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MUSSELWHITE MINE

2016 WEST ANTICLINE UNDERGROUND PROJECT

DIAMOND DRILL REPORT

G-Plan #2210, Skinner Lake

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SUMMARY

In the summer of 2016 (June to August), a diamond drilling program was conducted to explore the possible down-plunge extension of known mineralization associated with the West Anticline and Camp Zones of the Northern Iron Formation (NIF). Drilling was conducted underground from the 657mL WEL Access ramp, on the Musselwhite Mine property, which is owned and operated by Goldcorp Canada Ltd. The work completed comprises 4 separate mining leases. Drilling revealed similar geology and local mineralization to what had been previously discovered down plunge of the target area.

INTRODUCTION

Musselwhite Mine is a gold producing mine that is 100% owned and operated by Goldcorp Canada Ltd. The report discusses work conducted within the boundaries of mining leases PA449157, PA449158, PA449149, and PA529766. This report is written on behalf of Goldcorp Canada Ltd. by the staff of Musselwhite Mine.

The program was designed and implemented by the exploration department at Musselwhite Mine. Drilling was performed by Boart Longyear. The core from this program is stored adjacent to the exploration camp on the Musselwhite Mine property.

LOCATION AND ACCESS

The Musselwhite Mine property is located in the Patricia Mining District of northwestern Ontario on NTS map sheet 53B/9 (Opapimisk Lake) and on the Ontario Ministry of Northern Development and Mines G-Plan #2210, Skinner Lake. The mine is located at 52° 36' 50" N latitude and 90° 21' 43" W longitude. It is 480 km NNW of Thunder Bay (Figure 1) and 103 km north of Pickle Lake. The mine is serviced by an all-weather gravel road that extends north from Pickle Lake as well as charter air service from Thunder Bay and several local communities including Sioux Lookout, Round Lake and Cat Lake. This was an underground drill program, with mine roads and underground ramps used for access to the drill.

Figure 1: General Location Map



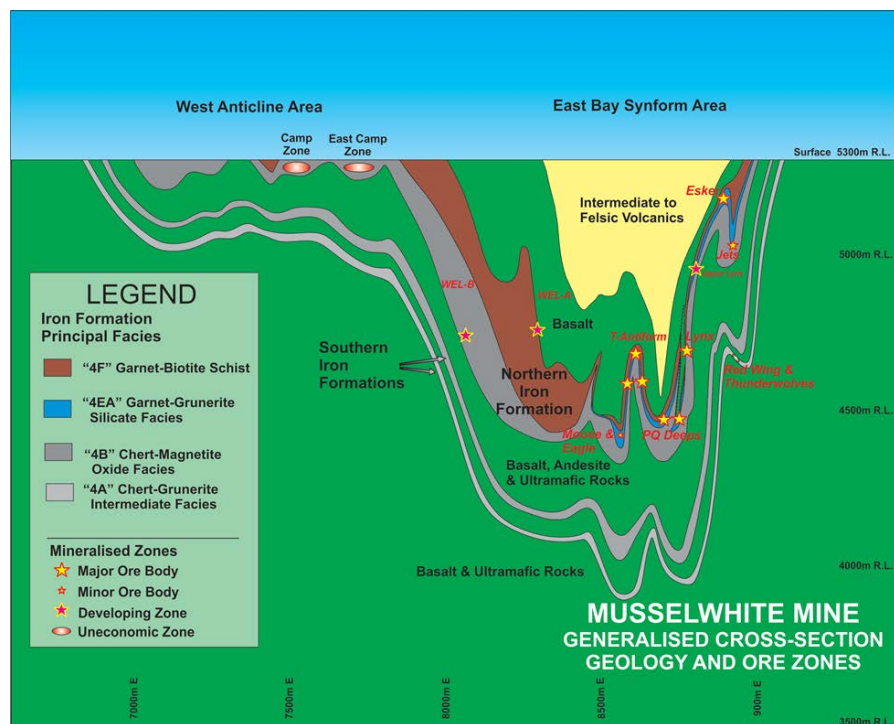
LAND TENURE & OWNERSHIP

All work in this report was conducted within the boundaries of the Musselwhite Mine property. Mining lease PA449157 is ~17.8 ha (1 claim unit), PA449158 is ~17.8 ha (1 claim unit), PA449149 is ~14.1 ha (1 claim unit), and PA529766 is ~16.8 ha (1 claim unit) in size. All 4 claim blocks are owned by Goldcorp Canada Ltd. The tenure rights for these leases are mining and surface rights.

PROPERTY GEOLOGY

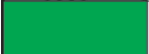
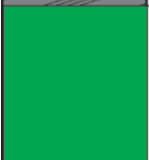
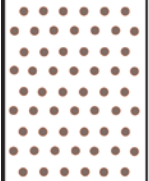
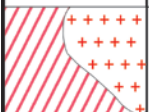
The Musselwhite Property covers a portion of the northwest-trending North Caribou greenstone belt which is located in the northern margin of the Archean North Caribou Superterrane. The North Caribou greenstone belt is comprised of 8 lithotectonic supercrustal assemblages, with the Opapimiskan-Markop metavolcanic suite hosting the Musselwhite gold deposit. The rocks of the Opapimiskan-Markop suite are subdivided into a detailed stratigraphic sequence that is relatively consistent over the property, with local facies changes observed along and across strike. The structurally lowermost units observed in drilling to date are fine-grained siliciclastic sediments with minor felsic volcanics that occur ~500m east of the mine. It is assumed that these are underlain by mafic-ultramafic flows which outcrop 2.5km southeast of the mine along the eastern edge of the belt. These are followed by largely komatiitic basalts and ultramafic flows/intrusions with local andesite flows. This predominantly high-Mg series of volcanic rocks is overlain by two major banded iron formations (BIF) separated by 10-30m of mafic-ultramafic volcanics (Figure-4).

Figure 2: General Cross-Section of Musselwhite Geology



The lowermost BIF is locally termed the Southern Iron Formation (SIF) and is a generally monotonous sequence of thinly laminated magnetite and chert. There is generally little or no silicate, sulphide, or other facies within this horizon in the mine area. The SIF commonly occurs in two principal horizons, each anywhere from 5 to 20m thick, separated by 5-10m of basalt. About 20-30m above the SIF is the Northern Iron Formation (NIF). This is a complexly layered horizon typically ~40m thick in total and comprised of up to seven different facies, which are not always present across the drilled extent of the NIF (Figure-5). Overlying the NIF is a variable thickness of basalts with meta-sedimentary interbeds, and crosscutting ultramafic dikes. The sedimentary interbeds consist of quartz-feldspar metasediments (6), garnet amphibolite (4E), and garnet biotite schist (4F). A felsic to intermediate volcanic “wedge” consisting of dacitic to rhyolitic tuffs and flows with intercalated meta-sediments overlies the majority of the Musselwhite Mine area.

Figure 3: Stratigraphy of the Musselwhite Mine area.

Musselwhite Mine Stratigraphy				
	Unit Name	Rock Types	Age (Ma)	Comments
	Avol	Dacite-rhyolite tuffs, flows, volcaniclastic sediments	2972	
	Bvol	Tholeiitic basalt, & 4 thin BIFs		
	Northern Iron Fm	Oxide, silicate & sulphide BIF		Mineralisation dated at 2690 Ma
	“Basement basalts”	Basalt, andesite, & ultramafic flows		
	Southern Iron Fm	2 Chert-Mt +/- Grunerite-Pyx BIFs		
	“Lower basalts”	Komatiitic basalts + ultramafics, local felsic volcanics		
	Felsic tuff	Felsic ash tuff	<i>under revision</i>	Possible major fault boundary with Opap. unit above
	“Lower sediments”	Fine grained siliciclastic sediments, lesser felsic volcanics, minor ultramafics		
	Late Plutons & Older Gneisses	TTG plutons intruding older TTG gneisses + greenstone	2723-29 & 2856-70	

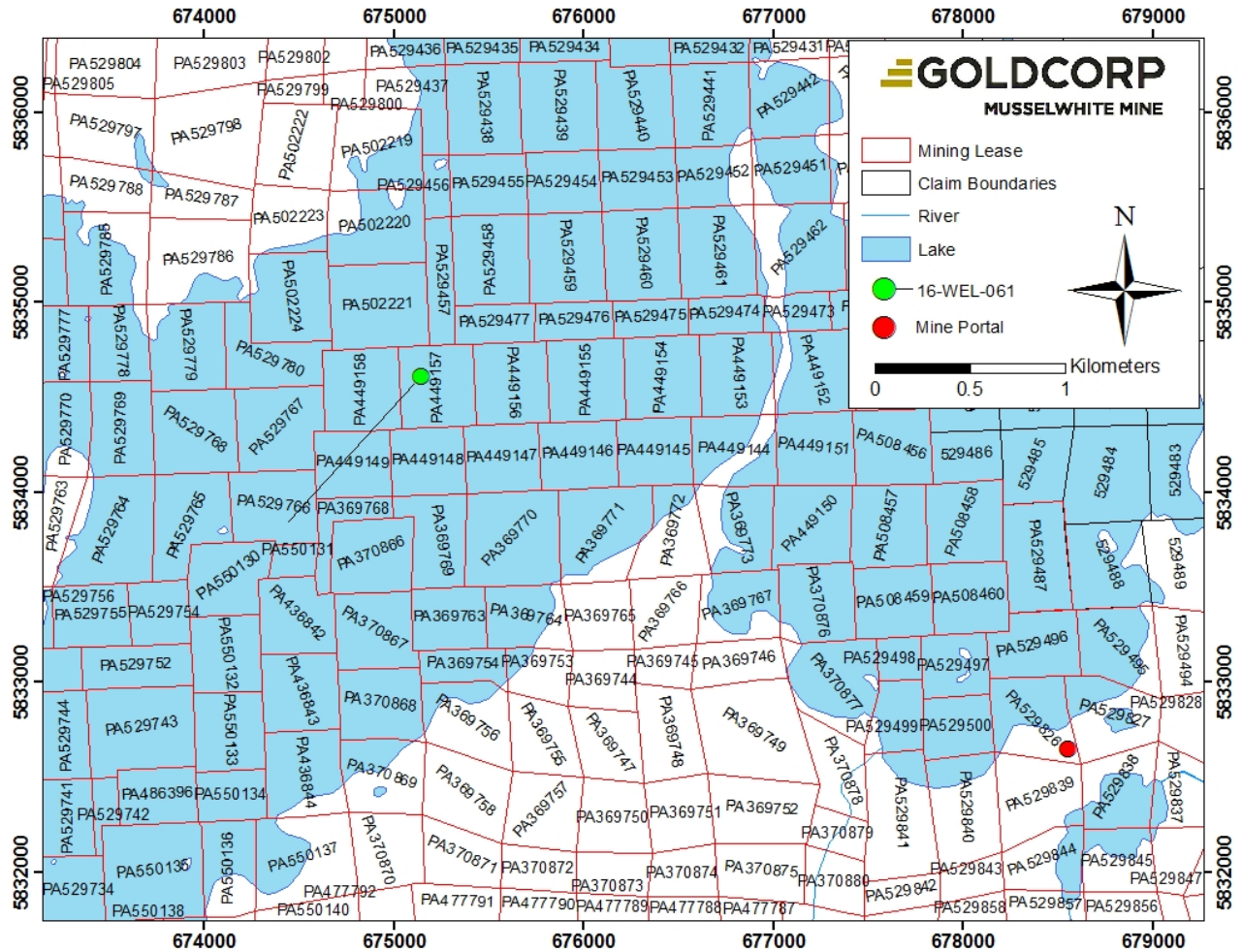
PROGRAM DESCRIPTION

An 1127 m drill hole was planned to test the magnetite-chert iron formation within the west anticline area of the highly folded “Northern Iron Formation” (NIF) in an attempt to identify any down-plunge extension of mineralization found in the East Camp Zone. The drill hole (16-WEL-061) was collared underground from the 657 WEL Access ramp located approximately 900m below Opapimiskan Lake. Drill hole information is shown below in **Table 1** and drill locations are shown in **Figure 2**.

Table 1: West Limb drill hole information.

Hole ID	UTM Co-ordinates NAD 83				Dip	Depth
	Easting	Northing	Elevation	Azimuth		
16-WEL-061	675165	5834629	-600 m	223	21	1127.2 m
	Mine Grid Co-ordinates					
	Easting	Northing	R.L.	Azimuth		
	8077	13500	4402	268		

Figure 4: Map showing location of drill hole.



RESULTS/RECOMMENDATIONS

The diamond drill hole was collared in the mixed metavolcanic and metasedimentary sequence overlying the Northern Iron Formation. 16-WEL-061 drilled the NIF on the west limb of the East Bay Synform area, ~600m of the underlying mafic volcanic package with minor ultramafic dikes, and then back into the NIF in the west anticline area before being terminated in felsic volcanics rocks. Rocks have been metamorphosed to amphibolite grade. A cross section of the drilling can be

seen in **Appendix 1** and drill logs in **Appendix 4** and the various lithology codes used during logging are briefly described below:

1	Ultramafic
2	Basalt
2H	Mafic dike
2U	Garnet bearing metavolcanic
3F	Felsic tuff/lapilli tuff
4A	Chert-grunerite iron formation
4B	Chert-magnetite iron formation
4BF	Chert-Magnetite iron formation with abundant garnet-biotite bands
4E	Garnet-amphibole iron formation
4EA	Garnet-amphibole-grunerite iron formation
4EF	Garnet-amphibole with less than 50% intercalated garnet-biotite schist
4F	Garnet-biotite schist
4FB	Garnet-biotite schist with abundant magnetite +/- chert
4FE	Garnet-biotite schist with less than 50% intercalated Garnet-amphibole
6	Metasediment
6W	Garnet-bearing mudstone/siltstone/sandstone
13	Lamprophyre dike

With several zones of mineralization intersected, further drilling is recommended to follow up the mineralization in the targeted area down-plunge extension of the Camp Zone, and to get a better understanding of the geology of the West Anticline Area of the mine property.

STATEMENT OF EXPENDITURES

A total of \$ 163,062 was spent drilling 16-WEL-061. Due to the expense incurred drilling, there was no need to claim assessment credits for related costs such as consumables or assay costs. A breakdown of the drilling expenditures can be seen in **Table 2** below and the drill invoices in **Appendix 5**.

Table 2: Detailed breakdown of 16-WEL-061 drilling expenditures.

Item	Cost
Move	\$5,611
Drilling	\$138,047
Survey	\$1,891
Grout	\$3,467
Supervision	\$5,662
Rentals	\$8,384
Total	\$163,062

Drill meters per claim were calculated by measuring (using the Vulcan 3D modelling software) the co-ordinates at the point where each drill hole crossed a claim boundary and then determining the downhole depth at that point using the calculated XYZ co-ordinates from the Maxibor downhole orientation surveys or by measuring from the claim line to the nearest labeled contact displayed in Vulcan. The total drilling cost of 16-WEL-061 as per the drill contractors invoices (Table 2) was then prorated by the percentage of the hole drilled on each claim as per **Table 3**.

Table 3: Percentage of drill holes attributed to each claim.

Hole Number	Claim #	Claim #	Claim #	Claim #
	PA449157	PA449158	PA449149	PA529766
16-WEL-061	18%	22%	37%	23%

STATEMENT OF QUALIFICATIONS

I, Matthew Zago, hereby certify that:

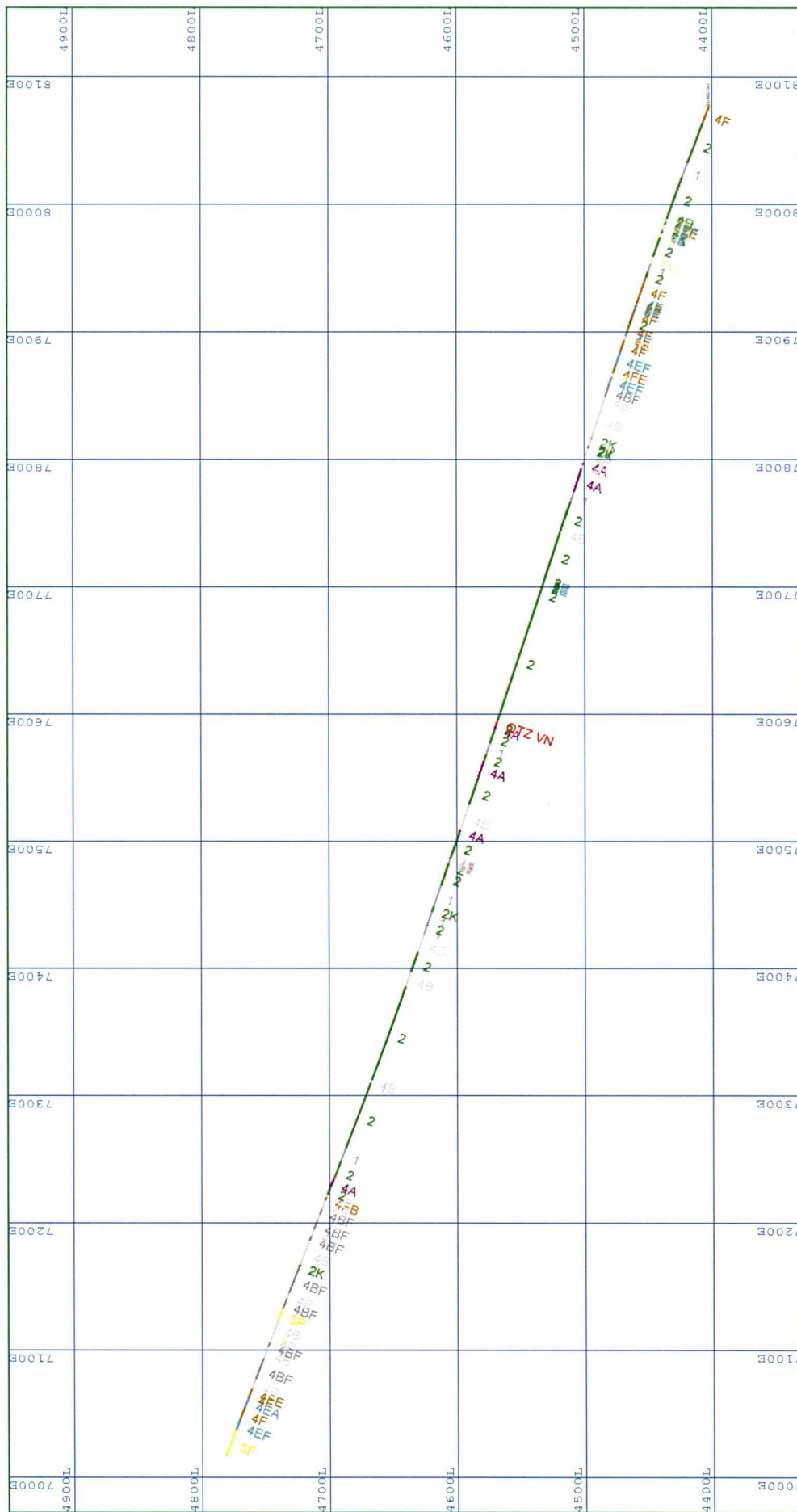
1. I am the author of this report.
2. I have a Bachelor of Science Honors in Geological Sciences from the University of Manitoba in Winnipeg, Manitoba.
3. I am a registered Professional Geologist of the Association of Professional Engineers and Geoscientists of Ontario #2442
4. I am employed by Goldcorp Canada Ltd. at Musselwhite Mine.
5. I agree with all the information contained within this report and believe that it is an accurate description of the work performed.
6. I reside in the city of Thunder Bay, Ontario, Canada.

Name: 

Date: August 28th, 2016

Goldcorp Canada Ltd.
Musselwhite Mine
PO Box 7500
Thunder Bay, ON
P7B 6S8

Appendix 1



Musselwhite Mine
goldcorp inc.

16-WEL-061
 657mL WEL Access
 13,500N

SCALE: 1:3000

30/08/2018

MZ

Appendix 2

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: **X**

UTM North:

Grout Test: YES

Target 2: **X**

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
0	268.1	20.8	MAXI
3	268	20.7	MAXI
6	268	20.7	MAXI
9	268	20.8	MAXI
12	268	20.7	MAXI
15	268	20.7	MAXI
18	267.9	20.7	MAXI
21	267.9	20.7	MAXI
24	268	20.7	MAXI
27	268	20.7	MAXI
30	268	20.7	MAXI
33	268.1	20.7	MAXI
36	268.1	20.8	MAXI
39	268.2	20.8	MAXI
42	268.2	20.8	MAXI
45	268.2	20.7	MAXI
48	268.1	20.7	MAXI
51	268.2	20.7	MAXI
54	268.2	20.5	MAXI
57	268.2	20.5	MAXI
60	268.2	20.4	MAXI
63	268.2	20.3	MAXI
66	268.2	20.4	MAXI
69	268.3	20.3	MAXI
72	268.3	20.2	MAXI
75	268.3	20.2	MAXI
78	268.4	20.2	MAXI
81	268.4	20.2	MAXI
84	268.4	20.1	MAXI
87	268.5	20.1	MAXI
90	268.6	20.1	MAXI
93	268.6	20.1	MAXI
96	268.6	20	MAXI
99	268.7	20	MAXI
102	268.7	19.9	MAXI
105	268.7	19.9	MAXI
108	268.8	19.8	MAXI
111	268.8	19.8	MAXI
114	268.8	19.7	MAXI
117	268.8	19.6	MAXI
120	268.8	19.6	MAXI
123	268.8	19.5	MAXI
126	268.8	19.5	MAXI
129	268.9	19.4	MAXI
132	269	19.4	MAXI
135	269	19.4	MAXI
138	269.1	19.4	MAXI
141	269.1	19.4	MAXI
144	269.1	19.3	MAXI
147	269.1	19.3	MAXI
150	269.1	19.2	MAXI
153	269.1	19.2	MAXI
156	269.1	19.1	MAXI
159	269	19.1	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: **X**

UTM North:

Grout Test: YES

Target 2: **X**

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
162	269.1	19.1	MAXI
165	269	19	MAXI
168	269.1	19	MAXI
171	269.1	19	MAXI
174	269.1	19.1	MAXI
177	269.1	19.1	MAXI
180	269.1	19.1	MAXI
183	269.1	19.1	MAXI
186	269.1	19.1	MAXI
189	269.1	19.1	MAXI
192	269.2	19	MAXI
195	269.2	19	MAXI
198	269.2	19	MAXI
201	269.2	18.9	MAXI
204	269.3	18.9	MAXI
207	269.3	18.9	MAXI
210	269.3	18.9	MAXI
213	269.3	18.9	MAXI
216	269.2	18.9	MAXI
219	269.2	18.9	MAXI
222	269.2	18.8	MAXI
225	269.2	18.8	MAXI
228	269.2	18.8	MAXI
231	269.3	18.8	MAXI
234	269.3	18.7	MAXI
237	269.3	18.7	MAXI
240	269.4	18.6	MAXI
243	269.3	18.5	MAXI
246	269.3	18.4	MAXI
249	269.2	18.4	MAXI
252	269.2	18.4	MAXI
255	269.1	18.4	MAXI
258	269.1	18.2	MAXI
261	269.1	18.3	MAXI
264	269.1	18.3	MAXI
267	269.1	18.3	MAXI
270	269.1	18.3	MAXI
273	269.1	18.3	MAXI
276	269	18.2	MAXI
279	269	18.2	MAXI
282	269	18.2	MAXI
285	269	18.2	MAXI
288	269	18.2	MAXI
291	269.1	18.2	MAXI
294	269.1	18.2	MAXI
297	269.2	18.3	MAXI
300	269.2	18.3	MAXI
303	269.3	18.3	MAXI
306	269.3	18.3	MAXI
309	269.2	18.4	MAXI
312	269.2	18.4	MAXI
315	269.3	18.4	MAXI
318	269.4	18.4	MAXI
321	269.4	18.4	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: X

UTM North:

Grout Test: YES

Target 2: X

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
324	269.4	18.4	MAXI
327	269.4	18.4	MAXI
330	269.4	18.4	MAXI
333	269.4	18.3	MAXI
336	269.5	18.3	MAXI
339	269.5	18.3	MAXI
342	269.4	18.2	MAXI
345	269.5	18.2	MAXI
348	269.5	18.3	MAXI
351	269.6	18.3	MAXI
354	269.6	18.3	MAXI
357	269.6	18.3	MAXI
360	269.7	18.3	MAXI
363	269.7	18.3	MAXI
366	269.7	18.2	MAXI
369	269.7	18.1	MAXI
372	269.8	18.1	MAXI
375	269.8	18.1	MAXI
378	269.9	18.1	MAXI
381	269.9	18.1	MAXI
384	269.9	18.1	MAXI
387	269.9	18.1	MAXI
390	269.9	18.1	MAXI
393	269.9	18.2	MAXI
396	269.9	18.2	MAXI
399	269.9	18.3	MAXI
402	270	18.4	MAXI
405	269.9	18.4	MAXI
408	270	18.4	MAXI
411	270	18.4	MAXI
414	270	18.4	MAXI
417	270	18.4	MAXI
420	270.1	18.5	MAXI
423	270.1	18.5	MAXI
426	270.1	18.5	MAXI
429	270.1	18.5	MAXI
432	270.1	18.5	MAXI
435	270.1	18.5	MAXI
438	270.1	18.5	MAXI
441	270.1	18.5	MAXI
444	270.1	18.5	MAXI
447	270	18.4	MAXI
450	270	18.3	MAXI
453	270	18.3	MAXI
456	270	18.2	MAXI
459	270	18.2	MAXI
462	270	18.3	MAXI
465	270	18.3	MAXI
468	270	18.3	MAXI
471	270	18.3	MAXI
474	269.9	18.3	MAXI
477	269.9	18.4	MAXI
480	269.9	18.5	MAXI
483	269.9	18.5	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286
 Mine Grid Northing: 13500.957
 Elevation: 4402.323

Planned Depth(m): 1080
 Actual Depth (m): 1127.2
 Core Diameter: NQ2

Drill Start Date: 6/26/2016
 Drill End Date: 8/5/2016

UTM East:
 UTM North:

Plugged: YES
 Grout Test: YES
 Result: BAD

Target 1: **X**

Target 2: **X**

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
486	269.9	18.6	MAXI
489	269.9	18.6	MAXI
492	270	18.5	MAXI
495	270	18.7	MAXI
498	270.1	18.7	MAXI
501	270.1	18.7	MAXI
504	270.1	18.7	MAXI
507	270.1	18.7	MAXI
510	270.1	18.7	MAXI
513	270.1	18.7	MAXI
516	270.1	18.7	MAXI
519	270.1	18.7	MAXI
522	270.2	18.7	MAXI
525	270.2	18.7	MAXI
528	270.2	18.7	MAXI
531	270.2	18.8	MAXI
534	270.3	18.8	MAXI
537	270.3	18.7	MAXI
540	270.3	18.8	MAXI
543	270.3	18.9	MAXI
546	270.3	19	MAXI
549	270.2	19	MAXI
552	270.2	18.9	MAXI
555	270.2	18.8	MAXI
558	270.2	18.9	MAXI
561	270.2	18.9	MAXI
564	270.2	19	MAXI
567	270.2	18.9	MAXI
570	270.1	18.9	MAXI
573	270.1	18.9	MAXI
576	270.1	19	MAXI
579	270	18.9	MAXI
582	270	18.9	MAXI
585	270	18.9	MAXI
588	270	18.8	MAXI
591	270.1	18.8	MAXI
594	270.1	18.8	MAXI
597	270.1	18.8	MAXI
600	270.1	18.8	MAXI
603	270.1	18.8	MAXI
606	270.2	18.9	MAXI
609	270.2	18.9	MAXI
612	270.2	18.9	MAXI
615	270.2	18.9	MAXI
618	270.2	19	MAXI
621	270.2	19	MAXI
624	270.3	19	MAXI
627	270.3	19	MAXI
630	270.3	19.1	MAXI
633	270.3	19	MAXI
636	270.3	19	MAXI
639	270.3	19.1	MAXI
642	270.4	19	MAXI
645	270.4	19.1	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: X

UTM North:

Grout Test: YES

Target 2: X

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
648	270.4	19.1	MAXI
651	270.4	19.1	MAXI
654	270.4	19.2	MAXI
657	270.4	19.2	MAXI
660	270.5	19.2	MAXI
663	270.5	19.2	MAXI
666	270.5	19.2	MAXI
669	270.6	19.2	MAXI
672	270.6	19.2	MAXI
675	270.6	19.1	MAXI
678	270.6	19.1	MAXI
681	270.7	19.1	MAXI
684	270.7	19	MAXI
687	270.7	19	MAXI
690	270.8	19.1	MAXI
693	270.8	19.1	MAXI
696	270.9	19.1	MAXI
699	270.9	19.2	MAXI
702	270.8	19.1	MAXI
705	270.8	19.1	MAXI
708	270.8	19	MAXI
711	270.7	19	MAXI
714	270.7	19	MAXI
717	270.7	19.1	MAXI
720	270.7	19.1	MAXI
723	270.8	19.1	MAXI
726	270.9	19.1	MAXI
729	270.9	19.2	MAXI
732	270.9	19.3	MAXI
735	271	19.3	MAXI
738	271	19.4	MAXI
741	271	19.4	MAXI
744	271.1	19.4	MAXI
747	271.1	19.5	MAXI
750	271.1	19.5	MAXI
753	271.2	19.6	MAXI
756	271.2	19.6	MAXI
759	271.2	19.7	MAXI
762	271.2	19.8	MAXI
765	271.3	19.8	MAXI
768	271.3	19.9	MAXI
771	271.3	19.9	MAXI
774	271.3	19.9	MAXI
777	271.3	20	MAXI
780	271.3	20.1	MAXI
783	271.4	20.1	MAXI
786	271.4	20.2	MAXI
789	271.4	20.3	MAXI
792	271.5	20.4	MAXI
795	271.5	20.4	MAXI
798	271.5	20.5	MAXI
801	271.5	20.5	MAXI
804	271.5	20.6	MAXI
807	271.5	20.6	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: **X**

UTM North:

Grout Test: YES

Target 2: **X**

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
810	271.5	20.7	MAXI
813	271.5	20.6	MAXI
816	271.5	20.7	MAXI
819	271.5	20.7	MAXI
822	271.6	20.7	MAXI
825	271.6	20.8	MAXI
828	271.6	20.8	MAXI
831	271.6	20.9	MAXI
834	271.6	20.9	MAXI
837	271.6	20.9	MAXI
840	271.6	21	MAXI
843	271.6	21	MAXI
846	271.6	21	MAXI
849	271.6	21.1	MAXI
852	271.6	21.1	MAXI
855	271.6	21.1	MAXI
858	271.6	21.1	MAXI
861	271.6	21.1	MAXI
864	271.6	21.2	MAXI
867	271.6	21.2	MAXI
870	271.6	21.2	MAXI
873	271.5	21.2	MAXI
876	271.5	21.1	MAXI
879	271.5	21.1	MAXI
882	271.5	21.1	MAXI
885	271.5	21.1	MAXI
888	271.6	21.2	MAXI
891	271.5	21.3	MAXI
894	271.6	21.3	MAXI
897	271.6	21.3	MAXI
900	271.6	21.4	MAXI
903	271.6	21.4	MAXI
906	271.7	21.4	MAXI
909	271.6	21.3	MAXI
912	271.6	21.4	MAXI
915	271.6	21.4	MAXI
918	271.6	21.4	MAXI
921	271.5	21.4	MAXI
924	271.4	21.5	MAXI
927	271.4	21.4	MAXI
930	271.3	21.4	MAXI
933	271.2	21.4	MAXI
936	271.1	21.4	MAXI
939	271	21.4	MAXI
942	270.9	21.5	MAXI
945	270.9	21.5	MAXI
948	270.9	21.4	MAXI
951	270.9	21.5	MAXI
954	270.9	21.5	MAXI
957	270.9	21.5	MAXI
960	270.8	21.5	MAXI
963	270.8	21.5	MAXI
966	270.8	21.5	MAXI
969	270.8	21.5	MAXI

MUSSELWHITE MINE - GEOLOGY

Hole: **16-WEL-061**

Project: **WEL**

Mine Grid Easting: 8077.286

Planned Depth(m): 1080

Drill Start Date: 6/26/2016

Mine Grid Northing: 13500.957

Actual Depth (m): 1127.2

Drill End Date: 8/5/2016

Elevation: 4402.323

Core Diameter: NQ2

UTM East:

Plugged: YES

Target 1: X

UTM North:

Grout Test: YES

Target 2: X

Result: BAD

Target 3:

Drill Instructions:

Collar Comments:

Survey			
Depth	Azimuth	Dip	SurveyType
972	270.8	21.5	MAXI
975	270.8	21.5	MAXI
978	270.8	21.5	MAXI
981	270.8	21.5	MAXI
984	270.8	21.4	MAXI
987	270.8	21.4	MAXI
990	270.8	21.3	MAXI
993	270.8	21.3	MAXI
996	270.8	21.4	MAXI
999	270.8	21.4	MAXI
1002	270.8	21.4	MAXI
1005	270.7	21.4	MAXI
1008	270.75	21.35	MAXI
1011	270.75	21.35	MAXI
1014	270.74	21.34	MAXI
1017	270.74	21.33	MAXI
1020	270.73	21.32	MAXI
1023	270.72	21.31	MAXI
1026	270.72	21.3	MAXI
1029	270.71	21.29	MAXI
1032	270.71	21.28	MAXI
1035	270.7	21.27	MAXI
1038	270.69	21.26	MAXI
1041	270.68	21.27	MAXI
1044	270.67	21.27	MAXI
1047	270.67	21.26	MAXI
1050	270.66	21.25	MAXI
1053	270.65	21.25	MAXI
1056	270.65	21.24	MAXI
1059	270.64	21.23	MAXI
1062	270.63	21.23	MAXI
1065	270.63	21.22	MAXI
1068	270.62	21.22	MAXI
1071	270.61	21.21	MAXI
1074	270.6	21.2	MAXI
1077	270.6	21.19	MAXI
1080	270.59	21.18	MAXI
1083	270.59	21.18	MAXI
1086	270.58	21.17	MAXI
1089	270.57	21.16	MAXI
1092	270.57	21.15	MAXI
1095	270.56	21.15	MAXI
1098	270.55	21.14	MAXI
1101	270.55	21.13	MAXI
1104	270.54	21.13	MAXI
1107	270.53	21.12	MAXI
1110	270.53	21.11	MAXI
1113	270.52	21.1	MAXI
1116	270.51	21.1	MAXI
1119	270.51	21.09	MAXI
1122	270.5	21.08	MAXI
1125	270.49	21.07	MAXI
1127.2	270.49	21.07	MAXI

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Depth	MAJOR UNIT			MINERALS							QTZ VEINING							FABRIC						FOLD						FAULT							
	From	To	Unit	As%	Cp%	Mt%	Po%	Py%	VG Specks	Comments	From	To	Vein Type	Vein %	Tex	Contact Type	Alpha deg	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	
195	195.5	205	4F																200	200.1	58	MOD	S1		200.5	200.6	75	MOD	FD								
205									3										207	207.1	65	MOD	S1		206.1	207.2	72	WEK	ZF								
210	205	217	4EF						2																207.8	209.8	70	MOD	ZF								
215																														213	213.6	73	MODE	HZ			
220	217	223.2	4FE						2										216	216.1	70	MOD	S1		215.3	215.4	77	WEK	FD	Folded vein							
225	223.2	226.2																	222	222.1	58	MOD	S1														
230	226.2	232.1	4EF						1	1									230	230.1	65	WEK	S1														
235	232.1	242	4BF						2																232.8	233.3	68	MOD	ZF			232.8	234.1	77	INT	HZ	Strongly deformed area
																			239	239.1	62	MOD	S1														

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Elev ft	MAJOR UNIT			MINERALS							QTZ VEINING							FABRIC						FOLD						FAULT									
	From	To	Unit	As%	Cp%	Mt%	Po%	Py%	VG Specks	Comments	From	To	Vein Type	Vein %	Tex	Contact Type	Alpha deg	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments			
	232.1	242	4BF																																				
								2																	242	242.3	70	MOD	ZF										
245	242	246.3	4B																245	245.1	43	MOD	S1									243.6	244	70	MOD	E	HZ		
																			248	248.1	38	INT	S1		247.2	248.4	63	MOD	ZF					247.6	248.1	45	MOD	E	HZ
250																																							
255																			254	254.1	60	MOD	S1																
																			259	259.1	78	MOD	S1		257.7	257.9	73	MOD	FD										
260																			261	261.1	40	MOD	S1																
	246.3	276.6	4B																264	264.1	40	MOD	S1		259.9	266.2	70	INT	MF										
265																																							
								4																	267.1	270.2	77	MOD	MF										
270																			271	271.1	65	MOD	S1																
																									271	271.8	72	MOD	SF										
275								3											274	274.1	87	MOD	S1																
	276.6	277.2	+ 2K																																				
								2											278	278.1	80	MOD	S1																
	277.2	283	4B																						279	279.7	75	MOD	SF					279	279.7	75	MOD	E	HZ

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MAJOR UNIT				MINERALS							QTZ VEINING							FABRIC						FOLD						FAULT							
Elev	From	To	Unit	As%	Cp%	Mt%	Po%	Py%	VG Specks	Comments	From	To	Vein Type	Vein %	Tex	Contact Type	Alpha deg	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	
405	397.9	409.4	2																405	405.1	70	MOD	S1														
410																																					
415																			414	414.1	70	WEK	S1														
420																																					
425	409.4	510.4	2																424	424.1	72	MOD	S1								409.4	462.1	67	INT	HZ	Intense shearing with qtz replacement and elevated alt	
430																																					
435																			435	435.1	62	WEK	S1		435.4	435.5	90	WEK	FD								
																			436	436.1	58	WEK	S1														
																			438	438.1	57	MOD	S1		437.3	437.6	90	WEK	FD								

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Elev m	MAJOR UNIT			MINERALS							QTZ VEINING							FABRIC						FOLD						FAULT							
	From	To	Unit	As%	Cp%	Mt%	Po%	Py%	VG Specks	Comments	From	To	Vein Type	Vein %	Tex	Contact Type	Alpha deg	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	
915	918.4	923	4BF																						920.6	920.7	90	MOD	MF								
925	923	927.8	4B																						923.9 924.2	924 924.3	85 80	MOD MOD	ZF FD								
930	927.8	935.7	4BF																						930.2	930.3	85	MOD	SF								
935	935.7	941	4B																						936.6 936.7	936.7 936.8	90 90	MOD MOD	SF FD								
940	941	945.4	4BF					3											943	943.1	60	MOD	S0		943	944	90	INT	FD								
945	945.4	965.3	4B					5																	950.5	950.6	85	MOD	FD								
950	945.4	965.3	4B																952.6	952.7	75	MOD	S0														
955																			958.8	958.9	80	MOD	S1														

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Elev ft	MAJOR UNIT			MINERALS							QTZ VEINING							FABRIC						FOLD						FAULT							
	From	To	Unit	As%	Cp%	Mt%	Po%	Py%	VG Specks	Comments	From	To	Vein Type	Vein %	Tex	Contact Type	Alpha deg	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	From	To	Alpha deg	Int	Type	Comments	
1035	1035.2	1044.5	4B																1042	1042.1	42	MOD	S1		1040.9	1041.6	90	MOD	FD								
								2												1041.9	1042.1	90	WEK	ZF													
1045																			1047	1047.1	32	MOD	S1		1044.5	1045.1	82	MOD	ZF								
								4																													
1050																			1052	1052.1	43	MOD	S1														
	1044.5	1062	4BF																1053.7	1053.8	0	MOD	S1		1052.7	1054.1	90	MOD	FD		1051.7	1053.5	43	MODE	HZ		
1055																			1055	1055.1	37	MOD	S1														
																									1056.1	1057	87	MOD	FD								
1060																			1060	1060.1	50	MOD	S1														
1065	1062	1070.3	4B					1																													
								4																													
								1																													
								3																													
1070	1070.3	1074	4FE					2											1070	1070.1	63	MOD	S1														
1075	1074	1078.1	4F																																		
	1078.1	1084.9	4EA																1079	1079.1	66	MOD	S1		1079.2	1079.7	78	WEK	FD								

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MAJOR UNIT							MINOR UNIT		ALTERATION							
From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments
0	14.1	4F	B	POR BL	Porphyroblastic biotite garnet schist. 2-5cm bands of garnet-amphibole are observed to be folded across the path of the drill hole. Fold axis are highly variable but typically very shallow to the core axis.	Traces of PO are observed throughout as fine grains to medium blebs disseminated in the groundmass. The fabric is strongly deformed but often indiscernible as the rock does not preserve strain well.										
14.1	48	2	DG	FOL	Fine grained, dark green mafic metavolcanic. Weakly to moderately biotite altered. Biotite grains are preferentially oriented at a steep angle to the core axis. 5-25mm carbonate veins are abundant, 2-10 per meter.	Blue-grey qtz veins increase in abundance down hole of 35m from 1/m to 3-5/peter. Intensely mineralized below 43m (see min tab). The largest carbonate veins contain small qtz lenses.										

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MAJOR UNIT							MINOR UNIT		ALTERATION							
From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments
232.1	242	4BF	G	BA	Dark grey-brown, fg-mg, banded, foliated, 4BF. ~25% bio+grt bands intercalated within alternating bands of mag and chert. Weak folding locally present. Trace PO min withy up to 3% PO locally throughout. Sharp LC with 4B.											
242	246.3	4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, magnetic 4B. Alternating 0.5-2cm bands of chert (~60%) and magnetite (~35%). There are occasional non-mag wisps of dark green amph throughout (~5-8% of unit). Chert bands are generally wider than	the mag bands. Weak to mod folded patches locally throughout. Trace to 2% PY min locally present. Diffuse LC with 4B.										
246.3	276.6	4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, very magnetic 4B. Strained in localized patches. Alternating 0.5-2cm bands of chert (~60%) and magnetite (~35%). Chert bands are generally wider than the mag bands.	Trace to 3% PO and PY min locally present throughout. Well folded patches locally throughout with M and S folding. Sharp LC with 2K.										
276.6	277.2	+ 2K	DG	FOL	Dark green, fg, foliated mafic dyke. Mod bio and amph alt throughout that is well foliated and weakly strained. There are ~2-3% qtz-crz stringers (~0.5cm) throughout. No min or mag present. Well foliated with sharp contacts. Sharp LC with 4B.											
277.2	283	4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, very magnetic 4B. Alternating 0.5-2cm bands of chert (~65%) and magnetite (~30%). Chert bands are generally wider than the mag bands. Trace to 3% PO min locally present throughout.	Mod to well folded patches locally throughout. Sharp LC with 2J.										

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16-WEL-061																	
	MAJOR UNIT						MINOR UNIT		ALTERATION								
	From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments
277.2	283		4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, very magnetic 4B. Alternating 0.5-2cm bands of chert (~65%) and magnetite (~30%). Chert bands are generally wider than the mag bands. Trace to 3% PO min locally present throughout.	Mod to well folded patches locally throughout. Sharp LC with 2J.										
283	284.6		2K	DG	FOL	Dark green, mg, foliated mafic dyke. Much coarser texture than typical mafic units. Mod green amph alt throughout that is well foliated. No min or mag present. Well foliated with sharp contacts. Sharp LC with 2K.											
284.6	285.1		2K	DG	FOL	Dark green, fg, foliated mafic dyke. Mod bio and amph alt throughout that is well foliated and weakly strained. There are ~2-3% qtz-cr-b stringers (~0.5cm) throughout. No min or mag present. Well foliated with sharp contacts. Sharp LC with 4B.											
285.1	297.1		4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, very magnetic 4B. Alternating 0.5-2cm bands of chert (~65%) and magnetite (~30%). Chert bands are generally wider than the mag bands. Trace PO min with up to 8% PO locally present throughout.	Mod folded patches locally present throughout. Diffuse LC with 4A.										
297.1	298.6		4A	G	BA	Grey-beige, fg, foliated chert-grunerite iron formation (4A). Strongly silicified chert with well-developed banding. ~75% chert with ~10% grun wispy bands finely intermixed. ~8% PO min throughout entire unit and trace mag present locally.	Diffuse LC with 4B.										
298.6	301.8		4B	G	BA	Dark grey-light grey, fg, banded to laminated, folded, very magnetic 4B. Alternating 0.5-2cm bands of chert (~65%) and magnetite (~30%). Chert bands are generally wider than the mag bands. Trace to ~2% PO min locally present throughout.	Mod folded patches locally present throughout.										
301.8	320.9		4A	G	DI	Grey-green-beige, fg, distorted, foliated, altered chert-grunerite iron formation (4A). Strongly silicified chert with well-developed green amph wisps throughout composing ~25% of unit. ~40-50% chert with ~6-8% grun wispy bands finely intermixed.	There are also occasional wisps of magnetite locally throughout (~8%). Trace to 10% PO min throughout entire unit and weak mag locally associated with magnetite. Elevated strain and weak folds found throughout unit. Diffuse LC with UM.										

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	MAJOR UNIT								MINOR UNIT		ALTERATION							
	From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments	
	719.6	731.7	4B	G	BA	Aphanitic to fine grained magnetite chert grunerite iron formation. The banded fabric is strongly distorted by sweeping folds throughout the unit. Therefore the orientation of the compositional banding is highly variable.	Traces of PO are observed throughout as fine stringers or disseminated blebs, locally 1% proximal to lower contact. Chert is translucent to opaque and buff to pale green colored. Grunerite occurs as thin selvages bordering magnetite bands.											
												S					intercalated zone between 2 and 4B. strongly chlorite altered.	
	731.7	809.8	2	DG	FOL	Fine grained, pale green, mafic metavolcanic. Weakly to moderately biotite altered. Strongly foliated with tight folds observed occasionally. Weak chlorite alteration, intense amphibole alteration.	Sparsely sub cm tightly folded qtz veins may be observed. Barren of sulphide mineralization.											

	MAJOR UNIT						MINOR UNIT		ALTERATION								
	From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments
	731.7	809.8	2	DG	FOL	Fine grained, pale green, mafic metavolcanic. Weakly to moderately biotite altered. Strongly foliated with tight folds observed occasionally. Weak chlorite alteration, intense amphibole alteration.	Sparsely sub cm tightly folded qtz veins may be observed. Barren of sulphide mineralization.					S					

16-WEL-061

16-WEL-061																	
	MAJOR UNIT						MINOR UNIT		ALTERATION								
	From	To	Unit	Col	Text	Comments	Comments	Unit	Comments	Bio	Car	Chl	Gru	Hem	Ser	Si	Comments
	731.7	809.8	2	DG	FOL	Fine grained, pale green, mafic metavolcanic. Weakly to moderately biotite altered. Strongly foliated with tight folds observed occasionally. Weak chlorite alteration, intense amphibole alteration.	Sparsely sub cm tightly folded qtz veins may be observed. Barren of sulphide mineralization.	4B	intraformational 4B			S					
	809.8	810.9	4B	G	BA	Intraformational 4B. sub cm bands of aphanitic white chert and black magnetite. Banding shows weak deformation, displaying a wavy character. Highly strained upper contact with strong to intense chlorite alteration.	Lower contact is diffuse due to contact metamorphism with ultramafic dyke.										
	810.9	812.5		DG	FOL	Dark green, fine grained ultramafic intrusive. Similar in appearance to mafic metavolcanics, but identified through characteristic ultramafic alteration and typically soft character. Soapy to the touch.											
	812.5	867.5	2	DG	FOL	Dominantly fine grained mafic metavolcanic. Weakly biotite altered. Strongly foliated. PO and CPY occur as fine disseminated grains. Within the rock mass or in association with sub cm qtz carb veins.	Veins are dominantly planar but may be weakly boudinaged or moderately folded. 3-5cm qtz veins are present rarely. Rarely folding of the foliated fabric is observed.	2	what is interpreted to be a coarse grained flow center. amphibolite grade featuring coarse 5-15mm long asccular amphibole grains.								

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Appendix 3

**Information withheld for
client confidentiality.**