	86.2	80.7	78.5	76.5	75.3	71.5	64.6	30.7	9.5	2.7	1.4	0.8
10-09	10-09a	0.3-5.7	85.6	73.2	66.1	60.5	49.8	45.7	39.9	37.0	30.9	24.6	14.3	6.6	3.5	2.4	1.8
10-10	10-10a	0.4-6.5	74.7	67.6	60.1	56.1	50.8	48.1	43.7	41.3	35.8	28.6	16.2	6.7	3.0	1.9	1.4
10-11	10-11a	0.4-6.5	81.1	77.2	62.8	55.3	48.1	45.5	41.3	38.9	33.4	26.1	15.0	6.4	2.8	1.6	1.1
10-12	10-12a	0.4-7.0	90.4	83.4	76.0	64.9	58.5	54.7	48.4	44.8	36.7	27.6	15.7	7.2	3.6	2.5	2.0
10-13	10-13a	0.3-6.9	84.6	78.4	69.1	64.2	54.2	50.5	45.1	42.2	35.1	27.4	16.2	8.2	3.6	1.9	1.3
10-14	10-14a	0.4-6.8	81.8	81.8	75.5	69.7	63.9	58.2	51.6	47.4	38.6	29.6	16.6	7.6	4.2	2.8	2.0
10-15	10-15a	0.4-7.0	100.0	93.4	83.6	75.0	60.5	51.9	45.1	41.2	32.3	24.9	14.6	6.3	2.9	1.7	1.1
10-16	10-16a	0.4-6.7	92.0	84.7	72.2	63.8	54.9	49.1	42.9	39.7	33.5	26.7	15.8	7.0	3.0	1.7	1.2
10-17	10-17a	0.4-6.4	93.6	78.9	63.5	57.1	48.2	43.5	38.2	35.6	30.5	25.1	15.2	6.3	2.9	1.8	1.3
10-18	10-18a	0.4-6.9	84.1	71.4	60.8	54.3	45.2	42.4	38.7	36.7	32.7	28.0	17.4	7.5	3.0	1.7	1.1
10-19	10-19a	0.4-6.1	94.3	91.5	77.3	69.0	61.9	58.7	53.9	51.2	46.5	41.0	27.6	10.7	4.3	2.9	2.3
10-20	10-20a	0.4-4.7	90.7	83.8	74.2	65.5	53.6	45.7	36.3	29.0	20.1	16.6	11.3	6.2	3.9	2.9	2.3
10-20	10-20b	4.7-6.5	100.0	90.9	87.5	84.6	80.7	79.2	76.6	75.2	71.6	65.3	40.9	11.7	3.3	1.6	0.8
10-21	10-21a	0.4-6.7	68.7	59.0	52.3	47.2	40.4	37.7	34.3	32.2	27.8	23.0	17.2	8.5	5.3	2.3	0.8
10-22	10-22a	0.4-6.8	86.4	77.1	77.1	66.1	54.1	48.8	42.3	39.2	32.9	27.6	18.6	11.3	1.6	0.7	0.6
10-23	10-23a	0.4-7.5	94.7	84.4	77.4	64.0	56.5	51.1	44.9	41.7	34.1	26.3	15.8	7.5	3.6	2.3	1.6
10-24	10-24a	0.5-6.9	77.9	68.7	57.3	49.4	44.6	39.7	35.3	32.9	28.1	22.5	12.9	5.6	2.5	1.4	0.8
10-25	10-25a	0.5-6.1	65.2	54.5	48.6	43.8	37.6	34.8	31.9	30.0	26.2	21.6	13.2	6.1	2.6	1.3	0.8
	MAX		100	100.0	100.0	94.4	92.0	90.2	87.8	86.1	81.0	71.2	45.3	15.2	6.3	5.1	4.3
	MIN		65.20539	54.5	48.6	43.8	37.6	34.8	31.9	29.0	20.1	16.6	11.3	5.6	1.6	0.7	0.6
	SD		10.14326	12.03	12.44	12.26	12.83	13.10	13.55	13.87	14.12	13.38	7.92	2.28	1.12	0.94	0.85
	MEAN		87	78.6	70.0	62.7	54.6	50.5	45.6	42.7	36.9	30.6	18.8	8.0	3.5	2.2	1.6
	MEAN-2SD		66	54.6	45.1	38.2	28.9	24.3	18.4	15.0	8.7	3.9	2.9	3.5	1.3	0.3	0.0
	MEAN+2SD		100	100.0	94.9	87.3	80.2	76.7	72.7	70.5	65.2	57.4	34.6	12.6	5.8	4.1	3.3



USC Legend

MATERIALS CLASSIFICATION LEGEND

MAJOR DIVISIONS	SYMBOL	SOIL TYPE						
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	WELL GRADED GRAVELS OR GRAVEL-SAND MIXTURES, < 5% FINES					
		GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, < 5% FINES					
		GM*	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES					
		GC*	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES					
	SAND AND SANDY SOILS	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES					
		SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, < 5% FINES					
		SM*	SILTY SANDS SAND-SILT MIXTURES					
		SC*	CLAYEY SANDS SAND-CLAY MIXTURES					
FINE GRAINED SOILS	SILTS AND CLAYS $w_L < 50$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY					
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS					
		OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY					
	SILTS AND CLAYS $w_L > 50$	MH	INORGANIC SILTS, MICACEOUS OR DIATOM-ACEOUS FINE SANDY OR SILTY SOILS, PLASTIC SILTS					
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS					
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS					
ORGANIC SOILS	Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS						
TOPSOIL	TS	TOPSOIL WITH ROOTS, ETC.						
COBBLES	SB	ROCK FRAGMENTS AND COBBLES, PARTICLE SIZE 75mm TO 300mm						
LARGE BOULDERS	LB	BOULDERS, PARTICLE SIZE OVER 300mm						
BEDROCK	BR	BEDROCK						
FOR SOILS HAVING 5 - 12% PASSING .075 SIEVE, USE DUAL SYMBOL <table style="width: 100%; border: none;"> <tr> <td style="border: none;">*GM1; GC1; SM1; SC1; 12 - 20%</td> <td rowspan="4" style="border: none; font-size: 3em; vertical-align: middle;">}</td> <td rowspan="4" style="border: none; vertical-align: middle;">PASSING .075mm SIEVE</td> </tr> <tr> <td style="border: none;">GM2; GC2; SM2; SC2; 20 - 30%</td> </tr> <tr> <td style="border: none;">GM3; GC3; SM3; SC3; 30 - 40%</td> </tr> <tr> <td style="border: none;">GM4; GC4; SM4; SC4; 40 - 50%</td> </tr> </table>			*GM1; GC1; SM1; SC1; 12 - 20%	}	PASSING .075mm SIEVE	GM2; GC2; SM2; SC2; 20 - 30%	GM3; GC3; SM3; SC3; 30 - 40%	GM4; GC4; SM4; SC4; 40 - 50%
*GM1; GC1; SM1; SC1; 12 - 20%	}	PASSING .075mm SIEVE						
GM2; GC2; SM2; SC2; 20 - 30%								
GM3; GC3; SM3; SC3; 30 - 40%								
GM4; GC4; SM4; SC4; 40 - 50%								

REV. 90-04-26



PROVINCE of BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & HIGHWAYS
Geotechnical & Materials Engineering

UNIFIED SOIL CLASSIFICATION LEGEND

Drawn: LU	Date: JULY'97	Scale:
File No.:	ACAD File: ACADSTDS 830205\SOIL-APP	

Photos



Photo 1 View from the top of the southern face looking north (October 2023).



Photo 2 TP23-01 (October 2023).



Photo 3 TP23-01 spoil pile. Note the amount and size of large boulders (October 2023).



Photo 4 View of the pit face looking south. Note the limited space on the pit floor (October 2023).

February 2024



Photo 5 Another mining face to the east of the southern face. The yellow cylinder in the background is near the salt shed in the northern part of the pit (October 2023).



Photo 6 A large pile of oversize rock (October 2023).



Photo 7 Small area for stockpile space (October 2023).

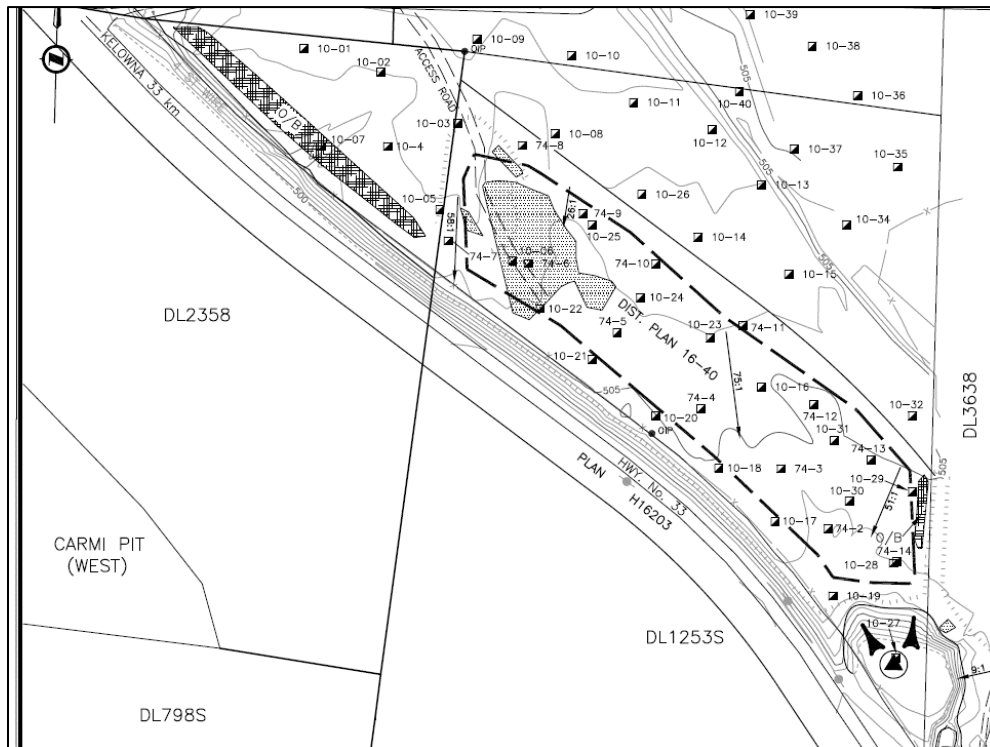


Photo 8 Historical plan to be used only for approximate locations of 2010 test pits. See Figure 3 for the 2024 Pit Development Plan.