MAR 20140005: CLEAR HILLS

Clear Hills Project- A report on Iron deposits in the Clear Hills in northwest Alberta.

Received date: Jun 17, 2014

Public release date: Jan 08, 2016

ironstone RESOURCES

Suite 200, 6125 – 11th Street S.E.
Calgary, Alberta, Canada T2H2L6
T (403) 640-7977
F (403) 640-3646

ASSESSMENT WORK

PART "B"
TECHNICAL DOCUMENT

METALLIC AND INDUSTRIAL MINERALS PERMIT NUMBERS

9312060404	9312060405	9312060406
9312060407		9312060410

CLEAR HILLS PROJECT

IRONSTONE RESOURCES LTD.

COVERING THE PERIOD

JANUARY 1, 2012 to JANUARY 1, 2013

SUBMITTED BY

ANDREW READER, B.Sc.
GEOLOGIST, EXPLORATION & DEVELOPMENT

JUNE 15, 2014

Table of Contents

Executive Summary

Ironstone Resources Ltd. ("Ironstone") has been developing the Clear Hills ironstone deposit since 2007. In 2008 a 51-hole drilling program was completed on the northern portion of the deposit in order to confirm historic drilling reports. Using these drill holes, SRK Consulting Canada ("SRK") calculated a compliant resource of: 139.6 Mt grading 33% Fe and 0.21% V_2O_5 indicated and 62.8 Mt grading 33.7% Fe inferred. Details of this drill program can be found in Ironstone's Assessment Report "Clear Hills Project" dated July 5, 2008. In early 2011 a second drill program was completed on the Clear Hills project. In total, 148 holes were drilled directly to the south of the 2008 drilling. SRK completed an updated resource report stating that the compliant resource was: 557.7 Mt @ 33.3% Fe and 0.20% V_2O_5 indicated, and 94.7 Mt @ 34.1% Fe inferred. In addition a bulk sample pit was excavated in early 2011 and 11,000 tonnes were extracted for use in various pilot engineering tests.

In February 2012, Ironstone completed a third drilling program on the Clear Hills project which is the focus of this Assessment Report. 31 holes were drilled in the approximate southeastern-most portion of the Clear Hills deposit. Core collected was described, sampled, shipped to Inspectorate Exploration & Mining Services Ltd. ("Inspectorate") in Vancouver, BC for whole-rock geochemical and bulk density analyses.

Introduction

During early 2012 a 31-hole core drilling program was completed on the southeastern-most extent of the deposit. The area drilled has historically been referred to as the "South Whitemud Block". Iron ore was recovered in 27 of the 31 holes drilled and holes with iron recovered were described and sampled according to the same procedure as the 2011 Clear Hills drilling program.

Results of the work completed on the Clear Hills project covering the period from January 2012 to July 2012 are highlighted below with full reports and data attached in the appendix (Part C).

Location and Access

The Clear Hills iron deposits underlie much of the Clear Hills in northwestern Alberta, 80 km northwest of the town of Peace River, Alberta, and 480 air-km northwest of Edmonton (Figure 1). The deposits are primarily within National Topographic System (NTS) map-areas 84D and 84E.

The southern parts of the Clear Hills iron deposits are accessible by gravel road extending north from the community of Worsley. Further north, the deposits, which crop out along Rambling Creek (formerly called Swift Creek), are accessible by foot from the dry weather gravel road that extends to the Notikewin forestry tower and airstrip.

The South Whitemud Block that was the focus of this drill program was accessed by a large, well-maintained gravel road owned by Canadian Forest Products (CANFOR). The road in question is accessed to the northeast of the town of Hines Creek, and runs through the middle of the drilling area (See Figure 1).

In general, access to other locations in the Clear Hills is best by helicopter, or in winter months by skidoo along seismic lines which transect this area.

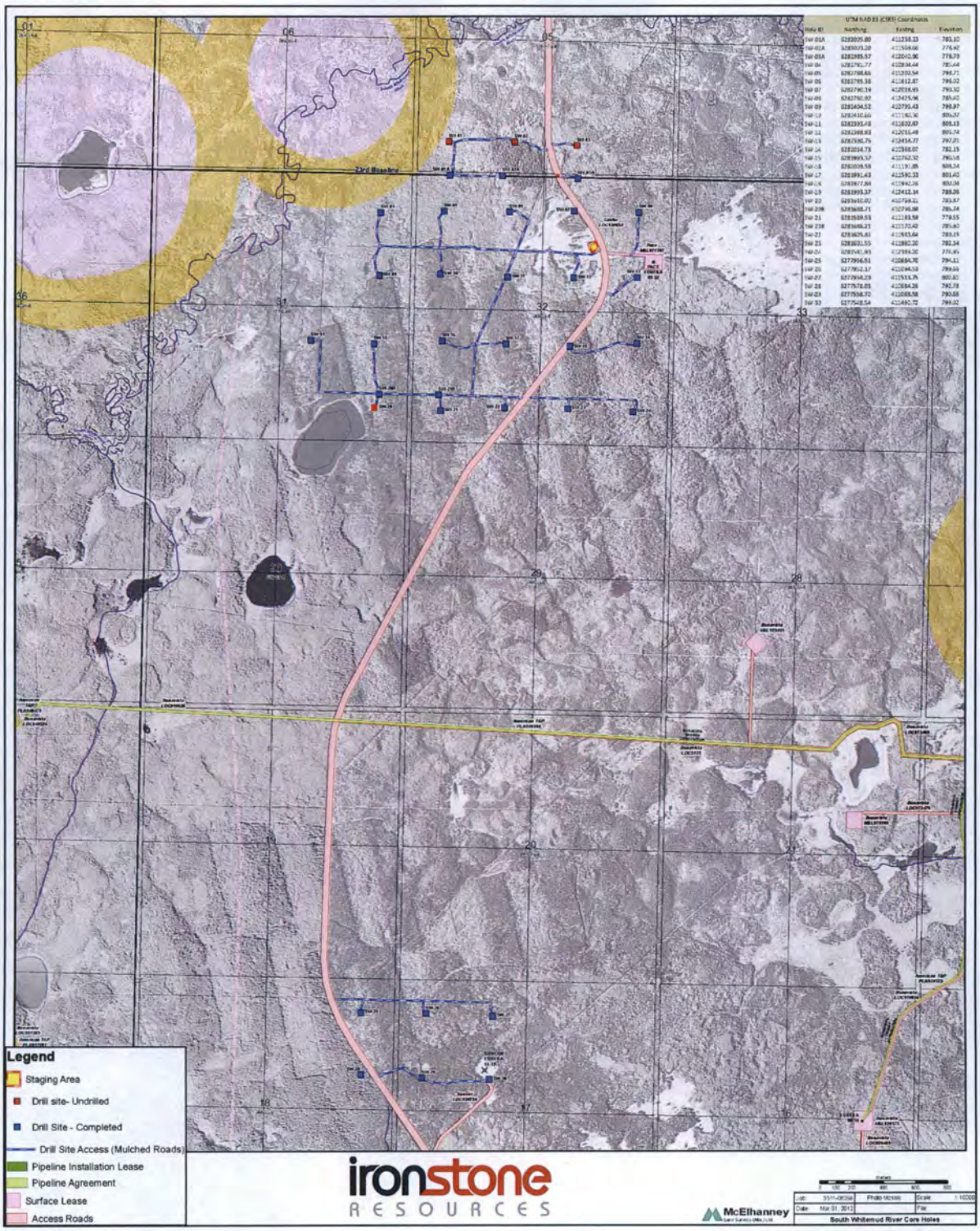


Figure 1: Clear Hills 2012 Drilling Locations

Stratigraphy

The Clear Hills iron deposit consists of a ferruginous oolite ore of the Minette type hosted by the Bad Heart Formation (Petruk, 1977). Hamilton (1980) described the lithology as a dark brown and green to black, ferruginous oolite, forming a bed up to 12m thick.

Outcrop of the Bad Heart formation in the Clear Hills, and northwestern Alberta in general, is scarce. The best exposures of the Bad Heart formation, including the type section, occur along the Smoky River near its intersection with the Bad Heart River approximately 100 km southwest of the town of Peace River. In the Clear Hills, the best natural exposures of the Bad Heart formation ooidal ironstone are along Rambling Creek on the company's Rambling Creek block (although the entire Bad Heart formation section is not exposed) (Figure 2). Donaldson (1999) suggests the ooidal ironstone was deposited in a shallow marine and clastic starved environment due to the well sorted/rounded and grain-supported nature of the deposit, and the lack of detrital material throughout the entire ooidal facies.

Figure 2: Outcrop of Bad Heart ironstone along Rambling Creek

Structural Geology

Kidd (1959) describes the regional structure as a gently undulating homocline, dipping regionally to the southwest at 20 to 25 feet per mile. He interpreted the dip on the iron bed as 8 feet per mile, to the southwest. Green and Mellon (1962) suggest reversal of dips locally result in variable dip directions.

In general, the regional dips are extremely low and rarely exceed 5 meters per kilometer. Structure contours within the Clear Hills on the top of the Bad Heart formation show that the unit is mainly shallowly east-dipping.

The thickness of the iron bed varies from zero to 12m and forms a series of sandstone bodies that trend northwest, which are exposed along the flanks of the hills at elevations between 762 and 823 meters (Mellon et al, 1975).

Economic Geology

The Clear Hills deposit has been the subject of quite detailed reserves estimates by the Alberta Research Council, on the basis of surface exposures and drilling programs carried out between 1959 and 1965 on four areas supervised by N. S. Edgar, a consulting mining engineer. The reserves were summarized as follows:

Block Name	Reserves			No of Drillholes
	Proven	Probable	Possible	
Worsley "A"	25,750,000	8,225,000	-	120
Rambling Creek "B"	210,000,000	-	-	115
Whitemud "C"	-	684,000,000	-	Proven
S. Whitemud "D"	-	-	205,000,000	8
TOTAL	**226,750,000**	**692,225,000**	**205,000,000**	

Table 1: Reserves of sedimentary Iron ore,
Clear Hills District, northwestern Alberta.
After Bertram and Mellon, 1975

Metallic and Industrial Minerals Permits

Permit Number	Area (Ha)
9312060404	2,048
9312060405	7,424
9312060406	6,908
9312060407	4,608
9312060410	4,608
Total Area:	25,596

Table 2: List of permits included in this assessment

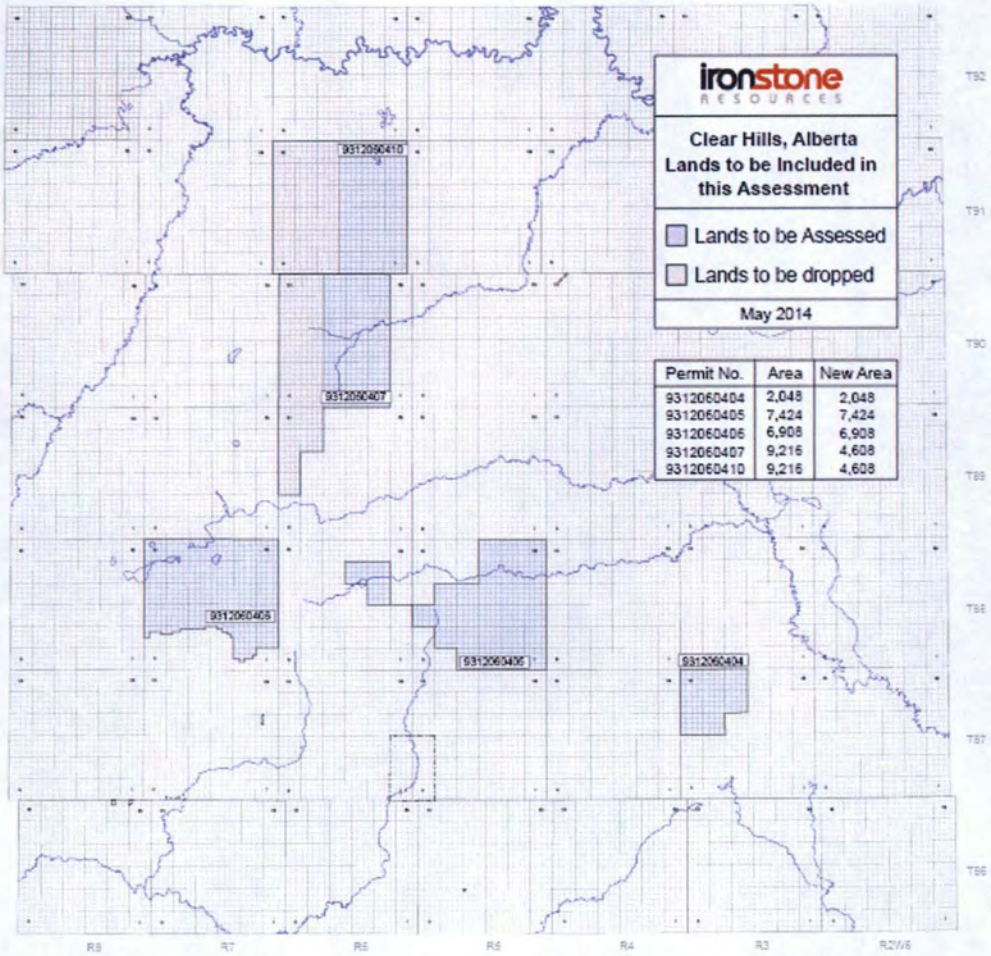


Figure 3: Location of permits included in this assessment report (included in appendix C)

Work Performed

Access and Surveying

Ironstone Resource's properties are best accessed in the winter when roads are frozen due to muddy conditions that prevail during the rest of the year.

Public access to the Clear Hills is closely monitored by Alberta Environment & Sustainable Resource Development (AESRD) to protect its ecosystems. Two forestry companies (Canadian Forest Products and Diashowa) and several oil and gas companies currently operate in the area.

Ironstone's properties can be accessed by the well-maintained Notikewin Fire Tower Road, north of Eureka River during the winter. During the fall of 2011, permanent culverts were replaced by Ironstone at several river crossings to improve accessibility. Another road (Iron Haul Road), although mostly inaccessible in its current form, splits off of the Notikewin Road at the south and runs north along the west side of Ironstone's properties.

The southeastern portion of the property can be accessed by a large, well-maintained gravel road owned by CANFOR located to the northeast of the town of Hines Creek.

Tyran Transport Ltd. (Clayhurst, BC) was contracted to act as prime contractor for the drill program and maintained temporary access roads throughout the drilling program. Mcelhanney Associates (Grande Prairie, AB) was hired to conduct all survey work for Ironstone. Drill sites were positioned and marked initially by handheld GPS, with final, accurate drill collar surveys completed on all boreholes after drilling.

All drilling locations were permanently marked with metal identification tags bearing the MME number, hole number and DLS location. The tags were affixed to a tree at the southwest corner of each location.

A 50x50 meter staging area was cleared just off of the CANFOR road in order to set up a temporary drilling camp. The camp consisted of an office trailer, core trailer, and storage for drilling supplies.

At the completion of the drilling program, all of the drill sites were "rolled back" to AESRD specification, leaving the area as close to original condition as possible.

Drilling Program

During February 2012, Ironstone conducted a drilling program on its South Whitemud block (Figure 4). Over 1400 meters of drilling was completed over an 11-day period from February 11th to February 21st. Bad Heart core was recovered from 27 holes using an HQ size coring bit. The drilling was completed on a roughly 400 meter grid over two separate drilling blocks.

Ironstone contracted Radius Drilling (Prince George, BC) to conduct the drilling and coring of the ironstone. Radius supplied 2 diamond drill rigs that were skidded between locations by bulldozer.

Each core channel was marked to identify the intervals, including tops and bottoms, and the core boxes were marked with the hole ID. Core boxes were sealed and transported offsite for description and sampling between February 22nd and March 1st, 2012.

Core Sampling, Description, and Analysis

All core was brought to the core handling facility where it was halved. One half of the core was further quartered, and the other half was set out for core

Figure 4: Drill rig at South Whitemud River drill location

description and photographs (Figure 5). One quarter of the core was sampled for geochemical analysis in 0.5 meter intervals. The other quarter of the core was sampled for metallurgical tests in 1 meter intervals. Three samples were collected from each hole at roughly the top, middle, and base of the ironstone interval for bulk density analysis.

All geochemical and bulk density samples were packed in crates and sent to Inspectorate to be analyzed using lithium metaborate fusion analysis for whole-rock analysis, and wax bulk density analysis for bulk density. Geochemical standards were inserted at a rate of 1 standard per hole to check the labs accuracy.

Figure 5: Core cutting, description, and sampling

All core descriptions were completed in footage, and used a set list of descriptors. Core was tested for hardness using the Mohs scale of mineral hardness.

Results Obtained

Drilling Program

The goal of the 2012 drilling program was to define the quality and extent of the Clear Hills ironstone in the southeastern-most corner of the project. Prior to 2011, a total of 16 holes had been drilled targeting the ironstone south of the Rambling Creek block in the previously defined North Whitemud and South

Whitemud River blocks. Out of those 16 holes, only 12 intersected ironstone. From these holes, an historic resource was calculated by Hamilton of approximately 800 million tonnes.

A total of 27 of the 31 holes drilled in early 2012 on the South Whitemud block intersected ironstone. The ironstone in this area is close to the erosional edge of the deposit. Several of the holes drilled encountered ironstone that was extremely friable, and in some cases entirely unlithified (loose ooidal iron sands). Due to this, holes closest to the erosional edge had poor core returns.

Drilling logs and maps are attached in the appendix.

Core Sampling, Description, and Analysis

All core was described and sampled off site at a secure location near Clayhurst, BC. Core was logged by Ironstone exploration staff for all recovered intervals. A sample log is inserted below.

ironstone RESOURCES

Core Log

Drilling Rig Name-No. Radius Rig #1

Hole No.	1A	Hole ID	SW-01A
GPS Elevation		Collar	2569.19
Sounding Depth	149.0	Top Iron	2456.0
		Base Iron	2428.8

	Estimated	Actual			
Thickness Overburden	92.2	113.2	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone		54.1	ft	No. of Core Boxes	6.0
Est. Core Point	2486.8	2530.2	ft	Core Cut	110.0 ft
Thickness of Iron	19.7	27.2	ft	Fe Core Cut	27.2 ft
Thickness of Lower Zone		8.6	ft		
End of Hole		2420.2	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	39.0	49.0	10.0	4.0	4.0	Glacial Till
Core No. 2	49.0	59.0	10.0	5.0	0.0	Gravel/Boulders
Core No. 3	59.0	69.0	10.0	4.8	4.8	Shale
Core No. 4	69.0	79.0	10.0	4.7	4.7	Shale
Core No. 5	79.0	84.0	5.0	4.8	4.8	Shale
Core No. 6			0.0			Channel Not Used
Core No. 7	84.0	94.0	10.0	1.5	1.4	Shale
Core No. 8	94.0	104.0	10.0	0.9	0.9	Shale
Core No. 9	104.0	109.0	5.0	5.0	5.0	Shale (Iron stained)
Core No. 10	109.0	114.0	5.0	4.1	4.0	Shale -> IR
Core No. 11	114.0	119.0	5.0	4.7	4.7	IR
Core No. 12	119.0	124.0	5.0	4.2	3.5	IR
Core No. 13	124.0	129.0	5.0	4.8	4.4	IR
Core No. 14	129.0	134.0	5.0	2.0	0.9	IR -> broken up IR
Core No. 15	134.0	139.0	5.0	1.1	0.0	IR cobbles
Core No. 16	139.0	144.0	5.0	3.6	3.5	Shale
Core No. 17	144.0	149.0	5.0	5.0	5.0	Shale
		TOTAL	110.0	60.2	51.6	
			% Recovery	54.7%	46.9%	

Coring Comments: Shale directly overlying ironstone.
Gravel/Boulder seam at 49'-59' depth (separates glacial till from marine shales).

Figure 6: Core Log

Core was described by Ironstone geologists on-site. A standard set of descriptors was employed over all intervals recovered. A sample core description log follows.

ironstone RESOURCES

Core Description Log

Hole ID: SW-30 | Project: South Whitemud River | Date Logged: 2012/02/23 | Logged By: Liam Murphy

Collar: 799.02 | Total Depth: 758.8 | Core Size: HQ | Lat: 56.63 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
77.0	105.2	28.2	[SHALE] Medium grey, homogeneous and massive shale unit. No inclusions present. Very sharp lower contact with iron sediments. MOHS 1.5-3.					
105.2	121.3	16.1	[IRONSTONE] Rusty brown/green colored oolitic sandstone unit. Very rusted and oxidized in appearance. Clay content increases with depth. Some interbedded clay layers present. MOHS 2-4.	105.2	108.2	3.0	Very rusty and sandy unit with moderate amount of ooids. Decreasing clay content with depth. Some ooid clasts are visible. MOHS 2-3.	
				108.2	112.0	3.8	Densely oolitic ironstone. Very rusty and sandy. Less resistive and weathered. MOHS 3-4.	
				112.0	114.6	2.6	No recovery.	112.0' - 114.6' : LOST CORE
				114.6	117.0	2.4	Densely oolitic ironstone. Resistive. MOHS 4-5.	
				117.0	117.8	0.8	No recovery.	117.0' - 117.8' : LOST CORE
				117.8	118.0	0.2	Rounded ironstone pebbles. Largest ironstone pebble is roughly 6 cm in diameter (across).	
				118.0	120.5	2.5	Oolitic sandstone with increasing clay content with depth. Clay and sand interbedded with more resistive iron sand layers (beds ~ 2cm thick)	
				120.5	121.3	0.8	Bleached ironstone/sandstone unit. Increasing clay, shale and sand content with depth. Decreasing iron content with depth. Sharp underlying contact with hard shale cap.	
121.3	122.9	1.6	[SANDY SHALE] Dark grey to black sandy shale unit. Very resistive. Some minor ooids present. This unit appears similar to other "transition zones". Gradual increase in clay content with depth. Gradual contact with lower shale unit. MOHS 4.					
122.9	132.0	9.1	[SHALE] Homogeneous and massive shale unit with some minor sulfides (pyrite) present. No pebble inclusions visible.					

Figure 7: Core Description

Core was sampled in 0.5 meter composites for geochemical analysis, and 1 meter intervals for metallurgical work. On average, 3 bulk density samples were sampled per hole from the top, middle and bottom of the ironstone. In addition, 1 iron ore standard was inserted per hole for quality assurance, and approximately 1 duplicate sample was inserted per hole. A representative geochemistry sample log follows.

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No. 1A | Hole ID SW-01A | Collar 783.10

WRA Top Fe 34.5 | WRA Base Fe 42.8 | Thickness Fe 8.3

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
109.9	33.50	-	34.00	01				C
	34.00	-	34.50	02				C
	34.50	-	35.00	03				IR
	35.00	-	35.50	04				IR
	35.50	-	36.00	05		05B		IR
	36.00	-	36.50	06				IR
	36.50	-	37.00	07				IR
	37.00	-	37.50	08				IR
	37.50	-	38.00	09		09B		IR
	38.00	-	38.50	10				IR
	38.50	-	39.00	11				IR
	39.00	-	39.50	12				IR
	39.50	-	40.00	13		13B		IR
	40.00	-	40.50	14				LC
		-		15	GIOP-104			-
	40.50	-	41.00	16				IR
	41.00	-	41.50	17				LC
	41.50	-	42.00	18				LC
	42.00	-	42.50	19				IR/LC
	42.50	-	42.80	20				IR
	42.80	-	43.30	21				C
	43.30	-	43.80	22			22D	C

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 19 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

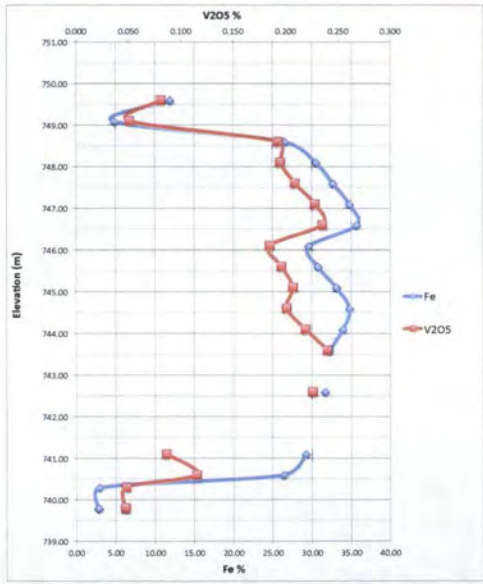
Figure 8: Geochemistry Sample Log

All geochemical and bulk density samples were sent to Inspectorate for analysis. Samples were shipped to Inspectorate at the beginning of June 2012, and all analyses were completed by mid-July 2012. Geochemical and bulk density data received from Inspectorate was organized by hole and is attached in the appendix. A sample of the geochemical and bulk density analyses follows.

Analyte Symbol	Al2O3	BaO	CaO	Cr2O3	Cu	Fe	K2O	MgO	Mn	Na2O	Ni	P	S	SiO2	TiO2	V2O5	Zn	Zr	Total	LOI	Depth	Depth	Elevation	Elevation
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	m	m	m	m
Detection Limit																					From	To	From	To
Analysis Method	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	Sample Top	ample Bottor	Sample Top	Sample Bottom
SW 01A 01	12.11	0.07	1.32	0.025	0.004	**11.97**	2.234	1.42	0.043	0.33	0.004	0.223	0.566	53.56	0.624	**0.081**	0.023	<0.01	93.38	8.77	33.50	34.00	749.60	749.10
SW 01A 02	14.94	0.09	0.91	0.018	0.003	**4.90**	2.891	1.46	0.008	0.45	0.003	0.067	0.534	62.71	0.837	**0.051**	0.012	<0.01	96.40	6.53	34.00	34.50	749.10	748.60
SW 01A 03	8.50	0.05	1.68	0.038	0.007	**26.64**	1.109	1.29	0.050	0.13	0.010	0.362	0.646	36.15	0.343	**0.193**	0.053	<0.01	88.18	10.94	34.50	35.00	748.60	748.10
SW 01A 04	7.04	0.04	2.07	0.037	0.008	**30.57**	0.896	1.41	0.122	0.12	0.010	0.535	0.491	29.94	0.285	**0.195**	0.059	<0.01	86.43	12.62	35.00	35.50	748.10	747.60
SW 01A 05	6.38	0.04	1.97	0.031	0.007	**32.74**	0.743	1.35	0.120	0.11	0.010	0.563	0.242	26.66	0.232	**0.209**	0.065	<0.01	84.62	13.17	35.50	36.00	747.60	747.10
SW 01A 06	6.25	0.04	1.70	0.032	0.009	**34.86**	0.652	1.31	0.096	0.10	0.013	0.563	0.187	25.86	0.213	**0.228**	0.063	<0.01	84.54	12.37	36.00	36.50	747.10	746.60
SW 01A 07	6.23	0.03	1.08	0.034	0.008	**35.75**	0.619	1.27	0.103	0.09	0.016	0.475	0.089	25.98	0.201	**0.235**	0.064	<0.01	84.34	12.07	36.50	37.00	746.60	746.10
SW 01A 08	7.41	0.05	0.97	0.027	0.007	**29.66**	0.930	1.22	0.065	0.10	0.014	0.425	0.161	35.02	0.319	**0.185**	0.050	<0.01	86.31	9.70	37.00	37.50	746.10	745.60
SW 01A 09	7.19	0.11	1.70	0.026	0.007	**30.83**	0.810	1.48	0.089	0.11	0.011	0.566	0.139	31.63	0.290	**0.196**	0.057	<0.01	86.17	10.93	37.50	38.00	745.60	745.10
SW 01A 10	6.86	0.03	1.77	0.028	0.008	**33.19**	0.703	1.56	0.067	0.10	0.013	0.508	0.337	28.89	0.257	**0.207**	0.061	<0.01	85.56	10.99	38.00	38.50	745.10	744.60
SW 01A 11	6.17	0.03	2.23	0.024	0.008	**34.86**	0.589	1.55	0.080	0.10	0.011	0.712	0.257	25.99	0.220	**0.201**	0.058	<0.01	84.30	11.22	38.50	39.00	744.60	744.10
SW 01A 12	5.73	0.02	2.59	0.027	0.007	**33.99**	0.466	1.85	0.096	0.10	0.013	0.709	0.173	25.95	0.178	**0.219**	0.064	<0.01	84.71	12.53	39.00	39.50	744.10	743.60
SW 01A 13	5.81	0.03	2.45	0.032	0.008	**32.29**	0.419	2.38	0.080	0.11	0.017	0.483	0.708	27.63	0.163	**0.240**	0.074	<0.01	86.07	13.16	39.50	40.00	743.60	743.10
SW 01A 14 Lost Core																					40.00	40.50	743.10	742.60
SW 01A 15 CRM	0.54	<0.01	2.19	0.004	0.009	29.94	0.039	2.50	0.077	0.02	0.003	0.106	0.235	53.01	0.004	<0.001	0.005	<0.01	87.60	0.00	-	-	-	-
SW 01A 16	5.47	0.04	3.34	0.029	0.007	**31.74**	0.397	2.16	0.108	0.11	0.014	0.762	0.187	26.19	0.153	**0.226**	0.059	<0.01	85.17	14.18	40.50	41.00	742.60	742.10
SW 01A 17 Lost Core																					41.00	41.50	742.10	741.60
SW 01A 18 Lost Core																					41.50	42.00	741.60	741.10
SW 01A 19	4.19	0.03	3.68	0.015	0.005	**29.29**	0.665	1.97	0.204	0.13	0.006	0.643	0.168	25.23	0.182	**0.086**	0.031	<0.01	85.68	19.16	42.00	42.50	741.10	740.60
SW 01A 20	5.55	0.04	4.15	0.021	0.006	**26.48**	0.808	2.04	0.181	0.17	0.009	0.775	0.200	27.94	0.231	**0.115**	0.048	<0.01	86.93	18.18	42.50	42.80	740.60	740.30
SW 01A 21	15.97	0.08	0.62	0.021	0.003	**3.01**	2.936	1.40	0.008	0.47	0.002	0.097	0.415	65.33	0.896	**0.048**	0.011	<0.01	97.40	6.09	42.80	43.30	740.30	739.80
SW 01A 22	15.65	0.08	0.49	0.018	0.002	**2.87**	2.900	1.35	0.007	0.47	0.001	0.068	0.454	66.27	0.891	**0.047**	0.011	<0.01	97.29	5.71	43.30	43.80	739.80	739.30
SW 01A 22D	15.73	0.08	0.55	0.021	0.003	2.95	2.910	1.34	0.008	0.47	0.003	0.070	0.514	66.39	0.886	0.047	0.013	<0.01	97.70	5.70	43.30	43.80	739.80	739.30
Averages (Fe >25%)																								

Analyte Symbol	Density	Depth	Depth	Elevation	Elevation
Unit Symbol	g/cm3	m	m	m	m
Detection Limit		From	To	From	To
Analysis Method	GRAV	Sample Top	ample Bottor	Sample Top	ample Bottom
SW 01A 05B	2.76	35.50	36.00	747.60	747.10
SW 01A 09B	2.01	37.50	38.00	745.60	745.10
SW 01A 13B	2.11	39.50	40.00	743.60	743.10

	Depth	Elevation
WRA Top Fe (m) =	34.50	748.60
WRA Base Fe (m) =	42.80	740.30
Thickness Fe (m) =	8.30	8.30
Grade Fe (%) =	31.64	31.64
Grade V2O5 (%) =	0.195	0.195



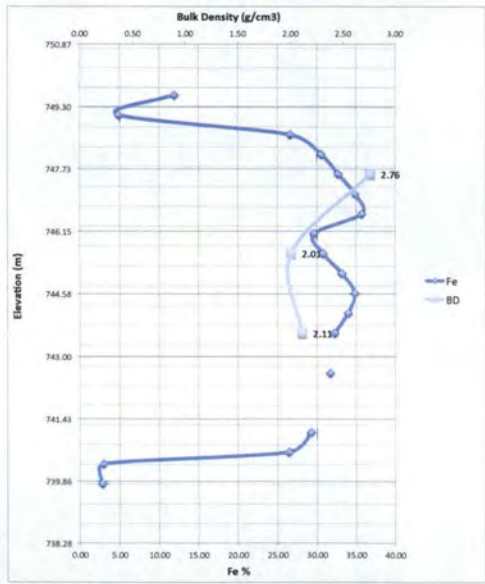


Figure 9: Geochemistry Results

Geology

Following geochemical analysis, Ironstone geologists updated geologic maps with the new data. The deposit extends from north of Rambling Creek, through the North Whitemud block, and down to the 2012 South Whitemud drilling area which indicates a very large under-explored area in between the previously drilled areas. Attached below is a map showing the various drilling areas over the project along with total iron isopach using a 20% Fe cut-off.

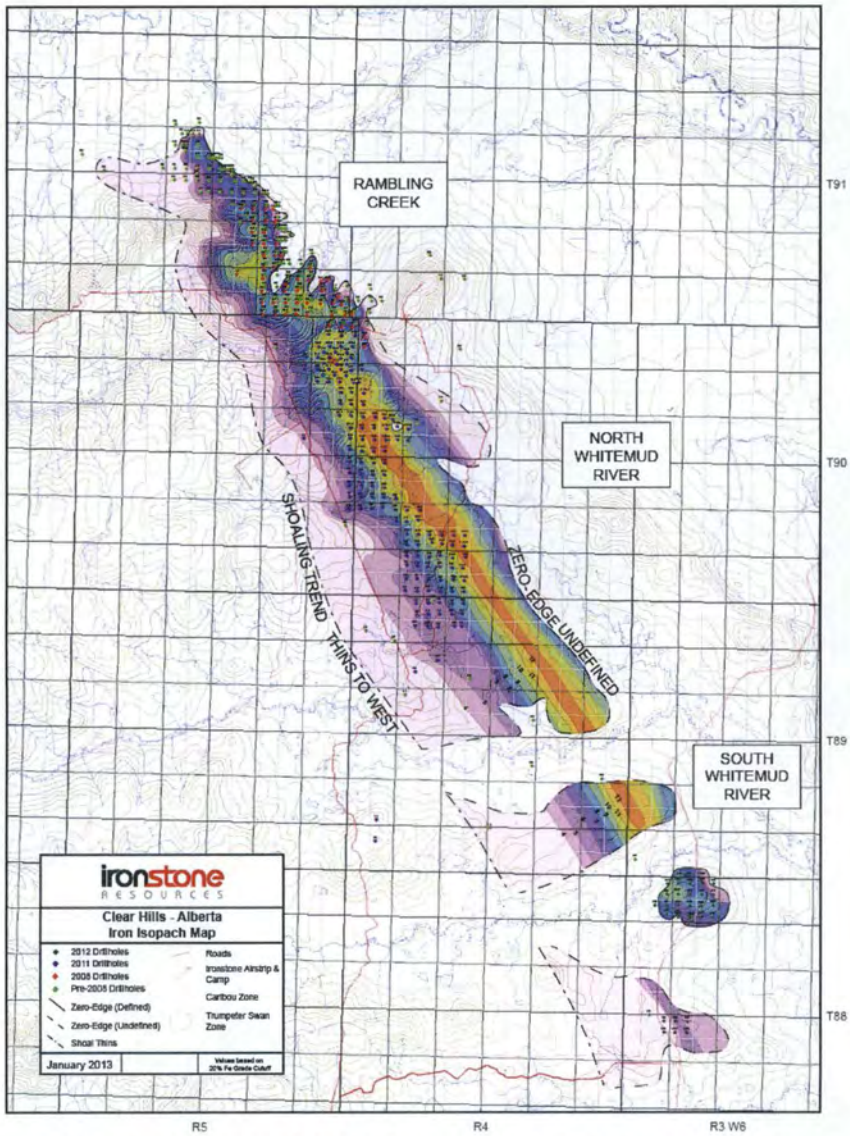


Figure 10: Isopach Map (Larger version in Appendix C)

Conclusion

The most significant work completed during this assessment period was the 2012 South Whitemud River drilling program. This program allowed for 31 holes to be drilled at the southeastern-most corner of the Clear Hills project. The identification of ironstone at this location has allowed the deposit to be mapped over 30 kilometers along its depositional trend. This may allow for a bulk sample pit to be permitted closer to a planned demonstration pilot plant outside Hines Creek, AB.

Geologically, the most striking difference between the ironstone recovered in the South Whitemud block compared to the North Whitemud block is the presence of extreme weathering. The geochemistry of the deposit varies slightly from the averages of the North Whitemud block. This could be due to a combination of differing sedimentology, differing grade, or alteration from weathering.

In the future, this portion of the Clear Hills deposit may be added to the compliant resource total as calculated by SRK however there are no immediate plans to do so.

Author

Andrew Reader, B.Sc., Geologist, Exploration and Development, of Ironstone Resources, is the author of this report.

Mr. Reader graduated from the University of Calgary in April 2011 with a Bachelor of Science degree in Geology. He has worked for Ironstone Resources since May 2010, and has been involved in the mapping, planning, and drilling of the Clear Hills iron deposit throughout this time. Mr. Reader completed his undergraduate thesis on the Clear Hills iron deposits in 2011. Mr. Reader is currently a member in training with the Association of Professional Engineers, and Geoscientists of Alberta (APEGA).

References

1. Bertram, E.F. and G.B. Mellon (1975) "Peace River Iron Deposits", Information Series 75, Alberta Research Council, Edmonton, Alberta, 30pp.

2. Gravenor, C.P. (1962) "Peace River Iron Deposits" in Samis, C.S. and J. Gregory "the Reduction of Clear Hills Iron Ore by the R N Process", Research Council of Alberta Information Series No. 40, Edmonton, Alberta, 35pp.

3. Edgar, N.S. (1962) "Iron Prospecting Permit No. 17", Unpublished, File No. 102510 (Economic Minerals Branch, Alberta Department of Mines and Minerals File Report No. FE-AF-017(01). 15pp, 1 Appendix.

4. Boyle, R.W. (1979) "The Geochemistry of Gold and its Deposits", Geological Survey of Canada Bulletin 280

5. Hamilton, W.N. (1980) "Clear Hills Iron Deposit Geology, Mineralogy and Ore Reserves", Geological Survey Department, Alberta Research Council Report 1982 13, Edmonton, Alberta 43pp.

6. Kidd, Donald J. (1959) "Iron Occurrences in die Peace River Region, Alberta", Preliminary Report 59 3, Research Council of Alberta, Geological Division, Edmonton, Alberta 38pp.

7. Petruk, W., I.B. Klymowsky and G.O. Hayslip (1977) "Mineralogical Characteristics and Beneficiation of an Oolitic Iron Ore from the Peace River District, Alberta", Canadian Mining and Metallurgical Bulletin, October, 1977 pp. 1 10.

8. Petruk, W., D.M. Farrell, E.E. Laufer, R.J. Tremblay and P.G. Manning (1977) "Nontronite and Ferruginous Opal from the Peace River Iron Deposit in Alberta, Canada. Canadian Mineralogist, Vol. 15, pp. 14 21.

9. Petruk, W. (1977) "Mineralogical Characteristics of an Oolitic Iron Deposit in the Peace River District, Alberta" Canadian Mineralogist Vol. 15, pp. 3 13.

10. Jones, Brian and Q.H. Goodbody (1984) "Biological Factors in the Formation of Quiet-Water Ooids", Bull. Canadian Petroleum Geol., Vol. 32:2, p. 190 200.

11. Mikhail, S.A., A.M. Turcotte, A.L. Putz, S. Kuyucak, M.T. Shehata, PJ.A. Prud'homme, and A. Demers (1996) "Preliminary Evaluation of Clear Hills Iron Ore", Mining and Mineral Sciences Laboratories, CANMET, Ottawa Report NIMSI, 96 41 (CR), 13 pp.

12. R.A. Olson, D.R. Eccles, C.J. Collom (1999), "A Study of Potential Co-Product Trace Elements Within the Clear Hills Iron Deposits, Northwestern Alberta", AGS Special Report 08.

13. R.A. Olson, J.A. Weiss and E.J. Alesi (2006), "Digital Compilation of Ooidal Ironstone and Coal Data, Clear Hills - Smoky River Region, Northwestern Alberta", EUB/AGS Geo-Note 2005-05

14. Caplan, B.R. (2008) "Clear Hills Project (NTS84D)" - Alberta Department of Energy: Mineral Assessment Report, Report Code: MIN20080020

15. Donaldson, S.W. (1997) "The Sedimentology, Stratigraphy and Diagenesis of the Upper Cretaceous Bad Heart Formation, NW Alberta. Ph.D Thesis, University of Western Ontario" 492p

16. Donaldson, S.W., Plint, A.G., Longstaffe, F.J. (1999) "Tectonic and eustatic control on deposition and preservation of Upper Cretaceous ooidal ironstone and associated facies: Peace River Arch area, NW Alberta, Canada", Sedimentology, 46: 1159-1182

17. Caplan, B.R. (2010) "Clear Hills Project" - Alberta Department of Energy: Mineral Assessment Report

18. Caplan, B.R. (2012) "Clear Hills Project" - Alberta Department of Energy: Mineral Assessment Report

ironstone RESOURCES

Suite 200, 6125 – 11th Street S.E.
Calgary, Alberta, Canada T2H2L6
T (403) 640-7977
F (403) 640-3646

ASSESSMENT WORK

PART "C"
TECHNICAL APPENDICES

METALLIC AND INDUSTRIAL MINERALS PERMIT NUMBERS

9312060404	9312060405	9312060406
9312060407		9312060410

CLEAR HILLS PROJECT

IRONSTONE RESOURCES LTD.

COVERING THE PERIOD

JANUARY 1, 2012 to JANUARY 1, 2013

SUBMITTED BY

ANDREW READER, B.Sc.
GEOLOGIST, EXPLORATION & DEVELOPMENT

JUNE 15, 2014

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Project Map

T91

2011 Bulk Sample Pit

IRL Airstrip and Drilling Camp

86.9 Mt Inferred Fe at 34.1%

556.5 Mt Indicated Fe at 33.3% and 2.45 billion lbs of Indicated V2O5 at 0.20%

T90

Iron Haul Road

Tower Road

Fire

Notikewin

Canfor Logging Road

T89

South Whitemud River Drilling Area (2012)

T88

ironstone RESOURCES

Clear Hills

- 2008 IRL Drilling Location
- 2011 IRL Drilling Location
- 2012 IRL Drilling Location
- SRK Classified Indicated Resource Block
- SRK Classified Inferred Resource Block

March 2012

3 km

R5 R4 R3W6

ironstone
RESOURCES

Assessment Permit Map

ironstone RESOURCES

Clear Hills, Alberta
Lands to be Included in this Assessment

Lands to be Assessed

Lands to be dropped

May 2014

Permit No.	Area	New Area
9312060404	2,048	2,048
9312060405	7,424	7,424
9312060406	6,908	6,908
9312060407	9,216	4,608
9312060410	9,216	4,608

9312060410

9312060407

9312060406

9312060405

9312060404

T92

T91

T90

T89

T88

T87

T86

R8 R7 R6 R5 R4 R3 R2W6

ironstone
RESOURCES

Clear Hills Iron Isopach Map

RAMBLING CREEK

NORTH WHITEMUD RIVER

SOUTH WHITEMUD RIVER

SHOALING TREND — THINS TO WEST

ZERO-EDGE UNDEFINED

T91

T90

T89

T88

R5

R4

R3 W6

ironstone RESOURCES

Clear Hills - Alberta
Iron Isopach Map

- 2012 Drillholes
- 2011 Drillholes
- 2008 Drillholes
- Pre-2008 Drillholes
- Zero-Edge (Defined)
- Zero-Edge (Undefined)
- Shoal Thins
- Roads
- Ironstone Airstrip & Camp
- Caribou Zone
- Trumpeter Swan Zone

January 2013

Values based on 20% Fe Grade Cutoff

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Borehole Coordinates

Project Area	Hole ID	Easting (NAD83)	Northing (NAD83)	Longitude	Latitude	Elevation
South Whitemud River	SW-01A	411238.23	6283005.80	-118.4489037	56.6827094	783.10
South Whitemud River	SW-02A	411569.66	6283003.20	-118.4434948	56.6827489	778.92
South Whitemud River	SW-03A	412040.90	6282985.57	-118.4357991	56.6826794	778.79
South Whitemud River	SW-04	410804.44	6282781.77	-118.4559045	56.6806147	785.44
South Whitemud River	SW-05	411202.54	6282788.66	-118.4494113	56.6807524	798.71
South Whitemud River	SW-06	411612.87	6282785.36	-118.4427149	56.6808006	796.02
South Whitemud River	SW-07	412018.93	6282790.19	-118.4360908	56.6809206	790.30
South Whitemud River	SW-08	412425.96	6282780.92	-118.4294463	56.6809138	785.40
South Whitemud River	SW-09	410795.43	6282404.52	-118.4559208	56.6772249	798.97
South Whitemud River	SW-10	411180.30	6282410.66	-118.4496437	56.6773534	806.07
South Whitemud River	SW-11	411602.67	6282393.46	-118.4427467	56.6772790	808.13
South Whitemud River	SW-12	412016.49	6282388.83	-118.4359935	56.6773155	803.74
South Whitemud River	SW-13	412414.77	6282390.75	-118.4294960	56.6774076	797.01
South Whitemud River	SW-14	410368.07	6282014.73	-118.4627575	56.6736425	782.15
South Whitemud River	SW-15	410762.32	6281993.37	-118.4563186	56.6735260	796.58
South Whitemud River	SW-16	411191.85	6282009.58	-118.4493169	56.6737535	808.24
South Whitemud River	SW-17	411590.33	6281991.43	-118.4428100	56.6736659	801.40
South Whitemud River	SW-18	411992.26	6281977.84	-118.4362483	56.6736197	800.04
South Whitemud River	SW-19	412412.14	6281993.37	-118.4294038	56.6738381	788.06
South Whitemud River	SW-20R	410796.84	6281688.71	-118.4556498	56.6707964	785.74
South Whitemud River	SW-21	411183.59	6281589.53	-118.4493068	56.6699793	779.55
South Whitemud River	SW-21R	411170.42	6281686.21	-118.4495550	56.6708451	785.90
South Whitemud River	SW-22	411583.64	6281605.81	-118.4427867	56.6702014	789.15
South Whitemud River	SW-23	411980.20	6281601.55	-118.4363165	56.6702380	782.14
South Whitemud River	SW-24	412389.20	6281581.93	-118.4296381	56.6701386	774.95
South Whitemud River	SW-25	410684.70	6277956.51	-118.4561863	56.6372558	794.11
South Whitemud River	SW-26	411094.53	6277952.17	-118.4495054	56.6372949	799.66
South Whitemud River	SW-27	411513.75	6277934.29	-118.4426668	56.6372137	802.61
South Whitemud River	SW-28	410684.26	6277578.03	-118.4560625	56.6338566	792.78
South Whitemud River	SW-29	411068.58	6277558.70	-118.4497928	56.6337562	790.66
South Whitemud River	SW-30	411490.72	6277548.54	-118.4429099	56.6337449	799.02

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Drilling Reports

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
1		SW-01	4	5	89	3	W6M

LAT	LONG	EAST	NORTH
56.68452320	-118.44906860	411232.40	6283207.89

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	772.34	McElhanney Land Surveys

SURVEYOR'S REMARKS

Only Pre-Survey completed as this survey was not drilled - No Post-Collar Survey Completed

DRILLING

DRILL RIG NAME & NUMBER: **N/A**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time

Weather Conditions | Temp | Total Drilling Time (Hrs): **0.0**

DRILLER'S REMARKS

THIS LOCATION WAS NOT DRILLED

Casing Set | Pulled | Sounding | Driller: **N/A** | **/ N/A**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		772.34	24.3	
Upper Shale				
Iron Core Point	751.0			
BH / Ironstone	748.0		6.0	
Lower Shale	742.0			
End of Hole	737.0		Total Drilled	772.3

Top Ironstone **Bottom Ironstone**

Coring Comments (Losses, etc.)
THIS LOCATION WAS NOT DRILLED

Est. 5-ft Cores: **9.0**

Fe Core Cut (m)

Fe Recovered (m)

Fe Core Rec'vd %

Est./Act Core Box: **3**

Sample Pail

Geology Notes:

Coal | Congl | LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **N/A** Date:

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
1A		SW-01A	13	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68270940	-118.44890370	411238.23	6283005.80

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	783.10	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/18	11:30 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/19	12:00 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild	-10.0	12.5

DRILLER'S REMARKS

Casing Set Pulled X Sounding **45.4** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		783.10	28.1	18.0
Upper Shale		765.1		16.5
Iron Core Point	758.0	771.2		
BH / Ironstone	755.0	748.6	6.0	8.3
Lower Shale	749.0	740.3		
End of Hole	744.0	737.7	Total Drilled	45.4

Top Ironstone 748.60 **Bottom Ironstone** 740.31

Coring Comments (Losses, etc.)
Shale directly overlying ironstone.
Gravel/Boulder seam at 49'-59' depth (separates glacial till from marine shales).

Est. 5-ft Cores: **9.0**

Fe Core Cut (m): **8.3**

Fe Recovered (m): **5.4**

Fe Core Rec'vd %: **64.7%**

Est./Act Core Box: **3** **6**

Sample Pail

Geology Notes: **Gravel/Boulder seam at 49'-59' depth (separates glacial till from marine shales)**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/24**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
2		SW-02	3	5	89	3	W6M

LAT	LONG	EAST	NORTH
56.68457350	-118.44234570	411644.32	6283204.79

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	768.31	McElhanney Land Surveys

SURVEYOR'S REMARKS

Only Pre-Survey completed as this survey was not drilled - No Post-Collar Survey Completed

DRILLING

DRILL RIG NAME & NUMBER: **N/A**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time

Weather Conditions | Temp | Total Drilling Time (Hrs): **0.0**

DRILLER'S REMARKS

THIS LOCATION WAS NOT DRILLED

Casing Set | Pulled | Sounding | Driller: **N/A** | **/ N/A**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		768.31	19.3	
Upper Shale				
Iron Core Point	752.0			
BH / Ironstone	749.0		7.0	
Lower Shale	742.0			
End of Hole	737.0		Total Drilled	768.3

Top Ironstone **Bottom Ironstone**

Coring Comments (Losses, etc.)
THIS LOCATION WAS NOT DRILLED

Est. 5-ft Cores: **10.0**

Fe Core Cut (m)

Fe Recovered (m)

Fe Core Rec'vd %

Est./Act Core Box: **3**

Sample Pail

Geology Notes:

Coal | Congl | LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **N/A** Date:

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
2A		SW-02A	14	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68274890	-118.44349480	411569.66	6283003.2

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	778.92	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/19	03:30 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/20	01:30 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild temp./light snow	-13.0	10.0

DRILLER'S REMARKS

Casing Set Pulled X Sounding **42.4** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		778.92	25.9	30.6
Upper Shale				
Iron Core Point	756.0	748.7		
BH / Ironstone	753.0	748.3	7.0	7.2
Lower Shale	746.0	741.0		
End of Hole	741.0	736.6	Total Drilled	42.4

Top Ironstone 748.29 **Bottom Ironstone** 741.05

Coring Comments (Losses, etc.)
No 'Upper Shale' encountered. Glacial till directly overlying ironstone unit.

Est. 5-ft Cores: **10.0**

Fe Core Cut (m): **7.2**

Fe Recovered (m): **4.3**

Fe Core Rec'vd %: **58.9%**

Est./Act Core Box: **3** **3**

Sample Pail

Geology Notes: **No 'Upper Shale' encountered. Glacial till directly overlying ironstone unit.**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
3		SW-03	2	5	89	3	W6M

LAT	LONG	EAST	NORTH
56.68445820	-118.43596040	412035.17	6283183.74

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	770.80	McElhanney Land Surveys

SURVEYOR'S REMARKS

Only Pre-Survey completed as this survey was not drilled - No Post-Collar Survey Completed

DRILLING

DRILL RIG NAME & NUMBER: **N/A**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time

Weather Conditions	Temp	Total Drilling Time (Hrs)
		0.0

DRILLER'S REMARKS

THIS LOCATION WAS NOT DRILLED

Casing Set	Pulled	Sounding	Driller:	
			N/A	/ N/A

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		770.80	20.8	
Upper Shale				
Iron Core Point	753.0			
BH / Ironstone	750.0		7.0	
Lower Shale	743.0			
End of Hole	738.0		Total Drilled	770.8

Top Ironstone	Bottom Ironstone

Coring Comments (Losses, etc.)
THIS LOCATION WAS NOT DRILLED

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
10.0				3	

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **N/A** Date:

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
3A		SW-03A	15	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68267940	-118.43579910	412040.90	6282985.57

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	778.79	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/20	03:30 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/20	01:00 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
snowy/mild temperature	-17.0	9.5

DRILLER'S REMARKS

Casing Set Pulled X Sounding 37.8 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		778.79	28.8	19.5
Upper Shale		759.3		8.6
Iron Core Point	753.0	760.8		
BH / Ironstone	750.0	750.7	7.0	5.1
Lower Shale	743.0	745.6		
End of Hole	738.0	741.0	Total Drilled	37.8

Top Ironstone 750.67 **Bottom Ironstone** 745.57

Coring Comments (Losses, etc.)
Shale directly overlying ironstone

Est. 5-ft Cores: **10.0**

Fe Core Cut (m): **5.1**

Fe Recovered (m): **3.2**

Fe Core Rec'vd %: **62.7%**

Est./Act Core Box: **3** **5**

Sample Pail

Geology Notes: **Congolmerate and boulders found in glacial till between 61'-64' depth (760.2m-759.3m elev. asl)**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/24**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
4		SW-04	16	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.68061470	-118.45590450	410804.44	6282781.77

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	785.44	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/17	11:30 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/18	05:10 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
cold	-20.0	5.7

DRILLER'S REMARKS

Very poor recoveries; many 5' tubes pulled with no recovery and others with <1 foot recov.

Casing Set Pulled X Sounding **40.8** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		785.44	22.5	40.8
Upper Shale				
Iron Core Point	765.9	765.9		
BH / Ironstone	762.9	744.6	6.0	0.0
Lower Shale	756.9	744.6		
End of Hole	751.9	744.6	Total Drilled	40.8

Top Ironstone	744.60	Bottom Ironstone	744.60

Coring Comments (Losses, etc.)
NO IRON RECOVERED
- ONLY GLACIAL TILL AND GRAVEL INTERSECTED

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
9.0	0.0	0.0	?	3	1

Geology Notes: **No iron interval recovered - glacial till recovered followed by thick interval of gravels/boulders**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/26**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
5		SW-05	13	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68075240	-118.44941130	411202.54	6282788.66

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	798.71	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/16	08:45 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/17	08:30 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild/cloudy	-20.0	11.8

DRILLER'S REMARKS

Casing Set Pulled X Sounding 55.5 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		798.71	35.8	31.1
Upper Shale		767.6		14.3
Iron Core Point	765.9	767.6		
BH / Ironstone	762.9	753.3	7.5	8.5
Lower Shale	755.4	744.8		
End of Hole	750.4	743.2	Total Drilled	55.5

Top Ironstone	753.29	Bottom Ironstone	744.84

Coring Comments (Losses, etc.)
Shale directly overlying ironstone.
Underlying shales hosting marine shells.

Est. 5-ft Cores	10.0
Fe Core Cut (m)	8.5
Fe Recovered (m)	5.6
Fe Core Rec'vd %	65.8%
Est./Act Core Box	3 6
Sample Pail	

Geology Notes: **Gravels at 57' depth (781.3m elev. asl)**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
6		SW-06	14	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68080060	-118.44271490	411612.87	6282785.36

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	796.02	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/17	02:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/17	06:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
very mild	-7.0	16.5

DRILLER'S REMARKS

Core point hit around noon (12PM)

Casing Set Pulled X Sounding **51.5** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		796.02	43.0	40.8
Upper Shale				
Iron Core Point	756.0	764.3		
BH / Ironstone	753.0	755.2	9.5	8.8
Lower Shale	743.5	746.3		
End of Hole	738.5	744.5	Total Drilled	51.5

Top Ironstone 755.18 **Bottom Ironstone** 746.34

Coring Comments (Losses, etc.)
- Conglomerate-like material around 50' depth as well

Est. 5-ft Cores: **11.0**

Fe Core Cut (m): **8.8**

Fe Recovered (m): **8.4**

Fe Core Rec'vd %: **95.2%**

Est./Act Core Box: **3** **5**

Sample Pail

Geology Notes: **Gravel interval found between 60'-70' depth (777.7-774.7m elev. asl)**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
7		SW-07	15	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68092060	-118.43609080	412018.93	6282790.19

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	790.30	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/16	03:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/16	10:15 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
cloudy/mildly cold	-10.0	7.3

DRILLER'S REMARKS

quick drilling

Casing Set Pulled X Sounding **46.9** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		790.30	30.0	29.0
Upper Shale				
Iron Core Point	763.3	764.1		
BH / Ironstone	760.3	761.3	7.0	7.2
Lower Shale	753.3	754.0		
End of Hole	748.3	743.4	Total Drilled	46.9

Top Ironstone	761.27	Bottom Ironstone	754.03

Coring Comments (Losses, etc.)
Shale and sandstone layers break up solid ironstone interval

Est. 5-ft Cores	10.0
Fe Core Cut (m)	7.2
Fe Recovered (m)	6.4
Fe Core Rec'vd %	88.4%
Est./Act Core Box	3 5
Sample Pail	

Geology Notes: **Shale and sandstone layers break up solid ironstone interval**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/26**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
8		SW-08	16	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.68091380	-118.42944630	412425.96	6282780.92

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	785.40	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/16	12:15 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/16	05:50 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter weather	-10.0	5.8

DRILLER'S REMARKS

NO IRON RECOVERED

Casing Set Pulled X Sounding **40.8** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		785.40	37.0	41.0
Upper Shale				
Iron Core Point	751.4	765.9		
BH / Ironstone	748.4	744.4	12.0	0.0
Lower Shale	736.4	744.4		
End of Hole	731.4	744.4	Total Drilled	41.0

Top Ironstone	744.43	Bottom Ironstone	744.43

Coring Comments (Losses, etc.)
NO IRON RECOVERED
- ONLY SHALE AND SANDSTONE INTERSECTED

Est. 5-ft Cores	13.0
Fe Core Cut (m)	0.0
Fe Recovered (m)	0.0
Fe Core Rec'vd %	?
Est./Act Core Box	4 5
Sample Pail	

Geology Notes: **NO IRON INTERVAL ENCOUNTERED - ALL SHALES AND SANDSTONES**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/03/01**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
9		SW-09	9	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.67722490	-118.45592080	410795.43	6282404.52

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	798.97	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/17	12:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/17	10:55 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
winter weather	-10.0	11.0

DRILLER'S REMARKS

Casing Set Pulled X Sounding 49.4 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		798.97	47.0	34.9
Upper Shale				
Iron Core Point	755.0	767.9		
BH / Ironstone	752.0	764.0	5.5	10.6
Lower Shale	746.5	753.5		
End of Hole	741.5	749.6	Total Drilled	49.4

Top Ironstone	764.04	Bottom Ironstone	753.46

Coring Comments (Losses, etc.)
157'-162' washed out, only 0.5' recovery of sandy shale
re-recovered extra 2' from 157'-162' and called EOH

Est. 5-ft Cores	9.0
Fe Core Cut (m)	10.6
Fe Recovered (m)	7.9
Fe Core Rec'vd %	74.9%
Est./Act Core Box	3 4
Sample Pail	

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/24**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
10		SW-10	12	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67735340	-118.44964370	411180.30	6282410.66

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	806.07	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/16	08:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/16	05:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
very mild winter weather	-7.0	9.5

DRILLER'S REMARKS

Core point hit around noon (12PM) 2012/02/16

Casing Set Pulled X Sounding **57.0** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		806.07	57.0	42.1
Upper Shale				
Iron Core Point	752.1	767.4		
BH / Ironstone	749.1	764.0	6.0	10.5
Lower Shale	743.1	753.5		
End of Hole	738.1	749.1	Total Drilled	57.0

Top Ironstone	764.01	Bottom Ironstone	753.46

Est. 5-ft Cores: **9.0**

Fe Core Cut (m): **10.5**

Fe Recovered (m): **6.6**

Fe Core Rec'vd %: **62.4%**

Est./Act Core Box: **3** **4**

Sample Pail

Coring Comments (Losses, etc.)

100' down at 10:36AM, 152' down at 15:18PM, Waiting for water at 12:30PM
- Iron interval split into two sections separated by a thin (2.2 m) shale unit
- 7.0 meter combined iron thickness' (>25% Fe) over a 9.2 meter interval - See handwritten highlighted notes above

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/24**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
11		SW-11	11	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67727900	-118.44274670	411602.67	6282393.46

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	808.13	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/15	03:30 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/16	04:25 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
winter weather	-15.0	13.0

DRILLER'S REMARKS

Drilling torquing up too high to continue past 187' depth - Ended hole in ironstone

Casing Set Pulled X Sounding **57.0** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		808.13	46.2	49.4
Upper Shale				
Iron Core Point	764.9	764.8		
BH / Ironstone	761.9	758.8	8.0	7.6
Lower Shale	753.9	751.1		
End of Hole	748.9	751.1	Total Drilled	57.0

Top Ironstone	758.75	Bottom Ironstone	751.13

Est. 5-ft Cores: **10.0**

Fe Core Cut (m): **7.6**

Fe Recovered (m): **5.3**

Fe Core Rec'vd %: **69.2%**

Est./Act Core Box: **3** **3**

Sample Pail

Coring Comments (Losses, etc.)
- **Drill torquing up and forced to call end of hole**
- **Ended hole in oolitic ironstone unit**
- **Incomplete ironstone interval recovered**

Geology Notes: **GRAVELS ENCOUNTERED AT 75' DEPTH**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
12		SW-12	10	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67731550	-118.43599350	412016.49	6282388.83

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	803.74	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/14	03:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/15	12:30 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
Clear, bright	-20.0	21.5

DRILLER'S REMARKS

11:41AM at 126' switch to core barrel; coring started at 129'

Casing Set Pulled X Sounding **65.2** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		803.74	44.4	47.2
Upper Shale				
Iron Core Point	762.3	765.3		
BH / Ironstone	759.3	756.5	10.0	8.1
Lower Shale	749.3	748.4		
End of Hole	744.3	738.5	Total Drilled	65.2

Top Ironstone	756.53	Bottom Ironstone	748.42

Coring Comments (Losses, etc.)

Gravels seen at ~70' depth with underlying sands (~5' thick gravel interval)

Est. 5-ft Cores	12.0
Fe Core Cut (m)	8.1
Fe Recovered (m)	6.3
Fe Core Rec'vd %	77.8%
Est./Act Core Box	4 6
Sample Pail	

Geology Notes: **Gravels overlying ironstone in shales**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/27**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
13		SW-13	9	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67740760	-118.42949600	412414.77	6282390.75

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	797.01	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/15	08:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/15	05:20 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter weather	-8.0	9.3

DRILLER'S REMARKS

Casing Set Pulled X Sounding **53.0** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		797.01	47.0	43.1
Upper Shale				
Iron Core Point	753.0	763.2		
BH / Ironstone	750.0	754.0	11.0	4.3
Lower Shale	739.0	749.7		
End of Hole	734.0	744.0	Total Drilled	53.0

Top Ironstone	753.96	Bottom Ironstone	749.70

Coring Comments (Losses, etc.)

Est. 5-ft Cores
12.0
Fe Core Cut (m)
4.3
Fe Recovered (m)
4.2
Fe Core Rec'vd %
97.8%
Est./Act Core Box
4 5
Sample Pail

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/26**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
14		SW-14	7	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.67364250	-118.46275750	410368.07	6282014.73

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	782.15	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/15	03:30 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/15	11:00 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter weather - no snow	-8.0	7.5

DRILLER'S REMARKS

NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES

Casing Set Pulled X Sounding **37.2** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		782.15	32.0	37.2
Upper Shale				
Iron Core Point	753.2	767.8		
BH / Ironstone	750.2	745.0	5.0	0.0
Lower Shale	745.2	745.0		
End of Hole	740.2	745.0	Total Drilled	37.2

Top Ironstone	744.96	Bottom Ironstone	744.96

Coring Comments (Losses, etc.)

NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
9.0	0.0	0.0	?	3 5	

Geology Notes: **NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/03/01**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
15		SW-15	8	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.67352600	-118.45631860	410762.32	6281993.37

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	796.58	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/14	12:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/15	12:45 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter night	-14.0	12.7

DRILLER'S REMARKS

Put core barrel on at 94' depth (767.9 m asl) but iron wasn't expected until ~113' depth

Casing Set Pulled X Sounding 44.8 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		796.58	36.7	32.6
Upper Shale				
Iron Core Point	762.9	764.0		
BH / Ironstone	759.9	764.0	5.5	8.2
Lower Shale	754.4	755.8		
End of Hole	749.4	751.8	Total Drilled	44.8

Top Ironstone	763.97	Bottom Ironstone	755.81

Coring Comments (Losses, etc.)
No overlying shales recovered - top of first run is ironstone

Est. 5-ft Cores: **9.0**

Fe Core Cut (m): **8.2**

Fe Recovered (m): **7.7**

Fe Core Rec'vd %: **94.4%**

Est./Act Core Box: **3** **3**

Sample Pail

Geology Notes: **No overlying shales recovered - top of first run is ironstone**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/27**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
16		SW-16	5	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67375350	-118.44931690	411191.85	6282009.58

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	808.24	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
2012/02/12	08:00 PM	2012/02/12	10:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/13	12:00 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
Clear	-5.0	14.0

DRILLER'S REMARKS

145' depth at 3:00AM Feb 13th - driller switched to core bit (started hitting something hard)

Casing Set Pulled X Sounding **57.0** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		808.24	57.0	45.9
Upper Shale				
Iron Core Point	754.2	763.4		
BH / Ironstone	751.2	762.3	5.8	7.1
Lower Shale	745.4	755.2		
End of Hole	740.4	751.2	Total Drilled	57.0

Top Ironstone	762.29	Bottom Ironstone	755.20

Coring Comments (Losses, etc.)
Driller noted: hit iron at end of 152'-157' run

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
9.0	7.1	6.5	92.0%	3	3

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/27**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
17		SW-17	6	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67366590	-118.44281000	411590.33	6281991.43

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	801.40	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/13	04:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/14	09:00 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter night	-10.0	17.0

DRILLER'S REMARKS

Driller remarked iron sands washed out (3') and 2' of shale between 177'-182' depth

Casing Set Pulled X Sounding 61.6 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		801.40	54.0	40.0
Upper Shale				
Iron Core Point	750.4	765.7		
BH / Ironstone	747.4	761.4	6.5	8.1
Lower Shale	740.9	753.3		
End of Hole	735.9	739.2	Total Drilled	62.2

Top Ironstone	761.39	Bottom Ironstone	753.30

Est. 5-ft Cores: 10.0

Fe Core Cut (m): 8.1

Fe Recovered (m): 7.0

Fe Core Rec'vd %: 86.3%

Est./Act Core Box: 3 6

Sample Pail

Coring Comments (Losses, etc.)
- **50' depth at 6:00PM Feb 13th 2012**
- **some gravels present in the shales**

Geology Notes:

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/29**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
18		SW-18	7	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67361970	-118.43624830	411992.26	6281977.84

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	800.04	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER	DRILLING SUPERINTENDENT
Radius Rig #1	Howard Harder

Move In Date	Move In Time	Spud Date	Spud Time
2012/02/10	05:00 PM	2012/02/11	10:00 AM
Move Out Date	**Move Out Time**	**End Drilling Date**	**End Drilling Time**
		2012/02/11	10:51 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
clear skies and cold	-20.0	12.9

DRILLER'S REMARKS

Hit something hard (bldr?) at 52' depth - drilled 3' in 0.5 hrs. Switched to core bit at 55' depth

Casing Set Pulled X Sounding 59.1 Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		800.04	24.7	42.1
Upper Shale				
Iron Core Point	778.3	777.5		
BH / Ironstone	775.3	758.0	7.0	8.8
Lower Shale	768.3	749.1		
End of Hole	763.3	740.9	Total Drilled	59.1

Top Ironstone	757.98	Bottom Ironstone	749.14

Coring Comments (Losses, etc.)

Est. 5-ft Cores	10.0
Fe Core Cut (m)	8.8
Fe Recovered (m)	8.5
Fe Core Rec'vd %	95.7%
Est./Act Core Box	3 7
Sample Pail	

Geology Notes: **gravel seam overlying clays at 84' depth. Some ooids at bottom of last run (184'-194' depth)**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/28**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
19		SW-19	8	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67383810	-118.42940380	412412.14	6281993.37

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	788.06	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER	DRILLING SUPERINTENDENT
Radius Rig #1	Howard Harder

Move In Date	Move In Time	Spud Date	Spud Time
2012/02/11		2012/02/12	08:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/12	05:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild	0.0	9.5

DRILLER'S REMARKS

Hit gravels between 84'-94' depth. Rig starting coring at 90' depth at 11:30AM 2012/02/12.

Casing Set Pulled X Sounding **45.4** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		788.06	22.0	29.7
Upper Shale				
Iron Core Point	769.1	762.5		
BH / Ironstone	766.1	758.4	10.0	9.0
Lower Shale	756.1	749.4		
End of Hole	751.1	742.6	Total Drilled	45.4

Top Ironstone	758.40	Bottom Ironstone	749.43

Coring Comments (Losses, etc.)
3' VOID between 114'-119' depth (only 1' recovered in this 5' Fe interval)

Est. 5-ft Cores	12.0
Fe Core Cut (m)	9.0
Fe Recovered (m)	4.3
Fe Core Rec'vd %	47.4%
Est./Act Core Box	4 4
Sample Pail	

Geology Notes: **Glacial Till with gravels overlying shale. Shale overlying sandy ironstones.**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/03/01**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
20		SW-20	1	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.67008430	-118.45607330	410769.21	6281610.00

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	783.87	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **N/A**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
Move Out Date	Move Out Time	End Drilling Date	End Drilling Time

Weather Conditions | Temp | Total Drilling Time (Hrs)

DRILLER'S REMARKS

THIS LOCATION WAS NOT DRILLED

Casing Set | Pulled | Sounding | Driller: **N/A** | **/ N/A**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		783.87	20.9	0.0
Upper Shale				
Iron Core Point	766.0	783.9		
BH / Ironstone	763.0	783.9	7.0	0.0
Lower Shale	756.0	783.9		
End of Hole	751.0	783.9	Total Drilled	

Top Ironstone	783.87	Bottom Ironstone	783.87

Coring Comments (Losses, etc.)
THIS LOCATION WAS NOT DRILLED

Est. 5-ft Cores: **10.0**

Fe Core Cut (m): **0.0**

Fe Recovered (m): **0.0**

Fe Core Rec'vd %: **?**

Est./Act Core Box: **3** **0**

Sample Pail

Geology Notes:

Coal | Congl | LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **N/A** Date:

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
20A		SW-20A	1	31	88	3	W6M

LAT	LONG	EAST	NORTH
56.67079640	-118.45564980	410796.84	6281688.71

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	785.74	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Cliff McCarthy**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/20	03:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/20	08:50 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild snowy winter day	-10.0	5.8

DRILLER'S REMARKS

Glacial boulders/till/gravels directly overlying ironstone unit

Casing Set Pulled X Sounding **33.2** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		785.74	15.0	22.3
Upper Shale				
Iron Core Point	773.7	773.9		
BH / Ironstone	770.7	763.4	6.0	8.2
Lower Shale	764.7	755.2		
End of Hole	759.7	752.5	Total Drilled	33.2

Top Ironstone	763.40	Bottom Ironstone	755.17

Est. 5-ft Cores: **9.0**

Fe Core Cut (m): **8.2**

Fe Recovered (m): **7.7**

Fe Core Rec'vd %: **93.7%**

Est./Act Core Box: **3** **5**

Sample Pail

Coring Comments (Losses, etc.)
99'-104' = Iron sands at top with shale
Glacial boulders/till/gravels directly overlying ironstone unit
Poor recoveries in glacial till

Geology Notes: **Glacial till and gravels directly overlying ironstone unit**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/22**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
21		SW-21	4	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.66997930	-118.44930680	411183.59	6281589.53

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	779.55	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/12	10:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/12	05:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter weather	-10.0	7.5

DRILLER'S REMARKS

NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES

Casing Set Pulled X Sounding 46.3 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		779.55	34.0	46.3
Upper Shale				
Iron Core Point	748.6	747.7		
BH / Ironstone	745.6	733.2	5.5	0.0
Lower Shale	740.1	733.2		
End of Hole	735.1	733.2	Total Drilled	46.3

Top Ironstone	733.22	Bottom Ironstone	733.22

Est. 5-ft Cores: 9.0

Fe Core Cut (m): 0.0

Fe Recovered (m): 0.0

Fe Core Rec'vd %: ?

Est./Act Core Box: 3 4

Sample Pail

Coring Comments (Losses, etc.)

NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES
No recovery 57'-102' depth, boulders at 102'-105' depth, Black surface returns at 102'-107' depth, 107'-127' = 15' shale recovered

Geology Notes: **NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
21R	X	SW-21R	4	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67084510	-118.44955500	411170.42	6281686.21

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	785.90	McElhanney Land Surveys

SURVEYOR'S REMARKS

First surveyed by Ironstone personnel with handheld garmin - final collar surveyed in after

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/18	09:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/18	07:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter weather	-5.0	10.5

DRILLER'S REMARKS

Went from area of zero recovery (sands?) at SW-21 to area of DOI at SW-21R (only 60m away)

Casing Set Pulled X Sounding 35.7 Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		785.90	19.0	24.4
Upper Shale				
Iron Core Point	769.9	766.1		
BH / Ironstone	766.9	761.5	5.0	7.5
Lower Shale	761.9	754.1		
End of Hole	756.9	750.2	Total Drilled	35.7

Top Ironstone 761.55 **Bottom Ironstone** 754.08

Coring Comments (Losses, etc.)
- Significantly different results from SW-21 from merely 60 meters away
- Glacial till directly overlying ironstone unit

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
9.0	7.5	7.2	95.9%	3 4	

Geology Notes: **Glacial till directly overlying ironstone unit**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/25**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
22		SW-22	3	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67020140	-118.44278670	411583.64	6281605.81

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	789.15	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
2012/02/10	02:00 PM	2012/02/11	01:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/12	12:24 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild/cold winter weather with clear sky	-22.0	11.4

DRILLER'S REMARKS

Gravel at 70' depth with underlying sands - poor recoveries in this hole

Casing Set Pulled X Sounding 38.7 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		789.15	13.9	27.0
Upper Shale				
Iron Core Point	778.3	780.9		
BH / Ironstone	775.3	762.1	5.5	8.5
Lower Shale	769.8	753.6		
End of Hole	764.8	750.4	Total Drilled	38.7

Top Ironstone	762.14	Bottom Ironstone	753.64

Coring Comments (Losses, etc.)

IR intervals split by shale horizon (27.9' from top of IR to bottom but actually only 22.4' thick)
- Iron interval split into two sections separated by a thin (1.7 m) shale unit
- 6.8 meter combined iron thickness' over an 8.5 meter interval - See handwritten highlighted notes above
- Went through light gravels above 22' depth (but not much). Hit another gravel bed at 37' depth and again at 70' depth.

Est. 5-ft Cores	
9.0	
Fe Core Cut (m)	
8.5	
Fe Recovered (m)	
4.7	
Fe Core Rec'vd %	
54.8%	
Est./Act Core Box	
3	6
Sample Pail	

Geology Notes: **Glacial till encountered 11' above ironstone (separated by shale horizon)**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/29**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
23		SW-23	2	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67023800	-118.43631650	411980.20	6281601.55

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	782.14	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER	DRILLING SUPERINTENDENT
Radius Rig #1	Howard Harder

Move In Date	Move In Time	Spud Date	Spud Time
2012/02/12	11:00 PM	2012/02/12	11:45 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/13	07:00 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
cold night with small snowfall	-20.0	7.3

DRILLER'S REMARKS

ROD MISCOUNT - END OF HOLE = 154' (ORIGINAL EOH=184') DEPTHS DECREASED BY 30'

Casing Set Pulled X Sounding 46.9 Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		782.14	32.0	25.8
Upper Shale				
Iron Core Point	753.1	762.8		
BH / Ironstone	750.1	756.4	6.5	7.5
Lower Shale	743.6	748.9		
End of Hole	738.6	735.2	Total Drilled	46.9

Top Ironstone	756.38	Bottom Ironstone	748.92

Est. 5-ft Cores	10.0
Fe Core Cut (m)	7.5
Fe Recovered (m)	4.2
Fe Core Rec'vd %	56.5%
Est./Act Core Box	3 5
Sample Pail	

Coring Comments (Losses, etc.)

*** RODS MISCOUNT - END OF HOLE = 154' - DEPTHS DECREASED BY 30' ***
- Hit gravels at 35' depth - switched to core bit (hit something hard)
- Terrible recoveries in this hole (~50%) possibly due to the sandy and loosely consolidated nature of the ironstone

Geology Notes: **Glacial till above 10' of shales overlying ironstone**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/28**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
24		SW-24	1	32	88	3	W6M

LAT	LONG	EAST	NORTH
56.67013860	-118.42963810	412389.20	6281581.93

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	774.95	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #1**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/13	08:45 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/13	11:35 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
Mild winter weather overnight	-10.0	14.9

DRILLER'S REMARKS

Very poor recoveries - 15' interval in 5' tube in iron sands. VOID (?) hit between 73'-78' depth.

Casing Set Pulled X Sounding **39.0** Driller: **Billy Bartlett / Chris Junkins**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		774.95	27.0	19.7
Upper Shale				
Iron Core Point	751.0	767.3		
BH / Ironstone	748.0	755.3	8.5	8.0
Lower Shale	739.5	747.3		
End of Hole	734.5	735.9	Total Drilled	39.0

Top Ironstone	755.29	Bottom Ironstone	747.33

Coring Comments (Losses, etc.)

Drillers mentioned that a "void" was hit between 73'-78' depth (within iron sands interval). The drills rods and core barrel just drifted down with zero torque and pressure being applied. No core was recovered over this interval.

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
11.0	8.0	2.7	34.5%	3 5	

Geology Notes: **Glacial till directly overlying iron sands**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/03/01**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
25		SW-25	16	18	88	3	W6M

LAT	LONG	EAST	NORTH
56.63725580	-118.45618630	410684.70	6277956.51

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	794.11	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/18	11:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/19	07:05 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
cold winter night	-20.0	8.1

DRILLER'S REMARKS

Switched to core bit at 2AM (Feb 18) at 62' depth; Had to trip out at 4:30AM (Feb 19) at 77' depth because bit got clogged and needed unplugging

Casing Set Pulled X Sounding **31.1** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		794.11	21.1	24.9
Upper Shale				
Iron Core Point	776.0	776.7		
BH / Ironstone	773.0	769.2	6.0	1.8
Lower Shale	767.0	767.4		
End of Hole	762.0	763.0	Total Drilled	31.1

Top Ironstone	769.19	Bottom Ironstone	767.44

Coring Comments (Losses, etc.)
Glacial till directly overlying ironstone unit

Est. 5-ft Cores	
9.0	
Fe Core Cut (m)	
1.8	
Fe Recovered (m)	
1.2	
Fe Core Rec'vd %	
67.8%	
Est./Act Core Box	
3	3
Sample Pail	

Geology Notes: **Glacial till directly overlying ironstone unit**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/23**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
26		SW-26	13	17	88	3	W6M

LAT	LONG	EAST	NORTH
56.63729490	-118.44950540	411094.53	6277952.17

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	799.66	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/18	02:30 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/18	07:12 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
Mild February day weather	-6.5	4.7

DRILLER'S REMARKS

Casing Set Pulled X Sounding 38.7 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		799.66	27.8	30.3
Upper Shale				
Iron Core Point	774.9	774.7		
BH / Ironstone	771.9	769.3	6.5	5.3
Lower Shale	765.4	764.1		
End of Hole	760.4	760.9	Total Drilled	38.7

Top Ironstone 769.33 **Bottom Ironstone** 764.07

Coring Comments (Losses, etc.)
- 92' depth at 5:50PM 18 Feb 2012
- Shale contacting both boundaries of ironstone

Est. 5-ft Cores: **10.0**

Fe Core Cut (m): **5.3**

Fe Recovered (m): **4.8**

Fe Core Rec'vd %: **91.6%**

Est./Act Core Box: **3** **3**

Sample Pail

Geology Notes: **Small chunks of gravel/boulders situated on top of shales**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Quinn Brown** Date: **2012/02/23**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
27		SW-27	14	17	88	3	W6M

LAT	LONG	EAST	NORTH
56.63721370	-118.44266680	411513.75	6277934.29

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	802.61	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/18	01:30 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/18	12:30 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
very cold and clear winter night	-21.0	11.0

DRILLER'S REMARKS

Hit iron at 125' depth at 10:45AM Feb 18th 2012

Casing Set Pulled X Sounding **43.3** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		802.61	38.9	35.7
Upper Shale				
Iron Core Point	766.7	766.9		
BH / Ironstone	763.7	766.9	7.5	4.6
Lower Shale	756.2	762.4		
End of Hole	751.2	759.3	Total Drilled	43.3

Top Ironstone	766.95	Bottom Ironstone	762.38

Coring Comments (Losses, etc.)
- **Sandy iron from 117' downwards**
- **More solid ironstone from 122' downwards**
- **Shales recovered beneath ironstone unit**

Est. 5-ft Cores	10.0
Fe Core Cut (m)	4.6
Fe Recovered (m)	4.0
Fe Core Rec'vd %	88.0%
Est./Act Core Box	3 2
Sample Pail	

Geology Notes: **No shales recovered above ironstone unit. Shaley moderately oolitic ironstone encountered in first 5' run.**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/24**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
28		SW-28	9	18	88	3	W6M

LAT	LONG	EAST	NORTH
56.63385660	-118.45606250	410684.26	6277578.03

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	792.78	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER	DRILLING SUPERINTENDENT
Radius Rig #1	Howard Harder

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/21	12:30 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/21	05:15 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
Snowy night	-16.0	4.8

DRILLER'S REMARKS

Switched to core bit at 2:30AM Feb 21st 2012.

Casing Set Pulled X Sounding 30.2 Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		792.78	6.0	22.4
Upper Shale				
Iron Core Point	789.8	774.8		
BH / Ironstone	786.8	770.4	6.0	4.3
Lower Shale	780.8	766.1		
End of Hole	775.8	762.6	Total Drilled	30.2

Top Ironstone	770.41	Bottom Ironstone	766.11

Coring Comments (Losses, etc.)
- **Glacial till directly overlying ironstone (erosional contact)**
- **FINAL HOLE DRILLED IN SOUTH WHITEMUD DRILLING PROGRAM**

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
9.0	4.3	2.4	56.0%	3 3	

Geology Notes: **Gravels in glacial till directly overlying ironstone**

Coal Congl X LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/23**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
29		SW-29	12	17	88	3	W6M

LAT	LONG	EAST	NORTH
56.63375620	-118.44979280	411068.58	6277558.70

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	790.66	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/19	09:00 PM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/20	02:00 AM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mildly cold and snowy February night	-15.0	5.0

DRILLER'S REMARKS

23:15 Feb 19th 2012 drill was coring at 67' depth.

Casing Set Pulled X Sounding **31.1** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		790.66	11.0	20.9
Upper Shale				
Iron Core Point	782.7	773.3		
BH / Ironstone	779.7	769.8	6.5	5.5
Lower Shale	773.2	764.3		
End of Hole	768.2	759.6	Total Drilled	31.1

Top Ironstone	769.78	Bottom Ironstone	764.29

Coring Comments (Losses, etc.)

- Poor recoveries in the iron.
- LAST HOLE DRILLED BY RADIUS RIG #2
- Radius Rig #2 finished hole and packed up to be transported away from site, leaving Radius Rig #1 to finish up the remainder of the holes (SW-28 and SW-20A).

Est. 5-ft Cores	
10.0	
Fe Core Cut (m)	
5.5	
Fe Recovered (m)	
3.2	
Fe Core Rec'vd %	
58.3%	
Est./Act Core Box	
3	3
Sample Pail	

Geology Notes: **Shales contacting both sides of ironstone unit**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Andrew Reader** Date: **2012/02/23**

ironstone RESOURCES

Drilling Report

Program Name: **2012 Clear Hills Drilling Program** Project Area: **South Whitemud River**

LOCATION

Hole No.	Re-Drill	Hole ID	LSD	SEC	TWP	RNG	MER
30		SW-30	11	17	88	3	W6M

LAT	LONG	EAST	NORTH
56.63374490	-118.44290990	411490.72	6277548.54

Map Elevation (m)	Collar Elevation (m)	SURVEY BY
	799.02	McElhanney Land Surveys

SURVEYOR'S REMARKS

DRILLING

DRILL RIG NAME & NUMBER: **Radius Rig #2**

DRILLING SUPERINTENDENT: **Howard Harder**

Move In Date	Move In Time	Spud Date	Spud Time
		2012/02/19	10:00 AM

Move Out Date	Move Out Time	End Drilling Date	End Drilling Time
		2012/02/19	05:45 PM

Weather Conditions	Temp	Total Drilling Time (Hrs)
mild winter day with trace amounts of snow	-7.0	7.8

DRILLER'S REMARKS

70' deep about to core at 2:45PM Feb 19th 2012

Casing Set Pulled X Sounding **40.2** Driller: **Cliff McCarthy / Cliff Walker**

GEOLOGY

	Est. Top	Act. Top	Est. Thick	Act. Thick
Overburden		799.02	27.0	32.1
Upper Shale				
Iron Core Point	775.0	775.6		
BH / Ironstone	772.0	767.0	7.5	4.9
Lower Shale	764.5	762.0		
End of Hole	759.5	758.8	Total Drilled	40.2

Top Ironstone	766.95	Bottom Ironstone	762.05

Coring Comments (Losses, etc.)
Shales contacting both top and bottom of iron unit

Est. 5-ft Cores	Fe Core Cut (m)	Fe Recovered (m)	Fe Core Rec'vd %	Est./Act Core Box	Sample Pail
10.0	4.9	3.9	78.9%	3 4	

Geology Notes: **No glacial till present**

Coal Congl LithLog Name:

Tech Name: **Dennis Simoneau** Geol Name: **Liam Murphy** Date: **2012/02/23**

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Core Logs

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	1A	Hole ID	SW-01A
GPS Elevation		Collar	2569.19
Sounding Depth	149.0	Top Iron	2456.0
		Base Iron	2428.8

	Estimated	Actual			
Thickness Overburden	92.2	113.2	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone		54.1	ft	No. of Core Boxes	6.0
Est. Core Point	2486.8	2530.2	ft	Core Cut	110.0 ft
Thickness of Iron	19.7	27.2	ft	Fe Core Cut	27.2 ft
Thickness of Lower Zone		8.6	ft		
End of Hole		2420.2	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	39.0	49.0	10.0	4.0	4.0	Glacial Till
Core No. 2	49.0	59.0	10.0	5.0	0.0	Gravel/Boulders
Core No. 3	59.0	69.0	10.0	4.8	4.8	Shale
Core No. 4	69.0	79.0	10.0	4.7	4.7	Shale
Core No. 5	79.0	84.0	5.0	4.8	4.8	Shale
Core No. 6			0.0			Channel Not Used
Core No. 7	84.0	94.0	10.0	1.5	1.4	Shale
Core No. 8	94.0	104.0	10.0	0.9	0.9	Shale
Core No. 9	104.0	109.0	5.0	5.0	5.0	Shale (Iron stained)
Core No. 10	109.0	114.0	5.0	4.1	4.0	Shale -> IR
Core No. 11	114.0	119.0	5.0	4.7	4.7	IR
Core No. 12	119.0	124.0	5.0	4.2	3.5	IR
Core No. 13	124.0	129.0	5.0	4.8	4.4	IR
Core No. 14	129.0	134.0	5.0	2.0	0.9	IR -> broken up IR
Core No. 15	134.0	139.0	5.0	1.1	0.0	IR cobbles
Core No. 16	139.0	144.0	5.0	3.6	3.5	Shale
Core No. 17	144.0	149.0	5.0	5.0	5.0	Shale
		TOTAL	110.0	60.2	51.6	
			% Recovery	54.7%	46.9%	

Coring Comments

Shale directly overlying ironstone.
Gravel/Boulder seam at 49'-59' depth (separates glacial till from marine shales).

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	2A	Hole ID	SW-02A
GPS Elevation		Collar	2555.48
Sounding Depth	139.0	Top Iron	2455.0
		Base Iron	2431.2

	Estimated	Actual			
Thickness Overburden	85.0	100.5	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2480.4	2456.5	ft	Core Cut	40.0 ft
Thickness of Iron	23.0	23.8	ft	Fe Core Cut	23.8 ft
Thickness of Lower Zone		14.8	ft		
End of Hole		2416.5	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	99.0	104.0	5.0	3.5	3.5	Glacial till -> IR
Core No. 2	104.0	109.0	5.0	4.6	4.6	IR
Core No. 3	109.0	114.0	5.0	3.3	3.3	LC & IR
Core No. 4	114.0	124.0	10.0	1.5	0.0	LC & Rubbly IR
Core No. 5	124.0	129.0	5.0	5.0	5.0	Shale
Core No. 6	129.0	134.0	5.0	4.6	4.6	Shale
Core No. 7	134.0	139.0	5.0	3.5	3.5	LC & Shale
Core No. 8						
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	40.0	26.0	24.5	
			% Recovery	65.0%	61.3%	

Coring Comments: No 'Upper Shale' encountered. Glacial till directly overlying ironstone unit.

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	3A	Hole ID	SW-03A
GPS Elevation		Collar	2555.05
Sounding Depth	124.0	Top Iron	2462.8
		Base Iron	2446.1

	Estimated	Actual			
Thickness Overburden	94.5	92.3	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone		28.2	ft	No. of Core Boxes	5.0
Est. Core Point	2470.4	2496.1	ft	Core Cut	65.0 ft
Thickness of Iron	23.0	16.8	ft	Fe Core Cut	16.8 ft
Thickness of Lower Zone		15.0	ft		
End of Hole		2431.1	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	59.0	64.0	5.0	3.5	3.5	Glacial till
Core No. 2	64.0	69.0	5.0	2.8	2.8	Shale
Core No. 3	69.0	74.0	5.0	5.0	5.0	Shale
Core No. 4	74.0	79.0	5.0	4.0	4.0	Shale
Core No. 5	79.0	84.0	5.0	3.2	3.2	Shale
Core No. 6	84.0	89.0	5.0	4.0	4.0	Shale
Core No. 7	89.0	94.0	5.0	4.4	4.4	Shale -> IR
Core No. 8	94.0	99.0	5.0	2.3	2.2	IR
Core No. 9	99.0	104.0	5.0	5.0	5.0	IR
Core No. 10	104.0	109.0	5.0	1.8	1.5	Shale -> Ooidal s.s.
Core No. 11	109.0	114.0	5.0	3.4	3.4	Shale and s.s.
Core No. 12	114.0	119.0	5.0	2.8	2.1	Shale
Core No. 13	119.0	124.0	5.0	3.0	2.0	Shale and s.s.
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	65.0	45.1	43.1	
			% Recovery	69.3%	66.2%	

Coring Comments: Shale directly overlying ironstone

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	4	Hole ID	SW-04
GPS Elevation		Collar	2576.87
Sounding Depth	134.0	Top Iron	2442.9
		Base Iron	2442.9

	Estimated	Actual			
Thickness Overburden	73.8	134.0	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	1.0
Est. Core Point	2512.9	2512.9	ft	Core Cut	70.0 ft
Thickness of Iron	19.7	0.0	ft	Fe Core Cut	0.0 ft
Thickness of Lower Zone		0.0	ft		
End of Hole		2442.9	ft		

Overburden Notes: Core No. 3 : 50' interval with less than 1' recovered. Extremely poor recoveries.

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	64.0	74.0	10.0	0.8	0.8	Glacial till w/ gravel
Core No. 2	74.0	84.0	10.0	1.3	1.0	Clay
Core No. 3	84.0	134.0	50.0	0.8	0.0	Gravels/Boulders
Core No. 4						
Core No. 5						
Core No. 6						
Core No. 7						
Core No. 8						
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	70.0	2.9	1.8	
			% Recovery	4.1%	2.6%	

Coring Comments:
NO IRON RECOVERED
- ONLY GLACIAL TILL AND GRAVEL INTERSECTED

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	5	Hole ID	SW-05
GPS Elevation		Collar	2620.41
Sounding Depth	182.0	Top Iron	2471.4
		Base Iron	2443.7

	Estimated	Actual			
Thickness Overburden	117.5	149.0	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone		46.9	ft	No. of Core Boxes	6.0
Est. Core Point	2512.8	2518.4	ft	Core Cut	80.0 ft
Thickness of Iron	24.6	27.8	ft	Fe Core Cut	27.8 ft
Thickness of Lower Zone		5.3	ft		
End of Hole		2438.4	ft		

Overburden Notes Gravels at 57' depth (781.3m elev. asl)

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	102.0	107.0	5.0	5.0	5.0	Shale
Core No. 2	107.0	112.0	5.0	5.0	5.0	Shale
Core No. 3	112.0	117.0	5.0	5.0	5.0	Shale
Core No. 4	117.0	122.0	5.0	5.0	5.0	Shale
Core No. 5	122.0	127.0	5.0	5.0	5.0	Shale
Core No. 6	127.0	132.0	5.0	5.0	5.0	Shale
Core No. 7	132.0	137.0	5.0	5.0	5.0	Shale
Core No. 8	137.0	142.0	5.0	5.0	5.0	Shale
Core No. 9	142.0	147.0	5.0	5.0	5.0	Shale
Core No. 10	147.0	152.0	5.0	3.8	3.8	Shale -> IR
Core No. 11	152.0	157.0	5.0	3.1	3.1	IR
Core No. 12	157.0	162.0	5.0	2.5	2.5	IR
Core No. 13	162.0	167.0	5.0	3.2	3.0	IR
Core No. 14	167.0	172.0	5.0	3.5	1.5	IR
Core No. 15	172.0	177.0	5.0	2.3	1.5	IR
Core No. 16	177.0	182.0	5.0	5.0	5.0	Shale
Core No. 17						
		TOTAL	80.0	68.3	65.4	
			% Recovery	85.4%	81.7%	

Coring Comments Shale directly overlying ironstone.
Underlying shales hosting marine shells.

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	6	Hole ID	SW-06
GPS Elevation		Collar	2611.58
Sounding Depth	169.0	Top Iron	2477.6
		Base Iron	2448.6

	Estimated	Actual			
Thickness Overburden	141.1	134.0	ft	Est. 5ft Sleeves	11.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2480.4	2507.6	ft	Core Cut	65.0 ft
Thickness of Iron	31.2	29.0	ft	Fe Core Cut	29.0 ft
Thickness of Lower Zone		6.0	ft		
End of Hole		2442.6	ft		

Overburden Notes: Gravel interval found between 60'-70' depth (777.7-774.7m elev. asl)

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	104.0	109.0	5.0	1.1	1.1	Shale
Core No. 2	109.0	114.0	5.0	0.6	0.6	Shale
Core No. 3	114.0	119.0	5.0	0.7	0.4	Gravel and Shale
Core No. 4	119.0	124.0	5.0	5.0	5.0	Shale
Core No. 5	124.0	129.0	5.0	4.8	4.8	Shale
Core No. 6	129.0	134.0	5.0	5.0	5.0	Shale
Core No. 7	134.0	139.0	5.0	5.0	4.8	IR (sandy)
Core No. 8	139.0	144.0	5.0	4.9	4.9	IR
Core No. 9	144.0	149.0	5.0	4.9	4.5	IR
Core No. 10	149.0	154.0	5.0	4.8	4.7	IR
Core No. 11	154.0	159.0	5.0	5.0	4.6	IR
Core No. 12	159.0	164.0	5.0	4.0	3.4	IR->Tran->Shale
Core No. 13	164.0	169.0	5.0	5.0	5.0	Shale
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	65.0	50.8	48.8	
			% Recovery	78.2%	75.1%	

Coring Comments: - Conglomerate-like material around 50' depth as well

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	7	Hole ID	SW-07
GPS Elevation		Collar	2592.82
Sounding Depth	154.0	Top Iron	2497.6
Base Iron	2473.8		

	Estimated	Actual			
Thickness Overburden	98.4	95.3	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2504.2	2506.8	ft	Core Cut	68.0 ft
Thickness of Iron	23.0	23.8	ft	Fe Core Cut	23.8 ft
Thickness of Lower Zone		35.0	ft		
End of Hole		2438.8	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	86.0	94.0	8.0	5.0	4.8	Shale
Core No. 2	94.0	99.0	5.0	4.0	3.8	Shale and IR
Core No. 3	99.0	104.0	5.0	4.6	4.6	IR
Core No. 4	104.0	109.0	5.0	4.1	4.1	IR
Core No. 5	109.0	114.0	5.0	4.8	3.5	IR and Shale
Core No. 6	114.0	119.0	5.0	5.0	4.8	IR
Core No. 7	119.0	124.0	5.0	1.0	0.0	Sandstone (S.S.)
Core No. 8	124.0	129.0	5.0	0.8	0.8	Shale
Core No. 9	129.0	134.0	5.0	3.9	3.3	Shale->S.S.->IR
Core No. 10	134.0	139.0	5.0	2.7	0.0	S.S.
Core No. 11	139.0	144.0	5.0	3.3	1.5	S.S.
Core No. 12	144.0	149.0	5.0	3.3	2.4	S.S. -> Shale
Core No. 13	149.0	154.0	5.0	1.5	1.5	Shale
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	68.0	44.0	34.9	
			% Recovery	64.7%	51.3%	

Coring Comments: Shale and sandstone layers break up solid ironstone interval

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	8	Hole ID	SW-08
GPS Elevation		Collar	2576.74
Sounding Depth	134.0	Top Iron	2442.3
		Base Iron	2442.3

	Estimated	Actual			
Thickness Overburden	121.4	134.4	ft	Est. 5ft Sleeves	13.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2465.2	2512.7	ft	Core Cut	70.4 ft
Thickness of Iron	39.4	0.0	ft	Fe Core Cut	0.0 ft
Thickness of Lower Zone		0.0	ft		
End of Hole		2442.3	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	64.0	69.0	5.0	5.0	5.0	Shale
Core No. 2	69.0	74.0	5.0	4.6	4.6	Shale
Core No. 3	74.0	79.0	5.0	5.0	5.0	Shale
Core No. 4	79.0	84.0	5.0	5.0	5.0	Shale
Core No. 5	84.0	89.0	5.0	4.8	4.8	Shale
Core No. 6	89.0	94.0	5.0	5.0	5.0	Shale
Core No. 7	94.0	99.0	5.0	4.5	4.5	Shale
Core No. 8	99.0	104.0	5.0	4.5	4.5	Shale
Core No. 9	104.0	109.0	5.0	5.0	5.0	Shale
Core No. 10	109.0	114.0	5.0	5.0	5.0	Shale
Core No. 11	114.0	119.0	5.0	4.8	4.8	Shale
Core No. 12	119.0	124.0	5.0	4.8	4.8	Shale
Core No. 13	124.0	129.0	5.0	3.3	1.0	Shaley s.s.
Core No. 14	129.0	134.0	5.0	1.8	0.8	Shaley s.s.
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	70.0	62.9	59.7	
			% Recovery	89.9%	85.2%	

Coring Comments

NO IRON RECOVERED
- ONLY SHALE AND SANDSTONE INTERSECTED

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	9	Hole ID	SW-09
GPS Elevation		Collar	2621.26
Sounding Depth	162.0	Top Iron	2506.7
		Base Iron	2472.0

	Estimated	Actual			
Thickness Overburden	154.2	114.6	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2476.9	2519.3	ft	Core Cut	60.0 ft
Thickness of Iron	18.0	34.7	ft	Fe Core Cut	34.7 ft
Thickness of Lower Zone		12.7	ft		
End of Hole		2459.3	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	102.0	107.0	5.0	5.0	5.0	Shale
Core No. 2	107.0	112.0	5.0	4.0	4.0	Shale
Core No. 3	112.0	117.0	5.0	5.0	5.0	Shale + IR
Core No. 4	117.0	122.0	5.0	3.0	3.0	IR
Core No. 5	122.0	127.0	5.0	4.8	4.8	IR
Core No. 6	127.0	132.0	5.0	2.8	2.8	IR
Core No. 7	132.0	137.0	5.0	5.0	5.0	IR
Core No. 8	137.0	142.0	5.0	3.5	3.5	IR
Core No. 9	142.0	147.0	5.0	3.2	3.2	IR
Core No. 10	147.0	152.0	5.0	3.2	3.2	IR + Shale
Core No. 11	152.0	157.0	5.0	4.5	4.5	Shale
Core No. 12	157.0	162.0	5.0	2.6	2.6	Shale
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	60.0	46.5	46.5	
			% Recovery	77.4%	77.4%	

Coring Comments: 157'-162' washed out, only 0.5' recovery of sandy shale re-recovered extra 2' from 157'-162' and called EOH

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	10	Hole ID	SW-10
GPS Elevation		Collar	2644.55
Sounding Depth	187.0	Top Iron	2506.6
		Base Iron	2472.0

	Estimated	Actual			
Thickness Overburden	187.0	138.0	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2467.4	2517.6	ft	Core Cut	60.0 ft
Thickness of Iron	19.7	34.6	ft	Fe Core Cut	34.6 ft
Thickness of Lower Zone		14.4	ft		
End of Hole		2457.6	ft		

Overburden Notes: Shale overlying ironstone unit. Two ironstone units present - divided by shale unit.

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	127.0	132.0	5.0	5.0	5.0	Shale
Core No. 2	132.0	137.0	5.0	4.9	4.9	Shale
Core No. 3	137.0	142.0	5.0	1.9	1.6	Shale
Core No. 4	142.0	147.0	5.0	3.3	2.9	IR
Core No. 5	147.0	152.0	5.0	0.8	0.0	IR
Core No. 6	152.0	157.0	5.0	3.6	3.5	IR + Shale
Core No. 7	157.0	162.0	5.0	3.5	1.8	IR
Core No. 8	162.0	167.0	5.0	3.3	3.3	IR
Core No. 9	167.0	172.0	5.0	3.8	2.8	IR
Core No. 10	172.0	177.0	5.0	4.0	1.2	IR + Shale
Core No. 11	177.0	182.0	5.0	5.0	5.0	Shale
Core No. 12	182.0	187.0	5.0	5.0	5.0	Shale
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	60.0	44.0	37.0	
			% Recovery	73.3%	61.6%	

Coring Comments:
100' down at 10:36AM, 152' down at 15:18PM, Waiting for water at 12:30PM
- Iron interval split into two sections separated by a thin (2.2 m) shale unit
- 7.0 meter combined iron thickness' (>25% Fe) over a 9.2 meter interval - See handwritten highlighted notes above

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	11	Hole ID	SW-11
GPS Elevation		Collar	2651.31
Sounding Depth	187.0	Top Iron	2489.3
		Base Iron	2464.3

	Estimated	Actual			
Thickness Overburden	151.6	162.0	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2509.6	2509.3	ft	Core Cut	45.0 ft
Thickness of Iron	26.2	25.0	ft	Fe Core Cut	25.0 ft
Thickness of Lower Zone		0.0	ft		
End of Hole		2464.3	ft		

Overburden Notes: Gravels at 75' depth

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	142.0	147.0	5.0	5.0	5.0	Shale
Core No. 2	147.0	152.0	5.0	2.2	2.2	Shale
Core No. 3	152.0	157.0	5.0	5.0	5.0	Shale
Core No. 4	157.0	162.0	5.0	4.6	4.6	Shale
Core No. 5	162.0	167.0	5.0	0.9	0.0	Oily Sandy IR Rubble
Core No. 6	167.0	172.0	5.0	2.9	1.7	IR
Core No. 7	172.0	177.0	5.0	5.0	4.6	IR
Core No. 8	177.0	182.0	5.0	4.9	4.8	IR
Core No. 9	182.0	187.0	5.0	3.6	3.1	IR
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	45.0	34.1	31.0	
		% Recovery		75.8%	68.9%	

Coring Comments:
- Drill torquing up and forced to call end of hole
- Ended hole in oolitic ironstone unit
- Incomplete ironstone interval recovered

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	12	Hole ID	SW-12
GPS Elevation		Collar	2636.91
Sounding Depth	214.0	Top Iron	2482.0
Base Iron	2455.4		

	Estimated	Actual			
Thickness Overburden	145.7	154.9	ft	Est. 5ft Sleeves	12.0
Thickness of Upper Zone			ft	No. of Core Boxes	6.0
Est. Core Point	2501.1	2510.9	ft	Core Cut	88.0 ft
Thickness of Iron	32.8	26.6	ft	Fe Core Cut	26.6 ft
Thickness of Lower Zone		32.5	ft		
End of Hole		2422.9	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	126.0	134.0	8.0	5.0	5.0	Clay
Core No. 2	134.0	139.0	5.0	5.0	5.0	Clay
Core No. 3	139.0	144.0	5.0	5.0	5.0	Clay
Core No. 4	144.0	149.0	5.0	5.0	5.0	Clay
Core No. 5	149.0	154.0	5.0	5.0	5.0	Clay
Core No. 6	154.0	159.0	5.0	5.0	5.0	Clay + IR
Core No. 7	159.0	164.0	5.0	5.0	5.0	IR
Core No. 8	164.0	169.0	5.0	4.1	3.5	IR
Core No. 9	169.0	174.0	5.0	3.0	1.8	IR
Core No. 10	174.0	179.0	5.0	3.0	2.5	IR
Core No. 11	179.0	184.0	5.0	4.0	2.5	IR + Clay
Core No. 12	184.0	189.0	5.0	3.1	3.1	Clay
Core No. 13	189.0	194.0	5.0	2.8	2.8	Clay
Core No. 14	194.0	199.0	5.0	1.5	1.5	Clay
Core No. 15	199.0	204.0	5.0	0.8	0.8	Clay
Core No. 16	204.0	209.0	5.0	4.7	4.0	Clay
Core No. 17	209.0	214.0	5.0	3.8	3.8	Clay
		TOTAL	88.0	65.7	61.1	
		% Recovery		74.6%	69.4%	

Coring Comments: Gravels seen at ~70' depth with underlying sands (~5' thick gravel interval)

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	13	Hole ID	SW-13
GPS Elevation		Collar	2614.83
Sounding Depth	174.0	Top Iron	2473.6
		Base Iron	2459.6

	Estimated	Actual			
Thickness Overburden	154.2	141.3	ft	Est. 5ft Sleeves	12.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2470.5	2503.8	ft	Core Cut	63.0 ft
Thickness of Iron	36.1	14.0	ft	Fe Core Cut	14.0 ft
Thickness of Lower Zone		18.8	ft		
End of Hole		2440.8	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	109.0	114.0	5.0	3.0	3.0	Clay
Core No. 2	114.0	119.0	5.0	5.0	5.0	Clay
Core No. 3	119.0	124.0	5.0	4.5	4.5	Clay
Core No. 4	124.0	129.0	5.0	4.8	4.8	Clay
Core No. 5	129.0	134.0	5.0	4.4	4.4	Clay
Core No. 6	134.0	139.0	5.0	5.0	5.0	Clay
Core No. 7	139.0	144.0	5.0	5.0	5.0	Clay + IR
Core No. 8	144.0	149.0	5.0	5.0	5.0	IR
Core No. 9	149.0	154.0	5.0	4.7	4.7	IR
Core No. 10	154.0	159.0	5.0	5.0	5.0	IR + Clay
Core No. 11	159.0	164.0	5.0	4.5	4.5	Clay
Core No. 12	164.0	169.0	5.0	4.6	4.6	Clay
Core No. 13	169.0	174.0	5.0	4.4	4.3	Clay
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	65.0	59.9	59.8	
			% Recovery	92.2%	92.0%	

Coring Comments

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	14	Hole ID	SW-14
GPS Elevation		Collar	2566.08
Sounding Depth	122.0	Top Iron	2444.1
		Base Iron	2444.1

	Estimated	Actual			
Thickness Overburden	105.0	122.0	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2470.9	2519.1	ft	Core Cut	75.0 ft
Thickness of Iron	16.4	0.0	ft	Fe Core Cut	0.0 ft
Thickness of Lower Zone		0.0	ft		
End of Hole		2444.1	ft		

Overburden Notes: GLACIAL TILL WITH GRAVELS DIRECTLY OVERLYING SHALE UNIT

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	47.0	52.0	5.0	0.0	0.0	LC
Core No. 2	52.0	57.0	5.0	0.0	0.0	LC
Core No. 3	57.0	62.0	5.0	0.2	0.2	T
Core No. 4	62.0	67.0	5.0	2.2	2.2	T
Core No. 5	67.0	72.0	5.0	1.0	1.0	T
Core No. 6	72.0	77.0	5.0	1.8	1.5	T
Core No. 7	77.0	82.0	5.0	0.5	0.5	T
Core No. 8	82.0	87.0	5.0	1.5	1.5	T
Core No. 9	87.0	92.0	5.0	1.0	1.0	T
Core No. 10	92.0	97.0	5.0	1.8	1.8	T
Core No. 11	97.0	102.0	5.0	0.5	0.3	T
Core No. 12	102.0	107.0	5.0	1.8	0.8	C
Core No. 13	107.0	112.0	5.0	2.3	2.3	C
Core No. 14	112.0	117.0	5.0	5.0	5.0	C
Core No. 15	117.0	122.0	5.0	1.0	1.0	C
Core No. 16						
Core No. 17						
		TOTAL	75.0	20.5	19.0	
		% Recovery		27.3%	25.3%	

Coring Comments: NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	15	Hole ID	SW-15
GPS Elevation		Collar	2613.42
Sounding Depth	147.0	Top Iron	2506.4
		Base Iron	2479.7

	Estimated	Actual			
Thickness Overburden	120.4	107.0	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2502.9	2506.4	ft	Core Cut	40.0 ft
Thickness of Iron	18.0	26.8	ft	Fe Core Cut	26.8 ft
Thickness of Lower Zone		13.3	ft		
End of Hole		2466.4	ft		

Overburden Notes: No overburden recovered. Ironstone was encountered at the top of the first run.

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	107.0	112.0	5.0	5.0	4.3	IR
Core No. 2	112.0	117.0	5.0	4.8	4.5	IR
Core No. 3	117.0	122.0	5.0	5.0	5.0	IR
Core No. 4	122.0	127.0	5.0	4.5	4.5	IR
Core No. 5	127.0	132.0	5.0	4.3	4.3	IR
Core No. 6	132.0	137.0	5.0	4.8	4.5	IR + C
Core No. 7	137.0	142.0	5.0	4.8	4.2	C
Core No. 8	142.0	147.0	5.0	4.3	4.3	C
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	40.0	37.4	35.6	
		% Recovery		93.5%	88.9%	

Coring Comments: No overlying shales recovered - top of first run is ironstone

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	16	Hole ID	SW-16
GPS Elevation		Collar	2651.67
Sounding Depth	187.0	Top Iron	2500.9
		Base Iron	2477.7

	Estimated	Actual			
Thickness Overburden	187.0	150.8	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2474.5	2504.7	ft	Core Cut	40.0 ft
Thickness of Iron	19.0	23.3	ft	Fe Core Cut	23.3 ft
Thickness of Lower Zone		13.0	ft		
End of Hole		2464.7	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	147.0	152.0	5.0	5.0	5.0	C + IR
Core No. 2	152.0	157.0	5.0	5.0	5.0	IR
Core No. 3	157.0	162.0	5.0	3.7	3.7	IR
Core No. 4	162.0	167.0	5.0	5.0	4.8	IR
Core No. 5	167.0	172.0	5.0	4.4	3.9	IR
Core No. 6	172.0	177.0	5.0	4.5	1.3	IR + C
Core No. 7	177.0	182.0	5.0	4.7	4.7	C
Core No. 8	182.0	187.0	5.0	5.0	5.0	C
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	40.0	37.3	33.3	
		% Recovery		93.3%	83.3%	

Coring Comments: Driller noted: hit iron at end of 152'-157' run

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	17	Hole ID	SW-17
GPS Elevation		Collar	2629.23
Sounding Depth	202.0	Top Iron	2498.0
		Base Iron	2471.4

	Estimated	Actual			
Thickness Overburden	177.2	131.3	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	6.0
Est. Core Point	2461.9	2512.2	ft	Core Cut	87.0 ft
Thickness of Iron	21.3	26.6	ft	Fe Core Cut	26.6 ft
Thickness of Lower Zone		46.2	ft		
End of Hole		2425.2	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	117.0	122.0	5.0	5.0	5.0	Clay
Core No. 2	122.0	127.0	5.0	5.0	5.0	Clay
Core No. 3	127.0	132.0	5.0	5.0	5.0	Clay + Iron
Core No. 4	132.0	137.0	5.0	4.9	4.9	Iron
Core No. 5	137.0	142.0	5.0	4.8	2.6	Iron
Core No. 6	142.0	147.0	5.0	4.2	2.2	Iron
Core No. 7	147.0	152.0	5.0	5.0	5.0	Iron
Core No. 8	152.0	157.0	5.0	3.3	2.9	Iron + Clay
Core No. 9	157.0	162.0	5.0	4.3	4.0	Clay
Core No. 10	162.0	167.0	5.0	5.0	5.0	Clay
Core No. 11	167.0	172.0	5.0	5.0	5.0	Clay
Core No. 12	172.0	177.0	5.0	2.7	2.7	Clay
Core No. 13	177.0	182.0	5.0	2.0	2.0	Clay
Core No. 14	182.0	187.0	5.0	5.0	5.0	Clay
Core No. 15	187.0	192.0	5.0	5.0	5.0	Clay
Core No. 16	192.0	197.0	5.0	2.8	2.8	Clay
Core No. 17	197.0	202.0	5.0	5.0	5.0	Clay
		TOTAL	85.0	74.0	69.1	
		% Recovery		87.0%	81.3%	

Coring Comments

- 50' depth at 6:00PM Feb 13th 2012
- some gravels present in the shales

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	18	Hole ID	SW-18
GPS Elevation		Collar	2624.77
Sounding Depth	194.0	Top Iron	2486.8
		Base Iron	2457.8

	Estimated	Actual			
Thickness Overburden	81.0	138.0	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	7.0
Est. Core Point	2553.6	2550.8	ft	Core Cut	120.0 ft
Thickness of Iron	23.0	29.0	ft	Fe Core Cut	29.0 ft
Thickness of Lower Zone		27.0	ft		
End of Hole		2430.8	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	74.0	84.0	10.0	5.0	5.0	Clay
Core No. 2	84.0	94.0	10.0	5.0	5.0	Clay
Core No. 3	94.0	104.0	10.0	5.0	5.0	Clay
Core No. 4	104.0	109.0	5.0	5.0	5.0	Clay
Core No. 5	109.0	114.0	5.0	4.8	4.8	Clay
Core No. 6	114.0	119.0	5.0	4.3	3.9	Clay
Core No. 7	119.0	124.0	5.0	5.0	5.0	Clay
Core No. 8	124.0	129.0	5.0	5.0	5.0	Clay
Core No. 9	129.0	134.0	5.0	5.0	5.0	Clay
Core No. 10	134.0	139.0	5.0	5.0	3.8	Clay + Iron
Core No. 11	139.0	144.0	5.0	5.0	3.0	Iron
Core No. 12	144.0	149.0	5.0	5.0	4.7	Iron
Core No. 13	149.0	154.0	5.0	5.0	4.5	Iron
Core No. 14	154.0	159.0	5.0	5.0	3.9	Iron
Core No. 15	159.0	164.0	5.0	4.8	4.5	Iron
Core No. 16	164.0	167.0	3.0	2.5	2.1	Iron
Core No. 17	167.0	174.0	7.0	5.0	5.0	Clay
		TOTAL	100.0	81.3	75.1	
			% Recovery	81.3%	75.1%	

Coring Comments

	From		To		Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 18:	174.0'	-	184.0'	:	10.0	3.65	3.65	Clay
Core No. 19:	184.0'	-	194.0'	:	10.0	2.80	2.00	Clay

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	19	Hole ID	SW-19
GPS Elevation		Collar	2585.47
Sounding Depth	149.0	Top Iron	2488.2
		Base Iron	2458.7

	Estimated	Actual			
Thickness Overburden	72.2	97.3	ft	Est. 5ft Sleeves	12.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2523.1	2501.5	ft	Core Cut	65.0 ft
Thickness of Iron	32.8	29.5	ft	Fe Core Cut	29.5 ft
Thickness of Lower Zone		22.3	ft		
End of Hole		2436.5	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	84.0	94.0	10.0	1.0	0.0	T
Core No. 2	94.0	99.0	5.0	5.0	4.9	C + IR
Core No. 3	99.0	104.0	5.0	5.0	5.0	IR
Core No. 4	104.0	109.0	5.0	0.5	0.0	IR
Core No. 5	109.0	114.0	5.0	1.0	0.4	IR
Core No. 6	114.0	119.0	5.0	0.8	0.8	IR
Core No. 7	119.0	124.0	5.0	1.5	0.9	IR + T
Core No. 8	124.0	129.0	5.0	4.4	3.3	IR + C
Core No. 9	129.0	134.0	5.0	4.8	4.3	C
Core No. 10	134.0	139.0	5.0	2.8	2.8	C
Core No. 11	139.0	144.0	5.0	3.7	3.7	C
Core No. 12	144.0	149.0	5.0	3.5	3.5	C
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	65.0	34.0	29.6	
		% Recovery		52.3%	45.5%	

Coring Comments: 3' VOID between 114'-119' depth (only 1' recovered in this 5' Fe interval)

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	20A	Hole ID	SW-20A
GPS Elevation		Collar	2577.86
Sounding Depth	109.0	Top Iron	2504.6
		Base Iron	2477.6

	Estimated	Actual			
Thickness Overburden	49.2	73.3	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2538.5	2538.9	ft	Core Cut	70.0 ft
Thickness of Iron	19.7	27.0	ft	Fe Core Cut	27.0 ft
Thickness of Lower Zone		8.7	ft		
End of Hole		2468.9	ft		

Overburden Notes Glacial boulders/till/gravels directly overlying ironstone unit

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	39.0	44.0	5.0	0.0	0.0	Lost Core
Core No. 2	44.0	49.0	5.0	0.8	0.8	Transition
Core No. 3	49.0	54.0	5.0	0.0	0.0	Lost Core
Core No. 4	54.0	59.0	5.0	1.5	1.4	Transition
Core No. 5	59.0	64.0	5.0	0.5	0.4	Transition
Core No. 6	64.0	69.0	5.0	0.8	0.8	Transition
Core No. 7	69.0	74.0	5.0	1.8	1.4	Tran. + Lg. Boulders
Core No. 8	74.0	79.0	5.0	4.5	3.3	Iron
Core No. 9	79.0	84.0	5.0	4.6	4.2	Iron
Core No. 10	84.0	89.0	5.0	5.6	5.3	Iron
Core No. 11	89.0	94.0	5.0	4.9	4.9	Iron
Core No. 12	94.0	99.0	5.0	4.4	4.2	Iron
Core No. 13	99.0	104.0	5.0	5.0	4.3	Iron + Clay
Core No. 14	104.0	109.0	5.0	4.8	4.8	Clay
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	70.0	39.0	35.6	
		% Recovery		55.7%	50.9%	

Coring Comments
99'-104' = Iron sands at top with shale
Glacial boulders/till/gravels directly overlying ironstone unit
Poor recoveries in glacial till

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	21	Hole ID	SW-21
GPS Elevation		Collar	2557.55
Sounding Depth	152.0	Top Iron	2405.5
		Base Iron	2405.5

	Estimated	Actual			
Thickness Overburden	111.5	152.0	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2455.8	2453.0	ft	Core Cut	47.5 ft
Thickness of Iron	18.0	0.0	ft	Fe Core Cut	0.0 ft
Thickness of Lower Zone		0.0	ft		
End of Hole		2405.5	ft		

Overburden Notes: Glacial tills directly overlying shales - No iron interval recovered

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	52.0	102.0	50.0	0.0	0.0	Lost Core
Core No. 2	102.0	107.0	5.0	3.8	3.8	Glacial till + Clay
Core No. 3	107.0	112.0	5.0	5.0	5.0	Clay
Core No. 4	112.0	117.0	5.0	0.8	0.8	Clay
Core No. 5	117.0	122.0	5.0	5.0	5.0	Clay
Core No. 6	122.0	127.0	5.0	5.0	5.0	Clay
Core No. 7	127.0	132.0	5.0	5.0	5.0	Clay
Core No. 8	132.0	137.0	5.0	5.0	5.0	Clay
Core No. 9	137.0	142.0	5.0	5.0	5.0	Clay
Core No. 10	142.0	147.0	5.0	5.0	5.0	Clay
Core No. 11	147.0	152.0	5.0	5.0	5.0	Clay
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	100.0	44.6	44.6	
		% Recovery		44.6%	44.6%	

Coring Comments: NO IRON INTERVAL ENCOUNTERED - ALL GLACIAL TILL & SHALES
No recovery 57'-102' depth, boulders at 102'-105' depth, Black surface returns at 102'-107' depth, 107'-127' = 15' shale recovered

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	21R	Hole ID	SW-21R
GPS Elevation		Collar	2578.38
Sounding Depth	117.0	Top Iron	2498.5
		Base Iron	2474.0

	Estimated	Actual			
Thickness Overburden	62.3	79.9	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2525.9	2513.4	ft	Core Cut	52.0 ft
Thickness of Iron	16.4	24.5	ft	Fe Core Cut	24.5 ft
Thickness of Lower Zone		12.6	ft		
End of Hole		2461.4	ft		

Overburden Notes: Glacial till directly overlying ironstone unit

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	65.0	73.0	8.0	0.9	0.9	Glacial till
Core No. 2	73.0	78.0	5.0	2.7	2.7	Glacial till
Core No. 3	78.0	83.0	5.0	5.0	4.4	Glacial till+Clay+Iron
Core No. 4	83.0	88.0	5.0	4.8	4.6	Iron
Core No. 5	88.0	93.0	5.0	5.0	5.0	Iron
Core No. 6	93.0	98.0	5.0	5.0	5.0	Iron
Core No. 7	98.0	103.0	5.0	4.8	4.0	Iron
Core No. 8	103.0	108.0	5.0	4.8	4.8	Iron + Clay
Core No. 9	108.0	113.0	5.0	5.0	5.0	Clay
Core No. 10	113.0	117.0	4.0	4.3	3.7	Clay
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	52.0	42.2	40.1	
			% Recovery	81.1%	77.1%	

Coring Comments:
- Significantly different results from SW-21 from merely 60 meters away
- Glacial till directly overlying ironstone unit

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	22	Hole ID	SW-22
GPS Elevation		Collar	2589.04
Sounding Depth	127.0	Top Iron	2500.4
		Base Iron	2472.5

	Estimated	Actual			
Thickness Overburden	45.6	88.6	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	6.0
Est. Core Point	2553.3	2562.0	ft	Core Cut	100.0 ft
Thickness of Iron	18.0	27.9	ft	Fe Core Cut	27.9 ft
Thickness of Lower Zone		10.5	ft		
End of Hole		2462.0	ft		

Overburden Notes Glacial till overlying 11.2' of shale. Shale directly overlying first ironstone horizon.

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	27.0	37.0	10.0	0.6	0.6	Glacial till
Core No. 2	37.0	47.0	10.0	0.0	0.0	Lost Core
Core No. 3	47.0	52.0	5.0	0.3	0.0	Glacial till
Core No. 4	52.0	57.0	5.0	0.5	0.0	Glacial till
Core No. 5	57.0	62.0	5.0	1.8	1.8	Glacial till
Core No. 6	62.0	67.0	5.0	0.6	0.6	Glacial till
Core No. 7	67.0	72.0	5.0	0.0	0.0	Lost Core
Core No. 8	72.0	77.0	5.0	0.5	0.0	Glacial till
Core No. 9	77.0	82.0	5.0	5.0	5.0	Clay
Core No. 10	82.0	87.0	5.0	4.9	4.9	Clay
Core No. 11	87.0	92.0	5.0	4.4	4.4	Clay + Iron
Core No. 12	92.0	97.0	5.0	5.0	5.0	Clay + Iron
Core No. 13	97.0	102.0	5.0	2.2	2.2	Iron
Core No. 14	102.0	107.0	5.0	3.2	2.7	Iron
Core No. 15	107.0	112.0	5.0	3.9	2.6	Iron
Core No. 16	112.0	117.0	5.0	3.0	1.9	Iron + Clay
Core No. 17	117.0	122.0	5.0	5.0	5.0	Clay
		TOTAL	95.0	40.8	36.6	
			% Recovery	42.9%	38.5%	

Coring Comments

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 18	122	127	5	5	5	Clay

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	23	Hole ID	SW-23
GPS Elevation		Collar	2566.04
Sounding Depth	154.0	Top Iron	2481.5
		Base Iron	2457.0

	Estimated	Actual			
Thickness Overburden	105.0	84.5	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2470.9	2502.5	ft	Core Cut	90.5 ft
Thickness of Iron	21.3	24.5	ft	Fe Core Cut	24.5 ft
Thickness of Lower Zone		45.0	ft		
End of Hole		2412.0	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	54.0	64.0	10.0	0.5	0.5	Glacial till
Core No. 2	64.0	74.0	10.0	1.8	0.0	Glacial till + Clay
Core No. 3	74.0	84.0	10.0	5.0	5.0	Clay
Core No. 4	84.0	94.0	10.0	5.0	5.0	Clay + IR
Core No. 5	94.0	99.0	5.0	2.8	2.8	IR
Core No. 6	99.0	104.0	5.0	3.0	3.0	IR
Core No. 7	104.0	109.0	5.0	3.1	3.1	IR
Core No. 8	109.0	114.0	5.0	4.2	3.7	C
Core No. 9	114.0	124.0	10.0	5.0	3.6	C
Core No. 10	124.0	134.0	10.0	5.0	5.0	C
Core No. 11	134.0	139.0	5.0	4.8	4.8	C
Core No. 12	139.0	144.0	5.0	5.0	5.0	C
Core No. 13	144.0	149.0	5.0	5.0	5.0	C
Core No. 14	149.0	154.0	5.0	4.6	4.4	C
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	100.0	54.7	50.8	
		% Recovery		54.7%	50.8%	

Coring Comments

*** RODS MISCOUNT - END OF HOLE = 154' - DEPTHS DECREASED BY 30' ***
- Hit gravels at 35' depth - switched to core bit (hit something hard)
- Terrible recoveries in this hole (~50%) possibly due to the sandy and loosely consolidated nature of the ironstone

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	24	Hole ID	SW-24
GPS Elevation		Collar	2542.46
Sounding Depth	128.0	Top Iron	2478.0
		Base Iron	2451.9

	Estimated	Actual			
Thickness Overburden	88.6	64.5	ft	Est. 5ft Sleeves	11.0
Thickness of Upper Zone			ft	No. of Core Boxes	5.0
Est. Core Point	2463.7	2517.5	ft	Core Cut	103.0 ft
Thickness of Iron	27.9	26.1	ft	Fe Core Cut	26.1 ft
Thickness of Lower Zone		37.4	ft		
End of Hole		2414.5	ft		

Overburden Notes: Glacial till directly overlying iron sands

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	25.0	33.0	8.0	1.6	1.5	Glacial till
Core No. 2	33.0	43.0	10.0	4.5	4.5	Glacial till
Core No. 3	43.0	53.0	10.0	1.1	1.1	Glacial till
Core No. 4	53.0	63.0	10.0	0.5	0.3	Glacial till
Core No. 5	63.0	78.0	15.0	2.4	2.3	Glacil till + IR
Core No. 6	78.0	88.0	10.0	5.0	4.6	IR
Core No. 7	88.0	94.0	6.0	3.3	1.8	IR + Clay
Core No. 8	94.0	98.0	4.0	4.0	3.7	Clay
Core No. 9	98.0	103.0	5.0	4.3	4.3	Clay
Core No. 10	103.0	108.0	5.0	3.3	3.0	Clay
Core No. 11	108.0	113.0	5.0	1.8	1.8	Clay
Core No. 12	113.0	118.0	5.0	4.8	4.8	Clay
Core No. 13	118.0	123.0	5.0	4.8	4.6	Clay
Core No. 14	123.0	128.0	5.0	5.0	5.0	Clay
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	103.0	46.1	43.2	
			% Recovery	44.7%	41.9%	

Coring Comments: Drillers mentioned that a "void" was hit between 73'-78' depth (within iron sands interval). The drills rods and core barrel just drifted down with zero torque and pressure being applied. No core was recovered over this interval.

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	25	Hole ID	SW-25
GPS Elevation		Collar	2605.32
Sounding Depth	102.0	Top Iron	2523.6
		Base Iron	2517.8

	Estimated	Actual			
Thickness Overburden	69.2	81.8	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2545.9	2548.3	ft	Core Cut	45.0 ft
Thickness of Iron	19.7	5.8	ft	Fe Core Cut	5.8 ft
Thickness of Lower Zone		14.5	ft		
End of Hole		2503.3	ft		

Overburden Notes: Glacial till directly overlying ironstone unit

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	57.0	62.0	5.0	3.0	3.0	Glacial till
Core No. 2	62.0	67.0	5.0	5.0	5.0	Glacial till
Core No. 3	67.0	72.0	5.0	0.0	0.0	Lost Core
Core No. 4	72.0	77.0	5.0	4.9	4.9	Glacial till
Core No. 5	77.0	82.0	5.0	0.7	0.7	Glacial till + IR
Core No. 6	82.0	87.0	5.0	3.3	2.8	IR
Core No. 7	87.0	92.0	5.0	4.6	4.6	IR + Clay
Core No. 8	92.0	97.0	5.0	5.0	5.0	Clay
Core No. 9	97.0	102.0	5.0	5.0	5.0	Clay
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	45.0	31.5	31.0	
			% Recovery	70.0%	68.8%	

Coring Comments: Glacial till directly overlying ironstone unit

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	26	Hole ID	SW-26
GPS Elevation		Collar	2623.52
Sounding Depth	127.0	Top Iron	2524.0
Base Iron	2506.8		

	Estimated	Actual			
Thickness Overburden	91.2	99.5	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2542.2	2541.5	ft	Core Cut	45.0 ft
Thickness of Iron	21.3	17.3	ft	Fe Core Cut	17.3 ft
Thickness of Lower Zone		10.3	ft		
End of Hole		2496.5	ft		

Overburden Notes

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	82.0	87.0	5.0	5.0	4.8	Clay
Core No. 2	87.0	92.0	5.0	5.0	4.9	Clay
Core No. 3	92.0	97.0	5.0	5.0	5.0	Clay
Core No. 4	97.0	102.0	5.0	4.2	4.2	Clay + IR
Core No. 5	102.0	107.0	5.0	5.0	4.5	IR
Core No. 6	107.0	112.0	5.0	5.0	5.0	IR
Core No. 7	112.0	117.0	5.0	3.8	3.0	IR
Core No. 8	117.0	122.0	5.0	5.0	4.3	IR + Clay
Core No. 9	122.0	127.0	5.0	5.0	5.0	Clay
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	45.0	43.0	40.7	
			% Recovery	95.4%	90.3%	

Coring Comments

- 92' depth at 5:50PM 18 Feb 2012
- Shale contacting both boundaries of ironstone

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	27	Hole ID	SW-27
GPS Elevation		Collar	2633.20
Sounding Depth	142.0	Top Iron	2516.2
		Base Iron	2501.2

	Estimated	Actual			
Thickness Overburden	127.6	117.0	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	2.0
Est. Core Point	2515.4	2516.2	ft	Core Cut	25.0 ft
Thickness of Iron	24.6	15.0	ft	Fe Core Cut	15.0 ft
Thickness of Lower Zone		10.0	ft		
End of Hole		2491.2	ft		

Overburden Notes
- Sandy/shaley irons recovered at the direct top of the hole (117' depth)
- No shales or other units recovered above iron units

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	117.0	122.0	5.0	4.9	4.9	Transition + IR
Core No. 2	122.0	127.0	5.0	5.0	5.0	IR
Core No. 3	127.0	132.0	5.0	3.3	3.3	IR + Transition
Core No. 4	132.0	134.0	2.0	1.2	1.2	Sandy oily clay
Core No. 5	134.0	139.0	5.0	3.2	2.8	Sandy clay
Core No. 6	139.0	142.0	3.0	3.0	3.0	Sandy clay
Core No. 7						
Core No. 8						
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	25.0	20.6	20.2	
			% Recovery	82.4%	80.8%	

Coring Comments
- Sandy iron from 117' downwards
- More solid ironstone from 122' downwards
- Shales recovered beneath ironstone unit

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #1**

Hole No.	28	Hole ID	SW-28
GPS Elevation		Collar	2600.95
Sounding Depth	99.0	Top Iron	2527.6
Base Iron	2513.5		

	Estimated	Actual			
Thickness Overburden	19.7	73.4	ft	Est. 5ft Sleeves	9.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2591.1	2542.0	ft	Core Cut	40.0 ft
Thickness of Iron	19.7	14.1	ft	Fe Core Cut	14.1 ft
Thickness of Lower Zone		11.5	ft		
End of Hole		2502.0	ft		

Overburden Notes: Gravels directly overlying iron

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	59.0	64.0	5.0	5.0	4.5	Glacial till
Core No. 2	64.0	69.0	5.0	0.2	0.0	Gravel chunk
Core No. 3	69.0	74.0	5.0	1.4	0.7	0.7' boulder & 0.7' IR
Core No. 4	74.0	79.0	5.0	1.9	1.9	IR
Core No. 5	79.0	84.0	5.0	4.8	3.8	IR
Core No. 6	84.0	89.0	5.0	1.7	1.4	Transition IR
Core No. 7	89.0	94.0	5.0	5.0	4.5	Clay
Core No. 8	94.0	99.0	5.0	3.8	3.8	Clay
Core No. 9						
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	40.0	23.8	20.6	
		% Recovery		59.4%	51.4%	

Coring Comments:
- Glacial till directly overlying ironstone (erosional contact)
- FINAL HOLE DRILLED IN SOUTH WHITEMUD DRILLING PROGRAM

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	29	Hole ID	SW-29
GPS Elevation		Collar	2594.00
Sounding Depth	102.0	Top Iron	2525.5
		Base Iron	2507.5

	Estimated	Actual			
Thickness Overburden	36.1	68.5	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	3.0
Est. Core Point	2567.8	2537.0	ft	Core Cut	45.0 ft
Thickness of Iron	21.3	18.0	ft	Fe Core Cut	18.0 ft
Thickness of Lower Zone		15.5	ft		
End of Hole		2492.0	ft		

Overburden Notes: Some low recoveries in iron

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	57.0	62.0	5.0	5.0	5.0	Clay
Core No. 2	62.0	67.0	5.0	5.0	5.0	Clay
Core No. 3	67.0	72.0	5.0	3.8	3.6	IR
Core No. 4	72.0	77.0	5.0	2.1	1.5	IR
Core No. 5	77.0	82.0	5.0	3.1	2.0	IR
Core No. 6	82.0	87.0	5.0	2.5	2.5	IR + Clay
Core No. 7	87.0	92.0	5.0	5.0	5.0	Clay
Core No. 8	92.0	97.0	5.0	4.8	4.8	Clay
Core No. 9	97.0	102.0	5.0	5.0	5.0	Clay
Core No. 10						
Core No. 11						
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	45.0	36.3	34.4	
			% Recovery	80.6%	76.4%	

Coring Comments:
- Poor recoveries in the iron.
- LAST HOLE DRILLED BY RADIUS RIG #2
- Radius Rig #2 finished hole and packed up to be transported away from site, leaving Radius Rig #1 to finish up the remainder of the holes (SW-28 and SW-20A).

ironstone RESOURCES

Core Log

Drilling Rig Name-No. **Radius Rig #2**

Hole No.	30	Hole ID	SW-30
GPS Elevation		Collar	2621.42
Sounding Depth	132.0	Top Iron	2516.2
		Base Iron	2500.1

	Estimated	Actual			
Thickness Overburden	88.6	105.2	ft	Est. 5ft Sleeves	10.0
Thickness of Upper Zone			ft	No. of Core Boxes	4.0
Est. Core Point	2542.7	2544.4	ft	Core Cut	55.0 ft
Thickness of Iron	24.6	16.1	ft	Fe Core Cut	16.1 ft
Thickness of Lower Zone		10.7	ft		
End of Hole		2489.4	ft		

Overburden Notes: No glacial till encountered

	From	To	Core Cut (ft)	Core Recovered	RQD	Notes
Core No. 1	77.0	82.0	5.0	4.7	4.7	Clay
Core No. 2	82.0	87.0	5.0	4.7	4.7	Clay
Core No. 3	87.0	92.0	5.0	4.9	4.9	Clay
Core No. 4	92.0	97.0	5.0	5.0	5.0	Clay
Core No. 5	97.0	102.0	5.0	5.0	5.0	Clay
Core No. 6	102.0	107.0	5.0	5.0	5.0	Clay + IR
Core No. 7	107.0	112.0	5.0	5.0	5.0	IR
Core No. 8	112.0	117.0	5.0	2.5	2.3	IR
Core No. 9	117.0	122.0	5.0	4.2	3.5	IR -> Transition/Clay
Core No. 10	122.0	127.0	5.0	4.8	4.6	Transition -> Clay
Core No. 11	127.0	132.0	5.0	4.2	4.2	Clay
Core No. 12						
Core No. 13						
Core No. 14						
Core No. 15						
Core No. 16						
Core No. 17						
		TOTAL	55.0	50.0	48.9	
		% Recovery		90.9%	88.9%	

Coring Comments: Shales contacting both top and bottom of iron unit

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Core Descriptions

ironstone RESOURCES

Core Description Log

Hole ID	SW-01A	Project	South Whitemud River	Date Logged	2012/02/24	Logged By	Liam Murphy
Collar	783.10	Total Depth	737.7	Core Size	HQ	Lat	56.68	Long	-118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
39.0	49.0	10.0	[GLACIAL TILL] Green/brown gray clay unit with small quartz and sandstone pebble inclusions. MOHS 2.					
49.0	59.0	10.0	[GRAVEL/BOULDER SEAM] Gravels and cobbles ranging in diameter from 1cm to 15cm.					Good recovery of gravels
59.0	113.2	54.2	[SHALE] Dark gray and homogeneous shale/clay unit with very few inclusions. Massive. MOHS 2-3.	59.0	61.0	2.0	Sulfur stained and softer (less resistive) with some pebble sandstone and quartz inclusions	
				84.0	90.0	6.0	LOST CORE	
				94.0	101.0	7.0	LOST CORE	
				106.0	113.2	7.2	Iron stained sandy shales; homogenous with minor amount of ooids present	
113.2	140.4	27.2	[IRONSTONE] Rusted brown/orange oolitic sandstone/sand unit. Varying degrees of recessiveness. Massive - no bedding but varying degrees of lithification. Some small pebble inclusions (sandstone and quartz) seen in more resistive ironstone intervals. MOHS 2.5-4.0.	113.2	117.6	4.4	Very sandy and recessive oolitic sand unit. Very rusted/oxidized. Massive structure. MOHS 2-3.	
				117.6	125.0	7.4	Densely oolitic ironstone with increased hardness and resitivity. Broken up in some areas; less rusted/oxidized color; massive structure; matrix eroded in some areas. MOHS 4-5.	
				125.0	129.0	4.0	Weaker and more rusted/oxidized oolitic sands. Massive structure. MOHS 2-3.	Interbedded rusted clay/shale layer at 127.9' depth (1" thick)
				129.0	130.7	1.7	Moderately oolitic ironstone. More resistive and less evidence of rusting/oxidization.	
				130.7	140.4	9.7	Broken up iron ooids and sandy clasts/cobbles. Rounding of cobbles and clay content increasing with increasing depth.	Only 1.9' recovered over 9.7' interval (broken up clasts)
140.4	149.0	8.6	[SHALE] Medium gray homogeneous and massive shale/clay unit. Some sulfur staining and minor sulfide presence (framboidal pyrite). MOHS 2-3.					

ironstone RESOURCES

Core Description Log

Hole ID: SW-02A | Project: South Whitemud River | Date Logged: 2012/02/25 | Logged By: Andrew Reader

Collar: 778.92 | Total Depth: 736.6 | Core Size: HQ | Lat: 56.68 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
99.0	100.3	1.3	LOST CORE - Washout					
100.3	100.5	0.3	[GLACIAL TILL] Medium gray clay with rounded pebbles.					
100.5	124.3	23.8	[IRONSTONE] Ooidal ironstone unit. Brown/green to orange/brown in color. Variable amounts of clay throughout. The upper sections grade from high clay content with reduced clay content with increased depth. Rubbly ironstone found in some areas (iron clasts/cobbles). MOHS 4.	100.5	103.2	2.7	[TRANSITION] Moderately oolitic ironstone grading, with depth, into densely oolitic ironstone. Brown in color and fairly competent. MOHS 3.	
				103.2	109.0	5.8	[IRONSTONE] Densely oolitic ironstone. Dark green/brown in color. MOHS 4-5.	
				109.0	110.8	1.8	LOST CORE - Washout	
				110.8	114.0	3.3	[IRONSTONE] Primarily densely oolitic ironstone with moderately oolitic ironstone from 111.75'-112.75'. Fairly competent. MOHS 3-4.	
				114.0	122.0	8.0	LOST CORE - Washout	
				122.0	124.3	2.3	[RUBBLY IRONSTONE] Ironstone clasts in shaley unit.	
124.3	139.0	14.8	[SHALE] Medium gray shale unit with variable amounts of sand throughout. Fairly homogeneous and oily throughout.	134.0	135.5	1.5	LOST CORE - Washout	

ironstone RESOURCES

Core Description Log

Hole ID	SW-03A	Project	South Whitemud River	Date Logged	2012/02/24	Logged By	Andrew Reader
Collar	778.79	Total Depth	741.0	Core Size	HQ	Lat	56.68	Long	-118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
60.5	64.0	3.5	[GLACIAL TILL] Dark gray clay unit with pebbles and boulders. MOHS 1-2.	63.0	64.0	1.0	Boulder with garnets	59.0' - 60.5' : LOST CORE
64.0	92.3	28.3	[SHALE] Medium gray homogeneous and monotonous shale/clay unit. Shells present (marine shales). MOHS 2.	76.3	76.3	0.1	Shell present in shales/clays	64.0' - 65.5' : LOST CORE 68.1' - 69.0' : LOST CORE 74.0' - 75.0' : LOST CORE 79.0' - 80.9' : LOST CORE 84.0' - 85.0' : LOST CORE 89.0' - 89.75': LOST CORE
92.3	104.0	11.8	[IRONSTONE] Ooidal ironstone unit. Grades from shale into ironstone at top of unit, which transitions into a densely oolitic ironstone at bottom (104' depth). Orange/brown colored throughout. High argillaceous content throughout. Not very competent. MOHS 3.	92.3	94.0	1.8	[TRANSITION] Moderately oolitic ironstone. Grading from shale into ironstone. Crumbly with red faces on iron clasts. Some light colored clasts at 93.5' depth.	94.0' - 97.0' : LOST CORE
				97.0	104.0	7.0	[IRONSTONE] Transition from moderately oolitic ironstone into densely oolitic ironstone. Good recoveries but very soft. MOHS 3.	
104.0	107.3	3.3	LOST CORE - washout (w/o)					104.0' -107.25' : LOST CORE
107.3	109.0	1.8	[OOIDAL SANDSTONE] Dark gray muddy/shaley sandstone unit. Poorly sorted. Some Fe present. MOHS 3.					
109.0	124.0	15.0	[SHALEY SANDSTONE] Medium gray muddy/shaley sandstone unit. Variable sand content. Poorly sorted grains. Oily.	110.5	111.0	0.5	Unconsolidated sands.	109.0' - 110.5' : LOST CORE
				111.0	114.0	3.0	Clay-rich sandstone. Medium gray shale/clay with some sands present and mixed throughout	
				114.0	114.5	0.5	Unconsolidated Sandstone	114.5' - 116.6' : LOST CORE
				116.6	119.0	2.4	Shale/clay rich sandstone	
				119.0	122.0	3.0	Unconsolidated Sands (poor recoveries)	
				122.0	124.0	2.0	Shale/clay rich sandstone	

ironstone RESOURCES

Core Description Log

Hole ID	SW-04	Project	South Whitemud River	Date Logged	2012/02/26	Logged By	Liam Murphy
Collar	785.44	Total Depth	744.6	Core Size	HQ	Lat	56.68	Long	-118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
64.0	73.2	9.2	LOST CORE					NO IRON RECOVERED
72.4	76.8	4.4	[GLACIAL TILL] Dark/medium gray clay/shale unit. Slightly sandy with cobbles visible in shale at 74' depth. MOHS 2.					
76.8	84.0	7.2	LOST CORE					
84.0	134.0	50.0	[GRAVELS/BOULDERS] Quartzite and other metamorphic gravels and cobbles with extremely poor recovery (0.8' over 50' interval). Gravels/cobbles ranging from 1 cm to 9 cm in diameter. Some clays 'mixed up' (together) with pebbles for ~2". MOHS 6-7.					VERY POOR RECOVERY 0.8' RECOVERED OVER 50.0'

ironstone RESOURCES

Core Description Log

Hole ID: SW-05 | Project: South Whitemud River | Date Logged: 2012/02/25 | Logged By: Andrew Reader

Collar: 798.71 | Total Depth: 743.2 | Core Size: HQ | Lat: 56.68 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
102.0	144.2	42.2	[SHALE] Medium gray and homogeneous shale unit. Some shells present (marine shales). Iron staining visible towards base of unit. MOHS 2.	111.0	112.0	1.0	Abundant shells in shale	
				129.0	144.2	15.2	Iron stained shales throughout. Becomes much more iron stained between 142'-144.15' depth	
144.2	145.2	1.0	[IRONSTONE] Moderately oolitic ironstone/shale. Iron ooids in shale. Very iron stained. MOHS 2.					
145.2	149.0	3.9	[SHALE] Medium gray and homogeneous shale unit. Iron staining visible.					147.0' - 148.25' : LOST CORE
149.0	176.8	27.8	[IRONSTONE] Brown/green ooidal ironstone unit. Clay content variable throughout. Competency variable throughout. MOHS 2-4.	149.0	152.0	3.0	Ironstone with high clay content. Rubbly iron. Grades from moderately to densely oolitic at base.	152.0' - 154.0' : LOST CORE
				154.0	157.0	3.0	Densely oolitic ironstone. 154'-155' is unconsolidated. 155'-157' well consolidated. MOHS 4.	157.0' - 159.5' : LOST CORE
				159.5	162.0	2.5	Poorly consolidated densely oolitic ironstone. Brown/orange in color. MOHS 2.	
				163.8	169.0	5.3	Ironstone - unconsolidated iron sands from 163.75'-167.0' depth. Competent densely oolitic ironstone from 167'-169' depth.	162.0' - 163.75' : LOST CORE
				170.5	172.0	1.5	Competent densely oolitic ironstone	169.0' - 170.5' : LOST CORE
				174.8	176.8	2.0	Competent densely oolitic ironstone	172.0' - 174.75' : LOST CORE
176.8	182.0	5.3	[SHALE] Medium gray and homogeneous shale unit. Quite competent. Some iron staining near top of unit. MOHS 2.	177.0	177.3	0.3	Abundant iron staining and veins of clear crystals (gypsum?) throughout. MOHS 4.	

ironstone RESOURCES

Core Description Log

Hole ID	SW-06	Project	South Whitemud River	Date Logged	2012/02/25	Logged By	Liam Murphy
Collar	796.02	Total Depth	744.5	Core Size	HQ	Lat	56.68	Long	-118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
104.0	134.0	30.0	[SHALE] Medium gray homogeneous and massive shale/clay unit. No inclusions present with the exception of gravels between 118.3'-119.5' depth. MOHS 2.	107.9	109.0	1.1	Homogeneous shale	104.0' - 107.9' : LOST CORE 109.0' - 112.6' : LOST CORE
				112.6	113.2	0.6	Homogeneous shale	113.2' - 118.3' : LOST CORE
				118.3	118.7	0.4	Gravels recovered and interbedded with shale until 119.5' depth	
				118.7	119.5	0.8	Gravels interbedded in shales	
				119.5	134.0	14.5	Massive shale interval. Shale becomes sandier at base of unit between 131'-134' depth.	
134.0	159.6	25.6	[IRONSTONE] Dark brown/black oolitic sandstone unit. Moderately mottled with clay and argillaceous material. Pebble inclusions seen throughout. Massive structure with some very small veins (gypsum?). MOHS 4-5.	134.0	139.0	5.0	Moderately oolitic ironstone; more recessive and sandy unit. Muddier. Matrix washes away with water.	
				139.0	158.0	19.0	Densely oolitic ironstone with mottled clay and argillaceous material. MOHS 5.	
				158.0	159.6	1.6	Increasing sand and clay content with depth. More broken up/rubbly. MOHS 3.	
159.6	163.0	3.4	[TRANSITION] More recessive sandstone unit; mildly oolitic and massive; very mottled with argillaceous material; increasing sand/clay content with depth. Very gradual and gradational contact with underlying shale. MOHS 2-3.					
163.0	169.0	6.0	[SHALE] Medium gray homogeneous and massive shale/clay unit. Some Fe/S staining visible at top of unit. Sand content decreases with depth. Some sulfide presence (minor pyrite mineralization). MOHS 2-3.					

ironstone RESOURCES

Core Description Log

Hole ID: SW-07 | Project: South Whitemud River | Date Logged: 2012/02/26 | Logged By: Quinn Brown

Collar: 790.30 | Total Depth: 743.4 | Core Size: HQ | Lat: 56.68 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
86.0	95.3	9.3	[SHALE] Medium grey homogeneous shale unit. MOHS 2.					
95.3	110.7	15.5	[IRONSTONE] Medium brown/grey densely oolitic ironstone with argillaceous inclusions and minor amounts of small pebbles. MOHS 3-5.	109.0	110.7	1.7	Broken and chunky ironstone	98.0' - 99.3' : LOST CORE 104' - 105' : LOST CORE
110.7	113.0	2.3	[SHALE] Medium grey shale unit. MOHS 2.					
113.0	119.0	6.0	[SANDY IRONSTONE] Moderately oolitic sandy ironstone unit with abundant small pebbles and oily scent.					
119.0	133.0	14.0	[SANDSTONE] Dark grey, poorly sorted sandstone with abundant clay. Very poor recoveries from 119'-128' depth.	130.3	130.5	0.2	Chunks of sandstone with minor amounts of shale	120.0 - 128.2 : LOST CORE 129.0 - 130.3 : LOST CORE
133.0	133.5	0.5	[IRONSTONE] Small chunks of densely oolitic ironstone present. MOHS 4-5.					
133.5	143.0	9.5	[SANDSTONE] Dark grey, poorly sorted sandstone with abundant shale. MOHS 3.					
143.0	154.0	11.0	[SHALE] Medium grey shale unit with layers of intermittent centimeter-sized pebbles.					

ironstone RESOURCES

Core Description Log

Hole ID: SW-08 | Project: South Whitemud River | Date Logged: 2012/03/01 | Logged By: Quinn Brown

Collar: 785.40 | Total Depth: 744.4 | Core Size: HQ | Lat: 56.68 | Long: -118.43

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
64.0	126.3	62.3	[SHALE] Medium gray shale. Scarce and intermittent mm-scale pebbles present. MOHS 1-2.	76.0	76.1	0.1	Layers of thin, white fibrous material. Reacts intensely with HCl. Shell fragments?	
				77.8	77.9	0.1	mm-scale pyrite at 77.8' depth	
				79.5	79.8	0.3	Layer of mm-scale pebbles.	
				82.1	82.1	0.0	cm-scale pyrite at 82.1' depth	
				87.8	87.9	0.1	Layer of mm-scale pebbles	
126.3	134.0	7.7	[SANDSTONE] Dark gray sandstone with high clay content.	128.8	128.8	0.1	Large shell fragments at 128.75' depth	

ironstone RESOURCES

Core Description Log

Hole ID: SW-09 | Project: South Whitemud River | Date Logged: 2012/02/24 | Logged By: Quinn Brown

Collar: 798.97 | Total Depth: 749.6 | Core Size: HQ | Lat: 56.68 | Long: -118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
102.0	114.6	12.6	[SHALE] Medium gray shale with iron staining throughout. MOHS 2.					110.8 - 112.0 : LOST CORE
114.6	149.3	34.7	[IRONSTONE] Gray-brown to dark-gray-brown oolitic ironstone unit. MOHS 1-5.	114.6	115.3	0.7	Sandy moderately to densely oolitic ironstone mixed with minor amounts of shale.	
				115.3	117.0	1.7	Dark gray densely oolitic ironstone interlayered with moderately oolitic ironstone. MOHS 2-5.	117.0' - 119.0' : LOST CORE
				119.0	119.5	0.5	Sandy, mildly oolitic ironstone mixed with shale. MOHS 1.	
				119.5	122.0	2.5	Intermixed mildly and moderately oolitic ironstone along with shale. Clear/milky nodules present in a few areas. MOHS 2-4.	
				122.0	127.0	5.0	Light grey-brown densely oolitic ironstone. MOHS 4-5.	127.0' - 129.25' : LOST CORE
				129.3	130.3	1.0	Highly oolitic ironstone mixed with shale. MOHS 1-2.	
				130.3	137.0	6.8	Medium gray-brown densely oolitic ironstone with large consolidated ironstone chunks. MOHS 4-5.	137.0' - 138.35' : LOST CORE
				138.4	142.0	3.7	Brown moderately oolitic ironstone mixed with shale along with densely oolitic ironstone chunks.	142.0' - 144.0' : LOST CORE
				144.0	145.0	1.0	Brown moderately oolitic ironstone mixed with shale along with densely oolitic ironstone chunks.	
				145.0	149.3	4.3	Medium gray-brown densely oolitic ironstone. MOHS 4-5.	
149.3	162.0	12.7	[SHALE] Medium gray shale. MOHS 2.					150.1' - 152.0' : LOST CORE 157.0' - 159.5' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-10 | Project: South Whitemud River | Date Logged: 2012/02/24 | Logged By: Quinn Brown

Collar: 806.07 | Total Depth: 749.1 | Core Size: HQ | Lat: 56.68 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
127.0	138.0	11.0	[SHALE] Medium gray shale. MOHS 2-3.					
138.0	152.1	14.1	[IRONSTONE] Light gray-brown to dark gray ironstone. MOHS 3-5.	138.0	138.7	0.7	Moderately oolitic transitional ironstone.	138.7' - 142.0' : LOST CORE
				142.0	147.5	5.5	Interlayered gray-brown densely oolitic ironstone with layers of densely oolitic ironstone mixed with shale	143.75' -144.25' : LOST CORE 146.0' - 147.0' : LOST CORE
				147.5	148.0	0.5	Unconsolidated ironstone mixed with small amounts of shale.	148.0' - 152.0' : LOST CORE
				152.0	152.1	0.1	Chunky densely oolitic ironstone in shale.	153.5' - 154.7' : LOST CORE
152.1	156.5	4.4	[SHALE] Medium gray shale mixed with angular pebbles. MOHS 1.	154.7	156.5	1.8	Shale with angular pebbles.	
156.5	177.0	20.5	[IRONSTONE] Medium brown-green oolitic ironstone unit.	156.5	157.0	0.5	Highly oolitic ironstone unit mixed with shale.	
				157.0	160.0	3.0	Densely oolitic ironstone and loosely consolidated ironstone interlayered with areas of lost core (1.3' lost core)	
				160.0	161.0	1.0	Moderately to densely oolitic ironstone mixed with light brown shale.	
				161.0	162.0	1.0	Solid densely oolitic ironstone with chunks.	162.0' - 163.5' : LOST CORE
				163.5	169.3	5.8	Solid and chunky densely oolitic ironstone interlayered with areas of light brown shale.	169.3' - 171.0' : LOST CORE
				171.0	177.0	6.0	Highly oolitic ironstone and densely oolitic ironstone chunks mixed in light brown shale. (175'-176' lost core)	175.0' - 176.0' : LOST CORE
177.0	187.0	10.0	[SHALE] Medium gray shale. MOHS 1-2.	181.7	181.8	0.1	Small piece of gypsum?	

ironstone RESOURCES

Core Description Log

Hole ID: SW-11 | Project: South Whitemud River | Date Logged: 2012/02/25 | Logged By: Liam Murphy

Collar: 808.13 | Total Depth: 751.1 | Core Size: HQ | Lat: 56.68 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
142.0	162.0	20.0	[SHALE] Medium gray, massive shale/clay unit; homogeneous with no apparant inclusions. MOHS 2.					147.0' - 149.8' : LOST CORE
162.0	169.5	7.5	[RUBBLY IRONSTONE] Very broken up, oolitic ironstone pieces (1cm -8cm in diameter). Some completely covered with hydrocarbons (oil stained). Moderately to densely oolitic chunks broken up (angular). Extremely poor recovery. Nature of this core possibly due to drilling issues? MOHS 4-5.	162.0	167.0	5.0	Extremely poor recoveries: five foot interval with only 0.9' recovered. Very oil stained ironstone (totally black and drenched in oil). Pieces between 1cm and 8cm across in diameter.	
				167.0	169.5	2.5	Poor recoveries continue. 2.5' interval with only 0.7' recovered. Broken up ironstone fragments 1cm-6cm across in diameter. No oil staining present.	
169.5	187.0	17.5	[IRONSTONE] Dark green/brown densely oolitic sandstone/ironstone unit. Massive structure; fairly homogeneous with some pebble inclusions. Some minor quartz and sandstone inclusions (rounded and <0.5cm in diameter). Fairly consistent over entire 17.5' interval. Argillaceous and clay content mottled throughout. Some areas where matrix is removed. MOHS 4-5.					182.0' - 183.3' : LOST CORE
				186.0	187.0	1.0	Slightly more broken up moderately/densely oolitic ironstone. A bit sandier but remains fairly consistent with overlying ironstone.	

ironstone RESOURCES

Core Description Log

Hole ID	SW-12	Project	South Whitemud River	Date Logged	2012/02/27	Logged By	Quinn Brown
Collar	803.74	Total Depth	738.5	Core Size	HQ	Lat	56.68	Long	-118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
126.0	154.9	28.9	[SHALE] Medium grey shale with scarce intermittent pebble and gypsum inclusions.					
154.9	181.5	26.6	[IRONSTONE] Brown-green oolitic ironstone with abundant argillaceous inclusions/veins and small pebbles. MOHS 4-5+.	154.9	158.6	3.7	Moderate to highly oolitic ironstone intermixed with shale. MOHS 3-4.	
				158.6	167.4	8.8	Densely oolitic ironstone with abundant small pebbles and argillaceous inclusions/veins. MOHS 5.	167.4' - 167.9' : LOST CORE
				167.9	168.3	0.4	Densely oolitic ironstone with abundant small pebbles and argillaceous inclusions/veins. MOHS 5.	
				168.3	169.8	1.5	Chunky and broken densely oolitic ironstone.	
				169.8	179.0	9.2	Densely oolitic ironstone with abundant small pebbles and argillaceous inclusions/veins. MOHS 5.	171.1' - 172.1' : LOST CORE 172.4' - 173.2' : LOST CORE 175.8' - 176.3' : LOST CORE 179.0' - 180.2' : LOST CORE
				180.2	181.5	1.3	Chunky and broken densely oolitic ironstone.	
181.5	204.5	23.0	[SHALE] Medium grey shale. MOHS 1-2.	181.5	188.0	6.5	Silty/sandy shale with oily smell (abundant oil).	185.2' - 186.9' : LOST CORE 189.0' - 191.3' : LOST CORE 194.0' - 197.7' : LOST CORE 199.0' - 203.3' : LOST CORE 204.0' - 204.5' : LOST CORE
204.5	214.0	9.5	[SANDSTONE] Light grey, quartz-rich sandstone abundant with clays. MOHS 2.					209.0' - 210.3' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID	SW-13	Project	South Whitemud River	Date Logged	2012/02/26	Logged By	Quinn Brown
Collar	797.01	Total Depth	744.0	Core Size	HQ	Lat	56.68	Long	-118.43

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
111.0	141.3	30.3	[SHALE] Medium grey shale. MOHS 1-2.	111.0	111.3	0.3	Layer of 1cm - 5cm sized rounded pebbles.	129.0' - 129.6' : LOST CORE
141.3	155.2	14.0	[IRONSTONE] Brown-green grey oolitic ironstone unit with abundant clay inclusions and small pebbles. MOHS 3-4.	141.3	142.3	1.0	Moderately oolitic ironstone mixed with shale.	
				142.3	143.5	1.3	Densely oolitic ironstone. MOHS 4.	
				143.5	153.5	10.0	Densely oolitic ironstone. Loosely consolidated. MOHS 3.	
				153.5	155.2	1.7	[TRANSITION ZONE] Moderately oolitic ironstone mixed with shale.	159.0' - 159.6' : LOST CORE
155.2	174.0	18.8	[SHALE] Medium-dark grey shale unit. MOHS 1-2.	164.3	165.0	0.8	Layer of consolidated oily sandstone. MOHS 4.	164.0' - 164.3' : LOST CORE 169.0' - 169.8' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-14 | Project: South Whitemud River | Date Logged: 2012/03/01 | Logged By: Quinn Brown

Collar: 782.15 | Total Depth: 745.0 | Core Size: HQ | Lat: 56.67 | Long: -118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
								47.0' - 61.9' : LOST CORE
61.9	102.5	40.6	[GLACIAL TILL] Gravel and pebbles in a medium grey silty/sandy clay. MOHS 1-2.					64.3' - 70.3' : LOST CORE 71.3' - 72.0' : LOST CORE 74.0' - 81.0' : LOST CORE 81.7' - 85.0' : LOST CORE 86.3' - 87.0' : LOST CORE 88.0' - 90.8' : LOST CORE 91.3' - 95.3' : LOST CORE 97.0' - 101.0' : LOST CORE
102.5	122.0	19.5	[SHALE] Medium grey silty shale with oily scent.	112.0	117.0	5.0	Very scarce iron staining visible.	103.0' - 105.8' : LOST CORE 109.7' - 112.0' : LOST CORE 117.0' - 121.0' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-15 | Project: South Whitemud River | Date Logged: 2012/02/27 | Logged By: Quinn Brown

Collar: 796.58 | Total Depth: 751.8 | Core Size: HQ | Lat: 56.67 | Long: -118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
107.0	133.8	26.8	[IRONSTONE] Brown-green grey oolitic ironstone unit with small mm-scale pebbles and argillaceous inclusions. MOHS 1-5.	107.0	109.9	2.9	Moderately-densely oolitic ironstone with shale. Loosely to moderately consolidated with intermittent clay layers. MOHS 1-3.	
				109.9	112.0	2.1	Densely oolitic ironstone mixed with shale and densely oolitic ironstone chunks. MOHS 2.	
				112.0	128.0	16.0	Densely oolitic ironstone with pebbles and argillaceous inclusions. MOHS 5+.	
				128.0	133.8	5.8	[TRANSITION ZONE] Ironstone mixed with silty shale. Some densely oolitic chunks and clay layers. MOHS 2-3.	133.0' - 133.7' : mm-scale gypsum veins and cm-scale circular/veiny gypsum inclusions
133.8	147.0	13.3	[SHALE] Medium grey shale. Sulfur and iron staining visible. MOHS 1-2.					

ironstone RESOURCES

Core Description Log

Hole ID: SW-16 | Project: South Whitemud River | Date Logged: 2012/02/27 | Logged By: Quinn Brown

Collar: 808.24 | Total Depth: 751.2 | Core Size: HQ | Lat: 56.67 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
147.0	150.8	3.8	[SHALE] Medium grey shale. MOHS 1-2.	147.4	147.5	0.1	Thin layer of small mm-sized subangular pebbles	
150.8	174.0	23.3	[IRONSTONE] Brown-green to medium grey-brown ironstone with abundant small mm-sized pebbles. MOHS 2-4.	150.8	152.5	1.8	Moderately oolitic ironstone unit. Moderately consolidated with thin clay layers throughout. MOHS 3-4.	
				152.5	170.6	18.1	Densely oolitic ironstone with some thin clay layers at 154.25' depth and 158.3' depth. Argillaceous inclusions also present.	157.0' - 157.5' : LOST CORE
				170.6	174.0	3.4	[TRANSITION ZONE] Moderately oolitic ironstone intermixed with shale. Some thin clay layers present. MOHS 1-4.	171.4' - 172.0' : LOST CORE
								174.0' - 174.5' : LOST CORE
174.0	187.0	13.0	[SHALE] Medium grey shale. MOHS 1-2.	174.5	178.9	4.4	Silty shale with oily scent. MOHS 1-2.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-17 | Project: South Whitemud River | Date Logged: 2012/02/29 | Logged By: Quinn Brown

Collar: 801.40 | Total Depth: 739.2 | Core Size: HQ | Lat: 56.67 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
117.0	131.3	14.3	[SHALE] Medium grey shale unit. Very scarce small pebbles and cm-scale gravel pieces present. MOHS 1-2.	118.5	122.0	3.5	Extremely soft clay, MOHS 0.5	118.0' - 118.5' : Gravel layer
				127.0	128.5	1.5	Very soft silty/sandy clay. MOHS 0.5	
				131.0	131.3	0.3	Silty/Sandy shale. MOHS 1-2	
131.3	157.8	26.6	[IRONSTONE] Grey-green oolitic ironstone unit with small pebble inclusions. Argillaceous inclusions/veins present in densely oolitic areas.	131.3	132.0	0.7	Chunky and broken moderately oolitic ironstone mixed with shale	
				132.3	139.0	6.8	Chunky/fractured densely oolitic ironstone with intermittent clay layers	
				139.0	140.5	1.5	Chunky densely oolitic ironstone with only 50% core recovery	139.0' - 140.5' : 50% core rec.
				140.5	147.0	6.5	Chunky and broken densely oolitic ironstone with some thin clay layers	142.8' - 143.5' : LOST CORE
				147.0	155.3	8.3	Densely oolitic ironstone	152.0' - 153.75' : LOST CORE
				155.3	157.8	2.6	[TRANSITION ZONE] Densely and moderately oolitic ironstone chunks with silty/sandy shale	157.0' - 157.5' : LOST CORE
157.8	204.0	46.2	[SHALE] Medium grey shale unit. Scarce and intermittent pebble and gravel pieces. Intermittent iron staining. Some silty/sandy intervals with oily smell. MOHS 1-2.	157.8	159.8	2.0	Sandy/silty shale with oily smell	
				159.8	172.6	12.9	Medium grey shale	172.0' - 172.6' : LOST CORE
				172.6	189.5	16.9	Sandy/silty shale with oily smell	172.8' - 174.3' : LOST CORE 177.0' - 180.0' : LOST CORE
				189.5	204.0	14.5	Shale with pyrite	195.1' - 197.0' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-18 | Project: South Whitemud River | Date Logged: 2012/02/28 | Logged By: Quinn Brown

Collar: 800.04 | Total Depth: 740.9 | Core Size: HQ | Lat: 56.67 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
74.0	138.0	64.0	[SHALE] Medium grey shale unit. A few small pebbles intermittently spaced. MOHS 2.					116.8' - 117.3' : LOST CORE
138.0	167.0	29.0	[IRONSTONE] Green-grey-brown oolitic ironstone unit. Mildly to densely oolitic with small pebbles intermixed. Abundant argillaceous inclusions and veins/layers also present.	138.0	139.0	1.0	Moderately oolitic sandy ironstone unit with shale. Some small gypsum crystals present. MOHS 3.	
				139.0	139.8	0.8	Densely oolitic ironstone unit with abundant small pebble and argillaceous inclusions. MOHS 5.	
				139.8	141.8	2.0	Chunky and broken densely oolitic ironstone unit with clay layers.	
				141.8	147.3	5.5	Densely oolitic ironstone unit with abundant small pebble and argillaceous inclusions. MOHS 5.	
				147.3	148.0	0.8	Chunky and broken densely oolitic ironstone unit with clay layers.	
				148.0	161.5	13.5	Densely oolitic ironstone unit with abundant small pebble and argillaceous inclusions. MOHS 5.	
				161.5	164.0	2.5	Chunky and broken densely oolitic ironstone unit mixed with clay. Unit transitions to moderately oolitic closer to 164' depth.	
				164.0	167.0	3.0	[TRANSITION ZONE] Moderately to mildly oolitic ironstone unit mixed with shale.	
167.0	194.0	27.0	[SHALE] Medium to light grey shale unit with intermittent pebbles and iron staining. Some very small gypsum crystals also present.	167.0	169.3	2.3	Sandy/silty shale unit	
								177.0' - 179.8' : LOST CORE b/c a 10' run
								190.4' - 194.0' : LOST CORE b/c a 10' run

ironstone RESOURCES

Core Description Log

Hole ID	SW-19	Project	South Whitemud River	Date Logged	2012/03/01	Logged By	Quinn Brown
Collar	788.06	Total Depth	742.6	Core Size	HQ	Lat	56.67	Long	-118.43

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
92.0	94.4	2.4	[GLACIAL TILL] Gravels and pebbles contained within a medium grey shale (where recovered). Very poor recoveries. MOHS 1-2.					84.0' - 92.0' : LOST CORE
94.4	97.3	2.9	[SHALE] Medium grey shale unit with iron staining. MOHS 2.					
97.3	126.8	29.5	[SANDY IRONSTONE] Mildly to moderately oolitic sandy ironstone unit. Medium brown-grey in color. Very loosely consolidated to densely consolidated. MOHS 1-4.	97.3	101.0	3.7	Mildly oolitic sandy ironstone unit mixed with shales. Loosely consolidated.	
				101.0	109.0	8.0	Moderately oolitic sandy ironstone unit with very poor consolidation to no consolidation whatsoever.	104.0' - 108.0' : LOST CORE 109.0' - 113.0' : LOST CORE
				113.0	119.0	6.0	Mildly to densely oolitic iron sands. Some more solid chunks of ironstone present in loosely consolidated iron sands. MOHS 2-4.	114.0' - 118.0' : LOST CORE VOID??
				122.5	125.8	3.3	Mildly oolitic and loosely consolidated iron sands. Some chunky, moderate to densely oolitic sandy ironstone pieces mixed in. Some clay layers are present and large pieces of gravel are noted between 123.5'-124.0' depth.	119.0' - 122.5' : LOST CORE 123.5' - 124.0' : Large gravel pieces
				125.8	126.8	1.0	[TRANSITION ZONE] Iron sands mixed with silty shale. Oily scent noticeable.	
126.8	149.0	22.3	[SHALE] Medium grey shale unit with intermittent iron staining present. Small pebbles, small gypsum crystals, sulfur staining and small amounts of pyrite also present.	126.8	128.3	1.5	Silty shale unit with small pebbles and noticeable oily scent.	134.0' - 136.25' : LOST CORE 139.8' - 141.1' : LOST CORE 144.0' - 144.7' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-20A | Project: South Whitemud River | Date Logged: 2012/02/22 | Logged By: Liam Murphy

Collar: 785.74 | Total Depth: 752.5 | Core Size: HQ | Lat: 56.67 | Long: -118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
				39.0	48.3	9.3	LOST CORE - Washed out glacial till	
48.3	73.3	25.1	[GLACIAL TILL] Grey glacial till/clay unit with pebbles. Slightly sandy texture. Possibly some pyrite crystals present? MOHS 1-2.	49.0	56.3	7.3	LOST CORE - Washout	
				56.3	57.8	1.5	Glacial till as above with some larger pebbles	
				57.8	63.5	5.8	LOST CORE	
				63.5	64.0	0.5	Glacial till as above	
				64.0	67.7	3.7	LOST CORE - Washout	
				67.7	68.5	0.8	Glacial till as above	
				68.5	72.3	3.9	LOST CORE - Washout with large boulder at bottom	
				72.3	73.3	1.0	Glacial Boulders with the largest boulder being ~0.9' in diameter	1" sandy clay till at 73.25' depth
73.3	100.3	27.0	[IRONSTONE] Oolitic ironstone unit. Brown-green in color. Homogeneous and massive structure with some fractures visible. Some argillaceous content increasing with depth. Some pebble inclusions present. MOHS 2-5.	73.3	79.0	5.7	[TRANSITION ZONE] Moderately oolitic ironstone with high argillaceous content. Orange-brown in color. Broken up and less resistive. MOHS 2.	
				79.0	92.3	13.3	Densely oolitic ironstone with increasing (90%) ooid content. Some pebbles and argillaceous content. Dark green-brown in color. Grades into underlying transition zone. MOHS 4-5.	Marble pebble (2" diameter) with some clay at 86.3' depth
				92.3	100.3	8.0	[TRANSITION ZONE] Moderately oolitic ironstone with high argillaceous content. Orange-brown in color. Interbedded with clays (1" thick units) and less resisitive. MOHS 3.	Shells (2 cm diameter) at 98.5' depth
100.3	109.0	8.7	[SHALE] Medium gray, homogeneous fine clay/shale unit with some iron and sulfur staining. MOHS 2.	103.5	103.7	0.2	Hard light grey nodule hit. ~2" across with veining visible.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-21 | Project: South Whitemud River | Date Logged: 2012/02/25 | Logged By: Quinn Brown

Collar: 779.55 | Total Depth: 733.2 | Core Size: HQ | Lat: 56.67 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
52.0	104.5	52.5	LOST CORE					
104.5	109.0	4.5	[GLACIAL TILL] Medium grey clay till with cm-sized sub-angular to sub-rounded pebble inclusions. MOHS 2.	104.5	104.9	0.4	Layer of pebbles	
				104.9	107.0	2.1	Glacial till as described	
				107.0	108.3	1.3	LOST CORE	
				108.3	108.5	0.3	Layer of pebbles	
				108.5	109.0	0.5	Glacial till as described	
109.0	152.0	43.0	[SHALE] Medium to dark grey shale. MOHS 2-3.	117.0	120.0	3.0	LOST CORE	
				120.5	122.0	1.5	LOST CORE	
				137.0	137.5	0.5	Layer of mm-sized, sub-angular pebbles	
				147.0	147.5	0.5	Layer of mm-sized, sub-angular pebbles	
				147.5	152.0	4.5	Intermittent groupings of pebbles (same pebbles as above)	

ironstone RESOURCES

Core Description Log

Hole ID: SW-21R | Project: South Whitemud River | Date Logged: 2012/02/25 | Logged By: Quinn Brown

Collar: 785.90 | Total Depth: 750.2 | Core Size: HQ | Lat: 56.67 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
65.0	79.9	14.9	[GLACIAL TILL] Medium grey-brown shales interlayered with beds of angular to sub-rounded pebbles of varying sizes. Abundant iron staining. MOHS 1-4.	65.0	71.5	6.5	LOST CORE	
				72.5	75.5	3.0	LOST CORE	
79.9	104.4	24.5	[IRONSTONE] Brown-grey to dark grey-brown ironstone unit with small rounded pebbles throughout. MOHS 2-5.	79.9	82.0	2.1	Moderately to densely oolitic ironstone. Grey-brown in color. Mixed with minor amounts of shale. MOHS 2-3.	
				82.0	87.3	5.3	Densely oolitic ironstone. Moderately consolidated with some solid ironstone chunks. MOHS 4-5.	
				87.3	98.9	11.6	Solid, resistive, densely oolitic ironstone with some chunky/broken up areas. MOHS 5.	87.75' - 88.00' : LOST CORE
				98.9	102.8	3.9	Sandy, densely oolitic ironstone unit mixed with solid densely oolitic ironstone chunks. MOHS 3-5.	
				102.8	103.2	0.5	LOST CORE	
				103.2	104.4	1.2	Moderately oolitic sandy ironstone. Shale content increasing with depth. Unit transitions to more of a shale unit by 104' depth. Some solid densely oolitic ironstone chunks present. MOHS 3-5.	
104.4	117.0	12.6	[SHALE] Medium grey shale unit. MOHS 1-2.					

ironstone RESOURCES

Core Description Log

Hole ID: SW-22 | Project: South Whitemud River | Date Logged: 2012/02/29 | Logged By: Quinn Brown

Collar: 789.15 | Total Depth: 750.4 | Core Size: HQ | Lat: 56.67 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
27.0	77.0	50.0	[GLACIAL TILL] Medium grey clays mixed with mm to (few) cm-scale subangular to subrounded pebbles. Very poor recoveries.					27.0' - 36.0' : LOST CORE 37.0' - 51.5' : LOST CORE 53.0' - 59.0' : LOST CORE 61.0' - 65.8' : LOST CORE
77.0	88.2	11.2	[SHALE] Medium grey shale with iron staining and occasional small pebbles.	77.0	77.5	0.5	Sulfur staining	66.5' - 76.5' : LOST CORE
				81.5	81.6	0.1	5 cm stone, light grey in color	
								88.2' - 88.6' : LOST CORE
88.6	89.9	1.3	[IRONSTONE] Mildly to moderately oolitic ironstone unit mixed with shales. Brown-grey in color. MOHS 2-3.					
89.9	95.4	5.5	[SHALE] Same as above but shalier with intense iron staining					
95.4	116.5	21.1	[IRONSTONE] Green-grey and brown oolitic ironstone unit with small pebbles and argillaceous inclusions.	95.4	97.0	1.6	Moderate to densely oolitic ironstone chunks mixed with clay/shales	
								97.0' - 99.8' : LOST CORE
				99.8	101.0	1.2	Densely oolitic ironstone chunks with clay in between	
				101.0	112.0	11.0	Densely oolitic ironstone. Broken in some areas with thin clay layers.	102.0' - 103.9' : LOST CORE 109.0' - 109.5' : LOST CORE 112.0' - 113.2' : LOST CORE
				113.2	114.5	1.3	Some areas of sandy, moderately consolidated iron with densely oolitic chunks.	
				114.5	114.6	0.1	Some sort of gray, rimmed inclusion present.	
				114.6	115.3	0.7	Densely oolitic ironstone. Broken in some areas with thin clay layers.	
								115.4' - 116.1' : LOST CORE
				116.1	116.5	0.4	Chunky densely oolitic and moderately oolitic ironstone transitioning into shale.	
116.5	127.0	10.5	[SHALE] Medium grey shale unit with a few small pebbles and minor iron staining present.					

ironstone RESOURCES

Core Description Log

Hole ID	SW-23	Project	South Whitemud River	Date Logged	2012/02/28	Logged By	Quinn Brown
Collar	782.14	Total Depth	735.2	Core Size	HQ	Lat	56.67	Long	-118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
63.5	74.0	10.5	[GLACIAL TILL] Large boulders and pebbles mixed in a dark grey shale (where recovered). Very poor recoveries.					54.0' - 63.5' : LOST CORE 64.0' - 67.25' : LOST CORE
74.0	84.5	10.5	[SHALE] Medium grey shale with iron staining. MOHS 1-2.					
84.5	109.0	24.5	[IRONSTONE] Brown-grey-green oolitic ironstone unit with high sand content. Moderately to loosely consolidated. Some small pebbles are present. Some (but few) densely oolitic ironstone intervals. Mainly moderately to highly oolitic ironstone. MOHS 2-3.	96.2	96.7	0.5	Densely oolitic ironstone with small pebbles.	94.0' - 95.3' : LOST CORE 96.7' - 97.9' : LOST CORE
				99.4	99.7	0.3	Small densely oolitic ironstone piece.	99.7' - 101.0' : LOST CORE
				101.0	106.2	5.2	Mildly to moderately oolitic iron sands with small, iron stained silty shale (?) chunks intermixed.	
				107.5	108.5	1.0	[TRANSITION ZONE] Sandy ironstone mixed with shale. MOHS 2-3.	108.5' - 109.7' : LOST CORE
109.0	154.0	45.0	[SHALE] Medium grey shale with scarce, intermittent pebbles and small gypsum crystals. MOHS 1-2.	109.7	124.0	14.3	Abundant iron and sulfur staining.	

ironstone RESOURCES

Core Description Log

Hole ID	SW-24	Project	South Whitemud River	Date Logged	2012/03/01	Logged By	Quinn Brown
Collar	774.95	Total Depth	735.9	Core Size	HQ	Lat	56.67	Long	-118.43

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
25.0	64.5	39.5	[GLACIAL TILL] Medium grey sandy shale with small pebble and gravel inclusions. MOHS 1-2.	33.0	40.0	7.0	Mild iron staining.	26.5' - 32.25' : LOST CORE 44.2' - 53.0' : LOST CORE 53.75' - 63.0' : LOST CORE
64.5	90.6	26.1	[IRON SANDS] Brown-grey, oolitic, rusted iron sands. Loosely to moderately consolidated. MOHS 0.5-2.	78.0	78.5	0.5	Thin gravel layer.	65.0' - 77.0' :- LOST CORE
				88.0	90.6	2.6	[TRANSITION ZONE] Mildly oolitic iron sands mixed with shale.	
90.6	128.0	37.4	[SHALE] Medium grey shale. MOHS 1-2.	90.6	101.5	10.9	Shale with minor iron and sulfur staining.	91.7' - 94.0' : LOST CORE 98.0' - 98.5' : LOST CORE
				101.5	122.5	21.0	Silty shale with oily scent.	103.0' - 104.8' : LOST CORE 108.0' - 111.3' : LOST CORE
				122.5	128.0	5.5	Shale with sulfur staining and intermittent pyrite crystals.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-25 | Project: South Whitemud River | Date Logged: 2012/02/23 | Logged By: Andrew Reader

Collar: 794.11 | Total Depth: 763.0 | Core Size: HQ | Lat: 56.64 | Long: -118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
57.0	81.8	24.8	[GLACIAL TILL] Medium grey, primarily homogeneous shales/clays. Various pebbles and cobbles throughout. MOHS 2.	57.0	60.0	3.0	Darker grey glacial till with abundant pebbles.	
				60.0	62.0	2.0	No recoveries - washout.	60.0' - 62.0' : LOST CORE
				62.0	67.0	5.0	Medium grey homogeneous glacial till.	Cobbles at 62.75' depth
				67.0	72.0	5.0	No recoveries - washout.	67.0' - 72.0' : LOST CORE
				72.0	77.0	5.0	Medium grey homogeneous glacial till.	Oily at 76.75' depth.
				77.0	81.3	4.3	No recoveries - washout.	77.0' - 81.3' : LOST CORE
				81.3	81.8	0.5	Medium grey glacial till with abundant pebbles.	
81.8	87.5	5.8	[IRONSTONE] Oolitic ironstone unit. Primarily densely oolitic ironstone. Fairly competent. MOHS 4-5.	85.3	85.8	0.5	Rubbly oolitic ironstone.	
				85.8	87.4	1.7	No recoveries - washout.	85.8' - 87.4' : LOST CORE
				87.4	87.5	0.1	Oolitic ironstone.	
87.5	102.0	14.5	[SHALE] Medium grey and homogeneous shale unit. Some sandier sections/areas. Some pyrite throughout. MOHS 2.	87.5	88.0	0.5	Sandy shale.	
				88.0	102.0	14.0	Shale.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-26 | Project: South Whitemud River | Date Logged: 2012/02/23 | Logged By: Quinn Brown

Collar: 799.66 | Total Depth: 760.9 | Core Size: HQ | Lat: 56.64 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
82.0	99.5	17.5	[SHALE] Medium grey shale with small chunks of gravel/boulders situated on top of unit. MOHS 1-2.	88.3	88.4	0.1	0.5" layer of few small pebbles and/or shell fragments.	
				92.3	92.4	0.1	Small pyrite inclusions.	
99.5	105.3	5.8	[TRANSITION ZONE] Moderate to densely oolitic shaley ironstone. Dark grey/green and brown in color. MOHS 2-4.	100.5	100.8	0.3	Ironstone inclusions surrounded by shaley ironstone.	
				102.0	105.3	3.3	Small voids concentrated in layers/groupings. Numerous small pebbles and areas with thin brown layers.	
105.3	116.8	11.5	[IRONSTONE] Dark grey/green densely oolitic ironstone unit. MOHS 4-5.	106.0	107.0	1.0	Abundant clear/milky layers and inclusions with numerous small pebbles.	
				107.0	112.0	5.0	Numerous small pebbles.	
				111.5	114.0	2.5	Small voids concentrated in layers/groupings. Thin brown layers on edges of voids.	112.0' - 113.5' : LOST CORE
				114.0	115.0	1.0	Moderate amounts of clear/milky layers and inclusions with small voids concentrated in layers/groupings. Thin brown layers on edges of voids.	
				115.0	115.5	0.5	Densely oolitic ironstone starting to get shaley. Moderate amounts of clear/milky layers and inclusions with small voids concentrated in layers/groupings. Thin brown layers on edges of voids. MOHS 2-3.	
				115.5	115.8	0.3	Chunky broken core with open spaces	
				115.8	116.8	1.0	Densely oolitic ironstone starting to get shaley with small voids and moderate amounts of clear/milky layers and inclusions. MOHS 2-3.	
116.8	127.0	10.3	[SHALE] Medium grey shale with small chunks of ironstone at the top of the interval. MOHS 1-2.	117.0	118.7	1.7	Minor amounts of small pyrite inclusions.	119.25' - 119.30' : Light grey pebble ~ 1" in size
				120.7	121.5	0.8	Chunky fragmented boulder. Light grey in color. Small pieces of red/brown glassy material.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-27 | Project: South Whitemud River | Date Logged: 2012/02/24 | Logged By: Andrew Reader

Collar: 802.61 | Total Depth: 759.3 | Core Size: HQ | Lat: 56.64 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
117.0	132.0	15.0	[IRONSTONE] Ooidal ironstone unit. Green-brown in color and homogeneous. Ranges from sparsely to densely oolitic. MOHS 4.	117.0	119.5	2.5	[TRANSITION ZONE] Grades from shale at the top into moderately oolitic ironstone at the bottom. Browny color. MOHS 2.5.	
				119.5	129.0	9.5	Densely oolitic ironstone. Dark green-brown in color. Abundant ooids throughout. MOHS 4.	
				129.0	129.7	0.7	[TRANSITION ZONE] Moderately to sparsely oolitic ironstone grading into more of a lithic sandstone towards the bottom.	Shells recovered around ~129.7' depth.
				129.7	131.2	1.5	No recoveries - washout.	129.7' - 131.2' : LOST CORE
				131.2	132.0	0.8	[TRANSITION ZONE] As above: Moderately to sparsely oolitic ironstone grading into more of a lithic sandstone towards the bottom.	
132.0	142.0	10.0	[MIXED SANDS & SHALES] Medium grey shale unit with varying amounts of sand present. Fairly homogeneous. Oil throughout. MOHS 2.	132.0	133.5	1.5	Poorly sorted sandy clay/shale unit with lots of oil.	
				133.5	136.0	2.5	No recoveries.	133.5' - 136.0' : LOST CORE
				136.0	142.0	6.0	As above: Poorly sorted sandy clay/shale unit with lots of oil. Medium grey in color and very homogeneous. Sandy shale unit grades to just shale at the bottom (i.e. 142' depth). Sandy clasts noted at 136' depth.	Sandy clasts at 136' depth

ironstone RESOURCES

Core Description Log

Hole ID	SW-28	Project	South Whitemud River	Date Logged	2012/02/23	Logged By	Liam Murphy
Collar	792.78	Total Depth	762.6	Core Size	HQ	Lat	56.63	Long	-118.46

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
59.0	73.4	14.4	[GLACIAL TILL] Dark grey clay/shale unit; homogeneous and weak/soft with organic matter (?); boulders and gravels present with very poor recovery over a large interval (59.0'-63.5' glacial till recovered). MOHS 1.	63.5	73.4	9.9	[GRAVELS] Quartzite and metamorphic gravels and boulders present. 1.4' gravels/boulders recovered at 63.5', 68.8' and 72.5' depth. Ironstone boulder found at 72.5' depth (5 cm across - densely oolitic ironstone). MOHS 6-7.	64.0' - 68.8' : LOST CORE 69.0' - 72.5' : LOST CORE
73.4	84.0	10.6	[IRONSTONE] Orange-brown-green oolitic ironstone/sandstone unit; moderately to densely oolitic; varying argillaceous content and matrix content; rusted Fe color; Less resistive in some areas; sandy; MOHS 3.	73.4	74.0	0.6	Sandy broken up and weak ironstone.	- abundant clear crystals (gypsum?)
				74.0	77.2	3.2	Lost core.	74.0' - 77.2' : LOST CORE
				77.2	79.2	2.0	Densely oolitic ironstone; very sandy and weak rusted iron interval; some areas with larger more cemented iron chunks.	
				79.2	82.0	2.8	More resistive and rusted densely oolitic ironstone/sandstone. MOHS 3.5.	
				82.0	84.0	2.0	Very massive densely oolitic ironstone. Sandy but more resistive.	
84.0	87.0	3.0	No recovery					84.0' - 87.0' : LOST CORE
87.0	87.5	0.5	Rusted pebbles ~3 cm in diameter. Possibly oolitic.					
87.5	97.8	10.3	[SHALE] Medium grey homogeneous and massive silty shale unit. Sulfides present (framboidal pyrite); some bioturbation visible. MOHS 2-3.	87.8	89.0	1.3	Very oily and sandy shale transition unit. Dark grey in color. Massive structure. MOHS 3.	- Light grey hard shale nodule or hard caps with white fractures present at 90.7'-91.0' and 94.7'-94.8' depth - Large 3 cm framboidal pyrite crystal at 93.2' depth
97.8	99.0	1.3	No recovery					97.8' - 99.0' : LOST CORE

ironstone RESOURCES

Core Description Log

Hole ID: SW-29 | Project: South Whitemud River | Date Logged: 2012/02/23 | Logged By: Andrew Reader

Collar: 790.66 | Total Depth: 759.6 | Core Size: HQ | Lat: 56.63 | Long: -118.45

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
57.0	67.0	10.0	[SHALE] Medium grey homogeneous shale unit. Some slight iron staining visible. Some sandy shale.	57.0	58.0	1.0	Sandy shale unit. Medium grey in color with some coarse sand present.	
				62.8	62.9	0.1	Shells present.	
				66.0	67.0	1.0	Iron staining in shale.	
67.0	68.5	1.5	No recoveries - washout (ironstone?)					67.0' - 68.5' : LOST CORE
68.5	86.5	18.0	[IRONSTONE] Ooidal ironstone unit. Brown-orange in color. Moderate to high argillaceous content. Clay content increases gradually with depth. MOHS 4.	68.5	72.0	3.5	Moderately oolitic ironstone. High argillaceous content and somewhat crumbly. MOHS 3.	
				72.0	75.0	3.0	No recoveries - washout.	72.0' - 75.0' : LOST CORE
				75.0	80.0	5.0	Densely oolitic ironstone. Crumbly ironstone unit with high ooid content. Browny-orange in color. MOHS 4.	
				80.0	84.5	4.5	No recoveries - washout.	80.0' - 84.5' : LOST CORE
				84.5	86.5	2.0	[TRANSITION] Moderately oolitic ironstone grading downwards into shale. MOHS 2.5-3.	
86.5	102.0	15.5	[SHALE] Medium grey homogeneous shale unit. Some iron staining visible. Some minor ooid content. MOHS 2.	97.5	97.8	0.3	[IRONSTONE] Moderately oolitic ironstone. Some Fe-bearing ooids in shale.	

ironstone RESOURCES

Core Description Log

Hole ID: SW-30 | Project: South Whitemud River | Date Logged: 2012/02/23 | Logged By: Liam Murphy

Collar: 799.02 | Total Depth: 758.8 | Core Size: HQ | Lat: 56.63 | Long: -118.44

Depth (ft)			Description	Sub-Depth (ft)			Sub-Interval Description	Remarks
From	To	Interval		From	To	Interval		
77.0	105.2	28.2	[SHALE] Medium grey, homogeneous and massive shale unit. No inclusions present. Very sharp lower contact with iron sediments. MOHS 1.5-3.					
105.2	121.3	16.1	[IRONSTONE] Rusty brown/green colored oolitic sandstone unit. Very rusted and oxidized in appearance. Clay content increases with depth. Some interbedded clay layers present. MOHS 2-4.	105.2	108.2	3.0	Very rusty and sandy unit with moderate amount of ooids. Decreasing clay content with depth. Some ooid clasts are visible. MOHS 2-3.	
				108.2	112.0	3.8	Densely oolitic ironstone. Very rusty and sandy. Less resistive and weathered. MOHS 3-4.	
				112.0	114.6	2.6	No recovery.	112.0' - 114.6' : LOST CORE
				114.6	117.0	2.4	Densely oolitic ironstone. Resistive. MOHS 4-5.	
				117.0	117.8	0.8	No recovery.	117.0' - 117.8' : LOST CORE
				117.8	118.0	0.2	Rounded ironstone pebbles. Largest ironstone pebble is roughly 6 cm in diameter (across).	
				118.0	120.5	2.5	Oolitic sandstone with increasing clay content with depth. Clay and sand interbedded with more resistive iron sand layers (beds ~ 2cm thick)	
				120.5	121.3	0.8	Bleached ironstone/sandstone unit. Increasing clay, shale and sand content with depth. Decreasing iron content with depth. Sharp underlying contact with hard shale cap.	
121.3	122.9	1.6	[SANDY SHALE] Dark grey to black sandy shale unit. Very resistive. Some minor ooids present. This unit appears similar to other "transition zones". Gradual increase in clay content with depth. Gradual contact with lower shale unit. MOHS 4.					
122.9	132.0	9.1	[SHALE] Homogeneous and massive shale unit with some minor sulfides (pyrite) present. No pebble inclusions visible.					

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Geochemistry Sample Logs

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
1A	SW-01A	783.10

WRA Top Fe	WRA Base Fe	Thickness Fe
34.5	42.8	8.3

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
109.9	33.50	-	34.00	01				C
	34.00	-	34.50	02				C
	34.50	-	35.00	03				IR
	35.00	-	35.50	04				IR
	35.50	-	36.00	05		05B		IR
	36.00	-	36.50	06				IR
	36.50	-	37.00	07				IR
	37.00	-	37.50	08				IR
	37.50	-	38.00	09		09B		IR
	38.00	-	38.50	10				IR
	38.50	-	39.00	11				IR
	39.00	-	39.50	12				IR
	39.50	-	40.00	13		13B		IR
	40.00	-	40.50	14				LC
		-		15	GIOP-104			-
	40.50	-	41.00	16				IR
	41.00	-	41.50	17				LC
	41.50	-	42.00	18				LC
	42.00	-	42.50	19				IR/LC
	42.50	-	42.80	20				IR
	42.80	-	43.30	21				C
	43.30	-	43.80	22			22D	C
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
19	3	1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
2A	SW-02A	778.92

WRA Top Fe	WRA Base Fe	Thickness Fe
30.6	37.9	7.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
100.5	30.63	-	31.13	01		01B		IR
	31.13	-	31.63	02				IR
	31.63	-	32.13	03			03D	IR
	32.13	-	32.63	04				IR
	32.63	-	33.13	05				IR
	33.13	-	33.63	06				LC
	33.63	-	34.13	07		07B		IR
	34.13	-	34.63	08				IR
	34.63	-	35.13	09				LC
	35.13	-	35.63	10				LC
	35.63	-	36.13	11				LC
	36.13	-	36.63	12				LC
	36.63	-	37.13	13				LC
	37.13	-	37.63	14				IR
	37.63	-	37.87	15		15B		IR
	37.87	-	38.37	16				C
	38.37	-	38.87	17				C
	38.87	-	39.37	18				C
		-		19	GIOP-104			

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
13	3	1

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No. 3A | Hole ID SW-03A | Collar 778.79

WRA Top Fe 28.1 | WRA Base Fe 32.5 | Thickness Fe 4.4

Top (ft): 89.0

Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
27.13	-	27.63	01				C
27.63	-	28.13	02				C
28.13	-	28.53	03		03B		IR
28.53	-	29.03	04				IR+LC
29.03	-	29.53	05				LC
29.53	-	30.03	06				IR
	-		07	GIOP-104			-
30.03	-	30.53	08			08D	IR
30.53	-	31.03	09		09B		IR
31.03	-	31.53	10				IR
31.53	-	32.03	11				IR+LC
32.03	-	32.53	12				LC
32.53	-	33.03	13				IR
33.03	-	33.22	14		14B		IR
33.22	-	33.72	15				C+s.s.
33.72	-	34.22	16				C+s.s.
34.22	-	34.72	17				C+s.s.

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Duplicate not marked on sheet - possibly taken and not marked or possibly no duplicate sample taken

Composite Samples 15 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
4	SW-04	785.44

WRA Top Fe	WRA Base Fe	Thickness Fe
0.0	0.0	0.0

Top (ft)	Sam Top m	Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
			NO SAMPLES				

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

NO GEOCHEMISTRY SAMPLES TAKEN

# Composite Samples	# Bulk Samples	# Duplicate Samples
0	0	0

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
5	SW-05	798.71

WRA Top Fe	WRA Base Fe	Thickness Fe
46.0	54.0	8.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
141.0	42.98	-	43.48	01				C
	43.48	-	43.98	02				C
	43.98	-	44.29	03				IR
	44.29	-	44.79	04				C
	44.79	-	45.29	05				C
	45.29	-	45.45	06				C
	45.45	-	45.95	07		07B		IR
	45.95	-	46.45	08				IR
	46.45	-	46.95	09				LC
	46.95	-	47.45	10				IR
	47.45	-	47.95	11				IR
	47.95	-	48.45	12				LC
	48.45	-	48.95	13		13B		IR
	48.95	-	49.45	14			14D	IR
	49.45	-	49.95	15				LC
		-		16	GIOP-104			
	49.95	-	50.45	17				IR
	50.45	-	50.95	18				IR
	50.95	-	51.45	19				IR
	51.45	-	51.95	20				IR
	51.95	-	52.45	21				IR
	52.45	-	52.95	22				IR/LC
	52.95	-	53.45	23				IR
	53.45	-	53.95	24		24B		IR
	53.95	-	54.45	25				C
		-		26	GIOP-104			
	54.45	-	54.95	27			27D	C
	54.95	-	55.45	28				C
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
25	3	2

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No. 6 | Hole ID SW-06 | Collar 796.02

WRA Top Fe 40.8 | WRA Base Fe 48.6 | Thickness Fe 7.8

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
130.6	39.80	-	40.30	01			01D	C
	40.30	-	40.80	02				C
	40.80	-	41.30	03		03B		IR
	41.30	-	41.80	04				IR
	41.80	-	42.30	05				IR
	42.30	-	42.80	06				IR
	42.80	-	43.30	07				IR
	43.30	-	43.80	08		08B		IR
	43.80	-	44.30	09				IR
	44.30	-	44.80	10				IR
	44.80	-	45.30	11				IR
	45.30	-	45.80	12				IR
	45.80	-	46.30	13		13B		IR
	46.30	-	46.80	14				IR
	46.80	-	47.30	15				IR
	47.30	-	47.80	16				IR
	47.80	-	48.30	17				IR
	48.30	-	48.60	18				IR
	48.60	-	49.10	19				TRAN
	49.10	-	49.60	20				TRAN
	49.60	-	50.10	21				C
	50.10	-	50.60	22				C
		-		23	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

TRAN = Moderately-sparsely oolitic ironstone

Composite Samples 23 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
7	SW-07	790.30

WRA Top Fe	WRA Base Fe	Thickness Fe
30.0	33.7	3.7

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
92.0	28.00	-	28.50	01				C
	28.50	-	29.00	02				C
	29.00	-	29.50	03				IR
	29.50	-	30.00	04				IR
	30.00	-	30.50	05		05B		IR
	30.50	-	31.00	06				IR
	31.00	-	31.50	07		07B		IR
	31.50	-	32.00	08				IR
	32.00	-	32.50	09		09B		IR
	32.50	-	33.00	10				IR
	33.00	-	33.50	11				IR
	33.50	-	33.70	12				IR
	33.70	-	34.20	13				C
	34.20	-	34.40	14				C
	34.40	-	34.90	15				IR
	34.90	-	35.40	16		16B		IR
	35.40	-	35.90	17				IR
	35.90	-	36.30	18			18D	IR
	36.30	-	36.80	19				C
	36.80	-	37.30	20				LC
	37.30	-	37.80	21				LC
	37.80	-	38.30	22				LC
	38.30	-	38.80	23				LC
	38.80	-	39.30	24				SS
	39.30	-	39.80	25				SS
	39.80	-	40.30	26				SS
	40.30	-	40.50	27				SS
	40.50	-	40.70	28				IR
	40.70	-	41.20	29				C
	41.20	-	41.70	30				C
		-		31	GIOP-104			-
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
27	4	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
8	SW-08	785.40

WRA Top Fe	WRA Base Fe	Thickness Fe
0.0	0.0	0.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
0.0		-		NO SAMPLES				

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

NO SAMPLES TAKEN

# Composite Samples	# Bulk Samples	# Duplicate Samples
0	0	0

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
9	SW-09	798.97

WRA Top Fe	WRA Base Fe	Thickness Fe
34.9	43.9	9.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
111.3	33.90	-	34.40	01				C
	34.40	-	34.90	02				C
	34.90	-	35.40	03				IR
	35.40	-	35.90	04				IR
	35.90	-	36.40	05		05B		IR
	36.40	-	36.90	06				IR
	36.90	-	37.40	07				IR
	37.40	-	37.90	08				IR
	37.90	-	38.40	09				IR
	38.40	-	38.90	10				IR
	38.90	-	39.40	11				LC
	39.40	-	39.90	12				IR
	39.90	-	40.40	13		13B		IR
	40.40	-	40.90	14				IR
	40.90	-	41.40	15				IR
	41.40	-	41.90	16				IR
	41.90	-	42.40	17				IR
	42.40	-	42.90	18				IR
	42.90	-	43.40	19				IR
	43.40	-	43.90	20				IR
	43.90	-	44.40	21		21B		IR
	44.40	-	44.90	22				IR
	44.90	-	45.40	23				IR
	45.40	-	45.50	24				IR
	45.50	-	46.00	25			25D	C
	46.00	-	46.50	26				C
		-		27	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 26

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
10	SW-10	806.07

WRA Top Fe	WRA Base Fe	Thickness Fe
42.1	51.3	9.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
134.5	41.10	-	41.60	01				C
	41.60	-	42.10	02				C
	42.10	-	42.60	03				IR
	42.60	-	43.10	04				LC
	43.10	-	43.60	05				IR
	43.60	-	44.10	06				IR
	44.10	-	44.60	07		07B		IR
	44.60	-	45.10	08				IR
	45.10	-	45.60	09				IR
	45.60	-	46.10	10				LC
	46.10	-	46.30	11				LC
	46.30	-	46.80	12				C
	46.80	-	47.30	13				C
	47.30	-	47.80	14				C
	47.80	-	48.30	15				IR
	48.30	-	48.80	16				IR
	48.80	-	49.30	17		17B		IR
	49.30	-	49.80	18				IR
	49.80	-	50.30	19				IR
	50.30	-	50.80	20				IR
	50.80	-	51.30	21				IR
	51.30	-	51.80	22				IR
	51.80	-	52.30	23				IR
	52.30	-	52.80	24				IR
	52.80	-	53.30	25		25B		IR
	53.30	-	53.80	26				IR
	53.80	-	54.10	27				IR
	54.10	-	54.60	28			28D	C
	54.60	-	55.10	29				C
		-		30	GIOP-104			-
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

- Iron interval split into two sections separated by a thin (2.2 m) shale unit
- 7.0 meter combined iron thickness' (>25% Fe) over a 9.2 meter interval - See handwritten highlighted notes above

# Composite Samples	# Bulk Samples	# Duplicate Samples
27	3	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
11	SW-11	808.13

WRA Top Fe	WRA Base Fe	Thickness Fe
49.9	57.0	7.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
158.7	48.40	-	48.90	01			01D	C
	48.90	-	49.40	02				C
	49.40	-	49.90	03				LC
	49.90	-	50.40	04				LC/IRR
	50.40	-	50.90	05				IRR
	50.90	-	51.40	06				IRR/LC
	51.40	-	51.90	07		07B		IRR/IR
	51.90	-	52.40	08				IR
	52.40	-	52.90	09				IR
	52.90	-	53.40	10				IR
		-		11	GIOP-104			-
	53.40	-	53.90	12				IR
	53.90	-	54.40	13		13B		IR
	54.40	-	54.90	14				IR
	54.90	-	55.40	15				IR
	55.40	-	55.90	16				IR
	55.90	-	56.40	17				IR
	56.40	-	56.90	18		18B		IR
	56.90	-	57.00	19				IR

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

IRR = Ironstone Rubble
Ended hole in iron interval (No underlying shales recovered)

Composite Samples 18 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
12	SW-12	803.74

WRA Top Fe	WRA Base Fe	Thickness Fe
48.2	55.3	7.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
151.6	46.20	-	46.70	01				C
	46.70	-	47.20	02				C
	47.20	-	47.70	03				IR
	47.70	-	48.20	04				IR
	48.20	-	48.70	05		05B		IR
	48.70	-	49.20	06				IR
	49.20	-	49.70	07				IR
	49.70	-	50.20	08				IR
	50.20	-	50.70	09				IR
	50.70	-	51.20	10		10B		IR
	51.20	-	51.70	11				IR
	51.70	-	52.20	12				IR
	52.20	-	52.70	13				IR
	52.70	-	53.20	14				IR
	53.20	-	53.70	15		15B		IR
	53.70	-	54.20	16				IR
	54.20	-	54.70	17				IR
	54.70	-	55.20	18				IR
	55.20	-	55.30	19				IR
	55.30	-	55.80	20			20D	C
	55.80	-	56.30	21				C
		-		22	GIOP-104			-
		-		23	GIOP-104			-
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
23	3	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
13	SW-13	797.01

WRA Top Fe	WRA Base Fe	Thickness Fe
44.1	47.3	3.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
138.0	42.10	-	42.60	01				C
	42.60	-	43.10	02				C
	43.10	-	43.60	03				IR
	43.60	-	44.10	04		04B		IR
	44.10	-	44.60	05				IR
	44.60	-	45.10	06				IR
	45.10	-	45.60	07				IR
	45.60	-	46.10	08				IR
	46.10	-	46.60	09				IR
	46.60	-	47.10	10		10B		IR
	47.10	-	47.30	11				IR
	47.30	-	47.80	12			12D	C
	47.80	-	48.30	13				C
		-		14	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
14	2	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
14	SW-14	782.15

WRA Top Fe	WRA Base Fe	Thickness Fe
0.0	0.0	0.0

Top (ft)	Sam Top m	Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
0.0			NO SAMPLES				

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

NO GEOCHEMISTRY SAMPLES TAKEN

# Composite Samples	# Bulk Samples	# Duplicate Samples
0	0	0

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
15	SW-15	796.58

WRA Top Fe	WRA Base Fe	Thickness Fe
32.6	39.1	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
107.0	32.60	-	33.10	01				IR
	33.10	-	33.60	02				IR
	33.60	-	34.10	03				IR
	34.10	-	34.60	04		04B		IR
	34.60	-	35.10	05				IR
	35.10	-	35.60	06				IR
	35.60	-	36.10	07				IR
	36.10	-	36.60	08				IR
	36.60	-	37.10	09		09B		IR
	37.10	-	37.60	10				IR
	37.60	-	38.10	11				IR
	38.10	-	38.60	12				IR
	38.60	-	39.10	13				IR
	39.10	-	39.60	14		14B		IR
	39.60	-	40.10	15				IR
	40.10	-	40.60	16				IR
	40.60	-	40.80	17				IR
	40.80	-	41.30	18				C
	41.30	-	41.80	19			19D	C
		-		20	GIOP-104			-
		-		21	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 21

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
16	SW-16	808.24

WRA Top Fe	WRA Base Fe	Thickness Fe
45.9	52.4	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
147.5	44.90	-	45.40	01				C+IR
	45.40	-	45.90	02				IR
	45.90	-	46.40	03				IR
	46.40	-	46.90	04		04B		IR
	46.90	-	47.40	05				IR
	47.40	-	47.90	06				IR
	47.90	-	48.40	07				IR
	48.40	-	48.90	08				IR
	48.90	-	49.40	09		09B		IR
	49.40	-	49.90	10				IR
	49.90	-	50.40	11				IR
	50.40	-	50.90	12				IR
	50.90	-	51.40	13				IR
	51.40	-	51.90	14		14B		IR
	51.90	-	52.40	15				IR
	52.40	-	52.90	16				IR
	52.90	-	53.00	17				IR
	53.00	-	53.50	18				C
	53.50	-	54.00	19			19D	C
		-		20	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 20

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
17	SW-17	801.40

WRA Top Fe	WRA Base Fe	Thickness Fe
40.0	47.5	7.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
128.0	39.00	-	39.50	01				C
	39.50	-	40.00	02				C
	40.00	-	40.50	03				IR
	40.50	-	41.00	04		04B		IR
	41.00	-	41.50	05				IR
	41.50	-	42.00	06				IR
	42.00	-	42.50	07				IR
	42.50	-	43.00	08				IR
	43.00	-	43.50	09				IR
	43.50	-	44.00	10				IR
	44.00	-	44.50	11		11B		IR
	44.50	-	45.00	12				IR
	45.00	-	45.50	13				IR
	45.50	-	46.00	14				IR
	46.00	-	46.50	15				IR
	46.50	-	47.00	16				IR
	47.00	-	47.50	17		17B		IR
	47.50	-	48.00	18				IR
	48.00	-	48.10	19				IR
	48.10	-	48.60	20			20D	C
	48.60	-	49.10	21				C
		-		22	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 22

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No. 18 | Hole ID SW-18 | Collar 800.04

WRA Top Fe 42.1 | WRA Base Fe 50.1 | Thickness Fe 8.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
134.7	41.10	-	41.60	01				C
	41.60	-	42.10	02				C
	42.10	-	42.60	03				IR
	42.60	-	43.10	04		04B		IR
	43.10	-	43.60	05				IR
	43.60	-	44.10	06				IR
	44.10	-	44.60	07				IR
	44.60	-	45.10	08				IR
	45.10	-	45.60	09				IR
	45.60	-	46.10	10		10B		IR
	46.10	-	46.60	11				IR
	46.60	-	47.10	12				IR
	47.10	-	47.60	13				IR
	47.60	-	48.10	14				IR
	48.10	-	48.60	15				IR
	48.60	-	49.10	16		16B		IR
	49.10	-	49.60	17				IR
	49.60	-	50.10	18				IR
	50.10	-	50.60	19				IR
	50.60	-	50.90	20				IR
	50.90	-	51.40	21				C
	51.40	-	51.90	22			22D	C
		-		23	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 23 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar	WRA Top Fe	WRA Base Fe	Thickness Fe
19	SW-19	788.06	30.7	37.2	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
94.0	28.70	-	29.20	01				C
	29.20	-	29.70	02				C
	29.70	-	30.20	03				IR
	30.20	-	30.70	04				IR
	30.70	-	31.20	05				IR
	31.20	-	31.70	06				IR
	31.70	-	32.20	07				LC
	32.20	-	32.70	08				LC
	32.70	-	33.20	09				IR
	33.20	-	33.70	10				LC
	33.70	-	34.20	11				LC
	34.20	-	34.70	12		12B		IR
	34.70	-	35.20	13				IR
	35.20	-	35.70	14				LC
	35.70	-	36.20	15		15B		IR
	36.20	-	36.70	16				IR
	36.70	-	37.20	17				LC
	37.20	-	37.70	18				IR
	37.70	-	38.20	19				IR
	38.20	-	38.60	20				IR
	38.60	-	39.10	21			21D	C
	39.10	-	39.60	22				C
		-		23	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 17

Bulk Samples 2

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No. 20A | Hole ID SW-20A | Collar 785.74

WRA Top Fe 22.3 | WRA Base Fe 28.8 | Thickness Fe 6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
73.3	22.30	-	22.80	01				IR
	22.80	-	23.30	02				IR
	23.30	-	23.80	03		03B		IR
	23.80	-	24.30	04				IR
	24.30	-	24.80	05				IR
	24.80	-	25.30	06				IR
	25.30	-	25.80	07				IR
	25.80	-	26.30	08		08B		IR
	26.30	-	26.80	09				IR
	26.80	-	27.30	10				IR
	27.30	-	27.80	11				IR
	27.80	-	28.30	12				IR
	28.30	-	28.80	13				IR
	28.80	-	29.30	14				IR
	29.30	-	29.80	15		15B	15D	IR
	29.80	-	30.30	16				IR
	30.30	-	30.60	17				IR
		-		18	GIOP-104			-
	30.60	-	31.10	19				C
	31.10	-	31.60	20				C

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 20 | # Bulk Samples 3 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
21	SW-21	779.55

WRA Top Fe	WRA Base Fe	Thickness Fe
		0.0

Top (ft)	Sam Top m	Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
0.0			NO SAMPLES				

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

NO GEOCHEMISTRY SAMPLES TAKEN

# Composite Samples	# Bulk Samples	# Duplicate Samples
0	0	0

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
21R	SW-21R	785.90

WRA Top Fe	WRA Base Fe	Thickness Fe
24.4	30.9	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
76.8	23.40	-	23.90	01				C
	23.90	-	24.40	02				C
	24.40	-	24.90	03				TRAN
	24.90	-	25.40	04				IR
	25.40	-	25.90	05				IR
	25.90	-	26.40	06		06B		IR
	26.40	-	26.90	07				IR
	26.90	-	27.40	08				IR
	27.40	-	27.90	09				IR
	27.90	-	28.40	10		10B		IR
	28.40	-	28.90	11				IR
	28.90	-	29.40	12				IR
	29.40	-	29.90	13				IR
	29.90	-	30.40	14		14B		IR
	30.40	-	30.90	15				IR
	30.90	-	31.40	16				IR
	31.40	-	31.90	17				TRAN
	31.90	-	32.40	18			18D	C
	32.40	-	32.90	19				C
		-		20	GIOP-104			
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						
		-						

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
20	3	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
22	SW-22	789.15

WRA Top Fe	WRA Base Fe	Thickness Fe
29.1	35.5	6.4

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
85.3	26.00	-	26.50	01				C
	26.50	-	27.00	02				C
	27.00	-	27.40	03				IR
	27.40	-	27.90	04				C
	27.90	-	28.40	05				C
	28.40	-	28.90	06				C
	28.90	-	29.10	07				C
	29.10	-	29.60	08				IR
	29.60	-	30.10	09				LC
	30.10	-	30.60	10				IR
	30.60	-	31.10	11		11B		IR
	31.10	-	31.60	12				LC
	31.60	-	32.10	13				IR
	32.10	-	32.60	14				IR
	32.60	-	33.10	15				IR
	33.10	-	33.60	16		16B		IR
	33.60	-	34.10	17				IR
	34.10	-	34.60	18				IR
	34.60	-	35.10	19		19B		IR
	35.10	-	35.50	20				IR
	35.50	-	36.00	21				C
	36.00	-	36.50	22			22D	C
		-		23	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
21	3	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
23	SW-23	782.14

WRA Top Fe	WRA Base Fe	Thickness Fe
25.8	31.3	5.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
79.7	24.30	-	24.80	01				C
	24.80	-	25.30	02				LC
	25.30	-	25.80	03				C
	25.80	-	26.30	04				IR
	26.30	-	26.80	05				LC
	26.80	-	27.30	06		06B		IR
	27.30	-	27.80	07				LC
	27.80	-	28.30	08				IR
	28.30	-	28.80	09				LC
	28.80	-	29.30	10				IR
	29.30	-	29.80	11		11B		IR
	29.80	-	30.30	12				IR
	30.30	-	30.80	13		13B		IR
	30.80	-	31.30	14				IR
	31.30	-	31.80	15				IR
	31.80	-	32.30	16				IR
	32.30	-	32.80	17				IR
	32.80	-	33.20	18				IR
	33.80	-	34.30	19				C
	34.30	-	34.80	20			20D	C
		-		21	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

33.1 - 33.5 = LOST CORE

# Composite Samples	# Bulk Samples	# Duplicate Samples
17	3	1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No. 24 | Hole ID SW-24 | Collar 774.95

WRA Top Fe 19.7 | WRA Base Fe 26.7 | Thickness Fe 7.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
61.2	18.70	-	19.20	01				LC
	19.20	-	19.70	02				T
	19.70	-	20.20	03				IR
	20.20	-	20.70	04				LC
	20.70	-	21.20	05				LC
	21.20	-	21.70	06				LC
	21.70	-	22.20	07				LC
	22.20	-	22.70	08				LC
	22.70	-	23.20	09				LC
	23.20	-	23.70	10				IR
	23.70	-	24.20	11				LC
	24.20	-	24.70	12				IR
	24.70	-	25.20	13				LC
	25.20	-	25.70	14				IR
	25.70	-	26.20	15				LC
	26.20	-	26.70	16				IR
	26.70	-	27.20	17		17B		IR
	27.20	-	27.60	18				IR
	27.60	-	28.10	19			19D	C
	28.10	-	28.60	20				C
		-		21	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 11 | # Bulk Samples 1 | # Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
25	SW-25	794.11

WRA Top Fe	WRA Base Fe	Thickness Fe
24.9	26.7	1.8

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
81.8	24.90	-	25.40	01		01B	01D	IR
	25.40	-	25.90	02				IR
	25.90	-	26.40	03		03B		IR/LC
	26.40	-	26.70	04				LC/IR
		-		05	GIOP-104			-
	26.70	-	27.20	06				C
	27.20	-	27.70	07				C

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples: 7

Bulk Samples: 2

Duplicate Samples: 1

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
26	SW-26	799.66

WRA Top Fe	WRA Base Fe	Thickness Fe
30.8	34.5	3.7

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
96.1	29.30	-	29.80	01				C
	29.80	-	30.30	02				C
	30.30	-	30.80	03		03B		IR
	30.80	-	31.50	04				IR
	31.50	-	32.10	05				IR
	32.10	-	32.60	06				IR
	32.60	-	33.00	07		07B		IR
	33.00	-	33.50	08				IR
	33.50	-	34.00	09				IR
	34.00	-	34.50	10				IR
	34.50	-	35.00	11		11B		IR
	35.00	-	35.60	12				IR
	35.60	-	36.00	13				IR+C
	36.00	-	36.50	14			14D	C
	36.50	-	37.00	15				C
		-		16	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 16

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
27	SW-27	802.61

WRA Top Fe	WRA Base Fe	Thickness Fe
36.2	40.2	4.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
117.0		-		01	GIOP-104			-
	35.66	-	36.16	02		02B		IR
	36.16	-	36.66	03				IR
	36.66	-	37.16	04				IR
	37.16	-	37.66	05				IR
	37.66	-	38.16	06		06B		IR
	38.16	-	38.66	07			07D	IR
	38.66	-	39.16	08				IR
	39.16	-	39.66	09				IR
	39.66	-	40.16	10				IR
	40.16	-	40.23	11		11B		IR
	40.23	-	40.73	12				C
	40.73	-	41.23	13				LC
	41.23	-	41.73	14				C
		-		15	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 14

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
28	SW-28	792.78

WRA Top Fe	WRA Base Fe	Thickness Fe
22.4	25.6	3.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
73.4	22.40	-	22.90	01		01B		IR
	22.90	-	23.40	02				LC
	23.40	-	23.90	03				IR
	23.90	-	24.40	04		04B		IR
	24.40	-	24.90	05			05D	IR
	24.90	-	25.40	06				IR
	25.40	-	25.60	07		07B		IR
		-		08	GIOP-104			-
	25.60	-	26.10	09				LC
	26.10	-	26.60	10				TRAN
	26.60	-	27.10	11				C
	27.10	-	27.60	12				C
	27.60	-	28.10	13				C
	28.10	-	28.60	14				C
	28.60	-	29.10	15				C

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

Composite Samples 13

Bulk Samples 3

Duplicate Samples 1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
29	SW-29	790.66

WRA Top Fe	WRA Base Fe	Thickness Fe
21.0	24.0	3.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
65.8	20.00	-	20.50	01				C
	20.50	-	21.00	02				C+LC
	21.00	-	21.50	03			03D	IR
	21.50	-	22.00	04		04B		IR
	22.00	-	22.50	05				IR+LC
	22.50	-	23.00	06				LC
	23.00	-	23.50	07				IR
	23.50	-	24.00	08				IR
	24.00	-	24.50	09		09B		IR
	24.50	-	25.00	10				IR+LC
	25.00	-	25.50	11				LC
	25.50	-	26.00	12				LC
		-		13	GIOP-104			-
	26.00	-	26.50	14		14B		IR
	26.50	-	26.60	15				IR
	26.60	-	27.10	16				C
	27.10	-	27.60	17				C

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
14	3	1

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Geochemistry Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
30	SW-30	799.02

WRA Top Fe	WRA Base Fe	Thickness Fe
32.6	37.5	4.9

Top (ft)	Sam Top m		Sam Bot m	Sample No.	Standard No	Bulk Den No	Duplicate No.	Note ID
101.9	31.10	-	31.60	01				C
	31.60	-	32.10	02				C
	32.10	-	32.60	03				IR
	32.60	-	33.10	04				IR
	33.10	-	33.60	05		05B		IR
	33.60	-	34.10	06				IR
	34.10	-	34.60	07		07B		IR
	34.60	-	35.10	08				IR
	35.10	-	35.60	09				IR
	35.60	-	36.10	10		10B		IR
	36.10	-	36.60	11				IR
	36.60	-	37.00	12				IR
	37.00	-	37.50	13				C
		-		14	GIOP-104			-
	37.50	-	38.00	15			15D	C
	38.00	-	38.50	16				C
		-		17	GIOP-104			-

Sampling Notes IR=Iron NS=Not Sampled LC=Lost Core C=Clay SH=Shale M=Mudstone CG=Conglomerate

# Composite Samples	# Bulk Samples	# Duplicate Samples
17	3	1

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Metallurgy Sample Logs

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	1A	Hole ID	SW-01A	Collar	783.10
WRA Top Fe	34.5	WRA Base Fe	42.8	Thickness Fe	8.3

Top (ft)	Sam Top m		Sam Bot m	Sample No.
109.9	33.50	-	34.50	01M
	34.50	-	35.50	02M
	35.50	-	36.50	03M
	36.50	-	37.50	04M
	37.50	-	38.50	05M
	38.50	-	39.50	06M
	39.50	-	40.50	07M
	40.50	-	41.50	08M
	41.50	-	42.80	09M
	42.80	-	43.80	10M
	43.80	-	44.80	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Clay : 01M, 10M, 11M
Iron : 02M-09M

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	2A	Hole ID	SW-02A	Collar	778.92
WRA Top Fe	30.6	WRA Base Fe	37.9	Thickness Fe	7.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.
100.5	30.63	-	31.63	01M
	31.63	-	32.63	02M
	32.63	-	33.63	03M
	33.63	-	34.63	04M
	34.63	-	35.63	05M
	35.63	-	36.63	06M
	36.63	-	37.63	07M
	37.63	-	37.87	08M
	37.87	-	38.87	09M
	38.87	-	39.87	10M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples 10

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	3A	Hole ID	SW-03A	Collar	778.79
WRA Top Fe	28.1	WRA Base Fe	32.5	Thickness Fe	4.4

Top (ft)	Sam Top m		Sam Bot m	Sample No.
89.0	27.13	-	28.13	01M
	28.13	-	29.13	02M
	29.13	-	30.13	03M
	30.13	-	31.13	04M
	31.13	-	32.13	05M
	32.13	-	33.13	06M
	33.13	-	33.22	07M
	33.22	-	34.22	08M
	34.22	-	35.22	09M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples 9

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No. 4 | Hole ID SW-04 | Collar 785.44

WRA Top Fe 0.0 | WRA Base Fe 0.0 | Thickness Fe 0.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
		-		NO SAMPLES

NO METALLURGICAL SAMPLES TAKEN

Composite Samples 0

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
5	SW-05	798.71

WRA Top Fe	WRA Base Fe	Thickness Fe
46.0	54.0	8.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
141.0	42.98	-	43.98	01M
	43.98	-	44.29	02M
	44.29	-	45.29	03M
	45.29	-	45.45	04M
	45.45	-	46.45	05M
	46.45	-	47.45	06M
	47.45	-	48.45	07M
	48.45	-	49.45	08M
	49.45	-	50.45	09M
	50.45	-	51.45	10M
	51.45	-	52.45	11M
	52.45	-	53.45	12M
	53.45	-	53.95	13M
	53.95	-	54.95	14M
	54.95	-	55.47	15M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 15

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	6	Hole ID	SW-06	Collar	796.02
WRA Top Fe	40.8	WRA Base Fe	48.6	Thickness Fe	7.8

Top (ft)	Sam Top m		Sam Bot m	Sample No.
130.6	39.80	-	40.80	01M
	40.80	-	41.80	02M
	41.80	-	42.80	03M
	42.80	-	43.80	04M
	43.80	-	44.80	05M
	44.80	-	45.80	06M
	45.80	-	46.80	07M
	46.80	-	47.80	08M
	47.80	-	48.60	09M
	48.60	-	49.60	10M
	49.60	-	50.60	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

C = 01M, 10M, 11M
IR = 02M-09M

Composite Samples 11

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
7	SW-07	790.30

WRA Top Fe	WRA Base Fe	Thickness Fe
30.0	33.7	3.7

Top (ft)	Sam Top m		Sam Bot m	Sample No.
92.0	28.00	-	29.00	01M
	29.00	-	30.00	02M
	30.00	-	31.00	03M
	31.00	-	32.00	04M
	32.00	-	33.00	05M
	33.00	-	33.70	06M
	33.70	-	34.40	07M
	34.40	-	35.40	08M
	35.40	-	36.30	09M
	36.30	-	37.30	10M
	37.30	-	38.30	11M
	38.30	-	39.30	12M
	39.30	-	40.30	13M
	40.30	-	40.50	14M
	40.50	-	41.50	15M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 15

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	8	Hole ID	SW-08	Collar	785.40
WRA Top Fe	0.0	WRA Base Fe	0.0	Thickness Fe	0.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
0.0		-		NO SAMPLES
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

NO METALLURGICAL SAMPLES TAKEN

Composite Samples: 0

Dennis Simoneau
Core Cutting Technician

N/A
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
9	SW-09	798.97

WRA Top Fe	WRA Base Fe	Thickness Fe
34.9	43.9	9.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
111.3	33.90	-	34.90	01M
	34.90	-	35.90	02M
	35.90	-	36.90	03M
	36.90	-	37.90	04M
	37.90	-	38.90	05M
	38.90	-	39.90	06M
	39.90	-	40.90	07M
	40.90	-	41.90	08M
	41.90	-	42.90	09M
	42.90	-	43.90	10M
	43.90	-	44.90	11M
	44.90	-	45.50	12M
	45.50	-	46.50	13M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples 13

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
10	SW-10	806.07

WRA Top Fe	WRA Base Fe	Thickness Fe
42.1	51.3	9.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.
134.5	41.10	-	42.10	01M
	42.10	-	43.10	02M
	43.10	-	44.10	03M
	44.10	-	45.10	04M
	45.10	-	46.10	05M
	46.10	-	46.30	06M
	46.30	-	47.30	07M
	47.30	-	47.70	08M
	47.70	-	48.70	09M
	48.70	-	49.70	10M
	49.70	-	50.70	11M
	50.70	-	51.70	12M
	51.70	-	52.70	13M
	52.70	-	53.70	14M
	53.70	-	54.00	15M
	54.00	-	55.00	16M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

06M = LOST CORE

- Iron interval split into two sections separated by a thin (2.2 m) shale unit
- 7.0 meter combined iron thickness' (>25% Fe) over a 9.2 meter interval - See handwritten highlighted notes above

Composite Samples: 16

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
11	SW-11	808.13

WRA Top Fe	WRA Base Fe	Thickness Fe
49.9	57.0	7.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.
160.4	48.90	-	49.90	01M
	49.90	-	50.90	02M
	50.90	-	51.90	03M
	51.90	-	52.90	04M
	52.90	-	53.90	05M
	53.90	-	54.90	06M
	54.90	-	55.90	07M
	55.90	-	56.90	08M
	56.90	-	57.00	09M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 9

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	12	Hole ID	SW-12	Collar	803.74
WRA Top Fe	48.2	WRA Base Fe	55.3	Thickness Fe	7.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.
151.6	46.20	-	47.20	01M
	47.20	-	48.20	02M
	48.20	-	49.20	03M
	49.20	-	50.20	04M
	50.20	-	51.20	05M
	51.20	-	52.20	06M
	52.20	-	53.20	07M
	53.20	-	54.20	08M
	54.20	-	55.20	09M
	55.20	-	55.30	10M
	55.30	-	56.30	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples 11

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
13	SW-13	797.01

WRA Top Fe	WRA Base Fe	Thickness Fe
44.1	47.3	3.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.
138.0	42.10	-	43.10	01M
	43.10	-	44.10	02M
	44.10	-	45.10	03M
	45.10	-	46.10	04M
	46.10	-	47.10	05M
	47.10	-	47.30	06M
	47.30	-	48.30	07M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 7

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	14	Hole ID	SW-14	Collar	782.15
WRA Top Fe	0.0	WRA Base Fe	0.0	Thickness Fe	0.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
0.0		-		NO SAMPLES
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

NO METALLURGY SAMPLES TAKEN

 # Composite Samples 0

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
15	SW-15	796.58

WRA Top Fe	WRA Base Fe	Thickness Fe
32.6	39.1	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
107.0	32.60	-	33.60	01M
	33.60	-	34.60	02M
	34.60	-	35.60	03M
	35.60	-	36.60	04M
	36.60	-	37.60	05M
	37.60	-	38.60	06M
	38.60	-	39.60	07M
	39.60	-	40.60	08M
	40.60	-	40.80	09M
	40.80	-	41.80	10M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 10

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
16	SW-16	808.24

WRA Top Fe	WRA Base Fe	Thickness Fe
45.9	52.4	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
147.5	44.90	-	45.90	01M
	45.90	-	46.90	02M
	46.90	-	47.90	03M
	47.90	-	48.90	04M
	48.90	-	49.90	05M
	49.90	-	50.90	06M
	50.90	-	51.90	07M
	51.90	-	52.90	08M
	52.90	-	53.00	09M
	53.00	-	54.00	10M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 10

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
17	SW-17	801.40

WRA Top Fe	WRA Base Fe	Thickness Fe
40.0	47.5	7.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
128.0	39.00	-	40.00	01M
	40.00	-	41.00	02M
	41.00	-	42.00	03M
	42.00	-	43.00	04M
	43.00	-	44.00	05M
	44.00	-	45.00	06M
	45.00	-	46.00	07M
	46.00	-	47.00	08M
	47.00	-	48.00	09M
	48.00	-	48.10	10M
	48.10	-	49.10	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
18	SW-18	800.04

WRA Top Fe	WRA Base Fe	Thickness Fe
42.1	50.1	8.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
134.7	41.10	-	42.10	01M
	42.10	-	43.10	02M
	43.10	-	44.10	03M
	44.10	-	45.10	04M
	45.10	-	46.10	05M
	46.10	-	47.10	06M
	47.10	-	48.10	07M
	48.10	-	49.10	08M
	49.10	-	50.10	09M
	50.10	-	50.90	10M
	50.90	-	51.90	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
19	SW-19	788.06

WRA Top Fe	WRA Base Fe	Thickness Fe
30.7	37.2	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
94.0	28.70	-	29.70	01M
	29.70	-	30.70	02M
	30.70	-	31.70	03M
	31.70	-	32.70	04M
	32.70	-	33.70	05M
	33.70	-	34.70	06M
	34.70	-	35.70	07M
	35.70	-	36.70	08M
	36.70	-	37.70	09M
	37.70	-	38.60	10M
	38.60	-	39.60	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Sample 04M = Lost Core

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
20A	SW-20A	785.74

WRA Top Fe	WRA Base Fe	Thickness Fe
22.3	28.8	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
73.3	22.30	-	23.30	01M
	23.30	-	24.30	02M
	24.30	-	25.30	03M
	25.30	-	26.30	04M
	26.30	-	27.30	05M
	27.30	-	28.30	06M
	28.30	-	29.30	07M
	29.30	-	30.30	08M
	30.30	-	30.60	09M
	30.60	-	31.60	10M
	31.60	-	32.60	11M
	32.60	-	33.20	12M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	Hole ID	Collar
21	SW-21	779.55

WRA Top Fe	WRA Base Fe	Thickness Fe
		0.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
0.0		-		NO SAMPLES
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

NO METALLURGICAL SAMPLES TAKEN

Composite Samples: 0

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
21R	SW-21R	785.90

WRA Top Fe	WRA Base Fe	Thickness Fe
24.4	30.9	6.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
76.8	23.40	-	24.40	01M
	24.40	-	25.40	02M
	25.40	-	26.40	03M
	26.40	-	27.40	04M
	27.40	-	28.40	05M
	28.40	-	29.40	06M
	29.40	-	30.40	07M
	30.40	-	31.40	08M
	31.40	-	31.90	09M
	31.90	-	32.90	10M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 10

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
22	SW-22	789.15

WRA Top Fe	WRA Base Fe	Thickness Fe
29.1	35.5	6.4

Top (ft)	Sam Top m		Sam Bot m	Sample No.
85.3	26.00	-	27.00	01M
	27.00	-	27.40	02M
	27.40	-	28.40	03M
	28.40	-	29.10	04M
	29.10	-	30.10	05M
	30.10	-	31.10	06M
	31.10	-	32.10	07M
	32.10	-	33.10	08M
	33.10	-	34.10	09M
	34.10	-	35.10	10M
	35.10	-	35.50	11M
	35.50	-	36.50	12M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 12

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	23	Hole ID	SW-23	Collar	782.14
WRA Top Fe	25.8	WRA Base Fe	31.3	Thickness Fe	5.5

Top (ft)	Sam Top m		Sam Bot m	Sample No.
79.7	24.30	-	25.30	01M
	25.30	-	25.80	02M
	25.80	-	26.80	03M
	26.80	-	27.80	04M
	27.80	-	28.80	05M
	28.80	-	29.80	06M
	29.80	-	30.80	07M
	30.80	-	31.80	08M
	31.80	-	32.80	09M
	32.80	-	33.20	10M
	33.20	-	34.20	11M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

33.1 - 33.5 = LOST CORE

Composite Samples: 11

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name: 2012 Clear Hills Drilling Program

Project Area: South Whitemud River

Hole No.	24	Hole ID	SW-24	Collar	774.95
WRA Top Fe	19.7	WRA Base Fe	26.7	Thickness Fe	7.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
61.2	18.70	-	19.70	01M
	19.70	-	20.70	02M
	20.70	-	21.70	03M
	21.70	-	22.70	04M
	22.70	-	23.70	05M
	23.70	-	24.70	06M
	24.70	-	25.70	07M
	25.70	-	26.70	08M
	26.70	-	27.60	09M
	27.60	-	28.60	10M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

03M AND 04M = LOST CORE (i.e. no core recovered between 20.7 m - 22.7 m)

Composite Samples: 10

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
25	SW-25	794.11

WRA Top Fe	WRA Base Fe	Thickness Fe
24.9	26.7	1.8

Top (ft)	Sam Top m		Sam Bot m	Sample No.
81.8	24.90	-	25.90	01M
	25.90	-	26.70	02M
	26.70	-	27.70	03M
	27.70	-	28.70	04M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 4

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
26	SW-26	799.66

WRA Top Fe	WRA Base Fe	Thickness Fe
30.8	34.5	3.7

Top (ft)	Sam Top m		Sam Bot m	Sample No.
96.1	29.30	-	30.30	01M
	30.30	-	31.30	02M
	31.30	-	32.30	03M
	32.30	-	33.30	04M
	33.30	-	34.30	05M
	34.30	-	35.30	06M
	35.30	-	35.60	07M
	35.60	-	36.60	08M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 8

Dennis Simoneau
Core Cutting Technician

Quinn Brown
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	27	Hole ID	SW-27	Collar	802.61
WRA Top Fe	36.2	WRA Base Fe	40.2	Thickness Fe	4.1

Top (ft)	Sam Top m		Sam Bot m	Sample No.
117.0	35.66	-	36.66	01M
	36.66	-	37.66	02M
	37.66	-	38.66	03M
	38.66	-	39.66	04M
	39.66	-	40.23	05M
	40.23	-	41.23	06M
	41.23	-	42.23	07M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples 7

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
28	SW-28	792.78

WRA Top Fe	WRA Base Fe	Thickness Fe
22.4	25.6	3.2

Top (ft)	Sam Top m		Sam Bot m	Sample No.
73.4	22.40	-	23.40	01M
	23.40	-	24.40	02M
	24.40	-	25.40	03M
	25.40	-	25.60	04M
	25.60	-	26.60	05M
	26.60	-	27.60	06M
	27.60	-	28.60	07M
	28.60	-	29.60	08M

Composite Samples 8

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
29	SW-29	790.66

WRA Top Fe	WRA Base Fe	Thickness Fe
21.0	24.0	3.0

Top (ft)	Sam Top m		Sam Bot m	Sample No.
65.8	20.00	-	21.00	01M
	21.00	-	21.50	02M
	21.50	-	22.50	03M
	22.50	-	23.50	04M
	23.50	-	24.50	05M
	24.50	-	25.50	06M
	25.50	-	26.50	07M
	26.50	-	26.60	08M
	26.60	-	27.60	09M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

Composite Samples: 9

Dennis Simoneau
Core Cutting Technician

Andrew Reader
Core Sampling Supervisor

ironstone RESOURCES

Metallurgy Sample Log

Program Name:
2012 Clear Hills Drilling Program

Project Area:
South Whitemud River

Hole No.	Hole ID	Collar
30	SW-30	799.02

WRA Top Fe	WRA Base Fe	Thickness Fe
32.6	37.5	4.9

Top (ft)	Sam Top m		Sam Bot m	Sample No.
101.9	31.10	-	32.10	01M
	32.10	-	33.10	02M
	33.10	-	34.10	03M
	34.10	-	35.10	04M
	35.10	-	36.10	05M
	36.10	-	37.00	06M
	37.00	-	38.00	07M
	38.00	-	39.00	08M
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		

01M, 07M and 08M = Shale

02M - 06M = Iron

Composite Samples: 8

Dennis Simoneau
Core Cutting Technician

Liam Murphy
Core Sampling Supervisor

ironstone
RESOURCES

2012 South Whitemud Drilling Program

Analytical Results

Analyte Symbol	Al2O3	BaO	CaO	Cr2O3	Cu	Fe	K2O	MgO	Mn	Na2O	Ni	P	S	SiO2	TiO2	V2O5	Zn	Zr	Total	LOI
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Detection Limit																				
Analysis Method	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100	NA-XF100
SW 01A 01	12.13	0.07	1.32	0.025	0.004	**11.97**	2.234	1.42	0.043	0.33	0.004	0.223	0.566	53.56	0.624	**0.081**	0.023	<0.01	93.38	8.77
SW 01A 02	14.94	0.09	0.91	0.018	0.003	**4.90**	2.891	1.46	0.008	0.45	0.003	0.067	0.534	62.71	0.837	**0.051**	0.012	<0.01	96.40	6.53
SW 01A 03	8.50	0.05	1.68	0.038	0.007	**26.64**	1.109	1.29	0.050	0.13	0.010	0.362	0.646	36.15	0.343	**0.193**	0.053	<0.01	88.18	10.94
SW 01A 04	7.04	0.04	2.07	0.037	0.008	**30.57**	0.896	1.41	0.122	0.12	0.010	0.535	0.491	29.94	0.285	**0.195**	0.059	<0.01	86.43	12.62
SW 01A 05	6.38	0.04	1.97	0.031	0.007	**32.74**	0.743	1.35	0.120	0.11	0.010	0.563	0.242	26.66	0.232	**0.209**	0.065	<0.01	84.62	13.17
SW 01A 06	6.25	0.04	1.70	0.032	0.009	**34.86**	0.652	1.31	0.096	0.10	0.013	0.563	0.187	25.86	0.213	**0.228**	0.063	<0.01	84.54	12.37
SW 01A 07	6.23	0.03	1.08	0.034	0.008	**35.75**	0.619	1.27	0.103	0.09	0.016	0.475	0.089	25.98	0.201	**0.235**	0.064	<0.01	84.34	12.07
SW 01A 08	7.41	0.05	0.97	0.027	0.007	**29.66**	0.930	1.22	0.065	0.10	0.014	0.425	0.161	35.02	0.319	**0.185**	0.050	<0.01	86.31	9.70
SW 01A 09	7.19	0.11	1.70	0.026	0.007	**30.83**	0.810	1.48	0.089	0.11	0.011	0.566	0.139	31.63	0.290	**0.196**	0.057	<0.01	86.17	10.93
SW 01A 10	6.86	0.03	1.77	0.028	0.008	**33.19**	0.703	1.56	0.067	0.10	0.013	0.508	0.337	28.89	0.257	**0.207**	0.061	<0.01	85.56	10.99
SW 01A 11	6.17	0.03	2.23	0.024	0.008	**34.86**	0.589	1.55	0.080	0.10	0.011	0.712	0.257	25.99	0.220	**0.201**	0.058	<0.01	84.30	11.22
SW 01A 12	5.73	0.02	2.59	0.027	0.007	**33.99**	0.466	1.85	0.096	0.10	0.013	0.709	0.173	25.95	0.178	**0.219**	0.064	<0.01	84.71	12.53
SW 01A 13	5.81	0.03	2.45	0.032	0.008	**32.29**	0.419	2.38	0.080	0.11	0.017	0.483	0.708	27.63	0.163	**0.240**	0.074	<0.01	86.07	13.16
SW 01A 14 Lost Core																				
SW 01A 16	5.47	0.04	3.34	0.029	0.007	**31.74**	0.397	2.16	0.108	0.11	0.014	0.762	0.187	26.19	0.153	**0.226**	0.059	<0.01	85.17	14.18
SW 01A 17 Lost Core																				
SW 01A 18 Lost Core																				
SW 01A 19	4.19	0.03	3.68	0.015	0.005	**29.29**	0.665	1.97	0.204	0.13	0.006	0.643	0.168	25.23	0.182	**0.086**	0.031	<0.01	85.68	19.16
SW 01A 20	5.55	0.04	4.15	0.021	0.006	**26.48**	0.808	2.04	0.181	0.17	0.009	0.775	0.200	27.94	0.231	**0.115**	0.048	<0.01	86.93	18.18
SW 01A 21	15.97	0.08	0.62	0.021	0.003	**3.01**	2.936	1.40	0.008	0.47	0.002	0.097	0.415	65.33	0.896	**0.048**	0.011	<0.01	97.40	6.09
SW 01A 22	15.65	0.08	0.49	0.018	0.002	**2.87**	2.900	1.35	0.007	0.47	0.001	0.068	0.454	66.27	0.891	**0.047**	0.011	<0.01	97.29	5.71
SW 02A 01	6.97	0.07	3.75	0.022	0.006	**24.10**	1.056	1.58	0.106	0.18	0.005	0.862	0.109	34.89	0.309	**0.139**	0.038	<0.01	88.05	13.87
SW 02A 02	6.89	0.04	2.26	0.028	0.006	**29.52**	0.893	1.61	0.119	0.12	0.009	0.595	0.066	30.31	0.279	**0.181**	0.052	<0.01	86.26	13.29
SW 02A 03	6.01	0.03	1.35	0.028	0.006	**33.45**	0.640	1.39	0.096	0.10	0.009	0.401	0.103	26.26	0.198	**0.217**	0.054	<0.01	83.10	12.77
SW 02A 04	6.40	0.05	2.00	0.027	0.007	**33.15**	0.718	1.39	0.106	0.12	0.010	0.677	0.057	25.91	0.222	**0.216**	0.056	<0.01	83.64	12.55
SW 02A 05	6.96	0.04	1.85	0.027	0.008	**31.34**	0.839	1.44	0.102	0.11	0.014	0.602	0.063	29.35	0.267	**0.202**	0.052	<0.01	85.31	12.04
SW 02A 06 Lost Core																				
SW 02A 07	7.05	0.08	1.65	0.025	0.006	**26.84**	0.941	1.44	0.068	0.11	0.009	0.444	0.193	37.62	0.312	**0.163**	0.048	<0.01	87.42	10.42
SW 02A 08	7.65	0.06	1.98	0.027	0.006	**26.21**	0.927	1.93	0.078	0.13	0.009	0.486	0.098	35.81	0.329	**0.182**	0.050	<0.01	87.62	11.68
SW 02A 09 Lost Core																				
SW 02A 10 Lost Core																				
SW 02A 11 Lost Core																				
SW 02A 12 Lost Core																				
SW 02A 13 Lost Core																				
SW 02A 14	6.27	0.04	2.80	0.022	0.007	**29.49**	0.740	2.36	0.120	0.11	0.011	0.515	0.133	26.64	0.253	**0.163**	0.045	<0.01	86.14	16.43
SW 02A 15	4.34	0.03	3.75	0.016	0.007	**31.39**	0.676	1.93	0.174	0.13	0.007	0.734	0.240	23.21	0.180	**0.093**	0.028	<0.01	85.19	18.25
SW 02A 16	14.91	0.09	0.50	0.019	0.003	**3.39**	2.802	1.40	0.013	0.48	0.005	0.087	0.767	67.16	0.869	**0.045**	0.019	<0.01	98.09	5.54
SW 02A 17	15.16	0.09	0.31	0.019	0.003	**3.55**	2.857	1.45	0.013	0.47	0.004	0.072	0.715	66.60	0.885	**0.044**	0.015	<0.01	97.87	5.82
SW 02A 18	14.64	0.08	0.37	0.019	0.003	**3.71**	2.774	1.42	0.012	0.49	0.002	0.089	0.864	65.81	0.862	**0.043**	0.013	<0.01	96.79	5.59
SW 03A 01	15.54	0.09	0.37	0.018	0.003	**4.32**	2.963	1.63	0.013	0.48	0.003	0.063	0.635	64.70	0.872	**0.053**	0.015	<0.01	97.52	5.76
SW 03A 02	14.93	0.09	0.31	0.017	0.003	**5.83**	2.819	1.56	0.011	0.46	0.003	0.052	0.421	63.30	0.846	**0.055**	0.015	<0.01	96.60	5.87
SW 03A 03	7.33	0.06	1.66	0.025	0.007	**26.51**	1.147	1.11	0.105	0.18	0.007	0.230	0.128	37.81	0.325	**0.144**	0.038	<0.01	87.75	10.93
SW 03A 04	8.27	0.09	4.08	0.026	0.006	**25.23**	1.248	1.17	0.113	0.20	0.008	1.152	0.126	34.75	0.379	**0.154**	0.044	<0.01	87.06	10.02
SW 03A 05 Lost Core																				
SW 03A 06	7.51	0.06	5.73	0.025	0.007	**24.95**	1.081	1.37	0.097	0.15	0.010	0.475	0.258	34.08	0.328	**0.163**	0.044	<0.01	88.07	11.74
SW 03A 08	6.89	0.06	3.69	0.025	0.007	**29.89**	0.908	1.62	0.104	0.15	0.011	0.660	0.316	29.12	0.281	**0.178**	0.055	<0.01	85.74	11.80
SW 03A 09	6.32	0.04	2.93	0.027	0.007	**30.15**	0.769	2.06	0.142	0.13	0.012	0.476	0.178	26.98	0.244	**0.178**	0.054	<0.01	86.00	15.32
SW 03A 10	6.49	0.04	2.62	0.027	0.006	**28.73**	0.804	2.11	0.134	0.13	0.011	0.435	0.275	29.12	0.243	**0.195**	0.055	<0.01	86.60	15.20
SW 03A 11	6.70	0.04	3.27	0.038	0.006	**25.42**	0.961	2.22	0.089	0.15	0.010	0.593	0.459	32.39	0.270	**0.187**	0.050	<0.01	87.99	15.15
SW 03A 12 Lost Core																				
SW 03A 13	6.64	0.05	2.87	0.034	0.005	**20.97**	1.177	2.17	0.068	0.14	0.040	0.459	0.307	39.75	0.279	**0.148**	0.039	<0.01	90.06	14.94
SW 03A 14	5.69	0.05	2.52	0.027	0.005	**21.85**	1.062	1.85	0.104	0.14	0.005	0.505	0.081	41.88	0.244	**0.113**	0.028	<0.01	89.96	13.82
SW 03A 15	6.90	0.08	1.41	0.024	0.004	**14.10**	1.350	1.26	0.046	0.20	0.007	0.264	0.263	58.84	0.297	**0.120**	0.026	<0.01	93.04	7.86
SW 03A 16	12.52	0.08	0.72	0.025	0.003	**7.66**	2.343	1.44	0.022	0.37	0.004	0.160	0.638	63.19	0.700	**0.064**	0.017	<0.01	96.39	6.44
SW 03A 17	14.61	0.09	0.32	0.021	0.004	**5.40**	2.710	1.55	0.011	0.45	0.005	0.066	0.649	64.93	0.852	**0.053**	0.015	<0.01	97.39	5.66
SW 05 02	11.59	0.07	2.34	0.020	0.005	**16.80**	1.967	1.15	0.055	0.32	0.008	0.530	0.901	46.70	0.566	**0.118**	0.040	<0.01	91.72	8.55
SW 05 03	11.53	0.07	1.59	0.024	0.005	**16.60**	2.044	1.12	0.057	0.29	0.006	0.228	0.945	48.40	0.568	**0.103**	0.035	<0.01	91.95	8.34
SW 05 04	15.85	0.09	0.44	0.020	0.003	**4.01**	3.120	1.33	0.008	0.46	0.002	0.065	0.297	64.96	0.884	**0.054**	0.025	<0.01	97.53	5.91
SW 05 05	15.02	0.10	0.59	0.018	0.003	**5.24**	2.874	1.33	0.023	0.46	0.003	0.057	0.323	63.60	0.854	**0.051**	0.015	<0.01	96.83	6.27
SW 05 06	14.30	0.10	0.57	0.018	0.004	**9.90**	2.639	1.40	0.061	0.39	0.006	0.066	0.180	56.58	0.781	**0.056**	0.030	<0.01	94.84	7.77
SW 05 07	9.32	0.05	4.78	0.023	0.006	**21.97**	1.281	1.19	0.170	0.16	0.013	0.542	1.753	34.66	0.378	**0.153**	0.074	<0.01	89.01	12.49
SW 05 08	7.92	0.04	2.07	0.026	0.007	**30.04**	1.002	1.23	0.093	0.10	0.013	0.265	0.790	31.37	0.307	**0.182**	0.065	<0.01	87.08	11.57
SW 05 09 Lost Core																				
SW 05 10	6.45	0.06	2.07	0.030	0.008	**33.94**	0.705	1.22	0.109	0.11	0.012	0.700	0.177	26.76	0.228	**0.223**	0.061	<0.01	84.53	11.68
SW 05 11	6.60	0.05	1.11	0.035	0.008	**35.14**	0.666	1.33	0.105	0.10	0.012	0.496	0.054	26.54	0.217	**0.245**	0.061	<0.01	84.48	11.73
SW 05 12 Lost Core																				
SW 05 13	5.58	0.03	2.34	0.027	0.008	**33.21**	0.594	1.62	0.512	0.09	0.016	0.512	0.058	25.09	0.196	**0.186**	0.049	<0.01	84.91	14.80
SW 05 14	6.10	0.03	1.23	0.025	0.008	**36.64**	0.610	1.38	0.061	0.09	0.011	0.468	0.106	25.98	0.226	**0.192**	0.054	<0.01	83.89	10.68
SW 05 15 Lost Core																				
SW 05 17	5.60	0.07	2.18	0.031	0.007	**27.89**	0.696	0.97	0.067	0.14	0.009	0.716	0.102	39.37	0.218	**0.159**	0.042	<0.01	87.08	8.83
SW 05 18	5.09	0.05	1.12	0.033	0.008	**33.75**	0.553	0.89	0.074	0.11	0.010	0.486	0.124	32.87	0.196	**0.200**	0.046	<0.01	85.15	9.56
SW 05 19	6.85	0.03	1.56	0.032	0.008	**33.57**	0.688	1.56	0.111	0.11	0.011	0.533	0.061	27.19	0.233	**0.238**	0.066	<0.01	84.94	12.10
SW 05 20	6.59	0.03	3.08	0.030	0.007	**30.63**	0.599	2.37	0.122	0.13	0.014	0.679	0.200	26.75	0.222	**0.215**	0.069	<0.01	85.82	14.10
SW 05 21	6.15	0.05	3.62	0.031	0.007	**30.30**	0.475	2.82	0.102	0.13	0.015	0.724	0.368	26.12	0.186	**0.232**	0.075	<0.01	86.07	14.67
SW 05 22	5.23	0.03	2.73	0.041	0.007	**32.81**	0.383	2.41	0.087	0.10	0.013	0.514	0.225	26.16	0.148	**0.224**	0.060	<0.01	85.30	14.15
SW 05 23	5.78	0.03	3.57	0.031	0.007	**31.77**	0.467	2.37	0.102	0.12	0.022	0.732	0.517	24.62	0.172	**0.220**	0.061	<0.01	85.20	14.63
SW 05 24	4.87	0.02	5.27	0.022	0.006	**31.79**	0.339	1.96	0.153	0.09	0.012	0.567	1.873	19.44	0.106	**0.176**	0.062	<0.01	84.56	17.82
SW 05 25	13.32	0.16	1.28	0.018	0.003	**5.30**	2.408	1.14	0.016	0.45	0.005	0.091	0.978	63.62	0.715	**0.045**	0.016	<0.01	97.04	7.47
SW 05 27	12.10	0.08	1.52	0.025	0.004	**2.60**	2.289	1.01	0.005	0.41	<0.001	0.062	1.144	69.69	0.736	**0.042**	0.010	<0.01	97.85	6.13
SW 05 28	14.48	0.08	0.52	0.022	0.002	**3.48**	2.685	1.18	0.006	0.47	<0.001	0.075	0.756	66.29	0.837	**0.045**	0.007	<0.01	97.58	6.66
SW 06 01	15.76	0.09	0.32	0.021	0.003	**5.05**	3.005	1.66	0.011	0.46	0.004	**0.062**	**0.718**	63.88	0.882	**0.056**	**0.016**	**<0.01**	98.06	6.07
SW 06 02	14.65	0.09	0.57	0.020	0.004	**7.58**	2.676	1.61	0.020	0.40	0.004	0.086	0.780	60.69	0.796	**0.071**	0.020	<0.01	97.02	6.97
SW 06 09	5.94	0.04	3.00	0.018	0.006	**28.52**	0.843	2.02	0.147	0.11	0.007	0.268	0.178	25.64	0.248	**0.126**	0.040	<0.01	87.08	19.94
SW 06 04	7.41	0.04	1.60	0.031	0.006	**28.15**	0.921	1.81	0.090	0.12	0.009	0.247	0.256	31.61	0.288	**0.217**	0.053	<0.01	87.50	14.65
SW 06 05	6.43	0.04	1.13	0.032	0.007	**30.81**	0.781	1.32	0.086	0.11	0.010	0.343	0.053	32.82	0.240	**0.211**	0.052	<0.01	86.27	11.82
SW 06 06	6.59	0.05	2.72	0.030	0.007	**32.40**	0.764	1.40	0.101	0.12	0.010	0.826	0.045	26.59	0.239	**0.204**	0.056	<0.01	85.06	12.93
SW 06 07	6.35	0.04	1.74	0.030	0.008	**34.69**	0.679	1.27	0.101	0.11	0.011	0.599	0.047	25.79	0.212	**0.224**	0.059	<0.01	84.39	12.43
SW 06 08	6.62	0.04	1.40	0.029	0.007	**33.84**	0.768	1.30	0.104	0.11	0.011	0.484	0.045	27.25	0.238	**0.214**	0.057	<0.01	85.01	12.50
SW 06 09	6.73	0.04	1.80	0.031	0.006	**28.50**	0.872	1.26	0.096	0.12	0.009	0.598	0.052	35.33	0.264	**0.187**	0.045	<0.01	87.20	11.24
SW 06 10	6.90	0.05	1.76	0.025	0.006	**27.01**	0.903	1.41	0.087	0.13	0.015	0.457	0.327	35.97	0.303	**0.166**	0.070	<0.01	87.81	12.23
SW 06 11	6.55	0.04	2.38	0.029	0.007	**30.41**	0.719	1.38	0.096	0.13	0.009	0.721	0.052	31.33	0.249	**0.205**	0.049	<0.01	86.00	11.66
SW 06 12	7.15	0.04	1.50	0.029	0.007	**31.12**	0.788	1.56	0.101	0.12	0.011	0.452	0.064	30.56	0.274	**0.208**	0.057	<0.01	86.17	12.14
SW 06 13	6.34	0.03	2.00	0.029	0.008	**32.51**	0.618	1.65	0.117	0.11	0.012	0.553	0.091	27.50	0.207	**0.211**	0.054	<0.01	85.33	13.30
SW 06 14	5.97	0.03	2.17	0.026	0.007	**32.86**	0.566	1.69	0.097	0.11	0.010	0.568	0.100	27.32	0.202	**0.201**	0.054	<0.01	85.20	13.22
SW 06 15	6.11	0.02	2.41	0.027	0.007	**31.85**	0.598	1.86	0.089	0.12	0.012	0.579	0.139	27.43	0.204	**0.201**	0.055	<0.01	85.28	13.58
SW 06 16	5.52	0.03	2.94	0.026	0.007	**31.90**	0.525	1.87	0.112	0.11	0.012	0.678	0.223	26.78	0.166	**0.200**	0.056	<0.01	85.24	14.11
SW 06 17	5.51	0.06	4.28	0.027	0.006	**27.82**	0.647	2.06	0.132	0.14	0.011	0.866	0.251	28.68	0.176	**0.184**	0.054	<0.01	86.48	15.60
SW 06 18	5.60	0.04	5.93	0.025	0.006	**26.13**	0.769	2.53	0.115	0.13	0.008	0.444	0.130	24.76	0.207	**0.166**	0.045	<0.01	87.99	20.98
SW 06 19	5.70	0.04	3.33	0.029	0.005	**21.94**	0.956	1.84	0.108	0.19	0.006	0.633	0.206	38.80	0.233	**0.131**	0.038	<0.01	89.49	15.31
SW 06 20	5.60	0.05	2.51	0.030	0.004	**16.43**	1.074	1.43	0.072	0.20	0.006	0.496	0.418	51.45	0.246	**0.090**	0.026	<0.01	91.70	11.58
SW 06 21	8.94	0.07	2.37	0.027	0.003	**8.49**	1.786	1.40	0.037	0.32	0.003	0.520	0.557	61.88	0.487	**0.053**	0.011	<0.01	95.70	8.75
SW 06 22	14.71	0.08	0.33	0.021	0.004	**3.11**	2.779	1.43	0.011	0.47	0.004	0.089	0.502	68.74	0.851	**0.044**	0.018	<0.01	98.43	5.23
SW 07 01	16.05	0.10	0.42	0.020	0.003	**4.49**	3.101	1.60	0.010	0.46	0.003	0.066	0.660	64.00	0.896	**0.055**	0.017	<0.01	97.87	5.93
SW 07 02	14.95	0.09	0.46	0.019	0.003	**6.07**	2.827	1.56	0.012	0.43	0.004	0.064	0.793	62.76	0.841	**0.061**	0.018	<0.01	97.36	6.39
SW 07 03	6.93	0.06	2.77	0.026	0.005	**22.72**	1.045	1.74	0.098	0.15	0.011	0.447	1.126	35.05	0.298	**0.140**	0.038	<0.01	89.19	16.54
SW 07 04	8.22	0.06	2.81	0.029	0.006	**22.77**	1.166	1.85	0.085	0.15	0.008	0.491	0.326	36.09	0.362	**0.179**	0.046	<0.01	89.47	14.82
SW 07 05	6.40	0.05	4.48	0.026	0.007	**28.05**	0.847	1.58	0.111	0.14	0.010	1.088	0.056	28.44	0.261	**0.159**	0.046	<0.01	86.46	14.72
SW 07 06	6.69	0.05	2.26	0.029	0.007	**30.26**	0.859	1.49	0.115	0.12	0.010	0.532	0.031	29.49	0.262	**0.182**	0.052	<0.01	86.26	13.84
SW 07 07	6.37	0.05	3.63	0.024	0.007	**31.25**	0.775	1.52	0.130	0.13	0.011	0.943	0.035	25.35	0.238	**0.172**	0.055	<0.01	85.50	14.83
SW 07 08	6.53	0.04	1.76	0.031	0.007	**33.34**	0.669	1.44	0.088	0.11	0.010	0.479	0.030	27.28	0.215	**0.223**	0.056	<0.01	85.26	12.97
SW 07 09	6.87	0.05	2.26	0.027	0.007	**30.42**	0.833	1.55	0.090	0.12	0.010	0.541	0.054	29.53	0.260	**0.192**	0.054	<0.01	86.59	13.73
SW 07 10	6.72	0.04	2.47	0.027	0.006	**27.86**	0.826	1.80	0.098	0.12	0.011	0.436	0.219	31.76	0.276	**0.175**	0.050	<0.01	87.32	14.44
SW 07 11	6.40	0.05	3.58	0.022	0.006	**24.37**	0.915	1.59	0.097	0.14	0.009	0.755	0.194	34.64	0.291	**0.129**	0.035	<0.01	88.06	14.86
SW 07 12	7.03	0.06	4.37	0.023	0.005	**23.15**	1.064	1.48	0.105	0.16	0.008	1.081	0.286	35.07	0.345	**0.118**	0.035	<0.01	87.86	13.48
SW 07 13	11.59	0.07	0.75	0.022	0.004	**9.67**	2.116	1.36	0.013	0.17	0.004	0.072	0.581	60.84	0.680	**0.057**	0.016	<0.01	95.19	7.18
SW 07 14	9.97	0.06	1.25	0.021	0.004	**12.94**	1.759	1.39	0.038	0.17	0.004	0.183	0.448	55.50	0.561	**0.067**	0.019	<0.01	93.79	9.41
SW 07 15	6.04	0.05	3.33	0.024	0.005	**22.07**	0.902	1.79	0.106	0.13	0.007	0.488	0.435	38.80	0.273	**0.119**	0.032	<0.01	89.26	14.66
SW 07 16	6.80	0.06	2.71	0.024	0.005	**23.52**	0.922	1.65	0.080	0.14	0.009	0.525	0.305	39.17	0.285	**0.165**	0.044	<0.01	89.01	12.61

SW 07 17	6.82	0.05	2.80	0.024	0.005	20.92	0.986	1.83	0.070	0.13	0.007	0.451	0.450	40.21	0.298	0.141	0.037	<0.01	89.97	14.76
SW 07 18	5.81	0.04	2.95	0.036	0.005	20.95	0.856	1.97	0.083	0.13	0.024	0.501	0.731	40.32	0.239	0.160	0.039	<0.01	89.97	15.15
SW 07 19	3.69	0.03	3.57	0.021	0.006	25.90	0.644	2.22	0.149	0.12	0.004	0.495	0.664	29.17	0.164	0.077	0.017	<0.01	87.40	20.47
SW 07 20 Lost Core																				
SW 07 21 Lost Core																				
SW 07 22 Lost Core																				
SW 07 23 Lost Core																				
SW 07 24	9.18	0.05	0.78	0.026	0.004	10.46	1.654	1.23	0.021	0.15	0.005	0.122	0.555	63.05	0.511	0.086	0.023	<0.01	94.73	6.82
SW 07 25	10.96	0.07	0.73	0.033	0.004	9.84	2.005	1.37	0.017	0.17	0.004	0.122	0.517	62.45	0.630	0.065	0.018	<0.01	95.34	6.34
SW 07 26	8.77	0.06	1.60	0.022	0.005	15.06	1.559	1.57	0.058	0.17	0.004	0.261	0.637	51.41	0.491	0.059	0.015	<0.01	92.62	10.88
SW 07 27	5.58	0.05	2.71	0.025	0.005	22.31	0.796	1.75	0.100	0.13	0.007	0.484	0.741	40.34	0.234	0.132	0.035	<0.01	89.34	13.94
SW 07 28	6.50	0.04	2.73	0.028	0.006	24.87	0.854	1.84	0.088	0.14	0.007	0.543	0.438	35.66	0.265	0.165	0.042	<0.01	88.09	13.88
SW 07 29	6.72	0.04	2.77	0.029	0.006	23.40	0.922	1.91	0.077	0.15	0.010	0.560	1.042	37.77	0.288	0.168	0.043	<0.01	88.93	13.04
SW 07 30	5.72	0.05	4.26	0.017	0.005	23.97	0.909	2.23	0.097	0.15	0.006	0.836	0.398	31.65	0.280	0.080	0.022	<0.01	88.21	17.54
SW 09 01	14.95	0.10	0.46	0.022	0.003	4.29	2.828	1.24	0.008	0.49	0.003	0.043	0.251	65.95	0.868	0.051	0.016	<0.01	97.42	5.86
SW 09 02	13.33	0.07	0.51	0.027	0.003	7.65	2.288	1.14	0.009	0.38	0.005	0.099	0.199	62.51	0.726	0.095	0.029	<0.01	96.01	6.92
SW 09 03	8.24	0.06	1.86	0.021	0.007	28.48	1.179	1.10	0.140	0.14	0.013	0.572	0.351	31.52	0.360	0.159	0.058	<0.01	86.36	12.10
SW 09 04	10.01	0.06	3.28	0.023	0.005	19.55	1.595	1.23	0.085	0.16	0.009	0.732	0.637	39.52	0.493	0.156	0.052	<0.01	89.28	11.75
SW 09 05	9.30	0.06	2.29	0.024	0.005	21.22	1.395	1.09	0.098	0.20	0.009	0.533	0.436	40.88	0.399	0.168	0.051	<0.01	89.22	11.08
SW 09 06	11.03	0.06	2.16	0.023	0.005	16.14	1.821	1.17	0.070	0.20	0.008	0.380	0.639	47.79	0.542	0.124	0.043	<0.01	91.59	9.39
SW 09 07	7.97	0.05	2.41	0.020	0.006	25.01	1.347	1.04	0.135	0.16	0.007	0.451	0.676	37.34	0.388	0.099	0.035	<0.01	87.64	10.51
SW 09 08	7.94	0.06	2.40	0.021	0.006	24.96	1.365	1.03	0.133	0.16	0.006	0.447	0.675	37.35	0.381	0.098	0.034	<0.01	87.10	10.04
SW 09 09	6.03	0.04	1.86	0.028	0.009	37.11	0.647	1.13	0.124	0.10	0.010	0.740	0.079	23.68	0.216	0.228	0.059	<0.01	83.03	10.94
SW 09 10	5.90	0.04	1.66	0.032	0.009	37.67	0.551	1.16	0.093	0.10	0.011	0.700	0.060	23.84	0.187	0.248	0.061	<0.01	82.96	10.66
SW 09 11 Lost Core																				
SW 09 12	6.21	0.04	1.54	0.031	0.009	36.88	0.621	1.15	0.094	0.11	0.013	0.645	0.112	24.88	0.212	0.236	0.067	<0.01	83.81	10.98
SW 09 13	6.26	0.04	1.40	0.030	0.008	36.67	0.627	1.13	0.084	0.09	0.011	0.605	0.058	25.63	0.220	0.226	0.059	<0.01	83.78	10.63
SW 09 14	6.24	0.04	1.96	0.030	0.008	37.27	0.613	1.18	0.082	0.10	0.011	0.751	0.132	23.80	0.215	0.222	0.062	<0.01	83.38	10.67
SW 09 15	5.80	0.03	2.22	0.031	0.009	37.52	0.522	1.30	0.103	0.10	0.013	0.774	0.062	21.78	0.183	0.225	0.064	<0.01	82.82	12.10
SW 09 16	5.07	0.04	1.94	0.030	0.009	39.20	0.385	1.22	0.066	0.10	0.012	0.716	0.061	21.75	0.134	0.230	0.062	<0.01	82.32	11.31
SW 09 17	5.11	0.04	3.39	0.032	0.007	33.35	0.386	1.71	0.102	0.12	0.012	0.870	0.230	23.85	0.122	0.241	0.074	<0.01	83.52	13.90
SW 09 18	5.71	0.04	2.34	0.035	0.008	29.50	0.789	0.99	0.080	0.31	0.009	0.509	0.432	36.15	0.223	0.193	0.047	<0.01	86.42	9.06
SW 09 19	5.14	0.04	2.08	0.030	0.007	33.85	0.592	1.03	0.078	0.23	0.010	0.551	0.363	30.09	0.171	0.212	0.054	<0.01	84.45	9.94
SW 09 20	4.12	0.04	3.30	0.016	0.008	33.95	0.679	2.45	0.249	0.08	0.007	0.371	0.407	17.08	0.187	0.078	0.024	<0.01	84.65	21.61
SW 09 21	5.30	0.05	5.12	0.031	0.005	19.70	0.876	1.64	0.132	0.15	0.014	0.529	1.295	40.85	0.216	0.128	0.037	<0.01	89.59	13.53
SW 09 22	6.03	0.05	2.78	0.030	0.004	17.38	0.968	1.20	0.119	0.17	0.009	0.242	1.445	49.27	0.229	0.101	0.037	<0.01	91.79	11.73
SW 09 23	8.11	0.07	0.69	0.031	0.002	5.57	1.702	0.81	0.005	0.29	<0.001	0.157	0.585	72.63	0.450	0.055	0.010	<0.01	97.00	5.85
SW 09 24	7.17	0.08	11.55	0.035	0.003	5.41	1.370	0.73	0.022	0.34	0.004	2.151	3.406	50.80	0.374	0.040	0.011	<0.01	92.52	9.03
SW 09 25	13.51	0.10	1.53	0.019	0.003	4.00	2.589	1.11	0.005	0.50	<0.001	0.263	1.163	64.25	0.776	0.046	0.007	<0.01	97.13	7.27
SW 09 26	12.20	0.08	0.24	0.021	0.002	4.19	2.454	1.05	0.006	0.45	<0.001	0.150	0.507	69.16	0.708	0.038	0.006	<0.01	97.05	5.79
SW 10 01	13.49	0.07	0.59	0.024	0.003	8.10	2.387	1.53	0.018	0.43	0.006	0.091	0.793	60.83	0.747	0.085	0.023	<0.01	96.12	6.91
SW 10 02	11.10	0.07	1.48	0.023	0.004	13.84	2.011	1.88	0.062	0.34	0.005	0.165	0.823	49.68	0.602	0.104	0.025	<0.01	93.41	11.21
SW 10 03	7.10	0.05	3.22	0.019	0.006	25.38	1.180	2.12	0.136	0.21	0.003	0.730	0.297	30.93	0.339	0.105	0.026	<0.01	87.88	16.05
SW 10 04 Lost Core																				
SW 10 05	5.77	0.04	2.76	0.017	0.007	30.25	0.895	1.72	0.185	0.13	0.005	0.304	0.138	26.09	0.265	0.114	0.031	<0.01	86.29	17.58
SW 10 06	6.07	0.04	3.35	0.018	0.006	28.83	0.894	2.11	0.148	0.13	0.005	0.413	0.149	25.08	0.260	0.135	0.034	<0.01	86.58	18.94
SW 10 07	6.87	0.05	6.74	0.023	0.006	24.27	0.963	1.84	0.104	0.15	0.009	1.455	0.160	28.20	0.287	0.162	0.048	<0.01	87.31	15.99
SW 10 08	5.67	0.03	5.92	0.030	0.007	31.07	0.591	1.19	0.107	0.14	0.010	1.690	0.054	24.72	0.189	0.226	0.061	<0.01	83.78	12.08
SW 10 09	7.48	0.05	1.65	0.030	0.007	30.71	0.931	1.33	0.083	0.12	0.011	0.520	0.045	30.96	0.302	0.208	0.048	<0.01	85.80	11.34
SW 10 10 Lost Core																				
SW 10 11 Lost Core																				
SW 10 12	11.31	0.07	5.79	0.025	0.003	4.31	2.078	1.82	0.033	0.58	0.002	0.080	1.043	59.12	0.593	0.033	0.012	<0.01	95.71	8.81
SW 10 13	14.53	0.10	1.61	0.020	0.004	4.89	2.709	1.59	0.016	0.49	0.004	0.093	1.164	62.02	0.807	0.052	0.015	<0.01	96.90	6.79
SW 10 14	12.42	0.07	7.59	0.020	0.004	6.00	2.021	1.77	0.036	0.44	0.004	0.165	1.167	51.27	0.591	0.048	0.016	<0.01	94.23	10.61
SW 10 15	6.62	0.05	2.68	0.027	0.007	32.18	0.800	1.35	0.100	0.14	0.011	0.731	0.258	25.97	0.258	0.191	0.066	<0.01	84.70	13.28
SW 10 16	5.54	0.03	1.38	0.033	0.008	37.93	0.481	1.21	0.082	0.09	0.012	0.584	0.063	22.84	0.154	0.244	0.061	<0.01	82.59	11.86
SW 10 17	5.28	0.04	2.36	0.032	0.008	37.43	0.422	1.38	0.098	0.10	0.013	0.782	0.131	20.34	0.144	0.229	0.063	<0.01	82.54	13.70
SW 10 18	4.76	0.04	3.35	0.029	0.008	36.33	0.386	1.42	0.115	0.12	0.011	1.025	0.074	20.26	0.121	0.214	0.063	<0.01	82.65	14.33
SW 10 19	4.94	0.03	1.71	0.031	0.009	37.42	0.381	1.44	0.086	0.09	0.013	0.566	0.112	22.22	0.118	0.234	0.063	<0.01	83.21	13.76
SW 10 20	4.76	0.03	2.93	0.033	0.008	34.25	0.407	1.75	0.099	0.12	0.013	0.745	0.361	23.30	0.133	0.227	0.066	<0.01	83.89	14.68
SW 10 21	4.23	0.04	4.33	0.021	0.005	25.94	0.639	2.14	0.152	0.11	0.007	0.472	0.959	29.38	0.155	0.112	0.035	<0.01	86.96	18.25
SW 10 22	6.38	0.05	2.71	0.029	0.004	14.51	1.085	0.97	0.044	0.20	0.006	0.443	1.361	54.79	0.262	0.105	0.030	<0.01	92.98	10.01
SW 10 23	5.04	0.04	2.69	0.027	0.005	22.19	0.826	1.60	0.168	0.14	0.009	0.319	1.517	40.26	0.202	0.114	0.035	<0.01	89.46	14.29
SW 10 24	4.96	0.04	3.06	0.025	0.006	23.53	0.760	1.54	0.168	0.14	0.008	0.359	1.434	38.17	0.185	0.109	0.037	<0.01	89.33	14.82
SW 10 25	6.02	0.05	3.78	0.025	0.004	16.96	0.970	0.83	0.046	0.18	0.006	0.349	2.411	48.17	0.233	0.089	0.030	<0.01	92.14	12.00
SW 10 26	5.93	0.06	2.89	0.032	0.003	11.79	1.099	0.94	0.067	0.20	0.004	0.235	1.511	58.46	0.264	0.051	0.020	<0.01	94.13	10.59
SW 10 27	7.92	0.07	2.44	0.035	0.003	4.77	1.569	0.77	0.005	0.31	<0.001	0.395	1.386	69.21	0.427	0.054	0.009	<0.01	97.06	7.70
SW 10 28	9.89	0.07	1.44	0.026	0.004	3.65	1.918	0.87	0.007	0.39	<0.001	0.361	1.037	69.99	0.552	0.049	0.006	<0.01	97.47	7.21
SW 10 29	12.78	0.08	0.29	0.022	0.003	2.80	2.452	1.07	0.006	0.51	<0.001	0.071	0.576	71.12	0.756	0.043	0.006	<0.01	97.98	5.41
SW 11 01	15.35	0.10	0.36	0.018	0.003	4.85	2.930	1.58	0.011	0.47	0.003	0.052	0.762	63.61	0.863	0.052	0.015	<0.01	96.87	5.86
SW 11 02	13.44	0.08	0.82	0.020	0.004	9.59	2.518	1.71	0.030	0.39	0.005	0.121	0.755	56.37	0.733	0.065	0.019	<0.01	95.25	8.58
SW 11 03 Lost Core																				
SW 11 04	5.09	0.04	4.90	0.017	0.006	28.33	0.719	2.42	0.137	0.09	0.006	0.262	0.248	22.48	0.202	0.119	0.032	<0.01	87.14	22.07
SW 11 05	5.98	0.04	5.56	0.019	0.005	26.56	0.856	2.31	0.106	0.11	0.006	0.532	0.168	24.74	0.261	0.119	0.034	<0.01	87.33	19.94
SW 11 06	6.13	0.06	7.53	0.020	0.007	27.37	0.792	1.64	0.130	0.17	0.009	1.992	0.077	24.27	0.254	0.151	0.044	<0.01	84.98	14.34
SW 11 07	6.32	0.04	3.00	0.031	0.009	34.36	0.689	1.21	0.087	0.15	0.011	1.006	0.047	24.09	0.218	0.216	0.063	<0.01	83.79	12.25
SW 11 08	6.57	0.04	1.65	0.031	0.009	34.24	0.733	1.20	0.089	0.12	0.011	0.590	0.039	26.55	0.240	0.224	0.055	<0.01	84.42	12.04
SW 11 09	7.15	0.05	3.21	0.027	0.007	29.12	0.934	1.21	0.101	0.15	0.009	1.050	0.046	31.24	0.311	0.177	0.053	<0.01	86.28	11.44
SW 11 10	6.66	0.05	2.76	0.027	0.007	31.82	0.754	1.35	0.120	0.14	0.011	0.822	0.051	27.51	0.252	0.189	0.056	<0.01	85.00	12.44
SW 11 12	6.27	0.04	1.70	0.028	0.008	34.31	0.640	1.49	0.108	0.12	0.013	0.489	0.060	25.86	0.216	0.210	0.059	<0.01	84.69	13.09
SW 11 13	6.06	0.04	2.01	0.030	0.008	34.48	0.567	1.53	0.089	0.12	0.012	0.602	0.077	25.79	0.198	0.218	0.057	<0.01	84.58	12.69
SW 11 14	5.70	0.03	1.72	0.030	0.008	34.95	0.510	1.51	0.092	0.12	0.012	0.519	0.139	25.98	0.174	0.219	0.056	<0.01	84.43	12.69
SW 11 15	5.47	0.03	2.13	0.027	0.008	36.13	0.484	1.52	0.085	0.15	0.012	0.640	0.085	23.78	0.160	0.218	0.067	<0.01	84.14	13.16
SW 11 16	5.17	0.03	1.97	0.029	0.007	36.59	0.405	1.58	0.073	0.12	0.013	0.574	0.322	23.70	0.127	0.228	0.059	<0.01	83.77	12.78
SW 11 17	5.05	0.04	2.35	0.033	0.010	35.01	0.419	1.68	0.085	0.13	0.015	0.601	0.164	25.11	0.126	0.230	0.062	<0.01	84.47	13.37
SW 11 18	4.85	0.04	2.97	0.028	0.007	34.14	0.429	1.79	0.116	0.13	0.012	0.648	0.201	23.09	0.124	0.205	0.061	<0.01	84.10	15.28
SW 11 19	4.87	0.04	3.73	0.029	0.007	32.13	0.495	1.99	0.104	0.14	0.011	0.688	0.422	23.69	0.126	0.203	0.058	<0.01	85.17	16.46
SW 12 01	15.02	0.12	2.63	0.019	0.004	4.67	2.872	1.56	0.013	0.48	0.003	0.593	0.817	60.85	0.835	0.052	0.015	<0.01	96.72	6.18
SW 12 02	12.98	0.08	1.04	0.022	0.004	9.17	2.390	1.56	0.028	0.39	0.005	0.104	1.082	54.27	0.718	0.073	0.022	<0.01	96.08	8.14
SW 12 03	6.55	0.06	2.46	0.027	0.007	23.78	0.986	1.95	0.118	0.16	0.008	0.306	0.557	34.34	0.288	0.139	0.038	<0.01	88.80	17.04
SW 12 04	7.62	0.05	3.33	0.029	0.006	23.80	1.042	2.04	0.075	0.13	0.009	0.345	0.429	34.79	0.327	0.183	0.048	<0.01	89.18	15.14
SW 12 05	6.95	0.05	2.82	0.027	0.007	28.25	0.921	1.57	0.100	0.15	0.011	0.741	0.077	31.99	0.282	0.178	0.052	<0.01	87.02	12.86
SW 12 06	6.11	0.04	2.30	0.027	0.008	33.01	0.692	1.37	0.102	0.14	0.010	0.674	0.042	26.79	0.216	0.212	0.056	<0.01	84.98	13.20
SW 12 07	6.13	0.03	1.59	0.030	0.008	34.64	0.665	1.28	0.111	0.13	0.011	0.505	0.045	25.61	0.210	0.218	0.057	<0.01	84.48	13.23
SW 12 08	6.69	0.04	3.23	0.028	0.008	31.75	0.788	1.27	0.092	0.16	0.011	1.033	0.060	27.37	0.258	0.205	0.065	<0.01	85.18	12.13
SW 12 09	6.72	0.04	1.96	0.029	0.007	31.23	0.805	1.30	0.106	0.14	0.011	0.618	0.045	30.23	0.254	0.201	0.050	<0.01	85.97	12.24
SW 12 10	7.42	0.07	1.38	0.028	0.006	23.02	1.035	1.35	0.074	0.14	0.012	0.345	0.094	43.99	0.339	0.162	0.048	<0.01	89.90	10.39
SW 12 11	7.75	0.06	2.08	0.022	0.006	21.14	1.232	1.37	0.080	0.15	0.006	0.459	0.307	42.36	0.405	0.092	0.041	<0.01	90.21	12.65
SW 12 12	6.60	0.05	2.64	0.027	0.008	30.26	0.737	1.50	0.112	0.15	0.010	0.760	0.075	30.19	0.251	0.193	0.057	<0.01	86.26	12.65
SW 12 13	6.75	0.07	2.78	0.028	0.007	30.43	0.743	1.61	0.092	0.15	0.012	0.778	0.085	29.29	0.256	0.190	0.056	<0.01	85.98	12.68
SW 12 14	6.31	0.06	2.82	0.025	0.007	29.28	0.685	1.64	0.122	0.14	0.012	0.706	0.109	30.90	0.230	0.171	0.055	<0.01	86.61	13.56
SW 12 15	6.06	0.07	2.87	0.026	0.007	30.54	0.645	1.69	0.112	0.13	0.011	0.732	0.104	29.06	0.228	0.178	0.052	<0.01	85.86	13.36
SW 12 16	5.91	0.04	2.53	0.025	0.007	31.34	0.577	1.79	0.170	0.13	0.013	0.577	0.143	28.01	0.204	0.193	0.052	<0.01	85.64	13.90
SW 12 17	5.80	0.04	2.96	0.032	0.007	30.57	0.569	1.74	0.102	0.13	0.010	0.772	0.167	29.17	0.195	0.202	0.056	<0.01	85.72	13.21
SW 12 18	4.63	0.04	3.77	0.029	0.007	29.48	0.602	2.04	0.140	0.12	0.009	0.613	0.212	25.62	0.158	0.136	0.049	<0.01	86.25	18.41
SW 12 19	4.41	0.04	3.94	0.023	0.007	28.07	0.629	2.17	0.213	0.11	0.009	0.596	0.714	25.25	0.160	0.117	0.035	<0.01	86.94	20.46
SW 12 20	6.07	0.04	3.05	0.025	0.005	21.77	0.836	1.50	0.058	0.15	0.007	0.627	0.847	35.85	0.212	0.194	0.051	<0.01	90.25	18.97
SW 12 21	4.18	0.04	3.90	0.032	0.005	17.91	0.861	1.79	0.084	0.15	0.004	0.248	1.613	44.59	0.192	0.059	0.017	<0.01	90.80	15.13
SW 13 01	15.14	0.10	0.34	0.022	0.003	4.32	2.927	1.56	0.012	0.50	0.004	0.055	0.661	65.49	0.882	0.054	0.016	<0.01	97.77	5.68
SW 13 02	14.96	0.09	0.46	0.022	0.004	6.96	2.817	1.67	0.015	0.43	0.004	0.064	0.641	61.28	0.823	0.063	0.018	<0.01	96.95	6.63
SW 13 03	6.74	0.08	4.26	0.023	0.005	23.69	1.056	1.38	0.103	0.21	0.005	0.861	0.087	38.08	0.312	0.131	0.033	<0.01	88.78	13.74
SW 13 04	8.40	0.06	2.19	0.028	0.005	22.79	1.273	1.86	0.089	0.16	0.008	0.249	0.100	37.92	0.380	0.174	0.050	<0.01	90.44	14.71
SW 13 05	7.30	0.06	3.85	0.026	0.006	24.36	1.082	1.65	0.098	0.16	0.008	0.742	0.084	35.12	0.319	0.164	0.041	<0.01	88.81	13.75
SW 13 06	7.32	0.06	2.47	0.027	0.006	26.68	1.034	1.61	0.083	0.14	0.008	0.348	0.061	36.00	0.311	0.183	0.048	<0.01	88.70	12.33
SW 13 07	6.55	0.06	3.40	0.024	0.007	29.85	0.863	1.73	0.124	0.16	0.011	0.677	0.225	28.13	0.261	0.175	0.053	<0.01	86.86	14.57
SW 13 08	6.03	0.05	3.73	0.022	0.007	29.77	0.801	1.90	0.165	0.15	0.009	0.680	0.070	26.92	0.246	0.169	0.046	<0.01	86.84	16.10
SW 13 09	6.25	0.04	2.71	0.022	0.006	31.31	0.761	1.98	0.133	0.13	0.011	0.355	0.464	26.52	0.228	0.192	0.054	<0.01	86.57	15.42
SW 13 10	6.11	0.04	3.28	0.025	0.005	24.94	0.983	2.39	0.097	0.14	0.010	0.492	0.499	32.31	0.250	0.159	0.042	<0.01	88.54	16.78
SW 13 11	4.61	0.05	2.84	0.019	0.005	24.88	0.951	2.56	0.117	0.12	0.004	0.246	0.291	32.91	0.201	0.092	0.021	<0.01	88.98	19.07
SW 13 12	9.21	0.06	1.15	0.032	0.003	9.69	2.104	1.45	0.023	0.27	0.003	0.209	0.510	63.97	0.465	0.092	0.021	<0.01	95.59	6.33
SW 13 13	14.22	0.09	0.31	0.024	0.003	5.48	2.661	1.51	0.009	0.47	0.011	0.055	0.593	66.16	0.853	0.051	0.014	<0.01	97.87	5.36
SW 15 01	7.85	0.06	1.71	0.019	0.007	31.11	1.156	1.16	0.092	0.13	0.008	0.518	0.061	31.87	0.355	0.173	0.040	<0.01	86.64	10.32

SW 15 02	7.64	0.06	1.49	0.024	0.007	**30.85**	1.052	1.31	0.085	0.14	0.008	0.466	0.046	31.65	0.341	**0.198**	0.048	<0.01	86.76	11.36
SW 15 03	6.44	0.05	1.79	0.027	0.008	**35.43**	0.709	1.27	0.084	0.13	0.009	0.608	0.033	25.46	0.230	**0.237**	0.058	<0.01	85.10	12.52
SW 15 04	5.93	0.05	1.57	0.031	0.008	**37.94**	0.547	1.15	0.100	0.12	0.011	0.600	0.035	23.01	0.186	**0.254**	0.067	<0.01	84.18	12.61
SW 15 05	5.80	0.05	1.60	0.028	0.008	**37.27**	0.517	1.08	0.079	0.11	0.013	0.611	0.032	23.60	0.190	**0.238**	0.060	<0.01	82.92	11.64
SW 15 06	6.21	0.04	1.62	0.029	0.008	**37.16**	0.626	1.10	0.084	0.12	0.011	0.654	0.026	24.22	0.214	**0.236**	0.060	<0.01	84.28	11.88
SW 15 07	6.12	0.04	1.75	0.028	0.008	**37.83**	0.593	1.15	0.092	0.12	0.011	0.670	0.026	21.84	0.210	**0.233**	0.060	<0.01	83.88	13.12
SW 15 08	5.74	0.03	1.89	0.026	0.006	**36.61**	0.554	1.26	0.082	0.11	0.010	0.662	0.038	21.62	0.184	**0.217**	0.061	<0.01	82.24	13.15
SW 15 09	5.48	0.03	1.94	0.028	0.008	**38.81**	0.448	1.33	0.081	0.10	0.011	0.693	0.049	21.22	0.155	**0.241**	0.065	<0.01	83.43	12.75
SW 15 10	4.99	0.03	1.74	0.031	0.008	**38.85**	0.351	1.32	0.088	0.10	0.012	0.625	0.237	22.02	0.116	**0.254**	0.066	<0.01	83.43	12.61
SW 15 11	4.91	0.03	1.95	0.028	0.008	**38.46**	0.383	1.34	0.076	0.11	0.011	0.699	0.065	22.71	0.119	**0.248**	0.067	<0.01	83.37	12.17
SW 15 12	4.70	0.02	2.35	0.026	0.006	**34.74**	0.425	1.66	0.114	0.10	0.009	0.580	0.127	23.92	0.114	**0.217**	0.056	<0.01	83.48	14.32
SW 15 13	5.70	0.05	2.73	0.024	0.006	**27.84**	0.714	2.15	0.093	0.12	0.009	0.447	0.268	32.81	0.192	**0.186**	0.055	<0.01	88.28	14.89
SW 15 14	6.09	0.05	2.80	0.030	0.004	**21.98**	0.922	1.78	0.100	0.14	0.008	0.384	0.466	41.76	0.232	**0.165**	0.046	<0.01	90.47	13.53
SW 15 15	5.48	0.04	3.13	0.022	0.004	**21.51**	0.915	1.90	0.169	0.15	0.008	0.276	1.111	41.19	0.230	**0.110**	0.033	<0.01	90.63	14.37
SW 15 16	6.07	0.05	4.73	0.034	0.003	**13.04**	1.040	0.90	0.152	0.20	0.013	0.290	2.284	54.14	0.247	**0.084**	0.038	<0.01	93.84	10.54
SW 15 17	6.63	0.06	2.12	0.036	0.002	**8.07**	1.310	0.68	0.007	0.25	<0.001	0.243	1.511	71.41	0.321	**0.056**	0.012	<0.01	99.23	8.52
SW 15 18	11.81	0.09	2.16	0.023	0.002	**3.87**	2.395	1.02	0.005	0.50	<0.001	0.379	1.430	65.61	0.737	**0.044**	0.005	<0.01	98.09	8.02
SW 15 19	13.63	0.09	1.51	0.019	0.005	**4.42**	2.683	1.15	0.006	0.49	<0.001	0.131	1.291	64.33	0.795	**0.048**	0.007	<0.01	98.03	7.44
SW 16 01	9.50	0.09	2.52	0.028	0.004	**11.48**	1.795	1.63	0.049	0.43	0.003	0.279	0.904	54.90	0.495	**0.066**	0.018	<0.01	92.61	8.43
SW 16 02	14.71	0.09	0.50	0.023	0.003	**5.90**	2.880	1.60	0.015	0.44	0.004	0.089	0.638	61.79	0.819	**0.062**	0.017	<0.01	95.92	6.34
SW 16 03	7.29	0.05	4.46	0.023	0.005	**24.55**	1.124	2.17	0.099	0.16	0.007	0.560	0.279	29.52	0.343	**0.149**	0.040	<0.01	87.52	16.71
SW 16 04	6.47	0.05	2.12	0.027	0.007	**32.80**	0.779	1.58	0.096	0.13	0.009	0.567	0.054	25.70	0.242	**0.211**	0.054	<0.01	84.86	13.96
SW 16 05	5.65	0.05	1.79	0.030	0.008	**36.73**	0.596	1.26	0.110	0.11	0.010	0.593	0.037	22.29	0.184	**0.233**	0.063	<0.01	83.50	13.77
SW 16 06	5.74	0.04	1.62	0.033	0.008	**37.30**	0.553	1.16	0.103	0.11	0.012	0.613	0.037	22.54	0.179	**0.240**	0.060	<0.01	83.08	12.76
SW 16 07	6.63	0.04	1.59	0.029	0.007	**33.61**	0.753	1.21	0.102	0.12	0.010	0.537	0.044	26.57	0.242	**0.214**	0.071	<0.01	84.44	12.68
SW 16 08	6.53	0.04	1.65	0.029	0.007	**34.37**	0.712	1.25	0.081	0.12	0.011	0.555	0.034	25.63	0.247	**0.210**	0.055	<0.01	84.12	12.60
SW 16 09	6.35	0.04	2.28	0.030	0.007	**34.70**	0.686	1.35	0.085	0.13	0.011	0.720	0.051	23.98	0.231	**0.206**	0.062	<0.01	83.96	13.05
SW 16 10	6.02	0.04	2.43	0.028	0.007	**34.97**	0.604	1.48	0.081	0.12	0.011	0.694	0.072	22.60	0.207	**0.203**	0.058	<0.01	83.44	13.84
SW 16 11	5.48	0.03	2.08	0.030	0.008	**37.25**	0.456	1.42	0.074	0.11	0.012	0.656	0.090	21.58	0.155	**0.230**	0.061	<0.01	82.56	12.84
SW 16 12	4.74	0.03	1.72	0.030	0.008	**38.94**	0.318	1.35	0.084	0.09	0.011	0.589	0.134	20.89	0.113	**0.240**	0.063	<0.01	82.12	12.79
SW 16 13	4.46	0.03	2.50	0.028	0.008	**36.95**	0.394	1.56	0.101	0.10	0.012	0.660	0.250	21.07	0.102	**0.216**	0.059	<0.01	82.79	14.36
SW 16 14	4.68	0.03	3.10	0.030	0.008	**34.19**	0.399	1.76	0.106	0.12	0.011	0.732	0.151	23.48	0.116	**0.216**	0.059	<0.01	83.79	14.62
SW 16 15	5.25	0.04	3.41	0.023	0.006	**27.31**	0.747	2.52	0.098	0.13	0.008	0.478	1.052	27.83	0.197	**0.143**	0.045	<0.01	86.69	17.41
SW 16 16	4.17	0.04	6.46	0.036	0.003	**11.25**	0.879	1.48	0.077	0.16	0.004	0.143	2.156	56.42	0.191	**0.062**	0.014	<0.01	92.07	8.54
SW 16 17	5.14	0.03	5.52	0.036	0.003	**18.81**	0.821	2.09	0.101	0.15	0.004	0.400	0.845	41.84	0.195	**0.122**	0.033	<0.01	90.52	14.40
SW 16 18	6.10	0.05	1.53	0.045	0.004	**12.63**	1.139	1.33	0.048	0.22	0.005	0.293	2.149	60.26	0.264	**0.110**	0.030	<0.01	95.05	8.86
SW 16 19	6.02	0.07	1.68	0.048	0.003	**7.89**	1.256	1.07	0.045	0.23	0.003	0.194	1.107	68.30	0.295	**0.070**	0.018	<0.01	95.57	7.29
SW 17 01	12.49	0.09	1.02	0.026	0.004	**9.89**	2.306	1.63	0.035	0.40	0.004	0.140	0.661	57.07	0.673	**0.081**	0.019	<0.01	94.15	7.62
SW 17 02	14.54	0.12	0.38	0.025	0.003	**6.92**	2.755	1.60	0.011	0.45	0.011	0.060	0.719	61.29	0.830	**0.058**	0.017	<0.01	95.75	5.97
SW 17 03	5.91	0.04	4.82	0.021	0.006	**26.38**	0.896	2.29	0.125	0.13	0.008	0.439	0.588	26.05	0.262	**0.125**	0.039	<0.01	86.77	18.66
SW 17 04	7.14	0.05	2.51	0.030	0.006	**29.50**	0.943	1.65	0.082	0.13	0.011	0.648	0.099	29.69	0.289	**0.202**	0.058	<0.01	85.83	12.79
SW 17 05	6.41	0.05	2.80	0.031	0.007	**32.74**	0.786	1.33	0.090	0.12	0.010	0.861	0.040	25.90	0.240	**0.211**	0.064	<0.01	84.40	12.73
SW 17 06	5.77	0.04	2.16	0.033	0.008	**35.82**	0.603	1.20	0.107	0.11	0.010	0.711	0.337	23.02	0.193	**0.222**	0.059	<0.01	83.57	13.17
SW 17 07	6.24	0.04	1.64	0.035	0.008	**35.60**	0.635	1.16	0.081	0.12	0.012	0.621	0.139	25.39	0.205	**0.239**	0.055	<0.01	83.85	11.66
SW 17 08	6.89	0.05	2.31	0.030	0.007	**32.32**	0.843	1.20	0.095	0.13	0.010	0.790	0.057	27.47	0.266	**0.208**	0.063	<0.01	84.62	11.89
SW 17 09	7.32	0.05	2.22	0.028	0.006	**29.97**	0.977	1.24	0.092	0.14	0.010	0.749	0.040	30.87	0.314	**0.188**	0.055	<0.01	85.55	11.30
SW 17 10	6.49	0.06	2.97	0.027	0.007	**32.55**	0.767	1.43	0.100	0.13	0.010	0.872	0.053	24.99	0.258	**0.184**	0.056	<0.01	84.40	13.45
SW 17 11	6.34	0.03	2.28	0.025	0.005	**33.85**	0.664	1.70	0.098	0.14	0.013	0.559	0.242	23.71	0.239	**0.191**	0.054	<0.01	84.74	14.59
SW 17 12	5.76	0.03	2.26	0.030	0.005	**34.88**	0.504	1.76	0.081	0.14	0.011	0.568	0.325	23.89	0.186	**0.214**	0.056	<0.01	84.30	13.59
SW 17 13	5.40	0.03	2.48	0.029	0.005	**36.75**	0.429	1.51	0.081	0.13	0.010	0.736	0.114	21.66	0.155	**0.226**	0.054	<0.01	83.10	13.28
SW 17 14	5.22	0.02	1.70	0.032	0.005	**36.70**	0.386	1.44	0.073	0.13	0.011	0.555	0.088	24.71	0.132	**0.247**	0.062	<0.01	83.57	12.04
SW 17 15	5.00	0.03	2.79	0.029	0.005	**35.77**	0.410	1.67	0.082	0.15	0.010	0.762	0.128	22.95	0.138	**0.224**	0.057	<0.01	83.79	13.57
SW 17 16	5.10	0.06	5.52	0.032	0.004	**32.26**	0.439	1.72	0.074	0.22	0.011	1.541	0.175	23.36	0.138	**0.241**	0.061	<0.01	83.86	12.87
SW 17 17	4.92	0.03	3.98	0.026	0.004	**29.89**	0.520	2.21	0.111	0.15	0.008	0.687	0.481	25.62	0.151	**0.199**	0.051	<0.01	85.73	16.65
SW 17 18	5.50	0.05	2.04	0.031	0.003	**16.51**	0.986	1.60	0.062	0.21	0.003	0.270	2.010	53.23	0.254	**0.095**	0.025	<0.01	93.74	10.85
SW 17 19	5.37	0.04	1.99	0.043	0.003	**21.48**	0.839	1.44	0.067	0.18	0.006	0.361	0.870	45.69	0.222	**0.129**	0.033	<0.01	90.67	11.90
SW 17 20	6.22	0.06	1.53	0.031	0.002	**11.87**	1.189	1.41	0.059	0.23	0.002	0.187	0.928	60.79	0.307	**0.071**	0.016	<0.01	94.25	9.34
SW 17 21	10.59	0.07	0.61	0.028	<0.001	**6.28**	1.914	1.26	0.009	0.32	<0.001	0.090	1.024	68.39	0.528	**0.054**	0.013	<0.01	96.56	5.36
SW 18 01	14.90	0.09	0.46	0.018	0.001	**6.39**	2.759	1.60	0.020	0.45	0.002	0.065	0.759	61.12	0.810	**0.057**	0.015	0.01	96.52	6.99
SW 18 02	7.82	0.05	3.83	0.021	0.002	**19.78**	1.285	1.78	0.096	0.22	0.003	0.342	1.253	37.12	0.389	**0.098**	0.026	<0.01	89.56	15.42
SW 18 03	6.70	0.04	2.56	0.023	0.004	**27.56**	0.884	1.99	0.101	0.13	0.007	0.930	0.853	29.59	0.284	**0.170**	0.044	<0.01	87.51	16.23
SW 18 04	7.01	0.04	2.17	0.025	0.004	**29.03**	0.925	1.85	0.094	0.14	0.007	0.340	0.293	28.49	0.303	**0.173**	0.047	<0.01	86.48	15.50
SW 18 05	6.04	0.04	1.52	0.027	0.005	**33.56**	0.683	1.42	0.121	0.11	0.008	0.361	0.059	26.71	0.222	**0.211**	0.046	<0.01	85.12	13.97
SW 18 06	6.16	0.04	1.51	0.033	0.007	**34.74**	0.702	1.23	0.095	0.11	0.010	0.488	0.041	25.01	0.231	**0.222**	0.057	<0.01	83.68	12.99
SW 18 07	7.09	0.03	1.59	0.029	0.005	**31.70**	0.865	1.27	0.090	0.13	0.009	0.496	0.039	29.76	0.284	**0.207**	0.052	<0.01	85.72	12.07
SW 18 08	7.28	0.04	1.90	0.027	0.004	**28.06**	0.956	1.21	0.080	0.13	0.008	0.596	0.057	35.11	0.322	**0.180**	0.044	<0.01	87.13	11.12
SW 18 09	6.91	0.04	1.39	0.026	0.004	**31.27**	0.808	1.34	0.092	0.13	0.009	0.425	0.071	30.82	0.275	**0.195**	0.050	<0.01	85.97	12.11
SW 18 10	6.80	0.04	2.00	0.025	0.004	**31.91**	0.778	1.49	0.122	0.13	0.010	0.537	0.057	27.28	0.263	**0.185**	0.051	<0.01	85.18	13.50
SW 18 11	6.36	0.02	2.09	0.026	0.004	**32.76**	0.643	1.60	0.111	0.11	0.012	0.552	0.068	26.49	0.226	**0.197**	0.050	<0.01	84.85	13.51
SW 18 12	5.97	0.03	2.09	0.024	0.004	**33.59**	0.576	1.58	0.107	0.12	0.009	0.575	0.150	25.85	0.204	**0.198**	0.052	<0.01	84.44	13.29
SW 18 13	5.65	0.03	2.34	0.027	0.005	**34.43**	0.499	1.60	0.101	0.12	0.011	0.643	0.111	24.94	0.181	**0.206**	0.054	<0.01	84.25	13.27
SW 18 14	5.44	0.03	2.40	0.029	0.005	**34.93**	0.457	1.59	0.095	0.11	0.011	0.686	0.120	24.85	0.162	**0.213**	0.055	<0.01	84.23	13.02
SW 18 15	4.84	0.03	2.72	0.027	0.004	**34.72**	0.394	1.57	0.103	0.12	0.011	0.758	0.167	24.87	0.140	**0.205**	0.050	<0.01	84.05	13.32
SW 18 16	5.03	0.03	2.81	0.027	0.004	**32.54**	0.449	1.88	0.110	0.13	0.010	0.640	0.283	25.87	0.143	**0.211**	0.053	<0.01	84.72	14.47
SW 18 17	4.22	0.03	5.02	0.019	0.003	**30.80**	0.473	2.16	0.119	0.13	0.023	0.787	1.312	20.99	0.137	**0.150**	0.044	<0.01	84.58	18.14
SW 18 18	4.73	0.03	3.45	0.023	0.003	**31.08**	0.600	1.78	0.172	0.13	0.023	0.429	1.463	23.58	0.154	**0.140**	0.043	<0.01	83.45	17.46
SW 18 19	5.09	0.04	2.19	0.034	0.002	**18.12**	0.884	0.91	0.067	0.17	0.006	0.328	1.214	51.99	0.211	**0.100**	0.030	<0.01	91.79	10.39
SW 18 20	5.39	0.05	1.53	0.041	0.002	**10.26**	1.130	0.92	0.052	0.28	0.001	0.185	0.748	65.65	0.280	**0.054**	0.015	<0.01	95.12	8.51
SW 18 21	7.25	0.06	0.62	0.042	0.003	**4.39**	1.543	0.79	0.004	0.35	<0.001	0.096	0.535	75.72	0.422	**0.048**	0.007	<0.01	97.46	5.58
SW 18 22	10.22	0.08	1.15	0.040	0.003	**3.91**	2.114	0.97	0.005	0.44	<0.001	0.195	0.951	69.04	0.596	**0.047**	0.006	<0.01	95.55	6.66
SW 19 01	15.17	0.10	0.53	0.024	0.001	**3.53**	2.842	1.26	0.006	0.44	<0.001	0.056	0.307	66.57	0.819	**0.050**	0.008	<0.01	95.04	5.78
SW 19 02	14.92	0.11	0.57	0.022	0.002	**4.57**	2.819	1.26	0.007	0.81	<0.001	0.054	0.269	64.68	0.843	**0.056**	0.008	<0.01	97.12	6.12
SW 19 03	7.88	0.05	2.11	0.029	0.003	**22.91**	1.217	0.61	0.053	0.18	0.004	0.439	0.878	40.88	0.362	**0.141**	0.036	<0.01	89.14	11.34
SW 19 04	8.01	0.05	3.90	0.029	0.002	**23.23**	1.085	0.91	0.061	0.13	0.006	0.553	1.372	35.66	0.343	**0.171**	0.036	0.01	88.75	13.17
SW 19 05	8.18	0.05	2.33	0.030	0.006	**28.33**	0.989	0.82	0.076	0.45	0.011	0.487	0.762	32.46	0.294	**0.170**	0.052	<0.01	85.16	11.72
SW 19 06	7.04	0.04	3.52	0.031	0.005	**31.52**	0.873	0.82	0.058	0.13	0.014	1.054	0.550	28.00	0.288	**0.189**	0.051	<0.01	84.99	10.77
SW 19 07																				
SW 19 08																				
SW 19 09	7.49	0.05	3.64	0.031	0.004	**26.02**	0.948	1.05	0.072	0.17	0.010	1.132	0.099	35.75	0.317	**0.168**	0.047	0.01	86.78	9.77
SW 19 10																				
SW 19 11																				
SW 19 12	6.79	0.04	2.20	0.024	0.003	**25.98**	0.873	1.61	0.130	0.13	0.007	0.471	0.082	35.17	0.298	**0.155**	0.038	<0.01	87.81	13.78
SW 19 13	6.59	0.05	1.91	0.039	0.003	**24.04**	0.917	1.49	0.111	0.12	0.005	0.351	0.187	39.39	0.310	**0.132**	0.034	<0.01	88.83	13.20
SW 19 14																				
SW 19 15	6.30	0.06	2.79	0.027	0.006	**27.75**	0.777	1.79	0.111	0.14	0.011	0.656	0.244	32.55	0.279	**0.159**	0.059	<0.01	87.04	13.32
SW 19 16	6.85	0.07	3.67	0.025	0.003	**27.67**	0.805	1.59	0.093	0.17	0.007	1.062	0.185	31.20	0.278	**0.177**	0.055	<0.01	85.80	11.86
SW 19 17																				
SW 19 18	5.43	0.04	2.90	0.028	0.003	**22.06**	0.862	1.30	0.133	0.23	0.005	0.379	0.977	42.00	0.240	**0.093**	0.028	<0.01	89.03	12.30
SW 19 19	4.56	0.04	2.21	0.042	0.001	**11.89**	0.888	1.32	0.065	0.25	<0.001	0.144	0.467	62.37	0.216	**0.044**	0.011	<0.01	93.65	9.12
SW 19 20	5.57	0.06	0.70	0.050	0.001	**7.03**	1.235	0.66	0.015	0.22	<0.001	0.122	0.452	73.94	0.284	**0.050**	0.012	<0.01	96.49	6.09
SW 19 21	6.43	0.06	0.36	0.050	<0.001	**3.08**	1.430	0.69	0.005	0.25	<0.001	0.082	0.278	80.02	0.365	**0.039**	0.002	<0.01	98.44	5.30
SW 19 22	13.71	0.08	0.51	0.028	<0.001	**2.99**	2.595	1.22	0.006	0.50	<0.001	0.109	0.472	68.41	0.785	**0.042**	0.004	<0.01	97.47	6.02
SW 20A 01	7.18	0.04	2.46	0.026	0.004	**28.98**	0.995	1.77	0.099	0.17	0.010	0.508	0.207	27.96	0.317	**0.149**	0.041	<0.01	86.16	15.25
SW 20A 02	7.38	0.05	1.69	0.019	0.004	**30.53**	1.024	1.46	0.094	0.14	0.005	0.449	0.050	29.16	0.307	**0.177**	0.041	<0.01	85.99	13.42
SW 20A 03	8.39	0.05	2.22	0.021	0.003	**25.72**	1.210	1.50	0.071	0.16	0.004	0.500	0.066	35.28	0.361	**0.191**	0.034	<0.01	87.63	11.84
SW 20A 04	6.07	0.04	2.09	0.024	0.005	**33.75**	0.673	1.58	0.107	0.12	0.006	0.436	0.065	24.51	0.207	**0.204**	0.049	<0.01	85.34	15.41
SW 20A 05	5.85	0.03	1.85	0.031	0.005	**36.96**	0.534	1.08	0.090	0.14	0.010	0.680	0.030	23.59	0.193	**0.243**	0.063	<0.01	83.36	11.96
SW 20A 06	6.21	0.03	1.59	0.028	0.005	**37.33**	0.582	1.09	0.082	0.13	0.009	0.608	0.027	23.51	0.198	**0.232**	0.058	<0.01	83.68	11.98
SW 20A 07	6.17	0.03	2.38	0.027	0.005	**37.26**	0.564	1.24	0.081	0.13	0.009	0.801	0.033	23.34	0.194	**0.225**	0.058	<0.01	83.28	12.74
SW 20A 08	6.02	0.04	3.13	0.025	0.004	**29.09**	0.632	1.58	0.084	0.18	0.005	0.561	0.108	31.34	0.201	**0.179**	0.071	<0.01	86.66	13.41
SW 20A 09	5.33	0.03	1.88	0.031	0.006	**38.87**	0.354	1.32	0.073	0.11	0.008	0.634	0.053	21.63	0.122	**0.252**	0.062	<0.01	82.74	11.97
SW 20A 10	5.11	0.03	2.61	0.026	0.005	**37.88**	0.391	1.43	0.091	0.12	0.010	0.796	0.134	20.13	0.125	**0.220**	0.070	<0.01	82.59	13.42
SW 20A 11	4.67	0.03	2.70	0.024	0.005	**36.13**	0.365	1.73	0.105	0.11	0.009	0.642	0.149	22.00	0.109	**0.211**	0.058	<0.01	83.65	14.61
SW 20A 12	5.58	0.04	3.54	0.023	0.003	**26.73**	0.704	1.84	0.094	0.14	0.007	0.555	0.795	32.93	0.184	**0.175**	0.056	<0.01	87.56	14.78
SW 20A 13	5.49	0.04	2.87	0.025	0.003	**24.13**	0.806	1.62	0.120	0.12	0.008	0.342	0.867	38.03	0.197	**0.138**	0.040	<0.01	88.87	14.03
SW 20A 14	6.01	0.05	2.90	0.024	0.002	**20.50**	0.917	1.69	0.103	0.15	0.004	0.311	1.026	42.63	0.233	**0.118**	0.036	<0.01	90.29	13.60
SW 20A 15	6.18	0.04	2.65	0.031	0.002	**17.49**	0.944	1.26	0.062	0.20	0.003	0.891	1.280	49.62	0.222	**0.106**	0.031	<0.01	91.88	11.37
SW 20A 16	5.55	0.06	3.30	0.036	<0.001	**12.45**	1.014	0.71	0.021	0.25	<0.001	0.579	1.165	59.00	0.228	**0.083**	0.018	<0.01	93.29	8.84
SW 20A 17	6.60	0.06	4.37	0.035	<0.001	**7.86**	1.293	0.75	0.018	0.34	<0.001	1.123	1.293	62.45	0.344	**0.063**	0.009	<0.01	95.06	8.41
SW 20A 19	13.32	0.09	0.67	0.024	<0.001	**3.93**	2.567	1.13	0.005	0.53	<0.001	0.154	0.755	67.30	0.805	**0.046**	0.003	0.01	97.99	6.65
SW 20A 20	12.14	0.06	3.50	0.015	0.001	**5.26**	2.308	1.09	0.030	0.46	<0.001	0.074	1.980	60.17	0.712	**0.037**	0.012	<0.01	96.55	8.71
SW 21R 01	10.79	0.07	3.07	0.019	0.001	**13.86**	1.839	1.42	0.037	0.34	0.002	0.563	0.209	49.87	0.532	**0.091**	0.025	<0.01	92.47	9.74

SW 21R 02	10.32	0.07	2.54	0.025	0.002	**12.77**	1.811	1.72	0.059	0.63	0.002	0.198	0.323	51.82	0.469	**0.088**	0.023	<0.01	93.29	10.43
SW 21R 03	6.84	0.05	2.41	0.017	0.003	**26.64**	1.027	2.14	0.126	0.13	0.002	0.299	0.097	29.22	0.302	**0.126**	0.030	<0.01	87.79	18.34
SW 21R 04	8.40	0.05	2.87	0.022	0.003	**27.30**	1.175	1.36	0.071	0.16	0.005	0.806	0.053	32.96	0.362	**0.187**	0.044	<0.01	86.85	11.02
SW 21R 05	6.34	0.04	1.43	0.028	0.005	**36.64**	0.665	1.14	0.089	0.12	0.007	0.525	0.024	24.83	0.218	**0.243**	0.056	<0.01	83.61	11.24
SW 21R 06	5.81	0.04	2.21	0.029	0.005	**37.49**	0.529	1.16	0.095	0.12	0.008	0.750	0.029	21.80	0.177	**0.241**	0.061	<0.01	82.93	12.39
SW 21R 07	6.43	0.04	2.69	0.029	0.005	**35.81**	0.589	1.30	0.075	0.14	0.009	0.874	0.030	22.50	0.196	**0.241**	0.057	<0.01	83.30	12.29
SW 21R 08	7.11	0.04	2.33	0.023	0.004	**32.00**	0.837	1.43	0.074	0.18	0.007	0.611	0.084	27.93	0.272	**0.191**	0.055	<0.01	85.54	12.37
SW 21R 09	6.40	0.03	3.46	0.026	0.005	**32.12**	0.745	1.62	0.085	0.23	0.008	0.613	0.183	25.50	0.231	**0.184**	0.052	<0.01	85.04	13.55
SW 21R 10	6.02	0.04	2.33	0.026	0.005	**35.35**	0.596	1.46	0.087	0.13	0.008	0.655	0.130	22.33	0.197	**0.200**	0.055	<0.01	83.72	14.11
SW 21R 11	5.88	0.04	1.98	0.028	0.005	**37.26**	0.495	1.40	0.075	0.12	0.010	0.605	0.078	21.54	0.166	**0.230**	0.062	<0.01	83.26	13.32
SW 21R 12	4.92	0.04	2.61	0.028	0.005	**38.50**	0.355	1.35	0.085	0.12	0.010	0.837	0.155	19.76	0.114	**0.230**	0.062	<0.01	82.29	13.13
SW 21R 13	4.92	0.03	2.02	0.027	0.005	**37.98**	0.362	1.47	0.083	0.12	0.010	0.613	0.128	21.47	0.111	**0.233**	0.063	<0.01	82.89	13.26
SW 21R 14	5.49	0.04	3.25	0.028	0.003	**29.26**	0.586	1.35	0.072	0.16	0.006	0.700	0.771	31.24	0.147	**0.203**	0.053	<0.01	86.44	13.10
SW 21R 15	5.73	0.04	3.55	0.022	0.003	**27.69**	0.691	1.82	0.109	0.12	0.007	0.373	1.066	28.65	0.178	**0.142**	0.049	<0.01	86.72	16.50
SW 21R 16	5.59	0.04	4.73	0.027	0.002	**20.43**	0.784	1.50	0.151	0.17	0.005	0.441	1.766	39.66	0.181	**0.112**	0.040	<0.01	89.42	13.79
SW 21R 17	6.68	0.05	3.85	0.031	<0.001	**10.10**	1.205	0.68	0.049	0.26	0.006	0.530	1.555	60.39	0.296	**0.069**	0.020	<0.01	94.13	8.36
SW 21R 18	13.46	0.07	0.87	0.024	<0.001	**3.72**	2.543	1.11	0.006	0.58	<0.001	0.110	0.848	66.19	0.771	**0.047**	0.004	<0.01	97.14	6.78
SW 21R 19	13.01	0.08	0.81	0.023	0.001	**2.94**	2.644	1.10	0.007	0.51	<0.001	0.079	0.701	68.09	0.814	**0.045**	0.004	0.01	96.80	5.94
SW 22 01	15.14	0.12	0.41	0.022	0.004	**3.93**	3.037	1.36	0.009	0.50	0.002	0.050	0.309	65.11	0.886	**0.055**	0.010	0.02	96.85	5.88
SW 22 02	14.73	0.09	0.50	0.023	0.004	**6.01**	2.648	1.30	0.011	0.45	0.003	0.072	0.303	63.97	0.768	**0.077**	0.021	0.02	97.04	6.04
SW 22 03	9.74	0.04	1.12	0.023	0.003	**24.38**	1.426	1.07	0.077	0.24	0.005	0.311	0.639	38.72	0.418	**0.138**	0.041	<0.01	88.26	9.88
SW 22 04	9.95	0.06	1.93	0.021	0.002	**19.05**	1.768	1.23	0.097	0.28	0.004	0.263	0.928	44.93	0.517	**0.097**	0.028	<0.01	90.33	9.17
SW 22 05	13.50	0.09	0.66	0.027	0.003	**5.80**	2.679	1.28	0.018	0.44	0.004	0.094	0.359	64.94	0.778	**0.066**	0.019	0.02	96.57	5.79
SW 22 06	14.64	0.12	0.96	0.017	0.001	**5.71**	2.719	1.40	0.013	0.45	<0.001	0.057	0.485	62.41	0.798	**0.051**	0.010	<0.01	95.96	6.12
SW 22 07	13.65	0.07	0.52	0.019	0.002	**10.84**	2.392	1.32	0.017	0.40	0.004	0.098	0.176	57.08	0.714	**0.074**	0.020	<0.01	94.14	6.75
SW 22 08	7.89	0.05	3.53	0.020	0.003	**26.67**	1.148	1.62	0.105	0.16	0.007	0.607	0.424	31.55	0.346	**0.151**	0.040	<0.01	87.21	12.88
SW 22 09																				
SW 22 10	6.84	0.04	2.23	0.033	0.005	**30.62**	0.836	1.34	0.087	0.13	0.007	0.519	0.333	30.72	0.261	**0.217**	0.048	<0.01	86.22	11.95
SW 22 11	6.10	0.03	1.27	0.031	0.005	**36.76**	0.588	1.35	0.112	0.10	0.008	0.461	0.047	23.31	0.195	**0.238**	0.055	<0.01	83.97	13.31
SW 22 12																				
SW 22 13	6.64	0.04	2.50	0.025	0.004	**32.96**	0.717	1.64	0.099	0.12	0.009	0.663	0.146	24.49	0.240	**0.198**	0.058	<0.01	84.75	14.21
SW 22 14	6.14	0.03	2.17	0.028	0.005	**35.30**	0.579	1.53	0.087	0.12	0.009	0.643	0.090	23.47	0.191	**0.211**	0.057	<0.01	84.05	13.40
SW 22 15	6.01	0.04	1.99	0.029	0.005	**35.67**	0.551	1.54	0.082	0.11	0.009	0.617	0.082	23.20	0.181	**0.221**	0.056	<0.01	83.63	13.26
SW 22 16	5.41	0.04	1.78	0.031	0.005	**38.26**	0.387	1.44	0.072	0.10	0.010	0.630	0.089	21.38	0.129	**0.244**	0.064	<0.01	82.47	12.41
SW 22 17	5.15	0.03	1.68	0.030	0.005	**37.54**	0.361	1.56	0.077	0.10	0.010	0.565	0.097	22.64	0.117	**0.239**	0.066	<0.01	83.11	12.85
SW 22 18	4.99	0.02	1.78	0.032	0.004	**35.40**	0.406	1.68	0.098	0.09	0.009	0.387	0.292	24.30	0.122	**0.225**	0.058	<0.01	84.19	14.31
SW 22 19	4.30	0.04	3.98	0.021	0.005	**33.41**	0.427	1.82	0.139	0.11	0.009	0.518	1.391	21.56	0.110	**0.173**	0.057	<0.01	84.44	16.38
SW 22 20	6.08	0.03	4.22	0.025	0.004	**28.88**	0.726	1.05	0.145	0.15	0.010	0.793	2.079	26.84	0.190	**0.126**	0.055	<0.01	86.53	15.14
SW 22 21	14.44	0.08	0.71	0.019	<0.001	**4.46**	2.609	1.17	0.016	0.51	<0.001	0.113	0.576	64.85	0.814	**0.052**	0.010	<0.01	96.87	6.44
SW 22 22	13.29	0.08	0.50	0.021	<0.001	**4.00**	2.507	1.10	0.009	0.51	<0.001	0.078	0.594	67.40	0.788	**0.047**	0.006	<0.01	97.21	6.27
SW 23 01	14.58	0.09	0.66	0.024	0.001	**6.01**	2.767	1.28	0.015	0.42	0.001	0.111	0.288	63.20	0.784	**0.069**	0.014	<0.01	96.26	5.95
SW 23 02																				
SW 23 03	14.53	0.08	0.55	0.019	<0.001	**6.39**	2.721	1.26	0.027	0.46	<0.001	0.077	0.197	62.71	0.803	**0.050**	0.014	<0.01	95.98	6.09
SW 23 04	7.33	0.04	4.09	0.028	0.003	**27.03**	0.984	1.29	0.121	0.11	0.009	0.195	0.782	31.30	0.298	**0.178**	0.043	<0.01	86.41	12.59
SW 23 05																				
SW 23 06	7.20	0.05	3.71	0.022	0.004	**26.79**	1.072	0.82	0.137	0.17	0.008	0.798	0.783	33.57	0.316	**0.137**	0.043	<0.01	86.74	11.13
SW 23 07																				
SW 23 08	7.71	0.05	2.61	0.027	0.004	**29.29**	1.009	1.24	0.098	0.13	0.008	0.562	0.073	32.53	0.317	**0.193**	0.048	<0.01	86.09	10.19
SW 23 09																				
SW 23 10	6.24	0.03	2.18	0.028	0.005	**35.29**	0.605	1.46	0.097	0.12	0.009	0.718	0.079	23.41	0.200	**0.211**	0.060	<0.01	83.58	12.85
SW 23 11	5.51	0.03	2.81	0.027	0.005	**35.99**	0.463	1.60	0.113	0.13	0.011	0.807	0.173	21.18	0.152	**0.217**	0.066	<0.01	83.46	14.19
SW 23 12	5.54	0.03	1.94	0.032	0.005	**35.93**	0.431	1.62	0.082	0.11	0.011	0.610	0.193	24.39	0.130	**0.250**	0.067	<0.01	83.71	12.36
SW 23 13	5.21	0.04	4.52	0.027	0.003	**28.88**	0.518	2.59	0.112	0.13	0.009	0.685	0.418	25.05	0.137	**0.207**	0.063	<0.01	86.19	17.60
SW 23 14	6.05	0.04	3.86	0.025	0.003	**25.21**	0.739	1.73	0.141	0.14	0.009	0.457	1.539	32.57	0.187	**0.128**	0.054	<0.01	87.98	15.12
SW 23 15	5.94	0.05	2.03	0.036	0.002	**14.95**	1.004	0.77	0.049	0.18	0.006	0.286	1.607	56.30	0.240	**0.091**	0.031	<0.01	93.27	9.71
SW 23 16	7.41	0.08	1.13	0.041	<0.001	**6.18**	1.484	0.76	0.013	0.30	<0.001	0.118	0.760	71.98	0.384	**0.058**	0.006	<0.01	96.60	5.92
SW 23 17	7.23	0.07	1.20	0.042	<0.001	**6.96**	1.413	0.74	0.009	0.25	<0.001	0.115	0.695	71.16	0.356	**0.058**	0.014	<0.01	96.20	5.91
SW 23 18	8.57	0.08	0.90	0.048	<0.001	**4.52**	1.709	0.84	0.005	0.32	<0.001	0.153	0.614	73.29	0.469	**0.052**	0.004	<0.01	97.48	5.91
SW 23 19	15.20	0.07	0.60	0.024	<0.001	**2.88**	2.751	1.23	0.007	0.48	<0.001	0.065	0.451	67.21	0.851	**0.044**	0.006	<0.01	97.64	5.77
SW 23 20	15.50	0.08	0.50	0.019	<0.001	**2.94**	2.803	1.23	0.006	0.51	<0.001	0.065	0.442	66.67	0.863	**0.042**	0.007	<0.01	97.60	5.93
SW 24 01 Lost Core																				
SW 24 02	10.47	0.08	4.27	0.032	0.003	**3.57**	2.000	1.76	0.038	0.72	0.003	0.083	0.496	65.78	0.533	**0.027**	0.011	<0.01	97.07	7.21
SW 24 03	6.53	0.04	4.76	0.027	0.007	**27.64**	0.835	1.16	0.069	0.20	0.010	0.504	1.915	31.59	0.252	**0.171**	0.048	<0.01	85.95	10.21
SW 24 04 Lost Core																				
SW 24 05 Lost Core																				
SW 24 06 Lost Core																				
SW 24 07 Lost Core																				
SW 24 08 Lost Core																				
SW 24 09 Lost Core																				
SW 24 10	6.38	0.05	3.45	0.029	0.007	**31.47**	0.798	1.44	0.128	0.16	0.010	1.069	0.113	28.54	0.230	**0.186**	0.052	<0.01	84.75	10.66
SW 24 11 Lost Core																				
SW 24 12	6.20	0.07	2.41	0.034	0.008	**30.42**	0.752	1.66	0.112	0.14	0.013	0.560	0.374	32.18	0.195	**0.222**	0.061	<0.01	86.16	10.77
SW 24 13 Lost Core																				
SW 24 14	5.44	0.09	3.26	0.028	0.008	**32.24**	0.576	1.35	0.119	0.13	0.011	0.832	0.509	29.52	0.163	**0.199**	0.059	<0.01	85.30	10.78
SW 24 15 Lost Core																				
SW 24 16	5.63	0.04	1.78	0.030	0.006	**25.51**	0.944	1.28	0.135	0.18	0.007	0.632	0.140	42.36	0.224	**0.134**	0.036	<0.01	88.12	9.08
SW 24 17	7.02	0.06	1.02	0.046	0.004	**9.91**	1.392	0.96	0.041	0.26	0.004	0.299	0.206	67.61	0.325	**0.070**	0.024	<0.01	94.77	5.53
SW 24 18	6.76	0.06	0.88	0.050	0.003	**9.70**	1.396	0.97	0.040	0.26	0.004	0.262	0.196	69.04	0.315	**0.071**	0.023	<0.01	95.44	5.41
SW 24 19	14.16	0.08	0.27	0.025	0.003	**4.98**	2.684	1.33	0.019	0.45	0.002	0.085	0.172	66.81	0.782	**0.046**	0.011	<0.01	97.31	5.42
SW 24 20	14.82	0.09	0.35	0.022	0.002	**2.90**	2.793	1.36	0.010	0.50	0.001	0.056	0.192	69.48	0.821	**0.043**	0.011	<0.01	98.32	4.89
SW 25 01	4.95	0.03	2.51	0.031	0.009	**38.73**	0.369	1.74	0.100	0.13	0.012	0.622	0.718	17.83	0.117	**0.250**	0.063	<0.01	82.90	14.70
SW 25 02	4.66	0.05	3.43	0.027	0.007	**27.61**	0.552	2.15	0.080	0.13	0.009	0.516	0.504	31.34	0.146	**0.175**	0.050	<0.01	86.87	15.44
SW 25 03	3.97	0.03	4.58	0.019	0.005	**23.95**	0.629	2.52	0.093	0.11	0.004	0.224	0.460	31.27	0.151	**0.101**	0.027	<0.01	88.04	19.91
SW 25 04	4.11	0.05	7.65	0.031	0.008	**30.55**	0.402	1.41	0.108	0.22	0.008	2.031	0.360	22.50	0.116	**0.182**	0.051	<0.01	83.07	13.30
SW 25 06	7.38	0.06	1.68	0.044	0.004	**5.31**	1.432	0.84	0.028	0.26	0.003	0.237	1.643	71.81	0.378	**0.048**	0.014	<0.01	97.10	5.93
SW 25 07	8.96	0.07	0.47	0.049	0.003	**4.85**	1.780	0.83	0.010	0.29	0.002	0.088	2.214	71.76	0.472	**0.039**	0.011	<0.01	98.32	6.42
SW 26 01	15.53	0.15	0.38	0.023	0.004	**4.61**	2.952	1.61	0.012	0.46	0.004	0.052	0.955	63.23	0.824	**0.054**	0.015	<0.01	97.09	6.23
SW 26 02	11.31	0.07	1.25	0.022	0.004	**13.56**	2.043	2.13	0.047	0.35	0.004	0.111	0.957	48.48	0.568	**0.103**	0.025	<0.01	92.97	11.95
SW 26 03	8.34	0.06	2.17	0.027	0.005	**21.73**	1.306	1.98	0.087	0.22	0.005	0.222	0.447	36.46	0.378	**0.161**	0.037	<0.01	89.90	16.27
SW 26 04	7.13	0.05	5.48	0.021	0.005	**25.13**	1.105	2.42	0.095	0.14	0.006	0.454	0.323	26.47	0.308	**0.165**	0.035	<0.01	88.09	18.43
SW 26 05	7.05	0.05	4.76	0.021	0.006	**29.35**	1.003	2.21	0.090	0.16	0.006	0.795	0.079	23.16	0.293	**0.171**	0.044	<0.01	86.58	16.98
SW 26 06	5.99	0.03	2.59	0.030	0.008	**36.01**	0.606	1.77	0.085	0.14	0.010	0.618	0.073	20.64	0.194	**0.235**	0.059	<0.01	83.53	14.46
SW 26 07	5.29	0.03	2.04	0.031	0.009	**40.26**	0.414	1.51	0.088	0.11	0.011	0.594	0.075	16.83	0.139	**0.243**	0.065	<0.01	81.96	14.25
SW 26 08	4.77	0.03	1.89	0.031	0.009	**40.99**	0.328	1.48	0.090	0.11	0.012	0.596	0.043	17.27	0.109	**0.257**	0.065	<0.01	81.89	13.83
SW 26 09	4.55	0.04	2.72	0.029	0.007	**31.51**	0.487	1.80	0.111	0.13	0.011	0.573	0.207	29.13	0.131	**0.192**	0.052	<0.01	85.62	13.96
SW 26 10	4.44	0.04	2.95	0.027	0.006	**26.26**	0.545	1.73	0.089	0.14	0.009	0.559	1.008	37.01	0.134	**0.176**	0.052	<0.01	88.15	13.00
SW 26 11	4.74	0.04	3.68	0.033	0.005	**22.06**	0.708	2.02	0.071	0.13	0.009	0.447	0.854	39.32	0.167	**0.142**	0.047	<0.01	88.84	14.37
SW 26 12	5.06	0.04	3.63	0.024	0.004	**21.46**	0.810	2.36	0.076	0.14	0.006	0.386	1.115	38.05	0.192	**0.114**	0.031	<0.01	89.47	15.98
SW 26 13	11.23	0.07	1.67	0.033	0.003	**6.21**	2.136	1.26	0.022	0.34	0.003	0.106	1.813	64.49	0.597	**0.060**	0.018	<0.01	96.61	6.56
SW 26 14	10.71	0.08	1.34	0.033	0.003	**3.42**	2.136	1.00	0.012	0.36	0.002	0.060	1.385	71.82	0.593	**0.040**	0.011	<0.01	98.26	5.25
SW 26 15	8.83	0.06	8.92	0.033	0.002	**2.75**	1.777	1.08	0.022	0.32	0.001	0.054	1.117	62.18	0.491	**0.030**	0.009	<0.01	97.03	9.35
SW 27 02	8.15	0.06	4.41	0.024	0.005	**22.22**	1.355	2.03	0.082	0.22	0.005	0.806	0.403	33.36	0.380	**0.141**	0.036	<0.01	89.20	15.53
SW 27 03	7.30	0.05	5.54	0.022	0.006	**27.26**	1.064	2.25	0.091	0.16	0.008	0.637	0.132	24.66	0.304	**0.172**	0.043	<0.01	87.57	17.89
SW 27 04	6.67	0.04	2.65	0.024	0.008	**32.07**	0.859	2.00	0.090	0.16	0.008	0.539	0.025	24.21	0.258	**0.189**	0.051	<0.01	85.50	15.66
SW 27 05	5.90	0.04	3.04	0.028	0.007	**36.43**	0.583	1.79	0.079	0.17	0.009	0.773	0.035	18.92	0.185	**0.216**	0.056	<0.01	82.99	14.74
SW 27 06	4.94	0.03	2.30	0.032	0.008	**40.50**	0.339	1.49	0.082	0.14	0.019	0.707	0.102	16.15	0.112	**0.245**	0.064	<0.01	81.14	13.91
SW 27 07	4.85	0.04	2.86	0.027	0.008	**38.35**	0.336	1.67	0.093	0.15	0.012	0.732	0.782	17.81	0.111	**0.246**	0.063	<0.01	82.82	14.71
SW 27 08	4.91	0.05	3.52	0.026	0.006	**27.92**	0.535	1.90	0.094	0.17	0.011	0.620	0.927	31.84	0.143	**0.203**	0.061	<0.01	87.33	14.41
SW 27 09	4.40	0.03	7.21	0.020	0.004	**21.58**	0.652	1.97	0.118	0.17	0.008	0.634	0.262	35.80	0.150	**0.135**	0.038	<0.01	89.51	16.33
SW 27 10	4.39	0.05	8.05	0.023	0.004	**19.18**	0.726	2.07	0.138	0.13	0.005	0.233	0.834	36.76	0.162	**0.096**	0.027	<0.01	90.31	17.45
SW 27 11	4.72	0.04	3.74	0.019	0.005	**26.61**	0.616	2.28	0.078	0.15	0.006	0.467	0.731	30.77	0.156	**0.156**	0.044	<0.01	87.61	17.04
SW 27 12	10.01	0.07	3.62	0.023	0.003	**5.53**	2.012	1.13	0.028	0.41	0.002	0.867	1.933	64.48	0.554	**0.044**	0.011	<0.01	97.36	6.64
SW 27 13 Lost Core																				
SW 27 14	10.28	0.07	2.37	0.017	0.003	**9.99**	1.992	1.60	0.052	0.37	0.003	0.257	1.044	56.88	0.575	**0.057**	0.015	<0.01	94.95	9.38
SW 28 01	7.07	0.05	5.52	0.020	0.007	**27.71**	1.079	0.83	0.059	0.12	0.007	0.471	2.574	26.44	0.305	**0.150**	0.046	<0.01	85.60	13.14
SW 28 02 Lost Core																				
SW 28 03	5.74	0.04	2.44	0.025	0.008	**36.96**	0.608	1.11	0.110	0.12	0.014	0.735	0.106	23.46	0.186	**0.221**	0.062	<0.01	83.59	11.65
SW 28 04	5.49	0.05	2.89	0.032	0.005	**23.45**	0.737	0.94	0.073	0.15	0.014	0.561	0.444	43.87	0.178	**0.202**	0.058	<0.01	89.20	10.07
SW 28 05	8.45	0.06	6.21	0.020	0.007	**27.84**	1.128	0.97	0.101	0.14	0.010	0.810	2.143	24.43	0.320	**0.185**	0.056	<0.01	85.95	13.07
SW 28 06	7.22	0.05	3.35	0.023	0.008	**34.28**	0.947	1.02	0.130	0.12	0.009	0.473	0.744	23.95	0.281	**0.209**	0.055	<0.01	84.32	11.47
SW 28 07	6.68	0.04	3.02	0.032	0.008	**36.98**	0.695	1.03	0.115	0.12	0.016	0.707	0.732	20.99	0.220	**0.268**	0.069	<0.01	83.30	11.59
SW 28 09 Lost Core																				

SW 28 10	3.21	0.07	22.98	0.011	0.004	**8.16**	0.668	0.71	0.097	0.51	0.011	6.164	0.433	35.00	0.162	**0.042**	0.019	<0.01	87.71	9.46
SW 28 11	6.67	0.07	1.38	0.033	0.002	**5.60**	1.304	0.80	0.021	0.24	0.002	0.298	1.695	74.29	0.347	**0.051**	0.014	<0.01	98.65	5.84
SW 28 12	8.13	0.07	0.96	0.051	0.004	**3.68**	1.601	0.79	0.009	0.27	0.002	0.177	1.119	76.83	0.423	**0.043**	0.013	<0.01	99.21	5.04
SW 28 13	9.24	0.05	14.80	0.026	0.002	**3.26**	1.790	1.31	0.036	0.28	0.003	0.229	1.416	49.89	0.489	**0.032**	0.009	<0.01	96.26	13.41
SW 28 14	12.63	0.08	0.39	0.039	0.002	**3.47**	2.461	1.14	0.011	0.37	0.002	0.063	1.221	70.83	0.681	**0.045**	0.012	<0.01	99.15	5.71
SW 28 15	10.12	0.06	4.23	0.031	0.003	**4.16**	2.025	1.05	0.021	0.34	0.002	0.054	1.838	66.56	0.567	**0.037**	0.011	<0.01	96.89	5.78
SW 29 01	15.39	0.13	1.09	0.018	0.004	**4.45**	2.957	1.24	0.005	0.43	0.003	0.052	0.574	63.82	0.847	**0.055**	0.010	<0.01	97.38	6.31
SW 29 02	15.58	0.09	0.79	0.015	0.003	**5.62**	3.048	1.29	0.006	0.41	0.001	0.066	0.294	62.59	0.831	**0.059**	0.011	<0.01	96.86	6.16
SW 29 03	7.79	0.07	2.00	0.019	0.007	**29.54**	1.225	1.06	0.134	0.17	0.009	0.743	0.071	31.61	0.343	**0.155**	0.046	<0.01	86.34	11.36
SW 29 04	8.64	0.07	2.53	0.021	0.006	**27.17**	1.361	1.23	0.070	0.15	0.006	0.642	0.067	34.01	0.386	**0.174**	0.043	<0.01	87.07	10.49
SW 29 05	8.47	0.06	9.27	0.023	0.006	**22.52**	1.300	1.25	0.055	0.18	0.004	1.134	0.060	30.96	0.363	**0.200**	0.039	<0.01	88.97	13.08
SW 29 06 Lost Core																				
SW 29 07	7.18	0.04	4.82	0.019	0.007	**31.56**	1.022	1.28	0.096	0.13	0.008	0.696	0.083	26.02	0.296	**0.180**	0.047	<0.01	85.26	11.78
SW 29 08	5.90	0.05	3.90	0.023	0.007	**32.51**	0.768	1.17	0.091	0.15	0.010	1.179	0.099	27.59	0.212	**0.187**	0.058	<0.01	84.44	10.55
SW 29 09	4.18	0.04	6.69	0.023	0.004	**19.72**	0.761	0.85	0.173	0.15	0.009	0.418	0.607	45.03	0.166	**0.084**	0.033	<0.01	89.68	10.75
SW 29 10	5.57	0.04	10.39	0.023	0.005	**17.12**	0.723	0.74	0.149	0.14	0.013	0.463	4.630	35.47	0.172	**0.093**	0.060	<0.01	86.77	10.98
SW 29 11 Lost Core																				
SW 29 12 Lost Core																				
SW 29 14	7.83	0.06	1.97	0.045	0.003	**7.44**	1.435	0.62	0.010	0.27	0.002	0.238	1.310	66.86	0.378	**0.066**	0.019	<0.01	96.06	7.52
SW 29 15	12.85	0.08	0.91	0.031	0.003	**3.75**	2.512	0.96	0.005	0.38	<0.001	0.147	1.119	66.85	0.692	**0.045**	0.006	<0.01	97.96	7.62
SW 29 16	12.70	0.08	0.44	0.031	0.002	**3.33**	2.525	0.96	0.004	0.39	<0.001	0.085	0.773	69.32	0.712	**0.045**	0.006	<0.01	97.96	6.56
SW 29 17	11.13	0.08	0.30	0.032	0.002	**3.28**	2.327	0.82	0.004	0.36	<0.001	0.060	0.782	72.52	0.644	**0.044**	0.004	<0.01	98.51	6.12
SW 30 01	15.36	0.09	0.48	0.018	0.003	**4.17**	2.918	1.55	0.011	0.46	0.003	0.050	0.859	65.31	0.841	**0.053**	0.016	<0.01	98.19	6.00
SW 30 02	15.76	0.09	0.40	0.018	0.003	**4.85**	3.006	1.61	0.011	0.45	0.004	0.049	1.130	63.16	0.836	**0.056**	0.015	<0.01	97.82	6.38
SW 30 03	10.21	0.06	1.74	0.024	0.004	**18.30**	1.708	1.18	0.052	0.28	0.004	0.437	0.067	47.82	0.482	**0.160**	0.038	<0.01	90.94	8.38
SW 30 04	9.31	0.07	2.52	0.022	0.007	**24.69**	1.537	1.27	0.087	0.20	0.005	0.505	0.293	37.13	0.432	**0.167**	0.038	<0.01	88.19	9.90
SW 30 05	7.68	0.06	5.02	0.017	0.007	**27.86**	1.231	1.18	0.094	0.16	0.005	0.859	0.061	30.18	0.345	**0.153**	0.037	<0.01	86.62	11.67
SW 30 06	7.28	0.04	7.48	0.021	0.007	**27.60**	1.015	1.32	0.091	0.12	0.006	0.403	0.053	27.60	0.288	**0.211**	0.045	<0.01	87.43	13.87
SW 30 07	7.61	0.05	5.09	0.024	0.006	**29.70**	1.057	1.29	0.084	0.15	0.007	1.079	0.065	27.76	0.312	**0.215**	0.046	<0.01	85.33	10.81
SW 30 08	6.36	0.04	2.94	0.028	0.007	**36.73**	0.657	1.28	0.079	0.12	0.009	0.645	0.045	22.77	0.208	**0.254**	0.065	<0.01	83.56	11.34
SW 30 09	5.20	0.04	2.75	0.028	0.008	**39.21**	0.430	1.46	0.116	0.11	0.011	0.797	0.054	17.00	0.138	**0.246**	0.067	<0.01	82.03	14.37
SW 30 10	5.18	0.04	2.41	0.028	0.007	**34.93**	0.503	1.35	0.079	0.11	0.010	0.753	0.078	26.30	0.139	**0.237**	0.061	<0.01	84.11	11.91
SW 30 11	5.43	0.04	2.23	0.031	0.006	**24.05**	0.769	1.16	0.038	0.12	0.008	0.305	0.064	45.19	0.183	**0.176**	0.048	<0.01	89.03	9.19
SW 30 12	5.06	0.05	4.95	0.029	0.004	**19.88**	0.799	1.82	0.100	0.13	0.006	0.393	0.169	40.02	0.180	**0.131**	0.037	<0.01	90.20	16.46
SW 30 13	3.80	0.04	3.59	0.020	0.005	**25.24**	0.662	2.64	0.143	0.14	0.004	0.383	1.336	29.57	0.159	**0.074**	0.020	<0.01	87.49	19.68
SW 30 15	9.11	0.06	6.11	0.027	0.003	**6.49**	1.751	1.23	0.053	0.31	0.003	0.537	2.350	58.22	0.477	**0.057**	0.015	<0.01	94.60	7.80
SW 30 16	11.89	0.07	0.41	0.033	0.002	**3.64**	2.342	1.14	0.010	0.36	0.001	0.068	1.596	70.80	0.652	**0.044**	0.011	<0.01	98.41	5.34

Permit No.	Area (Ha)	Expiry
9306040749	8,996	Apr 2022
9306040750	5,576	Apr 2022
9306040751	9,000	Apr 2022
9306050831	4,884	May 2020
9306050832	3,972	May 2022
9306080769	9,216	Aug 2020
9306080770	9,168	Aug 2022
9306080798	9,216	Aug 2020
9306090859	9,216	Sep 2020
9308050888	704	May 2024
9310080616	256	Aug 2026
9310120508	8,200	Dec 2024
9311120656	9,216	Dec 2023
9311120657	9,216	Dec 2023
9311120658	8,580	Dec 2021
9311120659	8,512	Dec 2021
9311120660	8,320	Dec 2021
9311120661	8,604	Dec 2021
9311120662	9,076	Dec 2019
9312060404	2,048	Jun 2014
9312060405	7,424	Jun 2014
9312060406	6,908	Jun 2014
9312060407	9,216	Jun 2014
9312060408	6,568	Jun 2022
9312060409	4,160	Jun 2022
9312060410	9,216	Jun 2014

Lease No.	Area (Ha)	Expiry
9405040583	1,152	Apr 2020
9406011262	2,060	Jan 2021
9406011263	456	Jan 2021
9406011264	1,732	Jan 2021

9306040751
9312060409
9312060410
9306090859
940504 0583
9310080616
9306050832
9306050831
9308050888
9312060407
9312060408
9306040750
9306040749
9306080798
9306080769
9306080770
9312060406
9312060405
9310120508
9406011264
9406011262
9311120662
9311120661
9406011263
9312060404
9311120660
9311120659
9311120658
9311120657
9311120656

T92
T91
T90
T89
T88
T87
T86

R8
R7
R6
R5
R4
R3
R2W6

ironstone RESOURCES

Clear Hills, Alberta
Leases & Permits

October 2012

INSPECTORATE
A Bureau Veritas Group Company

Certificate of Analysis

12-360-04073-01

Inspectorate Exploration & Mining Services Ltd.
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada
Phone: 604-272-7818

Distribution List

Attention: Andrew Reader
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6
Phone: 403-640-7977
EMail: andrew@ironstoneresources.com

Attention: Liam Murphy
EMail: liam@ironstoneresources.com

Submitted By: **Ironstone Resources Ltd**
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Attention: **Andrew Reader**

Project: **South Whitemud River 2012**
Description: **IR-01-06-12**

Date Received: 06/25/2012
Date Completed: 06/28/2012
Invoice:

Location	Samples	Type	Preparation Description
Vancouver, BC	12	Pulp	SP-PU/Handling of submitted samples
Vancouver, BC	238	Rock	SP-RX-2K/Rock/Chips/Drill Core/Cuttings <2Kg

Location	Quantity	Method	Description
Vancouver, BC	227	NA-XF100	XRF Iron Ore

For and on behalf of ***Inspectorate Exploration and Mining Services Ltd***

By [redacted]

Sofia Devota – Operations Manager

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-01A 01	Rock	12.11	0.07	1.32	0.025	0.004	11.97	2.234	1.42	0.043	0.33	0.004	0.223	0.566	53.56
SW-01A 02	Rock	14.94	0.09	0.91	0.018	0.003	4.90	2.891	1.46	0.008	0.45	0.003	0.067	0.534	62.71
SW-01A 03	Rock	8.50	0.05	1.68	0.038	0.007	26.64	1.109	1.29	0.050	0.13	0.010	0.362	0.646	36.15
SW-01A 04	Rock	7.04	0.04	2.07	0.037	0.008	30.57	0.896	1.41	0.122	0.12	0.010	0.535	0.491	29.94
SW-01A 05	Rock	6.38	0.04	1.97	0.031	0.007	32.74	0.743	1.35	0.120	0.11	0.010	0.563	0.242	26.66
SW-01A 06	Rock	6.25	0.04	1.70	0.032	0.009	34.86	0.652	1.31	0.096	0.10	0.013	0.563	0.187	25.86
SW-01A 07	Rock	6.23	0.03	1.08	0.034	0.008	35.75	0.619	1.27	0.103	0.09	0.016	0.475	0.089	25.98
SW-01A 08	Rock	7.41	0.05	0.97	0.027	0.007	29.66	0.930	1.22	0.065	0.10	0.014	0.425	0.161	35.02
SW-01A 09	Rock	7.19	0.11	1.70	0.026	0.007	30.83	0.810	1.48	0.089	0.11	0.011	0.566	0.139	31.63
SW-01A 10	Rock	6.86	0.03	1.77	0.028	0.008	33.19	0.703	1.56	0.067	0.10	0.013	0.508	0.337	28.89
SW-01A 11	Rock	6.17	0.03	2.23	0.024	0.008	34.86	0.589	1.55	0.080	0.10	0.011	0.712	0.257	25.99
SW-01A 12	Rock	5.73	0.02	2.59	0.027	0.007	33.99	0.466	1.85	0.096	0.10	0.013	0.709	0.173	25.95
SW-01A 13	Rock	5.81	0.03	2.45	0.032	0.008	32.29	0.419	2.38	0.080	0.11	0.017	0.483	0.708	27.63
SW-01A 14	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-01A 15	Pulp	0.54	<0.01	2.19	0.004	0.009	29.94	0.039	2.50	0.077	0.02	0.003	0.106	0.235	53.01
SW-01A 16	Rock	5.47	0.04	3.34	0.029	0.007	31.74	0.397	2.16	0.108	0.11	0.014	0.762	0.187	26.19
SW-01A 17	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-01A 18	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-01A 19	Rock	4.19	0.03	3.68	0.015	0.005	29.29	0.665	1.97	0.204	0.13	0.006	0.643	0.168	25.23
SW-01A 20	Rock	5.55	0.04	4.15	0.021	0.006	26.48	0.808	2.04	0.181	0.17	0.009	0.775	0.200	27.94
SW-01A 21	Rock	15.97	0.08	0.62	0.021	0.003	3.01	2.936	1.40	0.008	0.47	0.002	0.097	0.415	65.33
SW-01A 22	Rock	15.65	0.08	0.49	0.018	0.002	2.87	2.900	1.35	0.007	0.47	0.001	0.068	0.454	66.27
SW-01A 22D	Rock	15.73	0.08	0.55	0.021	0.003	2.95	2.910	1.34	0.008	0.47	0.003	0.070	0.514	66.39
SW-02A 01	Rock	6.97	0.07	3.75	0.022	0.006	24.10	1.056	1.58	0.106	0.18	0.005	0.862	0.109	34.89
SW-02A 02	Rock	6.89	0.04	2.26	0.028	0.006	29.52	0.893	1.61	0.119	0.12	0.009	0.595	0.066	30.31
SW-02A 03	Rock	6.01	0.03	1.35	0.028	0.006	33.45	0.640	1.39	0.096	0.10	0.009	0.401	0.103	26.26
SW-02A 03D	Rock	5.99	0.03	2.07	0.030	0.008	33.33	0.668	1.38	0.103	0.11	0.010	0.597	0.107	25.53
SW-02A 04	Rock	6.40	0.05	2.00	0.027	0.007	33.15	0.718	1.39	0.106	0.12	0.010	0.677	0.057	25.91
SW-02A 05	Rock	6.96	0.04	1.85	0.027	0.008	31.34	0.839	1.44	0.102	0.11	0.014	0.602	0.063	29.35
SW-02A 06	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 07	Rock	7.05	0.08	1.65	0.025	0.006	26.84	0.941	1.44	0.068	0.11	0.009	0.444	0.193	37.62
SW-02A 08	Rock	7.65	0.06	1.98	0.027	0.006	26.21	0.927	1.93	0.078	0.13	0.009	0.486	0.098	35.81
SW-02A 09	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 10	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 11	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 12	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 13	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-02A 14	Rock	6.27	0.04	2.80	0.022	0.007	29.49	0.740	2.36	0.120	0.11	0.011	0.515	0.133	26.64
SW-02A 15	Rock	4.34	0.03	3.75	0.016	0.007	31.39	0.676	1.93	0.174	0.13	0.007	0.734	0.240	23.21
SW-02A 16	Rock	14.91	0.09	0.50	0.019	0.003	3.39	2.802	1.40	0.013	0.48	0.005	0.087	0.767	67.16

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-02A 17	Rock	15.16	0.09	0.31	0.019	0.003	3.55	2.857	1.45	0.013	0.47	0.004	0.072	0.715	66.60
SW-02A 18	Rock	14.64	0.08	0.37	0.019	0.003	3.71	2.774	1.42	0.012	0.49	0.002	0.089	0.864	65.81
SW-02A 19	Pulp	0.53	<0.01	2.19	0.005	0.008	29.94	0.034	2.50	0.077	0.02	0.002	0.105	0.239	52.93
SW-03A 01	Rock	15.54	0.09	0.37	0.018	0.003	4.32	2.963	1.63	0.013	0.48	0.003	0.063	0.635	64.70
SW-03A 02	Rock	14.93	0.09	0.31	0.017	0.003	5.83	2.819	1.56	0.011	0.46	0.003	0.052	0.421	63.30
SW-03A 03	Rock	7.33	0.06	1.66	0.025	0.007	26.51	1.147	1.11	0.105	0.18	0.007	0.230	0.128	37.81
SW-03A 04	Rock	8.27	0.09	4.08	0.026	0.006	25.23	1.248	1.17	0.113	0.20	0.008	1.152	0.126	34.75
SW-03A 05	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-03A 06	Rock	7.51	0.06	5.73	0.025	0.007	24.95	1.081	1.37	0.097	0.15	0.010	0.475	0.258	34.08
SW-03A 07	Pulp	0.55	<0.01	2.16	0.004	0.009	29.99	0.037	2.49	0.076	0.03	0.003	0.105	0.228	53.05
SW-03A 08	Rock	6.89	0.06	3.69	0.025	0.007	29.89	0.908	1.62	0.104	0.15	0.011	0.660	0.316	29.12
SW-03A 08D	Rock	6.80	0.05	4.26	0.025	0.006	28.94	0.893	1.56	0.110	0.15	0.011	0.766	0.275	29.70
SW-03A 09	Rock	6.32	0.04	2.93	0.027	0.007	30.15	0.769	2.06	0.142	0.13	0.012	0.476	0.178	26.98
SW-03A 10	Rock	6.49	0.04	2.62	0.027	0.006	28.73	0.804	2.11	0.134	0.13	0.011	0.435	0.275	29.12
SW-03A 11	Rock	6.70	0.04	3.27	0.038	0.006	25.42	0.961	2.22	0.089	0.15	0.010	0.593	0.459	32.39
SW-03A 12	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-03A 13	Rock	6.64	0.05	2.87	0.034	0.005	20.97	1.177	2.17	0.068	0.14	0.040	0.459	0.307	39.75
SW-03A 14	Rock	5.69	0.05	2.52	0.027	0.005	21.85	1.062	1.85	0.104	0.14	0.005	0.505	0.081	41.88
SW-03A 15	Rock	6.90	0.08	1.41	0.024	0.004	14.10	1.350	1.26	0.046	0.20	0.007	0.264	0.263	58.84
SW-03A 16	Rock	12.52	0.08	0.72	0.025	0.003	7.66	2.343	1.44	0.022	0.37	0.004	0.160	0.638	63.19
SW-03A 17	Rock	14.61	0.09	0.32	0.021	0.004	5.40	2.710	1.55	0.011	0.45	0.005	0.066	0.649	64.93
SW-05 01	Rock	14.31	0.09	0.40	0.024	0.003	5.11	2.787	1.32	0.012	0.47	0.007	0.074	0.248	65.54
SW-05 02	Rock	11.59	0.07	2.34	0.020	0.005	16.80	1.967	1.15	0.055	0.32	0.008	0.530	0.901	46.70
SW-05 03	Rock	11.53	0.07	1.59	0.024	0.005	16.60	2.044	1.12	0.057	0.29	0.006	0.228	0.945	48.40
SW-05 04	Rock	15.85	0.09	0.44	0.020	0.003	4.01	3.120	1.33	0.008	0.46	0.002	0.065	0.297	64.96
SW-05 05	Rock	15.02	0.10	0.59	0.018	0.003	5.24	2.874	1.33	0.023	0.46	0.003	0.057	0.323	63.60
SW-05 06	Rock	14.30	0.10	0.57	0.018	0.004	9.90	2.639	1.40	0.061	0.39	0.006	0.066	0.180	56.58
SW-05 07	Rock	9.32	0.05	4.78	0.023	0.006	21.97	1.281	1.19	0.170	0.16	0.013	0.542	1.753	34.66
SW-05 08	Rock	7.92	0.04	2.07	0.026	0.007	30.04	1.002	1.23	0.093	0.10	0.013	0.265	0.790	31.37
SW-05 09	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-05 10	Rock	6.45	0.06	2.07	0.030	0.008	33.94	0.705	1.22	0.109	0.11	0.012	0.700	0.177	26.76
SW-05 11	Rock	6.60	0.05	1.11	0.035	0.008	35.14	0.666	1.33	0.105	0.10	0.012	0.496	0.054	26.54
SW-05 12	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-05 13	Rock	5.58	0.03	2.34	0.027	0.008	33.21	0.594	1.62	0.512	0.09	0.016	0.512	0.058	25.09
SW-05 14	Rock	6.10	0.03	1.23	0.025	0.008	36.64	0.610	1.38	0.061	0.09	0.011	0.468	0.106	25.98
SW-05 14D	Rock	5.81	0.04	1.81	0.025	0.007	36.68	0.591	1.28	0.063	0.10	0.010	0.628	0.141	24.79
SW-05 15	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-05 16	Pulp	0.53	<0.01	2.15	0.004	0.007	29.70	0.030	2.47	0.075	0.02	0.001	0.104	0.229	52.49
SW-05 17	Rock	5.60	0.07	2.18	0.031	0.007	27.89	0.696	0.97	0.067	0.14	0.009	0.716	0.102	39.37
SW-05 18	Rock	5.09	0.05	1.12	0.033	0.008	33.75	0.553	0.89	0.074	0.11	0.010	0.486	0.124	32.87

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-05 19	Rock	6.85	0.03	1.56	0.032	0.008	33.57	0.688	1.56	0.111	0.11	0.011	0.533	0.061	27.19
SW-05 20	Rock	6.59	0.03	3.08	0.030	0.007	30.63	0.599	2.37	0.122	0.13	0.014	0.679	0.200	26.75
SW-05 21	Rock	6.15	0.05	3.62	0.031	0.007	30.30	0.475	2.82	0.102	0.13	0.015	0.724	0.368	26.12
SW-05 22	Rock	5.23	0.03	2.73	0.041	0.007	32.81	0.381	2.41	0.087	0.10	0.013	0.514	0.225	26.16
SW-05 23	Rock	5.78	0.03	3.57	0.031	0.007	31.77	0.467	2.37	0.102	0.12	0.022	0.732	0.517	24.62
SW-05 24	Rock	4.87	0.02	5.27	0.022	0.006	31.79	0.339	1.96	0.153	0.09	0.012	0.567	1.873	19.44
SW-05 25	Rock	13.32	0.16	1.28	0.018	0.003	5.30	2.408	1.14	0.016	0.45	0.005	0.091	0.978	63.62
SW-05 26	Pulp	0.53	<0.01	2.18	0.003	0.008	30.04	0.036	2.49	0.077	0.03	0.002	0.105	0.228	52.72
SW-05 27	Rock	12.10	0.08	1.52	0.025	0.004	2.60	2.289	1.01	0.005	0.41	<0.001	0.062	1.144	69.69
SW-05 27D	Rock	12.29	0.07	1.25	0.023	0.003	2.50	2.274	1.02	0.005	0.42	<0.001	0.063	1.011	69.85
SW-05 28	Rock	14.48	0.08	0.52	0.022	0.002	3.48	2.685	1.18	0.006	0.47	<0.001	0.075	0.756	66.29
SW-06 01	Rock	15.76	0.09	0.32	0.021	0.003	5.05	3.005	1.66	0.011	0.46	0.004	0.062	0.718	63.88
SW-06 01D	Rock	15.79	0.09	0.37	0.018	0.004	4.89	2.994	1.64	0.011	0.46	0.003	0.061	0.660	64.28
SW-06 02	Rock	14.65	0.09	0.57	0.020	0.004	7.58	2.676	1.61	0.020	0.40	0.004	0.086	0.780	60.69
SW-06 03	Rock	5.94	0.04	3.00	0.018	0.006	28.52	0.843	2.02	0.147	0.11	0.007	0.268	0.178	25.64
SW-06 04	Rock	7.41	0.04	1.60	0.031	0.006	28.15	0.921	1.81	0.090	0.12	0.009	0.247	0.256	31.61
SW-06 05	Rock	6.43	0.04	1.13	0.032	0.007	30.81	0.781	1.32	0.086	0.11	0.010	0.343	0.053	32.82
SW-06 06	Rock	6.59	0.05	2.72	0.030	0.007	32.40	0.764	1.40	0.101	0.12	0.010	0.826	0.045	26.59
SW-06 07	Rock	6.35	0.04	1.74	0.030	0.008	34.69	0.679	1.27	0.101	0.11	0.011	0.599	0.047	25.79
SW-06 08	Rock	6.62	0.04	1.40	0.029	0.007	33.84	0.768	1.30	0.104	0.11	0.011	0.484	0.045	27.25
SW-06 09	Rock	6.73	0.04	1.80	0.031	0.006	28.50	0.872	1.26	0.096	0.12	0.009	0.598	0.052	35.33
SW-06 10	Rock	6.90	0.05	1.76	0.025	0.006	27.01	0.903	1.41	0.087	0.13	0.015	0.457	0.327	35.97
SW-06 11	Rock	6.55	0.04	2.38	0.029	0.007	30.41	0.719	1.38	0.096	0.13	0.009	0.721	0.052	31.33
SW-06 12	Rock	7.15	0.04	1.50	0.029	0.007	31.12	0.788	1.56	0.101	0.12	0.011	0.452	0.064	30.56
SW-06 13	Rock	6.34	0.03	2.00	0.029	0.008	32.51	0.618	1.65	0.117	0.11	0.012	0.553	0.091	27.50
SW-06 14	Rock	5.97	0.03	2.17	0.026	0.007	32.86	0.566	1.69	0.097	0.11	0.010	0.568	0.100	27.32
SW-06 15	Rock	6.11	0.02	2.41	0.027	0.007	31.85	0.598	1.86	0.089	0.12	0.012	0.579	0.139	27.43
SW-06 16	Rock	5.52	0.03	2.94	0.026	0.007	31.90	0.525	1.87	0.112	0.11	0.012	0.678	0.223	26.78
SW-06 17	Rock	5.51	0.06	4.28	0.027	0.006	27.82	0.647	2.06	0.132	0.14	0.011	0.866	0.251	28.68
SW-06 18	Rock	5.60	0.04	5.93	0.025	0.006	26.13	0.769	2.53	0.115	0.13	0.008	0.444	0.130	24.76
SW-06 19	Rock	5.70	0.04	3.33	0.029	0.005	21.94	0.956	1.84	0.108	0.19	0.006	0.633	0.206	38.80
SW-06 20	Rock	5.60	0.05	2.51	0.030	0.004	16.43	1.074	1.43	0.072	0.20	0.006	0.496	0.418	51.45
SW-06 21	Rock	8.94	0.07	2.37	0.027	0.003	8.49	1.786	1.40	0.037	0.32	0.003	0.520	0.557	61.88
SW-06 22	Rock	14.71	0.08	0.33	0.021	0.004	3.11	2.779	1.43	0.011	0.47	0.004	0.089	0.502	68.74
SW-06 23	Pulp	0.53	<0.01	2.18	0.004	0.008	29.99	0.032	2.51	0.077	0.02	0.002	0.106	0.224	53.20
SW-07 01	Rock	16.05	0.10	0.42	0.020	0.003	4.49	3.101	1.60	0.010	0.46	0.003	0.066	0.660	64.00
SW-07 02	Rock	14.95	0.09	0.46	0.019	0.003	6.07	2.827	1.56	0.012	0.43	0.004	0.064	0.793	62.76
SW-07 03	Rock	6.93	0.06	2.77	0.026	0.005	22.72	1.045	1.74	0.098	0.15	0.011	0.447	1.126	35.05
SW-07 04	Rock	8.22	0.06	2.81	0.029	0.006	22.77	1.166	1.85	0.085	0.15	0.008	0.491	0.326	36.09
SW-07 05	Rock	6.40	0.05	4.48	0.026	0.007	28.05	0.847	1.58	0.111	0.14	0.010	1.088	0.056	28.44

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-07 06	Rock	6.69	0.05	2.26	0.029	0.007	30.26	0.859	1.49	0.115	0.12	0.010	0.532	0.031	29.49
SW-07 07	Rock	6.37	0.05	3.63	0.024	0.007	31.25	0.775	1.52	0.130	0.13	0.011	0.943	0.035	25.35
SW-07 08	Rock	6.53	0.04	1.76	0.031	0.007	33.34	0.669	1.44	0.088	0.11	0.010	0.479	0.030	27.28
SW-07 09	Rock	6.87	0.05	2.26	0.027	0.007	30.42	0.833	1.55	0.090	0.12	0.010	0.541	0.054	29.53
SW-07 10	Rock	6.72	0.04	2.47	0.027	0.006	27.86	0.826	1.80	0.098	0.12	0.011	0.436	0.219	31.76
SW-07 11	Rock	6.40	0.05	3.58	0.022	0.006	24.37	0.915	1.59	0.097	0.14	0.009	0.755	0.194	34.64
SW-07 12	Rock	7.03	0.06	4.37	0.023	0.005	23.15	1.064	1.48	0.105	0.16	0.008	1.081	0.286	35.07
SW-07 13	Rock	11.59	0.07	0.75	0.022	0.004	9.67	2.116	1.36	0.013	0.17	0.004	0.072	0.581	60.84
SW-07 14	Rock	9.97	0.06	1.25	0.021	0.004	12.94	1.759	1.39	0.038	0.17	0.004	0.183	0.448	55.50
SW-07 15	Rock	6.04	0.05	3.33	0.024	0.005	22.07	0.902	1.79	0.106	0.13	0.007	0.488	0.435	38.80
SW-07 16	Rock	6.80	0.06	2.71	0.024	0.005	23.52	0.922	1.65	0.080	0.14	0.009	0.525	0.305	39.17
SW-07 17	Rock	6.82	0.05	2.80	0.024	0.005	20.92	0.986	1.83	0.070	0.13	0.007	0.451	0.450	40.21
SW-07 18	Rock	5.81	0.04	2.95	0.036	0.005	20.95	0.856	1.97	0.083	0.13	0.024	0.501	0.731	40.32
SW-07 18D	Rock	5.79	0.04	3.31	0.030	0.005	20.17	0.852	1.98	0.081	0.14	0.007	0.603	0.718	40.95
SW-07 19	Rock	3.69	0.03	3.57	0.021	0.006	25.90	0.644	2.22	0.149	0.12	0.004	0.495	0.664	29.17
SW-07 20	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-07 21	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-07 22	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-07 23	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-07 24	Rock	9.18	0.05	0.78	0.026	0.004	10.46	1.654	1.23	0.021	0.15	0.005	0.122	0.555	63.05
SW-07 25	Rock	10.96	0.07	0.73	0.033	0.004	9.84	2.005	1.37	0.017	0.17	0.004	0.122	0.517	62.45
SW-07 26	Rock	8.77	0.06	1.60	0.022	0.005	15.06	1.559	1.57	0.058	0.17	0.004	0.261	0.637	51.41
SW-07 27	Rock	5.58	0.05	2.71	0.025	0.005	22.31	0.796	1.75	0.100	0.13	0.007	0.484	0.741	40.34
SW-07 28	Rock	6.50	0.04	2.73	0.028	0.006	24.87	0.854	1.84	0.088	0.14	0.007	0.543	0.438	35.66
SW-07 29	Rock	6.72	0.04	2.77	0.029	0.006	23.40	0.922	1.91	0.077	0.15	0.010	0.560	1.042	37.77
SW-07 30	Rock	5.72	0.05	4.26	0.017	0.005	23.97	0.909	2.23	0.097	0.15	0.006	0.836	0.398	31.65
SW-07 31	Pulp	0.53	<0.01	2.19	0.005	0.008	29.83	0.032	2.51	0.076	0.02	0.002	0.104	0.229	53.01
SW-09 01	Rock	14.95	0.10	0.46	0.022	0.003	4.29	2.828	1.24	0.008	0.49	0.003	0.043	0.251	65.95
SW-09 02	Rock	13.33	0.07	0.51	0.027	0.003	7.65	2.288	1.14	0.009	0.38	0.005	0.099	0.199	62.51
SW-09 03	Rock	8.24	0.06	1.86	0.021	0.007	28.48	1.179	1.10	0.140	0.14	0.013	0.572	0.351	31.52
SW-09 04	Rock	10.01	0.06	3.23	0.023	0.005	19.55	1.595	1.23	0.085	0.16	0.009	0.732	0.637	39.52
SW-09 05	Rock	9.30	0.06	2.29	0.024	0.005	21.22	1.395	1.09	0.098	0.20	0.009	0.533	0.436	40.88
SW-09 06	Rock	11.03	0.06	2.16	0.023	0.005	16.14	1.821	1.17	0.070	0.20	0.008	0.380	0.639	47.79
SW-09 07	Rock	7.97	0.05	2.41	0.020	0.006	25.01	1.347	1.04	0.135	0.16	0.007	0.451	0.676	37.34
SW-09 08	Rock	7.94	0.06	2.40	0.021	0.006	24.96	1.365	1.03	0.133	0.16	0.006	0.447	0.675	37.35
SW-09 09	Rock	6.03	0.04	1.86	0.028	0.009	37.11	0.647	1.13	0.124	0.10	0.010	0.740	0.079	23.68
SW-09 10	Rock	5.90	0.04	1.66	0.032	0.009	37.67	0.551	1.16	0.093	0.10	0.011	0.700	0.060	23.84
SW-09 11	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-09 12	Rock	6.21	0.04	1.54	0.031	0.009	36.88	0.621	1.15	0.094	0.11	0.013	0.645	0.112	24.88
SW-09 13	Rock	6.26	0.04	1.40	0.030	0.008	36.67	0.627	1.13	0.084	0.09	0.011	0.605	0.058	25.63

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-09 14	Rock	6.24	0.04	1.96	0.030	0.008	37.27	0.613	1.18	0.082	0.10	0.011	0.751	0.132	23.80
SW-09 15	Rock	5.80	0.03	2.22	0.031	0.009	37.52	0.522	1.30	0.103	0.10	0.013	0.774	0.062	21.78
SW-09 16	Rock	5.07	0.04	1.94	0.030	0.009	39.20	0.385	1.22	0.066	0.10	0.012	0.716	0.061	21.75
SW-09 17	Rock	5.11	0.04	3.39	0.032	0.007	33.35	0.386	1.71	0.102	0.12	0.012	0.870	0.230	23.85
SW-09 18	Rock	5.71	0.04	2.34	0.035	0.008	29.50	0.789	0.99	0.080	0.31	0.009	0.509	0.432	36.15
SW-09 19	Rock	5.14	0.04	2.08	0.030	0.007	33.85	0.592	1.03	0.078	0.23	0.010	0.551	0.363	30.09
SW-09 20	Rock	4.12	0.04	3.30	0.016	0.008	33.95	0.679	2.45	0.249	0.08	0.007	0.371	0.407	17.08
SW-09 21	Rock	5.30	0.05	5.12	0.031	0.005	19.70	0.876	1.64	0.132	0.15	0.014	0.529	1.295	40.85
SW-09 22	Rock	6.03	0.05	2.78	0.030	0.004	17.38	0.968	1.20	0.119	0.17	0.009	0.242	1.445	49.27
SW-09 23	Rock	8.11	0.07	0.69	0.031	0.002	5.57	1.702	0.81	0.005	0.29	<0.001	0.157	0.585	72.63
SW-09 24	Rock	7.17	0.08	11.55	0.035	0.003	5.41	1.370	0.73	0.022	0.34	0.004	2.151	3.406	50.80
SW-09 25	Rock	13.51	0.10	1.53	0.019	0.003	4.00	2.589	1.11	0.005	0.50	<0.001	0.263	1.163	64.25
SW-09 25D	Rock	13.66	0.09	1.16	0.019	0.003	4.35	2.637	1.14	0.006	0.48	<0.001	0.278	0.943	64.64
SW-09 26	Rock	12.20	0.08	0.24	0.021	0.002	4.19	2.454	1.05	0.006	0.45	<0.001	0.150	0.507	69.16
SW-09 27	Pulp	0.53	<0.01	2.13	0.003	0.008	29.84	0.034	2.46	0.076	0.03	0.002	0.103	0.224	52.36
SW-10 01	Rock	13.49	0.07	0.59	0.024	0.003	8.10	2.387	1.53	0.018	0.43	0.006	0.091	0.793	60.83
SW-10 02	Rock	11.10	0.07	1.48	0.023	0.004	13.84	2.011	1.88	0.062	0.34	0.005	0.165	0.823	49.68
SW-10 03	Rock	7.10	0.05	3.22	0.019	0.006	25.38	1.180	2.12	0.136	0.21	0.003	0.730	0.297	30.93
SW-10 04	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-10 05	Rock	5.77	0.04	2.76	0.017	0.007	30.25	0.895	1.72	0.185	0.13	0.005	0.304	0.138	26.09
SW-10 06	Rock	6.07	0.04	3.35	0.018	0.006	28.83	0.894	2.11	0.148	0.11	0.005	0.413	0.149	25.08
SW-10 07	Rock	6.87	0.05	6.74	0.023	0.006	24.27	0.963	1.83	0.104	0.15	0.009	1.455	0.160	28.20
SW-10 08	Rock	5.67	0.03	5.92	0.030	0.007	31.07	0.591	1.19	0.107	0.14	0.010	1.690	0.054	24.72
SW-10 09	Rock	7.48	0.05	1.65	0.030	0.007	30.71	0.931	1.33	0.083	0.12	0.011	0.520	0.045	30.96
SW-10 10	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-10 11	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-10 12	Rock	11.31	0.07	5.79	0.025	0.003	4.31	2.078	1.82	0.033	0.58	0.002	0.080	1.043	59.12
SW-10 13	Rock	14.53	0.10	1.61	0.020	0.004	4.89	2.709	1.59	0.016	0.49	0.004	0.093	1.164	62.02
SW-10 14	Rock	12.42	0.07	7.59	0.020	0.004	6.00	2.021	1.77	0.036	0.44	0.004	0.165	1.167	51.27
SW-10 15	Rock	6.62	0.05	2.68	0.027	0.007	32.18	0.800	1.35	0.100	0.14	0.011	0.731	0.258	25.97
SW-10 16	Rock	5.54	0.03	1.38	0.033	0.008	37.93	0.481	1.21	0.082	0.09	0.012	0.584	0.063	22.84
SW-10 17	Rock	5.28	0.04	2.36	0.032	0.008	37.43	0.422	1.38	0.098	0.10	0.013	0.782	0.131	20.34
SW-10 18	Rock	4.76	0.04	3.35	0.029	0.008	36.33	0.386	1.42	0.115	0.12	0.011	1.025	0.074	20.26
SW-10 19	Rock	4.94	0.03	1.71	0.031	0.009	37.42	0.381	1.44	0.086	0.09	0.013	0.566	0.112	22.22
SW-10 20	Rock	4.76	0.03	2.93	0.033	0.008	34.25	0.407	1.75	0.099	0.12	0.013	0.745	0.361	23.30
SW-10 21	Rock	4.23	0.04	4.33	0.021	0.005	25.94	0.639	2.14	0.152	0.11	0.007	0.472	0.959	29.38
SW-10 22	Rock	6.38	0.05	2.71	0.029	0.004	14.51	1.085	0.97	0.044	0.20	0.006	0.443	1.361	54.79
SW-10 23	Rock	5.04	0.04	2.69	0.027	0.005	22.19	0.826	1.60	0.168	0.14	0.009	0.319	1.517	40.26
SW-10 24	Rock	4.96	0.04	3.06	0.025	0.006	23.53	0.760	1.54	0.168	0.14	0.008	0.359	1.434	38.17
SW-10 25	Rock	6.02	0.05	3.78	0.025	0.004	16.96	0.970	0.83	0.046	0.18	0.006	0.349	2.411	48.17

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-10 26	Rock	5.93	0.06	2.89	0.032	0.003	11.79	1.099	0.94	0.067	0.20	0.004	0.235	1.511	58.46
SW-10 27	Rock	7.92	0.07	2.44	0.035	0.003	4.77	1.569	0.77	0.005	0.31	<0.001	0.395	1.386	69.21
SW-10 28	Rock	9.89	0.07	1.44	0.026	0.004	3.65	1.918	0.87	0.007	0.39	<0.001	0.361	1.037	69.99
SW-10 28D	Rock	9.73	0.07	1.94	0.031	0.004	3.65	1.889	0.88	0.007	0.38	<0.001	0.414	1.194	69.46
SW-10 29	Rock	12.78	0.08	0.29	0.022	0.003	2.80	2.452	1.07	0.006	0.51	<0.001	0.071	0.576	71.12
SW-10 30	Pulp	0.54	<0.01	2.19	0.004	0.008	29.94	0.034	2.50	0.078	0.03	0.002	0.106	0.231	52.80
SW-11 01	Rock	15.35	0.10	0.36	0.018	0.003	4.85	2.930	1.58	0.011	0.47	0.003	0.052	0.762	63.61
SW-11 01D	Rock	15.21	0.19	0.35	0.016	0.003	4.85	2.882	1.56	0.011	0.46	0.003	0.050	0.848	63.14
SW-11 02	Rock	13.44	0.08	0.82	0.020	0.004	9.59	2.518	1.71	0.030	0.39	0.005	0.121	0.755	56.37
SW-11 03	Rock	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-11 04	Rock	5.09	0.04	4.90	0.017	0.006	28.33	0.719	2.42	0.137	0.09	0.006	0.262	0.248	22.48
SW-11 05	Rock	5.98	0.04	5.56	0.019	0.005	26.56	0.856	2.31	0.106	0.11	0.006	0.532	0.168	24.74
SW-11 06	Rock	6.13	0.06	7.53	0.020	0.007	27.37	0.792	1.64	0.130	0.17	0.009	1.992	0.077	24.27
SW-11 07	Rock	6.32	0.04	3.00	0.031	0.009	34.36	0.689	1.21	0.087	0.15	0.011	1.006	0.047	24.09
SW-11 08	Rock	6.57	0.04	1.65	0.031	0.009	34.24	0.733	1.20	0.089	0.12	0.011	0.590	0.039	26.55
SW-11 09	Rock	7.15	0.05	3.21	0.027	0.007	29.12	0.934	1.21	0.101	0.15	0.009	1.050	0.046	31.24
SW-11 10	Rock	6.66	0.05	2.76	0.027	0.007	31.82	0.754	1.35	0.120	0.14	0.011	0.822	0.051	27.51
SW-11 11	Pulp	0.53	<0.01	2.17	0.004	0.008	29.83	0.037	2.49	0.078	0.02	0.002	0.104	0.224	52.81
SW-11 12	Rock	6.27	0.04	1.70	0.028	0.008	34.31	0.640	1.49	0.108	0.12	0.013	0.489	0.060	25.86
SW-11 13	Rock	6.06	0.04	2.01	0.030	0.008	34.48	0.567	1.53	0.089	0.12	0.012	0.602	0.077	25.79
SW-11 14	Rock	5.70	0.03	1.72	0.030	0.008	34.95	0.510	1.51	0.092	0.12	0.012	0.519	0.139	25.98
SW-11 15	Rock	5.47	0.03	2.13	0.027	0.008	36.13	0.484	1.52	0.085	0.15	0.012	0.640	0.085	23.78
SW-11 16	Rock	5.17	0.03	1.97	0.029	0.007	36.59	0.405	1.58	0.073	0.12	0.013	0.574	0.322	23.70
SW-11 17	Rock	5.05	0.04	2.35	0.033	0.010	35.01	0.419	1.68	0.085	0.13	0.015	0.601	0.164	25.11
SW-11 18	Rock	4.85	0.04	2.97	0.028	0.007	34.14	0.429	1.79	0.116	0.13	0.012	0.648	0.201	23.09
SW-11 19	Rock	4.87	0.04	3.73	0.029	0.007	32.13	0.495	1.99	0.104	0.14	0.011	0.688	0.422	23.69
SW-12 01	Rock	15.02	0.12	2.63	0.019	0.004	4.67	2.872	1.56	0.013	0.48	0.003	0.593	0.817	60.85
SW-12 02	Rock	12.98	0.08	1.04	0.022	0.004	9.17	2.390	1.56	0.028	0.39	0.005	0.104	1.082	58.27
SW-12 03	Rock	6.55	0.06	2.46	0.027	0.007	23.78	0.986	1.95	0.118	0.16	0.008	0.306	0.557	34.34
SW-12 04	Rock	7.62	0.05	3.33	0.029	0.006	23.80	1.042	2.04	0.075	0.13	0.009	0.145	0.429	34.79
SW-12 05	Rock	6.95	0.05	2.82	0.027	0.007	28.25	0.921	1.57	0.100	0.15	0.011	0.741	0.077	31.99
SW-12 06	Rock	6.11	0.04	2.30	0.027	0.008	33.01	0.692	1.37	0.102	0.14	0.010	0.674	0.042	26.79
SW-12 07	Rock	6.13	0.03	1.59	0.030	0.008	34.64	0.665	1.28	0.111	0.13	0.011	0.505	0.045	25.61
SW-12 08	Rock	6.69	0.04	3.23	0.028	0.008	31.73	0.788	1.27	0.092	0.16	0.011	1.033	0.060	27.37
SW-12 09	Rock	6.72	0.04	1.96	0.029	0.007	31.23	0.805	1.30	0.106	0.14	0.011	0.618	0.045	30.23
SW-12 10	Rock	7.42	0.07	1.38	0.028	0.006	23.02	1.035	1.35	0.074	0.14	0.012	0.345	0.094	43.99
SW-12 11	Rock	7.75	0.06	2.08	0.022	0.006	21.14	1.232	1.37	0.080	0.15	0.006	0.459	0.307	42.36
SW-12 12	Rock	6.60	0.05	2.64	0.027	0.008	30.26	0.737	1.50	0.112	0.15	0.010	0.760	0.075	30.19
SW-12 13	Rock	6.75	0.07	2.78	0.028	0.007	30.43	0.743	1.61	0.092	0.15	0.012	0.778	0.085	29.29
SW-12 14	Rock	6.11	0.06	2.82	0.025	0.007	29.28	0.685	1.64	0.122	0.14	0.012	0.706	0.109	30.90

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
SW-12 15	Rock	6.06	0.07	2.87	0.026	0.007	30.54	0.645	1.69	0.112	0.13	0.011	0.732	0.104	29.06
SW-12 16	Rock	5.91	0.04	2.53	0.025	0.007	31.38	0.577	1.79	0.170	0.13	0.013	0.577	0.143	28.01
SW-12 17	Rock	5.80	0.04	2.96	0.032	0.007	30.57	0.569	1.74	0.102	0.13	0.010	0.772	0.167	29.17
SW-12 18	Rock	4.63	0.04	3.77	0.029	0.007	29.48	0.602	2.04	0.340	0.12	0.009	0.613	0.212	25.62
SW-12 19	Rock	4.41	0.04	3.94	0.023	0.007	28.07	0.629	2.17	0.213	0.11	0.009	0.596	0.714	25.25
SW-12 20	Rock	6.07	0.04	3.05	0.025	0.005	21.77	0.836	1.50	0.058	0.15	0.007	0.627	0.847	35.85
SW-12 20D	Rock	5.57	0.04	3.52	0.027	0.006	23.16	0.797	1.66	0.093	0.13	0.008	0.663	0.785	33.38
SW-12 21	Rock	4.18	0.04	3.90	0.032	0.005	17.91	0.861	1.79	0.084	0.15	0.004	0.248	1.613	44.59
SW-12 22	Pulp	0.55	<0.01	2.19	0.004	0.008	30.04	0.036	2.50	0.076	0.03	0.002	0.106	0.346	53.11
SW-12 23	Pulp	0.55	<0.01	2.19	0.005	0.009	30.10	0.032	2.51	0.078	0.03	0.002	0.105	0.299	53.04

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-01A 01	Rock	0.624	0.081	0.023	<0.01	93.38	8.77
SW-01A 02	Rock	0.837	0.051	0.012	<0.01	96.40	6.53
SW-01A 03	Rock	0.343	0.193	0.053	<0.01	88.18	10.94
SW-01A 04	Rock	0.285	0.195	0.059	<0.01	86.43	12.62
SW-01A 05	Rock	0.232	0.209	0.065	<0.01	84.62	13.17
SW-01A 06	Rock	0.213	0.228	0.063	<0.01	84.54	12.37
SW-01A 07	Rock	0.201	0.235	0.064	<0.01	84.34	12.07
SW-01A 08	Rock	0.319	0.185	0.050	<0.01	86.31	9.70
SW-01A 09	Rock	0.290	0.196	0.057	<0.01	86.17	10.93
SW-01A 10	Rock	0.257	0.207	0.061	<0.01	85.56	10.99
SW-01A 11	Rock	0.220	0.201	0.058	<0.01	84.30	11.22
SW-01A 12	Rock	0.178	0.219	0.064	<0.01	84.71	12.53
SW-01A 13	Rock	0.163	0.240	0.074	<0.01	86.07	13.16
SW-01A 14	Rock	NS	NS	NS	NS	NS	NS
SW-01A 15	Pulp	0.004	<0.001	0.005	<0.01	87.60	0.00
SW-01A 16	Rock	0.153	0.226	0.059	<0.01	85.17	14.18
SW-01A 17	Rock	NS	NS	NS	NS	NS	NS
SW-01A 18	Rock	NS	NS	NS	NS	NS	NS
SW-01A 19	Rock	0.182	0.086	0.031	<0.01	85.68	19.16
SW-01A 20	Rock	0.231	0.115	0.048	<0.01	86.93	18.18
SW-01A 21	Rock	0.896	0.048	0.011	<0.01	97.40	6.09
SW-01A 22	Rock	0.891	0.047	0.011	<0.01	97.29	5.71
SW-01A 22D	Rock	0.886	0.047	0.013	<0.01	97.70	5.70
SW-02A 01	Rock	0.309	0.139	0.038	<0.01	88.05	13.87
SW-02A 02	Rock	0.279	0.181	0.052	<0.01	86.26	13.29
SW-02A 03	Rock	0.198	0.217	0.054	<0.01	83.10	12.77
SW-02A 03D	Rock	0.208	0.221	0.058	<0.01	83.53	13.10
SW-02A 04	Rock	0.222	0.216	0.056	<0.01	83.64	12.55
SW-02A 05	Rock	0.267	0.202	0.052	<0.01	85.31	12.04
SW-02A 06	Rock	NS	NS	NS	NS	NS	NS
SW-02A 07	Rock	0.312	0.163	0.048	<0.01	87.42	10.42
SW-02A 08	Rock	0.329	0.182	0.050	<0.01	87.62	11.68
SW-02A 09	Rock	NS	NS	NS	NS	NS	NS
SW-02A 10	Rock	NS	NS	NS	NS	NS	NS
SW-02A 11	Rock	NS	NS	NS	NS	NS	NS
SW-02A 12	Rock	NS	NS	NS	NS	NS	NS
SW-02A 13	Rock	NS	NS	NS	NS	NS	NS
SW-02A 14	Rock	0.253	0.163	0.045	<0.01	86.14	16.43
SW-02A 15	Rock	0.180	0.093	0.028	<0.01	85.19	18.25
SW-02A 16	Rock	0.869	0.045	0.019	<0.01	98.09	5.54

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-02A 17	Rock	0.885	0.044	0.015	<0.01	97.87	5.62
SW-02A 18	Rock	0.862	0.043	0.013	<0.01	96.79	5.59
SW-02A 19	Pulp	0.004	<0.001	0.005	<0.01	87.48	0.00
SW-03A 01	Rock	0.872	0.053	0.015	<0.01	97.52	5.76
SW-03A 02	Rock	0.846	0.055	0.015	<0.01	96.60	5.87
SW-03A 03	Rock	0.325	0.144	0.038	<0.01	87.75	10.93
SW-03A 04	Rock	0.379	0.154	0.044	<0.01	87.06	10.02
SW-03A 05	Rock	NS	NS	NS	NS	NS	NS
SW-03A 06	Rock	0.328	0.163	0.044	<0.01	88.07	11.74
SW-03A 07	Pulp	0.005	<0.001	0.005	<0.01	87.70	0.00
SW-03A 08	Rock	0.281	0.178	0.055	<0.01	85.74	11.80
SW-03A 08D	Rock	0.279	0.179	0.051	<0.01	85.80	11.75
SW-03A 09	Rock	0.244	0.178	0.054	<0.01	86.00	15.32
SW-03A 10	Rock	0.243	0.195	0.055	<0.01	86.60	15.20
SW-03A 11	Rock	0.270	0.187	0.050	<0.01	87.99	15.15
SW-03A 12	Rock	NS	NS	NS	NS	NS	NS
SW-03A 13	Rock	0.279	0.148	0.039	<0.01	90.06	14.94
SW-03A 14	Rock	0.244	0.113	0.028	<0.01	89.96	13.82
SW-03A 15	Rock	0.297	0.120	0.026	<0.01	93.04	7.86
SW-03A 16	Rock	0.700	0.064	0.017	<0.01	96.39	6.44
SW-03A 17	Rock	0.852	0.053	0.015	<0.01	97.39	5.66
SW-05 01	Rock	0.820	0.060	0.013	<0.01	96.81	5.53
SW-05 02	Rock	0.566	0.118	0.040	<0.01	91.72	8.55
SW-05 03	Rock	0.568	0.103	0.035	<0.01	91.95	8.34
SW-05 04	Rock	0.884	0.054	0.025	<0.01	97.53	5.91
SW-05 05	Rock	0.854	0.051	0.015	<0.01	96.83	6.27
SW-05 06	Rock	0.781	0.056	0.030	<0.01	94.84	7.77
SW-05 07	Rock	0.378	0.153	0.074	<0.01	89.01	12.49
SW-05 08	Rock	0.307	0.182	0.065	<0.01	87.08	11.57
SW-05 09	Rock	NS	NS	NS	NS	NS	NS
SW-05 10	Rock	0.228	0.223	0.061	<0.01	84.53	11.68
SW-05 11	Rock	0.217	0.245	0.061	<0.01	84.48	11.73
SW-05 12	Rock	NS	NS	NS	NS	NS	NS
SW-05 13	Rock	0.196	0.186	0.049	<0.01	84.91	14.80
SW-05 14	Rock	0.226	0.192	0.054	<0.01	83.89	10.68
SW-05 14D	Rock	0.218	0.180	0.053	<0.01	83.21	10.80
SW-05 15	Rock	NS	NS	NS	NS	NS	NS
SW-05 16	Pulp	0.004	<0.001	0.004	<0.01	86.76	0.00
SW-05 17	Rock	0.218	0.159	0.042	<0.01	87.08	8.83
SW-05 18	Rock	0.196	0.200	0.046	<0.01	85.15	9.56

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-05 19	Rock	0.233	0.238	0.066	<0.01	84.94	12.10
SW-05 20	Rock	0.222	0.215	0.069	<0.01	85.82	14.10
SW-05 21	Rock	0.186	0.232	0.075	<0.01	86.07	14.67
SW-05 22	Rock	0.148	0.224	0.060	<0.01	85.30	14.15
SW-05 23	Rock	0.172	0.220	0.061	<0.01	85.20	14.63
SW-05 24	Rock	0.106	0.176	0.062	<0.01	84.56	17.82
SW-05 25	Rock	0.715	0.045	0.016	<0.01	97.04	7.47
SW-05 26	Pulp	0.005	<0.001	0.005	<0.01	87.41	0.00
SW-05 27	Rock	0.736	0.042	0.010	<0.01	97.85	6.13
SW-05 27D	Rock	0.748	0.043	0.013	<0.01	97.58	6.00
SW-05 28	Rock	0.837	0.045	0.007	<0.01	97.58	6.66
SW-06 01	Rock	0.882	0.056	0.016	<0.01	98.06	6.07
SW-06 01D	Rock	0.877	0.055	0.016	<0.01	98.15	5.93
SW-06 02	Rock	0.796	0.071	0.020	<0.01	97.02	6.97
SW-06 03	Rock	0.248	0.126	0.040	<0.01	87.08	19.94
SW-06 04	Rock	0.288	0.217	0.053	<0.01	87.50	14.65
SW-06 05	Rock	0.240	0.211	0.052	<0.01	86.27	11.82
SW-06 06	Rock	0.239	0.204	0.056	<0.01	85.06	12.93
SW-06 07	Rock	0.212	0.224	0.059	<0.01	84.39	12.43
SW-06 08	Rock	0.238	0.214	0.057	<0.01	85.01	12.50
SW-06 09	Rock	0.284	0.187	0.045	<0.01	87.20	11.24
SW-06 10	Rock	0.303	0.166	0.070	<0.01	87.81	12.23
SW-06 11	Rock	0.249	0.205	0.049	<0.01	86.00	11.66
SW-06 12	Rock	0.274	0.208	0.057	<0.01	86.17	12.14
SW-06 13	Rock	0.207	0.211	0.054	<0.01	85.33	13.30
SW-06 14	Rock	0.202	0.201	0.054	<0.01	85.20	13.22
SW-06 15	Rock	0.204	0.201	0.055	<0.01	85.28	13.58
SW-06 16	Rock	0.166	0.200	0.056	<0.01	85.24	14.11
SW-06 17	Rock	0.176	0.184	0.054	<0.01	86.48	15.60
SW-06 18	Rock	0.207	0.166	0.045	<0.01	87.99	20.98
SW-06 19	Rock	0.233	0.131	0.038	<0.01	89.49	15.31
SW-06 20	Rock	0.246	0.090	0.026	<0.01	91.70	11.58
SW-06 21	Rock	0.487	0.053	0.011	<0.01	95.70	8.75
SW-06 22	Rock	0.851	0.044	0.018	<0.01	98.43	5.23
SW-06 23	Pulp	0.005	0.001	0.005	<0.01	87.77	0.00
SW-07 01	Rock	0.896	0.055	0.017	<0.01	97.87	5.93
SW-07 02	Rock	0.841	0.061	0.018	<0.01	97.36	6.39
SW-07 03	Rock	0.298	0.140	0.038	<0.01	89.19	16.54
SW-07 04	Rock	0.362	0.179	0.046	<0.01	89.47	14.82
SW-07 05	Rock	0.261	0.159	0.046	<0.01	86.46	14.72

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-07 06	Rock	0.262	0.182	0.052	<0.01	86.26	13.84
SW-07 07	Rock	0.238	0.172	0.055	<0.01	85.50	14.83
SW-07 08	Rock	0.215	0.223	0.056	<0.01	85.26	12.97
SW-07 09	Rock	0.260	0.192	0.054	<0.01	86.59	13.73
SW-07 10	Rock	0.276	0.175	0.050	<0.01	87.32	14.44
SW-07 11	Rock	0.291	0.129	0.035	<0.01	88.06	14.86
SW-07 12	Rock	0.345	0.118	0.035	<0.01	87.86	13.48
SW-07 13	Rock	0.680	0.057	0.016	<0.01	95.19	7.18
SW-07 14	Rock	0.561	0.067	0.019	<0.01	93.79	9.41
SW-07 15	Rock	0.273	0.119	0.032	<0.01	89.26	14.66
SW-07 16	Rock	0.285	0.165	0.044	<0.01	89.01	12.61
SW-07 17	Rock	0.298	0.141	0.037	<0.01	89.97	14.76
SW-07 18	Rock	0.239	0.160	0.039	<0.01	89.97	15.15
SW-07 18D	Rock	0.237	0.156	0.039	<0.01	89.74	14.65
SW-07 19	Rock	0.164	0.077	0.017	<0.01	87.40	20.47
SW-07 20	Rock	NS	NS	NS	NS	NS	NS
SW-07 21	Rock	NS	NS	NS	NS	NS	NS
SW-07 22	Rock	NS	NS	NS	NS	NS	NS
SW-07 23	Rock	NS	NS	NS	NS	NS	NS
SW-07 24	Rock	0.511	0.086	0.023	<0.01	94.73	6.82
SW-07 25	Rock	0.630	0.065	0.018	<0.01	95.34	6.34
SW-07 26	Rock	0.491	0.059	0.015	<0.01	92.62	10.88
SW-07 27	Rock	0.234	0.132	0.035	<0.01	89.34	13.94
SW-07 28	Rock	0.265	0.165	0.042	<0.01	88.09	13.88
SW-07 29	Rock	0.288	0.168	0.043	<0.01	88.93	13.04
SW-07 30	Rock	0.280	0.080	0.022	<0.01	88.21	17.54
SW-07 31	Pulp	0.005	<0.001	0.006	<0.01	87.63	0.00
SW-09 01	Rock	0.868	0.051	0.016	<0.01	97.42	5.86
SW-09 02	Rock	0.726	0.095	0.029	<0.01	96.01	6.92
SW-09 03	Rock	0.360	0.159	0.058	<0.01	86.36	12.10
SW-09 04	Rock	0.493	0.156	0.052	<0.01	89.28	11.75
SW-09 05	Rock	0.399	0.168	0.051	<0.01	89.22	11.08
SW-09 06	Rock	0.542	0.124	0.043	<0.01	91.59	9.39
SW-09 07	Rock	0.388	0.099	0.035	<0.01	87.64	10.51
SW-09 08	Rock	0.381	0.098	0.034	<0.01	87.10	10.04
SW-09 09	Rock	0.216	0.228	0.059	<0.01	83.03	10.94
SW-09 10	Rock	0.187	0.248	0.061	<0.01	82.96	10.66
SW-09 11	Rock	NS	NS	NS	NS	NS	NS
SW-09 12	Rock	0.212	0.236	0.067	<0.01	83.81	10.98
SW-09 13	Rock	0.220	0.226	0.059	<0.01	83.78	10.63

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-09 14	Rock	0.215	0.222	0.062	<0.01	83.38	10.67
SW-09 15	Rock	0.183	0.225	0.064	<0.01	82.82	12.10
SW-09 16	Rock	0.134	0.230	0.062	<0.01	82.32	11.31
SW-09 17	Rock	0.122	0.241	0.074	<0.01	83.52	13.90
SW-09 18	Rock	0.223	0.193	0.047	<0.01	86.42	9.06
SW-09 19	Rock	0.171	0.212	0.054	<0.01	84.45	9.94
SW-09 20	Rock	0.187	0.078	0.024	<0.01	84.65	21.61
SW-09 21	Rock	0.216	0.128	0.037	<0.01	89.59	13.53
SW-09 22	Rock	0.229	0.101	0.037	<0.01	91.79	11.73
SW-09 23	Rock	0.450	0.055	0.010	<0.01	97.00	5.85
SW-09 24	Rock	0.374	0.040	0.011	<0.01	92.52	9.03
SW-09 25	Rock	0.776	0.046	0.007	<0.01	97.13	7.27
SW-09 25D	Rock	0.785	0.048	0.007	<0.01	97.23	7.00
SW-09 26	Rock	0.708	0.038	0.006	<0.01	97.05	5.79
SW-09 27	Pulp	0.002	<0.001	0.004	<0.01	86.75	0.00
SW-10 01	Rock	0.747	0.085	0.023	<0.01	96.12	6.91
SW-10 02	Rock	0.602	0.104	0.025	<0.01	93.41	11.21
SW-10 03	Rock	0.339	0.105	0.026	<0.01	87.88	16.05
SW-10 04	Rock	NS	NS	NS	NS	NS	NS
SW-10 05	Rock	0.265	0.114	0.031	<0.01	86.29	17.58
SW-10 06	Rock	0.260	0.135	0.034	<0.01	86.58	18.94
SW-10 07	Rock	0.287	0.162	0.048	<0.01	87.31	15.99
SW-10 08	Rock	0.189	0.226	0.061	<0.01	83.78	12.08
SW-10 09	Rock	0.302	0.208	0.048	<0.01	85.80	11.34
SW-10 10	Rock	NS	NS	NS	NS	NS	NS
SW-10 11	Rock	NS	NS	NS	NS	NS	NS
SW-10 12	Rock	0.593	0.033	0.012	<0.01	95.71	8.81
SW-10 13	Rock	0.807	0.052	0.015	<0.01	96.90	6.79
SW-10 14	Rock	0.591	0.048	0.016	<0.01	94.23	10.61
SW-10 15	Rock	0.258	0.191	0.066	<0.01	84.70	13.28
SW-10 16	Rock	0.154	0.244	0.061	<0.01	82.59	11.86
SW-10 17	Rock	0.144	0.229	0.063	<0.01	82.54	13.70
SW-10 18	Rock	0.121	0.214	0.063	<0.01	82.65	14.33
SW-10 19	Rock	0.118	0.234	0.063	<0.01	83.21	13.76
SW-10 20	Rock	0.113	0.227	0.066	<0.01	83.89	14.68
SW-10 21	Rock	0.155	0.112	0.035	<0.01	86.96	18.25
SW-10 22	Rock	0.262	0.105	0.030	<0.01	92.98	10.01
SW-10 23	Rock	0.202	0.114	0.035	<0.01	89.46	14.29
SW-10 24	Rock	0.185	0.109	0.037	<0.01	89.33	14.82
SW-10 25	Rock	0.233	0.089	0.030	<0.01	92.14	12.00

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-10 26	Rock	0.264	0.051	0.020	<0.01	94.13	10.59
SW-10 27	Rock	0.427	0.054	0.009	<0.01	97.06	7.70
SW-10 28	Rock	0.552	0.049	0.006	<0.01	97.47	7.21
SW-10 28D	Rock	0.555	0.048	0.007	<0.01	97.82	7.56
SW-10 29	Rock	0.756	0.043	0.006	<0.01	97.98	5.41
SW-10 30	Pulp	0.005	<0.001	0.005	<0.01	87.34	0.00
SW-11 01	Rock	0.863	0.052	0.015	<0.01	96.87	5.86
SW-11 01D	Rock	0.858	0.051	0.015	<0.01	96.36	5.87
SW-11 02	Rock	0.733	0.065	0.019	<0.01	95.25	8.58
SW-11 03	Rock	NS	NS	NS	NS	NS	NS
SW-11 04	Rock	0.202	0.119	0.032	<0.01	87.14	22.07
SW-11 05	Rock	0.261	0.119	0.034	<0.01	87.33	19.94
SW-11 06	Rock	0.254	0.151	0.044	<0.01	84.98	14.34
SW-11 07	Rock	0.218	0.218	0.063	<0.01	83.79	12.25
SW-11 08	Rock	0.240	0.224	0.055	<0.01	84.42	12.04
SW-11 09	Rock	0.311	0.177	0.053	<0.01	86.28	11.44
SW-11 10	Rock	0.252	0.189	0.056	<0.01	85.00	12.44
SW-11 11	Pulp	0.003	<0.001	0.005	<0.01	87.33	0.00
SW-11 12	Rock	0.216	0.210	0.059	<0.01	84.69	13.09
SW-11 13	Rock	0.198	0.218	0.057	<0.01	84.58	12.69
SW-11 14	Rock	0.174	0.219	0.056	<0.01	84.43	12.69
SW-11 15	Rock	0.160	0.218	0.067	<0.01	84.14	13.16
SW-11 16	Rock	0.127	0.228	0.059	<0.01	83.77	12.78
SW-11 17	Rock	0.126	0.230	0.062	<0.01	84.47	13.37
SW-11 18	Rock	0.124	0.205	0.061	<0.01	84.10	15.28
SW-11 19	Rock	0.126	0.203	0.058	<0.01	85.17	16.46
SW-12 01	Rock	0.835	0.052	0.015	<0.01	96.72	6.18
SW-12 02	Rock	0.718	0.073	0.022	<0.01	96.08	8.14
SW-12 03	Rock	0.288	0.139	0.038	<0.01	88.80	17.04
SW-12 04	Rock	0.327	0.183	0.048	<0.01	89.18	15.14
SW-12 05	Rock	0.282	0.178	0.052	<0.01	87.02	12.86
SW-12 06	Rock	0.216	0.212	0.056	<0.01	84.98	13.20
SW-12 07	Rock	0.210	0.218	0.057	<0.01	84.48	13.23
SW-12 08	Rock	0.258	0.205	0.065	<0.01	85.18	12.13
SW-12 09	Rock	0.254	0.201	0.050	<0.01	85.97	12.24
SW-12 10	Rock	0.339	0.162	0.048	<0.01	89.90	10.39
SW-12 11	Rock	0.405	0.092	0.041	<0.01	90.21	12.65
SW-12 12	Rock	0.251	0.193	0.057	<0.01	86.26	12.65
SW-12 13	Rock	0.256	0.190	0.056	<0.01	85.98	12.68
SW-12 14	Rock	0.230	0.171	0.055	<0.01	86.61	13.56

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-12 15	Rock	0.228	0.178	0.052	<0.01	85.86	13.36
SW-12 16	Rock	0.204	0.193	0.052	<0.01	85.64	13.90
SW-12 17	Rock	0.195	0.202	0.056	<0.01	85.72	13.21
SW-12 18	Rock	0.158	0.136	0.049	<0.01	86.25	18.41
SW-12 19	Rock	0.160	0.117	0.035	<0.01	86.94	20.46
SW-12 20	Rock	0.212	0.194	0.051	<0.01	90.25	18.97
SW-12 20D	Rock	0.198	0.170	0.047	<0.01	89.37	19.12
SW-12 21	Rock	0.192	0.059	0.017	<0.01	90.80	15.13
SW-12 22	Pulp	0.006	<0.001	0.005	<0.01	88.00	0.00
SW-12 23	Pulp	0.006	0.001	0.005	<0.01	87.97	0.00

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
STD-SARM 5 expected		4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056			51.10
STD-SARM 5 result		4.13	<0.01	2.62	3.540	0.002	8.88	0.084	25.35	0.167	0.36	0.055	0.004	0.007	51.04
QCV1206-01664-0002-BLK		<0.01	<0.01	<0.01	<0.001	<0.001	<0.01	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001	99.31
STD-360-BCS No 381 expected		0.67		49.00	0.330				1.03						8.78
STD-360-BCS No 381 result		0.69	<0.01	49.02	0.310	0.008	13.28	0.056	0.98	2.437	0.27	0.003	6.840	0.187	8.73
SW-02A 03D	Rock	5.99	0.03	2.07	0.030	0.008	33.33	0.668	1.38	0.103	0.11	0.010	0.597	0.107	25.53
SW-02A 03D Dup		6.17	0.04	2.07	0.028	0.007	33.43	0.669	1.42	0.102	0.11	0.010	0.610	0.107	26.24
STD-SARM 5 expected		4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056			51.10
STD-SARM 5 result		4.16	<0.01	2.65	3.542	0.001	8.95	0.087	25.44	0.168	0.36	0.055	0.005	0.007	51.01
SW-03A 15	Rock	6.90	0.08	1.41	0.024	0.004	14.10	1.350	1.26	0.046	0.20	0.007	0.264	0.263	58.84
SW-03A 15 Dup		6.87	0.08	1.41	0.024	0.003	13.99	1.336	1.24	0.046	0.21	0.006	0.260	0.281	58.46
STD-JSS 852-2 expected		0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002	1.70
STD-JSS 852-2 result		0.39	<0.01	0.13	0.014	0.020	67.13	<0.001	1.13	0.078	0.02	0.045	0.012	0.004	1.67
SW-05 24	Rock	4.87	0.02	5.27	0.022	0.006	31.79	0.339	1.96	0.153	0.09	0.012	0.567	1.873	19.44
SW-05 24 Dup		4.95	0.03	5.25	0.023	0.007	31.81	0.337	2.01	0.153	0.09	0.013	0.572	1.882	19.56
STD-360-BCS No 381 expected		0.67		49.00	0.330				1.03						8.78
STD-360-BCS No 381 result		0.68	<0.01	49.11	0.310	0.008	13.26	0.057	0.97	2.446	0.27	0.003	6.838	0.188	8.73
SW-06 18	Rock	5.60	0.04	5.93	0.025	0.006	26.13	0.769	2.53	0.115	0.13	0.008	0.444	0.130	24.76
SW-06 18 Dup		5.52	0.03	5.93	0.023	0.006	26.08	0.763	2.50	0.115	0.12	0.008	0.441	0.128	24.89
STD-SARM 5 expected		4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056			51.10
STD-SARM 5 result		4.17	<0.01	2.64	3.521	0.002	8.92	0.090	25.35	0.168	0.35	0.055	0.005	0.014	51.09
SW-07 18D	Rock	5.79	0.04	3.31	0.030	0.005	20.17	0.852	1.98	0.081	0.14	0.007	0.603	0.718	40.95
SW-07 18D Dup		5.79	0.05	3.30	0.028	0.005	20.22	0.861	2.00	0.080	0.13	0.008	0.603	0.819	41.01
STD-JSS 852-2 expected		0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002	1.70
STD-JSS 852-2 result		0.39	<0.01	0.14	0.015	0.020	67.25	<0.001	1.13	0.079	0.02	0.046	0.012	0.003	1.70
SW-09 16	Rock	5.07	0.04	1.94	0.030	0.009	39.20	0.385	1.22	0.066	0.10	0.012	0.716	0.061	21.75
SW-09 16 Dup		5.08	0.04	1.97	0.034	0.009	39.46	0.388	1.21	0.066	0.10	0.022	0.722	0.062	22.01
STD-360-BCS No 381 expected		0.67		49.00	0.330				1.03						8.78
STD-360-BCS No 381 result		0.72	<0.01	48.69	0.307	0.008	13.22	0.059	0.98	2.428	0.28	0.003	6.786	0.199	8.69
SW-10 15	Rock	6.62	0.05	2.68	0.027	0.007	32.18	0.800	1.35	0.100	0.14	0.011	0.731	0.258	25.97
SW-10 15 Dup		6.60	0.05	2.67	0.026	0.007	32.26	0.798	1.34	0.099	0.14	0.010	0.733	0.244	25.90
STD-SARM 5 expected		4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056			51.10
STD-SARM 5 result		4.17	<0.01	2.63	3.542	0.001	8.92	0.083	25.37	0.171	0.36	0.055	0.004	0.007	51.18
SW-11 08	Rock	6.57	0.04	1.65	0.031	0.009	34.24	0.733	1.20	0.089	0.12	0.011	0.590	0.039	26.55
SW-11 08 Dup		6.55	0.04	1.66	0.031	0.008	34.20	0.736	1.20	0.089	0.12	0.011	0.594	0.039	26.64
STD-JSS 852-2 expected		0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002	1.70
STD-JSS 852-2 result		0.37	<0.01	0.13	0.013	0.020	67.04	<0.001	1.13	0.077	0.02	0.045	0.011	0.003	1.67
SW-12 13	Rock	6.75	0.07	2.78	0.028	0.007	30.43	0.743	1.61	0.092	0.15	0.012	0.778	0.085	29.29
SW-12 13 Dup		6.77	0.06	2.77	0.029	0.007	30.42	0.735	1.61	0.095	0.15	0.013	0.782	0.084	29.39
QCV1206-01664-0021-BLK		<0.01	<0.01	<0.01	0.002	<0.001	<0.01	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001	>100

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001	SiO2 NA-XF100 % 0.01
STD-360-BCS No 381 expected		0.67		49.00	0.330				1.03						8.78
STD-360-BCS No 381 result		0.66	<0.01	49.00	0.311	0.008	13.26	0.058	0.97	2.443	0.28	0.003	6.828	0.188	8.73

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
STD-SARM 5 expected		0.200	0.048				
STD-SARM 5 result		0.188	0.047	0.012	<0.01	96.46	
QCV1206-01664-0002-BLK		<0.001	<0.001	<0.001	<0.01	99.30	
STD-360-BCS No 381 expected		0.350	0.940				
STD-360-BCS No 381 result		0.340	0.910	0.004	<0.01	84.05	
SW-02A 03D	Rock	0.208	0.221	0.058	<0.01	83.53	13.10
SW-02A 03D Dup		0.207	0.220	0.058	<0.01	84.58	13.10
STD-SARM 5 expected		0.200	0.048				
STD-SARM 5 result		0.189	0.047	0.012	<0.01	96.67	
SW-03A 15	Rock	0.297	0.120	0.026	<0.01	93.04	7.86
SW-03A 15 Dup		0.294	0.119	0.026	<0.01	92.49	7.86
STD-JSS 852-2 expected		0.480	0.820				
STD-JSS 852-2 result		0.498	0.832	0.006	<0.01	71.94	
SW-05 24	Rock	0.106	0.176	0.062	<0.01	84.56	17.82
SW-05 24 Dup		0.105	0.178	0.062	<0.01	84.83	17.82
STD-360-BCS No 381 expected		0.350	0.940				
STD-360-BCS No 381 result		0.334	0.908	0.004	<0.01	84.10	
SW-06 18	Rock	0.207	0.166	0.045	<0.01	87.99	20.98
SW-06 18 Dup		0.204	0.165	0.045	<0.01	87.94	20.98
STD-SARM 5 expected		0.200	0.048				
STD-SARM 5 result		0.185	0.047	0.012	<0.01	96.60	
SW-07 18D	Rock	0.237	0.156	0.039	<0.01	89.74	14.65
SW-07 18D Dup		0.232	0.158	0.040	<0.01	89.98	14.65
STD-JSS 852-2 expected		0.480	0.820				
STD-JSS 852-2 result		0.499	0.833	0.005	<0.01	72.11	
SW-09 16	Rock	0.134	0.230	0.062	<0.01	82.32	11.31
SW-09 16 Dup		0.133	0.231	0.063	<0.01	82.89	11.31
STD-360-BCS No 381 expected		0.350	0.940				
STD-360-BCS No 381 result		0.333	0.903	0.004	<0.01	83.59	
SW-10 15	Rock	0.258	0.191	0.066	<0.01	84.70	13.28
SW-10 15 Dup		0.257	0.192	0.066	<0.01	84.66	13.28
STD-SARM 5 expected		0.200	0.048				
STD-SARM 5 result		0.190	0.046	0.012	<0.01	96.70	
SW-11 08	Rock	0.240	0.224	0.055	<0.01	84.42	12.04
SW-11 08 Dup		0.240	0.222	0.055	<0.01	84.46	12.04
STD-JSS 852-2 expected		0.480	0.820				
STD-JSS 852-2 result		0.498	0.831	0.005	<0.01	71.83	
SW-12 13	Rock	0.256	0.190	0.056	<0.01	85.98	12.68
SW-12 13 Dup		0.254	0.191	0.055	<0.01	86.07	12.68
QCV1206-01664-0021-BLK		0.003	<0.001	<0.001	<0.01	100.55	

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04073-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
STD-360-BCS No 381 expected		0.350	0.940				
STD-360-BCS No 381 result		0.331	0.909	0.004	<0.01	83.96	

INSPECTORATE
A Bureau Veritas Group Company

Certificate of Analysis

12-360-04074-01

Inspectorate Exploration & Mining Services Ltd.
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada
Phone: 604-272-7818

Distribution List

Attention: Andrew Reader
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6
Phone: 403-640-7977
EMail: andrew@ironstoneresources.com

Attention: Liam Murphy
EMail: liam@ironstoneresources.com

Submitted By: **Ironstone Resources Ltd**
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Attention: **Andrew Reader**

Project: **South Whitemud River 2012**
Description:

Date Received: 06/29/2012
Date Completed: 07/10/2012
Invoice:

Location	Samples	Type	Preparation Description
Vancouver, BC	206	Core	
Vancouver, BC	11	Pulp	

Location	Quantity	Method	Description
Vancouver, BC	205	SP-LOI	LOI
Vancouver, BC	205	NA-XF100	XRF Iron Ore

For and on behalf of ***Inspectorate Exploration and Mining Services Ltd***

By [redacted]

Sofia Devota – Operations Manager

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-13 01	Core	5.68	15.14	0.10	0.34	0.022	0.003	4.32	2.927	1.56	0.012	0.50	0.004	0.055	0.661
SW-13 02	Core	6.63	14.96	0.09	0.46	0.022	0.004	6.96	2.817	1.67	0.015	0.43	0.004	0.064	0.641
SW-13 03	Core	13.74	6.74	0.08	4.26	0.023	0.005	23.69	1.056	1.38	0.103	0.21	0.005	0.861	0.087
SW-13 04	Core	14.71	8.40	0.06	2.19	0.028	0.005	22.79	1.273	1.86	0.089	0.16	0.008	0.249	0.100
SW-13 05	Core	13.75	7.30	0.06	3.85	0.026	0.006	24.36	1.082	1.65	0.098	0.16	0.008	0.742	0.084
SW-13 06	Core	12.33	7.32	0.06	2.47	0.027	0.006	26.68	1.034	1.61	0.083	0.14	0.008	0.348	0.061
SW-13 07	Core	14.57	6.55	0.06	3.40	0.024	0.007	29.85	0.863	1.73	0.124	0.16	0.011	0.677	0.225
SW-13 08	Core	16.10	6.03	0.05	3.73	0.022	0.007	29.77	0.801	1.90	0.165	0.15	0.009	0.680	0.070
SW-13 09	Core	15.42	6.25	0.04	2.71	0.022	0.006	31.31	0.761	1.98	0.131	0.13	0.011	0.355	0.464
SW-13 10	Core	16.78	6.11	0.04	3.28	0.025	0.005	24.94	0.983	2.39	0.097	0.14	0.010	0.492	0.499
SW-13 11	Core	19.07	4.61	0.05	2.84	0.019	0.005	24.88	0.951	2.56	0.117	0.12	0.004	0.246	0.291
SW-13 12	Core	6.33	9.21	0.06	1.15	0.032	0.003	9.69	2.104	1.45	0.023	0.27	0.003	0.209	0.510
SW-13 12D	Core	5.66	13.58	0.09	0.40	0.020	0.003	5.97	2.585	1.52	0.011	0.44	0.003	0.071	0.713
SW-13 13	Core	5.36	14.22	0.09	0.31	0.024	0.003	5.48	2.661	1.51	0.009	0.47	0.011	0.055	0.593
SW-13 14	Pulp	<0.01	0.58	<0.01	2.20	0.003	0.008	30.05	0.037	2.53	0.077	0.03	0.002	0.108	0.230
SW-15 01	Core	10.32	7.85	0.06	1.71	0.019	0.007	31.11	1.156	1.16	0.092	0.13	0.008	0.518	0.061
SW-15 02	Core	11.36	7.64	0.06	1.49	0.024	0.007	30.85	1.052	1.31	0.085	0.14	0.008	0.466	0.046
SW-15 03	Core	12.52	6.44	0.05	1.79	0.027	0.008	35.43	0.709	1.27	0.094	0.13	0.009	0.608	0.033
SW-15 04	Core	12.61	5.91	0.05	1.57	0.031	0.008	37.94	0.547	1.15	0.100	0.12	0.011	0.600	0.035
SW-15 05	Core	11.64	5.80	0.05	1.60	0.028	0.008	37.27	0.517	1.08	0.079	0.11	0.013	0.611	0.032
SW-15 06	Core	11.88	6.21	0.04	1.62	0.029	0.008	37.16	0.626	1.10	0.084	0.12	0.011	0.654	0.026
SW-15 07	Core	13.12	6.12	0.04	1.75	0.028	0.008	37.83	0.593	1.15	0.092	0.12	0.011	0.670	0.026
SW-15 08	Core	13.15	5.74	0.03	1.89	0.026	0.006	36.61	0.554	1.26	0.082	0.11	0.010	0.662	0.038
SW-15 09	Core	12.75	5.48	0.03	1.94	0.028	0.008	38.81	0.448	1.33	0.081	0.10	0.011	0.693	0.049
SW-15 10	Core	12.61	4.99	0.03	1.74	0.031	0.008	38.85	0.351	1.32	0.088	0.10	0.012	0.625	0.237
SW-15 11	Core	12.17	4.91	0.03	1.95	0.028	0.008	38.46	0.383	1.34	0.076	0.11	0.011	0.699	0.065
SW-15 12	Core	14.32	4.70	0.02	2.35	0.026	0.006	34.74	0.425	1.66	0.114	0.10	0.009	0.580	0.127
SW-15 13	Core	14.89	5.70	0.05	2.73	0.024	0.006	27.84	0.714	2.15	0.093	0.12	0.009	0.447	0.268
SW-15 14	Core	13.53	6.09	0.05	2.80	0.030	0.004	21.98	0.922	1.78	0.100	0.14	0.008	0.384	0.466
SW-15 15	Core	14.37	5.48	0.04	3.13	0.022	0.004	21.51	0.915	1.90	0.169	0.15	0.008	0.276	1.111
SW-15 16	Core	10.54	6.07	0.05	4.73	0.034	0.003	13.04	1.040	0.90	0.152	0.20	0.013	0.290	2.284
SW-15 17	Core	8.52	6.63	0.06	2.12	0.036	0.002	6.07	1.310	0.68	0.007	0.25	<0.001	0.243	1.511
SW-15 18	Core	8.02	11.81	0.09	2.16	0.023	0.002	3.87	2.395	1.02	0.005	0.50	<0.001	0.379	1.430
SW-15 19	Core	7.44	13.63	0.09	1.51	0.019	0.005	4.42	2.683	1.15	0.006	0.49	<0.001	0.131	1.291
SW-15 19D	Core	6.71	13.73	0.08	0.71	0.018	0.003	4.10	2.743	1.17	0.004	0.51	<0.001	0.118	0.809
SW-15 20	Pulp	<0.01	0.54	<0.01	2.14	0.007	0.008	29.90	0.032	2.51	0.077	0.03	0.003	0.106	0.229
SW-15 21	Pulp	<0.01	0.54	<0.01	2.14	0.005	0.007	29.66	0.034	2.50	0.075	0.02	0.002	0.104	0.224
SW-16 01	Core	8.43	9.50	0.09	2.52	0.028	0.004	11.48	1.795	1.63	0.049	0.43	0.003	0.279	0.904
SW-16 02	Core	6.34	14.71	0.09	0.50	0.023	0.003	5.90	2.880	1.60	0.015	0.44	0.004	0.089	0.638
SW-16 03	Core	16.71	7.29	0.05	4.46	0.023	0.005	24.55	1.124	2.17	0.099	0.16	0.007	0.560	0.279

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-16 04	Core	13.96	6.47	0.05	2.12	0.027	0.007	32.80	0.779	1.58	0.096	0.13	0.009	0.567	0.054
SW-16 05	Core	13.77	5.65	0.05	1.79	0.030	0.008	36.73	0.596	1.26	0.110	0.11	0.010	0.593	0.037
SW-16 06	Core	12.76	5.74	0.04	1.62	0.033	0.008	37.30	0.553	1.16	0.103	0.11	0.012	0.613	0.037
SW-16 07	Core	12.68	6.63	0.04	1.59	0.029	0.007	33.61	0.753	1.21	0.102	0.12	0.010	0.537	0.044
SW-16 08	Core	12.60	6.53	0.04	1.65	0.029	0.007	34.37	0.712	1.25	0.081	0.12	0.011	0.555	0.034
SW-16 09	Core	13.05	6.35	0.04	2.28	0.030	0.007	34.70	0.686	1.35	0.085	0.13	0.011	0.720	0.051
SW-16 10	Core	13.84	6.02	0.04	2.43	0.028	0.007	34.97	0.604	1.48	0.081	0.12	0.011	0.694	0.072
SW-16 11	Core	12.84	5.48	0.03	2.08	0.030	0.008	37.25	0.456	1.42	0.074	0.11	0.012	0.656	0.090
SW-16 12	Core	12.79	4.74	0.03	1.72	0.030	0.008	38.94	0.318	1.35	0.084	0.09	0.011	0.589	0.134
SW-16 13	Core	14.36	4.46	0.03	2.50	0.028	0.008	36.95	0.334	1.56	0.101	0.10	0.012	0.660	0.250
SW-16 14	Core	14.62	4.68	0.03	3.10	0.030	0.008	34.19	0.399	1.76	0.106	0.12	0.011	0.732	0.151
SW-16 15	Core	17.41	5.25	0.04	3.41	0.023	0.006	27.31	0.747	2.52	0.098	0.13	0.008	0.478	1.052
SW-16 16	Core	8.54	4.17	0.04	6.46	0.036	0.003	11.25	0.879	1.48	0.077	0.16	0.004	0.143	2.156
SW-16 17	Core	14.40	5.14	0.03	5.52	0.036	0.003	18.81	0.821	2.09	0.101	0.15	0.004	0.400	0.845
SW-16 18	Core	8.86	6.10	0.05	1.53	0.045	0.004	12.63	1.139	1.33	0.048	0.22	0.005	0.293	2.149
SW-16 19	Core	7.29	6.02	0.07	1.68	0.048	0.003	7.89	1.256	1.07	0.045	0.23	0.003	0.194	1.107
SW-16 19D	Core	7.54	5.98	0.06	1.68	0.044	0.001	8.13	1.204	1.11	0.051	0.25	0.002	0.225	0.971
SW-16 20	Pulp	<0.01	0.54	<0.01	2.15	0.007	0.008	29.84	0.036	2.49	0.077	0.03	0.002	0.105	0.257
SW-17 01	Core	7.62	12.49	0.09	1.02	0.026	0.004	9.89	2.306	1.63	0.035	0.40	0.004	0.140	0.661
SW-17 02	Core	5.97	14.54	0.12	0.38	0.025	0.003	6.92	2.755	1.60	0.011	0.45	0.011	0.060	0.719
SW-17 03	Core	18.66	5.91	0.04	4.82	0.021	0.006	26.38	0.896	2.29	0.125	0.13	0.008	0.439	0.588
SW-17 04	Core	12.79	7.14	0.05	2.51	0.030	0.006	29.50	0.943	1.65	0.082	0.13	0.011	0.648	0.099
SW-17 05	Core	12.73	6.41	0.05	2.80	0.031	0.007	32.74	0.786	1.33	0.090	0.12	0.010	0.861	0.040
SW-17 06	Core	13.17	5.77	0.04	2.16	0.033	0.008	35.82	0.603	1.20	0.107	0.11	0.010	0.711	0.337
SW-17 07	Core	11.66	6.24	0.04	1.64	0.035	0.008	35.60	0.635	1.16	0.081	0.12	0.012	0.621	0.139
SW-17 08	Core	11.89	6.89	0.05	2.31	0.030	0.007	32.32	0.843	1.20	0.095	0.13	0.010	0.790	0.057
SW-17 09	Core	11.30	7.32	0.05	2.22	0.028	0.006	29.97	0.977	1.24	0.092	0.14	0.010	0.749	0.040
SW-17 10	Core	13.45	6.49	0.06	2.97	0.027	0.007	32.55	0.767	1.43	0.100	0.13	0.010	0.872	0.053
SW-17 11	Core	14.59	6.34	0.03	2.28	0.025	0.005	33.85	0.664	1.70	0.098	0.14	0.013	0.559	0.242
SW-17 12	Core	13.59	5.76	0.03	2.26	0.030	0.005	34.88	0.504	1.76	0.081	0.14	0.011	0.568	0.325
SW-17 13	Core	13.28	5.40	0.03	2.48	0.029	0.005	36.75	0.429	1.51	0.081	0.13	0.010	0.736	0.114
SW-17 14	Core	12.04	5.22	0.02	1.70	0.032	0.005	36.70	0.386	1.44	0.073	0.13	0.011	0.555	0.088
SW-17 15	Core	13.57	5.00	0.03	2.79	0.029	0.005	35.77	0.410	1.67	0.082	0.15	0.010	0.762	0.128
SW-17 16	Core	12.87	5.10	0.06	5.52	0.032	0.004	32.26	0.439	1.72	0.074	0.22	0.011	1.541	0.175
SW-17 17	Core	16.65	4.92	0.03	3.98	0.026	0.004	29.89	0.520	2.21	0.111	0.15	0.008	0.687	0.481
SW-17 18	Core	10.85	5.50	0.05	2.04	0.031	0.003	16.51	0.986	1.60	0.062	0.21	0.003	0.270	2.010
SW-17 19	Core	11.90	5.37	0.04	1.99	0.043	0.003	21.48	0.839	1.44	0.067	0.18	0.006	0.361	0.870
SW-17 20	Core	9.34	6.22	0.06	1.53	0.031	0.002	11.87	1.189	1.41	0.059	0.23	0.002	0.187	0.928
SW-17 20D	Core	8.59	6.49	0.05	1.38	0.036	0.002	11.12	1.223	1.36	0.052	0.24	0.002	0.191	0.954
SW-17 21	Core	5.36	10.59	0.07	0.61	0.028	<0.001	6.28	1.914	1.26	0.009	0.32	<0.001	0.090	1.024

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-17 22	Pulp	<0.01	0.56	<0.01	2.17	0.002	0.005	29.51	0.032	2.48	0.075	0.03	<0.001	0.102	0.241
SW-18 01	Core	6.99	14.90	0.09	0.46	0.018	0.001	6.39	2.759	1.60	0.020	0.45	0.002	0.065	0.759
SW-18 02	Core	15.42	7.82	0.05	3.83	0.021	0.002	19.78	1.285	1.78	0.096	0.22	0.003	0.342	1.253
SW-18 03	Core	16.23	6.70	0.04	2.56	0.023	0.004	27.56	0.884	1.99	0.101	0.13	0.007	0.330	0.853
SW-18 04	Core	15.50	7.01	0.04	2.17	0.025	0.004	29.03	0.935	1.85	0.094	0.14	0.007	0.340	0.293
SW-18 05	Core	13.97	6.04	0.04	1.52	0.027	0.005	33.56	0.683	1.42	0.121	0.11	0.008	0.361	0.059
SW-18 06	Core	12.99	6.16	0.04	1.51	0.033	0.007	34.74	0.702	1.23	0.095	0.11	0.010	0.488	0.041
SW-18 07	Core	12.07	7.09	0.03	1.59	0.029	0.005	31.70	0.865	1.27	0.090	0.13	0.009	0.496	0.039
SW-18 08	Core	11.12	7.28	0.04	1.90	0.027	0.004	28.06	0.956	1.21	0.080	0.13	0.008	0.596	0.057
SW-18 09	Core	12.11	6.91	0.04	1.39	0.026	0.004	31.27	0.808	1.34	0.092	0.13	0.009	0.425	0.071
SW-18 10	Core	13.50	6.80	0.04	2.00	0.025	0.004	31.91	0.778	1.49	0.122	0.13	0.010	0.537	0.057
SW-18 11	Core	13.51	6.36	0.02	2.09	0.026	0.004	32.76	0.643	1.60	0.111	0.11	0.012	0.552	0.068
SW-18 12	Core	13.29	5.97	0.03	2.09	0.024	0.004	33.59	0.576	1.58	0.107	0.12	0.009	0.575	0.150
SW-18 13	Core	13.27	5.65	0.03	2.34	0.027	0.005	34.43	0.499	1.60	0.101	0.12	0.011	0.643	0.111
SW-18 14	Core	13.02	5.44	0.03	2.40	0.029	0.005	34.93	0.457	1.59	0.095	0.11	0.011	0.686	0.120
SW-18 15	Core	13.32	4.84	0.03	2.72	0.027	0.004	34.72	0.394	1.57	0.103	0.12	0.011	0.758	0.167
SW-18 16	Core	14.47	5.03	0.03	2.81	0.027	0.004	32.54	0.449	1.88	0.110	0.13	0.010	0.640	0.283
SW-18 17	Core	18.14	4.22	0.03	5.02	0.019	0.003	30.80	0.473	2.16	0.119	0.13	0.023	0.787	1.312
SW-18 18	Core	17.46	4.73	0.03	3.45	0.023	0.003	31.08	0.600	1.78	0.172	0.13	0.023	0.429	1.463
SW-18 19	Core	10.39	5.09	0.04	2.19	0.034	0.002	18.12	0.884	0.91	0.067	0.17	0.006	0.328	1.214
SW-18 20	Core	8.51	5.39	0.05	1.53	0.041	0.002	10.26	1.130	0.92	0.052	0.28	0.001	0.185	0.748
SW-18 21	Core	5.58	7.25	0.06	0.62	0.042	0.003	4.39	1.543	0.79	0.004	0.35	<0.001	0.096	0.535
SW-18 22	Core	6.66	10.22	0.08	1.15	0.040	0.003	3.91	2.114	0.97	0.005	0.44	<0.001	0.195	0.951
SW-18 22D	Core	6.73	10.63	0.07	1.40	0.034	<0.001	3.81	2.088	0.98	0.004	0.44	<0.001	0.213	0.958
SW-18 23	Pulp	<0.01	0.56	<0.01	2.16	0.003	0.005	29.74	0.037	2.50	0.075	0.03	<0.001	0.103	0.233
SW-19 01	Core	5.78	15.17	0.10	0.53	0.024	0.001	3.53	2.842	1.26	0.006	0.44	<0.001	0.056	0.307
SW-19 02	Core	6.12	14.92	0.11	0.57	0.022	0.002	4.57	2.819	1.26	0.007	0.81	<0.001	0.054	0.269
SW-19 03	Core	11.34	7.88	0.05	2.11	0.029	0.003	22.91	1.217	0.61	0.053	0.18	0.004	0.439	0.878
SW-19 04	Core	13.17	8.01	0.05	3.90	0.029	0.002	23.23	1.085	0.91	0.061	0.13	0.006	0.553	1.372
SW-19 05	Core	11.72	8.18	0.05	2.33	0.030	0.006	28.33	0.989	0.82	0.076	0.45	0.011	0.487	0.762
SW-19 06	Core	10.77	7.04	0.04	3.52	0.031	0.005	31.52	0.873	0.82	0.058	0.13	0.014	1.054	0.550
SW-19 07	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 08	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 09	Core	9.77	7.49	0.05	3.64	0.031	0.004	26.02	0.948	1.05	0.072	0.17	0.010	1.132	0.099
SW-19 10	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 11	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 12	Core	13.78	6.79	0.04	2.20	0.024	0.003	25.98	0.873	1.61	0.130	0.13	0.007	0.471	0.082
SW-19 13	Core	13.20	6.59	0.05	1.91	0.039	0.003	24.04	0.917	1.49	0.111	0.12	0.005	0.351	0.137
SW-19 14	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 15	Core	13.32	6.30	0.06	2.79	0.027	0.006	27.75	0.777	1.79	0.111	0.14	0.011	0.656	0.244

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-19 16	Core	11.86	6.85	0.07	3.67	0.025	0.003	27.67	0.805	1.59	0.093	0.17	0.007	1.062	0.185
SW-19 17	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-19 18	Core	12.30	5.43	0.04	2.90	0.028	0.003	22.06	0.862	1.30	0.133	0.23	0.005	0.379	0.977
SW-19 19	Core	9.12	4.56	0.04	2.21	0.042	0.001	11.89	0.888	1.32	0.065	0.25	<0.001	0.144	0.467
SW-19 20	Core	6.09	5.57	0.06	0.70	0.050	0.001	7.03	1.235	0.66	0.015	0.22	<0.001	0.122	0.452
SW-19 21	Core	5.30	6.43	0.06	0.36	0.050	<0.001	3.08	1.430	0.69	0.005	0.25	<0.001	0.082	0.278
SW-19 21D	Core	5.27	6.49	0.06	0.34	0.044	<0.001	3.08	1.426	0.69	0.005	0.23	<0.001	0.102	0.264
SW-19 22	Core	6.02	13.71	0.08	0.51	0.028	<0.001	2.99	2.595	1.22	0.006	0.50	<0.001	0.109	0.472
SW-19 23	Pulp	<0.01	0.55	<0.01	2.17	0.005	0.005	29.89	0.035	2.50	0.075	0.02	<0.001	0.102	0.220
SW-20A 01	Core	15.25	7.18	0.04	2.46	0.026	0.004	28.98	0.995	1.77	0.099	0.17	0.010	0.508	0.207
SW-20A 02	Core	13.42	7.38	0.05	1.69	0.019	0.004	30.53	1.024	1.46	0.094	0.14	0.005	0.449	0.050
SW-20A 03	Core	11.84	8.39	0.05	2.22	0.021	0.003	25.72	1.210	1.50	0.071	0.16	0.004	0.500	0.066
SW-20A 04	Core	15.41	6.07	0.04	2.09	0.024	0.005	33.75	0.673	1.58	0.107	0.12	0.006	0.436	0.065
SW-20A 05	Core	11.96	5.85	0.03	1.85	0.031	0.005	36.96	0.534	1.08	0.090	0.14	0.010	0.680	0.030
SW-20A 06	Core	11.98	6.21	0.03	1.59	0.028	0.005	37.33	0.582	1.09	0.082	0.13	0.009	0.608	0.027
SW-20A 07	Core	12.74	6.17	0.03	2.38	0.027	0.005	37.26	0.564	1.24	0.081	0.13	0.009	0.801	0.033
SW-20A 08	Core	13.41	6.02	0.04	3.13	0.025	0.004	29.09	0.632	1.58	0.084	0.18	0.005	0.561	0.108
SW-20A 09	Core	11.97	5.33	0.03	1.88	0.031	0.006	38.87	0.354	1.32	0.073	0.11	0.008	0.634	0.053
SW-20A 10	Core	13.42	5.11	0.03	2.61	0.026	0.005	37.88	0.391	1.43	0.091	0.12	0.010	0.796	0.134
SW-20A 11	Core	14.61	4.67	0.03	2.70	0.024	0.005	36.13	0.365	1.73	0.105	0.11	0.009	0.642	0.149
SW-20A 12	Core	14.78	5.58	0.04	3.54	0.023	0.003	26.73	0.704	1.84	0.094	0.14	0.007	0.555	0.795
SW-20A 13	Core	14.03	5.49	0.04	2.87	0.025	0.003	24.13	0.806	1.62	0.120	0.12	0.008	0.342	0.867
SW-20A 14	Core	13.60	6.01	0.05	2.90	0.024	0.002	20.50	0.917	1.69	0.103	0.15	0.004	0.311	1.026
SW-20A 15	Core	11.37	6.18	0.04	2.65	0.031	0.002	17.49	0.944	1.26	0.062	0.20	0.003	0.391	1.280
SW-20A 15D	Core	11.79	6.26	0.04	2.32	0.027	0.002	18.34	0.922	1.34	0.078	0.18	0.005	0.277	1.221
SW-20A 16	Core	8.84	5.55	0.06	3.30	0.036	<0.001	12.45	1.014	0.71	0.021	0.25	<0.001	0.579	1.165
SW-20A 17	Core	8.41	6.60	0.06	4.37	0.035	<0.001	7.86	1.293	0.75	0.018	0.34	<0.001	1.123	1.293
SW-20A 18	Pulp	<0.01	0.55	<0.01	2.18	<0.001	0.005	30.10	0.039	2.51	0.076	0.02	<0.001	0.102	0.222
SW-20A 19	Core	6.65	13.32	0.09	0.67	0.024	<0.001	3.93	2.567	1.13	0.005	0.53	<0.001	0.154	0.755
SW-20A 20	Core	8.71	12.14	0.06	3.50	0.015	0.001	5.26	2.308	1.09	0.030	0.46	<0.001	0.074	1.980
SW-21R 01	Core	9.74	10.79	0.07	3.07	0.019	0.001	13.86	1.839	1.42	0.037	0.34	0.002	0.563	0.209
SW-21R 02	Core	10.43	10.32	0.07	2.54	0.025	0.002	12.77	1.811	1.72	0.059	0.63	0.002	0.198	0.323
SW-21R 03	Core	18.34	6.84	0.05	2.41	0.017	0.003	26.64	1.027	2.14	0.126	0.13	0.002	0.299	0.097
SW-21R 04	Core	11.02	8.40	0.05	2.87	0.022	0.003	27.30	1.175	1.36	0.071	0.16	0.005	0.806	0.053
SW-21R 05	Core	11.24	6.34	0.04	1.43	0.028	0.005	36.64	0.665	1.14	0.089	0.12	0.007	0.525	0.024
SW-21R 06	Core	12.39	5.81	0.04	2.21	0.029	0.005	37.49	0.529	1.16	0.095	0.12	0.008	0.750	0.029
SW-21R 07	Core	12.29	6.43	0.04	2.69	0.029	0.005	35.81	0.589	1.30	0.075	0.14	0.009	0.874	0.030
SW-21R 08	Core	12.37	7.11	0.04	2.33	0.023	0.004	32.00	0.837	1.43	0.074	0.18	0.007	0.611	0.084
SW-21R 09	Core	13.55	6.40	0.03	3.46	0.026	0.005	32.12	0.745	1.62	0.085	0.23	0.008	0.613	0.183
SW-21R 10	Core	14.11	6.02	0.04	2.33	0.026	0.005	35.35	0.596	1.46	0.087	0.13	0.008	0.655	0.130

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-21R 11	Core	13.32	5.88	0.04	1.98	0.028	0.005	37.26	0.495	1.40	0.075	0.12	0.010	0.605	0.078
SW-21R 12	Core	13.13	4.92	0.04	2.61	0.028	0.005	38.50	0.355	1.35	0.085	0.12	0.010	0.837	0.155
SW-21R 13	Core	13.26	4.92	0.03	2.02	0.027	0.005	37.98	0.362	1.47	0.083	0.12	0.010	0.613	0.128
SW-21R 14	Core	13.10	5.49	0.04	3.25	0.028	0.003	29.26	0.586	1.35	0.072	0.16	0.006	0.700	0.771
SW-21R 15	Core	16.50	5.73	0.04	3.55	0.022	0.003	27.69	0.691	1.82	0.109	0.12	0.007	0.373	1.066
SW-21R 16	Core	13.79	5.59	0.04	4.73	0.027	0.002	20.43	0.784	1.50	0.151	0.17	0.005	0.441	1.766
SW-21R 17	Core	8.36	6.68	0.05	3.85	0.031	<0.001	10.10	1.205	0.68	0.049	0.26	0.006	0.530	1.555
SW-21R 18	Core	6.78	13.46	0.07	0.87	0.024	<0.001	3.72	2.543	1.11	0.006	0.58	<0.001	0.110	0.848
SW-21R 18D	Core	6.52	13.80	0.08	0.92	0.023	<0.001	3.19	2.600	1.11	0.005	0.55	<0.001	0.092	0.787
SW-21R 19	Core	5.94	13.01	0.08	0.81	0.023	0.001	2.94	2.644	1.10	0.007	0.51	<0.001	0.079	0.701
SW-21R 20	Pulp	<0.01	0.56	<0.01	2.16	0.004	0.005	29.98	0.035	2.51	0.076	0.02	<0.001	0.102	0.229
SW-22 01	Core	5.88	15.14	0.12	0.41	0.022	0.004	3.93	3.037	1.36	0.009	0.50	0.002	0.050	0.309
SW-22 02	Core	6.04	14.73	0.09	0.50	0.023	0.004	6.01	2.648	1.30	0.011	0.45	0.003	0.072	0.303
SW-22 03	Core	9.88	9.74	0.04	1.12	0.023	0.003	24.38	1.426	1.07	0.077	0.24	0.005	0.311	0.639
SW-22 04	Core	9.17	9.95	0.06	1.93	0.021	0.002	19.05	1.768	1.23	0.097	0.28	0.004	0.263	0.928
SW-22 05	Core	5.79	13.50	0.09	0.66	0.027	0.003	5.80	2.679	1.28	0.018	0.44	0.004	0.094	0.359
SW-22 06	Core	6.12	14.64	0.12	0.96	0.017	0.001	5.71	2.719	1.40	0.013	0.45	<0.001	0.057	0.485
SW-22 07	Core	6.75	13.65	0.07	0.52	0.019	0.002	10.84	2.392	1.32	0.017	0.40	0.004	0.098	0.176
SW-22 08	Core	12.88	7.89	0.05	3.53	0.020	0.003	26.67	1.148	1.62	0.105	0.16	0.007	0.607	0.424
SW-22 09	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-22 10	Core	11.95	6.84	0.04	2.23	0.033	0.005	30.62	0.836	1.34	0.087	0.13	0.007	0.519	0.333
SW-22 11	Core	13.31	6.10	0.03	1.27	0.031	0.005	36.76	0.588	1.35	0.112	0.10	0.008	0.461	0.047
SW-22 12	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-22 13	Core	14.21	6.64	0.04	2.50	0.025	0.004	32.96	0.717	1.64	0.099	0.12	0.009	0.663	0.146
SW-22 14	Core	13.40	6.14	0.03	2.17	0.028	0.005	35.30	0.579	1.53	0.087	0.12	0.009	0.643	0.090
SW-22 15	Core	13.26	6.01	0.04	1.99	0.029	0.005	35.67	0.551	1.54	0.082	0.11	0.009	0.617	0.082
SW-22 16	Core	12.41	5.41	0.04	1.78	0.031	0.005	38.26	0.387	1.44	0.072	0.10	0.010	0.630	0.089
SW-22 17	Core	12.85	5.15	0.03	1.68	0.030	0.005	37.54	0.361	1.56	0.077	0.10	0.010	0.565	0.097
SW-22 18	Core	14.31	4.99	0.02	1.78	0.032	0.004	35.40	0.406	1.68	0.098	0.09	0.009	0.387	0.292
SW-22 19	Core	16.38	4.30	0.04	3.98	0.021	0.005	33.41	0.427	1.82	0.139	0.11	0.009	0.518	1.391
SW-22 20	Core	15.14	6.08	0.03	4.22	0.025	0.004	28.88	0.726	1.05	0.145	0.15	0.010	0.793	2.079
SW-22 21	Core	6.44	14.44	0.08	0.71	0.019	<0.001	4.46	2.609	1.17	0.016	0.51	<0.001	0.113	0.576
SW-22 22	Core	6.27	13.29	0.08	0.50	0.021	<0.001	4.00	2.507	1.10	0.009	0.51	<0.001	0.078	0.594
SW-22 22D	Core	6.28	13.39	0.08	0.45	0.022	<0.001	3.87	2.534	1.12	0.009	0.52	<0.001	0.072	0.590
SW-22 23	Pulp	<0.01	0.53	<0.01	2.18	0.003	0.005	30.04	0.035	2.50	0.076	0.02	<0.001	0.103	0.221
SW-23 01	Core	5.95	14.58	0.09	0.66	0.024	0.001	6.01	2.767	1.28	0.015	0.42	0.001	0.111	0.288
SW-23 02	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-23 03	Core	6.09	14.53	0.08	0.55	0.019	<0.001	6.39	2.721	1.26	0.027	0.46	<0.001	0.077	0.197
SW-23 04	Core	12.59	7.33	0.04	4.09	0.028	0.003	27.03	0.984	1.29	0.121	0.11	0.009	0.195	0.782
SW-23 05	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-23 06	Core	11.13	7.20	0.05	3.71	0.022	0.004	26.79	1.072	0.82	0.137	0.17	0.008	0.798	0.783
SW-23 07	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-23 08	Core	10.19	7.71	0.05	2.61	0.027	0.004	29.29	1.009	1.24	0.098	0.13	0.008	0.562	0.073
SW-23 09	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-23 10	Core	12.85	6.24	0.03	2.18	0.028	0.005	35.29	0.605	1.46	0.097	0.12	0.009	0.718	0.079
SW-23 11	Core	14.19	5.51	0.03	2.81	0.027	0.005	35.99	0.463	1.60	0.113	0.13	0.011	0.807	0.173
SW-23 12	Core	12.36	5.54	0.03	1.94	0.032	0.005	35.93	0.431	1.62	0.082	0.11	0.011	0.610	0.193
SW-23 13	Core	17.60	5.21	0.04	4.52	0.027	0.003	28.88	0.518	2.59	0.112	0.13	0.009	0.685	0.418
SW-23 14	Core	15.12	6.05	0.04	3.86	0.025	0.003	25.21	0.739	1.73	0.141	0.14	0.009	0.457	1.539
SW-23 15	Core	9.71	5.94	0.05	2.03	0.036	0.002	14.95	1.004	0.77	0.049	0.18	0.006	0.286	1.607
SW-23 16	Core	5.92	7.41	0.08	1.13	0.041	<0.001	6.18	1.484	0.76	0.013	0.30	<0.001	0.118	0.760
SW-23 17	Core	5.91	7.23	0.07	1.20	0.042	<0.001	6.96	1.413	0.74	0.009	0.25	<0.001	0.115	0.695
SW-23 18	Core	5.91	8.57	0.08	0.90	0.048	<0.001	4.52	1.709	0.84	0.005	0.32	<0.001	0.153	0.614
SW-23 19	Core	5.77	15.20	0.07	0.60	0.024	<0.001	2.88	2.751	1.23	0.007	0.48	<0.001	0.065	0.451
SW-23 20	Core	5.93	15.50	0.08	0.50	0.019	<0.001	2.94	2.803	1.23	0.006	0.51	<0.001	0.065	0.442
SW-23 20D	Core	6.00	15.61	0.08	0.61	0.022	<0.001	2.94	2.818	1.21	0.006	0.50	<0.001	0.067	0.513
SW-23 21	Pulp	<0.01	0.54	<0.01	2.19	0.003	0.005	30.07	0.035	2.51	0.076	0.02	<0.001	0.103	0.220

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-13 01	Core	65.49	0.882	0.054	0.016	<0.01	97.77	5.68
SW-13 02	Core	61.28	0.823	0.063	0.018	<0.01	96.95	6.63
SW-13 03	Core	36.08	0.312	0.131	0.033	<0.01	88.78	13.74
SW-13 04	Core	37.92	0.380	0.174	0.050	<0.01	90.44	14.71
SW-13 05	Core	35.12	0.319	0.164	0.041	<0.01	88.81	13.75
SW-13 06	Core	36.00	0.311	0.183	0.048	<0.01	88.70	12.33
SW-13 07	Core	28.13	0.261	0.175	0.053	<0.01	86.86	14.57
SW-13 08	Core	26.92	0.246	0.169	0.046	<0.01	86.84	16.10
SW-13 09	Core	26.52	0.228	0.192	0.054	<0.01	86.57	15.42
SW-13 10	Core	32.31	0.250	0.159	0.042	<0.01	88.54	16.78
SW-13 11	Core	32.91	0.201	0.092	0.021	<0.01	88.98	19.07
SW-13 12	Core	63.97	0.465	0.092	0.021	<0.01	95.59	6.33
SW-13 12D	Core	65.90	0.791	0.058	0.016	<0.01	97.82	5.66
SW-13 13	Core	66.16	0.853	0.051	0.014	<0.01	97.87	5.36
SW-13 14	Pulp	53.09	0.005	<0.001	0.005	<0.01	87.85	0.00
SW-15 01	Core	31.87	0.355	0.173	0.040	<0.01	86.64	10.32
SW-15 02	Core	31.65	0.341	0.198	0.048	<0.01	86.76	11.36
SW-15 03	Core	25.46	0.230	0.237	0.058	<0.01	85.10	12.52
SW-15 04	Core	23.01	0.186	0.254	0.067	<0.01	84.18	12.61
SW-15 05	Core	23.60	0.190	0.238	0.060	<0.01	82.92	11.64
SW-15 06	Core	24.22	0.214	0.236	0.060	<0.01	84.28	11.88
SW-15 07	Core	21.84	0.210	0.233	0.060	<0.01	83.88	13.12
SW-15 08	Core	21.62	0.184	0.217	0.061	<0.01	82.24	13.15
SW-15 09	Core	21.22	0.155	0.241	0.065	<0.01	83.43	12.75
SW-15 10	Core	22.02	0.116	0.254	0.066	<0.01	83.43	12.61
SW-15 11	Core	22.71	0.119	0.248	0.067	<0.01	83.37	12.17
SW-15 12	Core	23.92	0.114	0.217	0.056	<0.01	83.48	14.32
SW-15 13	Core	32.81	0.192	0.186	0.055	<0.01	88.28	14.89
SW-15 14	Core	41.76	0.232	0.165	0.046	<0.01	90.47	13.53
SW-15 15	Core	41.19	0.230	0.110	0.033	<0.01	90.63	14.37
SW-15 16	Core	54.14	0.247	0.084	0.038	<0.01	93.84	10.54
SW-15 17	Core	71.41	0.321	0.056	0.012	<0.01	99.23	8.52
SW-15 18	Core	65.61	0.737	0.044	0.005	<0.01	98.09	8.02
SW-15 19	Core	64.33	0.795	0.048	0.007	<0.01	98.03	7.44
SW-15 19D	Core	66.27	0.814	0.048	0.006	<0.01	97.84	6.71
SW-15 20	Pulp	52.48	0.002	0.001	0.005	<0.01	87.02	0.00
SW-15 21	Pulp	52.65	0.003	<0.001	0.005	<0.01	86.90	0.00
SW-16 01	Core	54.90	0.495	0.066	0.018	<0.01	92.61	8.43
SW-16 02	Core	61.79	0.819	0.062	0.017	<0.01	95.92	6.34
SW-16 03	Core	29.52	0.343	0.149	0.040	<0.01	87.52	16.71

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-16 04	Core	25.70	0.242	0.211	0.054	<0.01	84.86	13.96
SW-16 05	Core	22.29	0.184	0.233	0.063	<0.01	83.50	13.77
SW-16 06	Core	22.54	0.179	0.240	0.060	<0.01	83.08	12.76
SW-16 07	Core	26.57	0.242	0.214	0.071	<0.01	84.44	12.68
SW-16 08	Core	25.63	0.247	0.210	0.055	<0.01	84.12	12.60
SW-16 09	Core	23.98	0.231	0.206	0.062	<0.01	83.96	13.05
SW-16 10	Core	22.60	0.207	0.203	0.058	<0.01	83.44	13.84
SW-16 11	Core	21.58	0.155	0.230	0.061	<0.01	82.56	12.84
SW-16 12	Core	20.89	0.113	0.240	0.063	<0.01	82.12	12.79
SW-16 13	Core	21.07	0.102	0.216	0.059	<0.01	82.79	14.36
SW-16 14	Core	23.48	0.116	0.216	0.059	<0.01	83.79	14.62
SW-16 15	Core	27.83	0.197	0.143	0.045	<0.01	86.69	17.41
SW-16 16	Core	56.42	0.191	0.062	0.014	<0.01	92.07	8.54
SW-16 17	Core	41.84	0.195	0.122	0.033	<0.01	90.52	14.40
SW-16 18	Core	60.26	0.264	0.110	0.030	<0.01	95.05	8.86
SW-16 19	Core	68.30	0.295	0.070	0.018	<0.01	95.57	7.29
SW-16 19D	Core	68.02	0.301	0.066	0.015	<0.01	95.67	7.54
SW-16 20	Pulp	52.73	0.005	<0.001	0.005	<0.01	87.20	0.00
SW-17 01	Core	57.07	0.673	0.081	0.019	<0.01	94.15	7.62
SW-17 02	Core	61.29	0.830	0.058	0.017	<0.01	95.75	5.97
SW-17 03	Core	26.05	0.262	0.125	0.039	<0.01	86.77	18.66
SW-17 04	Core	29.69	0.289	0.202	0.058	<0.01	85.83	12.79
SW-17 05	Core	25.90	0.240	0.211	0.064	<0.01	84.40	12.73
SW-17 06	Core	23.02	0.193	0.222	0.059	<0.01	83.57	13.17
SW-17 07	Core	25.39	0.205	0.239	0.055	<0.01	83.85	11.66
SW-17 08	Core	27.47	0.266	0.208	0.063	<0.01	84.62	11.89
SW-17 09	Core	30.87	0.314	0.188	0.055	<0.01	85.55	11.30
SW-17 10	Core	24.99	0.258	0.184	0.056	<0.01	84.40	13.45
SW-17 11	Core	23.71	0.239	0.191	0.054	<0.01	84.74	14.59
SW-17 12	Core	23.89	0.186	0.214	0.056	<0.01	84.30	13.59
SW-17 13	Core	21.66	0.155	0.226	0.054	<0.01	83.10	13.28
SW-17 14	Core	24.71	0.132	0.247	0.062	<0.01	83.57	12.04
SW-17 15	Core	22.95	0.138	0.224	0.057	<0.01	83.79	13.57
SW-17 16	Core	23.36	0.138	0.241	0.061	<0.01	83.86	12.87
SW-17 17	Core	25.62	0.151	0.199	0.051	<0.01	85.73	16.65
SW-17 18	Core	53.23	0.254	0.095	0.025	<0.01	93.74	10.85
SW-17 19	Core	45.69	0.222	0.129	0.033	<0.01	90.67	11.90
SW-17 20	Core	60.79	0.307	0.071	0.016	<0.01	94.25	9.34
SW-17 20D	Core	63.03	0.311	0.074	0.017	<0.01	95.12	8.59
SW-17 21	Core	68.39	0.528	0.054	0.013	<0.01	96.56	5.36

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-17 22	Pulp	52.17	0.020	<0.001	0.002	<0.01	86.36	0.00
SW-18 01	Core	61.12	0.810	0.057	0.015	0.01	96.52	6.99
SW-18 02	Core	37.12	0.389	0.098	0.026	<0.01	89.56	15.42
SW-18 03	Core	29.59	0.284	0.170	0.044	<0.01	87.51	16.23
SW-18 04	Core	28.49	0.303	0.173	0.047	<0.01	86.48	15.50
SW-18 05	Core	26.71	0.222	0.211	0.046	<0.01	85.12	13.97
SW-18 06	Core	25.01	0.231	0.222	0.057	<0.01	83.68	12.99
SW-18 07	Core	29.76	0.284	0.207	0.052	<0.01	85.72	12.07
SW-18 08	Core	35.11	0.322	0.180	0.044	<0.01	87.13	11.12
SW-18 09	Core	30.82	0.275	0.195	0.050	<0.01	85.97	12.11
SW-18 10	Core	27.28	0.263	0.185	0.051	<0.01	85.18	13.50
SW-18 11	Core	26.49	0.226	0.197	0.050	<0.01	84.85	13.51
SW-18 12	Core	25.85	0.204	0.198	0.052	<0.01	84.44	13.29
SW-18 13	Core	24.94	0.181	0.206	0.054	<0.01	84.25	13.27
SW-18 14	Core	24.85	0.162	0.213	0.055	<0.01	84.23	13.02
SW-18 15	Core	24.87	0.140	0.205	0.050	<0.01	84.05	13.32
SW-18 16	Core	25.87	0.143	0.211	0.053	<0.01	84.72	14.47
SW-18 17	Core	20.99	0.137	0.150	0.044	<0.01	84.58	18.14
SW-18 18	Core	23.58	0.154	0.140	0.043	<0.01	83.45	17.46
SW-18 19	Core	51.99	0.211	0.100	0.030	<0.01	91.79	10.39
SW-18 20	Core	65.65	0.280	0.054	0.015	<0.01	95.12	8.51
SW-18 21	Core	75.72	0.422	0.048	0.007	<0.01	97.46	5.58
SW-18 22	Core	69.04	0.596	0.047	0.006	<0.01	95.55	6.66
SW-18 22D	Core	69.42	0.575	0.047	0.004	<0.01	94.95	6.73
SW-18 23	Pulp	52.80	0.023	<0.001	0.002	<0.01	87.25	0.00
SW-19 01	Core	66.57	0.819	0.050	0.008	<0.01	95.04	5.78
SW-19 02	Core	64.68	0.843	0.056	0.008	<0.01	97.12	6.12
SW-19 03	Core	40.88	0.362	0.141	0.036	<0.01	89.14	11.34
SW-19 04	Core	35.66	0.343	0.171	0.036	0.01	88.75	13.17
SW-19 05	Core	32.46	0.294	0.170	0.052	<0.01	85.16	11.72
SW-19 06	Core	28.00	0.288	0.189	0.051	<0.01	84.99	10.77
SW-19 07	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 08	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 09	Core	35.75	0.317	0.168	0.047	0.01	86.78	9.77
SW-19 10	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 11	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 12	Core	35.17	0.298	0.155	0.038	<0.01	87.81	13.78
SW-19 13	Core	39.39	0.310	0.132	0.034	<0.01	88.83	13.20
SW-19 14	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 15	Core	32.55	0.279	0.159	0.059	<0.01	87.04	13.32

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-19 16	Core	31.20	0.278	0.177	0.055	<0.01	85.80	11.86
SW-19 17	Core	NS	NS	NS	NS	NS	NS	NS
SW-19 18	Core	42.00	0.240	0.093	0.028	<0.01	89.03	12.30
SW-19 19	Core	62.37	0.216	0.044	0.011	<0.01	93.65	9.12
SW-19 20	Core	73.94	0.284	0.050	0.012	<0.01	96.49	6.09
SW-19 21	Core	80.02	0.365	0.039	0.002	<0.01	98.44	5.30
SW-19 21D	Core	79.67	0.348	0.038	0.002	<0.01	98.04	5.27
SW-19 22	Core	68.41	0.785	0.042	0.004	<0.01	97.47	6.02
SW-19 23	Pulp	52.59	0.004	<0.001	0.003	<0.01	87.11	0.00
SW-20A 01	Core	27.96	0.317	0.149	0.041	<0.01	86.16	15.25
SW-20A 02	Core	29.16	0.307	0.177	0.041	<0.01	85.99	13.42
SW-20A 03	Core	35.28	0.361	0.191	0.034	<0.01	87.63	11.84
SW-20A 04	Core	24.51	0.207	0.204	0.049	<0.01	85.34	15.41
SW-20A 05	Core	23.59	0.193	0.243	0.063	<0.01	83.36	11.96
SW-20A 06	Core	23.51	0.198	0.232	0.058	<0.01	83.68	11.98
SW-20A 07	Core	21.34	0.194	0.225	0.058	<0.01	83.28	12.74
SW-20A 08	Core	31.34	0.201	0.179	0.071	<0.01	86.66	13.41
SW-20A 09	Core	21.63	0.122	0.252	0.062	<0.01	82.74	11.97
SW-20A 10	Core	20.13	0.125	0.220	0.070	<0.01	82.59	13.42
SW-20A 11	Core	22.00	0.109	0.211	0.058	<0.01	83.65	14.61
SW-20A 12	Core	32.33	0.184	0.175	0.056	<0.01	87.56	14.78
SW-20A 13	Core	38.03	0.197	0.138	0.040	<0.01	88.87	14.03
SW-20A 14	Core	42.63	0.233	0.118	0.036	<0.01	90.29	13.60
SW-20A 15	Core	49.62	0.222	0.106	0.031	<0.01	91.88	11.37
SW-20A 15D	Core	48.47	0.222	0.105	0.033	<0.01	91.63	11.79
SW-20A 16	Core	59.00	0.228	0.083	0.018	<0.01	93.29	8.84
SW-20A 17	Core	62.45	0.344	0.063	0.009	<0.01	95.06	8.41
SW-20A 18	Pulp	53.11	0.003	<0.001	0.002	<0.01	87.97	0.00
SW-20A 19	Core	67.30	0.805	0.046	0.003	0.01	97.99	6.65
SW-20A 20	Core	60.17	0.712	0.037	0.012	<0.01	96.55	8.71
SW-21R 01	Core	49.87	0.532	0.091	0.025	<0.01	92.47	9.74
SW-21R 02	Core	51.82	0.469	0.088	0.023	<0.01	93.29	10.43
SW-21R 03	Core	29.22	0.302	0.126	0.030	<0.01	87.79	18.34
SW-21R 04	Core	32.96	0.362	0.187	0.044	<0.01	86.85	11.02
SW-21R 05	Core	24.83	0.218	0.243	0.056	<0.01	83.61	11.24
SW-21R 06	Core	21.80	0.177	0.241	0.061	<0.01	82.93	12.39
SW-21R 07	Core	22.50	0.196	0.241	0.057	<0.01	83.30	12.29
SW-21R 08	Core	27.93	0.272	0.191	0.055	<0.01	85.54	12.37
SW-21R 09	Core	25.50	0.231	0.184	0.052	<0.01	85.04	13.55
SW-21R 10	Core	22.33	0.197	0.200	0.055	<0.01	83.72	14.11

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-21R 11	Core	21.54	0.166	0.230	0.062	<0.01	83.26	13.32
SW-21R 12	Core	19.76	0.114	0.230	0.062	<0.01	82.29	13.13
SW-21R 13	Core	21.47	0.111	0.233	0.063	<0.01	82.89	13.26
SW-21R 14	Core	31.24	0.147	0.203	0.053	<0.01	86.44	13.10
SW-21R 15	Core	28.65	0.178	0.142	0.049	<0.01	86.72	16.50
SW-21R 16	Core	39.66	0.181	0.112	0.040	<0.01	89.42	13.79
SW-21R 17	Core	60.39	0.296	0.069	0.020	<0.01	94.13	8.36
SW-21R 18	Core	66.19	0.771	0.047	0.004	<0.01	97.14	6.78
SW-21R 18D	Core	67.14	0.797	0.048	0.005	<0.01	97.66	6.52
SW-21R 19	Core	68.09	0.814	0.045	0.004	0.01	96.80	5.94
SW-21R 20	Pulp	52.67	0.003	<0.001	0.003	<0.01	87.24	0.00
SW-22 01	Core	65.11	0.886	0.055	0.010	0.02	96.85	5.88
SW-22 02	Core	63.97	0.768	0.077	0.021	0.02	97.04	6.04
SW-22 03	Core	38.72	0.418	0.138	0.041	<0.01	88.26	9.88
SW-22 04	Core	44.93	0.517	0.097	0.028	<0.01	90.33	9.17
SW-22 05	Core	64.94	0.778	0.066	0.019	0.02	96.57	5.79
SW-22 06	Core	62.41	0.798	0.051	0.010	<0.01	95.96	6.12
SW-22 07	Core	57.08	0.714	0.074	0.020	<0.01	94.14	6.75
SW-22 08	Core	31.55	0.346	0.151	0.040	<0.01	87.21	12.88
SW-22 09	Core	NS	NS	NS	NS	NS	NS	NS
SW-22 10	Core	30.72	0.261	0.217	0.048	<0.01	86.22	11.95
SW-22 11	Core	23.31	0.195	0.238	0.055	<0.01	83.97	13.31
SW-22 12	Core	NS	NS	NS	NS	NS	NS	NS
SW-22 13	Core	24.49	0.240	0.198	0.058	<0.01	84.75	14.21
SW-22 14	Core	23.47	0.191	0.211	0.057	<0.01	84.05	13.40
SW-22 15	Core	23.20	0.181	0.221	0.056	<0.01	83.63	13.26
SW-22 16	Core	21.38	0.129	0.244	0.064	<0.01	82.47	12.41
SW-22 17	Core	22.64	0.117	0.239	0.066	<0.01	83.11	12.85
SW-22 18	Core	24.30	0.122	0.225	0.058	<0.01	84.19	14.31
SW-22 19	Core	21.56	0.110	0.173	0.057	<0.01	84.44	16.38
SW-22 20	Core	26.84	0.190	0.126	0.055	<0.01	86.53	15.14
SW-22 21	Core	64.85	0.814	0.052	0.010	<0.01	96.87	6.44
SW-22 22	Core	67.40	0.788	0.047	0.006	<0.01	97.21	6.27
SW-22 22D	Core	67.74	0.783	0.047	0.007	<0.01	97.51	6.28
SW-22 23	Pulp	52.74	0.002	<0.001	0.002	<0.01	87.34	0.00
SW-23 01	Core	63.20	0.784	0.069	0.014	<0.01	96.26	5.95
SW-23 02	Core	NS	NS	NS	NS	NS	NS	NS
SW-23 03	Core	62.71	0.803	0.050	0.014	<0.01	95.98	6.09
SW-23 04	Core	31.30	0.298	0.178	0.043	<0.01	86.41	12.59
SW-23 05	Core	NS	NS	NS	NS	NS	NS	NS

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-23 06	Core	33.57	0.316	0.137	0.043	<0.01	86.74	11.13
SW-23 07	Core	NS	NS	NS	NS	NS	NS	NS
SW-23 08	Core	32.53	0.317	0.193	0.048	<0.01	86.09	10.19
SW-23 09	Core	NS	NS	NS	NS	NS	NS	NS
SW-23 10	Core	23.41	0.200	0.211	0.060	<0.01	83.58	12.85
SW-23 11	Core	21.18	0.152	0.217	0.066	<0.01	83.46	14.19
SW-23 12	Core	24.39	0.130	0.250	0.067	<0.01	83.71	12.36
SW-23 13	Core	25.05	0.137	0.207	0.063	<0.01	86.19	17.60
SW-23 14	Core	32.57	0.187	0.128	0.054	<0.01	87.98	15.12
SW-23 15	Core	56.30	0.240	0.091	0.031	<0.01	93.27	9.71
SW-23 16	Core	71.98	0.384	0.058	0.006	<0.01	96.60	5.92
SW-23 17	Core	71.16	0.356	0.058	0.014	<0.01	96.20	5.91
SW-23 18	Core	73.29	0.469	0.052	0.004	<0.01	97.48	5.91
SW-23 19	Core	67.21	0.851	0.044	0.006	<0.01	97.64	5.77
SW-23 20	Core	66.67	0.863	0.042	0.007	<0.01	97.60	5.93
SW-23 20D	Core	66.99	0.865	0.043	0.006	<0.01	98.28	6.00
SW-23 21	Pulp	52.51	0.003	<0.001	0.003	<0.01	87.17	0.00

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
QCV1206-02161-0001-BLK			<0.01	<0.01	<0.01	0.002	<0.001	<0.01	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.16	<0.01	2.62	3.508	0.001	8.90	0.084	25.59	0.167	0.36	0.055	0.005	0.016
SW-15 09	Core		5.48	0.03	1.94	0.028	0.008	38.81	0.448	1.33	0.081	0.10	0.011	0.693	0.049
SW-15 09 Dup			5.53	0.03	1.93	0.028	0.008	38.92	0.445	1.32	0.081	0.10	0.011	0.696	0.048
STD-360-BCS No 381 expected			0.67		49.00	0.330				1.03					
STD-360-BCS No 381 result			0.67	<0.01	48.94	0.307	0.008	13.37	0.056	0.98	2.463	0.27	0.003	6.909	0.187
SW-16 11	Core		5.48	0.03	2.08	0.030	0.008	37.25	0.456	1.42	0.074	0.11	0.012	0.656	0.090
SW-16 11 Dup			5.48	0.03	2.08	0.031	0.008	37.34	0.456	1.42	0.074	0.11	0.012	0.653	0.092
STD-JSS 852-2 expected			0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002
STD-JSS 852-2 result			0.37	<0.01	0.13	0.016	0.019	66.67	<0.001	1.13	0.075	0.02	0.045	0.012	0.002
SW-17 14	Core		5.22	0.02	1.70	0.032	0.005	36.70	0.386	1.44	0.073	0.13	0.011	0.555	0.088
SW-17 14 Dup			5.24	0.03	1.69	0.033	0.005	36.57	0.384	1.44	0.073	0.15	0.013	0.548	0.087
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.16	<0.01	2.61	3.517	<0.001	8.93	0.081	25.35	0.173	0.37	0.056	0.006	0.007
SW-18 15	Core		4.84	0.03	2.72	0.027	0.004	34.72	0.394	1.57	0.103	0.12	0.011	0.758	0.167
SW-18 15 Dup			4.81	0.03	2.71	0.028	0.004	34.77	0.393	1.56	0.103	0.11	0.011	0.769	0.168
STD-360-BCS No 381 expected			0.67		49.00	0.330				1.03					
STD-360-BCS No 381 result			0.70	<0.01	49.21	0.306	0.005	13.29	0.057	0.99	2.432	0.28	0.002	6.678	0.186
SW-19 21	Core		6.43	0.06	0.36	0.050	<0.001	3.08	1.430	0.69	0.005	0.25	<0.001	0.082	0.278
SW-19 21 Dup			6.46	0.07	0.36	0.048	<0.001	3.11	1.440	0.70	0.005	0.24	<0.001	0.081	0.282
STD-JSS 852-2 expected			0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002
STD-JSS 852-2 result			0.40	<0.01	0.13	0.013	0.015	66.90	<0.001	1.14	0.077	0.03	0.044	0.011	0.006
SW-20A 20	Core		12.14	0.06	3.50	0.015	0.001	5.26	2.308	1.09	0.030	0.46	<0.001	0.074	1.980
SW-20A 20 Dup			12.10	0.06	3.48	0.017	<0.001	5.29	2.317	1.07	0.030	0.46	<0.001	0.074	1.976
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.20	<0.01	2.63	3.507	<0.001	8.98	0.083	25.53	0.168	0.37	0.051	0.004	0.007
SW-22 03	Core		9.74	0.04	1.12	0.023	0.003	24.38	1.426	1.07	0.077	0.24	0.005	0.311	0.639
SW-22 03 Dup			9.76	0.04	1.12	0.024	0.004	24.37	1.430	1.09	0.076	0.25	0.005	0.310	0.645
STD-360-BCS No 381 expected			0.67		49.00	0.330				1.03					
STD-360-BCS No 381 result			0.70	<0.01	49.18	0.305	0.006	13.36	0.054	0.99	2.450	0.28	<0.001	6.673	0.181
SW-23 08	Core		7.71	0.05	2.61	0.027	0.004	29.29	1.009	1.24	0.098	0.13	0.008	0.562	0.073
SW-23 08 Dup			7.81	0.04	2.63	0.027	0.004	29.42	1.018	1.24	0.100	0.13	0.008	0.564	0.074
STD-JSS 852-2 expected			0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002
STD-JSS 852-2 result			0.40	<0.01	0.13	0.019	0.016	66.86	<0.001	1.14	0.076	0.02	0.046	0.011	0.002
QCV1206-02161-0019-BLK			<0.01	<0.01	<0.01	<0.001	<0.001	<0.01	0.002	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.20	<0.01	2.63	3.525	<0.001	9.04	0.083	25.45	0.169	0.37	0.051	0.004	0.006
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.10													

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-13 10	Core	16.78													
SW-13 10 Dup		16.77													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.57													
SW-15 12	Core	14.32													
SW-15 12 Dup		14.35													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.03													
SW-16 07	Core	12.68													
SW-16 07 Dup		12.73													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.49													
SW-17 03	Core	18.66													
SW-17 03 Dup		18.66													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.20													
SW-17 20	Core	9.34													
SW-17 20 Dup		9.31													
STD-LOI-470 expected		1.35													
STD-LOI-470 result		1.27													
SW-18 14	Core	13.02													
SW-18 14 Dup		12.89													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.10													
SW-19 09	Core	9.77													
SW-19 09 Dup		9.71													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.61													
SW-20A 06	Core	11.98													
SW-20A 06 Dup		11.92													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.12													
SW-21R 02	Core	10.43													
SW-21R 02 Dup		10.37													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.08													
SW-21R 18D	Core	6.52													
SW-21R 18D Dup		6.45													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.69													

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-22 17	Core	12.85													
SW-22 17 Dup		12.79													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.04													

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04074-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
QCV1206-02161-0001-BLK		>100	<0.001	<0.001	<0.001	<0.01	100.43	
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.25	0.188	0.048	0.012	<0.01	96.92	
SW-15 09	Core	21.22	0.155	0.241	0.065	<0.01	83.43	12.75
SW-15 09 Dup		21.24	0.152	0.241	0.064	<0.01	83.58	12.75
STD-360-BCS No 381 expected		8.78	0.350	0.940				
STD-360-BCS No 381 result		8.74	0.341	0.936	0.004	<0.01	84.16	
SW-16 11	Core	21.58	0.155	0.230	0.061	<0.01	82.56	12.84
SW-16 11 Dup		21.63	0.156	0.230	0.061	<0.01	82.69	12.84
STD-JSS 852-2 expected		1.70	0.480	0.820				
STD-JSS 852-2 result		1.67	0.502	0.846	0.005	<0.01	71.48	
SW-17 14	Core	24.71	0.132	0.247	0.062	<0.01	83.57	12.04
SW-17 14 Dup		24.67	0.136	0.247	0.062	<0.01	83.42	12.04
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.19	0.202	0.046	0.010	<0.01	96.73	
SW-18 15	Core	24.87	0.140	0.205	0.050	<0.01	84.05	13.32
SW-18 15 Dup		24.82	0.140	0.205	0.050	<0.01	84.02	13.32
STD-360-BCS No 381 expected		8.78	0.350	0.940				
STD-360-BCS No 381 result		8.76	0.331	0.901	0.001	<0.01	84.10	
SW-19 21	Core	80.02	0.365	0.039	0.002	<0.01	98.44	5.30
SW-19 21 Dup		80.80	0.368	0.039	0.002	<0.01	99.31	5.30
STD-JSS 852-2 expected		1.70	0.480	0.820				
STD-JSS 852-2 result		1.68	0.500	0.836	0.001	<0.01	71.77	
SW-20A 20	Core	60.17	0.712	0.037	0.012	<0.01	96.55	8.71
SW-20A 20 Dup		60.50	0.723	0.038	0.012	0.02	88.19	8.71
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.33	0.180	0.045	0.010	<0.01	97.07	
SW-22 03	Core	38.72	0.418	0.138	0.041	<0.01	88.26	9.88
SW-22 03 Dup		38.98	0.420	0.138	0.041	<0.01	88.57	9.88
STD-360-BCS No 381 expected		8.78	0.350	0.940				
STD-360-BCS No 381 result		8.71	0.331	0.902	0.002	<0.01	84.10	
SW-23 08	Core	32.53	0.317	0.193	0.048	<0.01	86.09	10.19
SW-23 08 Dup		32.77	0.313	0.197	0.049	<0.01	86.58	10.19
STD-JSS 852-2 expected		1.70	0.480	0.820				
STD-JSS 852-2 result		1.70	0.491	0.822	0.003	<0.01	71.70	
QCV1206-02161-0019-BLK		99.72	<0.001	<0.001	<0.001	<0.01	99.69	
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.29	0.180	0.045	0.010	<0.01	97.01	

INSPECTORATE
A Bureau Veritas Group Company

Certificate of Analysis

12-360-04075-01

Inspectorate Exploration & Mining Services Ltd.
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada
Phone: 604-272-7818

Distribution List

Attention: Andrew Reader
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6
Phone: 403-640-7977
EMail: andrew@ironstoneresources.com

Attention: Liam Murphy
EMail: liam@ironstoneresources.com

Submitted By: **Ironstone Resources Ltd**
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Attention: **Andrew Reader**

Project: **South Whitemud River 2012**
Description:

Date Received: 06/28/2012
Date Completed: 07/06/2012
Invoice:

Location	Samples	Type	Preparation Description
Vancouver, BC	106	Core	SP-RX-2K/Rock/Chips/Drill Core/Cuttings <2Kg
Vancouver, BC	9	Pulp	SP-PU/Handling of submitted samples

Location	Quantity	Method	Description
Vancouver, BC	99	SP-LOI	LOI
Vancouver, BC	99	NA-XF100	XRF Iron Ore

For and on behalf of ***Inspectorate Exploration and Mining Services Ltd***

By [redacted]

Sofia Devota – Operations Manager

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-24 01	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 02	Core	7.21	10.47	0.08	4.27	0.032	0.003	3.57	2.000	1.76	0.038	0.72	0.003	0.083	0.496
SW-24 03	Core	10.21	6.53	0.04	4.76	0.027	0.007	27.64	0.835	1.16	0.069	0.20	0.010	0.504	1.915
SW-24 04	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 05	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 06	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 07	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 08	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 09	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 10	Core	10.66	6.38	0.05	3.45	0.029	0.007	31.47	0.798	1.44	0.128	0.16	0.010	1.069	0.113
SW-24 11	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 12	Core	10.77	6.20	0.07	2.41	0.034	0.008	30.42	0.752	1.66	0.112	0.14	0.013	0.560	0.374
SW-24 13	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 14	Core	10.78	5.44	0.09	3.26	0.028	0.008	32.24	0.576	1.35	0.119	0.13	0.011	0.832	0.509
SW-24 15	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-24 16	Core	9.08	5.63	0.04	1.78	0.030	0.006	25.51	0.944	1.28	0.135	0.18	0.007	0.632	0.140
SW-24 17	Core	5.53	7.02	0.06	1.02	0.046	0.004	9.91	1.392	0.96	0.041	0.26	0.004	0.299	0.206
SW-24 18	Core	5.41	6.76	0.06	0.88	0.050	0.003	9.70	1.396	0.97	0.040	0.26	0.004	0.262	0.196
SW-24 19	Core	5.42	14.16	0.08	0.27	0.025	0.003	4.98	2.684	1.33	0.019	0.45	0.002	0.085	0.172
SW-24 19D	Core	5.69	14.00	0.08	0.52	0.022	0.002	5.58	2.655	1.35	0.021	0.47	0.001	0.161	0.224
SW-24 20	Core	4.89	14.82	0.09	0.35	0.022	0.002	2.90	2.793	1.36	0.010	0.50	0.001	0.056	0.192
SW-24 21	Pulp	<0.01	0.52	<0.01	2.21	0.007	0.008	29.95	0.037	2.52	0.077	0.03	0.002	0.102	0.234
SW-25 01	Core	14.70	4.95	0.03	2.51	0.031	0.009	38.73	0.369	1.74	0.100	0.13	0.012	0.622	0.718
SW-25 01D	Core	15.32	4.76	0.04	2.98	0.030	0.008	38.58	0.357	1.72	0.109	0.14	0.009	0.756	0.068
SW-25 02	Core	15.44	4.66	0.05	3.43	0.027	0.007	27.61	0.552	2.15	0.080	0.13	0.009	0.516	0.504
SW-25 03	Core	19.91	3.97	0.03	4.58	0.019	0.005	23.95	0.629	2.52	0.093	0.11	0.004	0.224	0.460
SW-25 04	Core	13.30	4.11	0.05	7.65	0.031	0.008	30.55	0.402	1.41	0.108	0.22	0.008	2.031	0.360
SW-25 05	Pulp	<0.01	0.52	<0.01	2.21	0.005	0.007	30.00	0.036	2.50	0.077	0.03	0.002	0.106	0.236
SW-25 06	Core	5.93	7.38	0.06	1.68	0.044	0.004	5.31	1.432	0.84	0.028	0.26	0.003	0.237	1.643
SW-25 07	Core	6.42	8.96	0.07	0.47	0.049	0.003	4.85	1.780	0.83	0.010	0.29	0.002	0.088	2.214
SW-26 01	Core	6.23	15.53	0.15	0.38	0.023	0.004	4.61	2.952	1.61	0.012	0.46	0.004	0.052	0.955
SW-26 02	Core	11.95	11.31	0.07	1.25	0.022	0.004	13.56	2.043	2.13	0.047	0.35	0.004	0.111	0.957
SW-26 03	Core	16.27	8.34	0.06	2.17	0.027	0.005	21.73	1.306	1.98	0.087	0.22	0.005	0.222	0.447
SW-26 04	Core	18.43	7.13	0.05	5.48	0.021	0.005	25.13	1.105	2.42	0.095	0.14	0.006	0.454	0.323
SW-26 05	Core	16.98	7.05	0.05	4.76	0.021	0.006	29.35	1.003	2.21	0.090	0.16	0.006	0.795	0.079
SW-26 06	Core	14.46	5.99	0.03	2.59	0.030	0.008	36.01	0.606	1.77	0.085	0.14	0.010	0.618	0.073
SW-26 07	Core	14.25	5.29	0.03	2.04	0.031	0.009	40.26	0.414	1.51	0.088	0.11	0.011	0.594	0.075
SW-26 08	Core	13.83	4.77	0.03	1.89	0.031	0.009	40.99	0.328	1.48	0.090	0.11	0.012	0.596	0.043
SW-26 09	Core	13.96	4.55	0.04	2.72	0.029	0.007	31.51	0.487	1.80	0.111	0.13	0.011	0.573	0.207
SW-26 10	Core	13.00	4.44	0.04	2.95	0.027	0.006	26.26	0.545	1.73	0.089	0.14	0.009	0.559	1.008

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-26 11	Core	14.37	4.74	0.04	3.68	0.033	0.005	22.06	0.708	2.02	0.071	0.13	0.009	0.447	0.854
SW-26 12	Core	15.98	5.06	0.04	3.63	0.024	0.004	21.46	0.810	2.36	0.076	0.14	0.006	0.386	1.115
SW-26 13	Core	6.56	11.23	0.07	1.67	0.033	0.003	6.21	2.136	1.26	0.022	0.34	0.003	0.106	1.813
SW-26 14	Core	5.25	10.71	0.08	1.34	0.033	0.003	3.42	2.136	1.00	0.012	0.36	0.002	0.060	1.385
SW-26 14D	Core	5.17	11.11	0.08	0.63	0.037	0.003	3.51	2.202	1.02	0.012	0.36	0.002	0.059	1.376
SW-26 15	Core	9.35	8.83	0.06	8.92	0.033	0.002	2.75	1.777	1.08	0.022	0.32	0.001	0.054	1.117
SW-26 16	Pulp	<0.01	0.54	<0.01	2.21	0.005	0.007	29.90	0.035	2.51	0.077	0.03	0.002	0.104	0.264
SW-27 01	Pulp	<0.01	0.54	<0.01	2.20	0.005	0.008	30.03	0.035	2.51	0.078	0.03	0.002	0.104	0.247
SW-27 02	Core	15.53	8.15	0.06	4.41	0.024	0.005	22.22	1.355	2.03	0.082	0.22	0.005	0.806	0.403
SW-27 03	Core	17.89	7.30	0.05	5.54	0.022	0.006	27.26	1.064	2.25	0.091	0.16	0.008	0.637	0.132
SW-27 04	Core	15.66	6.67	0.04	2.65	0.024	0.008	32.07	0.859	2.00	0.090	0.16	0.008	0.539	0.025
SW-27 05	Core	14.74	5.90	0.04	3.04	0.028	0.007	36.43	0.583	1.79	0.079	0.17	0.009	0.773	0.035
SW-27 06	Core	13.91	4.94	0.03	2.30	0.032	0.008	40.50	0.339	1.49	0.082	0.14	0.019	0.707	0.102
SW-27 07	Core	14.71	4.85	0.04	2.86	0.027	0.008	38.35	0.336	1.67	0.093	0.15	0.012	0.732	0.782
SW-27 07D	Core	14.40	4.86	0.03	2.76	0.027	0.007	38.06	0.339	1.70	0.089	0.15	0.014	0.698	0.929
SW-27 08	Core	14.41	4.91	0.05	3.52	0.026	0.006	27.92	0.535	1.90	0.094	0.17	0.011	0.620	0.927
SW-27 09	Core	16.33	4.40	0.03	7.21	0.020	0.004	21.58	0.652	1.97	0.118	0.17	0.008	0.634	0.262
SW-27 10	Core	17.45	4.39	0.05	8.05	0.023	0.004	19.18	0.726	2.07	0.138	0.13	0.005	0.233	0.834
SW-27 11	Core	17.04	4.72	0.04	3.74	0.019	0.005	26.61	0.616	2.28	0.078	0.15	0.006	0.467	0.731
SW-27 12	Core	6.64	10.01	0.07	3.62	0.023	0.003	5.53	2.012	1.13	0.028	0.41	0.002	0.867	1.933
SW-27 13	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-27 14	Core	9.38	10.28	0.07	2.37	0.017	0.003	9.99	1.992	1.60	0.052	0.37	0.003	0.257	1.044
SW-27 15	Pulp	<0.01	0.55	<0.01	2.18	0.004	0.008	29.92	0.037	2.52	0.076	0.03	0.002	0.107	0.230
SW-28 01	Core	13.14	7.07	0.05	5.52	0.020	0.007	27.71	1.079	0.83	0.059	0.12	0.007	0.471	2.574
SW-28 02	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-28 03	Core	11.65	5.74	0.04	2.44	0.025	0.008	36.96	0.608	1.11	0.110	0.12	0.014	0.735	0.106
SW-28 04	Core	10.07	5.49	0.05	2.89	0.032	0.005	23.45	0.737	0.94	0.073	0.15	0.014	0.561	0.444
SW-28 05	Core	13.07	8.45	0.06	6.21	0.020	0.007	27.84	1.128	0.97	0.101	0.14	0.010	0.810	2.143
SW-28 05D	Core	13.38	8.52	0.05	7.00	0.020	0.006	26.50	1.068	0.94	0.093	0.14	0.010	0.898	2.477
SW-28 06	Core	11.47	7.22	0.05	3.35	0.023	0.008	34.28	0.947	1.02	0.130	0.12	0.009	0.473	0.744
SW-28 07	Core	11.59	6.68	0.04	3.02	0.032	0.008	36.98	0.695	1.03	0.115	0.12	0.016	0.707	0.732
SW-28 08	Pulp	<0.01	0.52	<0.01	2.20	0.004	0.008	30.04	0.034	2.50	0.075	0.03	0.002	0.105	0.224
SW-28 09	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-28 10	Core	9.46	3.21	0.07	22.98	0.011	0.004	8.16	0.668	0.71	0.097	0.51	0.011	6.164	0.433
SW-28 11	Core	5.84	6.67	0.07	1.38	0.033	0.002	5.60	1.304	0.80	0.021	0.24	0.002	0.298	1.695
SW-28 12	Core	5.04	8.13	0.07	0.96	0.051	0.004	3.68	1.601	0.79	0.009	0.27	0.002	0.177	1.119
SW-28 13	Core	13.41	9.24	0.05	14.80	0.026	0.002	3.26	1.790	1.31	0.036	0.28	0.003	0.229	1.416
SW-28 14	Core	5.71	12.63	0.08	0.39	0.039	0.002	3.47	2.461	1.14	0.011	0.37	0.002	0.063	1.221
SW-28 15	Core	5.78	10.12	0.06	4.23	0.031	0.003	4.16	2.025	1.05	0.021	0.34	0.002	0.054	1.838
SW-29 01	Core	6.31	15.39	0.13	1.09	0.018	0.004	4.45	2.957	1.24	0.005	0.43	0.003	0.052	0.574

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
SW-29 02	Core	6.16	15.58	0.09	0.79	0.015	0.003	5.62	3.048	1.29	0.006	0.41	0.001	0.066	0.294
SW-29 03	Core	11.36	7.79	0.07	2.00	0.019	0.007	29.54	1.225	1.06	0.134	0.17	0.009	0.743	0.071
SW-29 03D	Core	11.19	7.92	0.07	0.97	0.025	0.007	29.44	1.243	1.10	0.122	0.15	0.011	0.386	0.069
SW-29 04	Core	10.49	8.64	0.07	2.53	0.021	0.006	27.17	1.361	1.23	0.070	0.15	0.006	0.642	0.067
SW-29 05	Core	13.08	8.47	0.06	9.27	0.023	0.006	22.52	1.300	1.25	0.055	0.18	0.004	1.134	0.060
SW-29 06	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-29 07	Core	11.78	7.18	0.04	4.82	0.019	0.007	31.56	1.022	1.28	0.096	0.13	0.008	0.696	0.083
SW-29 08	Core	10.55	5.90	0.05	3.90	0.023	0.007	32.51	0.768	1.17	0.091	0.15	0.010	1.179	0.099
SW-29 09	Core	10.75	4.18	0.04	6.69	0.023	0.004	19.72	0.761	0.85	0.173	0.15	0.009	0.418	0.607
SW-29 10	Core	10.98	5.57	0.04	10.39	0.023	0.005	17.12	0.723	0.74	0.149	0.14	0.013	0.463	4.630
SW-29 11	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-29 12	Core	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-29 13	Pulp	<0.01	0.54	<0.01	2.21	0.004	0.008	29.97	0.036	2.52	0.076	0.03	0.001	0.103	0.243
SW-29 14	Core	7.52	7.83	0.06	1.97	0.045	0.003	7.44	1.435	0.62	0.010	0.27	0.002	0.238	1.310
SW-29 15	Core	7.62	12.85	0.08	0.91	0.031	0.003	3.75	2.512	0.96	0.005	0.38	<0.001	0.147	1.119
SW-29 16	Core	6.56	12.70	0.08	0.44	0.031	0.002	3.33	2.525	0.96	0.004	0.39	<0.001	0.085	0.773
SW-29 17	Core	6.12	11.13	0.08	0.30	0.032	0.002	3.28	2.327	0.82	0.004	0.36	<0.001	0.060	0.782
SW-30 01	Core	6.00	15.36	0.09	0.48	0.018	0.003	4.17	2.918	1.55	0.011	0.46	0.003	0.050	0.859
SW-30 02	Core	6.38	15.76	0.09	0.40	0.018	0.003	4.85	3.006	1.61	0.011	0.45	0.004	0.049	1.130
SW-30 03	Core	8.38	10.21	0.06	1.74	0.024	0.004	18.30	1.708	1.18	0.052	0.28	0.004	0.437	0.067
SW-30 04	Core	9.90	9.31	0.07	2.52	0.022	0.007	24.69	1.537	1.27	0.087	0.20	0.005	0.505	0.293
SW-30 05	Core	11.67	7.68	0.06	5.02	0.017	0.007	27.86	1.231	1.18	0.094	0.16	0.005	0.859	0.061
SW-30 06	Core	13.87	7.28	0.04	7.48	0.021	0.007	27.60	1.015	1.32	0.091	0.12	0.006	0.403	0.053
SW-30 07	Core	10.81	7.61	0.05	5.09	0.024	0.006	29.70	1.057	1.29	0.084	0.15	0.007	1.079	0.065
SW-30 08	Core	11.34	6.36	0.04	2.94	0.028	0.007	36.73	0.657	1.28	0.079	0.12	0.009	0.645	0.045
SW-30 09	Core	14.37	5.20	0.04	2.75	0.028	0.008	39.21	0.430	1.46	0.116	0.11	0.011	0.797	0.054
SW-30 10	Core	11.91	5.18	0.04	2.41	0.028	0.007	34.93	0.503	1.35	0.079	0.11	0.010	0.753	0.078
SW-30 11	Core	9.19	5.43	0.04	2.23	0.031	0.006	24.05	0.769	1.16	0.038	0.12	0.008	0.305	0.064
SW-30 12	Core	16.46	5.06	0.05	4.95	0.029	0.004	19.88	0.799	1.82	0.100	0.13	0.006	0.393	0.169
SW-30 13	Core	19.68	3.80	0.04	3.59	0.020	0.005	25.24	0.662	2.64	0.143	0.14	0.004	0.383	1.336
SW-30 14	Pulp	<0.01	0.55	<0.01	2.18	0.003	0.007	29.86	0.036	2.53	0.077	0.03	0.001	0.105	0.251
SW-30 15	Core	7.80	9.11	0.06	6.11	0.027	0.003	6.49	1.751	1.23	0.053	0.31	0.003	0.537	2.350
SW-30 15D	Core	9.22	9.96	0.07	1.92	0.035	0.003	8.08	1.918	1.21	0.027	0.32	0.003	0.248	1.904
SW-30 16	Core	5.34	11.89	0.07	0.41	0.033	0.002	3.64	2.342	1.14	0.010	0.36	0.001	0.068	1.596
SW-30 17	Pulp	<0.01	0.54	<0.01	2.17	0.004	0.008	29.87	0.037	2.48	0.077	0.03	0.002	0.101	0.224

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-24 01	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 02	Core	65.78	0.533	0.027	0.011	<0.01	97.07	7.21
SW-24 03	Core	31.59	0.252	0.171	0.048	<0.01	85.95	10.21
SW-24 04	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 05	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 06	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 07	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 08	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 09	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 10	Core	28.54	0.230	0.186	0.052	<0.01	84.75	10.66
SW-24 11	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 12	Core	32.18	0.195	0.222	0.061	<0.01	86.16	10.77
SW-24 13	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 14	Core	29.52	0.163	0.199	0.059	<0.01	85.30	10.78
SW-24 15	Core	NS	NS	NS	NS	NS	NS	NS
SW-24 16	Core	42.36	0.224	0.134	0.036	<0.01	88.12	9.08
SW-24 17	Core	67.61	0.325	0.070	0.024	<0.01	94.77	5.53
SW-24 18	Core	69.04	0.315	0.071	0.023	<0.01	95.44	5.41
SW-24 19	Core	66.81	0.782	0.046	0.011	<0.01	97.31	5.42
SW-24 19D	Core	65.32	0.767	0.048	0.011	<0.01	96.91	5.69
SW-24 20	Core	69.48	0.821	0.043	0.011	<0.01	98.32	4.89
SW-24 21	Pulp	53.31	0.006	<0.001	0.006	<0.01	88.29	0.00
SW-25 01	Core	17.83	0.117	0.250	0.063	<0.01	82.90	14.70
SW-25 01D	Core	17.45	0.110	0.242	0.062	<0.01	82.73	15.32
SW-25 02	Core	31.34	0.146	0.175	0.050	<0.01	86.87	15.44
SW-25 03	Core	31.27	0.151	0.101	0.027	<0.01	88.04	19.91
SW-25 04	Core	22.50	0.116	0.182	0.051	<0.01	83.07	13.30
SW-25 05	Pulp	53.09	0.008	<0.001	0.005	<0.01	88.17	0.00
SW-25 06	Core	71.81	0.378	0.048	0.014	<0.01	97.10	5.93
SW-25 07	Core	71.76	0.472	0.039	0.011	<0.01	98.32	6.42
SW-26 01	Core	63.23	0.824	0.054	0.015	<0.01	97.09	6.23
SW-26 02	Core	48.48	0.568	0.103	0.025	<0.01	92.97	11.95
SW-26 03	Core	36.46	0.378	0.161	0.037	<0.01	89.90	16.27
SW-26 04	Core	26.47	0.308	0.165	0.035	<0.01	88.09	18.43
SW-26 05	Core	23.16	0.293	0.171	0.044	<0.01	86.58	16.98
SW-26 06	Core	20.64	0.194	0.235	0.059	<0.01	83.53	14.46
SW-26 07	Core	16.83	0.139	0.243	0.065	<0.01	81.96	14.25
SW-26 08	Core	17.27	0.109	0.257	0.065	<0.01	81.89	13.83
SW-26 09	Core	29.13	0.131	0.192	0.052	<0.01	85.62	13.96
SW-26 10	Core	37.01	0.134	0.176	0.052	<0.01	88.15	13.00

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-26 11	Core	39.32	0.167	0.142	0.047	<0.01	88.84	14.37
SW-26 12	Core	38.05	0.192	0.114	0.031	<0.01	89.47	15.98
SW-26 13	Core	64.49	0.597	0.060	0.018	<0.01	96.61	6.56
SW-26 14	Core	71.82	0.593	0.040	0.011	<0.01	98.26	5.25
SW-26 14D	Core	72.98	0.615	0.042	0.011	<0.01	99.21	5.17
SW-26 15	Core	62.18	0.491	0.030	0.009	<0.01	97.03	9.35
SW-26 16	Pulp	53.29	0.005	<0.001	0.005	<0.01	88.05	0.00
SW-27 01	Pulp	53.33	0.004	<0.001	0.005	<0.01	88.08	0.00
SW-27 02	Core	33.36	0.380	0.141	0.036	<0.01	89.20	15.53
SW-27 03	Core	24.66	0.304	0.172	0.043	<0.01	87.57	17.89
SW-27 04	Core	24.21	0.258	0.189	0.051	<0.01	85.50	15.66
SW-27 05	Core	18.92	0.185	0.216	0.056	<0.01	82.99	14.74
SW-27 06	Core	16.15	0.112	0.245	0.064	<0.01	81.14	13.91
SW-27 07	Core	17.81	0.111	0.246	0.063	<0.01	82.82	14.71
SW-27 07D	Core	18.44	0.108	0.250	0.065	<0.01	82.92	14.40
SW-27 08	Core	31.84	0.143	0.203	0.061	<0.01	87.33	14.41
SW-27 09	Core	35.80	0.150	0.135	0.038	<0.01	89.51	16.33
SW-27 10	Core	36.76	0.162	0.096	0.027	<0.01	90.31	17.45
SW-27 11	Core	30.77	0.156	0.156	0.044	<0.01	87.61	17.04
SW-27 12	Core	64.48	0.554	0.044	0.011	<0.01	97.36	6.64
SW-27 13	Core	NS	NS	NS	NS	NS	NS	NS
SW-27 14	Core	56.88	0.575	0.057	0.015	<0.01	94.95	9.38
SW-27 15	Pulp	53.11	0.007	<0.001	0.005	<0.01	87.80	0.00
SW-28 01	Core	26.44	0.305	0.150	0.046	<0.01	85.60	13.14
SW-28 02	Core	NS	NS	NS	NS	NS	NS	NS
SW-28 03	Core	23.46	0.186	0.221	0.062	<0.01	83.59	11.65
SW-28 04	Core	43.87	0.178	0.202	0.058	<0.01	89.20	10.07
SW-28 05	Core	24.43	0.320	0.185	0.056	<0.01	85.95	13.07
SW-28 05D	Core	24.64	0.305	0.178	0.055	<0.01	86.27	13.38
SW-28 06	Core	23.95	0.281	0.209	0.055	<0.01	84.32	11.47
SW-28 07	Core	20.99	0.220	0.268	0.069	<0.01	83.30	11.59
SW-28 08	Pulp	53.25	0.007	0.002	0.005	<0.01	88.12	0.00
SW-28 09	Core	NS	NS	NS	NS	NS	NS	NS
SW-28 10	Core	35.00	0.162	0.042	0.019	<0.01	87.71	9.46
SW-28 11	Core	74.29	0.347	0.051	0.014	<0.01	98.65	5.84
SW-28 12	Core	76.83	0.423	0.043	0.013	<0.01	99.21	5.04
SW-28 13	Core	49.89	0.489	0.032	0.009	<0.01	96.26	13.41
SW-28 14	Core	70.83	0.681	0.045	0.012	<0.01	99.15	5.71
SW-28 15	Core	66.56	0.567	0.037	0.011	<0.01	96.89	5.78
SW-29 01	Core	63.82	0.847	0.055	0.010	<0.01	97.38	6.31

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
SW-29 02	Core	62.59	0.831	0.059	0.011	<0.01	96.86	6.16
SW-29 03	Core	31.61	0.343	0.155	0.046	<0.01	86.34	11.36
SW-29 03D	Core	33.70	0.347	0.173	0.050	<0.01	86.96	11.19
SW-29 04	Core	34.01	0.386	0.174	0.043	<0.01	87.07	10.49
SW-29 05	Core	30.96	0.363	0.200	0.039	<0.01	88.97	13.08
SW-29 06	Core	NS	NS	NS	NS	NS	NS	NS
SW-29 07	Core	26.02	0.296	0.180	0.047	<0.01	85.26	11.78
SW-29 08	Core	27.59	0.212	0.187	0.058	<0.01	84.44	10.55
SW-29 09	Core	45.03	0.166	0.084	0.033	<0.01	89.68	10.75
SW-29 10	Core	35.47	0.172	0.093	0.060	<0.01	86.77	10.98
SW-29 11	Core	NS	NS	NS	NS	NS	NS	NS
SW-29 12	Core	NS	NS	NS	NS	NS	NS	NS
SW-29 13	Pulp	53.06	0.008	<0.001	0.005	<0.01	87.73	0.00
SW-29 14	Core	66.86	0.378	0.066	0.019	<0.01	96.06	7.52
SW-29 15	Core	66.85	0.692	0.045	0.006	<0.01	97.96	7.62
SW-29 16	Core	69.32	0.712	0.045	0.006	<0.01	97.96	6.56
SW-29 17	Core	72.52	0.644	0.044	0.004	<0.01	98.51	6.12
SW-30 01	Core	65.31	0.841	0.053	0.016	<0.01	98.19	6.00
SW-30 02	Core	63.16	0.836	0.056	0.015	<0.01	97.82	6.38
SW-30 03	Core	47.82	0.482	0.160	0.038	<0.01	90.94	8.38
SW-30 04	Core	37.13	0.432	0.167	0.038	<0.01	88.19	9.90
SW-30 05	Core	30.18	0.345	0.153	0.037	<0.01	86.62	11.67
SW-30 06	Core	27.60	0.288	0.211	0.045	<0.01	87.43	13.87
SW-30 07	Core	27.76	0.312	0.215	0.046	<0.01	85.33	10.81
SW-30 08	Core	22.77	0.208	0.254	0.065	<0.01	83.56	11.34
SW-30 09	Core	17.00	0.138	0.246	0.067	<0.01	82.03	14.37
SW-30 10	Core	26.30	0.139	0.237	0.061	<0.01	84.11	11.91
SW-30 11	Core	45.19	0.183	0.176	0.048	<0.01	89.03	9.19
SW-30 12	Core	40.02	0.180	0.131	0.037	<0.01	90.20	16.46
SW-30 13	Core	29.57	0.159	0.074	0.020	<0.01	87.49	19.68
SW-30 14	Pulp	53.11	0.005	<0.001	0.005	<0.01	87.69	0.00
SW-30 15	Core	58.22	0.477	0.057	0.015	<0.01	94.60	7.80
SW-30 15D	Core	61.33	0.528	0.058	0.015	<0.01	96.84	9.22
SW-30 16	Core	70.80	0.652	0.044	0.011	<0.01	98.41	5.34
SW-30 17	Pulp	52.81	0.004	<0.001	0.005	<0.01	87.26	0.00

NS = No Sample

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
STD-JSS 852-2 expected			0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002
STD-JSS 852-2 result			0.37	<0.01	0.13	0.016	0.020	66.90	<0.001	1.12	0.077	0.02	0.044	0.009	<0.001
QCV1206-01988-0002-BLK			<0.01	<0.01	<0.01	0.001	<0.001	<0.01	<0.001	<0.01	<0.001	<0.01	<0.001	<0.001	<0.001
STD-360-BCS No 381 expected			0.67		49.00	0.330				1.03					
STD-360-BCS No 381 result			0.68	<0.01	48.81	0.314	0.008	13.30	0.055	0.96	2.458	0.28	0.003	6.861	0.182
SW-26 04	Core		7.13	0.05	5.48	0.021	0.005	25.13	1.105	2.42	0.095	0.14	0.006	0.454	0.323
SW-26 04 Dup			7.16	0.04	5.46	0.023	0.006	25.22	1.093	2.43	0.095	0.14	0.006	0.454	0.313
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.17	<0.01	2.66	3.506	0.002	8.88	0.088	25.32	0.172	0.37	0.054	0.003	<0.001
SW-27 10	Core		4.39	0.05	8.05	0.023	0.004	19.18	0.726	2.07	0.138	0.13	0.005	0.233	0.834
SW-27 10 Dup			4.35	0.04	8.03	0.023	0.005	19.14	0.721	2.06	0.138	0.13	0.005	0.231	0.802
STD-JSS 852-2 expected			0.38		0.13	0.004			0.007	1.15	0.077	0.03	0.045	0.014	0.002
STD-JSS 852-2 result			0.36	<0.01	0.13	0.012	0.019	66.88	<0.001	1.13	0.076	0.02	0.044	0.010	<0.001
SW-29 05	Core		8.47	0.06	9.27	0.023	0.006	22.52	1.300	1.25	0.055	0.18	0.004	1.134	0.060
SW-29 05 Dup			8.41	0.06	9.18	0.024	0.006	22.43	1.279	1.23	0.054	0.18	0.004	1.124	0.059
STD-360-BCS No 381 expected			0.67		49.00	0.330				1.03					
STD-360-BCS No 381 result			0.68	<0.01	49.29	0.305	0.008	13.31	0.058	0.98	2.456	0.29	0.003	6.894	0.252
SW-30 15	Core		9.11	0.06	6.11	0.027	0.003	6.49	1.751	1.23	0.053	0.31	0.003	0.537	2.350
SW-30 15 Dup			9.12	0.06	6.13	0.025	0.002	6.49	1.759	1.22	0.053	0.31	0.002	0.545	1.803
QCV1206-01988-0011-BLK			0.09	<0.01	<0.01	0.001	<0.001	<0.01	<0.001	<0.01	0.002	<0.01	<0.001	<0.001	<0.001
STD-SARM 5 expected			4.18		2.66	3.500	0.002		0.090	25.33		0.37	0.056		
STD-SARM 5 result			4.17	<0.01	2.66	3.506	0.002	8.88	0.088	25.32	0.172	0.37	0.054	0.003	<0.001
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.13													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.12													
SW-26 07	Core	14.25													
SW-26 07 Dup		14.32													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.61													
SW-27 07	Core	14.71													
SW-27 07 Dup		14.62													
STD-LOI-471 expected		5.67													
STD-LOI-471 result		5.67													
SW-28 10	Core	9.46													
SW-28 10 Dup		9.50													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.09													
SW-29 14	Core	7.52													
SW-29 14 Dup		7.53													

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	LOI SP-LOI % 0.01	Al2O3 NA-XF100 % 0.01	BaO NA-XF100 % 0.01	CaO NA-XF100 % 0.01	Cr2O3 NA-XF100 % 0.001	Cu NA-XF100 % 0.001	Fe NA-XF100 % 0.01	K2O NA-XF100 % 0.001	MgO NA-XF100 % 0.01	Mn NA-XF100 % 0.001	Na2O NA-XF100 % 0.01	Ni NA-XF100 % 0.001	P NA-XF100 % 0.001	S NA-XF100 % 0.001
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.12													
SW-30 14	Pulp	<0.01													
SW-30 14 Dup		<0.01													
STD-LOI-472 expected		10.30													
STD-LOI-472 result		10.07													

INSPECTORATE
A Bureau Veritas Group Company
#200 - 11620 Horseshoe Way
Richmond, BC V7A 4V5 Canada

Certificate of Analysis

12-360-04075-01

Ironstone Resources Ltd
Suite 200, 6125 11th SE
Calgary, Alberta T2H 2L6

Sample Description	Sample Type	SiO2 NA-XF100 % 0.01	TiO2 NA-XF100 % 0.001	V2O5 NA-XF100 % 0.001	Zn NA-XF100 % 0.001	Zr NA-XF100 % 0.01	Total NA-XF100 %	LOI NA-XF100 %
STD-JSS 852-2 expected		1.70	0.480	0.820				
STD-JSS 852-2 result		1.66	0.482	0.823	0.005	<0.01	71.64	
QCV1206-01988-0002-BLK		>100	<0.001	<0.001	<0.001	<0.01	100.03	
STD-360-BCS No 381 expected		8.78	0.350	0.940				
STD-360-BCS No 381 result		8.72	0.329	0.905	0.004	<0.01	83.84	
SW-26 04	Core	26.47	0.308	0.165	0.035	<0.01	88.09	18.43
SW-26 04 Dup		26.37	0.310	0.163	0.036	<0.01	87.75	18.43
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.08	0.182	0.047	0.012	<0.01	97.13	
SW-27 10	Core	36.76	0.162	0.096	0.027	<0.01	90.31	17.45
SW-27 10 Dup		36.73	0.166	0.096	0.027	<0.01	90.14	17.45
STD-JSS 852-2 expected		1.70	0.480	0.820				
STD-JSS 852-2 result		1.67	0.486	0.831	0.004	<0.01	71.64	
SW-29 05	Core	30.96	0.363	0.200	0.039	<0.01	88.97	13.08
SW-29 05 Dup		30.70	0.368	0.199	0.039	<0.01	88.42	13.08
STD-360-BCS No 381 expected		8.78	0.350	0.940				
STD-360-BCS No 381 result		8.73	0.325	0.914	0.004	<0.01	84.48	
SW-30 15	Core	58.22	0.477	0.057	0.015	<0.01	94.60	7.80
SW-30 15 Dup		58.70	0.484	0.055	0.016	<0.01	94.57	7.80
QCV1206-01988-0011-BLK		>100	0.002	<0.001	<0.001	<0.01	100.30	
STD-SARM 5 expected		51.10	0.200	0.048				
STD-SARM 5 result		51.08	0.182	0.047	0.012	<0.01	96.53	

INSPECTORATE
A Bureau Veritas Group Company

APPARENT SPECIFIC GRAVITY DETERMINATION

Client: Ironstone Resources
Sample: As per id
Date: 16-Jul-12
Project: 1204206

Objective: Measure rock samples apparent specific gravity by wax immersion method

Test description:

- Samples air dried over night
- Weighed single piece of rock, coated with molten wax, recorded total weight
- Waxed sample placed into a graduated cylinder with water, removed bubbles
- Volume change was recorded. Wax specific gravity from literature.

Count	Sample ID	Apparent Specifc Gravity g/cm^3
1	BR-01, 09B	2.073
2	BR-05A, 13B	2.786
3	BR-08A, 16B	2.460
4	BR-08A, 17B	2.867
5	BR-08A, 18B	2.164
6	BR-11A, 26B	2.356
7	BR-11A, 50B	2.675
8	SW-02A, 01B	2.339
9	SW-10, 17B	2.139
10	SW-16, 09B	2.027
11	SW-16, 14B	2.156
12	SW-18, 04B	2.269
13	SW-18, 10B	2.168
14	SW-21R, 10B	2.382
15	SW-21R, 14B	2.181
16	SW-30, 05B	2.471
17	SW-01A, 09B	2.005
18	SW-01A, 13B	2.110
19	SW-02A, 15B	2.435
20	SW-06, 08B	2.263
21	SW-09, 05B	2.148
22	SW-18, 16B	2.027
23	SW-19, 12B	2.044
24	SW-22, 11B	2.398
25	SW-30, 10B	2.038
26	SW-11, 13B	2.145
27	SW-11, 18B	2.134
28	SW-15, 04B	2.542
29	SW-15, 09B	2.195
30	SW-17, 04B	1.769
31	SW-20A, 08B	1.770
32	SW-25, 01B	1.885
33	SW-25,03B	2.671
34	SW-26, 07B	2.318
35	SW-06, 13B	1.940
36	SW-11, 07B	2.145
37	SW-17, 11B	2.115
38	SW-17, 17B	2.158
39	SW-19, 15B	2.042
40	SW-22, 16B	1.928
41	SW-27, 06B	1.873

INSPECTORATE
A Bureau Veritas Group Company

SPECIFIC GRAVITY DETERMINATION

Client: Ironstone Resources
Test: SG by Pycnometric method
Sample: As per id

Date: 16-Jul-12
Project: 1204206

Objective: Measure specific gravity by pycnometric method on samples received as <1/4"

Test description:

- Samples air dried over night
- Weight recorded and placed into the appropriate size volumetric flask
- Added deionized water and heated to remove air bubbles without boiling
- Content in the flask bulked up to the mark and weight recorded

Count	Sample ID	Solids Specific Gravity, g/cm^3
1	BR- 01, 19B	2.63
2	BR-05A, 10B	2.88
3	BR-11A, 39B	2.98
4	SW-02A, 07B	2.87
5	SW-03A, 03B	2.89
6	SW-03A, 09B	3.08
7	SW-03A, 14B	2.97
8	SW-10, 07B	3.40
9	SW-12, 05B	3.12
10	SW-13, 04B	2.96
11	SW-16, 04B	2.97
12	SW-20A, 15B	2.61
13	SW-27, 2B	2.77
14	SW-30, 07B	2.96
15	SW-09, 13B	2.92
16	SW-10, 25B	2.76
17	SW-12, 10B	2.65
18	SW-12, 15B	2.78
19	SW-13, 10B	2.81
20	SW-20A, 03B	3.13
21	SW-24, 17B	3.01
22	SW-27, 11B	3.04
23	SW-28, 04B	2.61
24	SW-29, 09B	2.91
25	SW-29, 14B	2.59
26	SW-01A, 05B	2.76
27	SW-07, 05B	2.98
28	SW-15, 14B	2.71
29	SW-21R, 06B	3.12
30	SW-23, 06B	3.11
31	SW-23, 13B	2.93
32	SW-26, 03B	3.01
33	SW-26,11B	2.83
34	SW-28, 01B	2.83
35	SW-28,07B	2.79
36	SW-29, 04B	2.62
37	SW-05, 07B	3.00
38	SW-05, 13B	2.90
39	SW-05, 24B	2.69
40	SW-06, 03B	2.83
41	SW-07, 07B	3.02
42	SW-07, 09B	2.97
43	SW-07, 16B	2.99
44	SW-09, 21B	2.66
45	SW-22, 19B	2.93
46	SW-23, 11B	2.74