Ontario

We are committed to providing accessible customer service.
If you need accessible formats or communications supports, please contact us.

Nous tenons à améliorer l’accessibilité des services à la clientèle.
Si vous avez besoin de formats accessibles ou d’aide à la communication, veuillez nous contacter.

2020 PROSPECTING REPORT

CLAIMS#103541,103542,103543,103544,103545,105003,107714,118817,122552,124142,125511,
136147,136148,137502,137503,139364,140129,143512,144292,161056,172866,172867,172888,180515
,181347,181348,181349,186579,188122,189494,190810,200324,202932,209592,209609,215853,21734
2,220674,234403,234404,234405,234406,235919,236773,238112,239474,246570,246571,246959,2469
74,252729,271781,281865,281866,283932,283933,288464,289938,294115,295338,296568,305491,308
719,312232,325110,329656,329657,341516

Swill Diamond Drill Project

THUNDER BAY MINING DISTRICT

Prepared By: Martin Drennan, P. Eng
And Robert Meek, G.I.T.
May 19, 2020

Contents

List of Figures:

1. Work Summary

Work during 2019, was based on the surface anomaly identification completed in 2016/2017. Drill targets had been identified at test locations and were drilled. Four drill holes were completed between September 14th and October 4th. No core logging or assays were completed as the geological team was delayed in visiting site for core logging. Logging and assays were anticipated for claims in an update report planned for November.

August and September were comprised of preparation work. This work included the purchase of drill supplies (rods, bits, casing, spill kit, etc.) and moving these items to site. Additionally, as the drill had not been utilized – all the new drill supplies as well as the testing of the new drill needed to be completed. It was determined ,after testing tramming and drill turning for the drill in the yard, that the water pump, drill pump, and rock penetration would be field tested. Odyssey Fluid Power completed the commissioning of the drill in early/mid-September.

Four holes were drilled for a total of 1011m of drilling. For this report due to the limitations based on the change from the old claim system, drill permits, and claim amalgamation, only the first 2 holes will be reported as there is a limitation of $50,000 per single claim. The total drilling reported for this period will be 554m (431m – Claim 139364; 123m – Claim 325110).

Additional work for 2019, specifically, October, November and December was the geological logging of the core, cutting for assay samples and lastly the receipt of the assay data and review. Further work was completed with respect to following up on the receipt of the core logs for inclusion in the report filed Sept 27th, 2018.

Drill work was performed by Martin Drennan, Christopher Bottomley (Driller), Patrick Steinberg (Driller Helper), Tylor Armitage (Driller), Kevin Castilloux (Driller Helper), Evan Trabbish-Finlayson (Driller Helper), and Brady Nugent (Driller Helper).

2. Introduction

This report is a description of the drilling completed on claim 139364 and claim 325110 which are claims in the Leslie Townships in the Thunder Bay Mining District. The claims can be described as being located in the Manitouwadge mining camp (as defined by previous copper producers – Wilroy and Geco Mines).

The work in this report has been reviewed by the lead author and determined to be accurate. These claims are held by the lead author.

3. Location and Access

Leslie Township is located south east of Thunder Bay. Access is via Regional Road 614 to Caramat Industrial road. Caramat Industrial leads to the access road – Swill Lake Road. Swill Lake road was used to access the work area. See Figure 1 – Location and Access (access is blue dashed line; work areas are highlighted with cyan lines.

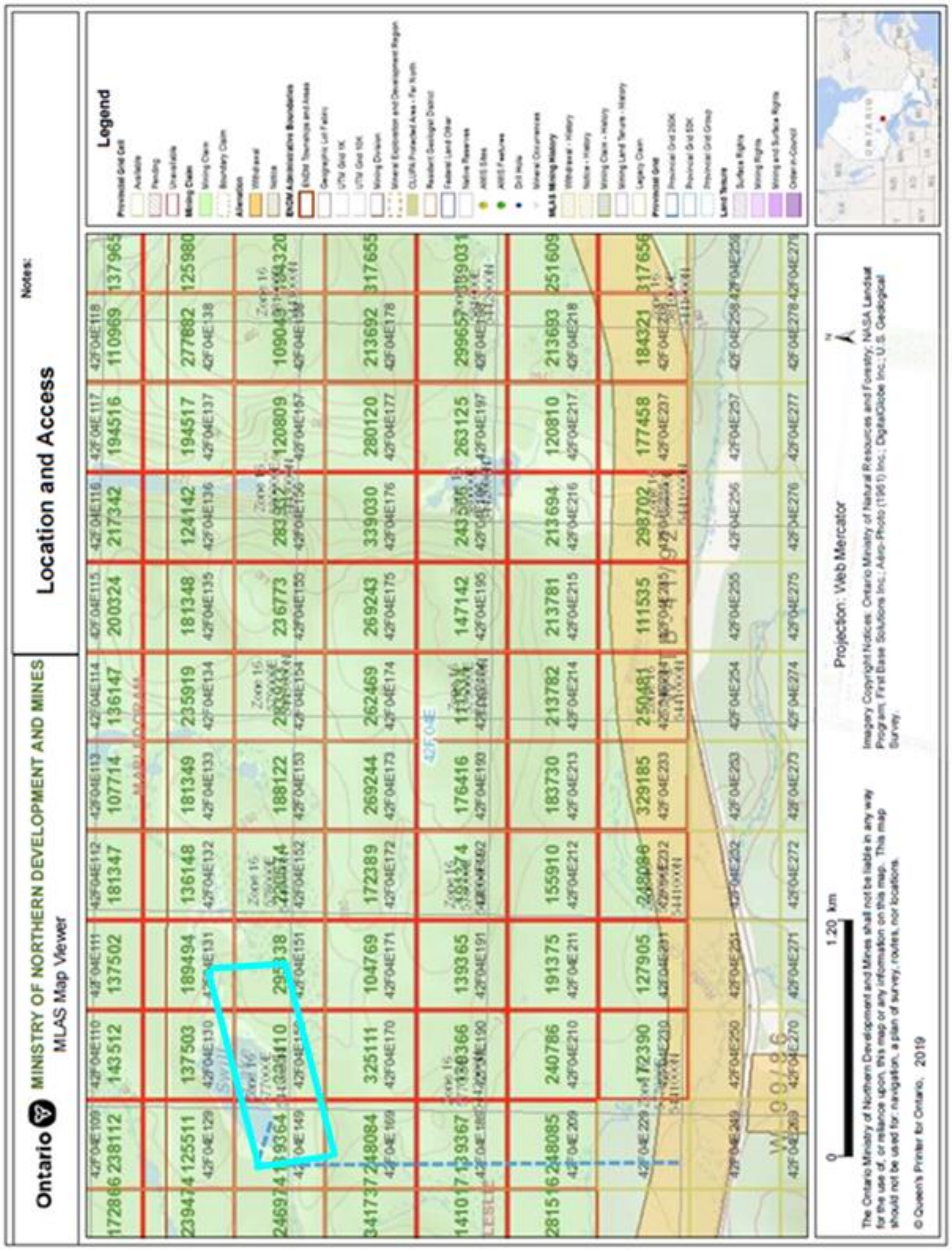


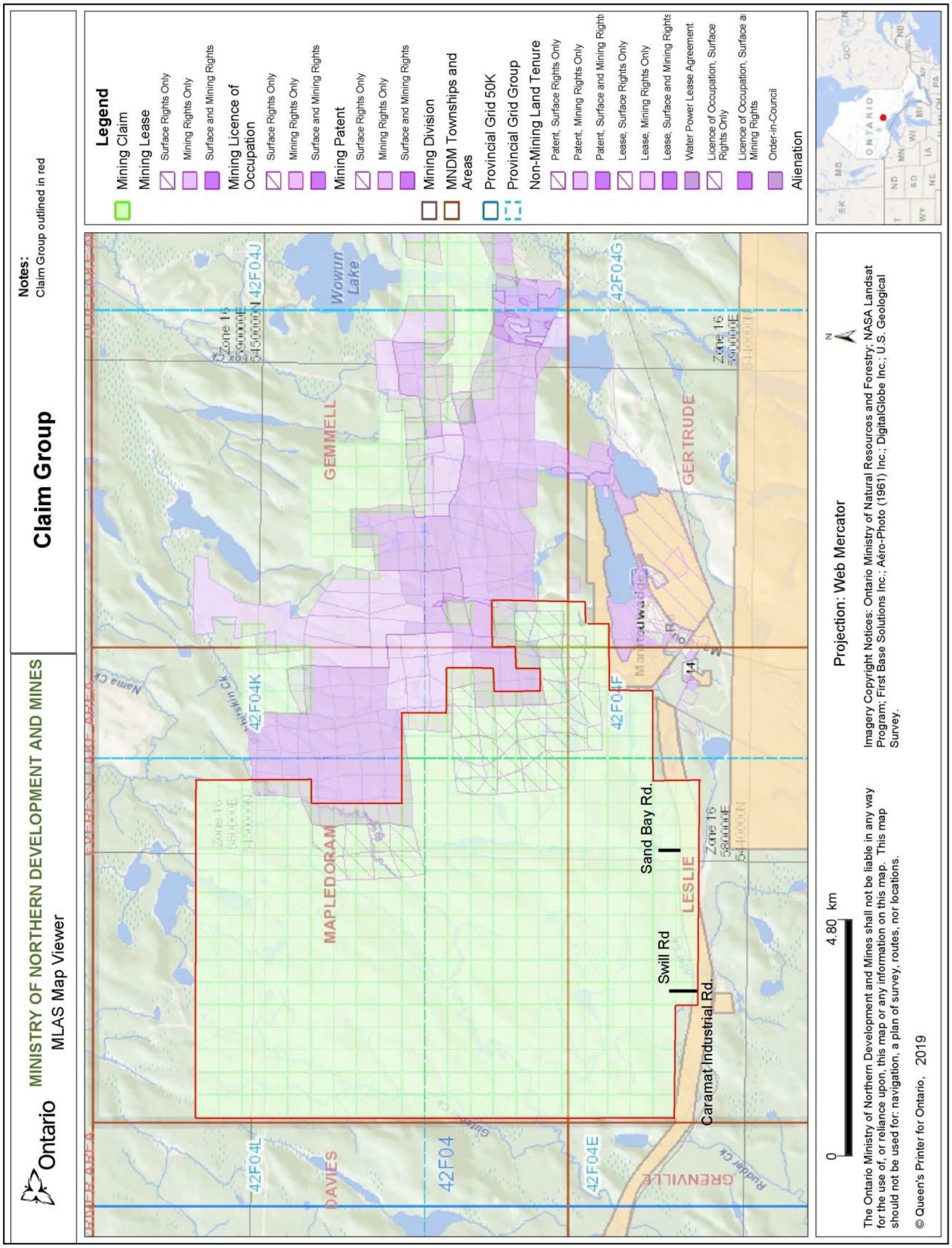
Figure 1 Location and Access

4. Property Description

The claim group consists of 381 claims in Manitouwadge area within the Thunder Bay Mining District. See Figure 2 –Claim Group Map. The claims are a continuous package (outlined in red) with the eastern claims adjacent to the patented Geco Mine claims and some surface property lots. The claims are: 103541,103542,103543,103544,103545,104022,104769,105000,105001,105002,105003,105372,105577,105578,105579,105806,106894,107714,107882,109020,109049,110611,110968,110969,111534,111535,111589,111905,112279,112280,113

567,114381,118817,119279,120809,120810,122552,124142,124353,124354,1252
81,125282,125283,125511,125977,125978,125979,125980,127905,128642,13047
4,130899,130900,131647,132424,135753,135754,136147,136148,136739,136815
,137212,137502,137503,137963,137964,137965,139364,139365,139366,139367,
140126,140127,140128,140129,140676,141017,142329,142466,143191,143512,1
44292,146080,146081,147142,147327,147328,147989,148331,148332,153306,15
5261,155262,155910,156587,157779,159618,161056,161363,162601,162602,165
736,165737,166690,167188,167189,167190,170517,170518,170519,170520,1717
33,171734,171913,172389,172390,172642,172643,172866,172867,172888,17339
8,175305,175306,175340,176208,176209,176210,176211,176416,176970,177458
,179158,180515,181347,181348,181349,181588,182040,182310,183730,183771,
183772,184320,184321,184670,185112,186579,187051,188122,188381,188382,1
88807,189022,189265,189494,189749,190721,190810,191374,191375,192647,19
2684,193704,194516,194517,196452,196453,196648,200324,200982,201003,201
041,201042,201904,202442,202932,207066,207882,207883,208546,209592,2096
09,209754,212925,212926,212927,213160,213659,213692,213693,213694,21378
1,213782,213822,214677,215523,215853,217342,220513,220514,220515,220674
,221930,224709,224710,226561,229860,229901,231364,232503,232504,232704,
234403,234404,234405,234406,235919,236773,238112,238388,238527,238691,2
39474,240124,240125,240786,241811,242068,242479,243566,245122,246321,24
6570,246571,246959,246974,247422,248084,248085,248086,249235,249884,250
317,250318,250481,251577,251578,251579,251609,252729,255686,256365,2566
30,257076,257433,260356,260357,260358,260359,261983,262374,262469,26312
5,263872,265206,266361,266362,267164,267165,267678,268654,268655,268656
,269243,269244,269285,269701,269702,269703,271781,271929,275130,275381,
277882,278851,280092,280120,281514,281515,281516,281865,281866,283932,2
83933,285805,286538,286539,288462,288463,288464,289938,292647,292648,29
2649,292661,292880,292881,294115,295338,296566,296567,296568,297451,297
452,297453,297454,298702,299162,299657,299924,300526,300527,302945,3047
82,304820,304821,304822,305200,305314,305315,305491,306014,308719,30986
4,310185,312232,312500,315217,315218,316891,317035,317036,317037,317655
,317656,319123,321819,321820,322527,323846,323847,323885,324447,325110,
325111,327733,327734,327735,328015,329185,329385,329386,329656,329657,3
30570,332376,332541,332542,333019,336634,336838,337292,337931,338494,33
9030,339031,341516,341737,341738,345446

Figure 2 –Claim Group Map



5. Regional Geography

Topography in the area is a mix of low areas with water and hills/ridges with a general east-west orientation. Outcrops are common of hillsides with numerous fragmented rocks buried in soil.

Vegetation is principally coniferous, and deciduous trees as well as numerous alder bush. In low lying areas, grass and cedars are predominant.

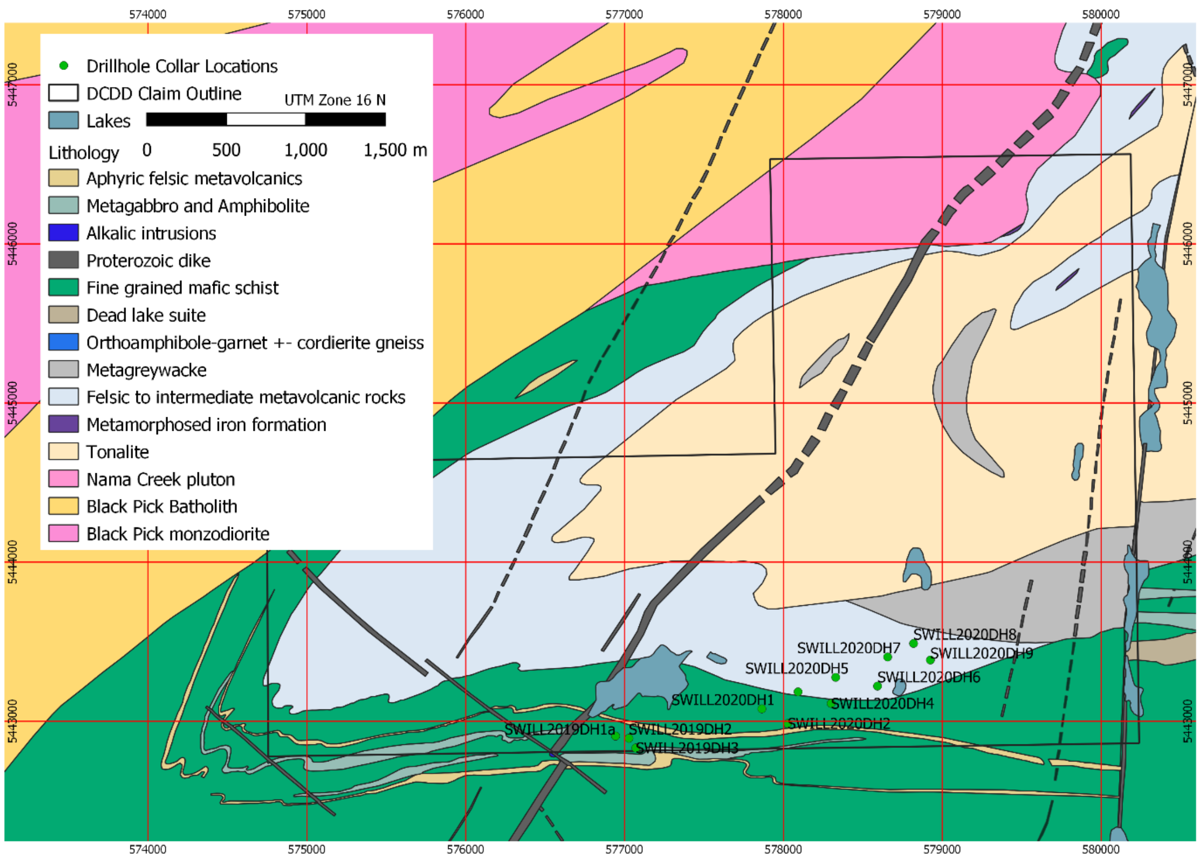
Wildlife activity is principally moose, bear, wolves, and beaver. Numerous bird species are present including grouse, and crows.

6. Regional Geology

The property is located within the Manitouwadge greenstone belt, which is located within the Wawa subprovince of the Archean Superior province. The Manitouwadge greenstone belt is located south of a tectonic boundary between the volcano-plutonic Wawa subprovince and the metasedimentary-migmatitic Quetico subprovince to the north (Zaleski and Peterson 1995). The Manitouwadge greenstone belt consists of bimodal felsic-mafic volcanic rocks, greywacke, iron-formation, and intrusive rocks that have all been metamorphosed to upper amphibolite facies and subject to four episodes of deformation (Zaleski and Peterson 1995). The Manitouwadge synform is the major structure present in the Swill Lake area. It is part of a group of regional Z-shaped D3 folds formed in response to dextral transpression (Zaleski and Peterson 1995). The Manitouwadge synform consists of an inner and outer volcanic belt which mantle a synvolcanic trondhjemite (Lodge 2013). The inner and outer belt are separated on the southern limb of the synform by metasedimentary rocks. Previously mined volcanogenic massive sulfide deposits are located on the southern limb of the Manitouwadge synform and have all been hosted in the inner volcanic belt (Lodge 2013).

7. Property Geology

The Swill Lake claims cover the hinge and the upper limbs of the Manitouwadge synform and have previously been interpreted to be stratigraphically above the Geco Mine Horizon (Degagne 1989). The metavolcanic rocks on this property belong to the outer volcanic belt of the Manitouwadge synform. The surficial geology of the claims from the southern limb to the core consists of mafic metavolcanics rocks including amphibolites, mafic schists and gneisses as well as foliated gabbroic units. Thin bands of felsic metavolcanics rocks including felsic gneisses and felsic schists are interlaid within the main mafic component. North of these units are felsic to intermediate metavolcanics rocks generally as muscovite-garnet to amph-muscovite-garnet schists and gneisses. Metasedimentary rocks, predominantly metagreywacke overlay the felsic to intermediate metavolcanics and are mainly located in the eastern claims. A massive tonalite is present in the core. In the northeastern portion of the claims granodiorite-monzadiorite of the Nama Creek pluton is present. NE-SW trending and NW-SE trending diabase dikes cut through the previously described units. A minor orthoamphibole-garnet ± cordierite gneiss outcrops SW of Swill Lake. Quartz veining observed on outcrop consists of thin 1-15 cm veins with occasional minor pyrite mineralization.



DCDD Swill Lake Property Geologic Map (After Zaleski and Peterson 2001)

Figure 3- Geological Map of the Swill Lake Property

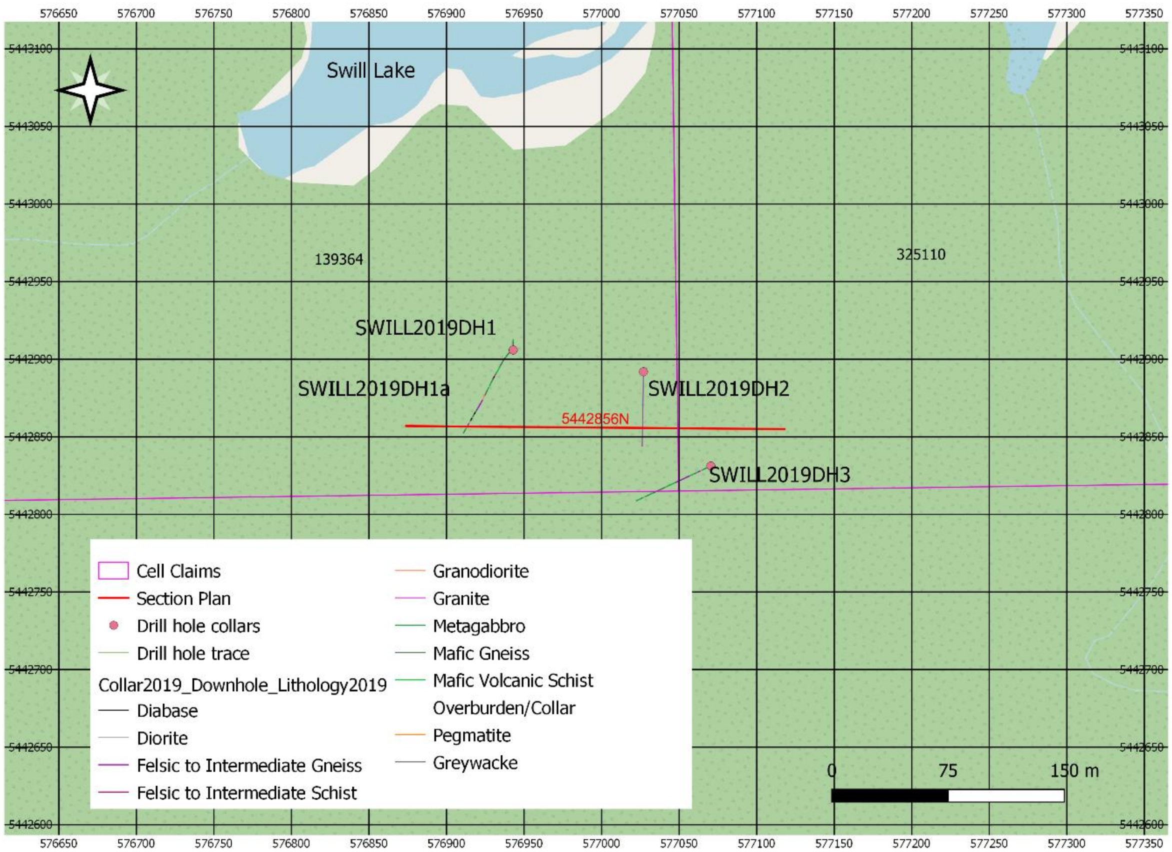


Figure 4- 2019 Drilling plans with drill hole trace projected to surface

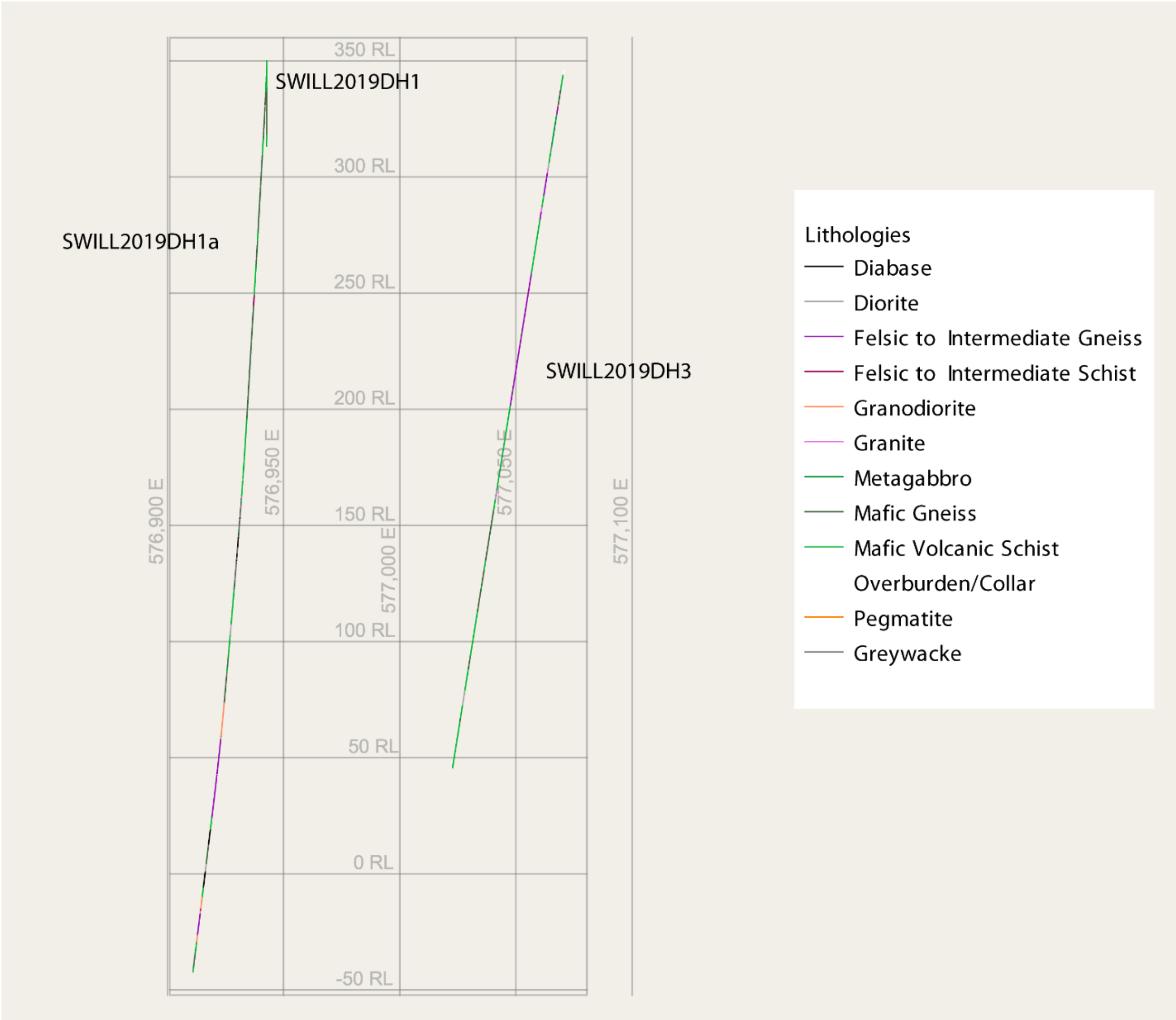


Figure 5- Drill hole cross section (Trace of cross section in map above).

8. Mineral deposit types-model-reasons

Exploration in the Swill Lake mining claims has targeted volcanogenic massive sulfide mineralization- Cu, Zn ± Au, Ag.

The Swill Lake mining claims lie east of four past producing volcanogenic massive sulfide deposits: Geco (55 Mt at 2.3% Cu, 8.2 Zn, 74 g/t Ag), Willroy (4.6 Mt at 1.3% Cu, 5.7% Zn, 48 g/t Ag), Willecho (3.8 Mt at 0.6% Cu, 3.9% Zn, 53 g/t Ag) and Nama Creek (0.3 Mt at 0.8% Cu, 3.9 % Zn, 28 g/t Ag) (Lodge 2012 and ref. within).

Although all known economic mineralization occurs in the inner volcanic belt, Zaleski and Peterson, 1995 correlated the inner and outer volcanic belts of the Manitouwadge synform as a product of D2 fold repetition. This is significant as, barring removal from erosion or faulting, altered and/or mineralized zones from the Wilroy-Geco area should be repeated (Zaleski and Peterson 1995).

9. Drill Hole Summary Tables:

Drill hole number:	Swill 2019-1
Collar Location (UTM Zone 16N)	576943 E, 5442906 N
Azimuth:	360º
Dip:	90
Hole length:	32.27 m
Number of Samples:	0
Number of Assays:	0

Drill hole number:	Swill 2019-1a
Collar Location (UTM Zone 16N)	576943 E, 5442906 N
Azimuth:	360º
Dip:	80º
Hole length:	398
Number of Samples:	23
Number of Assays:	23

Drill hole number:	Swill 2019-3
Collar Location (UTM Zone 16N)	577070.45 E, 5442831 N
Azimuth:	245°
Dip:	80°
Hole length:	398
Number of Samples:	65
Number of Assays:	65

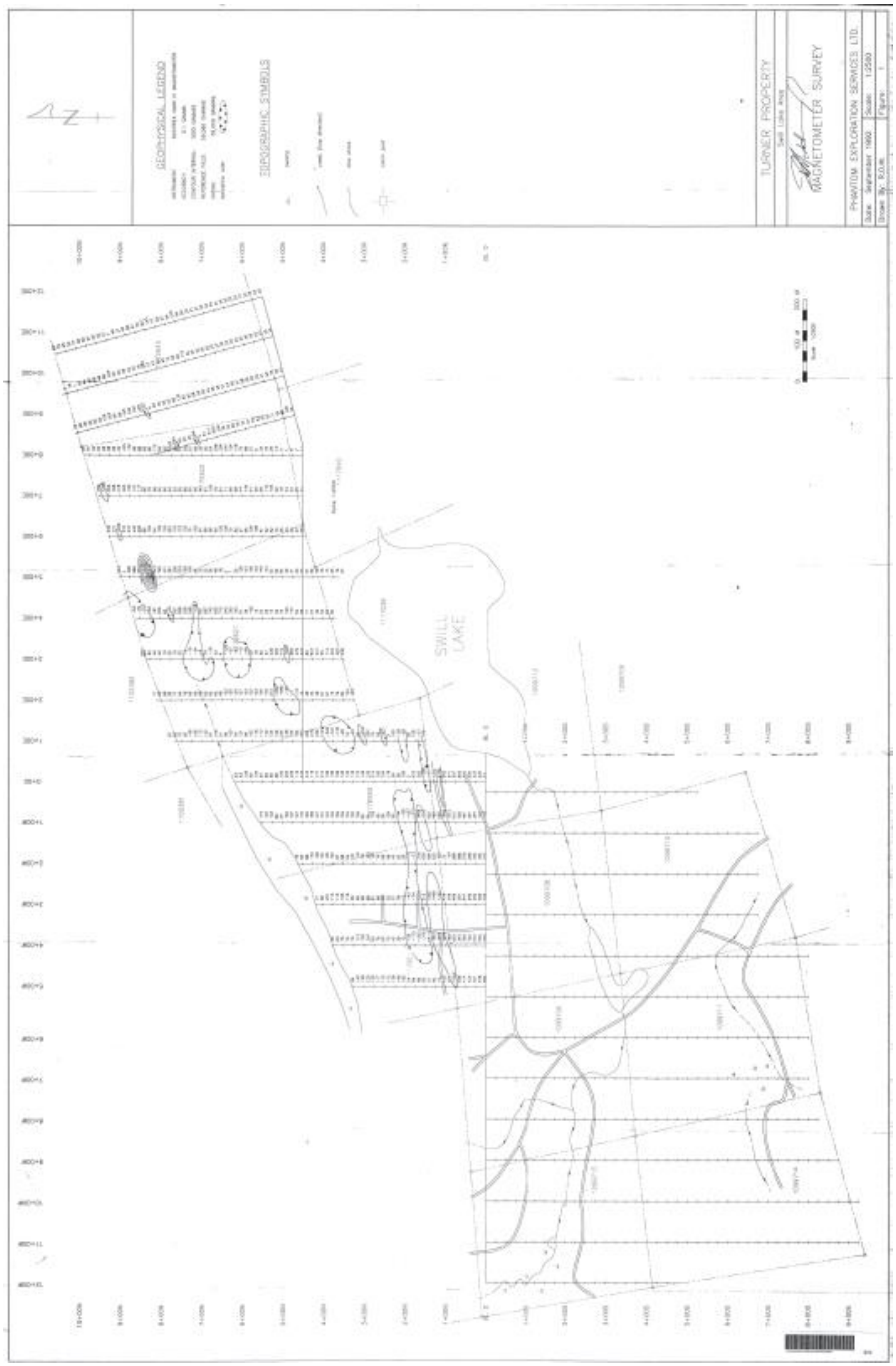
10. Work History

Multiple exploration efforts in the area were conducted in 1954. The Mining Corporation of Canada conducted a geological survey, magnetic survey, and a self-potential survey around the Swill Lake area (Britton 1954) [42F04NW0026 63.507]. Sharpe Geophysical Surveys limited conducted an electromagnetic survey on the property held by Minda-Scotia Mines Ltd along Nama Creek in the northwest end of their claim block (Seigel 1954 [42F04NW0027 63.504]. The western strike extension of a conductor interpreted to be the Nama Creek Fault was drilled by American Metal Company, Ltd with 1273 m drilled over 7 holes. Disseminated pyrite and rare chalcopyrite grains were observed in pink chlorite gneiss, hornblende gneiss, and along epidote filled fractures in diabase (Peach and Groom 1954) [42F04NW0067 25]. Buffalo Canadian Gold Mines conducted geological mapping, an electromagnetic survey, and a magnetometer survey followed by diamond drilling of six drill holes, with a total of 873 m of drilling completed. Sulfide mineralization consisting of pyrite and pyrrhotite was reported in the drill logs in addition to garnet and magnetite around a contact between mafic and felsic gneisses. (Fockler, Clifton, and Gledhill 1954)[42F04NW0052 40]. Conwest Exploration Company conducted a magnetometer survey on the property of Hucamp Mines to determine whether structures present in the Geco Mine property are continuous to the east (Lytle 1954) [42F04NE0061 63.476 10]. Okleco Mines Ltd conducted a diamond drill program with 740 m of core drilled over 8 holes (Kenty 1954)[42F04NW0084 13]. Wadge Mines conducted diamond drill program with 1515 m of core drilled over 9 holes (Ramsey 1954) [42F04NW0091 15]. Work has been completed between 1988-1990 by Noranda which included an airborne EM, soil sampling and magnetometer survey, followed by diamond drilling in any anomalous areas.[2] Other companies such as OKLEND, Delmico Mines and C.H.I.P. Mines performed magnetometer and geological surveys.[3] Anomalies appear to have been followed up with additional work including diamond drilling. Unfortunately, no assay results have been found by this author. Previous authors elude to finding results and reference to "G.D.I.F. 190 for further information".[4]

Further research was performed and work of interest was identified. Claims in this area were held in the early 1990's by Albert Turner. Mr. Turner drilled several shallow (less than 30m) drill holes. No significant assay data was recorded. Assays were for Ag, Au, Cu, Zn.[5] Additionally, Mr. Turner employed Phantom Exploration Services Ltd. (Phantom) of Thunder Bay to perform a geophysics study. The study consisted of VLF and proton magnetometer surveys. The surveys were conducted as per Figure 3.[6]

The results were summarized as a local magnetic high was noted as a diabase dyke. The next notable magnet anomaly was noted as iron rich mafic volcanics. Additionally, the results were cautioned as the topography and the soil clay content made all trends to be "considered superficial in nature"[7]

Figure 6 – Phantom Geophysics Testing


GEOPHYSICAL LEGEND
TOPOGRAPHIC SYMBOLS
TURNER PROPERTY
MAGNETOMETER SURVEY
PHANTOM EXPLORATION SERVICES LTD.
SWILL LAKE

11. Work this Period

As recommended in previous reports a shift to the south (east) of Swill Lake was made to test the area model that had been developed. The target was simply to identify any mineralization in this area and use this data as an indicator for follow up drilling. Anticipated was mineralized intersection(s) and some grading for the specific target of Cu. Once this test is completed, a clear understanding of the model/theory developed for the area could be confirmed. Anticipated was confirmation of a south – south east mineralized area. The test drilling would indicate if the mineralization was south east or south west or the model was completely invalid and subsequently a re-evaluation of the exploration strategy be required.

a. August, 2019

Work during this period was focused on two specific tasks. The first task was to locate and attract skilled drillers. The second task was to bring drill supplies to Manitouwadge.

Work on the first task had been ongoing with Northern College for well over a year. Numerous drill helper graduates had been approach for work and the inquires through various work site advertisements had been launched. No success was achieved in attracting talent. Fortunately, local inquiries in late August successfully attracted talented personnel. A complete single shift of seasoned Driller and Drill Helper had been satisfied by the end of August.

With respect to materials, a purchase from Fordia for all drill supplies to initiate drilling was completed. The materials were picked up by myself in Sudbury and brought to Manitouwadge by mid-August. Additional components were anticipated once drilling was commenced as planned in early September.

b. September, 2019

September was focused on achieving 3 holes drilled to 500m for a total of 1500m. The area had been selected in the 2018 field work. The road was checked in August 2019 and found to be in reasonable condition. The greatest challenge was trying to fit the holes in the narrow target projection - nearly all holes projected onto a single claim

(claim 139364). The goal of the drilling was to determine the direction of the next area of interest for drilling. The strike of the potential trend had been identified in 2018. This trend had following logical potential outcomes: 1. No mineralization would identified in drilling; 2. Sporadic mineralization would identified with no trend; 3. Mineralization would be identified in all three holes and would be in a manner which would make identification of a source direction possible; 4. The mineralization would be of significant valuations to identify an anomaly immediately.

With this logic base in place, the period was to drill these 3 holes with a new drill and new crews all effectively within a 28 day period. Not impossible, but certainly optimistic.

Three drill setup locations were established with the first holes at 16U 576943E 5442906N (accuracy 6m). Two holes were drilled at this location. 19 Swill Hole#1 was drilled to 33m@80degree dip when the hole caved. The hole was abandoned and a second hole 19 Swill Hole#1a was drilled to 398m depth at 90 degrees. The second drill setup was at 16U 577027E 5442892N (accuracy 3m). 19 Swill Hole#2 was drilled to a depth of 275m at 80 degree dip. Lastly, 9 Swill Hole#3 was drilled and the hole was completed on October 4th to a depth of 305m at 80 degrees.

The total drilled metres from what ended up being a drill start date of September 14th with 19 Swill Hole#1 and resumed drilling on September 18th dayshift through to October 4th would be 1,015m. The average including moves for drilling was 17 days with an average daily drill rate over 3 holes (with 2 moves) of 59m per day.

A professional geologist was hired on September 19th to log the core. The geologist anticipated an earlier start but unfortunately was delayed and began to log core on October 2nd.

c. October - December, 2019

October started with getting the geology crew setup. A core bench was constructed, lighting established and existing core organized. 19 Swill Hole#3 was ongoing so the logging started with hole #3. Drilling wrapped up with a change of crew in a couple of days. The focus shifted to drill teardown and core logging. Martin Drennan was the only remaining crew and as such the last drill site cleaned up in a couple of days with follow up on some Ministry items as well as checking on the core logging.

The first core logging crew completed hole#3 and started on hole #2. They unfortunately had to leave but a second crew working for this geological firm was to replace them. Due to various delays and timing issues the coring for all 3 holes was completed in early November and assay samples were taken by the geology firm to ActLabs in Thunder Bay for analysis.

As this was an initial pass for drill core assays a battery of tests were completed. The results were received back from ActLabs on December 3rd and forwarded to the geological firm for incorporation into their drill core logs.

Unfortunately, with the Christmas Season and the New Year, no drill log data has been received from the geological firm. To date no replies to calls or emails have been received. As such, with all the invoice paid – except a 17% hold back for the completed core log/assay integration spreadsheet – it has been determined that a new approach for completing the core logs was needed.

d. April, 2020

Beginning in March, several strategies were reviewed to determine the approach to ensure core and core logs were able to organized and reported. The culmination of this was to hire a permanent geologist who would be skilled and responsible for all tasks related to geology. Initially the goal was to hire a geologist whom was contacted autumn 2019 (sourced through Kelly's Recruiting). Unfortunately, the individual was interested in B.C. geology and returning to Ontario on a full time basis was not of interest. As such, the strategy morphed to source a graduating student.

Several Universities and inquiries to industry personnel were made. Several students were interested with various levels of study and experience. Phone interviews were conducted. All the students were very interested and they demonstrated their skill sets and depth of character. Tough decisions happen and as such I was fortunate to hire a field experienced MSc. G.I.T. graduate, Robert Meek. Robert was hired on April 10, 2020 and we proceeded to establish a strategy to make working through the covid19 limitations work. The first items on the list were getting everything Robert needed for a core shack and field work. Materials were sourced from Exploration Services in Sudbury. Secondly, dealing with the core was a daunting task. There was over a 1000m of core to be re-logged and stored. We tossed some ideas back and forth…it's his core shack – so it has to work for him. So, step one was source materials from Garden Lake timber in Thunder Bay. Two core racks were purchased with a design capacity for BQ core of in around 1200m. Step one complete – place to put core. Second was to establish a "flowing" log setup so moving core wasn't the challenge. This was accomplished with storage immediately behind the core bench. Robert designed and assembled a system where he could easily move core and layout 15 trays. Step two was now complete and core logging initiated. However, all this organizing and the limitations imposed by working with in the covid19 pandemic had placed us starting core logging in early May.

e. May, 2020

May – what to say. The time frame was to complete a significant core log effort and submit it by May 20th. Two problems existed. Firstly, logging 1000m+ of core in detail and presenting it would be difficult within 20 days and doing all the work by yourself. Ripping through it…no problem but providing a valuable level of detail – would be challenging even for seasoned geologists. Secondly, logging all the core was going to provide limited value to my submission. As noted early, with the change in claim system, the diamond drill permit from the old system limited the ability for the new system to have my claims amalgamated. As such a significant portion of the work I had completed in 2019 was limited to $50,000 for a single claim.

The claim limitation was tackled by setting a working limit of $50,000 for the drilling on claim 139364. So, to address that holes#1 and #1a were selected to be logged which totaled 435m of drilling. Adding the logging, assay, would bring that value in around $50,000. To note the $50,000 has no bank capacity – so adding more work nets zero for any bank or distribution to other claims. Robert rechecked my gps work and found that hole #3 was collared on claim 325110 and intersected claim 139364 at in around 123m with a linear projection for the hole. These two solutions for our second problem lead to the solution for logging: log 435m+123m of core or approximately half the core in the time limitation. Daunting still but doable. Robert completed logging this core on May 18th in the morning and proceeded to his writeup on May 18th and incorporated it in this document May 19th.

Other tasks were happening in the background for preparation for this season’s drilling efforts. Equipment purchases, preparation work, etc. The first key element of this year’s work is establishing a trail/access for the drill that is in around 900m. Clearing has been completed for approximately 450m using machete, bush axe and a Stihl bush cutter (FS91). Personnel completing this work were Martin Drennan, Robert Meek, Chris Bottomley, and Bruce Baziuk. Personnel maintained a 2m distance for this work with access being truck and ATV.

Lastly, the assembly and compilation of this report was completed April and May 2020 based on notes from 2019 drilling season. The focus will flip back to drilling requirements including access development, drill water sources and mobilization of drill crews work come May 21st.

Figure 7 – DeviShot Data – Hole #1a

Survey Report			
Survey ID		Survey Na	19-swill-a
Created	2019.09.2	Modified	2019.09.22 07:58:17
Location		Survey Ru	2019.09.22 07:58:17
Operator		Customer	
Tool	DeviShot	Serial nr.	9135
		Meas. Inte	5
Mag. Decl.	0.00 deg.		
9135 GTF (	0.00 deg.		
Northing	0.00 m		
Easting	0.00 m		
Elevation	0.00 m		

Recorded Data:

TimeStam	Depth	Az.	Incl.	North.	East.	Elev.	G.Tf.	G.Vec.	Mag.Dip	Mag.Tf.	Mag.Vec.	MagX	MagY	MagZ	Bat.	Temp.	Right/Left	Up/Down	Shortfall
38:24.6	8	261.06	-87.69	0	0	0	358.46	9.81	73.97	251.8	55990	53672	-15147	-4982	7	6.1	0	0	0
23:54.9	38	225.39	-85.36	-0.95	-1.46	-29.94	265.85	9.8	74.07	121.8	56291	53076	15942	-9869	7	5.9	-0.71	0.38	0.01
10:48.3	68	219.98	-85.04	-2.79	-3.16	-59.83	234.36	9.8	73.88	85.5	56286	52836	19342	1512	7	5.4	-2.27	1.14	0.06
56:11.6	98	216.05	-83.92	-5.07	-4.92	-89.69	324.82	9.81	74.23	171.3	56080	52359	3024	-19860	7	5.4	-4.24	2.03	0.14
42:22.4	128	210.77	-83.29	-7.86	-6.76	-119.51	297.19	9.8	74.05	139.3	56056	51982	13693	-15895	7	5.4	-6.71	3.07	0.26
50:26.3	158	206.93	-82.43	-11.13	-8.55	-149.27	309.6	9.81	73.57	148.4	56000	51383	11667	-18966	7	5.9	-9.66	4.15	0.43
38:49.0	188	211.29	-81.66	-14.75	-10.57	-178.98	80.49	9.8	73.98	281.5	56194	51521	-21984	4480	7	5.9	-12.92	5.51	0.64
46:14.2	218	207.38	-79.76	-18.97	-12.93	-208.59	187.77	9.8	73.26	25.2	56156	50365	10575	22473	7	6.3	-16.73	7.3	0.94
31:50.4	248	206.53	-78.86	-23.93	-15.45	-238.06	180.78	9.79	72.72	17.4	55712	49336	7730	24700	7	6.5	-21.24	9.37	1.35
16:31.5	278	205.53	-78.17	-29.3	-18.07	-267.46	215.55	9.8	72.7	51.2	56078	49318	20791	16738	7	6.7	-26.14	11.6	1.84
59:22.4	308	210.05	-77.42	-34.91	-21.03	-296.78	143.06	9.79	73.44	340.7	55915	49305	-8726	24888	7	7.2	-31.21	14.21	2.39
08:31.3	338	211.78	-76.24	-40.77	-24.55	-325.99	109.99	9.8	73.4	308	55625	48565	-21382	16685	7	7.6	-36.46	17.42	3.02
23:27.6	338	209.92	-76.62	-40.77	-24.55	-325.99	249.27	9.8	74.05	86.1	55852	49164	26439	1821	7	7.4	-36.46	17.42	3.02
47:57.4	368	209.67	-75.83	-46.97	-28.1	-355.13	212.32	9.79	73.91	48.6	56200	49046	20591	18135	7	7.6	-42.03	20.71	3.73
47:07.4	398	209.69	-75.83	-53.35	-31.73	-384.22	212.31	9.79	73.92	48.6	56203	49050	20591	18135	7	7.6	-47.76	24.11	4.48

Survey Report																			
Survey ID		Survey Nai	19-swill-02																
Created	2019.09.2(	Modified	2019.09.26 09:31:40																
Location		Survey Rur	2019.09.26 09:31:40																
Operator		Customer																	
Tool	DeviShot	Serial nr.	9135																
		Meas. Inte	5																
Mag. Decl.	0.00 deg.																		
9135 GTF (	0.00 deg.																		
Northing	0.00 m																		
Easting	0.00 m																		
Elevation	0.00 m																		
Recorded Data:																			
TimeStamı	Depth	Az.	Incl.	North.	East.	Elev.	G.Tf.	G.Vec.	Mag.Dip	Mag.Tf.	Mag.Vec.	MagX	MagY	MagZ	Bat.	Temp.	Right/Left	Up/Down	Shortfall
54:35.4	275	194.61	-69.07	0	0	0	7.08	9.79	73.66	193.9	55807	44589	-8038	-32582	7	6.3	0	0	0

Figure 8 – DeviShot Data – Hole #2

Figure 9 - Core Boxes

Figure 10 – Boxes Naming Convention

Figure 11 – Hole #1 and #1a

Figure 12 – Core in the Box

Figure 13 – Drill Setup Hole#1

Figure 14 – Water Pump

Figure 12 – Trail Clearing for 2020 Drill Season (Start of Trail)

Figure 13 – Trail Clearing for 2020 Drill Season (Clearing)

12. Conclusion and Recommendations

The work performed in 2019 and 2020 was reasonable with respect to obtaining this test drill hole data. The presence of silicified and chloritized zones was noted in the drill core and are tentatively interpreted to be part of a distal alteration zone in a VMS system, however there were no significant intersections of orthoamphibole-garnet-cordierite gneiss, a unit previously interpreted as correlative to the host rocks of the Wilroy-Geco area (Zaleski and Peterson 1995). The assay results as presented for Holes#1A and Hole #3 demonstrate areas with minor values for Cu (0.34%/1.14 m) Zn (0.122%/ 0.46 m) and Au (164 ppb/1.14 m) in lower mafic volcanic gneissic rocks. An area to the northeast of the test site has been selected by the lead author for the 2020 field season. This data matches model data developed by the lead author from field work between 2015 and 2018. The generalized model (supported by the results from all drilling and demonstrated by the holes presented in this work report) suggests that mineralization north east of this drill can be expected.

As such, based on the preceding years of work and supported by this year's test drilling, the recommended next phase is a 2020 drill program north east of this test location. A diamond drill program has been developed and is anticipated to advance in the Spring of 2020 once exploration is permitted (i.e. covid19 restrictions are lifted).

13. References

Zaleski, E., Peterson V.L., 1995. *Depositional Setting and Deformation of Massive Sulfide Deposits, Iron-Formation, and Associated Alteration in the Manitouwadge Greenstone Belt, Superior Province, Ontario*. Econ Geol Vol. 90, pp. 2244-2261.

Lodge, R.W.D., 2013. Regional volcanogenic massive sulphide metallogeny of the Neoarchean greenstone belt assemblages of the Wawa subprovince, Superior Province. PhD. Thesis. Laurentian University. 303 p.

Degagne, P., 1989. Report of work- Nama Creek Property. Mapledoram township. Noranda Exploration. 42F04NW8250.

Britton, J.W., 1954. Report on geophysical, geological, and self-potential surveys covering a group of 18 mining claims situated in the Manitouwadge Lake area (Nama Creek) Thunder Bay Mining District. Mining Corporation of Canada 42F04NW0026

Seigel, H.O., 1954. Report on an electromagnetic survey of a property of the Minda-Scotia Mines Limited, in the Manitouwadge area of Ontario by Sharpe Geophysical Surveys Limited. 42F04NW0027 63.504

Peach, P.A., Groom, J.R., 1954. Diamond drill record report 25. 42F04NW0067 25. American Metals Limited. Manitouwadge Lake.

Fockler, B.K., Clifton, F.T., Gledhill, T.R., 1954. Diamond drilling report no. 40. Manitouwadge Lake area. Buffalo Canadian Gold Mines. 42F04NW0052 40.

Lytle, L.K., 1954. Conwest Exploration Company Limited for Hucamp Mines Limited. Manitouwadge Lake Area.42F04NE0061 63.476 10

Kenty, H.A., 1954. Diamond drilling report no 13. Okleco Mines Limited, Manitiouwadge Property. 42F04NW0084 13.

Ramsey 1954. Diamond drilling report no 15. Area of Manitouwadge Lake Report. Wadge Mines Limited. 42F04NW0091 15

1. GRANGES INC., MAN PROJECT, GEMMEL, GERTRUDE, MAPLEDORAM AND LESLIE TOWNSHIPS CENTRAL AND NORTH CENTRAL GRID GEOLOGY REPORT, Warren Bates, B.Se., Hons. Geol August 6, 1993 (Page 2)
2. GRANGES INC., MAN PROJECT, GEMMEL, GERTRUDE, MAPLEDORAM AND LESLIE TOWNSHIPS CENTRAL AND NORTH CENTRAL GRID GEOLOGY REPORT, Warren Bates, B.Se., Hons. Geol August 6, 1993 (Page 3)
3. GRANGES INC., MAN PROJECT, GEMMEL, GERTRUDE, MAPLEDORAM AND LESLIE TOWNSHIPS CENTRAL AND NORTH CENTRAL GRID GEOLOGY REPORT, Warren Bates, B.Se., Hons. Geol August 6, 1993 (Page 3)
4. GRANGES INC., MAN PROJECT, GEMMEL, GERTRUDE, MAPLEDORAM AND LESLIE TOWNSHIPS CENTRAL AND NORTH CENTRAL GRID GEOLOGY REPORT, Warren Bates, B.Se., Hons. Geol August 6, 1993 (Page 3)
5. 42F04NW0001-Turner – Assessment work after staking a claim – work report number 1
6. 42F04NW0033-Turner-Maps - Geological and Geophysical Reports – Phantom Exploration Services Ltd. September 1992
7. 42F04NW0033-Turner – Geological and Geophysical Reports – Phantom Exploration Services Ltd. September 1992 (Page 5)

14. Appendices

14.1 Logging codes

Dt	Diorite	**Grt**	Granite
Gt	Granodiorite	**Db**	Diabase
Fis	Felsic-intermediate schist	**Fig**	Felsic-intermediate gneiss

Mvs	Mafic schist	**Mgb**	Metagabbro
Mgn	Mafic gneiss	**Peg**	Pegmatite
Sgw	Metagreywacke		

ALTERATION CODES				
Unalt	Unaltered		**Dol**	Dolomite
Chl	Chlorite		**Cc**	Calcite
Qtz	Quartz		**Ank**	Ankerite
Ser	Sericite		**K**	Potassic
Bt	Biotite		**Msc**	Muscovite
Fch	Fuchsite			
Sp	Serpentine		**ALTERATION INTENSITY**	
Tc	Talc		**Wk**	Weak
Ep	Epidote		**Md**	Moderate
Ab	Albite		**Str**	Strong

14.2 Drill hole Swill 2019-1

Project: Swill 2019

Logged by: Robert Meek

Hole ID: Swill 2019-1

Log start: May 11 2020

Log end: May 11 2020

UTM E (survey): 576943 **UTM N** (survey): 5442906

UTM zone 16 N

Azimuth: 360 **Dip**: 80

Collar Elev.: 350 **Depth**: 32.27

Overburden: 0.67 **Dip srvy mthd**: Devishot

Cell Number: 42F04E149 **Mining claim**: 139364

Lease Numbers:

Drilled by: Drennan Drilling and Consulting

Core size: BQ

INTERVAL		LITHOLOGY CODE	DESCRIPTIVE LOG
From	To		
0.00	0.67	Ovb	
0.67	2.08	Mvs	Mafic schist,dark green to grey, medium to coarse grained, parallel schistose banding between qtz-plag and bt-musc-hbl mineral. micas elongated ~40 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.5 cm wide clasts. Foliation defined by mica elongation present at 40 deg core axis. Two qtz-carb vein sets at 40 and 70 CA. Vein set at 40 CA slightly deformed. Sharp contact with underlying unit 80 CA.
2.08	2.22	Peg	Pegmatite, light grey to pinkish, coarse grained quartz and K-feldspar. Sharp contact with underlying unit (potential leucosome) at 80 CA
2.22	5.01	Mvs	Mafic schist,dark green to grey, medium to coarse grained, parallel schistose banding between qtz-plag and bt-musc-hbl mineral. micas elongated ~40 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.5 cm wide clasts. Chlorite alteration intensity weakens towards lower contact. Foliation defined by mica elongation present at 40 deg core axis. Two qtz-carb vein sets at 40 and 70 CA. Vein set at 40 CA slightly deformed. Sharp contact with underlying unit (50 CA).
5.01	5.11	Gd	Granodiorite, white to pinkish, medium grained, equigranular, massive, weak potassic overprint, trace disseminated pyrite, sharp contact (40 CA)

5.11	12.38	Mvs	Mafic schist, dark green to grey, medium to coarse grained, parallel schistose banding between qtz-plag and bt-musc-hbl mineral. micas elongated ~40 to core axis. At upper contact chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.5 cm wide clasts. These clasts gradually decrease in size downhole to 0.2-0.3 cm in diameter. Alternation between chlorite dominant zones and biotite-muscovite dominated zones occurs at approximately 8.60 m. Foliation defined by mica elongation present at 40 deg core axis. Two sets of quartz veins present, one parallel to foliation and a later generation of veins at 20 CA with sinistral offset of ~2 cm. Gradational contact to mafic dominated gneissic unit.
12.38	32.40	Mgn	Mafic gneiss, dark green to light grey, fine to medium grained with leucosome of plag and botryoidal muscovite at 14.62-14.77 m. Gneissic banding throughout unit. Muscovite and chlorite are dominant phyllosilicates in unit. Garnet and epidote present in thinner leucsomes throughout unit. Foliation at 40 present throughout unit, deformed at places. Two sets of veins present throughout unit, 1 a qtz carb +- gnt and ep vein set at 60 CA. 2 thinner qtz-carb veins at 30. Set 1 tends to be deformed with z-folds present near the bottom of the unit. A ~10 cm wide qtz-carb extensional vein at 75 CA intersects this unit. Disseminated Py is present throughout the unit, with higher concentrations and the occurrence of Po in musc-gnt zones or in qtz-carb vein set 1 proximal to musc-gnt zones. Sharp contact with underlying mafic schist
32.40	37.27	Mvs	Mafic schist, dark green to grey, medium to coarse grained, parallel schistose banding between qtz-plag and bt-musc-hbl mineral. micas elongated ~40 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.5 cm wide clasts. Foliation defined by mica elongation present at 40 deg core axis. Two sets of quartz veins present, 1. Qtz-carb veins ~0.5 cm parallel to foliation and 2-4 cm qtz-carb-gnt veins at 60 CA. End of hole.

ALTERATION															
Interval		Unalt	Chl	Qrtz	Ser	K	Fu	Sp	Tc	Ep	Ab	Dol	Cc	Ank	Comments
From	To	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	
0	0.67														Ovb.
0.67	2.08		Md												Chorite eyes, potential psuedomorph after pyroxene
2.08	2.22	Md													
2.22	5.01		Md												Same as mafic unit above chl alt intensity weakens towards contact with lower

															intrusive unit
5.01	5.11					Wk									Weak potassic alteration of intermediate intrusive
5.11	12.38		Md												Alternation between Chl and Musc-Bt altered bands
12.38	32.4		Md							Md					Md Ep alteration in qtz veins, commonly with garnet at the contact between veins and gneissic unit. Md chl alt throughout unit.
32.4	37.27		Md												

MINERALIZATION						
Interval		Py	Po	Cpy	Sph	Comments & Textures
From	To	%	%	%	%	
0.67	2.08	1				disseminated 1-5 mm, occasionally elongated parallel to foliation
5.01	5.11	<1				Trace disseminated py, <1 mm grains
5.11	12.38	1				disseminated 1-5 mm, occasionally elongated parallel to foliation
12.38	14.6	1				disseminated 1-5 mm, occasionally elongated parallel to foliation

14.6	18	3	2			disseminated 1-5 mm Py and Po, occasionally elongated parallel to foliation. Po preferentially with foliated muscovite zones
18	32.4	3	2			Po in gnt-muscovite-qtz zones ~1-3 mm anhedral grains, Py disseminated throughout ~1 mm, ~1-3 mm in gnt-musc-qtz zones
32.48	32.53	4	1			disseminated 1-5 mm Py and Po, occasionally elongated parallel to foliation.

STRUCTURE				
Interval		Code	Core angle	Comments
From	To			
0.00	0.67	OB		
0.67	2.08	Fol	40	Foliation defined by elongate chl, musc, +- bt grains
0.67	2.08	Vn	70	0.2-0.4 cm qtz-carb veins
0.67	2.08	Vn	40	0.4-1.5 cm qtz carb veins partially deformed
2.22	5.01	Fol	40	Foliation defined by elongate chl, musc, +- bt grains
2.22	2.65	Vn	85	2-15 cm wide qtz carb +- k-spar vein, mafic schist ripped up along largest vein edge
3.28	3.30	Vn	70	Extension qtz vein
2.22	5.01	Vn	40	Thin, ~0.5 cm qtz-carb veins parallel to foliation
5.11	12.38	Fol	40	Foliation defined by elongate chl, musc, +- bt grains
5.11	12.38	Vn	40	Qtz-carb veins parallel to foliation, 0.5- 1.0 cm wide, offset by set of qtz-carb veins at 20 CA
5.11	12.38	Vn	20	Set of ~0.5 cm qtz-carb veins cut veins above
12.38	32.40	Fol	40	Foliation defined by elongate chl, bt, musc +- hbl. Distorted and gneissic banding
12.38	32.40	Vn	60	Qtz-carb veins +- gnt & ep. 1-5 cm wide. Z-folding observed in veins in this set near bottom of gneissic unit
24.42	24.51	Vn	75	Qtz-carb extensional vein, wall rock rip up in vein, barren
12.38	30.40	Vn	30	Thin, ~0.5 cm qtz-carb veins intersecting dominant veinset
30.40	37.27	Fol	40	Foliation defined by elongate chl, musc, +- bt & hbl grains
30.40	37.27	Vn	40	Thin, ~0.5 cm qtz-carb veins parallel to foliation
31.52	31.54	Vn	60	Qtz-carb-Gnt vein

14.3 Drill hole Swill 2019-1a

Project:Swill 2019

Logged by: Robert Meek

Hole ID: Swill 2019-1a

Log start: May 12 2020

Log end: May 16 2020

UTM E(survey): 576943 **UTM N** (survey): 5442906

Azimuth: 360 **Dip**: 90

Collar Elev.: 350 **Depth**: 398

Overburden: 0.67 **Dip srvy mthd**: Devishot

Cell Number: 42F04E149 **Mining claim**: 139364

Lease Numbers:

Drilled by: Drennan Drilling and Consulting

Core size: BQ

INTERVAL		LITHOLOGY CODE	DESCRIPTIVE LOG
From	To		
0	0.1	OB	
0.1	13.8	Mvs	Mafic schist, dark green to grey, medium to coarse grained, parallel schistose banding between qtz-plag and bt-musc-hbl mineral. micas elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.2-0.4 cm wide clasts. Foliation defined by mica and hbl elongation present at 50 deg core axis. Two qtz-carb vein sets at 50 and 0 CA. Vein set at 50 CA slightly deformed with z folds occasional observed. Sharp contact with underlying gneissic unit ~50 CA. Intersected by 0.7 cm wide greyish-orange granodiorite unit similar to intermediate unit described below at 50 CA at 11.2 m.
13.8	19.34	Mgn	Mafic gneiss, dark green to light grey. Gneissic banding throughout unit. Muscovite and chlorite are dominant phyllosilicates in unit. Garnet and present in thinner leucosomes throughout unit. Foliation at 50 CA present throughout unit, deformed at places. One main vein set

			present running parallel to foliation at 50. Disseminated Py is present throughout the unit, with higher concentrations and the presence of pyrite veinlets as well as the occurrence of Po in musc-gnt zones or in qtz-carb veins proximal to musc-gnt zones. Sharp contact with underlying granodiorite at 30 CA.
19.34	20.2	Gd	Granodiorite, white to pinkish, coarse grained, equigranular, massive, weak potassic overprint, fine grained disseminated pyrite throughout unit, coarser grained Py and minor Cpy along edges of intersecting qtz veins. Sharp defined contact with lower mafic gneiss (30 CA)
20.2	34.02	Mgn	Mafic gneiss, (Musc-Gnt dominant gneiss) dark green to light grey. Gneissic banding throughout unit, weaker than gneiss unit above. Muscovite and chlorite are dominant phyllosilicates in unit. Garnet and present in thinner leucosomes throughout unit. Foliation at 50 present throughout unit, deformed at places by apparent Z-folds. Py and Po disseminated throughout unit, Po being more prominent along muscovite rich zones. Py occurs as coarser, 2-4 mm grains in qtz-carb veins trending 50 to CA. 1-2 mm Cpy grains in qtz-carb veins. Sharp contact at 50 CA.
34.02	39.11	Mvs	Mafic schist, dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.1-0.2 cm clasts. Unit weakly chloritized compared to previous units. Two qtz-carb vein sets at 50 and 30 CA. Py disseminated throughout unit, coarser in qtz veins. Sharp contact with underlying diorite unit ~45 CA.
39.11	39.22	Dt	Diorite, white, coarse grained, massive. Stockwork chl veins at 50 and 30 CA. Qtz vein 0 CA. Sharp contact with underlying mafic schist 90 CA.
39.22	40.95	Mvs	Mafic schist,dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.1-0.2 cm clasts. Unit weakly chloritized compared to schist at top of hole. Two qtz-carb vein sets at 50 and 30 CA. Py disseminated throughout unit, coarser in qtz veins. Gradational contact over 2-3 cm zone with underlying mafic gneiss unit
40.95	74.46	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Leucosomes greenish white. Potential bedding ~50 m. Musc occurs as thin beds near top of unit becoming more prevelant downhole. Unit is layered with pronounced ductile deformation from 56.3 - 60.7 m. Moderately magnetic with zones of Mt and Po. ~30 cm thick qtz-carb extensional veins cutting at a high angle to core axis from 57.60 m - 59 m. Mineralization is generally disseminated or spatially associated with thinner vein sets at 50 and 30 CA. Sharp contact with mafic schist at 70 CA.
74.46	78.03	Mvs	Hbl-chl-musc-gnt mafic schist, dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.1-0.2 cm clasts. Two qtz-carb vein sets at

			50 and 70 CA. Intruded by 1 cm wide plagioclase-qtz pegmatite dike at 77.69 m. Py disseminated throughout unit, coarser in qtz veins. Po veinlets at 74.73-74.74 m. Sharp contact with underlying mafic gneiss at 50 CA.
78.03	88.16	Mgn	Mafic gneiss (gnt, +-musc). Dark green to dark grey. Leucosomes greenish white. Moderately magnetic with zones of Mt and Po. Mineralization is generally disseminated or spatially associated with thinner vein sets at 50 and 70 CA. Sharp contact with mafic schist at 64 CA.
88.16	101.48	Mvs	Hbl-chl +- musc mafic schist, dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.2-0.6 cm clasts. Foliation becomes more defined downhole with chl porphyblast sizes becoming smaller and flattening. Two qtz-carb vein sets at 50 and 70 CA. Sharp contact at ~50 CA with int. schist.
101.48	106.15	Fis	Chl-Musc fel-int schist. Green to brown, fine to medium grained. Chl and musc elongated 50 CA. Str foliation at 50 CA, thinner bands and elongated clasts compared to unit above. Graphitic fractures 103-106.15 m. 102 m - 106.15 m bluish indet. mineral banding(sil-kyanite?). 104-106.15 m graphitic fractures running parallel to fol. Py-Po disseminated and as veinlets. One set of qtz-carb veins trending 50 CA variably deformed, 0.3-5 cm wide. Sharp, irregular contact with underlying gneissic unit.
106.15	154.79	Mgn	Mafic gneiss (gnt, hbl, musc). Dark green to dark grey. Leucosomes greenish white, ep altered. 149.10-149.18, 151.28-151.33, Alternation to thin decimeter scale felsic gneissic unit (or undeformed leucosome), ep-gnt-alb. Gnt concentrated in leucosomes. Gnt dominant zone from 137-147 m. 2-4 cm Patches of coarser grained chl-hbl. Mineralization is generally disseminated or spatially associated with vein sets at 50 CA. Thinner veins ~1 mm wide run 20 CA throughout. Plag-Qtz pegmatitic vein from 118.80-118.83 m showing symplektite texture. Foliation present throughout unit and best observed in zones of finer grained chl-musc. Sharp contact with mafic schist at 50 CA.
154.79	173.51	Mvs	Hbl-chl mafic schist, dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.2-0.6 cm clasts. Patchy moderate ep alteration, locally str near qtz veins. Two qtz-carb vein sets at 50 and 20 CA. Sharp contact at ~50 CA with granitic intrusion.
173.51	173.64	Grt	Granite, pinkish red, medium-coarse grained. Stockwork chl veins cut unit. Sharp contact ~50 CA to underlying mafic schist.
173.64	181.08	Mvs	Hbl-chl mafic schist, dark green to grey, medium grained, Chl and hbl elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, and occurs predominantly as rounded 0.2-0.6 cm clasts. Chlorite clasts decrease in size moving downhole from ~0.6 cm - 0.1 cm in diameter. Patchy weak

			ep alteration, locally mod near qtz veins. Two qtz-carb vein sets at 50 and 20 CA. Sharp contact at ~80 CA with intermediate intrusive unit. Disseminated py throughout, concentrated near contact with granitic intrusion and in qtz-carb veins. Magnetite throughout unit.
181.08	182.08	Dt	Diorite, white- pink, med-coarse grained, massive. Sharp contact with underlying mafic schist 70 CA.
182.08	188.7	Mvs	Hbl-chl +- musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. 2-4 cm wide musc dominant zones from 185 m onward. Potential felsic component from 187.23-183.39, chl-bt-qtz-kspar with wk Ep-K-Chl alteration. Two qtz-carb vein sets at 50 and 20 CA. Extensional qtz-carb vein at 184.89-184.95 m intersecting at 80 CA. Sharp contact at ~70 CA with granitic intrusive unit. Disseminated py throughout, concentrated near contact with granitic intrusion and in qtz-carb veins. Py veinlets trend parallel to foliation, magnetite near upper contact to ~182.20 m.
188.7	189.64	Grt	Granite, pinkish red, medium-coarse grained. Md pervasive potassic alteration. Sharp contact ~70 CA to underlying mafic schist.
189.64	190.23	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 70 CA, now at a higher core angle than previously observed, and best observed in zones of finer grained chl. Sharp contact with mafic schist at 60 CA.
190.23	191.04	Mvs	Hbl-chl +- musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~50 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. Two qtz-carb vein sets at 50 and 90 CA. Sharp contact at ~50 CA with gnt-dom mafic gneiss unit. Trace disseminated py throughout.
191.04	191.56	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 50 CA best observed in zones of finer grained chl. Sharp contact with metagreywacke at 60 CA.
191.56	191.89	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Qtz-carb veining parallel near lower contact. Thin, 1-2 mm veins throughout ~20 CA.
191.89	192.18	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 50 CA best observed in zones of finer grained chl. Qtz-carb veins trending parallel to foliation. Py min disseminated, concentration of py along qtz-carb veins. Sharp contact with metagreywacke at 75 CA.
192.18	193.29	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Thin, 1-2 mm veins throughout ~20 CA.
193.29	193.65	Grt	Granite, light orange-pink, medium grained increasing in grain size to very coarse grained at lower contact with metagreywacke unit. Stockwork chl veins throughout, intensify towards lower contact. Sharp

			contact with metased. Unit 60 CA.
193.65	197.91	Sgw	Metagreywacke, alternating light, dark grey, and red-orange bands. Red-orange bands potentially arkosic zones. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Thin, 1-2 mm veins throughout ~20 CA. Bedding parallel qtz veins trend 60 CA. 195.5-196 m musc-rich heavily fractured zone interpreted as metamudstone. ~3% Py disseminated as 1-3 mm anhedral grains throughout unit. Sharp contact with diabase, 80 CA.
197.91	198.45	Db	Diabase, dark grey, medium grained. 2-5 mm plagioclase phenocrysts. Two sets of thin veins trending at 20 and 85 CA. Sharp contact with metagreywacke at 60 CA.
198.45	202.35	Sgw	Metagreywacke, alternating light, dark grey, and red-orange bands. Red-orange bands potentially arkosic zones. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Thin, 1-2 mm veins throughout ~20 CA. Bedding parallel qtz veins trend 60 CA. ~5% Py disseminated as 1-3 mm anhedral grains throughout unit. Thin, ~ 1mm wide py veins dispersed throughout unit. Bedding thicker than previous greywacke units, 0.5-1 cm thick alternating chert- and silicified siliciclastic beds. Minor deformation throughout unit. Sharp contact 60 CA with gnt-gneiss.
202.35	206.65	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 50 CA best observed in zones of finer grained chl. Qtz-carb +- gnt veins trending parallel to foliation and at 35 CA. Py min disseminated, concentration of py along qtz-carb veins. Gnt-rich zone from 203-205 m. Sharp contact with diabase at 64 CA.
206.65	211	Db	Diabase, dark grey, medium grained. 2-5 mm plagioclase phenocrysts. Two sets of thin veins trending at 50 and 5 CA. Sharp contact with metagreywacke at 60 CA.
211	213.69	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Bedding parallel qtz veins trend 60 CA. ~5% Py disseminated as 1-3 mm anhedral grains throughout unit. Thin, ~ 1mm wide py veins dispersed throughout unit. Thin beds generally <0.5 cm thick. Minor deformation throughout unit reflected in folded veins and changes in bedding to core axis ratios. Sharp contact 80 CA with diabase.
213.69	215.33	Db	Diabase, dark grey, medium grained. 2-8 mm plagioclase phenocrysts. Two sets of thin veins trending at 75 and 45 CA. Plag phenocyrsts coarsen away from diabase margins. Sharp contact with metagreywacke at 60 CA.
215.33	215.85	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Bedding parallel qtz veins trend 60 CA. ~5% Py disseminated as 1-3 mm anhedral grains throughout unit. Thin, ~ 1mm wide py veins dispersed throughout unit. Thin beds generally <0.5 cm thick. Sharp contact 80 CA with diorite.
215.85	215.94	Dt	Diorite, white, med grained, massive. Sharp contact with underlying

			metagreywacke 60 CA.
215.94	216.51	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Bedding parallel qtz veins trend 60 CA. ~5% Py disseminated as 1-3 mm anhedral grains throughout unit. Thin, ~ 1mm wide py veins dispersed throughout unit. Thin beds generally <0.5 cm thick. Sharp contact 80 CA with diabase.
216.51	216.88	Db	Diabase, dark grey, fine-medium grained. Sharp contact with metagreywacke at 80 CA.
216.88	225.55	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Gnt from 223.80-225.55. Heavily silicified, chlorite banding potentially replacing biotite zones. Bedding parallel qtz veins trend 60 CA. ~10% Py, 5% po disseminated as 1-3 mm anhedral grains and ~1 mm py veins throughout unit and concentrated along qtz veins and qtz clasts. Thin beds generally <0.5 cm thick. Semi-massive py near lower contact. Sharp contact 60 CA with garnet-rich mafic gneiss.
225.55	226.15	Mgn	Mafic gneiss (gnt, hbl). Green to dark grey. Foliation present throughout unit at 60 CA best observed in zones of finer grained chl. Stockwork Qtz-carb-chl veins trending parallel to foliation, thin qtz-carb veins at 5 CA. Strong, pervasive, chl-K-ep-sil alt. Sharp contact with metagreywacke at 60 CA.
226.15	227.2	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified, chlorite banding potentially replacing biotite zones. Bedding parallel qtz veins trend 60 CA. ~10% Py as 1-2 mm beds concentrated near the upper contact with mafic gneiss. Sedimentary unit consists of thin beds generally <0.5 cm thick. Sharp contact 55 CA with garnet-rich mafic gneiss.
227.2	229.7	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 60 CA best observed in zones of finer grained chl. Qtz-carb +- gnt veins trending parallel to foliation. Thin qtz +- carb veining at 90 CA. Py min disseminated with concentration of py along qtz-carb-gnt veins. Thin ~1 mm py and po-py beds near contact with mafic schist. Sharp contact with mafic schist at 60 CA.
229.7	244.8	Mvs	Hbl-chl +- musc mafic schist, dark green to grey, fine-medium grained, Chl, hbl and musc elongated ~70 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. Two qtz-carb vein sets at 70 and 15 CA. Py min. associated with both sets of qtz veins, minor disseminated po min around 232- 232.15 m. Sharp, irregular contact with diorite intrusive unit.
244.8	249.52	Dt	Diorite, white-grey, grey-green, and greyish-pink. Medium to coarse grained, massive. Musc rich inclusions 2-4 cm wide. Sharp, irregular contact with underlying mafic schist.
249.52	257.35	Mvs	Hbl-chl +- musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~60 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. Three qtz-

			carb vein sets at 60, 80, and 30 CA. Py min. associated with sets of qtz veins and qtz clasts. Sharp, irregular contact with pegmatititic intrusive unit.
257.35	257.7	Peg	Pegmatite, pink-white. Coarse grained qtz, k-spar, albite. Sharp contact with lower mafic schist 70 CA.
257.7	259.9	Mvs	Hbl-chl-musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~60 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. 2-3 cm wide musc dominant patches. Patchy ep alteration parallel to fol. Thin qtz veining at 28 CA. 3 cm wide qtz-albite vein at 258.50 m. Py min. associated with sets of qtz veins and qtz clasts. Intruded by 7 cm wide medium grained, pinkish-grey, diorite at 261.90. Contact with mafic dominant gneissic unit in lost core.
259.9	263.64	Mgn	Mafic gneiss (gnt, hbl). Dark green to dark grey. Foliation present throughout unit at 60 CA best observed in zones of finer grained chl. Qtz-carb-kspar veins trending parallel to foliation variably boudinaged. Thin ~1 mm py beds throughout unit. Disseminated throughout unit as well. Sharp contact with mafic schist at 60 CA.
263.64	265.64	Mvs	Hbl-chl-musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~60 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. 2-3 cm wide musc dominant patches. Qtz veining at 50 CA, and 0 CA, variably deformed. 4 cm wide diorite intrusion at 264.13 m. Py min. associated with sets of qtz veins and qtz clasts. Contact with metasedimentary unit at 60 CA.
265.64	267.72	Sgw	Metagreywacke, alternating light and dark grey bands. Mud-silt to fine grain sand. Heavily silicified. Thin qtz veins trend 18 and 50 CA. Sedimentary unit consists of thin beds generally <0.5 cm thick. Sharp contact 67 CA with mafic gneiss.
267.72	279.12	Mgn	Mafic gneiss (hbl-musc-gnt-mt). Dark green to dark grey. Leucosomes greenish white, ep altered. Gnt concentrated in leucosomes. Mineralization is generally disseminated or spatially associated with vein sets and qtz veins. veinsets run parallel to foliation and at low angles CA. Foliation present throughout unit and best observed in zones of finer grained chl-musc. Sharp contact with granodiorite at 50 CA.
279.12	293.91	Gd	Granodiorite, white to pinkish, medium to coarse grained, massive, weak potassic overprint intensifying to moderate at the lower contact. Zones of moderate to str potassic alteration in coarser grained zone near the center of the unit. Sharp defined contact with lower mafic schist (30 CA)
293.91	294.21	Mvs	Hbl-chl-musc mafic schist, dark brown, medium grained, Chl, hbl and musc elongated ~70 to core axis. Qtz veining at 70 CA deformed. Contact with granodiorite unit at 70 CA.
294.21	295.06	Gd	Granodiorite, white to pinkish, medium to coarse grained, massive,

			weak potassic overprint intensifying to moderate at the lower contact. Zones of moderate to str potassic alteration in coarser grained zone near the center of the unit. Sharp defined contact with lower mafic schist (30 CA)
295.06	310.73	Fig	Felsic-intermediate gneiss, green-grey to orange. Mafic-fine-grained hbl-bt rich zone from 297.10-298.02 m. Heavily fractured from 307 m to lower contact. Graphite in fractures. Two qtz-carb veinsets, one parallel to foliation at 60 CA, one at 36 CA. Both weakly to heavily folded. Py disseminated throughout unit, generally 1-3 mm with rare subhedral grains, 5-7 mm present. Trace cpy localised on qtz clasts. Sharp contact with granitic intrusion at 70 CA
310.73	311.02	Grt	Granite, reddish-brown. Medium-coarse grained. Str pervasive potassic overprint, qtz veining at 80 CA. Sharp contact with felsic-intermediate gneiss 84 CA.
311.02	329.9	Fig	Felsic-intermediate gneiss, green-grey to orange. Heavily chloritised, with md patchy ep and k alteration. Alteration intensity decreases downhole. Fine-grained, hbl-bt rich zone from 317.45-323.54 m. Two qtz-carb veinsets, one parallel to foliation at 60 CA, one at 36 CA. Both weakly to heavily folded. Py disseminated throughout unit, generally 1-3 mm. Py veinlets parallel to foliation. Sharp contact with Mvs at 65 CA
329.9	335.25	Mvs	Hbl-chl mafic schist, dark green-dark grey, fine grained, Chl and hbl elongated ~70 to core axis. Md, pervasive chl alteration. Py and Po disseminated throughout unit and localised in areas of qtz-carb veining, and qtz clasts. Mt throughout unit. Veining predominantly parallel to foliation. Secondary veinset trends 35 CA. Stockwork chl veins from upper contact to 332 m. Faulting from 331.80-332 m displaying sinistral movement. Fault at 5 CA. Sharp irregular contact with diabase.
335.25	342.06	Db	Diabase, dark grey, fine-medium grained. Chill margin at upper contact with Mvs. Unit coarsens moving downhole from upper contact. Plagioclase phenocrysts sausauritized. Sharp contact with granodiorite at 45 CA.
342.06	342.22	Gd	Granodiorite, white to pinkish, medium to coarse grained, massive. Md potassic alteration near upper contact with diabase. Sharp contact with mafic gneiss at 80 CA.
342.22	350.46	Mgn	Mafic gneiss (hbl-chl), dark grey to dark green. Alternation between sub-meter massive dark beds and gneissic banded beds. Py and Po disseminated throughout unit and localised in areas of qtz-carb veining, and qtz clasts. Mt throughout unit. Intruded by medium grained, massive granodiorite units at 344.56-344.66 and at 345.27-345.57. In contrast to previous mafic gneisses described, this has larger massive-hbl-chl +- mt zones. Sharp contact with granodiorite at 70 CA.
350.46	353.66	Dt	Diorite, white to red. Potassic alteration intensifies towards lower contact, strongest in areas of thin veining. 3-5 cm fragments of previously described mafic gneiss throughout.Stockwork chl-qtz-ep veining throughout. Sharp, irregular contact with underlying diabase at a low angle to CA, ~10 deg.
353.66	360.98	Db	Diabase, dark grey, fine-medium grained. Chill margin at upper contact

			with Dt. Unit coarsens moving downhole from upper contact. Plagioclase phenocrysts sausauritized. Sharp, irregular contact with mvs at 30 CA.
360.98	365.14	Mvs	Hbl-chl +- musc mafic schist, dark green-dark grey, fine grained, Chl and hbl elongated ~55 to core axis. Md, pervasive chl alteration. Py disseminated throughout unit and localised in areas of qtz-carb veining, and qtz clasts. Veining predominantly parallel to foliation. Secondary veinset trends 20 CA. Faulting from 362.19-363.60 m displaying dextral movement. Fault at 20 CA. Faulting at 364.05 displays sinistral mvt. Sharp contact with underlying granodiorite 84 CA.
365.14	370.43	Gd	Granodiorite, white to pinkish, medium to coarse grained, massive, weak potassic overprint intensifying to moderate at the lower contact. Zones of moderate to str potassic alteration in coarser grained zones. sharp contact with Fig 90 CA.
370.43	371.15	Fig	Felsic-intermediate gneiss, greyish green to brown-grey bands. Angle of bands at 50 CA. Moderate pervasive chl alteration. Py disseminated throughout unit, generally 1-3 mm. Py veinlets parallel to foliation. Sharp contact with Gd at 60 CA.
371.15	372.25	Gd	Granodiorite, white to pinkish, medium to coarse grained, massive, weak potassic overprint intensifying to moderate at the lower contact. Zones of moderate to str potassic alteration in coarser grained zones. Gradational contact with Fig 40 CA.
372.25	381.8	Fig	Felsic-intermediate gneiss, green-grey to orange. Mafic-fine-grained hbl-bt zone from upper contact to 379 m with irregular stockwork veining. Two qtz-carb veinsets, one parallel to foliation and one at 25 CA. Both weakly to heavily folded. Py disseminated throughout unit, generally 1-3 mm. Py min associated with qtz veins and qtz clasts. Mt throughout unit. Sharp undulatory contact with granitic intrusion at 80 CA.
381.8	385.23	Gd	Granodiorite, white to pinkish, coarse-pegmatitic. Massive, md potassic overprint. Zones of moderate to str potassic alteration in coarser grained zones. Pegmatitic K-spar-albite +- qtz zone from 284.90-385.20 m.
385.23	389.82	Mvs	Hbl-chl-musc mafic schist, dark green to grey, medium grained, Chl, hbl and musc elongated ~70 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. 1-2 cm wide musc dominant patches. Qtz-carb +- kspar veining at 70 CA, variably deformed. Thin ~ 1mm wide qtz veins at 25 CA. Py and Po min. associated with sets of qtz veins and qtz clasts. Disseminated py throughout unit. Contact with mafic gneiss unit at 70 CA.
389.82	396.42	Mgn	Mafic gneiss (hbl-orthoamph-chl), dark green to bluish-grey. Py and Po disseminated throughout unit and localized in areas of qtz-carb veining, and qtz clasts. Mt throughout unit. Semi massive sph mineralization from 390.75-391.21 m. Gossanous zone at 395.39-395.44 m. Sharp contact with MVs at 75 CA.
396.42	398	Mvs	Hbl-chl-musc mafic schist, dark green to grey, medium grained, chl, hbl

			and musc elongated ~70 to core axis. Chlorite preferentially replaces coarse grained mafic precursor, potentially pyroxenes, with phenocrysts flattened and elongated parallel to foliation. 1-2 cm wide musc dominant patches. Qtz-carb +- k-spar veining at 70 CA, variably deformed. Py min disseminated and also associated with sets of qtz veins and qtz clasts. Mafic gneiss unit as described above from 385.83-396.04 m. End of hole

ALTERATION															
Interval		Unalt	Chl	Qrtz	Ser	K	Fu	Sp	Tc	Ep	Ab	Dol	Cc	Ank	Comments
From	To	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	Int	
0.1	13.8		Md												4.67-4.74 Interval of Str Chl-Musc, Chl preferentially replacing coarse grain mafic clasts clasts pot. Px, Olv
13.8	19.34		Md												1st appearance of muscovite from 14 m onwards
19.34	20.2					Wk									Weak potassic alteration of intermediate intrusive unit, granodiorite. Concentrated along fractures and veins within the unit.
20.2	34.02		Md	Md						Md					Md silicification near upper contact with Gd. Zone extends 10 cm past contact. Ep alteration in leucosomes. Chl replacing pyx and hbl grains
34.02	39.11		Wk												Minor chlorite replacement of amphiboles and pyroxenes

39.11	39.22	Str													
39.22	40.95														Minor chlorite replacement of amphiboles and pyroxenes
40.95	74.46		Md							Md					chlorite replacement of amphiboles and pyroxenes. Md ep alteration in leucosomes.
74.46	78.03		Md												chlorite replacement of amphiboles and pyroxenes.
78.03	88.16		Wk												Chl alt stronger in ~1 cm zones surrounding qtz-carb veining
88.16	101.5		Md												Chl preferential replacement of coarse grained pyx and hbl grains, 0.2-0.6 cm in diameter.
101.48	106.2		Str												Pervasive, str chl alt throughout unit, chl replacement of coarser grained phenocryst
106.15	154.8		Md							Md					Patches of Ep alteration in garnet-rich leucosomes
154.79	173.5		Md							Md					Md chl alt throughout unit, chl replacement of coarser grained phenocrysts. Patchy Ep alteration, generally md, locally str, focused along veins.
173.51	173.6					Md									Potassic

															alteration of granitic unit, localised along hairline fractures
173.64	181		Md			Wk				Wk					Md chl alt throughout unit, chl replacement of coarser grained phenocrysts. Weak K alteration at upper contact with granitic intrusion. Patchy wk ep alteration
181.08	182.1					Wk									Wk patchy potassic alteration
182.08	188.7		Md			Wk				Wk					Md chl alt throughout unit, chl replacement of coarser grained phenocrysts. Weak Ep and K alteration in zone above qtz-carb vein from 187.23-187,39
188.7	189.6					Md									Md potassic alteration of granitic unit
189.64	190.2		Str							Wk					Strong chl alteration, preferentially replacing mafic phenocrysts, wk patchy ep alteration
190.23	191		Wk												Wk pervasive chl, Md near lower contact with mafic gneiss
191.04	191.6		Str												Strong chl alteration, preferentially replacing mafic phenocrysts, wk patchy ep

															alteration around qtz-carb veins
191.56	192.9		Wk	Str											Heavy, pervasive silicification of metasedimentary unit, chl along fractures.
191.89	192.2		Str												Strong chl alteration, preferentially replacing mafic phenocrysts, wk patchy ep alteration around qtz-carb veins
192.18	193.3		Wk	Str											Heavy, pervasive silicification of metasedimentary unit, chl along fractures. Thin chl dom. Beds.
193.29	193.7					Md									Weak to moderate potassic alteration intensifying towards the lower contact with the metagreywacke in stockwork veined area
193.65	197.9		Wk	Str		Md									Potassic alteration at upper contact with granitic unit, extends ~20 cm. Md potassic alteration along fractures and thin low angle veinsets. Sedimentary unit metamorphosed and silicified, chl along fractures and along particular beds.

197.91	198.5	Str	Wk												Thin ~1-3 mm zones of wk chl alteration around thin ~1 veins
198.45	202.4		Wk	Str		Md									Md potassic alteration along fractures and thin low angle veinsets. Sedimentary unit metamorphosed and silicified, chl along fractures and along particular beds.
202.35	206.7		Str												Strong pervasive chl alteration.
206.65	211		Wk												Wk chl alteration focused along qtz veining. 5 cm wide zone of mod chl alt 208.48-208.55 m.
211	213.7		Wk	Str											Sedimentary unit metamorphosed and silicified, chl along fractures and along particular beds.
213.69	215.3		Wk												Wk chl alteration focused along qtz veining.
215.33	215.9		Wk	Str											Sedimentary unit metamorphosed and silicified, chl along fractures and along particular beds.
215.85	215.9		Wk												Weak pervasive chl overprint
215.94	216.5		Md	Str											Sedimentary unit metamorphosed and silicified, chl along fractures, qtz veins, and along particular beds.

216.51	216.9	Str													
216.88	225.6		Md	Str											Sedimentary unit metamorphosed and silicified, chl along fractures, qtz veins, and along particular beds.
225.55	226.2		Str	Str		Str				Str					Pervasive str chl, sil, and K alteration throughout unit
226.15	227.2		Md	Str		Wk									Md potassic alteration along fractures and thin low angle veinsets. Sedimentary unit metamorphosed and silicified, chl along fractures and along particular beds.
227.2	229.7		Str												Pervasive str chl alteration throughout unit
229.7	244.8		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.
244.8	249.5		Wk			Md									Chl alt intensify downhole from relatively unalt to pervasive, weak chl. K alt from 248 m intensifying from wk to md at lower contact.
249.52	257.4		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.
257.35	257.7					Wk									Weak pervasive K overprint
257.7	259.9		Md							Md					Md chl alt

															throughout unit, chl replacement of coarser grained phenocrysts. Patchy Ep alteration.
259.9	263.6		Md												Md chl alt throughout unit
263.64	265.6		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.
265.64	267.7			Str											Sedimentary unit metamorphosed and silicified
267.72	279.1		Md			Wk				Md					Patches of Ep alteration in garnet-rich leucosomes. Weak potassic overprint around some qtz-albite vein sets.
279.12	293.9					Md									Weak pervasive K overprint intensifying to md downhole, md to str K alt along coarser grained zones.
293.91	294.2		Md												Pervasive md chl alteration
294.21	295.1					Md									Weak pervasive K overprint, md to str K alt along coarser grained zones.
295.06	310.7		Str			Str				Str					Heavily altered unit, pervasive str chl alteration, str ep and k alt in leucosomes.
310.73	311					Str									Pervasive str potassic alt
311.02	329.9		Str			Md				Str					Heavily altered unit, pervasive str

															chl alteration, str ep and wk to k alt in leucosomes. Alteration intensity decreases downhole
329.9	335.3		Md												Pervasive md chl alteration
		Md									Wk				Minor sausauritization of plagioclase phenocrysts
342.06	342.2					Md									Md potassic alteration concentrated at upper contact with diabase.
342.22	350.5		Md												Pervasive md chl alteration
350.46	353.7					Md				Wk					Potassic alteration intensifies towards lower contact, strongest in areas of thin veining.
353.66	361	Md									Wk				Minor sausauritization of plagioclase phenocrysts
360.98	365.14		Md												Pervasive md chl alteration
365.14	370.43					Md									Weak pervasive K overprint intensifying to md downhole, md to str K alt along coarser grained zones.
370.43	371.15		Md												Md pervasive chl alteration.
371.15	372.25					Md									Weak pervasive K overprint intensifying to md downhole, md to str K alt along

															coarser grained zones.
372.25	381.8		Md			Wk				Wk					Md pervasive chl alteration. Weak potassic alteration in leucosomes and along qtz-albite-carb veins. Weak, patchy ep alteration.
381.8	385.23					Md									Pervasive K overprint, md to str K alt along coarser grained zones.
385.23	389.82		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.
389.82	396.42		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.
370.43	371.15		Md												Md chl alt throughout unit, chl replacement of coarser grained phenocrysts.

STRUCTURE				
Interval				
From	To	Code	Core angle	Comments
0.00	0.10	OB		
0.10	13.80	Fol	50	Foliation defined by elongate chl, bt +- hbl grains
0.10	13.80	Vn	50	<0.5 cm wide qtz-carb veins parallel to foliation, z-folds present in a few of these veins.
0.10	13.80	Vn	0	0.1-0.2 cm qtz veins
11.20	11.27	Vn	50	Qtz-Ksp vein
13.80	19.34	Fol	50	Foliation defined by elongate chl, musc, bt +- hbl grains

13.80	19.34	Vn	50	Qtz-carb veins running parallel to foliation, variably deformed
19.34	19.38	Vn	30	Qtz ~1 cm from upper granodiorite contact with mafic gneiss. Rip up clasts from wall rock within vein, Py min on the rip up clasts.
19.55	19.60	Vn	20	Qtz vein,~5 cm thick. ~1 mm cpy grains at vein contact with wallrock. Py veinlets ~1mm thick. Wall rock alteration along contacts of veins. Py also at vein contact.
20.20	34.02	Fol	50	Foliation defined by elongate chl, musc and hbl grains. Disrupted by folding
20.20	34.02	Vn	50	Qtz-carb veins running parallel to foliation, variably deformed. 0.1-1.0 cm wide.
20.20	34.02	Vn	15	Qtz-carb veins, 3-5 mm in width cutting veins running parallel to fol.
34.02	39.11	Fol	50	Foliation defined by elongate chl and hbl grains.
34.02	39.11	Vn	50	Qtz-carb veins, 0.1-3 cm wide, trending parallel to foliation
34.02	39.11	Vn	30	Thin, ~1 mm wide qtz veins cutting veins described above
39.11	39.22	Vsk	50	Thin, 1 mm thick chl-bt stockwork veins 50 and 30 to core axis
39.22	40.95	Fol	50	Foliation defined by elongate chl and hbl grains.
40.95	74.46	Fol	50	Foliation defined by elongate chl and hbl grains. Deformed down hole
40.95	74.46	Vn	50	Qtz-carb veins trending parallel to 50 CA fol. Moderately deformed.
40.95	74.46	Vn	30	Thin, 1-2 mm qtz carb veins cutting foliation parallel veins described above.
57.60	58.16	Vn	90	Extensional qtz-carb vein
58.25	58.60	Vn	80	Extensional qtz-carb vein
58.63	59.00	Vm	75	Extensional qtz-carb vein
74.46	78.03	Fol	50	Foliation defined by elongate chl musc and hbl grains.
74.46	78.03	Vn	50	Qtz-carb veins trending parallel to 50 CA fol. Moderately deformed.
74.46	78.03	Vn	70	Thin qtz-carb veins ~1 mm wide cutting vein set described above
76.00	76.02	Vn	30	Qtz-carb vein, deformed, Py min on downhole contact
76.36	76.38	Vn	50	Grey qtz vein
77.69	77.70	Vn	50	Qtz-plag peg vein
78.03	88.16	Fol	50	Foliation defined by elongate chl musc and hbl grains.
78.03	88.16	Vn	50	Qtz-carb veins trending parallel to 50 CA fol. Moderately deformed.
78.03	88.16	Vn	70	Qtz-carb veins, deformed
88.16	101.48	Fol	50	Foliation defined by elongate chl musc and hbl grains.
88.16	101.48	Vn	50	Qtz-carb veins trending parallel to 50 CA fol. Moderately deformed.
90.02	90.05	Vn	70	Extensional qtz-carb vein, mafic schist ripped up and encorporated into vein. Py min along vein-rock boundary.
100.10	100.12	Vn	70	Extensional qtz-carb vein, moderately deformed
101.45	101.48	Vn	70	Extensional qtz-carb vein with py-po mineralization along wallrock-vein boundary downhole
101.48	106.15	Fol	50	Foliation defined by elongate chl musc +- and hbl grains.
105.15	105.20	F	50	Graphitic fault zone

101.48	106.15	Vn	50	Qtz-carb veins parallel to foliation, variably deformed 0.3- 5 cm wide
106.15	106.71	Vn	0	2-3 cm wide albite-qtz vein, yellow-white, irregular
106.71	154.79	Fol	50	Foliation defined by elongate chl musc +- and hbl grains.
106.71	154.79	Vn	50	Qtz-carb and qtz-carb-gnt veinset running parallel to foliation. Variably deformed/folded
106.71	154.79	Vn	25	Thin, ~1 mm qtz veins
118.80	118.83	Vn	60	Plag-qtz peg vein, symplektic texture
154.79	173.57	Fol	50	Foliation defined by elongate chl musc +- and hbl grains.
154.79	173.57	Vn	50	Qtz-carb veinset running parallel to foliation. Variably deformed/folded
154.79	173.57	Vn	20	qtz-carb veinsets variably deformed. Thin ~1 mm wide veins dextrally offset previously described veinset
163.93	164.05	Vn	60	Extensional qtz-carb vein
173.57	173.64	Vsk		Thin stockwork chl dominated veins
173.64	181.08	Fol	50	Foliation defined by elongate chl and hbl grains.
173.64	181.08	Vn	50	Qtz-carb veinset running parallel to foliation. Variably deformed/folded
173.64	181.08	Vn	20	qtz-carb veinsets variably deformed. ~1-3 mm wide
182.02	188.70	Fol	50	Foliation defined by elongate chl musc +- and hbl grains.
182.02	188.70	Vn	50	Qtz-carb veinset running parallel to foliation. Variably deformed/folded
182.02	188.70	Vn	20	qtz-carb veinsets variably deformed. ~1-3 mm wide
184.89	184.95	Vn	80	Extensional qtz-carb vein
189.64	190.23	Fol	70	Foliation defined by elongate chl hbl grains, deformed.
189.64	190.23	Vn	70	Qtz-carb to qtz-gnt-carb veins trending parallel to foliation. Qtz-gnt-carb veins near lower contact are boudinaged and host blebby py mineralization.
189.64	189.74	Vn	70	Thin qtz-carb veins ~1 mm wide cutting vein set described above
190.23	191.04	Fol	50	Foliation defined by elongate chl hbl grains, deformed.
190.23	191.04	Vn	50	Qtz-carb to qtz-gnt-carb veins trending parallel to foliation. Qtz-gnt-carb veins near lower contact are boundaged and host blebby py mineralization.
190.23	191.04	Vn	90	Thin qtz-carb veins ~1 mm wide cutting vein set described above
191.04	191.56	Fol	50	Foliation defined by elongate chl hbl grains, deformed.
191.50	191.56	Vn	50	Qtz-carb veins trending parallel to foliation.
191.56	191.89	S0	60	Bedding defined by alternating light and dark grey bands

191.87	191.89	Vn	60	Qtz carb vein with inclusions of wallrock
191.56	191.89	Vn	20	Thin, 1-2 mm qtz carb veins
191.89	192.18	Fol	50	Foliation defined by elongate chl hbl grains, deformed.
191.89	192.18	Vn	50	Qtz-carb veins trending parallel to foliation.
192.18	193.29	S0	60	Bedding defined by alternating light and dark grey bands
192.18	193.29	Vn	20	Thin, 1-2 mm qtz carb veins
193.29	193.65	Vsk		Chl stockwork veinset intensifying downhole towards contact
193.65	197.91	S0	60	Bedding defined by alternating light and dark bands, disrupted by folding 194.34-38m.
193.65	197.91	Vn	60	Bedding parallel qtz veins
193.65	197.91	Vn	80	Thin, 1-2 mm qtz carb veins
197.91	198.45	Vn	20	Thin, 1-2 mm qtz carb veins
197.91	198.45	Vn	85	Thin, 1-2 mm qtz carb veins
198.45	202.35	S0	60	Bedding defined by alternating light and dark bands.
202.35	206.65	Fol	50	Foliation defined by elongate chl, hbl, +- gnt
202.35	206.65	Vn	50	Qtz-carb veins trending parallel to foliation.
202.35	206.65	Vn	35	Qtz-carb vein with gnt on rim
206.65	211.00	Vn	50	Qtz-carb veins running 50 CA
206.65	211.00	Vn	5	Qtz-carb veins running 50 CA
211.00	212.38	S0	60	Bedding defined by alternating light and dark bands.
212.38	212.42	S0	40	Bedding defined by alternating light and dark bands.
212.42	212.55	S0	80	Bedding defined by alternating light and dark bands.
212.55	213.69	S0	60	Bedding defined by alternating light and dark bands.
213.69	215.33	Vn	75	Qtz-carb veins running 75 CA
213.69	215.33	Vn	45	Qtz-carb veins running 45 CA
214.50	214.60	Vn	75	10 cm wide qtz-carb extensional vein
215.33	215.85	S0	60	Bedding defined by alternating light and dark bands.
215.33	215.85	Vn	60	Qtz-carb veins trending 60 CA. 1-4 mm py grains hosted in veins
215.94	216.51	S0	60	Bedding defined by alternating light and dark bands.
215.94	216.51	Vn	60	Qtz-carb veining with chl alteration around veins.
216.88	225.55	S0	60	Bedding defined by alternating light and dark bands.
216.88	225.55	Vn	60	Qtz-carb veining with chl alteration around veins.
216.88	225.55	Vn	5	Thin, ~ 1mm veins cutting previously described veins
225.55	226.15	Fol	60	Foliation defined by elongate chl, hbl, +- gnt
225.55	226.15	Vsk		Stockwork veining throughout unit

225.55	226.15	Vn	5	Low angle thin, ~1 mm qtz-carb veins
226.15	227.20	S0	60	Bedding defined by alternating light and dark bands.
226.15	227.20	Vn	60	Qtz-carb veining with chl alteration around veins.
226.15	227.20	Vn	70	Thin ~ 1 mm qtz veins
227.20	229.70	Fol	60	Foliation defined by elongate chl, hbl, +- gnt
227.20	229.70	Vn	60	Qtz-carb veining with chl alteration around veins. Variably deformed
227.20	229.70	Vn	90	Thin ~ 1 mm qtz veins
229.70	244.80	Fol	70	Foliation defined by elongate chl, hbl, +- gnt
229.70	244.80	Vn	70	Qtz-carb veining with chl alteration around veins. Variably deformed
229.70	244.80	Vn	15	Thin ~ 1 mm qtz veins
249.07	249.21	Vn	40	Coarse grained, qtz-k-spar-bt vein
249.42	249.52	Vn	40	Coarse grained, qtz-k-spar-bt vein
249.52	257.35	Fol	60	Foliation defined by elongate chl and hbl
249.52	257.35	Vn	60	Qtz-carb veinset running parallel to foliation. Variably deformed/folded
249.52	257.35	Vn	30	Thin ~ 1 mm qtz veins
249.52	257.35	Vn	80	Thin ~ 1 mm qtz veins
257.70	262.90	Fol	60	Foliation defined by elongate chl and hbl
257.70	262.90	Vn	28	Thin ~ 1 mm qtz veins
258.50	258.53	Vn	85	3 cm wide qtz-albite vein
262.90	263.64	Fol	60	Foliation defined by elongate chl and hbl
262.90	263.64	Vn	60	Qtz-ksp veining, variably deformed and boundined.
263.64	265.64	Fol	60	Foliation defined by elongate chl and hbl
263.64	265.64	Vn	50	Variably deformed qtz-carb veining
265.10	265.20	Vn	0	Heavily deformed qtz-carb vein with py min at each bend of vein
265.64	267.72	S0	75	Bedding defined by alternating light and dark bands.
265.64	267.72	Vn	18	Thin ~ 1 mm qtz veins
265.64	267.72	Vn	50	Thin ~ 1 mm qtz veins
267.72	271.69	Fol	70	Foliation defined by elongate chl and hbl
271.69	272.05	Fol	30	Foliation defined by elongate chl and hbl
272.05	279.12	Fol	70	Foliation defined by elongate chl and hbl
267.72	279.12	Vn	70	Qtz-carb and qtz-carb-gnt +- kspar veinsets running parallel to foliation.
271.69	272.05	Vn	30	Qtz-carb veinsets running parallel to folation
267.72	279.12	Vn	5	Low angle thin, ~1 mm qtz-carb veins, sinistrally offset foliation parallel veins.
271.37	271.58	Vn	85	Extensional qtz-carb vein
293.94	294.21	Fol	70	Foliation defined by elongate chl-musc +- hbl

294.10	294.12	Vn	70	2 cm folded qtz-carb extensional vein
295.06	311.73	Fol	60	Foliation defined by elongate chl-musc and hbl. Variably deformed.
295.06	311.73	Vn	60	Qtz-carb veinsets running parallel to folation
295.06	311.73	Vn	36	Folded thin qtz veins ~ 1mm in diameter
311.73	312.02	Vn	80	qtz-carb veinset
312.02	329.90	Fol	60	Foliation defined by elongate chl-musc and hbl. Variably deformed.
312.02	329.90	Vn	60	Qtz-carb veinsets running parallel to folation
312.02	329.90	Vn	36	Folded thin qtz veins ~ 1mm in diameter
329.90	335.25	Fol	70	Foliation defined by elongate chl and hbl. Variably deformed.
329.90	335.25	Vn	70	Qtz-carb veinsets running parallel to folation
329.90	335.25	Vsk		Stockwork chl veining throughout unit, strongest from upper contact to 332 m.
329.90	335.25	Vn	35	Thin, ~ 1mm veins cutting previously described veins
331.80	332.10	F	5	Faulting at low angle tCA, ~5. Sinistral movement of ~2-5 mm.
342.22	350.46	Fol	60	Foliation defined by elongate chl and hbl grains
342.22	350.46	Vn	60	Dominant veinset parallel to foliation, variably deformed
342.22	350.46	Vn	15	Thin ~ 1 mm qtz veins
346.34	346.44	Vn	60	Extensional qtz-carb vein
349.90	350.00	Vn	60	Extensional qtz-carb vein
350.46	353.66	Vsk		Stockwork qtz-chl-ep veining throughout unit
353.66	360.98	Vn	10	Thin, ~ 1 mm qtz veins
390.98	364.14	Fol	55	Foliation defined by elongate chl, musc and hbl grains
390.98	364.14	Vn	55	Dominant veinset parallel to foliation, variably deformed
390.98	364.14	Vn	20	Thin, ~ 1 mm qtz veins
362.19	363.60	F	20	Faulting at low angle tCA, ~20. Dextral movement of ~2-5 mm.
364.05	364.10	F	20	Faulting at low angle tCA, ~20. Sinistral movement of ~2-5 mm.
370.43	371.15	Vn	20	Thin, ~ 1mm qtz veins
371.68	371.98	Vn	33	Coarse grained qtz vein
372.25	379.30	Vsk		Stockwork chl, ep veins
379.30	381.80	Fol	70	Foliation defined by elongate chl, musc and hbl grains
379.30	381.80	Vn	70	Dominant veinset parallel to foliation, variably deformed
279.30	381.80	Vn	25	Thin, ~ 1mm qtz veins
385.23	389.82	Fol	70	Foliation defined by elongate chl, musc and hbl grains
385.23	389.82	Vn	70	Dominant veinset parallel to foliation, variably deformed

385.23	389.82	Vn	25	Thin, ~ 1mm qtz veins
389.82	396.41	Fol	70	Foliation defined by elongate chl, musc and orthoamph grains
389.82	396.41	Vn	70	Dominant veinset parallel to foliation, variably deformed
389.82	396.41	Vn	20	Thin, ~ 1mm qtz veins
396.41	398.00	Fol	70	Foliation defined by elongate chl, musc and orthoamph grains
396.41	398.00	Vn	70	Dominant veinset parallel to foliation, variably deformed

SAMPLES

From	To	Lith	Alt	Int	Sample #	Type	Au ppb (5)	Ag ppb (5)	Cu % (0.001)	Zn % (0.001)	Std type
13.8	14	Mgn	Chl	Md	185620	C	< 5	< 3	0.009	0.003	
15	16	Mgn	Chl	Md	185621	C	< 5	< 3	0.006	0.003	
16	17	Mgn	Chl	Md	185622	C	< 5	< 3	0.012	0.004	
17	18	Mgn	CHl	Md	185623	C	< 5	< 3	0.015	0.003	
18	19	Mgn	Chl	Md	185624	C	< 5	< 3	0.012	0.003	
19.28	20.2	Mgn/Gd	Chl/K	Md/Wk	185625	C	< 5	< 3	0.008	< 0.001	
29	30	Mgn	Chl	Md	185626	C	< 5	< 3	0.013	0.005	
30	31	Mgn	Chl	Md	185627	C	< 5	< 3	0.012	0.003	
31	32	Mgn	Chl	Md	185628	C	< 5	< 3	0.01	0.005	
32	33	Mgn	Chl	Md	185629	C	< 5	< 3	0.013	0.003	
42	43	Mgn	Chl	Md	185630	C	< 5	< 3	0.02	0.004	
44	45	Mgn	Chl	Md	185631	C	< 5	< 3	0.013	0.006	
62.53	63.23	Mgn	Chl	Md	185632	C	< 5	< 3	0.007	0.003	
74.75	80.12	Mvs/Mgn	Chl/Chl	Md/Wk	185633	C	5	< 3	0.02	0.003	
105.82	106.06	Fis	Chl	Str	185636	C	5	< 3	0.011	0.005	
116.16	116.39	Mgn	Chl	Md	185637	C	< 5	< 3	0.056	0.005	
158.5	158.8	Mvs	Chl	Md	185638	C	< 5	< 3	0.008	0.002	
172.15	172.6	Mvs	Chl	Md	185640	C	< 5	< 3	0.015	0.004	
172.6	172.8	Mvs	Chl	Md	185641	C	< 5	< 3	0.049	0.003	
221.4	221.6	Sgw	Qrtz	Str	185642	C	< 5	< 3	0.005	0.005	
229.1	230	Mgn/Mvs	Chl/Chl	Str/Md	185643	C	< 5	< 3	0.008	0.006	
271.55	271.93	Mgn	Chl	Md	185644	C	< 5	< 3	0.004	0.007	
390.75	391.21	Mgn	Chl	Md	185645	C	8	< 3	0.04	0.122	

14.4 Swill 2019-3

Project:	**Swill 2019**		
Logged by:	Robert Meek		
Hole ID:	**Swill 2019-3**		
		Log start:	**May 16 2020**
		Log end:	**May 17 2020**
UTM 16 E(survey): 577070.45		**Azimuth:**	**245**
UTM 16 N (survey): 5442831.25		**Dip:**	**80**
Collar Elev.:	**346**	**Depth:**	**398**
Overburden:	**2.30**	**Dip srvy mthd:**	Devishot
Cell Number	**42F04E150** **42F04E149**	**Mining claim:**	325110 139364
Lease Numbers:			
Drilled by:	Drennan Drilling and Consulting		
Core size:	**BQ**		

INTERVAL		LITHOLOGY CODE	ALT. CODE	ALT. INTENSITY	SAMPLES											
From	To				From	To	Lith	Alt	Int	Sample #	Type	Au ppb	Ag ppb	Cu %	Zn %	Std type
0.00	2.30	ob			51	52	Fig	Chl	Str	185551	C	< 5	< 3	0.01	0.007	
2.30	8.67	Mvs	Chl	Md	52	53	Fig	Chl	Str	185552	C	< 5	< 3	0.008	0.007	
8.67	15.54	Mgn	Chl	Md	53	54	Fig	Chl	Str	185553	C	< 5	< 3	0.005	0.008	
15.54	16.02	Peg	K	Wk	54	55	Fig	Chl	Str	185554	C	< 5	< 3	0.009	0.006	
16.02	19.82	Fig	Chl	Md	68	69	Mvs	Chl	Md	185555	C	< 5	< 3	0.012	0.009	
19.82	21.05	Mvs	Chl	Md	69	70	Mvs	Chl	Md	185556	C	< 5	< 3	0.006	0.008	
21.05	34.23	Mgb	Chl	Wk	70	71	Mvs	Chl	Md	185557	C	< 5	< 3	0.011	0.006	
34.23	35.00	Grt	K	Str	71	72	Mvs	Chl	Md	185558	C	< 5	< 3	0.009	0.008	
35.00	35.36	Mgb	Chl	Wk	80	81	Mvs	Chl	Md	185559	C	< 5	< 3	0.014	0.008	
35.36	35.51	Dt	Unalt	Wk	81	82.38	Mvs	Chl	Md	185560	C	< 5	< 3	0.006	0.01	
35.51	36.30	Mvs	Chl	Md	81	82	Mvs	Chl	Md	185561	St	587	8	0.489	0.001	Cu 155
36.30	36.44	Dt	Unalt	Wk	82.38	83	Mvs	Chl	Md	185562	C	< 5	< 3	0.003	0.008	
36.44	40.78	Mvs	Chl	Md	83	84	Mvs	Chl	Md	185563	C	< 5	< 3	0.005	0.007	
40.78	43.92	Dt	K	Str	84	85	Mvs	Chl	Md	185564	C	< 5	< 3	0.007	0.007	
43.92	45.24	Grt	K	Str	85	86	Mvs	Chl	Md	185565	C	< 5	< 3	0.007	0.006	
45.24	55.00	Fig	Chl	Str	86	87	Mvs	Chl	Md	185566	C	< 5	< 3	0.006	0.005	
55.00	60.08	Mvs	Chl	Md	87	88	Mvs	Chl	Md	185567	C	< 5	< 3	0.006	0.003	
60.08	62.30	Grt	K	Str	88	89	Mvs	Chl	Md	185568	C	< 5	< 3	0.008	0.004	
62.30	65.53	Fig	Chl	Str	89	90	Fig	Qtz	Str	185569	C	< 5	< 3	0.007	0.005	
65.53	89.33	Mvs	Chl	Md	90	91	Fig	Qtz	Str	185570	C	< 5	< 3	0.01	0.004	
89.33	115.08	Fig	Qtz	Str	91	92	Fig	Qtz	Str	185571	C	< 5	< 3	0.006	0.005	

115.08	115.90	Mgn	Chl	Str	95.5	96.5	Fig	Qtz	Str	185572	C	< 5	< 3	< 0.001	0.005	
115.90	116.10	Fig	K	Str	103	104	Fig	Qtz	Str	185573	C	< 5	< 3	< 0.001	< 0.001	
116.10	116.84	Mgn	Chl	Str	104	105	Fig	Qtz	Str	185574	C	< 5	< 3	< 0.001	< 0.001	
116.84	136.55	Fig	Qtz	Str	111	112	Fig	Qtz	Str	185575	C	< 5	< 3	< 0.001	< 0.001	
136.55	136.70	Mgn	Chl	Str	112	112.57	Fig	Qtz	Str	185576	C	< 5	< 3	< 0.001	< 0.001	
136.70	140.02	Fig	Qtz	Md	112.57	114	Fig	Qtz	Str	185577	C	< 5	< 3	0.001	0.005	
140.02	141.38	Mgn	Chl	Str	114	115	Fig	Qtz	Str	185578	C	< 5	< 3	< 0.001	0.004	
141.38	146.94	Fig	Qtz	Str	115	116	Mgn	Chl	Str	185579	C	< 5	< 3	< 0.001	0.013	
146.94	168.84	Mvs	Chl	Md	116	117	Mgn	Chl	Str	185580	C	< 5	< 3	0.003	0.01	
168.84	169.24	Fig	Chl	Str	116	117	Mgn	Chl	Str	185581	St	173	10	0.348	0.005	
169.24	179.85	Mvs	Chl	Md	132	133	Fig	Qtz	Str	185582	C	< 5	< 3	< 0.001	0.002	
179.85	180.06	Gd	K	Wk	133	134	Fig	Qtz	Str	185583	C	< 5	< 3	< 0.001	0.001	
180.06	183.91	Mvs	Chl	Md	134	135	Fig	Qtz	Str	185584	C	< 5	< 3	< 0.001	< 0.001	
183.91	185.92	Grt	K	Str	135	136	Fig	Qtz	Str	185585	C	< 5	< 3	< 0.001	< 0.001	
185.92	186.25	Mvs	Chl	Md	136	137	Mgn	Chl	Str	185586	C	< 5	< 3	0.001	0.039	
186.25	187.76	Grt	K	Str	137	138	Fig	Qtz	Md	185587	C	< 5	< 3	< 0.001	0.002	
187.76	192.64	Mvs	Chl	Md	138	139	Fig	Qtz	Md	185588	C	< 5	< 3	< 0.001	0.003	
192.64	215.20	Mgn	Chl	Md	139	140	Fig	Qtz	Md	185589	C	< 5	< 3	< 0.001	0.006	
215.20	218.82	Mvs	Chl	Md	140	141	Mgn	Chl	Str	185590	C	< 5	< 3	0.003	0.018	
218.82	225.55	Mgn	Chl	Md	146	147	Mvs	Chl	Md	185591	C	< 5	< 3	0.006	0.036	
225.55	226.81	Mvs	Chl	Md	162	163	Mvs	Chl	Md	185592	C	< 5	< 3	0.009	0.01	
226.81	230.58	Mgn	Chl	Md	163	164	Mvs	Chl	Md	185593	C	< 5	< 3	0.006	0.008	
230.58	230.82	Gd	K	Wk	164	165	Mvs	Chl	Md	185594	C	< 5	< 3	0.006	0.008	
230.82	236.82	Mgn	Chl	Md	165	166	Mvs	Chl	Md	185595	C	< 5	< 3	0.008	0.011	
236.82	253.22	Mvs	Chl	Md	166	167	Mvs	Chl	Md	185596	C	< 5	< 3	0.003	0.009	
253.22	253.30	Dt	Unalt	Wk	167	168	Mvs	Chl	Md	185597	C	< 5	< 3	0.009	0.006	
253.30	256.80	Mvs	Chl	Md	168	169	Mvs	Chl	Md	185598	C	< 5	< 3	0.006	0.007	
256.80	262.14	Mgn	Chl	Md	182.64	183.91	Mvs	Chl	Md	185599	C	< 5	< 3	< 0.001	0.006	
262.14	271.63	Mvs	Chl	Md	183.91	185	Grt	K	Str	185600	C	< 5	< 3	< 0.001	< 0.001	

271.63	271.83	Dt	K	Wk
271.83	272.00	Mvs	Chl	Md
272.00	278.15	Dt	K	Wk
278.15	283.83	Mvs	Chl	Md
283.83	285.56	Mgn	Chl	Md
285.56	297.34	Mvs	Chl	Md
297.34	297.47	Dt	Unalt	Wk
297.47	305.00	Mvs	Chl	Md

199	199.8	Mgn	Chl	Md	185601	C	7	< 3	0.002	0.014	
199	199.8	Mgn	Chl	Md	185602	St	583	7	0.475	0.001	
199.8	200.06	Mgn	Chl	Md	185603	C	< 5	< 3	0.002	0.014	
219	220	Mgn	Chl	Md	185604	C	< 5	< 3	0.002	0.004	
220	221	Mgn	Chl	Md	185605	C	< 5	< 3	0.003	0.005	
221	222	Mgn	Chl	Md	185606	C	< 5	< 3	0.009	0.009	
228	229	Mgn	Chl	Md	185607	C	< 5	< 3	0.007	0.005	
229	230	Mgn	Chl	Md	185608	C	< 5	< 3	0.006	0.001	
232	233	Mgn	Chl	Md	185609	C	5	< 3	0.007	0.004	
242	243	Mvs	Chl	Md	185610	C	< 5	< 3	0.005	0.005	
243	244	Mvs	Chl	Md	185611	C	< 5	< 3	0.005	0.006	
244	245	Mvs	Chl	Md	185612	C	< 5	< 3	0.006	0.005	
245	246	Mvs	Chl	Md	185613	C	< 5	< 3	0.003	0.008	
246	247	Mvs	Chl	Md	185614	C	< 5	< 3	0.005	0.005	
260	261	Mgn	Chl	Md	185617	C	< 5	< 3	0.005	0.006	
260	261	Mgn	Chl	Md	185618	Std	< 5	< 3	0.01	0.005	Cu 170
261	262.14	Mgn	Chl	Md	185619	C	164	9	0.34	0.004	
285.25	285.59	Mgn	Chl	Md	185634	C	6	< 3	0.058	0.855	
295.42	295.77	Mvs	Chl	Md	185635	C	5	< 3	0.005	0.018	

14.5 Certificate of Analysis

Quality Analysis ... **Actlabs** *Innovative Technologies*

Report No.:	**A19-15307**
Report Date:	**03-Dec-19**
Date Submitted:	**08-Nov-19**
Your Reference:	

Drennan Mining
37 Spruceside Ave
Hamilton ON L8P 3Y2
Canada

ATTN: Martin Drennan

CERTIFICATE OF ANALYSIS

99 Core samples were submitted for analysis.

The following analytical package(s) were requested:		Testing Date:
1A2-Tbay	QOP AA-Au (Au - Fire Assay AA)	2019-11-23 08:39:23
8-AR Tbay	QOP Assay (Code 8-Assays)	2019-11-22 12:41:25

REPORT **A19-15307**

This report may be reproduced without our consent. If only selected portions of the report are reproduced, permission must be obtained. If no instructions were given at time of sample submittal regarding excess material, it will be discarded within 90 days of this report. Our liability is limited solely to the analytical cost of these analyses. Test results are representative only of material submitted for analysis.

Notes:

If value exceeds upper limit we recommend reassay by fire assay gravimetric-Code 1A3

CERTIFIED BY:

Emmanuel Eseme , Ph.D.
Quality Control Coordinator

ACTIVATION LABORATORIES LTD.
1201 Walsh Street West, Thunder Bay, Ontario, Canada, P7E 4X6
TELEPHONE +807 622-6707 or +1.888.228.5227 FAX +1.905.648.9613
E-MAIL Tbay@actlabs.com ACTLABS GROUP WEBSITE www.actlabs.com

Analyte Symbol	Au	Ag	Cu	Zn
Unit Symbol	ppb	ppm	%	%
Lower Limit	5	3	0.001	0.001
Method Code	FA-AA	ICP-OES	ICP-OES	ICP-OES
185551	< 5	< 3	0.010	0.007
185552	< 5	< 3	0.008	0.007
185553	< 5	< 3	0.005	0.008
185554	< 5	< 3	0.009	0.006
185555	< 5	< 3	0.012	0.009
185556	< 5	< 3	0.006	0.008
185557	< 5	< 3	0.011	0.006
185558	< 5	< 3	0.009	0.008
185559	< 5	< 3	0.014	0.008
185560	< 5	< 3	0.006	0.010
185561	587	8	0.489	0.001
185562	< 5	< 3	0.003	0.008
185563	< 5	< 3	0.005	0.007
185564	< 5	< 3	0.007	0.007
185565	< 5	< 3	0.007	0.006
185566	< 5	< 3	0.006	0.005
185567	< 5	< 3	0.006	0.003
185568	< 5	< 3	0.008	0.004
185569	< 5	< 3	0.007	0.005
185570	< 5	< 3	0.010	0.004
185571	< 5	< 3	0.006	0.005
185572	< 5	< 3	< 0.001	0.005
185573	< 5	< 3	< 0.001	< 0.001
185574	< 5	< 3	< 0.001	< 0.001
185575	< 5	< 3	< 0.001	< 0.001
185576	< 5	< 3	< 0.001	< 0.001
185577	< 5	< 3	0.001	0.005
185578	< 5	< 3	< 0.001	0.004
185579	< 5	< 3	< 0.001	0.013
185580	< 5	< 3	0.003	0.010
185581	173	10	0.348	0.005
185582	< 5	< 3	< 0.001	0.002
185583	< 5	< 3	< 0.001	0.001
185584	< 5	< 3	< 0.001	< 0.001
185585	< 5	< 3	< 0.001	< 0.001
185586	< 5	< 3	0.001	0.039
185587	< 5	< 3	< 0.001	0.002
185588	< 5	< 3	< 0.001	0.003
185589	< 5	< 3	< 0.001	0.006
185590	< 5	< 3	0.003	0.018
185591	< 5	< 3	0.006	0.036
185592	< 5	< 3	0.009	0.010
185593	< 5	< 3	0.006	0.008
185594	< 5	< 3	0.006	0.008
185595	< 5	< 3	0.008	0.011
185596	< 5	< 3	0.003	0.009
185597	< 5	< 3	0.009	0.006
185598	< 5	< 3	0.006	0.007
185599	< 5	< 3	< 0.001	0.006
185600	< 5	< 3	< 0.001	< 0.001

Analyte Symbol	Au	Ag	Cu	Zn
Unit Symbol	ppb	ppm	%	%
Lower Limit	5	3	0.001	0.001
Method Code	FA-AA	ICP-OES	ICP-OES	ICP-OES
185601	7	< 3	0.002	0.014
185602	583	7	0.475	0.001
185603	< 5	< 3	0.002	0.014
185604	< 5	< 3	0.002	0.004
185605	< 5	< 3	0.003	0.005
185606	< 5	< 3	0.009	0.009
185607	< 5	< 3	0.007	0.005
185608	< 5	< 3	0.006	0.001
185609	5	< 3	0.007	0.004
185651	< 5	< 3	0.006	0.003
185652	< 5	< 3	0.015	0.005
185653	15	< 3	0.026	0.008
185654	< 5	< 3	0.014	0.005
185655	< 5	< 3	0.005	0.012
185610	< 5	< 3	0.005	0.005
185611	< 5	< 3	0.005	0.006
185612	< 5	< 3	0.006	0.005
185613	< 5	< 3	0.003	0.008
185614	< 5	< 3	0.005	0.005
185615	< 5	< 3	0.007	0.006
185616	< 5	< 3	0.006	0.006
185617	< 5	< 3	0.005	0.006
185618	< 5	< 3	0.010	0.005
185619	164	9	0.340	0.004
185620	< 5	< 3	0.009	0.003
185621	< 5	< 3	0.006	0.003
185622	< 5	< 3	0.012	0.004
185623	< 5	< 3	0.015	0.003
185624	< 5	< 3	0.012	0.003
185625	< 5	< 3	0.008	< 0.001
185626	< 5	< 3	0.013	0.005
185627	< 5	< 3	0.012	0.003
185628	< 5	< 3	0.010	0.005
185629	< 5	< 3	0.013	0.003
185630	< 5	< 3	0.020	0.004
185631	< 5	< 3	0.013	0.006
185632	< 5	< 3	0.007	0.003
185633	5	< 3	0.020	0.003
185634	6	< 3	0.058	0.855
185635	5	< 3	0.005	0.018
185636	5	< 3	0.011	0.005
185637	< 5	< 3	0.056	0.005
185638	< 5	< 3	0.008	0.002
185640	< 5	< 3	0.015	0.004
185641	< 5	< 3	0.049	0.003
185642	< 5	< 3	0.005	0.005
185643	< 5	< 3	0.008	0.006
185644	< 5	< 3	0.004	0.007
185645	8	< 3	0.040	0.122

Analyte Symbol	Au	Ag	Cu	Zn
Unit Symbol	ppb	ppm	%	%
Lower Limit	5	3	0.001	0.001
Method Code	FA-AA	ICP-OES	ICP-OES	ICP-OES
MP-1b Meas		48	3.04	17.0
MP-1b Cert		47	3.07	16.7
MP-1b Meas		48	2.96	16.8
MP-1b Cert		47	3.07	16.7
CPB-2 Meas			0.117	5.84
CPB-2 Cert			0.1213	6.04
CPB-2 Meas			0.121	5.83
CPB-2 Cert			0.1213	6.04
CZN-4 Meas		52	0.419	55.1
CZN-4 Cert		51	0.403	55.07
CZN-4 Meas		49	0.403	56.9
CZN-4 Cert		51	0.403	55.07
PTC-1b Meas		49	7.86	0.207
PTC-1b Cert		53	7.97	0.2083
PTC-1b Meas		51	7.89	0.205
PTC-1b Cert		53	7.97	0.2083
CCU-1e Meas		207	22.9	3.05
CCU-1e Cert		205	22.9	3.02
CCU-1e Meas		205	22.9	3.02
CCU-1e Cert		205	22.9	3.02
OREAS 220 (Fire Assay) Meas	853			
OREAS 220 (Fire Assay) Cert	866			
OREAS 220 (Fire Assay) Meas	901			
OREAS 220 (Fire Assay) Cert	866			
OREAS 220 (Fire Assay) Meas	884			
OREAS 220 (Fire Assay) Cert	866			
Oreas 77b (4 Acid Digest) Meas		< 3	0.330	0.018
Oreas 77b (4 Acid Digest) Cert		1.62	0.343	0.0205
Oreas 77b (4 Acid Digest) Meas		< 3	0.333	0.019
Oreas 77b (4 Acid Digest) Cert		1.62	0.343	0.0205
Oreas 77b (4 Acid Digest) Meas		< 3	0.328	0.019
Oreas 77b (4 Acid Digest) Cert		1.62	0.343	0.0205
Oreas 77b (4 Acid Digest) Meas		< 3	0.327	0.020
Oreas 77b (4 Acid Digest) Cert		1.62	0.343	0.0205
OREAS 238 (Fire Assay) Meas	3080			
OREAS 238 (Fire Assay) Cert	3030			
OREAS 238 (Fire Assay) Meas	3170			
OREAS 238 (Fire	3030			

Analyte Symbol	Au	Ag	Cu	Zn
Unit Symbol	ppb	ppm	%	%
Lower Limit	5	3	0.001	0.001
Method Code	FA-AA	ICP-OES	ICP-OES	ICP-OES
Assay) Cert				
OREAS 238 (Fire Assay) Meas	3130			
OREAS 238 (Fire Assay) Cert	3030			
185560 Orig	< 5			
185560 Dup	< 5			
185563 Orig		< 3	0.005	0.007
185563 Dup		< 3	0.005	0.006
185570 Orig	< 5			
185570 Dup	< 5			
185577 Orig		< 3	0.001	0.004
185577 Dup		< 3	0.001	0.005
185580 Orig	< 5			
185580 Dup	< 5			
185592 Orig		< 3	0.009	0.010
185592 Dup		< 3	0.009	0.010
185595 Orig	< 5			
185595 Dup	< 5			
185600 Orig	< 5	< 3	< 0.001	< 0.001
185600 Split PREP DUP	< 5	< 3	< 0.001	< 0.001
185604 Orig	< 5			
185604 Dup	< 5			
185605 Orig		< 3	0.003	0.005
185605 Dup		< 3	0.003	0.005
185655 Orig	< 5			
185655 Dup	< 5			
185615 Orig		< 3	0.007	0.006
185615 Dup		< 3	0.007	0.006
185624 Orig	< 5			
185624 Dup	< 5			
185629 Orig		< 3	0.013	0.003
185629 Dup		< 3	0.013	0.003
185634 Orig	6			
185634 Dup	6			
185645 Orig	10			
185645 Dup	7			
Method Blank	< 5			
Method Blank	< 5			
Method Blank	< 5			
Method Blank	< 5			
Method Blank	< 5			
Method Blank	< 5			
Method Blank		< 3	< 0.001	< 0.001
Method Blank		< 3	< 0.001	< 0.001
Method Blank		< 3	< 0.001	< 0.001