

Open File Report OF98-2

Geochemical Database for Phanerozoic Black Shales in Manitoba

**Manitoba
Energy and Mines**

David Newman
Minister





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Geochemical Database for Phanerozoic Black Shales in Manitoba

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INTRODUCTION

This geochemical database has been developed for metallogenetic and environmental/epidemiological studies of Phanerozoic black shales in Manitoba. The metallogenetic potential for black shale has been demonstrated world wide as (i) host rocks to precious and base metal mineralization, (ii) aquitards/"cap-rocks" for focussing mineralizing fluids, and (iii) metal-enriched source rocks (Bloomstein and Clark, 1990; Colman et al., 1989). Locally, their importance to mineral deposits has been demonstrated at Black Island in Lake Winnipeg (Fedikow, Bamburak and Weitzel, 1995) where the metal-enriched character of Ordovician black shales was interpreted to represent a link between mobilization of metals from a gold-enriched sulphide facies iron formation and the subsequent precipitation of these metals as variably coloured, metal-rich crusts on the shales. The chemical characteristics of these unique lithologies will provide an opportunity to develop new metallogenetic concepts relevant to mineral exploration in Phanerozoic sequences.

This project will parallel and complement an environmental geochemistry study initiated by the Geological Survey of Canada and recently described by Dunn (1990). The GSC study documents the chemistry of Cretaceous shales subcropping beneath glacial deposits and seeks to address the apparent link between the high incidence of multiple sclerosis at Henribourg, Saskatchewan (Irvine, Schiefer and Hader, 1988, 1989) and the chemistry of soils and well waters. This association has been previously suggested by Gould and Warren (1980) and Hasanen, Kinnunen and Alhonen (1986).

This database has been established using a variety of analytical methods to generate a wide range of chemical elements with the aim of providing baseline geochemical data to as wide a user group as possible. The geochemical data has been linked to Manitoba Phanerozoic stratigraphy so that chemical characteristics of individual stratigraphic units can be ascertained and related to specific lithologies and lithologic associations.

SAMPLE COLLECTION

The areal distribution of black shale sample sites is shown in Figure 1. Three types of samples were collected: (i) percussion chips from archived oil and gas well cuttings; (ii) diamond drill core from stratigraphic and mineral exploration drill core, and; (iii) outcrop chip samples. The archived well chips were sampled in approximately 15 m intervals to provide enough material for the various analytical methods. Questionable fragments that may have been introduced by the caving of the drill hole were

carefully removed by hand. Drill core was sampled by collecting 4 to 5 representative chips approximately 3 cm in core length. Representative outcrop samples comprise 2 to 3 chips of approximately 8 cm in diameter.

A brief description of lithology, colour, oxidation, identifiable mineralogy and other noteworthy features were documented from each sample and are presented in accompanying data files.

The distribution of black shale samples through the stratigraphic column is presented in Figure 2.

SAMPLE ANALYSIS

A description of the analytical methods with the upper and lower limits of detection for elements determined for this database are presented with the analytical data; individual analytical methodologies (neutron activation and inductively coupled plasma-atomic emission spectrometry) are described in Table 1. Analyses that are below the lower limit of detection (LLD) have been replaced by values of one half the LLD. Geochemical data quality was monitored by replicate analysis of standards LKSD-2 and LKSD-4. Both standards were supplied by the Geological Survey of Canada.

Table 1
Descriptions for analytical methods

Activation Laboratories Ltd. (Ancaster, Ontario)

"Au + 47": combination of neutron activation (INAA) and 4 acid total digestion inductively coupled plasma-emission spectrometry (ICP-AES).

Chemex Laboratories Ltd. (Vancouver, BC)

"UT-10": for the analysis of Ag, As, Bi, Cd, Cu, Mo, Pb, Sb and Zn samples are dissolved using an HCl-KClO₃ digestion. Subsequently, all elements are extracted into an organic solvent (MIBK) using Aliquat-336 as a complexing agent. Mercury is determined using cold vapour atomic absorption spectroscopy after a nitric-aqua regia digestion. Owing to rapid saturation of the chemical extraction system this approach is applicable only to weakly mineralized samples.

Hg: Hg is analyzed by digesting a 1 g sample with nitric acid for 1 hour, cooled and HCl is added to produce aqua regia. The solution is allowed to digest for one and a half hours then diluted to 25 ml with demineralized water and mixed. An aliquot is treated with stannous chloride to reduce the mercury. Resulting mercury is volatilized by argon-purging and measured by atomic absorption spectrometry.

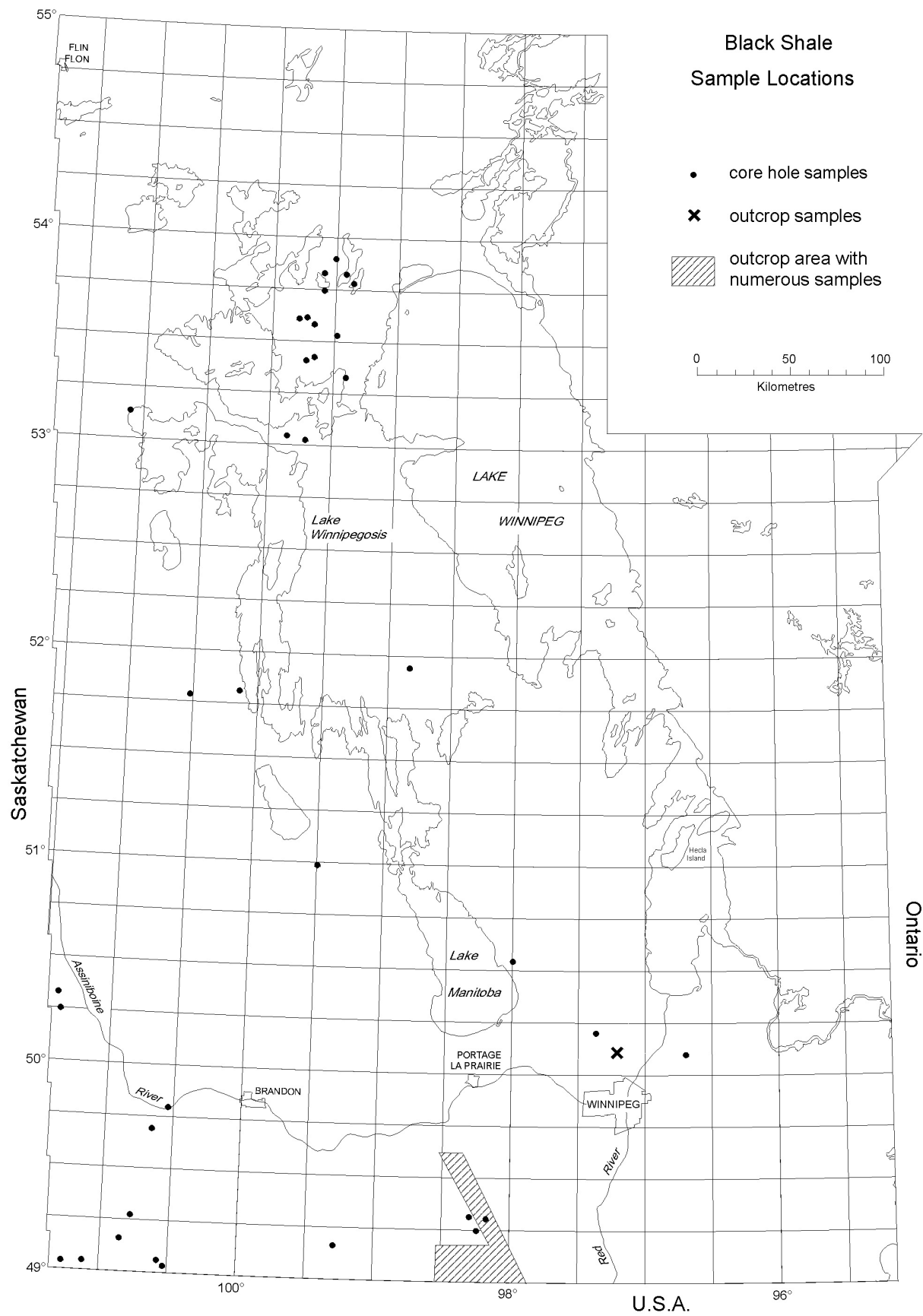


Figure 1: Black shale core hole and outcrop sample locations.






































































ERA	PERIOD	FORMATION		MEMBER	MAXIMUM THICKNESS (m)	BASIC LITHOLOGY		
CENOZOIC	QUATER-NARY	(Recent)				Top soil, dune sands, lake clays, peat		
		Glacial Drift			140	Clay, sand, gravel, boulders, till		
	TERTIARY							
MESOZOIC	CRETACEOUS		Turtle Mountain	 Peace Garden  Goodlands	160	Shale, clay, sand, lignite		
			Boissevain		45	Sand, sandstone, greenish grey		
			Pierre Shale (First White Specks)	 Coulter  Odanah  Millwood  Pembina  Gammon Ferruginous	400	Grey shales, non-calcareous, local ironstone, bentonitic, carbonaceous		
			Niobrara		75	Grey speckled shale, calcareous, bentonitic		
			Morden Shale		55	Dark grey shale, non-calcareous, concretions, local sand and silt		
			Favel (Second White Specks)	 Assiniboine  Keld	45	Grey shale with calcareous specks, bands of limestone and bentonite		
			Ashville	 Belle Fourche Shale  Westgate  Newcastle  Skull Creek	80	Dark grey shale, non-calcareous, silty, Newcastle (sand zone)-quartz sandstone		
			Swan River		150	Sandstone and sand, quartzose, pyritic shale, non-calcareous		
	JURASSIC	Waskada			60	Banded green shale and calcareous sandstone, bands of limestone, varicoloured shale		
		Melita			145			
			Reston		45	Limestone, buff, and grey shales		
			Upper	 Evaporite	55	White anhydrite and/or gypsum and banded dolomite and shale		
	TRIASSIC		Lower	 Red Beds	45	Red shale to siltstone, dolomitic		
	PALEOZOIC	PERMIAN	St. Martin Complex			265(+)	Carbonate breccia, trachyandesite (crypto-explosion structure?)	
		PENNSYLVANIAN						
		MISSISSIPPIAN	 Madison Group	Charles			20	Massive anhydrite and dolomite
				 Mission Canyon	 MC-5  MC-4  MC-3  MC-2  MC-1	120	Light buff limestone, oolitic, fossiliferous, fragmental, cherty, bands of shale and anhydrite	
				 Lodgepole	 Flossie Lake  Whitewater Lake  Virden  Scallion  Daly	185	Limestone and argillaceous limestone, light brown and reddish mottled, zones of shaley, oolitic, crinoidal and cherty limestone	
				 Bakken	 Upper  Middle  Lower	20	Two black shale zones separated by siltstone	
Qu'Appelle Group			 Sask. Group	 Three Forks		55	Red siltstone and shale, dolomitic	
		 Birdbear			40	Limestone and dolomite, yellow-grey, fossiliferous, porous, some anhydrite		
		 Duperow		120	Limestone and dolomite, argillaceous and anhydritic in places			
			 Souris River (First Red)		90	Cyclical shale, limestone and dolomite, anhydritic		
		DEVONIAN	 Man. Group	 Dawson Bay (Second Red)		50	Limestone and dolomite, porous, anhydritic, local red and green shale	
				 Winnipegosis		 Prairie Evap.	120	Halite, potash and anhydrite, interbedded dolomite
 Elk Point Group			 Elm Point			75	Dolomite, yellow brown, reefy	
			 Ashern			12	Dolomite and shale, brick red	
SILURIAN		Interlake Group			110	Dolomite, yellow buff, fossiliferous, several argillaceous marker beds		
ORDOVICIAN		Stonewall		 t-marker zone  Williams  Guntton	25	Dolomite, sparsely fossiliferous, t-marker defines Ordovician-Silurian boundary		
		 Stony Mountain	 Penitentiary  Fort Garry  Selkirk  Cat Head  Dog Head	 Gunn	45	Dolomite, yellow buff Dolomite, dusky yellow, fossiliferous, red shale, green fossiliferous limestone bands (Gunn)		
		 Red River	 Upper Unit  Lower Unit		170	Dolomitic limestone and dolomite, mottled (Tyndall Stone within Selkirk)		
		 Winnipeg			65	Green shale, waxy, interbedded sandstone Sand, sandstone and quartzose		
		Deadwood			25	Black to green grey sand, waxy, glauconitic siltstone and shale		
	CAMBRIAN							
PRECAMBRIAN						Metamorphic and crystalline rock		

Figure 2: Geological formations in Manitoban Phanerozoic rocks represented by black shale samples. The grey dot identifies the Formation/Member sampled.

Recommended geochemical values for these standards are presented with analytical results from this study. Analytical reproducibility was monitored by 29 duplicate pairs blindly inserted into the sample population.

Multiple analyses of the standards LKSD-2 and LKSD-4 by each of the three analytical methods utilized for this database indicate analyses are accurate for most elements when compared to provisional values based on total element contents (Lynch, 1990). UT-10/ICP-AES analyses of Sb and Zn tend to be somewhat low. Calcium analyses by ICP-AES are elevated over recommended values. Beryllium contents of the standards are mostly less than the lower limit of detection. Cadmium determinations by ICP-AES are slightly higher than recommended values, however, the provisional values are based on a concentrated HNO₃-HCl partial dissolution and accordingly are probably not reflecting "total" amounts of Cd. Interestingly, Cd contents determined by UT-10/ICP-AES show excellent correlation with provisional partial determinations. INAA for Ag, Hg, Ir, Mo, Se, Sn, Sr, Ta and W are less than the lower limit of detection. Non-reproducible results were obtained for Ca, Co, Rb and Tb.

Analytical reproducibility was monitored by 29 duplicate pairs prepared as homogenized splits in the Geological Services Branch laboratory. Field replicates were not collected. Analytical reproducibility for elements determined by UT-10/ICP-AES and ICP-AES (four acid total digestion) are excellent. INAA of Au at <20 ppb tends to be erratic.

DATA FILE ORGANIZATION

This database is organized on the basis of sample type (drill chip, drill core and outcrop) and analytical method (INAA, ICP-AES and "UT-10/ICP"). Standards and duplicates are also organized in this manner. Duplicate sample data are also presented as "averaged" data with the calculation of the arithmetic mean for two separate analyses. A stratigraphic column for the Phanerozoic sequences in Manitoba is also included as a "miscellaneous" file. The data files are organized as follows:

Black Shale Percussion Drill Chips

Analysis:	Description	File Name:	BSChips.xls
	Neutron Activation		BSChipNA.xls
	ICP-AES		BSChipIC.xls
	UT-10 (ICP-AES)		BSChipUT.xls

Black Shale Drill Core

Analysis:	Description	File Name:	BSCore.xls
	Neutron Activation		BSCoreNA.xls
	ICP-AES		BSCoreIC.xls
	UT-10 (ICP-AES)		BSCoreUT.xls

Black Shale Outcrop Chips Arithmetic Mean

Analysis:	Description	File Name:	BSCOC.xls
	Neutron Activation		BSOCNAM.xls
	ICP-AES		BSOCICM.xls
	UT-10 (ICP-AES)		BSOCUTM.xls

Black Shale Outcrop Chips Duplicates

Analysis:	Description	File Name:	BSCOC.xls
	Neutron Activation		BSOCNAD.xls
	ICP-AES		BSOCICD.xls
	UT-10 (ICP-AES)		BSOCUTD.xls

Standards

Analysis:	Neutron Activation	File Name:	NASTD.xls
	ICP-AES		ICPSTD.xls
	UT-10 (ICP-AES)		UTSTD.xls

Miscellaneous Files

Analysis:	Stratigraphic Column	File Name:	Formcode.txt
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To facilitate data manipulation the files are presented as EXCEL 4 spreadsheets (XLS) and as comma delimited text files (CSV). Data are also provided in Appendices 1 to 19.

ACKNOWLEDGEMENTS

This study was prompted by the preliminary black shale geochemical investigations undertaken by Erik Nielsen (Manitoba Energy and Mines, Geological Services Branch) involving the exploration of observed till geochemical patterns in the southwest area of the province and in the Manitoba Interlake. Doug Berk, Vio Varga, Gerry Bengner and Rick Unruh are thanked for sample location and preparation. Bonnie Lenton is thanked for figure preparation.

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Appendix 1
Black Shale Drill Chip Samples

Sample Number	Well Name	Location	UTM		Map	Measured Interval (metres)		Date Sampled	Sampled By	Colour	Period
			Easting	Northing		From	To				
1	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	128.0	140.2	Dec 13/95	M.F./R.B.	N5 - 5Y6/1	Cretaceous
2	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	143.3	155.5	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
3	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	158.5	170.7	Dec 13/95	M.F./R.B.	N5 - 5Y6/1	Cretaceous
4	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	173.7	185.9	Dec 13/95	M.F./R.B.	N5 - 5Y5/1	Cretaceous
5	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	189.0	204.2	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
6	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	207.3	219.5	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
7	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	222.5	237.7	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
8	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	240.8	253.0	Dec 13/95	M.F./R.B.	N5	Cretaceous
9	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	256.0	259.1	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
10	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	304.8	307.8	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
11	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	335.3	344.4	Dec 13/95	M.F./R.B.	N4 - N5	Cretaceous
12	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	362.7	374.9	Dec 13/95	M.F./R.B.	N4	Cretaceous
13	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	384.0	399.3	Dec 13/95	M.F./R.B.	N4	Cretaceous
14	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	402.3	414.5	Dec 13/95	M.F./R.B.	N4 - N6	Jurassic
15	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	417.6	429.8	Dec 13/95	M.F./R.B.	N4	Jurassic
16	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	432.8	445.0	Dec 13/95	M.F./R.B.	N5	Jurassic
17	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	448.1	460.2	Dec 13/95	M.F./R.B.	N4	Jurassic
18	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	463.3	475.5	Dec 13/95	M.F./R.B.	N5	Jurassic
19	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	478.5	490.7	Dec 13/95	M.F./R.B.	N5	Jurassic
20	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	193.8	509.0	Dec 13/95	M.F./R.B.	N5	Jurassic
21	Dalny	10-36-02-26W1	366425	5448050	62F/02	36.6	48.8	Jan 24/96	M.F./R.B.	N6	Cretaceous
22	Dalny	10-36-02-26W1	366425	5448050	62F/02	51.8	64.0	Jan 24/96	M.F./R.B.	N6	Cretaceous
23	Dalny	10-36-02-26W1	366425	5448050	62F/02	67.1	79.2	Jan 24/96	M.F./R.B.	N6	Cretaceous
24	Dalny	10-36-02-26W1	366425	5448050	62F/02	82.3	91.4	Jan 24/96	M.F./R.B.	N6	Cretaceous
25	Dalny	10-36-02-26W1	366425	5448050	62F/02	100.6	112.8	Jan 24/96	M.F./R.B.	N6	Cretaceous
26	Dalny	10-36-02-26W1	366425	5448050	62F/02	115.8	128.0	Jan 24/96	M.F./R.B.	N6	Cretaceous
27	Dalny	10-36-02-26W1	366425	5448050	62F/02	131.1	143.3	Jan 24/96	M.F./R.B.	N6	Cretaceous
28	Dalny	10-36-02-26W1	366425	5448050	62F/02	146.3	158.5	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
29	Dalny	10-36-02-26W1	366425	5448050	62F/02	161.5	173.7	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
30	Dalny	10-36-02-26W1	366425	5448050	62F/02	176.8	189.0	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
31	Dalny	10-36-02-26W1	366425	5448050	62F/02	192.6	204.2	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
32	Dalny	10-36-02-26W1	366425	5448050	62F/02	207.3	219.5	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
33	Dalny	10-36-02-26W1	366425	5448050	62F/02	222.5	234.7	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
34	Dalny	10-36-02-26W1	366425	5448050	62F/02	237.7	246.9	Jan 24/96	M.F./R.B.	N6 - N7	Cretaceous
35	Dalny	10-36-02-26W1	366425	5448050	62F/02	249.9	262.1	Jan 24/96	M.F./R.B.	N6 - N7	Cretaceous
36	Dalny	10-36-02-26W1	366425	5448050	62F/02	265.2	277.4	Jan 24/96	M.F./R.B.	N6 - N7	Cretaceous
37	Dalny	10-36-02-26W1	366425	5448050	62F/02	280.4	292.6	Jan 24/96	M.F./R.B.	N5 - N6	Cretaceous
38	Dalny	10-36-02-26W1	366425	5448050	62F/02	295.7	307.8	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
39	Dalny	10-36-02-26W1	366425	5448050	62F/02	310.9	323.1	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
40	Dalny	10-36-02-26W1	366425	5448050	62F/02	326.1	338.3	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
41	Dalny	10-36-02-26W1	366425	5448050	62F/02	341.1	353.6	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
42	Dalny	10-36-02-26W1	366425	5448050	62F/02	356.6	368.8	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
43	Dalny	10-36-02-26W1	366425	5448050	62F/02	371.9	384.0	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
44	Dalny	10-36-02-26W1	366425	5448050	62F/02	387.1	399.3	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
45	Dalny	10-36-02-26W1	366425	5448050	62F/02	402.3	414.5	Jan 24/96	M.F./R.B.	N4 - N5	Cretaceous
46	Dalny	10-36-02-26W1	366425	5448050	62F/02	417.6	429.8	Jan 24/96	M.F./R.B.	N3 - N5	Cretaceous
47	Dalny	10-36-02-26W1	366425	5448050	62F/02	432.8	445.0	Jan 24/96	M.F./R.B.	N3 - N5	Cretaceous
48	Dalny	10-36-02-26W1	366425	5448050	62F/02	448.1	460.2	Jan 24/96	M.F./R.B.	N3 - N5	Cretaceous
49	Dalny	10-36-02-26W1	366425	5448050	62F/02	463.3	475.5	Jan 24/96	M.F./R.B.	N3 - N5	Cretaceous
50	Dalny	10-36-02-26W1	366425	5448050	62F/02	478.5	490.7	Jan 24/96	M.F./R.B.	N3 - N5	Cretaceous
51	Dalny	10-36-02-26W1	366425	5448050	62F/02	493.8	506.0	Jan 31/96	M.F./R.B.	N3-N4	Cretaceous
52	Dalny	10-36-02-26W1	366425	5448050	62F/02	509.0	521.2	Jan 31/96	M.F./R.B.	N3-N4	Cretaceous
53	Dalny	10-36-02-26W1	366425	5448050	62F/02	524.3	536.4	Jan 31/96	M.F./R.B.	N3-N4	Cretaceous
54	Dalny	10-36-02-26W1	366425	5448050	62F/02	539.5	551.7	Jan 31/96	M.F./R.B.	N3-N4	Cretaceous
55	Dalny	10-36-02-26W1	366425	5448050	62F/02	554.7	566.9	Jan 31/96	M.F./R.B.	N3-N4, 5Y4/1	Cretaceous
56	Dalny	10-36-02-26W1	366425	5448050	62F/02	570.0	582.2	Jan 31/96	M.F./R.B.	N3-N4, 5Y4/1	Cretaceous
57	Dalny	10-36-02-26W1	366425	5448050	62F/02	585.2	597.4	Jan 31/96	M.F./R.B.	N3-N4, 5Y4/1	Cretaceous
58	Dalny	10-36-02-26W1	366425	5448050	62F/02	600.5	612.6	Jan 31/96	M.F./R.B.	N4-N5	Cretaceous
59	Dalny	10-36-02-26W1	366425	5448050	62F/02	615.7	627.9	Jan 31/96	M.F./R.B.	N4-N6	Cretaceous

Appendix 1 Continued
Black Shale Drill Chip Samples
Comments

Sample Number	Formation or Member	Formation Code	Comments
1	Boissevain	2070	light to dark grey shale/mudstone
2	Boissevain	2070	light to dark grey shale/mudstone
3	Pierre	2080	light to dark grey shale/mudstone
4	Pierre	2080	light to dark grey shale/mudstone
5	Pierre	2080	light to dark grey shale/mudstone
6	Niobrara	3050	light to dark grey shale/mudstone
7	Niobrara	3050	light to dark grey shale/mudstone
8	Morden	5670	light to dark grey shale/mudstone
9	Morden	5670	light to dark grey shale/mudstone
10	Keld	5800	light to dark grey shale/mudstone
11	Ashville	7950	light to dark grey shale/mudstone
12	Ashville	7950	light to dark grey shale/mudstone
13	Swan River	9315	light to dark grey shale/mudstone
14	Jurassic	20500	light to dark grey shale/mudstone
15	Jurassic	20500	light to dark grey shale/mudstone
16	Jurassic	20500	light to dark grey shale/mudstone
17	Jurassic	20500	light to dark grey shale/mudstone
18	Jurassic	20500	light to dark grey shale/mudstone
19	Jurassic	20500	light to dark grey shale/mudstone
20	Jurassic	20500	light to dark grey shale/mudstone
21	Pierre	2080	light grey shale; sulphur-yellow precipitate; minor granite
22	Pierre	2080	light grey shale; some light yellow precipitate; white precipitate @ 64.0m
23	Pierre	2080	light grey shale; minor specks of yellow precipitate
24	Pierre	2080	light grey to grey shale
25	Pierre	2080	light grey to grey shale; faint rusty Fe stain
26	Pierre	2080	light grey to grey shale
27	Pierre	2080	light grey to grey shale
28	Pierre	2080	grey shale
29	Pierre	2080	grey shale
30	Pierre	2080	grey shale
31	Pierre	2080	grey shale
32	Pierre	2080	grey shale
33	Pierre	2080	grey shale
34	Pierre	2080	light grey shale
35	Millwood	3010	light grey shale
36	Millwood	3010	light grey shale; minor dark grey shale material
37	Millwood	3010	light grey to grey shale; minor rusty stain/coating
38	Millwood	3010	light grey to grey shale; minor rusty stain/coating
39	Millwood	3010	grey shale; minor white precipitate; bentonitic (?)
40	Pembina	3020	grey shale; rusty precipitate; scattered white fragments; bentonitic
41	Pembina	3020	grey shale; rusty precipitate; scattered white fragments; bentonitic
42	Niobrara	3050	grey shale; minor gypsum? & white & yellow precipitate @ 368.8m
43	Niobrara	3050	grey shale; some calcitic fragments (?)
44	Niobrara	3050	grey shale; calcitic fragments
45	Niobrara	3050	grey shale
46	Morden	5670	grey to dark grey shale; abundant white crystals; speckled
47	Morden	5670	grey shale; abundant white crystals; fissile; platy; rusty stain
48	Assiniboine	5770	grey shale; massive; no white crystals
49	Keld	5800	dark grey shale
50	Belle Fourche	7970	dark grey shale
51	Belle Fourche	7970	dark grey shale; scattered white precipitate/crystals; scattered yellow brown precipitate/coating
52	Belle Fourche	7970	dark grey shale; scattered white crystals/precipitate
53	Belle Fourche	7970	dark grey shale; scattered white crystals; olive green precipitate on black shale 536.5m
54	Westgate	8000	dark grey shale; scattered white precipitate/crystals; scattered rusty stain
55	Ashville	7960	dark grey shale; scattered rusty stain; minor white precipitate
56	Swan River	9315	dark grey shale; scattered rusty stain/coating
57	Swan River	9315	light grey to grey shale; scattered quartzose sand
58	Swan River	9315	light grey to grey shale; abundant sand (well rounded)
59	Swan River	9315	light grey to grey shale; scattered white crystals

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Date Sampled	Sampled By	Colour	Period
			Easting	Northing		From	To				
60	Dalny	10-36-02-26W1	366425	5448050	62F/02	630.9	643.1	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Cretaceous
61	Dalny	10-36-02-26W1	366425	5448050	62F/02	646.2	658.4	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
62	Dalny	10-36-02-26W1	366425	5448050	62F/02	661.4	673.6	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
63	Dalny	10-36-02-26W1	366425	5448050	62F/02	676.7	688.8	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
64	Dalny	10-36-02-26W1	366425	5448050	62F/02	691.9	704.1	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
65	Dalny	10-36-02-26W1	366425	5448050	62F/02	707.1	719.3	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
66	Dalny	10-36-02-26W1	366425	5448050	62F/02	722.4	734.6	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
67	Dalny	10-36-02-26W1	366425	5448050	62F/02	737.6	749.8	Jan 31/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
68	Dalny	10-36-02-26W1	366425	5448050	62F/02	752.9	765.0	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
69	Dalny	10-36-02-26W1	366425	5448050	62F/02	768.1	780.3	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
70	Dalny	10-36-02-26W1	366425	5448050	62F/02	783.3	795.5	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
71	Dalny	10-36-02-26W1	366425	5448050	62F/02	798.6	810.8	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
72	Dalny	10-36-02-26W1	366425	5448050	62F/02	813.8	826.0	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
73	Dalny	10-36-02-26W1	366425	5448050	62F/02	829.1	841.2	Jan 31/96	M.F./R.B.	N4-N6	Jurassic
74	Dalny	10-36-02-26W1	366425	5448050	62F/02	844.3	856.5	Jan 31/96	M.F./R.B.	N4-N6	Triassic
75	Dalny	10-36-02-26W1	366425	5448050	62F/02	859.5	871.7	Jan 31/96	M.F./R.B.	N4-N6	Triassic
76	Dalny	10-36-02-26W1	366425	5448050	62F/02	874.8	880.9	Jan 31/96	M.F./R.B.	N4-N6	Triassic
77	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	112.8	125.0	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
78	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	128.0	140.2	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
79	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	143.3	155.4	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
80	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	158.5	170.7	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
81	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	173.7	185.9	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
82	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	189.0	201.2	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
83	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	204.2	216.4	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
84	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	219.5	231.6	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
85	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	234.7	246.9	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
86	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	249.9	262.1	Jan 31/96	M.F./R.B.	N6-N7, 5Y6/1	Cretaceous
87	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	265.2	277.4	Feb 7/96	M.F./R.B.	N5-N6	Cretaceous
88	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	280.4	292.6	Feb 7/96	M.F./R.B.	N5-N6	Cretaceous
89	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	295.7	307.8	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
90	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	310.9	323.1	Feb 7/96	M.F./R.B.	N3-N5	Cretaceous
91	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	326.1	338.3	Feb 7/96	M.F./R.B.	N4-N5	Cretaceous
92	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	341.4	353.6	Feb 7/96	M.F./R.B.	N4-N5	Cretaceous
93	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	356.6	368.8	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
94	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	371.9	384.0	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
95	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	387.1	399.3	Feb 7/96	M.F./R.B.	N3-N4	Cretaceous
96	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	402.3	414.5	Feb 7/96	M.F./R.B.	N3-N5	Cretaceous
97	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	417.6	429.8	Feb 7/96	M.F./R.B.	N3-N5	Cretaceous
98	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	432.8	445.0	Feb 7/96	M.F./R.B.	N4-N5	Cretaceous
99	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	448.1	460.2	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Cretaceous
100	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	163.3	475.5	Feb 7/96	M.F./R.B.	N4-N5	Cretaceous
101	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	478.5	490.7	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
102	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	493.8	506.0	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
103	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	509.0	521.2	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
104	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	524.3	536.4	Feb 7/96	M.F./R.B.	N4-N6, 5YR4/1	Cretaceous
105	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	539.5	548.6	Feb 7/96	M.F./R.B.	N4-N6	Cretaceous
106	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	615.7	927.9	Feb 7/96	M.F./R.B.	5YR4/1	Jurassic
107	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	630.9	643.1	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Jurassic
108	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	646.2	658.4	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Jurassic
109	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	661.4	673.6	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Jurassic
110	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	676.7	688.8	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Jurassic
111	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	691.9	704.1	Feb 7/96	M.F./R.B.	N4-N5, 5YR4/1	Jurassic
112	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	707.1	719.3	Feb 7/96	M.F./R.B.	N4-N6, 5YR4/1	Jurassic
113	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	722.4	733.0	Feb 7/96	M.F./R.B.	N4-N6, 5YR4/1	Jurassic
114	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	734.6	748.3	Feb 7/96	M.F./R.B.	N4-N6, 5YR4/1	Jurassic
115	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	749.8	755.9	Feb 7/96	M.F./R.B.	N4-N6, 5YR4/1	Jurassic
116	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	757.4	771.1	Feb 7/96	M.F./R.B.	N4-N6	Jurassic
117	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	774.2	787.9	Feb 7/96	M.F./R.B.	N4-N6	Jurassic
118	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	789.4	821.4	Feb 7/96	M.F./R.B.	N4-N5, 5GY4/1, 10R7/4	Jurassic
119	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	134.1	146.3	Feb 7/96	M.F./R.B.	5YR4/1, 5Y4/1	Cretaceous

Appendix 1 Continued
Black Shale Drill Chip Samples
Comments

Sample Number	Formation or Member	Formation Code	Comments
60	Swan River	9315	light grey to grey shale; sandy; rusty stain; white crystals; green yellow precipitate
61	Jurassic	20500	grey shale; brown precipitate/coating; scattered calcitic fragments (?)
62	Jurassic	20500	grey shale; minor sand
63	Jurassic	20500	grey shale; white crystals; brown precipitate; calcitic fragments; sandy
64	Jurassic	20500	grey shale; abundant white crystals; sandy
65	Jurassic	20500	grey shale; abundant white crystals; sandy
66	Jurassic	20500	grey shale; abundant white crystals; sandy
67	Jurassic	20500	grey shale; scattered white crystals
68	Jurassic	20500	grey shale; scattered white crystals; minor red shale; white calcitic fragments
69	Reston	22640	grey shale; scattered white crystals; minor red shale; white calcitic fragments
70	Reston	22640	grey shale; scattered white crystals; minor red shale; white calcitic fragments
71	Reston	22640	grey shale; abundant white chips (calcitic/gypsum?); red shale; white precipitate/crystals
72	Upper Amaranth	22655	grey shale; abundant gypsum fragments; white precipitate/coating
73	Upper Amaranth	22655	grey shale; abundant gypsum fragments; white precipitate/coating
74	Lower Amaranth	22670	grey shale; abundant gypsum fragments; white precipitate/coating
75	Lower Amaranth	22670	grey shale; scattered red shale
76	Lower Amaranth	22670	light grey shale; scattered red shale fragments
77	Pierre	2080	light grey shale; some rusty stain
78	Pierre	2080	light grey shale; some rusty stain
79	Pierre	2080	light grey shale; some rusty stain
80	Pierre	2080	light grey shale; some rusty stain
81	Pierre	2080	light grey shale; some rusty stain
82	Pierre	2080	light grey shale; scattered yellow brown stain/coating/precipitate; Fe stain
83	Pierre	2080	light grey shale; scattered yellow brown stain/coating/precipitate; Fe stain
84	Pierre	2080	light grey shale; minor white precipitate
85	Pierre	2080	light grey shale; brown rusty stain; Fe stain
86	Pierre	2080	light grey shale; minor Fe stain
87	Niobrara	3050	light grey shale; minor Fe stain
88	Niobrara	3050	light grey shale; minor brown rusty precipitate/coating
89	Niobrara	3050	light grey shale; dark black shale chips; white chips/precipitate; brown rusty precipitate
90	Niobrara	3050	medium to grey shale; abundant white fragments (calcitic?); rusty brown precipitate
91	Niobrara	3050	light grey to grey shale; minor white fragments/precipitate
92	Morden	5670	light grey to grey shale; minor white fragments/precipitate
93	Morden	5670	light grey to grey shale; minor rusty precipitate; white specks
94	Morden	5670	medium grey to grey shale; abundant white specks
95	Morden	5670	white speckled grey-medium grey shale
96	Morden	5670	white speckled grey-medium grey shale; less specks @ 408.4m
97	Keld	5800	light grey-medium grey shale; minor sulphur yellow/white precipitate
98	Favel	7950	light grey-medium grey shale; minor white and rusty precipitate
99	Ashville	7950	light grey-medium grey shale; white specks in black shale
100	Ashville	7950	light grey-medium grey shale; calcitic fragments; white specks; minor rusty precipitate
101	Ashville	7950	light grey-medium grey shale; rusty stain; minor white specks/precipitate
102	Ashville	7950	light grey-medium grey shale; rusty stain; minor white coating; black fragments
103	Ashville	7950	light grey-medium grey shale; rusty brown stain
104	Ashville	7950	grey shale; green and rusty brown precipitate; minor white fragments
105	Swan River	9315	light grey-medium grey shale; quartzose sand @ 548.6m
106	Jurassic	20500	silty shale; minor quartz sand infill; rusty stain; white precipitate
107	Jurassic	20500	silty shale; salt & pepper texture; white fragments; rusty stain
108	Jurassic	20500	silty shale; salt & pepper texture; white fragments; rusty stain
109	Jurassic	20500	silty shale; salt & pepper texture; white fragments; rusty stain
110	Jurassic	20500	silty shale; minor Fe stain; white fragments; red shale
111	Jurassic	20500	silty shale; red shale & white fragments; minor Fe stain
112	Reston	22640	silty shale; calcitic; minor red shale; beige fragments @ 716.3m
113	Reston	22640	silty shale; salt & pepper texture; calcitic.
114	Reston	22640	silty shale; calcitic
115	Reston	22640	silty shale; trace of gypsum?; calcitic.
116	Upper Amaranth	22655	silty shale; black to grey shale; minor white fragments
117	Upper Amaranth	22655	silty shale; salt and pepper texture; evaporite fragments; red shale
118	Upper Amaranth	22655	silty shale; medium grey shale; scattered evaporites; red, grey, olive green
119	Pierre	2080	brown grey shale/mudstone; minor white fragments

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Date Sampled	Sampled By	Colour	Period
			Easting	Northing		From	To				
120	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	149.4	161.5	Feb 7/96	M.F./R.B.	5YR4/1, 5Y4/1	Cretaceous
121	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	164.6	176.8	Feb 7/96	M.F./R.B.	5YR4/1, 5Y4/1	Cretaceous
122	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	179.8	192.0	Feb 7/96	M.F./R.B.	5YR4/1, 5Y4/1	Cretaceous
124	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	249.9	162.1	Feb 7/96	M.F./R.B.	N4, 5YR4/1	Cretaceous
125	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	265.2	277.4	Feb 7/96	M.F./R.B.	N3-N4, 5YR4/1	Cretaceous
126	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	280.4	292.6	Feb 7/96	M.F./R.B.	5YR4/1	Cretaceous
127	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	295.7	307.8	Feb 7/96	M.F./R.B.	5YR4/1	Cretaceous
128	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	310.9	323.1	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
129	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	326.1	338.3	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
130	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	341.4	353.6	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
131	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	356.6	368.8	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
132	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	371.9	384.0	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
133	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	387.1	399.3	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
134	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	402.3	414.5	Feb 14/96	M.F./R.B.	5Y4/1, N4-N5	Cretaceous
135	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	417.6	429.8	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Cretaceous
136	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	432.8	445.0	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Cretaceous
137	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	448.1	460.2	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Cretaceous
138	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	463.3	475.5	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
139	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	478.5	490.7	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
140	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	493.8	506.0	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
141	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	509.0	521.2	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
142	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	524.3	536.4	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
143	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	539.5	551.7	Feb 14/96	M.F./R.B.	5GY4/1, 5Y4/1, N4-N5	Jurassic
144	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	554.7	566.9	Feb 14/96	M.F./R.B.	N3-N5	Mississippian
145	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	570.0	582.2	Feb 14/96	M.F./R.B.	N3-N5	Mississippian
146	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	585.2	597.4	Feb 14/96	M.F./R.B.	N3-N5	Mississippian
147	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	600.5	612.6	Feb 14/96	M.F./R.B.	N3-N5	Mississippian
148	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	615.7	627.9	Feb 14/96	M.F./R.B.	N5-N8, 5YR4/1, 5Y8/1	Mississippian
149	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	630.9	643.1	Feb 14/96	M.F./R.B.	N5-N8, 5YR4/1	Devonian
150	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	646.2	658.4	Feb 14/96	M.F./R.B.	N5-N8, 5YR4/1	Devonian
151	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	661.4	673.6	Feb 14/96	M.F./R.B.	N5-N8, 5YR4/1	Devonian
152	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	243.8	236.0	Feb 14/96	M.F./R.B.	N4-N6, 5Y4/1	Cretaceous
153	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	259.1	271.3	Feb 14/96	M.F./R.B.	N4-N6, 5Y4/1	Cretaceous
154	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	274.3	286.5	Feb 14/96	M.F./R.B.	N4-N6, 5Y4/1	Cretaceous
155	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	289.6	301.8	Feb 14/96	M.F./R.B.	N4-N6, 5Y4/1	Cretaceous
156	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	304.8	317.0	Feb 14/96	M.F./R.B.	N6-N7	Cretaceous
157	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	320.0	332.2	Feb 14/96	M.F./R.B.	N6-N7	Cretaceous
158	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	335.3	347.5	Feb 14/96	M.F./R.B.	N6-N7	Cretaceous
159	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	350.5	362.7	Feb 14/96	M.F./R.B.	N5-N6	Cretaceous
160	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	365.8	378.0	Feb 14/96	M.F./R.B.	N5-N6	Cretaceous
161	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	381.0	393.2	Feb 14/96	M.F./R.B.	N4-N6, 5Y4/1	Cretaceous
162	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	396.2	408.4	Feb 21/96	M.F./R.B.	N5-N6, 5YR6/1	Cretaceous
163	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	411.5	423.7	Feb 21/96	M.F./R.B.	N5-N6, 5YR6/1	Cretaceous
164	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	426.7	438.9	Feb 21/96	M.F./R.B.	N4-N6	Cretaceous
165	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	442.0	454.2	Feb 21/96	M.F./R.B.	N5-N6	Cretaceous
166	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	457.2	469.4	Feb 21/96	M.F./R.B.	5YR4/1, 5YR6/1	Cretaceous
167	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	472.4	484.6	Feb 21/96	M.F./R.B.	N5-N6, 5YR4/1	Cretaceous
168	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	487.7	499.9	Feb 21/96	M.F./R.B.	N5-N7	Cretaceous
169	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	502.9	515.1	Feb 21/96	M.F./R.B.	N5-N7	Cretaceous
170	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	518.2	530.4	Feb 21/96	M.F./R.B.	N5-N7	Cretaceous
171	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	533.4	545.6	Feb 21/96	M.F./R.B.	N3-N5	Cretaceous
172	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	548.6	560.8	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
173	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	563.9	576.1	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
174	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	579.1	591.3	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
175	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	594.4	606.6	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
176	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	609.6	621.8	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
177	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	624.8	637.0	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
178	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	640.1	652.3	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous
179	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	655.3	667.5	Feb 21/96	M.F./R.B.	N3-N6	Cretaceous

Appendix 1 Continued
Black Shale Drill Chip Samples
Comments

Sample Number	Formation or Member	Formation Code	Comments
120	Pierre	2080	brown grey shale/mudstone; brown grey shale
121	Pierre	2080	brown grey shale/mudstone; brown grey shale
122	Pierre	2080	brown grey shale/mudstone; minor rusty stain; minor white; minor blue shale material
124	Niobrara	3050	grey brown shale
125	Niobrara	3050	grey brown shale; abundant white specks (swells)
126	Favel	5760	grey brown shale; less white specks @ 289.6m
127	Favel	5760	grey brown shale; olive green precipitate
128	Ashville	7950	grey shale; minor white precipitate/specks
129	Ashville	7950	grey shale; white precipitate/coatings; brown/light yellow precipitate/coating
130	Ashville	7950	grey shale; olive green precipitate
131	Ashville	7950	grey shale; olive brown precipitate; rusty weathering
132	Ashville	7950	grey shale; olive brown and green precipitate; white fragments; rusty brown stain
133	Ashville	7950	grey shale; minor brown coating
134	Ashville	7950	grey shale; minor brown coating and white precipitate.
135	Swan River	9315	grey shale; minor rusty brown coating; no white
136	Swan River	9315	grey shale; minor white; rusty brown precipitate; carbonaceous fragments
137	Swan River	9315	grey shale; abundant rusty stain; white fragments with fibrous crystals
138	Jurassic	20500	grey shale; abundant red brown oxide; minor white
139	Jurassic	20500	grey shale; no red or white
140	Jurassic	20500	light grey to grey shale; minor white fragments/specks
141	Jurassic	20500	grey shale; minor white fragments; no rusty brown stain
142	Jurassic	20500	grey shale; minor white fragments; no rusty brown stain
143	Jurassic	20500	grey shale; minor white precipitate; minor olive brown precipitate
144	L. Lodgepole	39757	grey shale; minor white precipitate; calcitic; minor red-orange
145	L. Lodgepole	39757	grey shale; scattered green white precipitate; abundant red-orange fragments
146	L. Lodgepole	39757	grey shale; rare orange pink fragments; minor white; rare brown
147	L. Lodgepole	39757	grey shale; scattered white; green/olive/white precipitate; no rusty stain
148	Bakken	40700	grey shale; abundant white precipitate; calcitic fragments; minor grey shale; abundant red
149	Three Forks	50600	grey shale; abundant red; white fragments/coatings
150	Birdbear	52800	grey shale; scattered white fragments/coating; red shale
151	Birdbear	52800	grey shale; abundant white fragments at base; calcitic; slight oily odor
152	Pierre	2080	grey shale; rusty red fragments
153	Pierre	2080	grey shale; rusty red fragments
154	Pierre	2080	grey shale; minor Fe stain
155	Pierre	2080	grey shale; dark black shale fragments
156	Pierre	2080	light grey shale; minor white fragments/specks/precipitate; Fe stain
157	Pierre	2080	light grey shale; minor Fe stain; white precipitate
158	Pierre	2080	light grey shale; rare rusty stain
159	Pierre	2080	light grey shale; rare red brown fragments
160	Pierre	2080	light grey shale; rare nonmetallic crystals; minor white and green precipitate
161	Pierre	2080	light to medium grey shale; minor carbonaceous material; crystals as above
162	Millwood	3010	light grey to light brown shale; rusty stain; minor white fragments
163	Millwood	3010	light grey to light brown shale; minor white precipitate/specks; red brown fragments
164	Pembina	3020	light grey to light brown shale; abundant white specks (esp. in 432.8m); minor brown stain
165	Pembina	3020	light grey shale; abundant white fragments and specks
166	Pembina	3020	light grey shale; scattered white fragments and specks
167	Niobrara	3050	light grey shale; minor white fragments
168	Niobrara	3050	brown grey shale; rare woody fragments; rare rusty stain; scattered white
169	Niobrara	3050	brown grey shale; minor Fe stain; minor white specks
170	Niobrara	3050	brown grey shale; minor brown stain; no white
171	Niobrara	3050	brown grey shale; abundant white specks/precipitate (@542.5-545.6); swelling
172	Niobrara	3050	black grey shale; abundant white specks/precipitate; swelling
173	Keld	5800	black grey shale; abundant white specks/precipitate; swelling
174	Favel	5760	grey brown shale; very minor white precipitate
175	Ashville	7950	grey brown shale; scattered white precipitate/specks
176	Ashville	7950	dark brown grey shale; scattered white specks/precipitate; rare brown stain
177	Belle Fourche	7970	dark brown grey shale; some white precipitate; rusty stain
178	Ashville	7950	dark brown grey shale; scattered white precipitate/specks
179	Ashville	7950	dark brown grey shale; minor white specks

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Date Sampled	Sampled By	Colour	Period
			Easting	Northing		From	To				
180	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	670.6	682.8	Feb 21/96	M.F./R.B.	N4-N6, 5YR6/1	Cretaceous
181	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	685.8	698.0	Feb 21/96	M.F./R.B.	N4-N6, 5YR6/1	Cretaceous
182	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	722.4	734.6	Feb 21/96	M.F./R.B.	N5-N6	Jurassic
183	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	737.6	749.8	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
184	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	752.9	765.1	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
185	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	768.1	780.3	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
186	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	783.3	795.5	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
187	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	798.6	810.8	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
188	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	813.8	826.0	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
189	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	829.1	841.2	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
190	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	844.3	856.5	Mar 6/96	R.B.	N4-N6, 5YR4/1	Jurassic
191	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	859.5	871.7	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
192	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	874.8	887.0	Mar 6/96	R.B.	N4-N6	Jurassic
193	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	890.0	902.2	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
194	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	905.3	917.5	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
195	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	920.5	932.7	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
196	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	935.7	947.9	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
197	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	951.0	963.2	Mar 6/96	R.B.	N4-N6, 5Y4/1	Jurassic
198	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	966.2	978.4	Mar 14/96	R.B.	N4-N6, 5YR4/1	Jurassic
199	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	984.5	996.7	Mar 14/96	R.B.	N4-N6, 5YR4/1	Jurassic
200	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	999.7	1011.9	Mar 14/96	R.B.	N4-N6	Jurassic
201	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1015.0	1027.2	Mar 14/96	R.B.	N4-N6, 10R5/4	Jurassic
202	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1034.8	1048.5	Mar 14/96	R.B.	N4-N6, 10R5/4	Jurassic
203	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1050.0	1063.8	Mar 14/96	R.B.	N4-N6, 10R5/4	Jurassic
204	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1065.3	1072.9	Mar 14/96	R.B.	N4-N6, 10R5/4	Mississippian
205	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	94.5	106.7	Mar 14/96	R.B.	N4-N6	Cretaceous
206	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	109.7	121.9	Mar 14/96	R.B.	N4-N6	Cretaceous
207	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	125.0	137.2	Mar 14/96	R.B.	N4-N6	Cretaceous
208	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	140.2	152.4	Mar 14/96	R.B.	N4-N6	Cretaceous
209	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	155.4	167.6	Mar 14/96	R.B.	N4-N6	Cretaceous
210	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	170.7	182.9	Mar 14/96	R.B.	N4-N6	Cretaceous
211	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	185.9	198.1	Mar 14/96	R.B.	N4-N6	Cretaceous
212	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	201.2	213.4	Mar 14/96	R.B.	N4-N6	Cretaceous
213	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	216.4	228.6	Mar 14/96	R.B.	N4-N6	Cretaceous
214	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	231.6	240.8	Mar 14/96	R.B.	N4-N6	Cretaceous
215	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	106.7	118.9	Mar 14/96	R.B.	N4-N5, 5YR4/1	Cretaceous
216	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	125.0	137.2	Mar 14/96	R.B.	N4-N5, 5YR4/1	Cretaceous
217	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	140.2	152.4	Mar 14/96	R.B.	N4-N5, 5YR4/1	Cretaceous
218	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	155.5	167.6	Mar 14/96	R.B.	N4-N5, 5YR4/1	Cretaceous
219	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	170.7	182.9	Mar 14/96	R.B.	N4-N5, 5YR4/1	Cretaceous
220	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	185.9	198.1	Mar 20/96	R.B.	N5-N7	Cretaceous
221	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	201.2	213.4	Mar 20/96	R.B.	N5-N7	Cretaceous
222	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	216.4	228.6	Mar 20/96	R.B.	N5-N7	Cretaceous
223	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	231.6	243.8	Mar 20/96	R.B.	N5-N7	Cretaceous
224	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	246.9	259.1	Mar 20/96	R.B.	N5-N7	Cretaceous
225	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	262.1	274.3	Mar 20/96	R.B.	N5-N7	Cretaceous
226	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	277.4	289.6	Mar 20/96	R.B.	N5-N7	Cretaceous
227	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	292.6	304.8	Mar 20/96	R.B.	N5-N7	Cretaceous
228	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	307.8	320.0	Mar 20/96	R.B.	N6-N7	Cretaceous
229	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	323.1	335.3	Mar 20/96	R.B.	N6-N7	Cretaceous
230	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	338.3	350.5	Mar 20/96	R.B.	N4-N6	Cretaceous
231	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	353.6	365.8	Mar 20/96	R.B.	N4-N6, 5Y4/1	Cretaceous
232	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	368.8	381.0	Mar 20/96	R.B.	N3-N6, 5Y4/1	Cretaceous
233	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	384.0	396.2	Mar 20/96	R.B.	N4-N6, 5Y4/1	Cretaceous
234	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	399.3	411.5	Mar 20/96	R.B.	N4-N5	Cretaceous
235	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	414.5	426.7	Mar 20/96	R.B.	N4-N5	Cretaceous
236	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	429.8	442.0	Mar 20/96	R.B.	5Y4/1, N4-N6	Cretaceous
237	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	445.0	457.2	Mar 20/96	R.B.	N4-N6	Cretaceous
238	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	460.2	472.4	Mar 20/96	R.B.	5Y4/1, N4-N6	Cretaceous
239	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	478.5	490.7	Mar 20/96	R.B.	5Y4/1, N4-N5	Cretaceous

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Formation or Member	Formation Code	Comments
180	Ashville	7950	brown to dark brown shale; minor white specks/precipitate
181	Ashville	7950	brown to medium brown shale; minor white precipitate/specks; rusty stain
182	Jurassic	20500	light to medium grey shale; abundant quartz sand; rare white precipitate; limonitic
183	Jurassic	20500	light to medium grey shale; scattered red-brown fragments; white and yellow precipitate
184	Jurassic	20500	light grey to grey shale; red brown fragments; abundant white precipitate
185	Jurassic	20500	light grey to grey shale; black fragments (coaly?); minor red brown fragments
186	Jurassic	20500	grey brown to grey shale; minor red brown fragments and white precipitate
187	Jurassic	20500	light to medium grey shale; abundant sand @ 804.7m; minor white fragments
188	Jurassic	20500	light grey to dark grey shale; scattered red brown fragments; rare white precipitate
189	Jurassic	20500	light grey to dark grey shale; abundant white fragments and precipitate; minor yellow brown fragments
190	Jurassic	20500	light grey to dark grey shale; clayey; abundant white calcitic fragments and precipitate; scattered sand grains
191	Jurassic	20500	light grey shale and clay; white precipitate
192	Jurassic	20500	grey shale; scattered white fragments and precipitate; scattered red brown fragments
193	Jurassic	20500	olive grey to grey shale; abundant white calcitic fragments and precipitate
194	Jurassic	20500	grey olive shale; abundant red brown fragments; scattered white fragments/precipitate
195	Jurassic	20500	grey shale; red brown fragments; minor white precipitate.
196	Reston	22640	light grey to dark grey shale; abundant red brown shale; white calcitic fragments
197	Reston	22640	light grey to dark grey shale; scattered red brown shale; scattered white fragments/precipitate
198	Reston	22640	grey black shale; white precipitate; orange red fragments; abundant white fragments
199	Amaranth	22650	grey black shale to olive brown; scattered white precipitate and calcitic fragments
200	Amaranth	22650	grey black shale; scattered white calcitic fragments and precipitate; rare red fragments
201	Amaranth	22650	grey to black shale; abundant red orange fragments at 1027.2m; scattered white
202	Amaranth	22650	black grey shale and red orange clay
203	Amaranth	22650	black grey shale and red orange clay; rare red; @ 1059.2m abundant white calcitic fragments
204	MC-3	38800	grey black shale with abundant white calcitic fragments; scattered red fragments
205	Pierre	2080	grey shale; very homogeneous; rare white and red
206	Pierre	2080	grey shale; rare white fragments
207	Pierre	2080	light grey homogeneous shale; rare white fragments
208	Pierre	2080	light grey homogeneous shale; scattered white fragments at 152.4m
209	Pierre	2080	light grey homogeneous shale; rare white precipitate/crystals?
210	Pierre	2080	light grey homogeneous shale
211	Pierre	2080	light grey homogeneous shale
212	Pierre	2080	light grey shale; homogeneous; rare red brown rusty stain
213	Pierre	2080	light grey/olive shale; homogeneous; scattered rusty stain
214	Pierre	2080	light grey shale; homogeneous; scattered rusty stain; rare white fragments
215	Pierre	2080	light grey shale; scattered white fragments; rare red stain
216	Pierre	2080	light grey shale; scattered white fragments/precipitate/crystals
217	Pierre	2080	light grey shale; scattered white fragments
218	Pierre	2080	light grey, homogeneous shale; rare white fragments
219	Pierre	2080	light grey shale; rare rusty stain
220	Pierre	2080	light grey to grey shale; rusty fragments; scattered white precipitate
221	Pierre	2080	light grey to grey shale; rusty fragments; minor white precipitate
222	Pierre	2080	light grey to grey shale; scattered brown rusty fragments
223	Pierre	2080	light grey to grey shale; scattered rusty fragments; rare white fragments/precipitate
224	Pierre	2080	light grey to grey shale; clayey at 259.1m; scattered rusty and white
225	Pierre	2080	light grey to grey shale; scattered rusty brown fragments; scattered white calcitic fragments
226	Pierre	2080	light grey to grey shale; scattered brown fragments; scattered white fragments (calcitic)
227	Pierre	2080	light grey to grey shale; scattered brown fragments; scattered white fragments (calcitic)
228	Pierre	2080	light grey to grey shale; scattered brown fragments; scattered white fragments (calcitic)
229	Pierre	2080	light grey to grey shale; clayey @ 329.2m; abundant rusty
230	Pierre	2080	medium grey to light grey shale; clayey; scattered white fragments & precipitate
231	Pierre	2080	light grey to dark grey shale; scattered white crystals and precipitate
232	Pierre	2080	grey to medium grey shale; dark black fragments; scattered white and rusty
233	Pierre	2080	grey to medium grey shale; slightly clayey; rare white precipitate
234	Pierre	2080	medium to dark grey shale/clay; abundant white (bentonite)
235	Niobrara	3050	medium to dark grey shale; clayey; abundant white fragments and rusty
236	Niobrara	3050	light to medium grey shale; scattered white precipitate and rusty
237	Niobrara	3050	light to medium grey shale; scattered rusty stain; clayey; rare white
238	Niobrara	3050	light to medium grey shale; rare white fragments and rusty fragments
239	Niobrara	3050	light to medium grey shale; clayey; abundant white precipitate and rusty precipitate

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Date Sampled	Sampled By	Colour	Period
			Easting	Northing		From	To				
240	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	493.8	506.0	Mar 20/96	R.B.	5Y4/1, N4-N5	Cretaceous
241	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	509.0	518.2	Mar 20/96	R.B.	5Y4/1, N4-N5	Cretaceous
242	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	524.3	536.4	Mar 20/96	R.B.	N3-N6	Cretaceous
243	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	539.5	551.7	Apr. 17/96	M.F./R.B.	N3-N4	Cretaceous
244	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	554.7	566.9	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
245	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	570.0	582.2	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
246	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	585.2	597.4	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
247	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	600.5	612.6	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
248	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	615.7	627.9	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
249	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	630.9	643.1	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
250	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	646.2	658.4	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
251	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	661.4	670.6	Apr. 17/96	M.F./R.B.	N3-N5	Cretaceous
252	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	734.6	746.8	Apr. 17/96	M.F./R.B.	N3-N4	Jurassic
253	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	749.8	762.0	Apr. 17/96	M.F./R.B.	N3-N4	Jurassic
254	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	765.0	777.2	Apr. 17/96	M.F./R.B.	N3-N4	Jurassic
255	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	780.3	792.5	Apr. 17/96	M.F./R.B.	N3-N5	Jurassic
256	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	795.5	807.7	Apr. 17/96	M.F./R.B.	N4-N5	Jurassic
257	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	810.8	823.0	Apr. 17/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
258	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	826.0	838.2	Apr. 17/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
259	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	841.2	853.4	Apr. 17/96	M.F./R.B.	N4-N5, 5YR6/1	Jurassic
260	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	856.5	868.7	Apr. 17/96	M.F./R.B.	N4-N5, 5YR6/1	Jurassic
261	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	871.7	883.9	Apr. 17/96	M.F./R.B.	N4-N5, 5YR6/1	Jurassic
262	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	887.0	899.2	Apr. 17/96	M.F./R.B.	N4-N5, 5YR6/1	Jurassic
263	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	902.2	914.4	Apr. 17/96	M.F./R.B.	N4-N5, 5Y4/1	Jurassic
264	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	917.4	929.6	May 1/96	M.F./R.B.	N4-N5	Jurassic
265	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	932.7	944.9	May 1/96	M.F./R.B.	N3-N5	Jurassic
266	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	947.9	960.1	May 1/96	M.F./R.B.	N3-N5	Triassic
267	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	963.2	975.4	May 1/96	M.F./R.B.	N3-N5, 5YR4/1	Triassic
268	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	978.4	1021.1	May 1/96	M.F./R.B.	N3-N5, 5YR4/1	Mississippian
269	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1024.1	1036.3	May 1/96	M.F./R.B.	N3-N5, 5YR8/1	Mississippian
270	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1039.4	1051.6	May 1/96	M.F./R.B.	N3-N5	Mississippian
271	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1054.6	1063.8	May 1/96	M.F./R.B.	N3-N5	Mississippian
272	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1066.8	1079.0	May 1/96	M.F./R.B.	N3-N5	Mississippian
273	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1082.0	1097.3	May 1/96	M.F./R.B.	N3-N5	Mississippian
274	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1100.3	1112.5	May 1/96	M.F./R.B.	N3-N5	Mississippian
275	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1115.6	1127.8	May 1/96	M.F./R.B.	N3-N5, 5Y6/1	Mississippian
276	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1133.9	1146.0	May 1/96	M.F./R.B.	N3-N5	Mississippian
277	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1149.1	1161.3	May 1/96	M.F./R.B.	N3-N5	Mississippian
278	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1164.3	1176.5	May 1/96	M.F./R.B.	N3-N6	Mississippian
279	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1179.6	1191.7	May 1/96	M.F./R.B.	N3-N6	Mississippian
280	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1194.8	1207.0	May 1/96	M.F./R.B.	N3-N5	Mississippian
281	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1210.1	1222.2	May 1/96	M.F./R.B.	N3-N5, 5Y4/1	Mississippian
282	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1225.3	1237.5	May 1/96	M.F./R.B.	N3-N5, 5Y4/1	Mississippian
283	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1240.5	1252.7	May 1/96	M.F./R.B.	N3-N5, 5Y4/1	Mississippian
284	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1255.8	1268.0	May 1/96	M.F./R.B.	N3-N5, 5Y4/1	Mississippian
285	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1271.0	1283.2	May 1/96	M.F./R.B.	N3-N5, 5R4/2	Devonian
286	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1307.6	1319.8	May 1/96	M.F./R.B.	N3-N5, 5YR4/1	Devonian
287	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1322.8	1335.0	May 1/96	M.F./R.B.	N5, 5YR4/1	Devonian
288	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1338.1	1350.3	May 1/96	M.F./R.B.	N3-N5, 5Y4/1	Devonian
289	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1353.3	1359.4	May 1/96	M.F./R.B.	N5, 5YR6/1	Devonian

Appendix 1 Continued
Black Shale Drill Chip Samples

Sample Number	Formation or Member	Formation Code	Comments
240	Niobrara	3050	light to medium grey shale; clayey; abundant white precipitate and rusty precipitate
241	Favel	5760	light to medium grey shale; rare black specks
242	Favel	5760	light grey to dark grey shale; abundant white and rare rusty; sandy?
243	Ashville	7950	light to dark grey shale; rare sand greens
244	Ashville	7950	light to dark grey shale; rare white fragments (calcitic)
245	Ashville	7950	light to dark grey shale; scattered white fragments
246	Ashville	7950	light to dark grey shale; scattered white fragments; scattered white coating
247	Ashville	7950	light to dark grey shale; minor white stain/coating; minor red/brown fragments
248	Ashville	7950	light to dark grey shale; white stain/coating; scattered yellow stain
249	Ashville	7950	light to dark grey shale; abundant white stain/coating; minor yellow brown stain
250	Swan River	9315	light to dark grey shale; scattered white coating/stain
251	Swan River	9315	light to dark grey shale; @ 673.6m quartz sand, fine grained
252	Jurassic	20500	medium grey shale; abundant white coating; scattered yellow stain; quartz sand
253	Jurassic	20500	medium to dark grey shale; white coated fragments; limonitic stain
254	Jurassic	20500	medium to dark grey shale; scattered white stain; calcitic fragments; limonitic
255	Jurassic	20500	light to dark grey shale; scattered white coating; red brown fragments
256	Jurassic	20500	light to medium grey shale; rare white stain; abundant brown shale
257	Jurassic	20500	light to medium grey shale; scattered white fragments; scattered red brown fragments
258	Jurassic	20500	light to medium grey shale; scattered white stain/coating
259	Jurassic	20500	light to medium grey shale; abundant white fragments (calcitic)
260	Jurassic	20500	light to medium grey shale; abundant white and yellow fragments
261	Reston	22640	medium to dark grey shale; abundant white coating and fragments
262	Reston	22640	light to dark grey shale; scattered white stain/coating
263	Amaranth	22650	light to dark grey shale; scattered white stain/fragments
264	Amaranth	22650	light to dark grey black shale; some white fragments/precipitate; minor red
265	Amaranth	22650	light to medium grey shale; minor white fragments
266	Lower Amaranth	22670	light to dark grey shale; scattered white fragments/shale; rusty red stain
267	Lower Amaranth	22670	light to dark grey shale; red grey shale; spongy texture; white stain
268	Charles	36010	red to grey shale; spongy; white/pink fragments; yellow/white stain
269	MC-2	39100	light to medium grey shale; abundant white fragments (calcitic); pink fragments
270	MC-1	39300	light to dark grey shale; abundant white/pink fragments (calcitic); white staining
271	MC-1	39300	light to medium grey shale; scattered white fragments; green fragments; red specks
272	MC-1	39300	light to medium dark grey shale; sandy @ 1072.9m; scattered white fragments (calcitic)
273	U. Lodgepole	39710	light to medium dark grey shale; black shale fragments; white fragments; sandy (fine grained)
274	U. Lodgepole	39710	light to dark grey shale; scattered white fragments; slight red fragments
275	U. Lodgepole	39710	light to dark grey shale; white fragments (calcitic); some white stain
276	U. Lodgepole	39710	light to medium grey shale; minor white/red fragments; white stain
277	U. Lodgepole	39710	light to dark grey shale; red shale
278	L. Lodgepole	39757	light to dark grey shale; white fragments (calcitic); darker in colour
279	L. Lodgepole	39757	light to dark grey shale; abundant white stain/fragments; more grey; minor red
280	L. Lodgepole	39757	medium to dark grey shale; minor red fragments
281	L. Lodgepole	39757	medium grey shale; some white stain
282	L. Lodgepole	39757	medium grey shale; olive stain; minor white fragments
283	L. Lodgepole	39757	medium grey shale; minor white fragments
284	Bakken	40700	light to medium grey shale; olive grey; abundant white fragments/stain
285	Three Forks	50600	grey to red shale; red brown; (no vials between 1286.3-1307.6m)
286	Birdbear	52800	grey shale; brown stain; minor white crust/thin film
287	Birdbear	52800	grey to black brown shale; very light in colour; minor white fragments
288	Duperow	53200	light to medium grey shale; minor olive colour
289	Duperow	53200	grey to light brown shale; fine grained sand; abundant white fragments; grey-beige

Appendix 2
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Colour	Formation	Formation Code
			Easting	Northing		(metres)				
						From	To			
1	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	128.0	140.2	N5 - 5Y6/1	Boissevain	2070
2	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	143.3	155.5	N4 - N5	Boissevain	2070
3	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	158.5	170.7	N5 - 5Y6/1	Pierre	2080
4	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	173.7	185.9	N5 - 5Y5/1	Pierre	2080
5	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	189.0	204.2	N4 - N5	Pierre	2080
6	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	207.3	219.5	N4 - N5	Niobrara	3050
7	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	222.5	237.7	N4 - N5	Niobrara	3050
8	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	240.8	253.0	N5	Morden	5670
9	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	256.0	259.1	N4 - N5	Morden	5670
10	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	304.8	307.8	N4 - N5	Keld	5800
11	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	335.3	344.4	N4 - N5	Ashville	7950
12	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	362.7	374.9	N4	Ashville	7950
13	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	384.0	399.3	N4	Swan River	9315
14	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	402.3	414.5	N4 - N6	Jurassic	20500
15	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	417.6	429.8	N4	Jurassic	20500
16	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	432.8	445.0	N5	Jurassic	20500
17	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	448.1	460.2	N4	Jurassic	20500
18	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	463.3	475.5	N5	Jurassic	20500
19	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	478.5	490.7	N5	Jurassic	20500
20	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	193.8	509.0	N5	Jurassic	20500
21	Dalny	10-36-02-26W1	366425	5448050	62F/02	36.6	48.8	N6	Pierre	2080
22	Dalny	10-36-02-26W1	366425	5448050	62F/02	51.8	64.0	N6	Pierre	2080
23	Dalny	10-36-02-26W1	366425	5448050	62F/02	67.1	79.2	N6	Pierre	2080
24	Dalny	10-36-02-26W1	366425	5448050	62F/02	82.3	91.4	N6	Pierre	2080
25	Dalny	10-36-02-26W1	366425	5448050	62F/02	100.6	112.8	N6	Pierre	2080
26	Dalny	10-36-02-26W1	366425	5448050	62F/02	115.8	128.0	N6	Pierre	2080
27	Dalny	10-36-02-26W1	366425	5448050	62F/02	131.1	143.3	N6	Pierre	2080
28	Dalny	10-36-02-26W1	366425	5448050	62F/02	146.3	158.5	N5 - N6	Pierre	2080
29	Dalny	10-36-02-26W1	366425	5448050	62F/02	161.5	173.7	N5 - N6	Pierre	2080
30	Dalny	10-36-02-26W1	366425	5448050	62F/02	176.8	189.0	N5 - N6	Pierre	2080
31	Dalny	10-36-02-26W1	366425	5448050	62F/02	192.6	204.2	N5 - N6	Pierre	2080
32	Dalny	10-36-02-26W1	366425	5448050	62F/02	207.3	219.5	N5 - N6	Pierre	2080
33	Dalny	10-36-02-26W1	366425	5448050	62F/02	222.5	234.7	N5 - N6	Pierre	2080
34	Dalny	10-36-02-26W1	366425	5448050	62F/02	237.7	246.9	N6 - N7	Pierre	2080
35	Dalny	10-36-02-26W1	366425	5448050	62F/02	249.9	262.1	N6 - N7	Millwood	3010
36	Dalny	10-36-02-26W1	366425	5448050	62F/02	265.2	277.4	N6 - N7	Millwood	3010
37	Dalny	10-36-02-26W1	366425	5448050	62F/02	280.4	292.6	N5 - N6	Millwood	3010
38	Dalny	10-36-02-26W1	366425	5448050	62F/02	295.7	307.8	N4 - N5	Millwood	3010
39	Dalny	10-36-02-26W1	366425	5448050	62F/02	310.9	323.1	N4 - N5	Millwood	3010
40	Dalny	10-36-02-26W1	366425	5448050	62F/02	326.1	338.3	N4 - N5	Pembina	3020
41	Dalny	10-36-02-26W1	366425	5448050	62F/02	341.1	353.6	N4 - N5	Pembina	3020
42	Dalny	10-36-02-26W1	366425	5448050	62F/02	356.6	368.8	N4 - N5	Niobrara	3050
43	Dalny	10-36-02-26W1	366425	5448050	62F/02	371.9	384.0	N4 - N5	Niobrara	3050
44	Dalny	10-36-02-26W1	366425	5448050	62F/02	387.1	399.3	N4 - N5	Niobrara	3050
45	Dalny	10-36-02-26W1	366425	5448050	62F/02	402.3	414.5	N4 - N5	Niobrara	3050
46	Dalny	10-36-02-26W1	366425	5448050	62F/02	417.6	429.8	N3 - N5	Morden	5670
47	Dalny	10-36-02-26W1	366425	5448050	62F/02	432.8	445.0	N3 - N5	Morden	5670
48	Dalny	10-36-02-26W1	366425	5448050	62F/02	448.1	460.2	N3 - N5	Assiniboine	5770
49	Dalny	10-36-02-26W1	366425	5448050	62F/02	463.3	475.5	N3 - N5	Keld	5800
50	Dalny	10-36-02-26W1	366425	5448050	62F/02	478.5	490.7	N3 - N5	Belle Fourche	7970
51	Dalny	10-36-02-26W1	366425	5448050	62F/02	493.8	506.0	N3-N4	Belle Fourche	7970
52	Dalny	10-36-02-26W1	366425	5448050	62F/02	509.0	521.2	N3-N4	Belle Fourche	7970
53	Dalny	10-36-02-26W1	366425	5448050	62F/02	524.3	536.4	N3-N4	Belle Fourche	7970
54	Dalny	10-36-02-26W1	366425	5448050	62F/02	539.5	551.7	N3-N4	Westgate	8000
55	Dalny	10-36-02-26W1	366425	5448050	62F/02	554.7	566.9	N3-N4, 5Y4/1	Ashville	7960
56	Dalny	10-36-02-26W1	366425	5448050	62F/02	570.0	582.2	N3-N4, 5Y4/1	Swan River	9315
57	Dalny	10-36-02-26W1	366425	5448050	62F/02	585.2	597.4	N3-N4, 5Y4/1	Swan River	9315
58	Dalny	10-36-02-26W1	366425	5448050	62F/02	600.5	612.6	N4-N5	Swan River	9315
59	Dalny	10-36-02-26W1	366425	5448050	62F/02	615.7	627.9	N4-N6	Swan River	9315

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
Detection Limit	2	5.0	0.5	50	0.5	1.0	1	5	1	0.01	1	1
1	1	2.5	7.8	390	3.4	2.0	26	55	4	2.81	3	1
2	1	2.5	13.0	750	3.9	2.0	25	100	7	3.73	4	1
3	1	2.5	20.0	850	3.7	0.5	29	110	9	4.47	5	1
4	6	2.5	41.0	590	5.1	2.0	39	130	10	4.99	5	1
5	18	2.5	49.0	810	11.0	3.0	25	160	9	4.83	6	1
6	1	2.5	22.0	740	6.9	0.5	26	130	9	3.55	6	1
7	7	2.5	25.0	750	7.0	0.5	23	130	8	4.03	5	1
8	1	2.5	24.0	910	6.5	2.0	20	130	10	4.29	4	1
9	1	2.5	27.0	690	7.4	0.5	26	150	10	4.35	5	1
10	5	2.5	20.0	850	5.8	0.5	20	140	10	4.31	6	1
11	7	2.5	26.0	380	8.1	13.0	15	75	5	2.98	3	1
12	10	2.5	23.0	510	4.8	0.5	17	110	9	3.76	5	1
13	1	2.5	21.0	1200	5.5	4.0	20	100	8	3.32	4	1
14	1	2.5	20.0	700	0.3	4.0	26	99	8	3.58	7	1
15	1	2.5	21.0	560	4.8	3.0	24	110	9	4.55	7	1
16	1	2.5	23.0	780	3.9	5.0	29	110	8	5.13	5	1
17	1	2.5	20.0	480	3.4	3.0	24	110	9	4.40	5	1
18	1	2.5	13.0	400	0.3	4.0	21	92	7	4.43	5	1
19	1	2.5	14.0	520	0.3	3.0	31	94	8	3.87	5	1
20	9	2.5	13.0	610	0.3	3.0	21	95	8	3.87	7	1
21	3	2.5	12.0	550	3.0	0.5	33	81	6	3.91	4	1
22	4	2.5	7.4	430	2.4	0.5	12	63	5	2.45	3	1
23	1	2.5	9.7	690	2.8	0.5	17	80	6	2.81	5	1
24	1	2.5	12.0	830	0.3	0.5	23	100	8	4.01	3	1
25	1	2.5	14.0	670	2.3	0.5	18	99	8	3.12	5	1
26	1	2.5	11.0	790	2.9	0.5	17	96	7	3.65	5	1
27	1	2.5	8.5	720	3.6	0.5	15	96	7	3.34	5	1
28	1	2.5	9.8	820	3.0	0.5	20	97	8	4.77	4	1
29	1	2.5	12.0	820	4.1	0.5	55	120	7	3.58	6	1
30	1	2.5	14.0	910	4.1	0.5	19	97	6	3.69	4	1
31	1	2.5	13.0	780	4.1	0.5	66	98	7	3.30	5	1
32	1	2.5	11.0	670	2.6	0.5	29	87	6	4.04	5	1
33	1	2.5	9.3	660	2.1	2.0	19	83	5	4.40	3	1
34	2	2.5	9.9	690	1.6	2.0	16	74	5	3.35	2	1
35	1	2.5	9.4	610	2.3	2.0	16	61	4	2.44	3	1
36	1	2.5	14.0	810	2.2	1.0	20	95	8	4.18	5	1
37	7	2.5	32.0	870	2.2	0.5	20	100	7	8.70	3	1
38	1	2.5	17.0	1000	0.3	2.0	23	97	9	6.93	4	1
39	1	2.5	22.0	820	2.0	3.0	23	110	7	6.11	5	1
40	7	2.5	23.0	820	4.7	0.5	26	100	8	5.55	6	1
41	12	2.5	35.0	910	6.6	0.5	22	150	9	4.83	6	1
42	8	2.5	46.0	870	7.2	2.0	22	150	8	6.94	6	1
43	7	2.5	31.0	680	4.9	5.0	17	140	8	4.20	5	1
44	6	2.5	14.0	660	4.4	4.0	13	130	9	3.49	5	1
45	1	2.5	22.0	600	5.0	9.0	43	90	6	3.92	4	1
46	6	2.5	46.0	610	4.7	6.0	18	88	6	7.05	4	1
47	1	2.5	53.0	590	5.8	3.0	21	93	7	5.92	2	1
48	11	2.5	48.0	500	5.6	4.0	22	99	6	5.48	3	1
49	1	2.5	26.0	310	6.4	20.0	12	48	3	2.70	2	1
50	5	2.5	18.0	220	3.5	24.0	11	45	3	2.13	2	1
51	3	2.5	22.0	420	2.7	9.0	13	82	6	3.36	4	1
52	5	2.5	20.0	450	3.3	0.5	14	92	8	3.58	4	1
53	4	2.5	24.0	590	3.7	2.0	21	110	8	4.06	4	1
54	9	2.5	20.0	390	2.4	3.0	14	88	6	4.11	4	1
55	3	2.5	19.0	520	3.6	0.5	18	91	7	4.99	4	1
56	8	2.5	17.0	850	2.0	5.0	15	80	6	4.89	5	1
57	6	2.5	17.0	910	2.5	6.0	25	66	5	4.61	5	1
58	1	2.5	15.0	450	2.9	1.0	17	77	7	3.95	5	1
59	5	2.5	18.0	460	2.0	1.0	22	66	6	5.04	5	1

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
Detection Limit	5	1	0.01	20	15	0.1	0.1	3	100	500	0.5	0.2
1	3	3	0.67	14	30	1.3	8.5	2	50	250	0.3	8.8
2	3	1	0.94	18	140	1.4	14.0	2	50	250	0.3	12.0
3	3	3	0.83	18	120	2.0	16.0	2	50	250	0.3	12.0
4	3	5	0.89	17	130	2.9	15.0	2	50	250	0.9	13.0
5	3	16	0.73	20	120	7.2	14.0	6	50	250	0.3	14.0
6	3	7	0.52	16	130	2.1	15.0	2	50	250	1.4	15.0
7	3	8	0.52	17	96	2.2	15.0	2	50	250	1.4	13.0
8	3	1	0.49	18	140	2.2	16.0	2	50	250	0.3	15.0
9	3	8	0.51	19	140	2.4	17.0	2	50	250	0.3	15.0
10	3	1	0.49	18	120	1.9	17.0	2	50	250	1.5	16.0
11	3	25	0.41	15	67	2.7	9.4	2	50	250	1.0	9.4
12	3	11	0.51	17	130	1.9	15.0	2	50	250	0.3	15.0
13	3	12	0.61	16	110	1.6	12.0	2	50	250	1.5	14.0
14	3	5	0.51	17	130	2.1	14.0	2	50	250	0.3	13.0
15	3	10	0.55	18	130	1.7	14.0	2	50	250	1.3	14.0
16	3	16	0.47	20	120	2.0	15.0	2	50	250	0.3	14.0
17	3	3	0.44	17	110	1.5	14.0	2	50	250	0.3	13.0
18	3	9	0.31	16	100	1.1	14.0	2	50	250	0.3	13.0
19	3	1	0.22	16	150	1.6	14.0	2	50	250	2.1	13.0
20	3	10	0.22	15	100	1.4	14.0	2	50	980	1.3	13.0
21	3	24	0.63	300	52	0.8	8.4	2	50	250	1.7	7.3
22	3	2	0.69	13	64	1.0	8.7	2	50	250	0.3	7.7
23	3	5	0.72	14	73	0.7	10.0	2	50	250	0.3	8.9
24	3	4	0.72	16	100	0.9	13.0	2	50	250	0.3	10.0
25	3	3	0.69	14	97	0.7	12.0	2	50	250	1.0	9.4
26	3	5	0.64	15	100	0.8	12.0	2	50	250	0.3	9.9
27	3	3	0.58	14	87	0.8	12.0	2	50	250	0.3	9.7
28	3	4	0.51	16	94	0.9	12.0	2	50	250	0.3	9.9
29	3	7	0.66	16	130	0.9	14.0	2	50	250	0.3	10.0
30	3	7	0.67	15	79	0.7	13.0	2	50	250	0.3	9.4
31	3	1	0.62	120	63	0.8	12.0	2	50	250	2.7	9.4
32	3	1	0.57	14	90	0.7	11.0	2	50	250	1.2	9.1
33	3	1	0.52	130	78	0.7	9.7	2	50	250	0.3	7.9
34	3	2	0.51	11	74	1.0	9.1	2	50	250	0.3	7.2
35	3	3	0.54	10	56	1.0	8.2	2	50	250	0.3	7.5
36	3	4	0.69	13	95	1.2	13.0	2	50	250	0.3	10.0
37	3	6	0.73	13	100	1.4	16.0	2	50	250	0.3	9.5
38	3	1	0.82	190	99	1.5	16.0	2	50	250	1.2	10.0
39	3	5	0.88	14	110	2.5	15.0	2	50	250	1.2	10.0
40	3	14	0.96	16	100	4.3	15.0	6	50	250	0.3	12.0
41	3	12	0.70	140	150	5.2	17.0	7	50	250	0.8	12.0
42	3	6	0.65	14	110	5.1	15.0	9	50	250	0.3	13.0
43	3	9	0.49	180	110	3.9	13.0	2	50	250	0.3	11.0
44	3	1	0.48	13	94	1.6	14.0	2	50	250	0.8	13.0
45	3	19	0.33	150	64	2.4	11.0	2	50	250	2.4	9.4
46	3	25	0.32	12	90	3.4	12.0	2	50	250	0.3	9.2
47	3	36	0.40	12	120	3.3	12.0	4	50	250	0.3	11.0
48	3	29	0.38	12	100	4.2	13.0	2	50	250	0.7	11.0
49	3	35	0.25	10	43	2.9	5.7	4	50	250	0.3	4.8
50	3	13	0.24	10	38	1.6	5.3	2	50	250	0.3	4.5
51	3	20	0.59	180	87	1.9	11.0	2	50	250	1.0	12.0
52	3	13	0.49	11	120	1.6	14.0	2	50	250	0.5	13.0
53	3	16	0.48	12	120	1.6	14.0	2	50	250	1.2	14.0
54	3	12	0.57	11	120	1.5	12.0	2	50	250	0.8	11.0
55	3	11	0.69	140	110	1.3	13.0	2	50	250	0.3	13.0
56	3	11	0.65	180	120	1.2	12.0	2	50	250	0.8	12.0
57	3	4	0.47	11	68	1.3	10.0	2	50	250	1.4	9.8
58	3	10	0.66	11	92	1.0	12.0	2	50	250	1.0	12.0
59	3	8	0.47	11	95	1.3	10.0	2	50	250	0.3	9.6

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
1	2.4	55	120	25	56	21	3.5	0.9	0.25	2.2	0.32
2	2.6	57	170	33	70	24	4.7	1.3	0.25	2.9	0.40
3	2.5	34	200	33	70	28	4.7	1.1	0.25	3.1	0.47
4	3.7	41	230	43	86	27	6.2	1.6	1.00	4.3	0.52
5	7.6	24	190	44	82	32	6.3	1.5	0.25	4.3	0.55
6	5.8	65	210	46	95	37	5.8	1.5	1.40	3.6	0.54
7	5.8	43	160	42	88	38	5.7	1.4	1.40	3.4	0.42
8	7.2	24	150	46	93	38	6.1	1.5	0.25	3.8	0.51
9	9.7	30	260	49	98	49	6.5	1.6	0.25	3.6	0.52
10	9.5	26	240	51	100	37	6.9	1.8	0.25	4.0	0.48
11	10.0	17	130	27	60	26	3.7	0.8	0.25	2.1	0.30
12	7.5	35	150	41	86	38	5.4	1.2	0.25	3.0	0.38
13	6.7	62	140	37	77	29	4.9	1.2	0.25	3.2	0.44
14	8.1	170	180	41	85	30	5.5	1.4	1.20	3.1	0.47
15	5.1	380	160	42	88	35	5.5	1.3	0.90	3.0	0.42
16	4.6	82	180	44	89	31	5.7	1.3	0.25	3.3	0.44
17	5.5	64	160	42	86	32	5.4	1.5	0.25	3.3	0.44
18	3.1	40	200	42	90	33	5.3	1.2	0.25	3.1	0.41
19	4.8	120	140	40	83	36	5.1	1.2	0.25	3.2	0.36
20	3.2	42	170	40	83	29	5.2	1.4	0.25	3.1	0.43
21	2.4	770	120	26	49	21	3.5	0.9	0.25	1.9	0.26
22	2.4	19	160	25	50	20	3.3	0.8	0.70	2.0	0.27
23	3.2	44	110	30	60	22	3.9	1.0	0.25	2.3	0.31
24	3.6	55	110	36	77	34	4.8	1.2	0.25	3.3	0.45
25	2.9	29	140	34	65	26	4.3	1.2	0.25	2.8	0.36
26	2.7	39	130	32	62	26	4.1	0.9	0.70	2.5	0.35
27	3.6	28	160	31	63	25	3.9	1.1	0.25	2.3	0.33
28	3.0	54	110	32	67	26	4.1	0.9	0.25	2.2	0.37
29	2.8	290	140	35	68	27	4.6	1.1	1.10	2.9	0.38
30	2.0	39	160	32	69	27	4.4	1.0	0.25	2.7	0.40
31	2.9	410	160	31	61	23	4.0	1.1	0.25	2.5	0.34
32	2.4	130	110	30	62	23	4.0	1.0	1.20	2.6	0.35
33	2.2	64	130	28	58	24	3.8	0.9	0.25	2.2	0.33
34	1.6	35	120	24	48	17	3.3	0.8	0.25	2.0	0.27
35	1.3	24	120	24	51	18	3.2	0.7	0.60	2.0	0.28
36	2.4	33	180	31	64	24	4.2	1.1	0.80	3.0	0.37
37	3.0	15	200	31	63	28	4.6	1.1	0.25	2.9	0.40
38	4.7	26	160	34	67	27	4.9	1.4	0.25	3.1	0.44
39	4.1	24	220	36	69	27	5.0	1.3	0.25	3.2	0.46
40	6.7	48	250	41	79	32	5.4	1.5	0.25	3.9	0.45
41	5.9	30	220	46	88	35	6.0	1.7	1.70	4.2	0.57
42	5.9	27	300	53	93	40	6.5	1.7	1.20	4.5	0.58
43	6.5	23	240	46	90	33	6.2	1.7	0.25	3.9	0.52
44	4.9	20	190	43	86	32	5.6	1.4	0.25	3.5	0.45
45	4.2	270	160	35	66	27	4.3	1.2	0.25	2.8	0.36
46	9.9	17	250	33	66	25	4.4	1.2	1.40	2.7	0.33
47	19.0	21	240	37	71	29	4.9	1.4	1.00	2.5	0.40
48	19.0	18	240	37	72	28	4.7	1.3	0.80	2.9	0.40
49	12.0	11	170	17	34	14	2.2	0.6	0.80	1.4	0.18
50	8.7	33	110	17	34	12	2.2	0.6	0.25	1.5	0.22
51	8.5	25	390	35	71	28	4.6	1.0	0.70	2.8	0.36
52	6.9	8	220	38	77	28	5.0	1.2	0.90	3.0	0.40
53	9.9	52	250	41	81	30	5.3	1.3	0.90	3.2	0.44
54	6.3	12	240	37	69	31	4.7	1.2	0.25	3.0	0.37
55	5.4	24	150	38	75	32	5.0	1.2	0.90	3.0	0.42
56	5.7	22	180	37	72	27	4.8	1.2	0.80	3.1	0.40
57	5.3	110	150	32	65	22	4.5	1.1	0.80	2.9	0.32
58	4.0	48	190	35	71	25	4.6	1.0	1.20	3.0	0.38
59	5.2	120	120	31	63	19	4.0	1.0	0.70	2.5	0.34

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Colour	Formation	Formation Code
			Easting	Northing		From	To			
60	Dalny	10-36-02-26W1	366425	5448050	62F/02	630.9	643.1	N4-N5, 5Y4/1	Swan River	9315
61	Dalny	10-36-02-26W1	366425	5448050	62F/02	646.2	658.4	N4-N5, 5Y4/1	Jurassic	20500
62	Dalny	10-36-02-26W1	366425	5448050	62F/02	661.4	673.6	N4-N5, 5Y4/1	Jurassic	20500
63	Dalny	10-36-02-26W1	366425	5448050	62F/02	676.7	688.8	N4-N5, 5Y4/1	Jurassic	20500
64	Dalny	10-36-02-26W1	366425	5448050	62F/02	691.9	704.1	N4-N5, 5Y4/1	Jurassic	20500
65	Dalny	10-36-02-26W1	366425	5448050	62F/02	707.1	719.3	N4-N5, 5Y4/1	Jurassic	20500
66	Dalny	10-36-02-26W1	366425	5448050	62F/02	722.4	734.6	N4-N5, 5Y4/1	Jurassic	20500
67	Dalny	10-36-02-26W1	366425	5448050	62F/02	737.6	749.8	N4-N5, 5Y4/1	Jurassic	20500
68	Dalny	10-36-02-26W1	366425	5448050	62F/02	752.9	765.0	N4-N6	Jurassic	20500
69	Dalny	10-36-02-26W1	366425	5448050	62F/02	768.1	780.3	N4-N6	Reston	22640
70	Dalny	10-36-02-26W1	366425	5448050	62F/02	783.3	795.5	N4-N6	Reston	22640
71	Dalny	10-36-02-26W1	366425	5448050	62F/02	798.6	810.8	N4-N6	Reston	22640
72	Dalny	10-36-02-26W1	366425	5448050	62F/02	813.8	826.0	N4-N6	Upper Amaranth	22655
73	Dalny	10-36-02-26W1	366425	5448050	62F/02	829.1	841.2	N4-N6	Upper Amaranth	22655
74	Dalny	10-36-02-26W1	366425	5448050	62F/02	844.3	856.5	N4-N6	Lower Amaranth	22670
75	Dalny	10-36-02-26W1	366425	5448050	62F/02	859.5	871.7	N4-N6	Lower Amaranth	22670
76	Dalny	10-36-02-26W1	366425	5448050	62F/02	874.8	880.9	N4-N6	Lower Amaranth	22670
77	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	112.8	125.0	N6-N7, 5Y6/1	Pierre	2080
78	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	128.0	140.2	N6-N7, 5Y6/1	Pierre	2080
79	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	143.3	155.4	N6-N7, 5Y6/1	Pierre	2080
80	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	158.5	170.7	N6-N7, 5Y6/1	Pierre	2080
81	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	173.7	185.9	N6-N7, 5Y6/1	Pierre	2080
82	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	189.0	201.2	N6-N7, 5Y6/1	Pierre	2080
83	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	204.2	216.4	N6-N7, 5Y6/1	Pierre	2080
84	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	219.5	231.6	N6-N7, 5Y6/1	Pierre	2080
85	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	234.7	246.9	N6-N7, 5Y6/1	Pierre	2080
86	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	249.9	262.1	N6-N7, 5Y6/1	Pierre	2080
87	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	265.2	277.4	N5-N6	Niobrara	3050
88	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	280.4	292.6	N5-N6	Niobrara	3050
89	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	295.7	307.8	N4-N6	Niobrara	3050
90	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	310.9	323.1	N3-N5	Niobrara	3050
91	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	326.1	338.3	N4-N5	Niobrara	3050
92	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	341.4	353.6	N4-N6	Morden	5670
93	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	356.6	368.8	N4-N6	Morden	5670
94	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	371.9	384.0	N4-N6	Morden	5670
95	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	387.1	399.3	N3-N4	Morden	5670
96	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	402.3	414.5	N3-N5	Morden	5670
97	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	417.6	429.8	N3-N5	Keld	5800
98	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	432.8	445.0	N4-N5	Favel	7950
99	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	448.1	460.2	N4-N5, 5YR4/1	Ashville	7950
100	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	163.3	475.5	N4-N5	Ashville	7950
101	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	478.5	490.7	N4-N6	Ashville	7950
102	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	493.8	506.0	N4-N6	Ashville	7950
103	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	509.0	521.2	N4-N6	Ashville	7950
104	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	524.3	536.4	N4-N6, 5YR4/1	Ashville	7950
105	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	539.5	548.6	N4-N6	Swan River	9315
106	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	615.7	927.9	5YR4/1	Jurassic	20500
107	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	630.9	643.1	N4-N5, 5YR4/1	Jurassic	20500
108	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	646.2	658.4	N4-N5, 5YR4/1	Jurassic	20500
109	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	661.4	673.6	N4-N5, 5YR4/1	Jurassic	20500
110	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	676.7	688.8	N4-N5, 5YR4/1	Jurassic	20500
111	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	691.9	704.1	N4-N5, 5YR4/1	Jurassic	20500
112	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	707.1	719.3	N4-N6, 5YR4/1	Reston	22640
113	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	722.4	733.0	N4-N6, 5YR4/1	Reston	22640
114	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	734.6	748.3	N4-N6, 5YR4/1	Reston	22640
115	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	749.8	755.9	N4-N6, 5YR4/1	Reston	22640
116	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	757.4	771.1	N4-N6	Upper Amaranth	22655
117	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	774.2	787.9	N4-N6	Upper Amaranth	22655
118	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	789.4	821.4	N4-N5, 5GY4/1, 10R7/4	Upper Amaranth	22655

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
Detection Limit	2	5.0	0.5	50	0.5	1.0	1	5	1	0.01	1	1
60	1	2.5	15.0	830	0.3	3.0	22	69	5	3.56	5	1
61	1	2.5	16.0	1300	0.3	5.0	22	49	3	3.62	5	1
62	1	2.5	16.0	740	3.0	8.0	19	51	3	3.28	4	1
63	1	2.5	24.0	550	0.3	3.0	21	74	5	4.00	3	1
64	3	2.5	23.0	560	3.6	4.0	25	98	7	4.08	4	1
65	3	2.5	23.0	590	2.5	7.0	21	93	7	4.40	5	1
66	1	2.5	21.0	530	0.3	6.0	43	97	7	4.84	6	1
67	8	2.5	19.0	540	3.0	6.0	43	90	8	4.91	6	1
68	1	2.5	17.0	610	2.1	6.0	22	92	7	4.62	6	1
69	8	2.5	17.0	700	2.3	5.0	21	89	8	4.53	5	1
70	1	2.5	16.0	1000	2.3	8.0	19	98	7	4.43	5	1
71	1	2.5	12.0	710	0.3	13.0	21	68	5	4.14	4	1
72	1	2.5	14.0	480	0.3	8.0	23	96	7	4.11	5	1
73	1	2.5	15.0	680	2.0	9.0	17	94	7	3.82	5	1
74	1	2.5	14.0	540	1.4	10.0	17	87	6	4.29	5	1
75	1	2.5	15.0	580	0.3	4.0	19	93	8	4.43	6	1
76	1	2.5	14.0	580	0.3	5.0	22	89	6	4.52	5	1
77	1	2.5	14.0	820	4.1	0.5	24	100	8	4.48	4	1
78	1	2.5	11.0	760	3.8	0.5	17	90	8	4.39	4	1
79	1	2.5	11.0	930	3.6	0.5	16	92	7	3.46	5	1
80	1	2.5	11.0	900	2.7	0.5	15	91	6	3.68	4	1
81	1	2.5	7.7	690	2.9	1.0	13	76	6	2.94	3	1
82	1	2.5	7.0	520	2.7	0.5	13	70	5	2.33	3	1
83	1	2.5	6.9	630	2.8	0.5	18	71	6	2.58	3	1
84	1	2.5	13.0	870	2.3	0.5	18	100	10	3.97	4	1
85	1	2.5	16.0	730	3.4	3.0	20	99	9	5.98	4	1
86	1	2.5	23.0	910	3.3	0.5	21	110	11	5.37	5	1
87	4	2.5	22.0	760	3.3	0.5	25	110	9	5.41	4	1
88	1	2.5	20.0	770	2.5	0.5	27	94	8	6.54	4	1
89	10	2.5	26.0	750	4.6	0.5	22	120	9	6.62	5	1
90	1	2.5	38.0	580	7.3	6.0	24	160	8	5.39	5	1
91	1	2.5	22.0	690	5.3	9.0	18	140	8	3.66	4	1
92	1	2.5	18.0	770	5.3	5.0	16	130	10	3.91	6	1
93	1	2.5	28.0	740	5.7	9.0	19	110	8	5.40	5	1
94	1	2.5	41.0	740	5.2	5.0	25	110	9	6.06	5	1
95	1	2.5	58.0	580	7.0	0.5	24	85	7	7.21	3	1
96	1	2.5	32.0	350	4.5	15.0	18	66	5	3.79	2	1
97	1	2.5	20.0	320	5.2	30.0	12	40	3	2.40	1	1
98	3	2.5	22.0	390	0.3	23.0	14	69	5	3.82	3	1
99	1	2.5	29.0	550	3.5	12.0	18	98	8	4.56	2	1
100	5	2.5	26.0	600	5.2	11.0	18	100	8	4.43	4	1
101	1	2.5	26.0	550	3.5	9.0	19	100	8	4.93	4	1
102	1	2.5	22.0	790	2.8	6.0	17	81	9	5.18	4	1
103	9	2.5	16.0	950	3.5	3.0	24	83	8	4.05	2	1
104	1	2.5	21.0	790	4.2	3.0	18	98	8	5.68	3	1
105	1	2.5	22.0	1200	3.1	0.5	17	92	8	5.67	6	1
106	7	2.5	25.0	480	3.9	3.0	17	89	8	6.08	5	1
107	1	2.5	21.0	590	2.7	6.0	17	92	7	4.86	5	1
108	9	2.5	22.0	600	0.3	6.0	19	84	7	7.40	4	1
109	1	2.5	18.0	2600	0.3	6.0	15	83	8	5.02	3	1
110	1	2.5	27.0	690	3.2	4.0	19	100	8	5.57	5	1
111	8	2.5	28.0	730	3.0	3.0	17	110	8	5.53	5	1
112	5	2.5	21.0	400	0.3	10.0	17	90	8	5.17	5	1
113	1	2.5	12.0	380	0.3	14.0	16	84	7	3.54	4	1
114	1	2.5	14.0	830	2.6	9.0	18	87	7	4.10	5	1
115	1	2.5	17.0	290	0.3	8.0	18	88	7	4.26	4	1
116	1	2.5	17.0	670	2.5	6.0	17	94	7	4.67	4	1
117	1	2.5	12.0	540	0.3	12.0	14	67	6	3.44	4	1
118	1	2.5	16.0	490	0.3	8.0	14	81	7	3.95	5	1

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
Detection Limit	5	1	0.01	20	15	0.1	0.1	3	100	500	0.5	0.2
60	3	7	0.50	11	85	1.2	9.9	2	50	250	0.7	9.1
61	3	4	0.31	10	63	1.2	7.1	2	50	250	1.1	7.0
62	3	8	0.32	10	53	1.2	7.4	2	50	250	0.3	6.7
63	3	12	0.31	10	77	2.6	10.0	2	50	250	0.3	9.5
64	3	10	0.32	160	96	2.1	13.0	3	50	250	1.2	12.0
65	3	9	0.32	15	110	2.1	15.0	2	50	250	0.3	12.0
66	3	4	0.32	16	120	2.2	16.0	2	50	250	1.4	12.0
67	3	6	0.30	120	110	1.6	16.0	2	50	250	1.5	13.0
68	3	7	0.30	15	110	1.7	16.0	2	50	250	1.6	13.0
69	3	9	0.36	150	120	1.4	17.0	2	50	250	0.3	13.0
70	3	4	0.32	15	130	1.4	16.0	2	50	250	0.3	12.0
71	3	8	0.21	13	79	1.1	12.0	3	50	250	1.2	9.3
72	3	7	0.22	15	120	1.4	15.0	2	50	250	0.3	11.0
73	3	4	0.21	13	120	1.3	15.0	2	50	250	0.9	11.0
74	3	1	0.21	110	76	1.3	14.0	2	50	250	1.0	11.0
75	3	4	0.31	14	120	1.4	16.0	2	50	250	0.9	13.0
76	3	9	0.43	130	120	1.0	15.0	2	50	250	0.3	11.0
77	3	1	0.73	150	99	0.7	15.0	2	50	250	0.3	9.7
78	3	3	0.78	170	95	0.8	14.0	2	50	250	1.5	9.2
79	3	2	0.89	15	81	0.9	14.0	2	50	250	0.3	11.0
80	3	2	0.79	15	90	0.9	14.0	2	50	250	1.3	9.9
81	3	1	0.75	13	94	0.7	11.0	2	50	250	0.3	8.0
82	3	2	0.67	13	45	0.9	9.0	2	50	250	1.1	6.6
83	3	1	0.78	110	50	1.2	10.0	2	50	250	0.3	7.7
84	3	3	0.90	180	93	1.5	17.0	2	50	250	0.3	10.0
85	3	1	0.94	15	120	1.6	19.0	2	50	250	0.3	10.0
86	3	1	1.07	17	130	1.7	20.0	2	50	250	0.3	11.0
87	3	2	1.09	17	130	1.5	19.0	2	50	250	1.3	11.0
88	3	3	0.99	16	120	2.4	17.0	2	50	250	0.3	10.0
89	3	6	0.79	17	97	3.9	17.0	2	50	250	0.3	11.0
90	3	9	0.66	16	110	6.5	15.0	15	50	250	0.3	11.0
91	3	1	0.49	200	92	3.1	14.0	2	50	250	1.4	12.0
92	3	4	0.55	15	140	2.1	17.0	2	50	250	1.3	13.0
93	3	18	0.42	230	100	3.4	15.0	5	50	250	0.3	11.0
94	3	19	0.44	16	110	3.0	16.0	2	50	250	0.3	12.0
95	3	25	0.42	15	100	4.3	13.0	2	50	250	1.1	10.0
96	3	21	0.30	140	75	3.8	11.0	2	50	250	0.3	8.2
97	3	23	0.27	10	34	2.6	5.8	2	50	520	0.3	4.1
98	3	19	0.32	13	69	2.1	11.0	2	50	530	1.0	8.2
99	3	21	0.50	120	110	2.5	14.0	2	50	250	0.7	11.0
100	3	12	0.62	13	100	2.6	15.0	6	50	250	0.3	10.0
101	3	15	0.51	13	97	2.7	15.0	2	50	250	0.8	11.0
102	3	14	0.56	15	120	1.9	15.0	2	50	250	1.3	12.0
103	3	5	0.69	15	120	1.1	15.0	2	50	250	1.1	14.0
104	3	8	0.59	15	130	1.5	16.0	2	50	250	0.9	14.0
105	3	7	0.44	13	110	1.3	16.0	2	50	250	0.3	14.0
106	3	13	0.44	13	110	2.1	15.0	4	50	250	0.3	12.0
107	3	11	0.33	14	130	1.7	15.0	2	50	250	0.3	12.0
108	3	10	0.38	14	95	1.9	13.0	2	50	250	0.3	10.0
109	3	7	0.27	13	120	2.1	15.0	2	50	250	0.8	12.0
110	3	9	0.36	16	99	2.5	17.0	2	50	250	0.3	13.0
111	3	12	0.34	15	140	2.4	17.0	2	50	250	0.3	13.0
112	3	10	0.25	13	130	1.6	15.0	2	50	250	0.3	12.0
113	3	5	0.20	13	100	1.2	14.0	2	50	250	0.3	10.0
114	3	3	0.22	13	110	1.6	15.0	2	50	250	1.1	11.0
115	3	9	0.24	14	120	1.5	15.0	2	50	250	0.9	12.0
116	3	6	0.24	14	100	1.9	15.0	2	50	250	1.1	11.0
117	3	7	0.19	12	83	1.0	12.0	2	50	1200	0.8	9.0
118	3	8	0.28	13	97	1.5	15.0	2	50	900	0.3	11.0

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
60	5.5	120	210	30	60	20	3.9	1.0	0.90	2.4	0.31
61	3.5	140	140	26	53	20	3.6	0.9	0.25	2.2	0.29
62	5.6	100	160	29	53	28	3.5	0.9	0.80	2.0	0.27
63	5.7	86	270	32	63	25	4.2	1.1	0.25	2.6	0.31
64	6.1	72	180	39	80	32	5.1	1.3	0.25	3.0	0.41
65	6.5	68	140	45	73	40	6.2	1.3	0.25	2.8	0.38
66	5.6	260	140	46	78	34	6.4	1.4	0.25	3.1	0.43
67	5.3	220	150	44	77	32	6.0	1.3	0.25	2.9	0.39
68	3.9	72	150	47	80	30	6.4	1.4	0.25	3.0	0.39
69	4.8	40	220	46	80	30	6.1	1.3	1.00	3.0	0.46
70	6.0	25	110	44	75	27	6.0	1.3	0.25	3.1	0.45
71	3.2	68	83	33	58	24	4.4	0.9	0.90	2.4	0.32
72	3.2	44	160	38	65	30	5.2	1.2	1.00	2.7	0.45
73	4.0	33	130	37	63	23	5.1	1.1	0.90	2.7	0.37
74	5.1	26	140	38	65	24	5.3	1.2	1.10	2.6	0.34
75	5.2	28	200	42	71	28	5.8	1.3	1.20	2.9	0.42
76	4.8	92	110	38	71	33	5.7	1.4	0.25	2.9	0.38
77	3.1	87	110	36	62	18	5.0	1.0	0.25	2.8	0.40
78	2.3	35	91	34	57	26	4.7	1.0	0.25	2.8	0.41
79	2.8	28	170	32	57	23	4.7	0.9	0.25	2.5	0.31
80	2.4	19	130	33	59	25	4.9	1.0	0.25	2.5	0.38
81	1.7	12	130	30	52	24	4.3	0.9	0.90	2.3	0.32
82	1.5	43	71	23	43	19	3.4	0.7	0.25	1.6	0.19
83	1.3	43	91	26	48	20	3.8	0.8	0.70	1.8	0.26
84	3.0	22	160	31	53	22	4.6	1.0	0.25	2.6	0.38
85	2.8	19	180	30	50	17	4.5	1.0	0.25	2.7	0.36
86	2.8	16	140	33	54	20	4.8	1.1	0.80	2.6	0.38
87	2.8	59	170	32	58	27	4.9	1.1	0.25	3.0	0.38
88	3.2	35	220	34	52	21	4.9	1.1	0.70	3.1	0.40
89	5.4	30	200	42	66	25	5.8	1.3	1.20	3.5	0.50
90	6.0	20	210	50	73	32	6.8	1.5	0.25	3.8	0.55
91	5.7	25	140	45	78	32	6.2	1.4	1.00	3.4	0.48
92	4.5	27	180	49	84	35	6.7	1.4	1.20	3.5	0.42
93	6.0	28	310	40	66	23	5.6	1.2	0.25	2.9	0.46
94	9.9	22	220	43	73	30	5.7	1.3	0.25	3.1	0.48
95	21.0	23	180	38	64	26	4.7	1.1	0.25	2.5	0.34
96	14.0	16	190	28	46	23	3.7	0.8	0.25	1.9	0.32
97	9.3	9	180	17	28	12	2.2	0.5	0.25	1.2	0.21
98	9.8	14	150	31	53	21	4.5	0.9	0.25	2.1	0.31
99	8.4	19	270	38	65	26	5.4	1.2	0.25	2.6	0.43
100	8.0	10	240	43	71	27	5.8	1.4	1.30	3.4	0.43
101	8.2	26	180	38	65	27	5.1	1.1	0.25	2.8	0.39
102	10.0	26	170	45	76	27	6.2	1.4	1.20	3.3	0.43
103	7.2	32	160	49	77	28	6.4	1.5	0.25	3.3	0.40
104	7.1	23	260	47	81	31	7.0	1.5	1.20	3.6	0.47
105	6.4	58	150	46	81	33	6.6	1.3	1.00	3.3	0.47
106	5.8	45	190	42	73	30	5.9	1.3	1.30	3.2	0.44
107	6.2	39	120	43	77	31	5.8	1.2	0.25	3.0	0.43
108	6.3	47	95	39	69	27	5.4	1.2	0.25	2.7	0.36
109	6.4	29	230	43	78	28	6.0	1.3	0.25	2.8	0.43
110	8.3	28	150	47	78	35	6.7	1.5	1.30	3.5	0.50
111	6.8	24	210	47	81	35	6.4	1.3	1.10	3.1	0.46
112	3.7	22	480	41	72	25	5.6	1.2	0.90	2.9	0.44
113	3.3	22	130	34	57	23	4.7	1.0	0.80	2.5	0.35
114	4.5	22	130	37	64	22	5.1	1.1	0.25	2.7	0.39
115	4.4	29	150	37	65	25	5.1	1.2	0.25	2.8	0.36
116	6.0	23	130	40	68	27	5.5	1.1	0.25	2.6	0.45
117	3.5	29	130	30	56	25	4.3	0.9	0.25	2.2	0.33
118	5.7	17	180	38	64	26	5.2	1.1	1.10	2.7	0.35

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Colour	Formation	Formation Code
			Easting	Northing		From	To			
119	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	134.1	146.3	5YR4/1, 5Y4/1	Pierre	2080
120	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	149.4	161.5	5YR4/1, 5Y4/1	Pierre	2080
121	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	164.6	176.8	5YR4/1, 5Y4/1	Pierre	2080
122	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	179.8	192.0	5YR4/1, 5Y4/1	Pierre	2080
124	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	249.9	162.1	N4, 5YR4/1	Niobrara	3050
125	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	265.2	277.4	N3-N4, 5YR4/1	Niobrara	3050
126	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	280.4	292.6	5YR4/1	Favel	5760
127	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	295.7	307.8	5YR4/1	Favel	5760
128	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	310.9	323.1	5Y4/1, N4-N5	Ashville	7950
129	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	326.1	338.3	5Y4/1, N4-N5	Ashville	7950
130	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	341.4	353.6	5Y4/1, N4-N5	Ashville	7950
131	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	356.6	368.8	5Y4/1, N4-N5	Ashville	7950
132	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	371.9	384.0	5Y4/1, N4-N5	Ashville	7950
133	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	387.1	399.3	5Y4/1, N4-N5	Ashville	7950
134	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	402.3	414.5	5Y4/1, N4-N5	Ashville	7950
135	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	417.6	429.8	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
136	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	432.8	445.0	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
137	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	448.1	460.2	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
138	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	463.3	475.5	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
139	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	478.5	490.7	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
140	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	493.8	506.0	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
141	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	509.0	521.2	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
142	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	524.3	536.4	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
143	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	539.5	551.7	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
144	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	554.7	566.9	N3-N5	L.Lodgepole	39757
145	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	570.0	582.2	N3-N5	L.Lodgepole	39757
146	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	585.2	597.4	N3-N5	L.Lodgepole	39757
147	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	600.5	612.6	N3-N5	L.Lodgepole	39757
148	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	615.7	627.9	N5-N8, 5YR4/1, 5Y8/1	Bakken	40700
149	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	630.9	643.1	N5-N8, 5YR4/1	Three Forks	50600
150	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	646.2	658.4	N5-N8, 5YR4/1	Birdbear	52800
151	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	661.4	673.6	N5-N8, 5YR4/1	Birdbear	52800
152	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	243.8	236.0	N4-N6, 5Y4/1	Pierre	2080
153	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	259.1	271.3	N4-N6, 5Y4/1	Pierre	2080
154	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	274.3	286.5	N4-N6, 5Y4/1	Pierre	2080
155	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	289.6	301.8	N4-N6, 5Y4/1	Pierre	2080
156	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	304.8	317.0	N6-N7	Pierre	2080
157	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	320.0	332.2	N6-N7	Pierre	2080
158	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	335.3	347.5	N6-N7	Pierre	2080
159	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	350.5	362.7	N5-N6	Pierre	2080
160	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	365.8	378.0	N5-N6	Pierre	2080
161	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	381.0	393.2	N4-N6, 5Y4/1	Pierre	2080
162	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	396.2	408.4	N5-N6, 5YR6/1	Millwood	3010
163	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	411.5	423.7	N5-N6, 5YR6/1	Millwood	3010
164	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	426.7	438.9	N4-N6	Pembina	3020
165	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	442.0	454.2	N5-N6	Pembina	3020
166	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	457.2	469.4	5YR4/1, 5YR6/1	Pembina	3020
167	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	472.4	484.6	N5-N6, 5YR4/1	Niobrara	3050
168	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	487.7	499.9	N5-N7	Niobrara	3050
169	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	502.9	515.1	N5-N7	Niobrara	3050
170	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	518.2	530.4	N5-N7	Niobrara	3050
171	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	533.4	545.6	N3-N5	Niobrara	3050
172	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	548.6	560.8	N3-N6	Niobrara	3050
173	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	563.9	576.1	N3-N6	Keld	5800
174	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	579.1	591.3	N3-N6	Favel	5760
175	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	594.4	606.6	N3-N6	Ashville	7950
176	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	609.6	621.8	N3-N6	Ashville	7950
177	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	624.8	637.0	N3-N6	Belle Fourche	7970

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
Detection Limit	2	5.0	0.5	50	0.5	1.0	1	5	1	0.01	1	1
119	1	2.5	15.0	500	0.3	10.0	17	81	8	4.06	6	1
120	15	2.5	34.0	790	3.8	0.5	85	110	9	6.39	5	1
121	7	2.5	24.0	940	4.1	3.0	31	110	8	5.95	5	1
122	1	2.5	29.0	700	2.8	0.5	30	110	8	6.89	4	1
124	1	2.5	23.0	710	8.6	4.0	17	150	10	3.93	5	1
125	6	2.5	55.0	690	8.7	6.0	28	100	9	6.53	4	1
126	1	2.5	53.0	590	9.7	6.0	29	90	7	6.75	3	1
127	12	2.5	34.0	560	10.0	14.0	19	68	4	4.42	3	1
128	1	2.5	35.0	750	6.7	14.0	21	82	6	4.60	4	1
129	12	2.5	39.0	650	6.0	5.0	20	120	9	4.91	5	1
130	5	2.5	25.0	760	5.5	3.0	19	99	8	4.36	3	1
131	1	2.5	22.0	640	3.7	2.0	28	97	8	4.11	6	1
132	8	2.5	16.0	550	3.8	0.5	18	100	7	4.05	3	1
133	1	2.5	15.0	660	3.6	0.5	21	100	9	3.80	6	1
134	1	2.5	16.0	690	0.3	2.0	23	99	9	3.98	6	1
135	8	2.5	18.0	500	0.3	3.0	18	90	7	4.37	6	1
136	1	2.5	22.0	630	0.3	0.5	24	96	6	4.75	5	1
137	1	2.5	19.0	640	2.4	0.5	24	100	6	5.24	7	1
138	6	2.5	16.0	650	0.3	3.0	31	92	6	4.94	7	1
139	8	2.5	18.0	890	2.9	2.0	24	100	7	4.54	6	1
140	1	2.5	22.0	670	0.3	0.5	27	110	7	4.70	7	1
141	1	2.5	23.0	870	0.3	0.5	36	100	7	4.75	6	1
142	4	2.5	18.0	600	2.8	0.5	22	92	6	4.13	6	1
143	1	2.5	16.0	690	3.1	5.0	21	96	6	4.15	6	1
144	1	2.5	21.0	700	3.3	4.0	22	97	6	4.19	5	1
145	9	2.5	24.0	620	0.3	9.0	20	94	6	4.08	4	1
146	1	2.5	19.0	520	3.2	6.0	18	84	6	3.55	5	1
147	5	2.5	21.0	540	3.4	6.0	17	89	5	3.68	4	1
148	1	2.5	20.0	580	2.6	6.0	20	88	5	3.37	4	1
149	1	2.5	24.0	570	3.6	4.0	24	96	5	4.09	5	1
150	1	2.5	14.0	370	3.6	14.0	19	72	4	2.64	3	1
151	1	2.5	12.0	410	3.2	16.0	22	55	4	2.20	2	1
152	1	2.5	11.0	830	3.6	0.5	18	98	6	3.47	4	1
153	1	2.5	11.0	680	2.5	0.5	19	79	6	3.54	2	1
154	1	2.5	7.6	670	2.1	2.0	13	80	5	3.89	2	1
155	6	2.5	7.8	680	0.3	1.0	13	79	5	3.28	2	1
156	1	2.5	6.6	710	1.5	1.0	15	69	4	2.54	2	1
157	1	2.5	9.2	620	1.7	0.5	13	70	5	2.55	3	1
158	1	2.5	7.2	640	0.3	0.5	13	67	4	2.54	3	1
159	1	2.5	7.7	730	0.3	2.0	14	79	5	3.44	2	1
160	4	2.5	16.0	920	2.3	3.0	18	88	7	6.71	2	1
161	1	2.5	18.0	970	1.4	3.0	17	96	7	7.67	5	1
162	4	2.5	23.0	1000	3.7	3.0	26	96	8	7.12	5	1
163	7	2.5	31.0	940	4.0	0.5	21	120	8	7.32	5	1
164	1	2.5	28.0	1000	4.2	2.0	21	120	7	4.81	3	1
165	1	2.5	36.0	1000	4.4	0.5	21	140	8	5.61	3	1
166	10	2.5	39.0	950	4.7	0.5	20	120	7	7.33	5	1
167	5	2.5	30.0	860	6.4	0.5	19	140	6	5.51	3	1
168	1	2.5	32.0	860	3.9	4.0	20	120	8	5.20	5	1
169	1	2.5	25.0	760	4.9	0.5	18	130	8	4.02	6	1
170	1	2.5	21.0	860	4.9	0.5	18	130	8	4.18	3	1
171	8	2.5	47.0	910	5.3	0.5	25	120	8	6.34	3	1
172	4	2.5	51.0	740	5.6	0.5	25	92	6	6.23	2	1
173	1	2.5	31.0	550	5.4	12.0	24	72	4	3.67	3	1
174	4	2.5	20.0	500	4.6	15.0	13	68	5	2.61	2	1
175	1	2.5	27.0	480	2.8	11.0	28	81	6	3.69	3	1
176	5	2.5	28.0	590	3.0	6.0	15	98	6	3.97	5	1
177	1	2.5	24.0	610	2.7	3.0	19	100	8	4.31	3	1

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
Detection Limit	5	1	0.01	20	15	0.1	0.1	3	100	500	0.5	0.2
119	3	7	0.31	14	100	0.9	15.0	2	50	1000	0.3	11.0
120	3	3	1.08	15	100	1.9	20.0	2	50	250	3.8	11.0
121	3	1	1.14	21	110	1.3	18.0	2	50	250	0.3	9.9
122	3	1	1.15	19	99	2.6	18.0	2	50	250	0.3	9.5
124	3	9	0.60	18	130	4.2	18.0	2	50	250	1.6	14.0
125	3	32	0.60	18	100	5.4	16.0	2	50	250	1.1	11.0
126	3	45	0.60	16	93	4.3	14.0	2	50	250	0.9	11.0
127	3	37	0.68	15	71	3.6	11.0	2	50	250	1.5	8.4
128	3	21	0.70	200	69	3.6	13.0	2	50	250	0.3	8.3
129	3	21	0.85	15	130	3.3	18.0	2	50	250	0.3	14.0
130	3	20	0.81	20	84	2.3	16.0	4	50	250	0.3	14.0
131	3	14	0.86	190	120	1.6	16.0	2	50	250	0.3	13.0
132	3	6	0.96	19	130	1.2	16.0	2	50	250	0.3	14.0
133	3	11	0.99	19	150	1.3	16.0	2	50	250	0.3	14.0
134	3	6	1.00	18	120	1.2	16.0	2	50	250	1.0	15.0
135	3	3	0.85	17	100	1.2	15.0	2	50	250	0.3	13.0
136	3	6	0.83	19	100	1.4	16.0	2	50	250	1.7	13.0
137	3	8	0.85	20	130	1.5	16.0	2	50	250	1.4	13.0
138	3	7	0.77	20	95	0.9	15.0	2	50	250	2.1	11.0
139	3	1	0.80	180	110	1.3	17.0	2	50	250	1.5	13.0
140	3	5	0.81	170	120	1.5	16.0	2	50	250	0.3	13.0
141	3	8	0.78	20	96	1.7	16.0	2	50	250	0.3	12.0
142	3	8	0.71	150	97	1.4	15.0	2	50	250	0.3	12.0
143	3	7	0.69	18	100	1.6	15.0	2	50	250	0.3	11.0
144	3	10	0.83	18	110	1.7	16.0	2	50	250	1.4	12.0
145	3	15	0.62	17	120	1.8	14.0	2	50	250	0.6	10.0
146	3	6	0.64	16	100	1.4	14.0	2	50	250	1.0	11.0
147	3	12	0.64	160	100	2.2	13.0	2	50	250	0.3	10.0
148	3	14	0.43	15	110	2.2	12.0	2	50	250	0.3	9.7
149	3	6	0.69	19	80	2.1	14.0	2	50	250	0.3	11.0
150	3	9	0.36	13	56	1.8	9.1	2	50	250	0.3	7.1
151	3	10	0.28	13	54	1.2	7.5	2	50	250	1.1	6.5
152	3	3	0.76	17	82	0.6	13.0	2	50	250	1.9	8.7
153	3	6	0.69	15	110	0.6	12.0	2	50	250	0.3	8.5
154	3	3	0.65	14	76	0.6	11.0	2	50	250	0.3	7.7
155	3	2	0.62	12	79	0.9	11.0	2	50	250	0.3	8.7
156	3	1	0.61	13	60	0.9	10.0	2	50	250	0.3	7.8
157	3	1	0.59	12	82	0.8	9.3	2	50	250	0.3	7.3
158	3	1	0.64	190	44	0.8	9.7	2	50	250	0.3	7.8
159	3	3	0.74	13	100	1.3	11.0	2	50	250	0.3	9.6
160	3	2	0.77	16	100	1.4	15.0	2	50	250	0.3	9.4
161	3	5	0.82	18	72	1.5	17.0	2	50	250	0.3	11.0
162	3	5	0.94	18	93	2.6	17.0	2	50	250	1.1	11.0
163	3	22	0.88	18	140	5.8	17.0	2	50	250	1.3	10.0
164	3	16	0.87	20	130	4.8	17.0	2	50	250	0.3	13.0
165	3	20	0.86	19	130	5.0	18.0	2	50	250	0.3	12.0
166	3	7	0.71	19	120	2.3	17.0	2	50	250	0.3	11.0
167	3	10	0.72	18	110	7.0	15.0	10	50	250	1.1	11.0
168	3	13	0.71	17	100	6.7	15.0	2	50	250	1.0	10.0
169	3	5	0.61	17	150	2.2	16.0	2	50	250	0.3	14.0
170	3	3	0.61	200	140	1.9	18.0	2	50	250	1.0	14.0
171	3	27	0.57	18	130	3.3	16.0	2	50	250	0.3	12.0
172	3	42	0.52	17	97	3.5	13.0	2	50	250	0.3	10.0
173	3	34	0.44	13	52	2.7	10.0	2	50	250	0.7	7.9
174	3	28	0.42	130	51	2.4	8.5	2	50	250	0.3	6.6
175	3	13	0.47	16	57	2.8	12.0	2	50	250	0.3	9.0
176	3	18	0.60	15	98	2.6	14.0	2	50	250	1.9	12.0
177	3	10	0.63	14	120	1.8	16.0	2	50	250	0.3	13.0

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
119	5.3	27	120	39	68	29	5.5	1.2	0.25	2.7	0.36
120	3.0	540	130	34	57	24	5.1	1.1	0.25	3.0	0.39
121	3.4	51	160	33	56	20	5.1	1.3	0.25	3.1	0.40
122	3.8	82	190	32	52	21	4.7	1.1	0.25	2.8	0.41
124	6.7	14	170	50	86	32	6.6	1.5	0.80	3.4	0.50
125	19.0	42	320	41	73	33	6.2	1.5	0.25	3.1	0.42
126	23.0	22	280	39	63	27	5.2	1.3	0.25	2.8	0.46
127	14.0	14	220	29	46	21	3.9	0.9	0.25	2.2	0.32
128	9.2	22	140	30	49	20	4.1	1.0	0.25	2.2	0.34
129	8.6	31	310	46	76	28	6.4	1.4	0.25	3.2	0.45
130	9.1	15	240	45	89	39	6.9	1.3	0.25	3.6	0.48
131	6.8	100	120	43	86	36	7.0	1.3	0.25	3.4	0.47
132	5.8	25	160	45	86	36	7.0	1.8	0.25	3.3	0.48
133	4.2	54	120	48	94	40	7.4	1.3	0.25	3.8	0.51
134	5.3	64	100	47	93	42	7.3	1.5	1.00	3.6	0.49
135	4.7	32	150	44	88	42	7.0	1.6	0.25	3.6	0.56
136	5.9	86	150	43	84	37	6.8	1.5	0.25	3.6	0.58
137	6.1	79	120	45	90	33	7.3	1.8	0.25	3.8	0.55
138	4.3	170	25	39	79	33	6.3	1.3	1.30	3.3	0.54
139	5.3	74	95	45	93	35	7.1	1.7	1.00	3.9	0.60
140	5.7	84	160	59	120	55	9.6	1.8	1.30	3.3	0.52
141	6.3	150	150	41	84	35	6.4	1.5	0.25	3.2	0.44
142	4.6	72	100	39	82	24	6.3	1.4	0.25	3.5	0.48
143	4.9	70	110	38	81	34	6.1	1.2	0.70	3.2	0.43
144	6.0	85	170	39	79	38	6.1	1.4	0.25	3.1	0.46
145	6.1	43	110	37	70	30	5.8	1.2	0.25	3.2	0.36
146	5.8	45	100	37	74	25	5.8	1.1	0.25	2.8	0.45
147	5.5	32	160	35	72	31	5.7	1.2	0.25	2.9	0.39
148	4.7	62	120	35	72	30	5.7	1.2	0.25	2.8	0.38
149	5.4	63	150	35	70	30	5.8	1.4	1.20	3.0	0.48
150	4.4	34	100	24	50	26	3.9	0.8	0.25	1.7	0.30
151	3.4	110	50	21	41	19	3.4	0.8	0.25	1.8	0.28
152	2.9	60	97	33	67	25	5.1	0.9	0.25	2.5	0.40
153	1.9	20	25	31	62	28	4.8	1.0	0.25	2.4	0.35
154	2.9	19	81	29	57	19	4.4	0.8	0.90	2.4	0.33
155	2.1	13	25	28	56	20	4.4	0.8	0.25	2.1	0.37
156	2.7	15	70	27	55	28	4.2	0.9	0.25	1.9	0.31
157	1.3	18	100	25	51	10	4.0	0.7	0.25	1.7	0.30
158	1.7	10	120	26	55	19	4.1	0.9	0.25	2.2	0.33
159	2.7	18	88	30	63	22	4.8	1.0	0.25	2.5	0.37
160	2.9	19	130	35	69	30	5.6	1.2	0.25	2.8	0.42
161	3.0	38	160	38	74	27	6.4	1.4	1.20	3.8	0.52
162	4.8	59	130	36	70	28	5.9	1.4	0.25	3.2	0.49
163	6.6	44	170	35	71	27	5.5	1.3	0.25	3.2	0.49
164	8.3	31	220	46	87	33	6.8	1.6	0.25	3.9	0.59
165	6.3	25	220	45	92	38	7.1	1.6	0.25	4.0	0.58
166	4.4	70	180	47	86	41	6.9	1.5	0.70	4.3	0.67
167	6.9	17	250	40	78	32	6.1	1.1	0.25	3.3	0.46
168	6.1	43	180	39	77	36	6.2	1.4	0.25	3.3	0.50
169	5.8	50	130	46	97	41	7.4	1.6	0.90	3.5	0.56
170	4.3	31	140	48	97	41	7.3	1.6	1.10	3.7	0.60
171	14.0	24	210	42	83	36	6.3	1.5	0.25	3.2	0.47
172	20.0	11	250	38	73	27	5.6	1.3	0.25	2.8	0.38
173	14.0	88	190	28	53	22	4.3	1.0	0.80	2.2	0.33
174	8.6	19	120	22	44	16	3.3	0.7	0.25	1.7	0.26
175	8.6	88	130	32	62	24	5.0	1.2	0.25	2.4	0.39
176	8.2	26	130	43	86	32	6.5	1.3	1.00	3.4	0.50
177	6.3	28	130	45	86	29	6.9	1.4	0.25	3.6	0.56

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Colour	Formation	Formation Code
			Easting	Northing		(metres)				
						From	To			
178	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	640.1	652.3	N3-N6	Ashville	7950
179	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	655.3	667.5	N3-N6	Ashville	7950
180	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	670.6	682.8	N4-N6, 5YR6/1	Ashville	7950
181	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	685.8	698.0	N4-N6, 5YR6/1	Ashville	7950
182	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	722.4	734.6	N5-N6	Jurassic	20500
183	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	737.6	749.8	N4-N6, 5YR4/1	Jurassic	20500
184	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	752.9	765.1	N4-N6, 5YR4/1	Jurassic	20500
185	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	768.1	780.3	N4-N6, 5YR4/1	Jurassic	20500
186	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	783.3	795.5	N4-N6, 5YR4/1	Jurassic	20500
187	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	798.6	810.8	N4-N6, 5YR4/1	Jurassic	20500
188	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	813.8	826.0	N4-N6, 5YR4/1	Jurassic	20500
189	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	829.1	841.2	N4-N6, 5YR4/1	Jurassic	20500
190	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	844.3	856.5	N4-N6, 5YR4/1	Jurassic	20500
191	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	859.5	871.7	N4-N6, 5Y4/1	Jurassic	20500
192	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	874.8	887.0	N4-N6	Jurassic	20500
193	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	890.0	902.2	N4-N6, 5Y4/1	Jurassic	20500
194	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	905.3	917.5	N4-N6, 5Y4/1	Jurassic	20500
195	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	920.5	932.7	N4-N6, 5Y4/1	Jurassic	20500
196	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	935.7	947.9	N4-N6, 5Y4/1	Reston	22640
197	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	951.0	963.2	N4-N6, 5Y4/1	Reston	22640
198	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	966.2	978.4	N4-N6, 5YR4/1	Reston	22640
199	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	984.5	996.7	N4-N6, 5YR4/1	Amaranth	22650
200	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	999.7	1011.9	N4-N6	Amaranth	22650
201	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1015.0	1027.2	N4-N6, 10R5/4	Amaranth	22650
202	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1034.8	1048.5	N4-N6, 10R5/4	Amaranth	22650
203	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1050.0	1063.8	N4-N6, 10R5/4	Amaranth	22650
204	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1065.3	1072.9	N4-N6, 10R5/4	MC-3	38800
205	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	94.5	106.7	N4-N6	Pierre	2080
206	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	109.7	121.9	N4-N6	Pierre	2080
207	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	125.0	137.2	N4-N6	Pierre	2080
208	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	140.2	152.4	N4-N6	Pierre	2080
209	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	155.4	167.6	N4-N6	Pierre	2080
210	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	170.7	182.9	N4-N6	Pierre	2080
211	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	185.9	198.1	N4-N6	Pierre	2080
212	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	201.2	213.4	N4-N6	Pierre	2080
213	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	216.4	228.6	N4-N6	Pierre	2080
214	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	231.6	240.8	N4-N6	Pierre	2080
215	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	106.7	118.9	N4-N5, 5YR4/1	Pierre	2080
216	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	125.0	137.2	N4-N5, 5YR4/1	Pierre	2080
217	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	140.2	152.4	N4-N5, 5YR4/1	Pierre	2080
218	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	155.5	167.6	N4-N5, 5YR4/1	Pierre	2080
219	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	170.7	182.9	N4-N5, 5YR4/1	Pierre	2080
220	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	185.9	198.1	N5-N7	Pierre	2080
221	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	201.2	213.4	N5-N7	Pierre	2080
222	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	216.4	228.6	N5-N7	Pierre	2080
223	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	231.6	243.8	N5-N7	Pierre	2080
224	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	246.9	259.1	N5-N7	Pierre	2080
225	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	262.1	274.3	N5-N7	Pierre	2080
226	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	277.4	289.6	N5-N7	Pierre	2080
227	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	292.6	304.8	N5-N7	Pierre	2080
228	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	307.8	320.0	N6-N7	Pierre	2080
229	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	323.1	335.3	N6-N7	Pierre	2080
230	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	338.3	350.5	N4-N6	Pierre	2080
231	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	353.6	365.8	N4-N6, 5Y4/1	Pierre	2080
232	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	368.8	381.0	N3-N6, 5Y4/1	Pierre	2080
233	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	384.0	396.2	N4-N6, 5Y4/1	Pierre	2080
234	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	399.3	411.5	N4-N5	Pierre	2080
235	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	414.5	426.7	N4-N5	Niobrara	3050
236	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	429.8	442.0	5Y4/1, N4-N6	Niobrara	3050
237	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	445.0	457.2	N4-N6	Niobrara	3050

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
Detection Limit	2	5.0	0.5	50	0.5	1.0	1	5	1	0.01	1	1
178	5	2.5	24.0	710	2.6	0.5	18	110	8	4.46	4	1
179	1	2.5	16.0	530	3.1	0.5	15	88	7	3.75	5	1
180	6	2.5	19.0	560	1.8	0.5	15	88	7	3.79	3	1
181	1	2.5	19.0	560	2.9	2.0	20	92	7	3.96	3	1
182	1	2.5	14.0	410	0.3	2.0	25	83	6	5.56	6	1
183	15	2.5	18.0	630	0.3	3.0	23	110	6	5.34	6	1
184	8	2.5	22.0	760	3.5	0.5	23	92	6	7.55	4	1
185	1	2.5	20.0	640	0.3	2.0	21	95	7	5.79	4	1
186	1	2.5	19.0	620	2.8	0.5	16	94	6	4.90	5	1
187	1	2.5	17.0	470	0.3	2.0	36	64	4	4.48	4	1
188	9	2.5	18.0	470	2.0	0.5	24	84	5	4.85	4	1
189	1	2.5	20.0	560	3.0	6.0	25	89	6	5.51	4	1
190	1	2.5	10.0	640	0.3	10.0	19	69	6	3.84	5	1
191	1	2.5	11.0	480	1.5	10.0	20	78	6	3.83	5	1
192	1	2.5	12.0	380	0.3	7.0	19	82	6	4.70	5	1
193	1	2.5	9.0	440	1.1	10.0	24	84	5	3.91	6	1
194	1	2.5	17.0	380	2.1	6.0	24	88	6	4.38	7	1
195	1	2.5	14.0	470	0.3	4.0	19	94	6	3.98	5	1
196	6	2.5	12.0	400	1.5	6.0	17	90	5	3.59	5	1
197	3	2.5	12.0	480	2.2	10.0	16	88	6	3.35	5	1
198	1	2.5	14.0	510	0.3	8.0	18	86	5	3.72	4	1
199	1	2.5	11.0	380	1.7	5.0	16	85	6	3.30	5	1
200	1	2.5	16.0	380	0.3	6.0	15	81	6	3.40	4	1
201	1	2.5	16.0	600	0.3	7.0	21	81	5	3.54	6	1
202	1	2.5	14.0	520	0.3	6.0	19	79	5	3.20	7	1
203	1	2.5	14.0	510	2.0	8.0	17	73	5	3.11	5	1
204	1	2.5	18.0	280	3.1	11.0	14	74	5	2.94	4	1
205	1	2.5	12.0	480	2.3	0.5	10	72	5	2.30	2	1
206	1	2.5	13.0	390	2.9	0.5	14	69	5	2.59	5	1
207	1	2.5	18.0	730	2.8	0.5	17	96	8	3.24	6	1
208	1	2.5	23.0	900	3.9	0.5	20	110	8	3.78	5	1
209	1	2.5	21.0	880	4.4	0.5	22	120	8	4.41	5	1
210	1	2.5	25.0	1000	3.5	0.5	18	110	8	4.46	4	1
211	7	2.5	13.0	740	4.1	0.5	18	110	6	3.14	6	1
212	1	2.5	24.0	820	3.8	0.5	19	100	7	3.34	5	1
213	1	2.5	19.0	800	4.4	0.5	19	91	8	3.70	5	1
214	1	2.5	13.0	810	2.8	0.5	19	92	8	3.59	5	1
215	1	2.5	16.0	1100	3.2	2.0	23	110	8	4.45	5	1
216	1	2.5	12.0	720	2.7	3.0	21	84	5	3.83	5	1
217	1	2.5	11.0	770	3.1	0.5	23	96	6	3.65	4	1
218	1	2.5	10.0	560	3.0	0.5	22	94	6	3.70	5	1
219	1	2.5	9.3	730	2.4	0.5	15	91	7	3.10	4	1
220	1	2.5	10.0	700	0.3	0.5	21	93	6	4.48	5	1
221	1	2.5	13.0	720	0.3	0.5	20	84	6	4.21	4	1
222	1	2.5	13.0	840	3.3	0.5	18	87	7	4.68	4	1
223	1	2.5	14.0	690	2.5	0.5	20	84	5	5.43	5	1
224	1	2.5	10.0	750	2.7	2.0	19	77	4	4.28	3	1
225	1	2.5	7.2	680	0.3	0.5	15	75	5	3.25	4	1
226	6	2.5	7.6	730	1.7	0.5	16	84	7	3.20	3	1
227	1	2.5	7.4	560	1.5	0.5	15	73	7	3.71	3	1
228	1	2.5	7.8	700	0.3	0.5	19	73	7	4.38	4	1
229	1	2.5	17.0	840	0.3	3.0	38	93	8	7.33	4	1
230	4	2.5	17.0	810	3.9	0.5	28	100	8	4.55	5	1
231	1	2.5	14.0	750	3.7	0.5	21	93	7	4.71	5	1
232	1	2.5	13.0	710	3.6	0.5	22	100	7	4.78	4	1
233	1	2.5	10.0	590	0.3	0.5	23	87	7	3.92	4	1
234	1	2.5	27.0	1000	5.2	0.5	21	140	10	4.99	6	1
235	12	2.5	33.0	1000	5.3	0.5	23	140	10	6.18	6	1
236	3	2.5	11.0	660	2.6	2.0	16	77	5	3.93	3	1
237	1	2.5	12.0	660	3.0	0.5	20	89	7	4.45	4	1

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
Detection Limit	5	1	0.01	20	15	0.1	0.1	3	100	500	0.5	0.2
178	3	18	0.65	17	100	2.0	17.0	2	50	250	0.3	14.0
179	3	9	0.73	14	130	1.0	14.0	2	50	250	0.3	12.0
180	3	8	0.79	15	120	1.5	14.0	2	50	250	1.3	13.0
181	3	12	0.71	140	130	1.9	15.0	2	50	250	0.3	14.0
182	3	10	0.59	17	79	1.4	15.0	2	50	250	0.3	13.0
183	3	11	0.63	20	75	2.1	18.0	2	50	250	0.3	16.0
184	3	10	0.55	19	100	2.0	16.0	2	50	250	0.3	11.0
185	3	11	0.61	19	100	1.8	15.0	4	50	250	0.3	12.0
186	3	10	0.71	18	99	1.8	14.0	2	50	250	0.3	11.0
187	3	10	0.41	15	47	1.1	9.4	2	50	250	0.3	8.7
188	3	11	0.54	15	84	1.4	13.0	2	50	250	1.4	11.0
189	3	18	0.50	18	89	2.0	13.0	2	50	250	0.3	10.0
190	3	6	0.49	15	79	0.9	12.0	2	50	250	0.3	9.9
191	3	6	0.57	18	79	0.8	12.0	2	50	250	0.3	11.0
192	3	1	0.51	17	120	1.1	13.0	2	50	250	1.2	11.0
193	3	10	0.47	15	90	1.1	13.0	2	50	250	1.1	10.0
194	3	10	0.46	15	97	1.3	12.0	2	50	250	0.3	10.0
195	3	7	0.36	14	120	1.3	13.0	2	50	250	0.3	12.0
196	3	9	0.36	14	110	1.2	12.0	2	50	250	0.3	11.0
197	3	4	0.31	12	98	1.2	12.0	6	50	250	0.3	11.0
198	3	1	0.34	13	92	1.4	12.0	2	50	250	0.3	12.0
199	3	4	0.34	12	74	1.0	12.0	2	50	250	1.0	10.0
200	3	7	0.34	13	93	1.5	11.0	2	50	250	0.3	11.0
201	3	6	0.44	14	82	1.3	12.0	2	50	250	1.4	10.0
202	3	6	0.63	14	76	1.5	11.0	2	50	250	1.2	11.0
203	3	5	0.43	11	73	1.4	11.0	2	50	250	0.3	9.3
204	3	7	0.32	11	86	1.8	9.6	2	50	250	0.3	8.3
205	3	3	0.43	13	67	0.8	8.1	2	50	250	1.0	6.7
206	3	1	0.60	14	84	0.9	9.1	2	50	250	1.5	8.2
207	3	4	0.66	15	100	0.6	12.0	2	50	250	0.3	11.0
208	3	4	0.77	180	120	1.0	14.0	2	50	250	1.4	11.0
209	3	6	0.75	17	94	1.1	14.0	2	50	250	1.1	11.0
210	3	1	0.71	16	93	1.1	13.0	2	50	250	0.3	11.0
211	3	1	0.67	15	110	0.9	12.0	2	50	250	0.3	10.0
212	3	1	0.74	15	96	0.9	13.0	2	50	250	0.3	10.0
213	3	4	0.79	15	100	1.0	13.0	2	50	250	0.3	9.5
214	3	1	0.73	16	90	1.0	13.0	2	50	250	0.3	10.0
215	3	6	0.74	17	140	1.4	13.0	2	50	570	0.3	10.0
216	3	3	0.69	14	98	0.7	10.0	2	50	500	0.3	8.8
217	3	5	0.57	15	93	0.8	12.0	2	50	250	1.4	9.5
218	3	2	0.57	15	95	0.8	12.0	2	50	250	1.4	9.4
219	3	1	0.55	13	87	0.8	12.0	2	50	250	1.2	9.1
220	3	6	0.60	15	120	0.7	12.0	2	50	250	0.3	9.2
221	3	1	0.61	15	87	0.9	12.0	2	50	250	1.6	8.5
222	3	1	0.66	15	70	0.7	12.0	2	50	250	1.7	8.6
223	3	6	0.68	15	93	0.9	12.0	2	50	250	2.2	8.6
224	3	1	0.67	15	82	0.7	11.0	2	50	250	0.3	9.6
225	3	5	0.59	14	71	0.9	9.2	2	50	250	0.3	8.4
226	3	1	0.69	17	63	0.7	12.0	2	50	250	0.3	8.2
227	3	7	0.65	15	57	1.0	10.0	2	50	250	0.3	7.6
228	3	1	0.69	16	75	0.9	11.0	2	50	250	0.3	7.5
229	3	1	0.76	18	79	1.2	17.0	2	50	250	0.3	9.2
230	3	9	0.85	17	95	3.5	15.0	6	50	250	0.3	9.2
231	3	9	0.87	19	110	2.3	14.0	2	50	250	1.2	9.8
232	3	8	0.86	19	87	1.7	14.0	2	50	250	0.7	10.0
233	3	1	0.77	18	80	1.1	13.0	2	50	250	2.2	9.7
234	3	8	0.89	19	130	4.6	19.0	2	50	250	0.3	13.0
235	3	9	0.85	17	140	4.4	20.0	2	50	250	0.3	13.0
236	3	1	0.69	17	87	1.4	11.0	2	50	250	0.3	8.2
237	3	1	0.72	17	94	1.8	13.0	2	50	250	0.3	8.9

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
178	9.0	15	130	44	90	39	7.0	1.4	0.25	3.3	0.49
179	6.7	13	130	39	79	26	5.9	1.4	0.25	3.2	0.43
180	5.2	19	130	41	83	31	6.3	1.2	0.70	3.2	0.47
181	5.5	30	120	43	83	36	6.5	1.5	0.25	3.4	0.52
182	5.0	120	150	39	78	34	5.9	1.2	0.25	3.4	0.48
183	7.2	57	25	59	130	56	11.0	2.0	1.30	4.7	0.64
184	7.5	38	140	40	81	28	6.4	1.4	0.25	3.2	0.49
185	5.9	55	110	41	87	35	6.7	1.5	0.25	3.3	0.52
186	6.1	36	160	38	76	28	6.1	1.2	0.25	3.0	0.44
187	3.7	230	25	28	60	22	4.7	1.0	0.25	2.3	0.37
188	4.8	92	110	37	77	28	5.8	1.3	0.25	3.1	0.40
189	8.6	83	140	43	89	38	6.7	1.3	1.20	3.2	0.50
190	4.0	72	92	43	92	34	6.2	1.2	1.40	2.9	0.37
191	4.1	63	51	38	77	31	5.9	1.1	0.90	2.6	0.44
192	4.8	140	50	38	78	34	5.8	1.2	0.25	2.7	0.37
193	4.1	50	100	41	84	36	6.1	1.4	0.25	2.4	0.10
194	4.6	80	120	40	82	32	4.9	1.2	0.25	3.0	0.44
195	4.5	34	190	38	77	27	4.8	1.3	0.25	3.0	0.41
196	4.3	35	140	35	73	29	4.7	1.1	1.10	2.7	0.38
197	4.1	22	120	34	69	22	4.4	1.1	0.90	2.5	0.33
198	5.1	41	160	35	68	28	4.6	1.2	0.25	2.6	0.37
199	3.9	18	110	33	71	29	4.4	1.1	0.25	2.7	0.39
200	5.7	29	110	34	70	31	4.4	1.2	0.25	2.7	0.34
201	4.9	93	100	32	69	31	4.4	1.1	1.00	2.9	0.31
202	5.7	55	120	32	68	24	4.5	1.1	0.25	2.8	0.33
203	3.6	27	130	31	64	25	4.0	1.0	0.25	2.3	0.32
204	5.2	16	120	27	53	24	3.7	1.0	0.70	2.2	0.30
205	1.9	16	97	23	46	17	3.1	0.8	0.25	1.6	0.19
206	3.5	43	130	27	54	16	3.7	0.9	0.25	2.3	0.29
207	2.8	44	90	36	74	28	4.5	1.2	0.25	2.7	0.40
208	4.1	29	150	37	80	32	4.8	1.2	0.25	2.8	0.45
209	3.3	86	190	36	71	22	4.6	1.2	0.25	2.8	0.39
210	3.1	30	160	34	68	23	4.4	1.1	0.80	2.6	0.32
211	3.5	41	120	32	66	23	4.1	1.0	0.25	2.6	0.38
212	2.6	31	160	32	63	26	4.2	1.2	0.90	2.6	0.36
213	2.6	53	110	31	60	25	4.1	1.1	0.25	2.7	0.37
214	2.9	54	140	31	62	25	4.1	1.0	0.80	2.6	0.32
215	3.9	60	190	35	68	25	4.5	1.1	0.25	2.9	0.41
216	2.6	68	150	29	56	24	3.7	0.9	1.70	2.4	0.34
217	3.1	53	130	32	61	27	4.1	1.0	0.25	2.8	0.40
218	2.2	67	120	32	63	24	4.1	1.1	0.25	2.6	0.34
219	2.8	24	150	31	63	21	4.0	1.0	0.80	2.4	0.32
220	2.7	92	200	30	64	21	4.0	1.0	0.25	2.5	0.34
221	1.8	77	150	29	56	21	3.8	1.0	0.25	2.4	0.33
222	2.3	48	140	30	57	26	4.0	1.0	0.25	2.5	0.40
223	1.8	79	170	29	64	22	4.1	0.9	0.25	2.7	0.34
224	2.6	58	140	29	61	29	4.0	1.0	0.25	2.7	0.39
225	1.9	33	130	26	57	17	3.6	0.9	0.25	2.2	0.27
226	2.5	40	100	30	52	22	4.3	1.0	1.10	2.3	0.28
227	1.5	30	140	27	49	21	3.7	0.7	0.25	2.2	0.21
228	2.6	64	120	30	52	23	4.5	0.9	0.90	2.4	0.34
229	2.4	200	170	33	59	27	5.0	1.1	0.25	2.3	0.39
230	5.4	150	200	35	55	24	4.9	1.1	0.25	2.8	0.34
231	3.5	80	140	34	56	23	4.8	1.0	0.80	2.7	0.41
232	4.2	68	110	34	63	25	4.9	1.0	1.00	2.7	0.38
233	4.1	110	120	32	58	26	4.5	0.9	0.25	2.4	0.32
234	5.3	43	180	50	82	37	6.8	1.5	1.50	4.1	0.55
235	6.1	39	260	57	91	41	7.7	1.5	0.25	4.4	0.54
236	3.3	40	140	29	51	20	4.1	0.8	0.25	2.1	0.23
237	4.0	62	130	33	56	20	4.8	1.1	1.00	2.6	0.33

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Well Name	Location	UTM		Map	Measured Interval		Colour	Formation	Formation Code
			Easting	Northing		(metres)				
						From	To			
238	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	460.2	472.4	5Y4/1, N4-N6	Niobrara	3050
239	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	478.5	490.7	5Y4/1, N4-N5	Niobrara	3050
240	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	493.8	506.0	5Y4/1, N4-N5	Niobrara	3050
241	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	509.0	518.2	5Y4/1, N4-N5	Favel	5760
242	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	524.3	536.4	N3-N6	Favel	5760
243	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	539.5	551.7	N3-N4	Ashville	7950
244	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	554.7	566.9	N3-N5	Ashville	7950
245	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	570.0	582.2	N3-N5	Ashville	7950
246	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	585.2	597.4	N3-N5	Ashville	7950
247	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	600.5	612.6	N3-N5	Ashville	7950
248	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	615.7	627.9	N3-N5	Ashville	7950
249	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	630.9	643.1	N3-N5	Ashville	7950
250	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	646.2	658.4	N3-N5	Swan River	9315
251	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	661.4	670.6	N3-N5	Swan River	9315
252	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	734.6	746.8	N3-N4	Jurassic	20500
253	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	749.8	762.0	N3-N4	Jurassic	20500
254	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	765.0	777.2	N3-N4	Jurassic	20500
255	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	780.3	792.5	N3-N5	Jurassic	20500
256	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	795.5	807.7	N4-N5	Jurassic	20500
257	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	810.8	823.0	N4-N5, 5Y4/1	Jurassic	20500
258	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	826.0	838.2	N4-N5, 5Y4/1	Jurassic	20500
259	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	841.2	853.4	N4-N5, 5YR6/1	Jurassic	20500
260	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	856.5	868.7	N4-N5, 5YR6/1	Jurassic	20500
261	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	871.7	883.9	N4-N5, 5YR6/1	Reston	22640
262	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	887.0	899.2	N4-N5, 5YR6/1	Reston	22640
263	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	902.2	914.4	N4-N5, 5Y4/1	Amaranth	22650
264	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	917.4	929.6	N4-N5	Amaranth	22650
265	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	932.7	944.9	N3-N5	Amaranth	22650
266	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	947.9	960.1	N3-N5	Lower Amaranth	22670
267	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	963.2	975.4	N3-N5, 5YR4/1	Lower Amaranth	22670
268	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	978.4	1021.1	N3-N5, 5YR4/1	Charles	36010
269	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1024.1	1036.3	N3-N5, 5YR8/1	MC-2	39100
270	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1039.4	1051.6	N3-N5	MC-1	39300
271	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1054.6	1063.8	N3-N5	MC-1	39300
272	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1066.8	1079.0	N3-N5	MC-1	39300
273	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1082.0	1097.3	N3-N5	U. Lodgepole	39710
274	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1100.3	1112.5	N3-N5	U. Lodgepole	39710
275	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1115.6	1127.8	N3-N5, 5Y6/1	U. Lodgepole	39710
276	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1133.9	1146.0	N3-N5	U. Lodgepole	39710
277	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1149.1	1161.3	N3-N5	U. Lodgepole	39710
278	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1164.3	1176.5	N3-N6	L. Lodgepole	39757
279	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1179.6	1191.7	N3-N6	L. Lodgepole	39757
280	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1194.8	1207.0	N3-N5	L. Lodgepole	39757
281	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1210.1	1222.2	N3-N5, 5Y4/1	L. Lodgepole	39757
282	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1225.3	1237.5	N3-N5, 5Y4/1	L. Lodgepole	39757
283	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1240.5	1252.7	N3-N5, 5Y4/1	L. Lodgepole	39757
284	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1255.8	1268.0	N3-N5, 5Y4/1	Bakken	40700
285	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1271.0	1283.2	N3-N5, 5R4/2	Three Forks	50600
286	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1307.6	1319.8	N3-N5, 5YR4/1	Birdbear	52800
287	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1322.8	1335.0	N5, 5YR4/1	Birdbear	52800
288	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1338.1	1350.3	N3-N5, 5Y4/1	Duperow	53200
289	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1353.3	1359.4	N5, 5YR6/1	Duperow	53200

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
Detection Limit	2	5.0	0.5	50	0.5	1.0	1	5	1	0.01	1	1
238	1	2.5	10.0	640	0.3	0.5	20	85	6	3.62	3	1
239	1	2.5	24.0	880	2.7	3.0	24	81	7	7.02	4	1
240	1	2.5	27.0	720	3.6	4.0	22	87	7	6.75	4	1
241	9	2.5	31.0	860	3.7	2.0	26	91	7	5.93	5	1
242	1	2.5	28.0	680	4.2	10.0	25	80	6	4.94	5	1
243	1	2.5	26.0	670	5.7	19.0	19	66	5	3.78	3	1
244	1	2.5	31.0	410	4.5	15.0	21	64	5	4.35	3	1
245	1	2.5	25.0	570	3.4	9.0	14	77	7	4.09	3	1
246	1	2.5	27.0	570	3.6	9.0	22	80	7	4.81	5	1
247	1	2.5	30.0	620	3.5	8.0	22	94	8	5.03	4	1
248	6	2.5	25.0	700	4.5	6.0	19	89	9	4.96	5	1
249	1	2.5	27.0	560	3.0	4.0	19	94	9	5.04	4	1
250	1	2.5	22.0	440	3.4	3.0	20	90	8	4.74	5	1
251	1	2.5	24.0	610	0.3	4.0	26	92	7	4.46	3	1
252	6	2.5	33.0	600	3.6	3.0	21	85	6	6.28	4	1
253	6	2.5	30.0	600	4.3	4.0	23	82	8	5.72	4	1
254	1	2.5	21.0	560	3.5	6.0	22	93	8	6.24	5	1
255	1	2.5	23.0	470	2.7	11.0	22	72	5	5.60	5	1
256	5	2.5	14.0	520	0.3	7.0	26	89	9	5.00	5	1
257	1	2.5	15.0	600	0.3	4.0	21	110	8	5.24	7	1
258	1	2.5	25.0	570	2.3	4.0	25	91	6	5.60	7	1
259	1	2.5	12.0	300	1.5	16.0	19	41	2	3.13	3	1
260	1	2.5	13.0	430	0.3	9.0	16	60	4	4.29	4	1
261	6	2.5	18.0	370	2.7	9.0	17	86	5	4.36	5	1
262	1	2.5	15.0	380	2.8	9.0	21	95	7	4.05	5	1
263	1	2.5	14.0	370	0.3	12.0	15	92	5	3.87	6	1
264	1	2.5	11.0	440	2.1	11.0	14	72	4	3.51	4	1
265	1	2.5	15.0	520	0.3	7.0	16	79	5	3.72	5	1
266	1	2.5	18.0	650	2.4	5.0	18	89	5	4.05	5	1
267	1	2.5	18.0	530	0.3	4.0	18	79	5	4.75	6	1
268	1	2.5	11.0	260	1.5	16.0	13	50	3	2.55	4	1
269	1	2.5	12.0	240	1.2	16.0	12	59	3	2.36	2	1
270	6	2.5	17.0	670	0.3	14.0	11	61	5	2.81	4	1
271	1	2.5	15.0	280	2.3	13.0	13	55	4	2.53	3	1
272	1	2.5	18.0	430	0.3	11.0	15	65	5	3.29	5	1
273	1	2.5	13.0	310	2.2	15.0	13	64	4	2.79	3	1
274	1	2.5	15.0	430	0.3	9.0	13	75	5	3.44	5	1
275	1	2.5	18.0	420	2.2	9.0	15	74	5	3.30	4	1
276	1	2.5	14.0	330	0.3	8.0	17	69	5	2.92	5	1
277	1	2.5	12.0	340	1.7	9.0	17	72	5	3.08	4	1
278	1	2.5	17.0	420	0.3	7.0	15	79	5	3.57	5	1
279	1	2.5	13.0	350	0.3	16.0	14	63	4	2.59	3	1
280	1	2.5	16.0	390	1.9	10.0	18	78	5	3.58	5	1
281	1	2.5	15.0	630	0.3	11.0	14	72	6	3.32	4	1
282	1	2.5	17.0	350	0.3	9.0	17	86	6	3.78	5	1
283	7	2.5	15.0	380	0.3	7.0	15	78	5	3.59	5	1
284	1	2.5	22.0	420	2.6	9.0	17	76	5	4.01	5	1
285	1	2.5	20.0	490	2.6	9.0	18	83	6	3.79	5	1
286	1	2.5	31.0	390	0.3	10.0	18	77	5	5.62	5	1
287	1	2.5	11.0	170	2.4	25.0	10	43	2	2.11	2	1
288	1	2.5	16.0	160	2.7	18.0	13	62	4	3.16	2	1
289	1	2.5	14.0	270	2.6	27.0	10	34	2	1.99	1	1

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
Detection Limit	5	1	0.01	20	15	0.1	0.1	3	100	500	0.5	0.2
238	3	3	0.71	17	100	1.0	12.0	2	50	250	0.3	8.6
239	3	7	0.72	19	86	2.2	14.0	2	50	250	0.3	8.7
240	3	11	0.70	18	120	2.7	14.0	2	50	250	1.4	8.9
241	3	10	0.70	19	110	3.1	15.0	2	50	250	0.3	9.9
242	3	17	0.55	18	84	2.7	13.0	2	50	250	0.3	8.5
243	3	27	0.41	16	100	2.9	9.7	2	50	250	0.3	6.6
244	3	22	0.53	17	70	2.2	11.0	2	50	250	0.3	7.2
245	3	12	0.57	15	75	2.1	12.0	2	50	250	1.2	8.2
246	3	15	0.59	17	87	2.6	13.0	2	50	250	0.3	10.0
247	3	20	0.65	18	96	2.4	15.0	2	50	250	1.1	10.0
248	3	14	0.77	18	140	1.9	16.0	4	50	540	1.4	12.0
249	3	17	0.71	19	140	1.9	16.0	2	50	250	1.1	12.0
250	3	13	0.62	19	110	1.7	15.0	2	50	250	1.1	12.0
251	3	8	0.55	17	76	1.8	13.0	2	50	250	1.3	10.0
252	3	21	0.48	16	98	2.9	13.0	2	50	250	0.3	10.0
253	3	15	0.53	17	100	2.7	14.0	4	50	1000	1.1	11.0
254	3	14	0.48	19	120	2.1	16.0	2	50	250	0.3	12.0
255	3	7	0.48	17	100	1.8	13.0	2	50	250	0.3	10.0
256	3	14	0.58	19	85	1.6	16.0	2	50	250	0.3	12.0
257	3	1	0.57	19	130	1.8	17.0	2	50	250	1.5	13.0
258	3	12	0.54	21	110	2.9	15.0	2	50	250	0.3	13.0
259	3	6	0.35	15	7.5	0.7	6.3	2	50	250	1.2	5.6
260	3	10	0.41	18	74	1.0	11.0	2	50	250	1.4	9.1
261	3	15	0.44	20	100	1.4	13.0	2	50	250	0.3	11.0
262	3	7	0.32	20	130	1.4	15.0	2	50	250	0.3	13.0
263	3	1	0.26	18	75	1.2	13.0	2	50	250	0.3	11.0
264	3	7	0.26	170	90	1.0	12.0	2	50	1100	1.4	9.7
265	3	10	0.36	16	78	1.3	13.0	2	50	250	0.3	12.0
266	3	9	0.39	17	130	1.2	14.0	2	50	250	0.3	13.0
267	3	10	0.44	16	120	1.3	14.0	2	50	250	0.3	11.0
268	3	6	0.31	15	42	0.8	8.0	2	50	250	0.3	7.0
269	3	2	0.24	12	66	0.8	8.3	2	50	930	0.3	7.3
270	3	10	0.27	15	58	1.0	9.6	2	50	1500	0.3	8.0
271	3	9	0.25	14	71	1.1	8.8	2	50	1200	0.3	7.0
272	3	7	0.32	130	94	1.1	12.0	2	50	670	0.3	10.0
273	3	6	0.24	13	50	0.9	9.3	2	50	250	1.3	8.1
274	3	8	0.29	14	80	1.0	12.0	2	50	570	1.2	11.0
275	3	7	0.30	16	75	1.4	11.0	2	50	250	0.3	11.0
276	3	5	0.30	15	65	0.8	11.0	2	50	710	0.3	9.3
277	3	11	0.28	15	74	0.9	11.0	2	50	250	0.3	11.0
278	3	8	0.32	15	95	0.8	14.0	2	50	250	0.3	12.0
279	3	4	0.23	13	44	0.9	9.3	2	50	840	0.3	8.5
280	3	13	0.39	15	100	1.1	13.0	2	50	590	0.3	11.0
281	3	6	0.26	13	84	1.0	12.0	2	50	670	0.3	9.9
282	3	10	0.31	16	95	0.9	13.0	2	50	250	0.3	11.0
283	3	2	0.28	15	87	1.0	12.0	2	50	250	1.6	11.0
284	3	11	0.27	15	83	2.1	12.0	2	50	250	0.3	11.0
285	3	8	0.31	16	120	1.6	13.0	2	50	250	0.9	11.0
286	3	18	0.36	15	86	1.2	12.0	2	50	250	0.3	10.0
287	3	10	0.14	11	55	0.7	5.5	2	50	250	0.3	4.5
288	3	10	0.22	13	72	1.5	8.5	2	50	250	1.4	6.5
289	3	11	0.12	10	28	1.0	4.5	2	50	250	0.3	3.6

Appendix 2 Continued
Black Shale Drill Chip Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
238	2.2	57	84	31	52	21	4.4	0.7	0.25	2.1	0.32
239	6.6	84	190	33	59	22	4.7	1.1	0.25	2.8	0.32
240	12.0	55	180	37	67	31	5.5	1.2	0.25	3.0	0.42
241	12.0	86	230	37	67	27	5.4	1.3	0.25	3.1	0.37
242	10.0	140	250	30	50	27	4.4	1.0	1.10	2.3	0.34
243	13.0	51	200	24	41	20	3.5	0.8	0.25	2.0	0.29
244	9.8	66	190	26	46	20	3.6	1.0	0.25	2.1	0.27
245	7.0	45	190	30	48	22	4.3	0.9	1.20	2.3	0.31
246	8.6	110	210	34	62	19	4.6	1.1	1.00	2.7	0.31
247	8.4	94	150	36	62	29	5.0	1.1	1.40	2.8	0.41
248	6.6	60	140	39	67	29	5.5	1.2	0.25	2.8	0.40
249	8.4	44	110	41	70	22	6.0	1.2	0.25	3.0	0.44
250	9.5	77	180	40	69	32	6.1	1.3	0.25	3.6	0.47
251	7.2	150	120	35	65	22	4.9	1.1	0.90	2.6	0.28
252	15.0	81	140	37	63	27	5.4	1.2	1.60	2.6	0.40
253	8.3	110	190	38	64	24	5.3	1.1	1.20	2.7	0.39
254	7.7	85	190	44	75	35	6.0	1.3	1.50	3.4	0.44
255	5.3	61	100	38	66	29	5.2	1.1	0.80	2.6	0.38
256	5.2	96	110	45	74	33	6.0	1.3	0.25	3.1	0.40
257	7.1	54	97	46	83	32	6.3	1.3	0.25	2.9	0.46
258	11.0	85	70	48	91	34	7.5	1.9	1.10	3.8	0.55
259	2.7	110	25	20	40	13	3.4	0.7	0.25	1.3	0.20
260	6.2	79	110	34	71	30	5.6	1.3	0.25	2.5	0.35
261	4.9	63	110	37	79	34	5.7	1.2	0.25	2.9	0.40
262	6.4	73	110	42	89	32	6.2	1.4	0.25	3.3	0.46
263	4.9	40	75	38	77	26	5.7	1.4	0.25	2.7	0.43
264	4.6	33	110	34	69	24	5.1	1.1	0.25	2.4	0.40
265	6.4	29	98	38	79	39	5.9	1.4	0.25	2.9	0.47
266	5.4	49	92	41	82	31	6.3	1.2	0.80	3.1	0.44
267	5.3	49	160	40	81	32	6.5	1.5	0.25	3.3	0.50
268	3.8	66	25	23	47	16	3.8	0.8	0.25	1.6	0.27
269	4.0	31	25	24	49	21	3.8	0.8	0.25	1.6	0.25
270	4.0	15	66	27	54	22	4.2	0.7	0.25	2.0	0.31
271	4.0	55	86	24	52	21	3.8	0.9	0.25	1.9	0.29
272	5.6	32	110	34	69	26	5.1	1.3	0.25	2.6	0.37
273	3.8	49	80	27	55	19	4.2	0.8	0.25	2.0	0.31
274	4.3	27	89	35	73	27	5.5	1.2	0.25	2.8	0.40
275	5.3	40	69	35	71	35	5.6	1.3	0.70	3.0	0.37
276	3.4	88	25	33	68	28	5.1	1.3	0.80	2.5	0.43
277	4.9	67	120	33	73	23	5.3	1.3	0.25	2.5	0.33
278	5.6	30	25	40	76	35	6.2	1.3	0.80	3.1	0.47
279	3.7	60	50	27	55	20	4.2	1.0	0.25	2.2	0.26
280	4.5	52	110	39	79	32	6.0	1.3	1.00	3.0	0.41
281	3.4	27	70	33	66	29	5.2	1.1	0.25	2.5	0.40
282	4.6	53	120	36	74	27	5.6	1.2	0.80	2.8	0.40
283	4.3	57	100	35	68	23	5.5	1.1	0.25	2.8	0.37
284	5.2	130	150	35	76	28	5.5	1.0	0.90	2.8	0.39
285	3.5	76	93	37	76	31	5.9	1.2	1.10	3.2	0.40
286	2.6	300	110	33	68	29	5.2	1.0	1.20	2.9	0.30
287	3.5	52	68	17	38	17	2.8	0.6	0.25	1.2	0.18
288	4.2	38	120	25	47	15	3.8	0.9	0.25	1.7	0.26
289	2.4	52	69	13	30	10	2.0	0.4	0.25	0.9	0.16

Appendix 3
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation	Formation Code
			Easting	Northing		From	To			
Detection Limit										
1	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	128.0	140.2	N5 - 5Y6/1	Boissevain	2070
2	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	143.3	155.5	N4 - N5	Boissevain	2070
3	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	158.5	170.7	N5 - 5Y6/1	Pierre	2080
4	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	173.7	185.9	N5 - 5Y5/1	Pierre	2080
5	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	189.0	204.2	N4 - N5	Pierre	2080
6	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	207.3	219.5	N4 - N5	Niobrara	3050
7	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	222.5	237.7	N4 - N5	Niobrara	3050
8	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	240.8	253.0	N5	Morden	5670
9	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	256.0	259.1	N4 - N5	Morden	5670
10	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	304.8	307.8	N4 - N5	Keld	5800
11	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	335.3	344.4	N4 - N5	Ashville	7950
12	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	362.7	374.9	N4	Ashville	7950
13	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	384.0	399.3	N4	Swan River	9315
14	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	402.3	414.5	N4 - N6	Jurassic	20500
15	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	417.6	429.8	N4	Jurassic	20500
16	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	432.8	445.0	N5	Jurassic	20500
17	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	448.1	460.2	N4	Jurassic	20500
18	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	463.3	475.5	N5	Jurassic	20500
19	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	478.5	490.7	N5	Jurassic	20500
20	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	193.8	509.0	N5	Jurassic	20500
21	Dalny	10-36-02-26W1	366425	5448050	62F/02	36.6	48.8	N6	Pierre	2080
22	Dalny	10-36-02-26W1	366425	5448050	62F/02	51.8	64.0	N6	Pierre	2080
23	Dalny	10-36-02-26W1	366425	5448050	62F/02	67.1	79.2	N6	Pierre	2080
24	Dalny	10-36-02-26W1	366425	5448050	62F/02	82.3	91.4	N6	Pierre	2080
25	Dalny	10-36-02-26W1	366425	5448050	62F/02	100.6	112.8	N6	Pierre	2080
26	Dalny	10-36-02-26W1	366425	5448050	62F/02	115.8	128.0	N6	Pierre	2080
27	Dalny	10-36-02-26W1	366425	5448050	62F/02	131.1	143.3	N6	Pierre	2080
28	Dalny	10-36-02-26W1	366425	5448050	62F/02	146.3	158.5	N5 - N6	Pierre	2080
29	Dalny	10-36-02-26W1	366425	5448050	62F/02	161.5	173.7	N5 - N6	Pierre	2080
30	Dalny	10-36-02-26W1	366425	5448050	62F/02	176.8	189.0	N5 - N6	Pierre	2080
31	Dalny	10-36-02-26W1	366425	5448050	62F/02	192.6	204.2	N5 - N6	Pierre	2080
32	Dalny	10-36-02-26W1	366425	5448050	62F/02	207.3	219.5	N5 - N6	Pierre	2080
33	Dalny	10-36-02-26W1	366425	5448050	62F/02	222.5	234.7	N5 - N6	Pierre	2080
34	Dalny	10-36-02-26W1	366425	5448050	62F/02	237.7	246.9	N6 - N7	Pierre	2080
35	Dalny	10-36-02-26W1	366425	5448050	62F/02	249.9	262.1	N6 - N7	Millwood	3010
36	Dalny	10-36-02-26W1	366425	5448050	62F/02	265.2	277.4	N6 - N7	Millwood	3010
37	Dalny	10-36-02-26W1	366425	5448050	62F/02	280.4	292.6	N5 - N6	Millwood	3010
38	Dalny	10-36-02-26W1	366425	5448050	62F/02	295.7	307.8	N4 - N5	Millwood	3010
39	Dalny	10-36-02-26W1	366425	5448050	62F/02	310.9	323.1	N4 - N5	Millwood	3010
40	Dalny	10-36-02-26W1	366425	5448050	62F/02	326.1	338.3	N4 - N5	Pembina	3020
41	Dalny	10-36-02-26W1	366425	5448050	62F/02	341.1	353.6	N4 - N5	Pembina	3020
42	Dalny	10-36-02-26W1	366425	5448050	62F/02	356.6	368.8	N4 - N5	Niobrara	3050
43	Dalny	10-36-02-26W1	366425	5448050	62F/02	371.9	384.0	N4 - N5	Niobrara	3050
44	Dalny	10-36-02-26W1	366425	5448050	62F/02	387.1	399.3	N4 - N5	Niobrara	3050
45	Dalny	10-36-02-26W1	366425	5448050	62F/02	402.3	414.5	N4 - N5	Niobrara	3050
46	Dalny	10-36-02-26W1	366425	5448050	62F/02	417.6	429.8	N3 - N5	Morden	5670
47	Dalny	10-36-02-26W1	366425	5448050	62F/02	432.8	445.0	N3 - N5	Morden	5670
48	Dalny	10-36-02-26W1	366425	5448050	62F/02	448.1	460.2	N3 - N5	Assiniboine	5770
49	Dalny	10-36-02-26W1	366425	5448050	62F/02	463.3	475.5	N3 - N5	Keld	5800
50	Dalny	10-36-02-26W1	366425	5448050	62F/02	478.5	490.7	N3 - N5	Belle Fourche	7970
51	Dalny	10-36-02-26W1	366425	5448050	62F/02	493.8	506.0	N3-N4	Belle Fourche	7970
52	Dalny	10-36-02-26W1	366425	5448050	62F/02	509.0	521.2	N3-N4	Belle Fourche	7970
53	Dalny	10-36-02-26W1	366425	5448050	62F/02	524.3	536.4	N3-N4	Belle Fourche	7970
54	Dalny	10-36-02-26W1	366425	5448050	62F/02	539.5	551.7	N3-N4	Westgate	8000
55	Dalny	10-36-02-26W1	366425	5448050	62F/02	554.7	566.9	N3-N4, 5Y4/1	Ashville	7960
56	Dalny	10-36-02-26W1	366425	5448050	62F/02	570.0	582.2	N3-N4, 5Y4/1	Swan River	9315
57	Dalny	10-36-02-26W1	366425	5448050	62F/02	585.2	597.4	N3-N4, 5Y4/1	Swan River	9315
58	Dalny	10-36-02-26W1	366425	5448050	62F/02	600.5	612.6	N4-N5	Swan River	9315
59	Dalny	10-36-02-26W1	366425	5448050	62F/02	615.7	627.9	N4-N6	Swan River	9315

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.50	5.0
1	2	26	20	114	0.2	55	6266	148	0.25	2.5
2	1	33	23	139	0.2	60	4078	168	0.25	2.5
3	1	40	22	173	0.2	73	4302	151	0.25	2.5
4	1	56	25	192	0.2	86	3285	173	0.25	2.5
5	11	71	21	218	0.2	72	1923	183	3.70	2.5
6	3	39	26	138	0.2	46	863	150	0.60	2.5
7	5	43	22	154	0.2	60	1358	156	1.10	2.5
8	2	44	26	176	0.2	51	943	147	0.60	2.5
9	5	45	25	164	0.2	56	910	146	0.90	2.5
10	3	45	24	153	0.2	48	1085	139	0.70	2.5
11	22	38	20	133	0.2	50	846	277	1.20	2.5
12	10	42	25	125	0.2	45	674	143	0.60	2.5
13	5	36	20	114	0.2	40	1527	164	0.50	2.5
14	7	39	25	132	0.2	46	1673	153	0.70	2.5
15	7	38	26	135	0.2	46	1620	162	0.60	2.5
16	5	34	25	104	0.2	45	1167	154	0.50	2.5
17	4	35	22	114	0.2	43	1979	173	0.25	2.5
18	3	33	23	112	0.2	37	1217	148	0.50	2.5
19	3	37	28	113	0.2	41	1100	136	0.70	2.5
20	2	32	18	106	0.2	35	812	838	0.60	2.5
21	2	25	17	85	0.2	25	332	110	0.25	2.5
22	1	14	15	90	0.2	22	199	99	0.25	2.5
23	1	17	16	101	0.2	27	173	111	0.25	2.5
24	1	20	19	113	0.2	31	1574	131	0.25	2.5
25	1	21	21	119	0.2	31	196	133	0.25	2.5
26	1	21	18	114	0.2	32	417	127	0.25	2.5
27	1	20	21	105	0.2	27	296	131	0.25	2.5
28	1	20	16	103	0.2	25	1093	121	0.25	2.5
29	1	23	23	112	0.2	28	347	136	0.25	2.5
30	1	22	17	109	0.2	29	415	139	0.25	2.5
31	1	21	13	104	0.2	29	433	132	0.25	2.5
32	1	18	15	98	0.2	27	1881	118	0.25	2.5
33	1	20	14	91	0.2	32	4476	104	0.25	2.5
34	1	21	14	93	0.2	39	4224	102	0.25	2.5
35	1	23	16	92	0.2	37	6307	104	0.25	2.5
36	1	33	18	128	0.2	46	3903	134	0.25	2.5
37	2	41	15	144	0.2	61	5629	160	0.25	2.5
38	1	41	25	156	0.2	55	3638	169	0.25	2.5
39	2	47	16	191	0.2	66	6593	160	0.60	2.5
40	6	53	21	177	0.2	56	3202	153	2.50	2.5
41	6	69	18	201	0.2	59	907	139	2.00	2.5
42	2	67	15	217	0.2	60	836	173	0.90	2.5
43	5	55	20	182	0.2	53	900	203	1.90	2.5
44	2	34	22	136	0.2	38	609	145	0.70	2.5
45	10	35	14	138	0.2	39	853	186	1.20	2.5
46	19	45	13	254	0.2	54	1254	169	1.60	2.5
47	25	53	20	184	0.2	55	226	110	1.20	2.5
48	25	57	17	208	0.4	59	347	151	1.50	2.5
49	30	37	10	164	0.4	61	183	376	1.70	2.5
50	11	28	9	115	0.5	28	319	425	1.00	2.5
51	15	39	19	367	0.2	46	490	228	2.40	2.5
52	12	49	16	201	0.2	51	216	142	1.40	2.5
53	13	43	21	181	0.5	46	243	118	1.00	2.5
54	6	35	21	161	0.2	39	413	127	0.70	2.5
55	7	32	18	140	0.2	35	982	121	0.25	2.5
56	5	32	21	114	0.2	35	1270	172	0.50	2.5
57	6	29	17	139	0.2	36	2262	157	0.50	2.5
58	4	29	21	131	0.4	34	869	119	0.50	2.5
59	6	28	15	119	0.2	33	1299	103	0.25	2.5

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample	V	Ca	P	Mg	Ti	Al	K	Y	Be
Number	ppm	%	%	%	%	%	%	ppm	ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
1	157	2.47	0.058	1.20	0.20	5.19	1.13	18	1
2	184	0.97	0.074	1.25	0.32	7.31	1.90	20	2
3	222	1.01	0.078	1.31	0.38	9.04	2.41	24	2
4	309	1.16	0.155	1.34	0.36	8.60	2.48	34	2
5	507	3.06	0.152	1.10	0.32	7.76	2.21	32	2
6	290	2.16	0.090	0.91	0.35	8.09	2.24	24	2
7	286	2.04	0.086	0.95	0.35	8.67	2.29	25	2
8	258	0.80	0.089	0.92	0.37	8.97	2.35	30	2
9	247	0.86	0.113	0.87	0.35	8.96	2.27	30	2
10	232	0.74	0.097	0.85	0.37	9.98	2.19	35	2
11	193	13.57	0.066	0.65	0.20	5.65	1.44	18	1
12	182	2.68	0.080	0.81	0.31	9.02	1.92	24	2
13	186	3.13	0.081	0.90	0.28	7.46	1.79	24	2
14	190	3.58	0.092	0.89	0.31	8.00	1.96	28	2
15	177	4.06	0.081	0.96	0.30	7.71	2.04	25	2
16	151	3.78	0.079	1.06	0.30	7.51	2.17	23	2
17	164	4.25	0.101	1.17	0.32	7.91	2.29	26	2
18	146	3.82	0.093	1.15	0.32	7.68	2.26	24	2
19	165	2.78	0.090	1.31	0.36	8.97	2.57	24	2
20	138	3.22	0.079	1.34	0.36	7.64	2.48	23	2
21	197	0.67	0.055	0.76	0.20	4.48	1.09	17	1
22	187	0.36	0.023	0.66	0.19	4.20	0.98	13	1
23	199	0.40	0.030	0.73	0.22	4.68	1.19	17	1
24	224	0.67	0.049	0.90	0.29	6.05	1.59	24	1
25	244	0.46	0.041	0.93	0.32	6.23	1.66	19	2
26	240	0.44	0.038	0.88	0.30	5.83	1.53	19	2
27	238	0.59	0.038	0.82	0.27	5.45	1.44	17	1
28	229	0.95	0.045	0.88	0.27	5.42	1.44	18	1
29	227	0.54	0.066	0.90	0.30	6.04	1.59	20	2
30	227	0.54	0.055	0.93	0.30	6.00	1.53	19	2
31	212	0.65	0.065	0.88	0.27	5.43	1.38	18	1
32	206	0.65	0.058	0.90	0.25	5.07	1.30	18	2
33	196	0.68	0.053	0.84	0.21	4.35	1.14	16	1
34	181	0.89	0.063	0.77	0.20	4.31	1.19	14	1
35	167	1.00	0.044	0.73	0.17	4.28	1.09	16	1
36	207	1.27	0.092	1.00	0.28	6.83	1.91	22	1
37	196	1.85	0.132	1.31	0.32	8.16	2.20	25	1
38	207	1.66	0.241	1.29	0.31	8.30	2.22	29	1
39	250	1.34	0.145	1.31	0.32	8.44	2.15	26	1
40	282	0.98	0.094	1.35	0.32	8.27	1.73	28	1
41	444	0.66	0.114	1.03	0.35	8.56	2.16	32	2
42	485	2.14	0.206	1.27	0.32	8.36	2.10	40	2
43	413	6.01	0.133	0.91	0.30	8.18	2.05	34	2
44	258	3.60	0.077	0.85	0.34	8.67	2.14	24	2
45	258	11.06	0.095	0.86	0.24	6.28	1.62	23	1
46	264	6.80	0.101	1.31	0.25	6.36	1.61	26	1
47	205	1.26	0.063	0.73	0.26	6.36	1.60	23	1
48	247	4.81	0.070	0.69	0.25	6.63	1.56	23	1
49	160	20.52	0.057	0.55	0.12	3.04	0.76	12	1
50	113	25.14	0.052	0.49	0.11	2.71	0.73	13	1
51	178	8.71	0.076	0.83	0.29	7.33	1.52	25	2
52	188	2.33	0.068	0.83	0.36	9.18	1.81	24	2
53	152	1.61	0.068	0.77	0.32	8.01	1.67	24	2
54	141	1.69	0.088	0.86	0.30	7.15	1.61	23	2
55	135	1.63	0.076	0.93	0.29	7.10	1.60	23	2
56	139	4.82	0.077	1.06	0.29	7.32	1.57	24	2
57	122	6.37	0.111	0.71	0.25	5.93	1.30	23	1
58	127	2.06	0.064	0.85	0.30	6.93	1.53	22	2
59	114	1.81	0.074	0.76	0.26	5.83	1.27	20	1

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation	Formation Code
Detection Limit			Easting	Northing		From	To			
60	Dalny	10-36-02-26W1	366425	5448050	62F/02	630.9	643.1	N4-N5, 5Y4/1	Swan River	9315
61	Dalny	10-36-02-26W1	366425	5448050	62F/02	646.2	658.4	N4-N5, 5Y4/1	Jurassic	20500
62	Dalny	10-36-02-26W1	366425	5448050	62F/02	661.4	673.6	N4-N5, 5Y4/1	Jurassic	20500
63	Dalny	10-36-02-26W1	366425	5448050	62F/02	676.7	688.8	N4-N5, 5Y4/1	Jurassic	20500
64	Dalny	10-36-02-26W1	366425	5448050	62F/02	691.9	704.1	N4-N5, 5Y4/1	Jurassic	20500
65	Dalny	10-36-02-26W1	366425	5448050	62F/02	707.1	719.3	N4-N5, 5Y4/1	Jurassic	20500
66	Dalny	10-36-02-26W1	366425	5448050	62F/02	722.4	734.6	N4-N5, 5Y4/1	Jurassic	20500
67	Dalny	10-36-02-26W1	366425	5448050	62F/02	737.6	749.8	N4-N5, 5Y4/1	Jurassic	20500
68	Dalny	10-36-02-26W1	366425	5448050	62F/02	752.9	765.0	N4-N6	Jurassic	20500
69	Dalny	10-36-02-26W1	366425	5448050	62F/02	768.1	780.3	N4-N6	Reston	22640
70	Dalny	10-36-02-26W1	366425	5448050	62F/02	783.3	795.5	N4-N6	Reston	22640
71	Dalny	10-36-02-26W1	366425	5448050	62F/02	798.6	810.8	N4-N6	Reston	22640
72	Dalny	10-36-02-26W1	366425	5448050	62F/02	813.8	826.0	N4-N6	Upper Amaranth	22655
73	Dalny	10-36-02-26W1	366425	5448050	62F/02	829.1	841.2	N4-N6	Upper Amaranth	22655
74	Dalny	10-36-02-26W1	366425	5448050	62F/02	844.3	856.5	N4-N6	Lower Amaranth	22670
75	Dalny	10-36-02-26W1	366425	5448050	62F/02	859.5	871.7	N4-N6	Lower Amaranth	22670
76	Dalny	10-36-02-26W1	366425	5448050	62F/02	874.8	880.9	N4-N6	Lower Amaranth	22670
77	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	112.8	125.0	N6-N7, 5Y6/1	Pierre	2080
78	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	128.0	140.2	N6-N7, 5Y6/1	Pierre	2080
79	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	143.3	155.4	N6-N7, 5Y6/1	Pierre	2080
80	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	158.5	170.7	N6-N7, 5Y6/1	Pierre	2080
81	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	173.7	185.9	N6-N7, 5Y6/1	Pierre	2080
82	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	189.0	201.2	N6-N7, 5Y6/1	Pierre	2080
83	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	204.2	216.4	N6-N7, 5Y6/1	Pierre	2080
84	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	219.5	231.6	N6-N7, 5Y6/1	Pierre	2080
85	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	234.7	246.9	N6-N7, 5Y6/1	Pierre	2080
86	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	249.9	262.1	N6-N7, 5Y6/1	Pierre	2080
87	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	265.2	277.4	N5-N6	Niobrara	3050
88	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	280.4	292.6	N5-N6	Niobrara	3050
89	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	295.7	307.8	N4-N6	Niobrara	3050
90	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	310.9	323.1	N3-N5	Niobrara	3050
91	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	326.1	338.3	N4-N5	Niobrara	3050
92	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	341.4	353.6	N4-N6	Morden	5670
93	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	356.6	368.8	N4-N6	Morden	5670
94	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	371.9	384.0	N4-N6	Morden	5670
95	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	387.1	399.3	N3-N4	Morden	5670
96	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	402.3	414.5	N3-N5	Morden	5670
97	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	417.6	429.8	N3-N5	Keld	5800
98	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	432.8	445.0	N4-N5	Favel	7950
99	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	448.1	460.2	N4-N5, 5YR4/1	Ashville	7950
100	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	163.3	475.5	N4-N5	Ashville	7950
101	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	478.5	490.7	N4-N6	Ashville	7950
102	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	493.8	506.0	N4-N6	Ashville	7950
103	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	509.0	521.2	N4-N6	Ashville	7950
104	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	524.3	536.4	N4-N6, 5YR4/1	Ashville	7950
105	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	539.5	548.6	N4-N6	Swan River	9315
106	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	615.7	927.9	5YR4/1	Jurassic	20500
107	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	630.9	643.1	N4-N5, 5YR4/1	Jurassic	20500
108	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	646.2	658.4	N4-N5, 5YR4/1	Jurassic	20500
109	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	661.4	673.6	N4-N5, 5YR4/1	Jurassic	20500
110	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	676.7	688.8	N4-N5, 5YR4/1	Jurassic	20500
111	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	691.9	704.1	N4-N5, 5YR4/1	Jurassic	20500
112	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	707.1	719.3	N4-N6, 5YR4/1	Reston	22640
113	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	722.4	733.0	N4-N6, 5YR4/1	Reston	22640
114	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	734.6	748.3	N4-N6, 5YR4/1	Reston	22640
115	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	749.8	755.9	N4-N6, 5YR4/1	Reston	22640
116	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	757.4	771.1	N4-N6	Upper Amaranth	22655
117	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	774.2	787.9	N4-N6	Upper Amaranth	22655
118	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	789.4	821.4	N4-N5, 5GY4/1, 10R7/4	Upper Amaranth	22655
119	Owen McAuley	03-33-15-29W1	327625	5576325	62K/06	134.1	146.3	5YR4/1, 5Y4/1	Pierre	2080

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.50	5.0
60	4	27	18	125	0.4	30	763	127	0.70	2.5
61	6	24	19	115	0.2	23	875	155	0.70	2.5
62	7	25	17	160	0.2	23	991	184	0.25	2.5
63	7	31	23	207	0.2	33	857	225	0.80	2.5
64	7	40	19	145	0.2	38	491	181	0.90	2.5
65	7	38	23	132	0.2	40	565	221	0.90	2.5
66	6	37	19	113	0.2	38	712	188	0.70	2.5
67	5	37	20	151	0.2	41	675	237	0.60	2.5
68	4	32	17	126	0.2	34	753	205	0.80	2.5
69	6	62	28	158	0.5	43	553	205	0.80	2.5
70	5	33	17	128	0.5	40	582	257	0.80	2.5
71	4	28	16	83	0.4	34	431	500	0.25	2.5
72	4	33	21	171	0.4	38	467	770	0.70	2.5
73	3	34	18	95	0.5	36	489	597	0.25	2.5
74	3	30	19	144	0.2	36	1037	665	0.80	2.5
75	3	36	19	142	0.2	45	798	336	0.60	2.5
76	4	29	19	166	0.4	40	1126	393	0.80	2.5
77	1	22	21	116	0.2	32	923	145	0.25	2.5
78	1	23	15	112	0.2	31	1091	155	0.25	2.5
79	1	21	16	114	0.2	32	417	152	0.25	2.5
80	1	19	20	109	0.2	27	607	146	0.25	2.5
81	1	17	18	105	0.2	30	840	132	0.25	2.5
82	1	18	16	92	0.2	31	2133	121	0.25	2.5
83	1	25	19	115	0.2	52	3832	129	0.25	2.5
84	1	35	20	146	0.4	55	1293	145	0.25	2.5
85	1	42	21	164	0.4	54	1019	161	0.25	2.5
86	1	40	21	160	0.4	59	3038	168	0.25	2.5
87	1	42	21	167	0.2	58	2732	176	0.25	2.5
88	1	47	24	193	0.2	80	6351	166	0.25	2.5
89	3	62	20	205	0.6	72	3518	157	1.40	2.5
90	5	72	22	207	0.8	76	1290	213	2.90	2.5
91	5	44	18	142	0.4	45	496	187	1.50	2.5
92	3	39	25	136	0.2	39	729	148	0.60	2.5
93	13	46	20	262	0.4	54	2061	191	2.30	2.5
94	14	52	18	195	0.2	50	1236	156	1.30	2.5
95	32	62	17	202	0.4	57	270	114	1.90	2.5
96	25	43	16	164	0.5	53	346	261	1.30	2.5
97	23	31	9	114	0.4	43	277	446	1.10	2.5
98	18	35	14	144	0.2	38	715	348	1.00	2.5
99	15	42	34	226	0.2	45	1505	249	1.30	2.5
100	10	45	16	157	0.5	69	2996	238	0.80	2.5
101	12	43	16	152	0.4	50	1831	207	1.20	2.5
102	12	41	27	164	0.2	45	2417	202	0.70	2.5
103	6	36	21	139	0.2	33	510	158	1.30	2.5
104	6	38	25	233	0.2	32	1437	146	1.90	2.5
105	7	41	31	105	0.2	38	1404	161	0.70	2.5
106	9	44	23	171	0.2	34	5397	139	0.90	2.5
107	8	42	23	137	0.2	34	1009	160	0.80	2.5
108	8	37	23	112	0.2	34	2047	166	0.90	2.5
109	7	41	23	202	0.2	35	1088	190	1.20	2.5
110	10	46	19	162	0.2	43	792	226	1.50	2.5
111	10	53	23	219	0.2	41	922	170	1.80	2.5
112	4	33	17	382	0.2	32	1282	193	3.80	2.5
113	3	32	18	111	0.2	31	773	250	0.70	2.5
114	3	34	20	95	0.2	35	1704	349	1.00	2.5
115	5	35	22	126	0.2	36	1416	542	0.70	2.5
116	5	37	19	106	0.2	40	625	400	0.80	2.5
117	4	27	20	97	0.2	27	602	1172	0.60	2.5
118	6	34	15	123	0.2	29	917	742	0.70	2.5
119	4	38	29	98	0.2	30	703	756	0.60	2.5

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
60	115	2.92	0.077	0.73	0.24	5.37	1.29	19	1
61	77	5.38	0.096	0.68	0.15	3.31	0.97	17	1
62	83	8.52	0.057	0.68	0.16	3.74	1.03	16	1
63	131	3.20	0.068	0.87	0.25	5.79	1.50	20	1
64	170	3.88	0.075	0.90	0.31	7.05	1.79	23	1
65	160	5.75	0.083	0.96	0.32	6.94	1.87	25	1
66	144	5.21	0.083	1.01	0.30	6.53	1.87	24	1
67	141	5.09	0.078	1.32	0.35	7.52	2.23	24	1
68	122	5.20	0.075	1.23	0.33	6.65	2.03	23	1
69	143	3.68	0.079	1.25	0.37	7.43	2.13	23	2
70	135	6.42	0.079	1.54	0.36	7.26	2.09	23	2
71	93	11.58	0.055	1.91	0.27	5.38	1.67	17	1
72	129	7.39	0.062	2.14	0.34	6.90	2.01	19	2
73	133	7.62	0.058	2.08	0.33	6.68	1.93	19	1
74	120	8.14	0.060	2.25	0.30	6.08	1.78	19	1
75	153	4.57	0.079	1.66	0.38	7.83	2.20	23	2
76	111	6.20	0.093	1.80	0.35	6.70	2.11	23	2
77	227	0.89	0.081	1.04	0.31	6.21	1.55	22	2
78	221	1.25	0.111	1.00	0.30	5.98	1.42	22	2
79	220	0.50	0.042	0.93	0.30	5.87	1.40	18	1
80	212	0.58	0.064	0.88	0.26	5.20	1.27	19	1
81	208	0.59	0.055	0.82	0.23	4.76	1.16	18	1
82	194	0.79	0.035	0.73	0.20	4.16	1.00	13	1
83	197	0.58	0.039	0.90	0.22	4.74	1.18	16	1
84	219	0.67	0.070	1.15	0.38	7.75	2.07	20	2
85	229	1.01	0.095	1.32	0.42	9.52	2.31	22	1
86	223	1.04	0.097	1.27	0.39	9.21	2.17	20	1
87	221	0.91	0.104	1.35	0.39	9.41	2.17	22	1
88	261	1.12	0.107	1.43	0.34	8.09	2.08	25	1
89	398	1.01	0.114	1.32	0.35	8.03	2.07	30	1
90	574	4.79	0.138	0.97	0.30	7.34	1.70	35	2
91	361	7.31	0.099	0.75	0.29	7.20	1.81	26	1
92	290	4.22	0.094	0.82	0.34	8.03	1.99	26	1
93	329	7.72	0.080	0.80	0.27	6.63	1.64	24	1
94	263	2.70	0.087	0.74	0.29	7.03	1.73	25	1
95	223	0.86	0.077	0.67	0.25	6.43	1.53	22	1
96	200	13.85	0.066	0.47	0.18	4.85	1.08	17	1
97	154	23.59	0.068	0.45	0.09	2.32	0.61	12	1
98	153	17.23	0.074	0.59	0.17	4.49	1.01	18	1
99	209	8.57	0.097	0.68	0.24	6.05	1.37	22	1
100	250	7.18	0.156	0.80	0.27	6.59	1.56	28	1
101	231	6.88	0.070	0.77	0.27	6.62	1.48	22	1
102	160	4.27	0.244	0.85	0.28	7.39	1.55	29	2
103	143	1.90	0.229	0.83	0.27	7.28	1.65	31	2
104	160	2.12	0.139	0.89	0.27	7.31	1.83	28	2
105	135	2.26	0.124	0.85	0.28	7.41	1.77	24	2
106	180	3.08	0.100	0.91	0.29	7.30	1.71	23	1
107	158	5.21	0.080	1.00	0.31	7.34	1.89	22	2
108	152	5.03	0.097	0.93	0.26	6.32	1.61	22	1
109	156	5.45	0.087	1.01	0.30	7.01	1.97	22	2
110	209	3.68	0.099	1.03	0.32	7.78	2.04	24	2
111	201	3.74	0.104	1.05	0.32	7.90	2.06	24	2
112	142	7.98	0.073	1.33	0.28	6.49	1.84	20	1
113	133	11.68	0.069	1.41	0.26	6.35	1.85	18	1
114	145	7.27	0.065	1.59	0.29	7.10	1.99	18	1
115	151	5.96	0.064	1.99	0.30	6.99	1.90	19	1
116	159	5.80	0.079	1.76	0.31	7.52	1.97	20	2
117	100	11.12	0.058	2.44	0.25	5.63	1.69	16	1
118	119	7.57	0.065	1.89	0.27	6.29	1.75	18	1
119	110	7.30	0.064	1.97	0.29	6.54	1.87	18	1

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation	Formation Code
Detection Limit			Easting	Northing		From	To			
120	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	149.4	161.5	5YR4/1, 5Y4/1	Pierre	2080
121	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	164.6	176.8	5YR4/1, 5Y4/1	Pierre	2080
122	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	179.8	192.0	5YR4/1, 5Y4/1	Pierre	2080
124	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	249.9	162.1	N4, 5YR4/1	Niobrara	3050
125	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	265.2	277.4	N3-N4, 5YR4/1	Niobrara	3050
126	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	280.4	292.6	5YR4/1	Favel	5760
127	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	295.7	307.8	5YR4/1	Favel	5760
128	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	310.9	323.1	5Y4/1, N4-N5	Ashville	7950
129	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	326.1	338.3	5Y4/1, N4-N5	Ashville	7950
130	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	341.4	353.6	5Y4/1, N4-N5	Ashville	7950
131	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	356.6	368.8	5Y4/1, N4-N5	Ashville	7950
132	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	371.9	384.0	5Y4/1, N4-N5	Ashville	7950
133	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	387.1	399.3	5Y4/1, N4-N5	Ashville	7950
134	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	402.3	414.5	5Y4/1, N4-N5	Ashville	7950
135	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	417.6	429.8	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
136	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	432.8	445.0	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
137	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	448.1	460.2	5GY4/1, 5Y4/1, N4-N5	Swan River	9315
138	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	463.3	475.5	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
139	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	478.5	490.7	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
140	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	493.8	506.0	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
141	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	509.0	521.2	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
142	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	524.3	536.4	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
143	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	539.5	551.7	5GY4/1, 5Y4/1, N4-N5	Jurassic	20500
144	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	554.7	566.9	N3-N5	L.Lodgepole	39757
145	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	570.0	582.2	N3-N5	L.Lodgepole	39757
146	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	585.2	597.4	N3-N5	L.Lodgepole	39757
147	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	600.5	612.6	N3-N5	L.Lodgepole	39757
148	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	615.7	627.9	N5-N8, 5YR4/1, 5Y8/1	Bakken	40700
149	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	630.9	643.1	N5-N8, 5YR4/1	Three Forks	50600
150	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	646.2	658.4	N5-N8, 5YR4/1	Birdbear	52800
151	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	661.4	673.6	N5-N8, 5YR4/1	Birdbear	52800
152	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	243.8	236.0	N4-N6, 5Y4/1	Pierre	2080
153	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	259.1	271.3	N4-N6, 5Y4/1	Pierre	2080
154	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	274.3	286.5	N4-N6, 5Y4/1	Pierre	2080
155	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	289.6	301.8	N4-N6, 5Y4/1	Pierre	2080
156	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	304.8	317.0	N6-N7	Pierre	2080
157	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	320.0	332.2	N6-N7	Pierre	2080
158	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	335.3	347.5	N6-N7	Pierre	2080
159	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	350.5	362.7	N5-N6	Pierre	2080
160	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	365.8	378.0	N5-N6	Pierre	2080
161	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	381.0	393.2	N4-N6, 5Y4/1	Pierre	2080
162	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	396.2	408.4	N5-N6, 5YR6/1	Millwood	3010
163	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	411.5	423.7	N5-N6, 5YR6/1	Millwood	3010
164	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	426.7	438.9	N4-N6	Pembina	3020
165	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	442.0	454.2	N5-N6	Pembina	3020
166	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	457.2	469.4	5YR4/1, 5YR6/1	Pembina	3020
167	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	472.4	484.6	N5-N6, 5YR4/1	Niobrara	3050
168	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	487.7	499.9	N5-N7	Niobrara	3050
169	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	502.9	515.1	N5-N7	Niobrara	3050
170	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	518.2	530.4	N5-N7	Niobrara	3050
171	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	533.4	545.6	N3-N5	Niobrara	3050
172	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	548.6	560.8	N3-N6	Niobrara	3050
173	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	563.9	576.1	N3-N6	Keld	5800
174	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	579.1	591.3	N3-N6	Favel	5760
175	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	594.4	606.6	N3-N6	Ashville	7950
176	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	609.6	621.8	N3-N6	Ashville	7950
177	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	624.8	637.0	N3-N6	Belle Fourche	7970
178	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	640.1	652.3	N3-N6	Ashville	7950
179	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	655.3	667.5	N3-N6	Ashville	7950

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.50	5.0
120	1	41	25	148	0.2	55	1601	170	0.25	2.5
121	1	42	33	156	0.2	54	2787	184	0.25	2.5
122	1	46	22	163	0.2	64	3747	185	0.80	2.5
124	10	53	31	179	0.2	61	1018	147	2.40	2.5
125	33	63	28	253	0.6	87	242	158	3.00	2.5
126	38	65	29	261	0.7	81	222	183	3.10	2.5
127	39	54	20	219	0.4	75	423	276	2.30	2.5
128	18	49	18	146	0.2	57	526	258	1.30	2.5
129	16	52	37	197	0.4	48	327	168	1.60	2.5
130	12	47	19	146	0.2	49	306	164	1.40	2.5
131	9	41	26	132	0.6	49	295	136	0.70	2.5
132	3	33	21	115	0.2	35	282	134	0.60	2.5
133	3	31	86	117	0.4	35	432	129	0.25	2.5
134	3	35	76	125	0.2	40	553	144	0.60	2.5
135	4	33	247	122	0.2	38	668	148	0.25	2.5
136	4	37	42	134	0.2	46	842	135	0.25	2.5
137	4	35	24	120	0.2	38	718	122	0.60	2.5
138	3	35	28	105	0.2	42	955	128	0.60	2.5
139	3	37	42	109	0.2	38	562	139	0.25	2.5
140	3	36	29	137	0.2	42	564	153	0.60	2.5
141	4	41	104	126	0.2	47	637	146	0.50	2.5
142	4	37	135	111	0.2	41	597	139	0.60	2.5
143	5	40	30	117	0.2	40	653	206	0.60	2.5
144	6	38	31	119	0.2	39	356	154	0.60	2.5
145	8	37	46	113	0.4	46	485	164	0.70	2.5
146	6	36	37	109	0.2	40	419	167	0.90	2.5
147	8	42	43	136	0.2	47	490	164	1.10	2.5
148	8	34	29	116	0.2	49	690	119	1.00	2.5
149	6	39	30	132	0.2	46	629	134	1.10	2.5
150	5	28	17	91	0.2	39	369	187	0.50	2.5
151	4	23	16	66	0.2	24	325	248	0.50	2.5
152	1	21	18	113	0.2	29	344	134	0.25	2.5
153	1	22	18	110	0.2	30	571	132	0.25	2.5
154	1	20	16	105	0.2	28	1203	125	0.25	2.5
155	1	23	21	115	0.2	34	2203	138	0.25	2.5
156	1	20	14	103	0.2	37	2433	120	0.25	2.5
157	1	21	14	99	0.2	35	3477	120	0.25	2.5
158	1	23	19	103	0.2	45	4568	122	0.25	2.5
159	1	27	28	113	0.2	48	4131	134	0.25	2.5
160	1	34	18	139	0.2	48	6001	193	0.60	2.5
161	1	38	17	148	0.2	54	9316	205	1.00	2.5
162	2	46	24	173	0.2	65	5897	163	1.80	2.5
163	13	55	50	210	0.2	66	3805	160	3.10	2.5
164	10	56	26	186	0.2	55	736	153	3.10	2.5
165	10	53	26	183	0.2	57	1025	158	2.10	2.5
166	1	44	24	161	0.2	50	6679	203	0.80	2.5
167	9	57	19	215	0.4	62	1177	175	6.00	2.5
168	11	52	21	212	0.4	60	2317	203	4.80	2.5
169	2	38	18	138	0.2	44	561	151	1.10	2.5
170	4	40	19	162	0.2	49	1375	153	1.30	2.5
171	17	50	23	242	0.2	69	501	133	2.10	2.5
172	29	60	25	224	0.2	69	328	132	2.20	2.5
173	24	44	19	164	0.2	58	401	272	1.40	2.5
174	19	37	14	131	0.2	51	549	338	1.20	2.5
175	11	43	62	169	0.2	49	754	295	2.00	2.5
176	11	40	25	172	0.2	47	436	200	1.40	2.5
177	8	46	46	140	0.2	47	422	177	0.90	2.5
178	11	45	24	157	0.2	49	478	136	1.20	2.5
179	6	35	25	105	0.2	38	279	136	0.90	2.5

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
120	223	1.46	0.132	1.16	0.35	8.53	1.96	20	1
121	224	1.99	0.173	1.24	0.35	8.21	1.87	24	1
122	236	3.44	0.144	1.40	0.33	7.82	1.76	23	1
124	406	2.24	0.089	0.87	0.36	9.47	2.17	25	2
125	325	4.90	0.094	0.77	0.28	7.37	1.69	28	1
126	255	5.42	0.103	0.74	0.24	6.55	1.48	25	1
127	227	12.91	0.088	0.74	0.20	5.50	1.29	19	1
128	227	11.42	0.099	0.81	0.23	5.81	1.37	18	1
129	226	4.34	0.079	0.90	0.31	7.85	1.70	22	2
130	205	3.80	0.080	0.86	0.32	8.73	1.78	23	2
131	179	1.21	0.093	0.92	0.33	8.85	1.84	25	2
132	164	1.56	0.089	0.87	0.29	7.34	1.70	23	2
133	151	0.91	0.088	0.88	0.31	7.81	1.76	24	2
134	159	1.63	0.084	0.91	0.34	9.15	1.84	25	2
135	155	2.41	0.089	0.88	0.31	7.98	1.77	25	2
136	181	1.54	0.088	0.90	0.33	7.95	1.77	24	2
137	161	0.84	0.080	0.84	0.33	7.53	1.67	24	2
138	153	2.44	0.072	0.92	0.31	6.92	1.60	23	2
139	159	2.36	0.089	1.02	0.32	7.73	1.92	23	2
140	165	2.38	0.093	0.96	0.31	7.32	1.74	22	2
141	183	1.91	0.086	0.98	0.34	8.15	1.88	22	2
142	164	2.63	0.085	0.95	0.32	7.24	1.78	20	2
143	162	6.19	0.143	1.09	0.30	7.52	1.88	22	2
144	185	4.49	0.071	1.09	0.31	7.70	1.79	20	2
145	164	8.52	0.068	1.10	0.26	6.50	1.84	19	1
146	163	7.03	0.072	0.84	0.29	7.03	1.71	20	2
147	211	6.62	0.089	1.03	0.30	7.42	1.82	23	2
148	185	7.54	0.086	3.36	0.25	5.83	2.67	20	1
149	200	4.88	0.079	2.12	0.29	6.96	2.03	20	1
150	156	13.76	0.052	3.58	0.19	4.62	1.57	14	1
151	109	16.32	0.040	3.22	0.14	3.39	0.95	11	1
152	224	0.50	0.039	0.84	0.27	5.80	1.45	16	2
153	227	0.53	0.038	0.86	0.27	5.54	1.39	17	1
154	213	0.60	0.042	0.85	0.23	5.11	1.28	16	1
155	214	0.76	0.055	0.90	0.24	5.36	1.34	17	1
156	193	0.67	0.036	0.75	0.20	4.46	1.12	13	1
157	194	0.72	0.035	0.74	0.19	4.32	1.06	13	1
158	182	0.80	0.041	0.85	0.19	4.53	1.14	13	1
159	185	0.94	0.054	1.01	0.22	5.26	1.31	17	1
160	200	2.63	0.194	1.32	0.29	6.98	1.84	24	1
161	203	2.35	0.243	1.41	0.32	7.77	2.07	30	1
162	241	1.18	0.113	1.37	0.32	7.92	2.01	22	1
163	303	1.32	0.115	1.30	0.33	8.00	1.99	20	1
164	325	0.64	0.075	1.13	0.34	8.25	1.82	23	2
165	326	1.10	0.106	1.21	0.35	8.23	2.05	24	2
166	323	2.21	0.264	1.31	0.33	7.83	2.09	32	2
167	464	2.96	0.107	1.08	0.30	7.24	1.81	22	1
168	430	4.87	0.161	1.07	0.32	7.83	1.90	24	2
169	284	2.18	0.084	0.88	0.35	8.31	2.05	24	2
170	293	1.60	0.089	1.01	0.37	9.43	2.19	23	2
171	272	1.32	0.069	0.81	0.31	6.94	1.75	20	1
172	230	0.73	0.064	0.81	0.28	6.42	1.61	20	1
173	200	12.34	0.072	0.61	0.20	4.96	1.24	17	1
174	193	15.96	0.054	0.61	0.17	4.30	1.13	13	1
175	227	12.12	0.071	0.74	0.23	5.81	1.47	18	1
176	205	5.84	0.079	1.01	0.28	6.47	1.50	20	1
177	212	3.36	0.075	0.94	0.33	7.74	1.72	20	2
178	193	1.22	0.071	0.86	0.33	8.07	1.71	20	2
179	144	0.53	0.076	0.82	0.29	7.14	1.57	19	2

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation	Formation Code
Detection Limit			Easting	Northing		From	To			
180	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	670.6	682.8	N4-N6, 5YR6/1	Ashville	7950
181	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	685.8	698.0	N4-N6, 5YR6/1	Ashville	7950
182	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	722.4	734.6	N5-N6	Jurassic	20500
183	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	737.6	749.8	N4-N6, 5YR4/1	Jurassic	20500
184	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	752.9	765.1	N4-N6, 5YR4/1	Jurassic	20500
185	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	768.1	780.3	N4-N6, 5YR4/1	Jurassic	20500
186	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	783.3	795.5	N4-N6, 5YR4/1	Jurassic	20500
187	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	798.6	810.8	N4-N6, 5YR4/1	Jurassic	20500
188	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	813.8	826.0	N4-N6, 5YR4/1	Jurassic	20500
189	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	829.1	841.2	N4-N6, 5YR4/1	Jurassic	20500
190	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	844.3	856.5	N4-N6, 5YR4/1	Jurassic	20500
191	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	859.5	871.7	N4-N6, 5Y4/1	Jurassic	20500
192	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	874.8	887.0	N4-N6	Jurassic	20500
193	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	890.0	902.2	N4-N6, 5Y4/1	Jurassic	20500
194	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	905.3	917.5	N4-N6, 5Y4/1	Jurassic	20500
195	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	920.5	932.7	N4-N6, 5Y4/1	Jurassic	20500
196	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	935.7	947.9	N4-N6, 5Y4/1	Reston	22640
197	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	951.0	963.2	N4-N6, 5Y4/1	Reston	22640
198	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	966.2	978.4	N4-N6, 5YR4/1	Reston	22640
199	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	984.5	996.7	N4-N6, 5YR4/1	Amaranth	22650
200	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	999.7	1011.9	N4-N6	Amaranth	22650
201	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1015.0	1027.2	N4-N6, 10R5/4	Amaranth	22650
202	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1034.8	1048.5	N4-N6, 10R5/4	Amaranth	22650
203	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1050.0	1063.8	N4-N6, 10R5/4	Amaranth	22650
204	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1065.3	1072.9	N4-N6, 10R5/4	MC-3	38800
205	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	94.5	106.7	N4-N6	Pierre	2080
206	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	109.7	121.9	N4-N6	Pierre	2080
207	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	125.0	137.2	N4-N6	Pierre	2080
208	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	140.2	152.4	N4-N6	Pierre	2080
209	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	155.4	167.6	N4-N6	Pierre	2080
210	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	170.7	182.9	N4-N6	Pierre	2080
211	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	185.9	198.1	N4-N6	Pierre	2080
212	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	201.2	213.4	N4-N6	Pierre	2080
213	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	216.4	228.6	N4-N6	Pierre	2080
214	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	231.6	240.8	N4-N6	Pierre	2080
215	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	106.7	118.9	N4-N5, 5YR4/1	Pierre	2080
216	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	125.0	137.2	N4-N5, 5YR4/1	Pierre	2080
217	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	140.2	152.4	N4-N5, 5YR4/1	Pierre	2080
218	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	155.5	167.6	N4-N5, 5YR4/1	Pierre	2080
219	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	170.7	182.9	N4-N5, 5YR4/1	Pierre	2080
220	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	185.9	198.1	N5-N7	Pierre	2080
221	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	201.2	213.4	N5-N7	Pierre	2080
222	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	216.4	228.6	N5-N7	Pierre	2080
223	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	231.6	243.8	N5-N7	Pierre	2080
224	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	246.9	259.1	N5-N7	Pierre	2080
225	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	262.1	274.3	N5-N7	Pierre	2080
226	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	277.4	289.6	N5-N7	Pierre	2080
227	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	292.6	304.8	N5-N7	Pierre	2080
228	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	307.8	320.0	N6-N7	Pierre	2080
229	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	323.1	335.3	N6-N7	Pierre	2080
230	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	338.3	350.5	N4-N6	Pierre	2080
231	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	353.6	365.8	N4-N6, 5Y4/1	Pierre	2080
232	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	368.8	381.0	N3-N6, 5Y4/1	Pierre	2080
233	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	384.0	396.2	N4-N6, 5Y4/1	Pierre	2080
234	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	399.3	411.5	N4-N5	Pierre	2080
235	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	414.5	426.7	N4-N5	Niobrara	3050
236	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	429.8	442.0	5Y4/1, N4-N6	Niobrara	3050
237	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	445.0	457.2	N4-N6	Niobrara	3050
238	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	460.2	472.4	5Y4/1, N4-N6	Niobrara	3050
239	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	478.5	490.7	5Y4/1, N4-N5	Niobrara	3050

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.50	5.0
180	5	36	23	131	0.2	39	482	153	0.70	2.5
181	6	32	30	126	0.2	36	457	150	0.50	2.5
182	5	32	31	108	0.2	36	529	130	0.80	2.5
183	6	39	34	122	0.2	46	442	136	1.00	2.5
184	6	37	28	162	0.2	47	1728	145	1.50	2.5
185	6	35	24	141	0.2	43	544	150	1.20	2.5
186	5	29	23	144	0.2	36	522	142	0.70	2.5
187	3	21	25	70	0.2	26	405	86	0.25	2.5
188	6	33	26	135	0.2	34	617	124	0.90	2.5
189	7	36	17	121	0.2	35	785	150	1.50	2.5
190	3	25	23	74	0.2	25	757	172	0.25	2.5
191	3	28	20	72	0.2	28	554	194	0.25	2.5
192	3	26	23	87	0.2	33	561	201	0.25	2.5
193	2	25	16	86	0.2	27	933	208	0.60	2.5
194	6	35	20	84	0.2	38	795	159	0.70	2.5
195	5	34	24	117	0.2	37	522	157	0.50	2.5
196	4	31	17	92	0.2	32	293	203	0.50	2.5
197	5	31	15	86	0.2	33	286	203	0.25	2.5
198	4	32	13	94	0.2	34	284	283	0.60	2.5
199	4	31	18	95	0.2	35	301	438	0.60	2.5
200	7	33	23	101	0.2	37	337	331	0.60	2.5
201	4	33	23	88	0.2	34	399	1139	0.60	2.5
202	4	36	20	89	0.2	34	483	398	0.25	2.5
203	3	40	16	84	0.2	28	417	458	0.25	2.5
204	4	35	11	91	0.2	29	431	364	0.90	2.5
205	1	14	40	97	0.2	19	146	122	0.25	2.5
206	2	20	21	111	0.4	29	161	135	0.25	2.5
207	1	22	44	124	0.2	32	179	144	0.25	2.5
208	1	24	26	130	0.2	35	348	152	0.25	2.5
209	1	26	24	154	0.2	36	932	159	0.25	2.5
210	1	24	20	127	0.2	34	649	145	0.25	2.5
211	1	20	19	113	0.2	30	167	135	0.25	2.5
212	1	25	18	119	0.2	31	215	143	0.25	2.5
213	1	25	20	121	0.2	34	251	151	0.25	2.5
214	1	25	20	124	0.2	34	294	154	0.25	2.5
215	1	25	20	124	0.2	34	247	171	0.25	2.5
216	1	19	17	95	0.2	26	544	153	0.25	2.5
217	1	20	16	113	0.2	29	371	139	0.25	2.5
218	5	27	17	115	0.2	34	342	135	0.25	2.5
219	1	21	13	113	0.2	31	207	144	0.25	2.5
220	1	24	20	116	0.2	32	763	144	0.25	2.5
221	1	21	19	104	0.2	27	1062	138	0.25	2.5
222	1	22	17	109	0.2	27	1485	158	0.25	2.5
223	1	21	13	103	0.2	27	2520	153	0.25	2.5
224	1	20	19	105	0.2	29	2899	146	0.25	2.5
225	1	18	10	99	0.2	30	3744	124	0.25	2.5
226	1	17	11	99	0.2	30	3312	119	0.25	2.5
227	1	19	8	95	0.2	33	8601	123	0.25	2.5
228	1	22	14	101	0.2	41	9223	137	0.25	2.5
229	1	33	10	131	0.2	47	6331	169	0.25	2.5
230	6	35	19	149	0.2	43	2585	134	2.10	2.5
231	3	28	18	128	0.2	38	3226	137	1.10	2.5
232	3	28	16	132	0.2	38	1587	137	0.90	2.5
233	1	22	17	114	0.2	31	1563	133	0.50	2.5
234	3	57	19	181	0.2	56	509	151	1.50	2.5
235	4	52	24	188	0.2	54	761	173	1.60	2.5
236	1	22	11	109	0.2	36	2394	126	0.25	2.5
237	3	30	23	127	0.2	38	2954	146	1.00	2.5
238	1	23	15	112	0.2	33	1661	136	0.25	2.5
239	9	34	21	188	0.4	45	3111	159	0.60	2.5

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
180	167	1.08	0.079	0.89	0.31	7.47	1.65	22	2
181	173	1.39	0.073	0.90	0.31	7.25	1.61	22	2
182	152	1.31	0.059	0.70	0.32	7.30	1.40	20	2
183	187	1.49	0.064	0.71	0.38	8.79	1.51	29	2
184	210	1.72	0.074	0.93	0.29	7.08	1.52	23	2
185	200	1.57	0.070	0.82	0.29	6.73	1.52	23	2
186	215	1.12	0.062	0.86	0.29	6.24	1.53	19	1
187	119	0.62	0.035	0.50	0.18	3.89	0.89	12	1
188	162	1.40	0.066	0.83	0.25	5.46	1.40	18	1
189	170	6.29	0.072	0.88	0.27	5.99	1.65	20	1
190	102	10.16	0.071	1.02	0.27	5.61	1.70	18	1
191	110	8.88	0.063	1.17	0.29	6.00	1.79	18	1
192	129	7.46	0.122	1.16	0.28	5.97	1.81	17	1
193	114	8.00	0.068	2.01	0.27	5.47	1.73	18	1
194	121	4.94	0.072	1.13	0.30	5.87	1.79	18	1
195	154	4.38	0.076	1.20	0.34	7.27	2.07	19	2
196	142	6.53	0.054	1.99	0.29	6.50	1.82	18	1
197	132	9.00	0.057	1.34	0.30	6.63	1.77	18	1
198	131	7.61	0.056	1.53	0.29	6.61	1.61	18	1
199	132	6.23	0.052	1.74	0.31	6.93	1.97	17	2
200	148	7.16	0.057	1.61	0.27	6.66	1.61	19	1
201	130	6.44	0.057	1.93	0.28	6.15	1.70	17	1
202	128	6.23	0.059	1.56	0.27	6.00	1.80	18	1
203	123	8.08	0.051	1.51	0.25	5.66	1.66	16	1
204	132	12.37	0.055	1.59	0.23	5.27	1.42	17	1
205	182	1.27	0.023	0.71	0.20	4.29	1.06	13	1
206	202	1.12	0.027	0.88	0.23	5.05	1.17	17	1
207	245	0.70	0.044	0.94	0.30	6.45	1.69	18	2
208	264	0.55	0.046	0.95	0.33	7.11	1.86	19	2
209	262	0.86	0.045	1.08	0.33	7.44	1.88	18	2
210	260	0.55	0.041	0.91	0.30	6.47	1.69	18	2
211	246	0.56	0.041	0.84	0.30	5.94	1.56	17	2
212	239	0.53	0.051	0.89	0.31	6.61	1.65	17	1
213	234	0.60	0.047	0.91	0.31	6.73	1.62	18	2
214	232	0.64	0.048	0.94	0.31	6.85	1.62	18	2
215	237	1.68	0.040	0.91	0.31	6.63	1.78	18	2
216	190	1.92	0.045	0.78	0.24	5.40	1.51	16	1
217	231	1.01	0.042	0.93	0.27	5.80	1.58	17	1
218	236	0.65	0.038	0.81	0.27	5.77	1.54	16	1
219	242	0.62	0.070	0.82	0.28	5.76	1.57	17	2
220	231	0.72	0.054	0.94	0.28	6.08	1.57	17	2
221	206	0.67	0.056	0.88	0.25	5.63	1.41	17	1
222	215	0.85	0.090	0.95	0.27	6.05	1.48	18	1
223	198	1.04	0.089	1.00	0.25	5.77	1.41	19	1
224	200	0.91	0.075	0.92	0.24	5.51	1.33	18	1
225	187	0.74	0.044	0.78	0.19	4.58	1.13	14	1
226	200	0.66	0.050	0.79	0.21	4.57	1.19	14	1
227	182	1.21	0.067	0.80	0.19	4.35	1.11	16	1
228	173	1.54	0.111	0.91	0.19	4.58	1.18	18	1
229	194	2.63	0.157	1.25	0.28	6.89	1.87	22	1
230	247	0.74	0.072	0.98	0.27	6.22	1.57	20	1
231	228	0.89	0.057	0.95	0.27	5.98	1.52	18	1
232	234	0.72	0.055	0.97	0.27	6.23	1.52	18	2
233	214	0.66	0.047	0.89	0.25	5.59	1.42	16	1
234	358	1.00	0.101	1.09	0.34	8.01	2.04	25	2
235	345	1.87	0.165	1.18	0.33	7.90	2.01	31	2
236	192	1.15	0.052	0.90	0.22	4.94	1.26	16	1
237	220	1.56	0.100	0.98	0.25	5.89	1.50	20	1
238	205	0.84	0.078	0.87	0.25	5.48	1.39	17	1
239	207	2.34	0.105	1.14	0.25	6.05	1.55	20	1

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation	Formation
Number			Easting	Northing		From	To			Code
Detection Limit										
240	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	493.8	506.0	5Y4/1, N4-N5	Niobrara	3050
241	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	509.0	518.2	5Y4/1, N4-N5	Favel	5760
242	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	524.3	536.4	N3-N6	Favel	5760
243	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	539.5	551.7	N3-N4	Ashville	7950
244	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	554.7	566.9	N3-N5	Ashville	7950
245	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	570.0	582.2	N3-N5	Ashville	7950
246	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	585.2	597.4	N3-N5	Ashville	7950
247	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	600.5	612.6	N3-N5	Ashville	7950
248	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	615.7	627.9	N3-N5	Ashville	7950
249	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	630.9	643.1	N3-N5	Ashville	7950
250	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	646.2	658.4	N3-N5	Swan River	9315
251	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	661.4	670.6	N3-N5	Swan River	9315
252	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	734.6	746.8	N3-N4	Jurassic	20500
253	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	749.8	762.0	N3-N4	Jurassic	20500
254	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	765.0	777.2	N3-N4	Jurassic	20500
255	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	780.3	792.5	N3-N5	Jurassic	20500
256	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	795.5	807.7	N4-N5	Jurassic	20500
257	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	810.8	823.0	N4-N5, 5Y4/1	Jurassic	20500
258	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	826.0	838.2	N4-N5, 5Y4/1	Jurassic	20500
259	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	841.2	853.4	N4-N5, 5YR6/1	Jurassic	20500
260	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	856.5	868.7	N4-N5, 5YR6/1	Jurassic	20500
261	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	871.7	883.9	N4-N5, 5YR6/1	Reston	22640
262	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	887.0	899.2	N4-N5, 5YR6/1	Reston	22640
263	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	902.2	914.4	N4-N5, 5Y4/1	Amaranth	22650
264	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	917.4	929.6	N4-N5	Amaranth	22650
265	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	932.7	944.9	N3-N5	Amaranth	22650
266	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	947.9	960.1	N3-N5	Lower Amaranth	22670
267	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	963.2	975.4	N3-N5, 5YR4/1	Lower Amaranth	22670
268	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	978.4	1021.1	N3-N5, 5YR4/1	Charles	36010
269	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1024.1	1036.3	N3-N5, 5YR8/1	MC-2	39100
270	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1039.4	1051.6	N3-N5	MC-1	39300
271	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1054.6	1063.8	N3-N5	MC-1	39300
272	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1066.8	1079.0	N3-N5	MC-1	39300
273	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1082.0	1097.3	N3-N5	U. Lodgepole	39710
274	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1100.3	1112.5	N3-N5	U. Lodgepole	39710
275	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1115.6	1127.8	N3-N5, 5Y6/1	U. Lodgepole	39710
276	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1133.9	1146.0	N3-N5	U. Lodgepole	39710
277	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1149.1	1161.3	N3-N5	U. Lodgepole	39710
278	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1164.3	1176.5	N3-N6	L. Lodgepole	39757
279	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1179.6	1191.7	N3-N6	L. Lodgepole	39757
280	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1194.8	1207.0	N3-N5	L. Lodgepole	39757
281	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1210.1	1222.2	N3-N5, 5Y4/1	L. Lodgepole	39757
282	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1225.3	1237.5	N3-N5, 5Y4/1	L. Lodgepole	39757
283	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1240.5	1252.7	N3-N5, 5Y4/1	L. Lodgepole	39757
284	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1255.8	1268.0	N3-N5, 5Y4/1	Bakken	40700
285	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1271.0	1283.2	N3-N5, 5R4/2	Three Forks	50600
286	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1307.6	1319.8	N3-N5, 5YR4/1	Birdbear	52800
287	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1322.8	1335.0	N5, 5YR4/1	Birdbear	52800
288	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1338.1	1350.3	N3-N5, 5Y4/1	Duperow	53200
289	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1353.3	1359.4	N5, 5YR6/1	Duperow	53200

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.50	5.0
240	11	37	23	183	0.2	48	2428	156	1.00	2.5
241	12	42	25	241	0.4	56	1443	150	1.40	2.5
242	17	40	14	242	0.2	51	1430	213	1.60	2.5
243	24	40	15	209	0.4	56	601	299	1.60	2.5
244	18	37	16	185	0.4	49	748	264	1.40	2.5
245	12	34	19	230	0.2	44	540	234	1.40	2.5
246	12	35	24	184	0.2	42	719	220	0.90	2.5
247	16	39	25	152	0.4	50	930	215	0.90	2.5
248	11	38	25	136	0.5	44	711	197	0.90	2.5
249	14	40	21	146	0.4	45	610	182	0.70	2.5
250	10	41	21	191	0.2	47	740	176	1.10	2.5
251	10	33	19	111	0.4	36	723	154	0.70	2.5
252	20	43	43	164	0.4	49	1041	163	1.60	2.5
253	13	37	63	152	0.2	42	1156	922	1.40	2.5
254	10	36	22	119	0.2	38	1579	264	1.10	2.5
255	9	31	28	134	0.2	37	1574	333	0.80	2.5
256	6	28	17	106	0.2	33	1138	733	0.60	2.5
257	8	34	46	114	0.2	41	608	202	0.80	2.5
258	10	35	31	109	0.4	44	692	183	1.70	2.5
259	4	15	17	49	0.2	17	1111	229	0.50	2.5
260	7	24	18	93	0.2	25	714	201	0.70	2.5
261	7	27	21	95	0.2	31	433	295	1.00	2.5
262	6	31	20	93	0.2	36	318	668	0.50	2.5
263	4	27	17	71	0.2	30	464	368	0.70	2.5
264	5	25	12	76	0.2	27	634	802	0.50	5.0
265	6	30	22	89	0.2	33	533	490	0.60	2.5
266	6	32	22	96	0.2	33	417	438	0.70	2.5
267	5	31	35	131	0.2	33	600	347	0.25	2.5
268	4	21	25	71	0.2	20	322	700	0.25	2.5
269	4	20	15	58	0.2	19	351	961	0.25	2.5
270	5	23	22	76	0.2	24	363	1958	0.60	2.5
271	4	21	16	80	0.2	23	350	605	0.60	2.5
272	5	26	22	122	0.2	28	367	723	0.25	2.5
273	4	21	32	84	0.2	23	590	530	0.90	2.5
274	6	29	24	92	0.2	31	406	650	0.60	2.5
275	6	26	23	89	0.2	30	393	656	0.60	2.5
276	3	25	22	83	0.2	26	363	269	0.70	2.5
277	5	27	20	84	0.2	32	290	273	0.25	2.5
278	6	31	17	101	0.2	34	361	377	0.80	2.5
279	4	18	23	72	0.2	21	299	606	0.25	2.5
280	5	25	21	87	0.2	31	460	360	0.80	2.5
281	21	35	26	82	0.2	176	470	769	0.90	2.5
282	6	27	25	123	0.2	33	419	344	0.50	2.5
283	5	28	26	104	0.2	31	400	316	0.80	2.5
284	10	34	32	131	0.2	41	431	258	1.50	2.5
285	7	28	23	124	0.2	44	440	816	1.00	2.5
286	22	32	36	108	0.2	90	784	364	1.10	2.5
287	6	16	30	58	0.2	17	230	401	0.25	2.5
288	15	25	58	114	0.2	28	418	413	1.00	2.5
289	5	14	22	55	0.2	15	257	398	0.25	2.5

Appendix 3 Continued
Black Shale Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
240	222	1.85	0.100	1.06	0.25	6.12	1.58	24	1
241	222	2.33	0.084	1.03	0.26	6.37	1.65	22	1
242	203	7.66	0.073	0.89	0.23	5.63	1.46	18	1
243	172	15.59	0.072	0.67	0.17	4.32	1.11	16	1
244	167	12.00	0.063	0.78	0.19	4.77	1.26	16	1
245	175	8.52	0.063	0.88	0.23	5.50	1.38	17	1
246	172	7.54	0.063	0.91	0.24	5.93	1.44	17	1
247	180	6.95	0.071	0.94	0.26	6.71	1.67	19	1
248	184	5.23	0.071	0.88	0.28	7.25	1.64	19	1
249	169	4.07	0.071	0.85	0.30	7.65	1.66	20	2
250	179	3.95	0.100	0.93	0.30	7.78	1.68	23	2
251	146	3.83	0.069	0.69	0.24	5.72	1.27	17	1
252	174	3.83	0.115	0.78	0.24	5.85	1.33	24	1
253	162	3.24	0.094	1.18	0.26	6.37	1.50	19	1
254	158	4.60	0.091	1.14	0.29	6.93	1.79	22	1
255	124	9.62	0.074	0.99	0.24	5.48	1.54	19	1
256	130	6.49	0.080	1.23	0.30	6.54	2.01	20	1
257	132	5.04	0.070	1.32	0.32	7.33	2.07	19	2
258	164	4.84	0.101	1.06	0.28	6.37	1.70	24	1
259	58	15.94	0.049	7.09	0.12	2.51	0.77	12	1
260	93	9.32	0.065	4.04	0.20	4.69	1.34	18	1
261	122	9.58	0.060	1.59	0.27	5.86	1.72	18	1
262	136	8.62	0.058	1.45	0.31	6.89	1.94	18	1
263	112	9.70	0.058	1.88	0.28	5.94	1.82	17	1
264	99	10.54	0.058	2.41	0.23	5.31	1.57	17	1
265	129	7.27	0.068	1.93	0.28	6.59	1.75	18	1
266	134	5.82	0.060	1.62	0.30	7.02	1.76	18	1
267	125	5.33	0.091	1.55	0.29	6.76	1.71	19	1
268	66	17.54	0.038	1.73	0.17	3.79	1.09	13	1
269	70	16.81	0.040	2.29	0.17	4.04	1.14	13	1
270	98	14.36	0.065	2.48	0.20	4.68	1.27	16	1
271	85	14.18	0.037	2.02	0.17	4.20	1.12	13	1
272	102	12.07	0.070	2.22	0.23	5.40	1.50	17	1
273	83	15.30	0.042	1.59	0.18	4.38	1.26	14	1
274	102	8.89	0.054	1.98	0.26	6.11	1.67	18	1
275	124	10.16	0.073	1.29	0.24	5.82	1.41	20	1
276	107	8.63	0.050	1.35	0.25	6.04	1.53	18	1
277	95	8.58	0.054	1.11	0.24	5.88	1.40	18	1
278	111	6.38	0.064	1.60	0.31	7.52	1.84	20	2
279	75	15.12	0.042	0.95	0.19	4.58	1.20	14	1
280	102	9.00	0.053	1.45	0.27	6.65	1.68	18	1
281	100	11.34	0.067	1.47	0.24	5.97	1.76	19	1
282	99	9.32	0.058	1.40	0.27	6.17	1.86	18	1
283	104	7.40	0.054	1.40	0.27	6.29	1.73	18	1
284	149	10.21	0.063	1.81	0.25	5.85	1.71	19	1
285	138	9.05	0.068	2.68	0.27	6.14	2.16	19	1
286	104	10.19	0.064	1.61	0.22	5.46	1.48	17	1
287	53	23.45	0.036	2.64	0.11	2.44	0.78	11	1
288	100	16.63	0.047	2.26	0.17	3.78	1.11	13	1
289	48	28.03	0.025	1.55	0.09	2.04	0.64	8	1

Appendix 4
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation
			Easting	Northing		From	To		
Detection Limit									
1	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	128.0	140.2	N5 - 5Y6/1	Boissevain
2	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	143.3	155.5	N4 - N5	Boissevain
3	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	158.5	170.7	N5 - 5Y6/1	Pierre
4	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	173.7	185.9	N5 - 5Y5/1	Pierre
5	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	189.0	204.2	N4 - N5	Pierre
6	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	207.3	219.5	N4 - N5	Niobrara
7	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	222.5	237.7	N4 - N5	Niobrara
8	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	240.8	253.0	N5	Morden
9	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	256.0	259.1	N4 - N5	Morden
10	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	304.8	307.8	N4 - N5	Keld
11	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	335.3	344.4	N4 - N5	Ashville
12	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	362.7	374.9	N4	Ashville
13	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	384.0	399.3	N4	Swan River
14	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	402.3	414.5	N4 - N6	Jurassic
15	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	417.6	429.8	N4	Jurassic
16	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	432.8	445.0	N5	Jurassic
17	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	448.1	460.2	N4	Jurassic
18	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	463.3	475.5	N5	Jurassic
19	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	478.5	490.7	N5	Jurassic
20	Hamiota Cartwright	04-32-02-14W1	476575	5445575	62G/03	193.8	509.0	N5	Jurassic
21	Dalny	10-36-02-26W1	366425	5448050	62F/02	36.6	48.8	N6	Pierre
22	Dalny	10-36-02-26W1	366425	5448050	62F/02	51.8	64.0	N6	Pierre
23	Dalny	10-36-02-26W1	366425	5448050	62F/02	67.1	79.2	N6	Pierre
24	Dalny	10-36-02-26W1	366425	5448050	62F/02	82.3	91.4	N6	Pierre
25	Dalny	10-36-02-26W1	366425	5448050	62F/02	100.6	112.8	N6	Pierre
26	Dalny	10-36-02-26W1	366425	5448050	62F/02	115.8	128.0	N6	Pierre
27	Dalny	10-36-02-26W1	366425	5448050	62F/02	131.1	143.3	N6	Pierre
28	Dalny	10-36-02-26W1	366425	5448050	62F/02	146.3	158.5	N5 - N6	Pierre
29	Dalny	10-36-02-26W1	366425	5448050	62F/02	161.5	173.7	N5 - N6	Pierre
30	Dalny	10-36-02-26W1	366425	5448050	62F/02	176.8	189.0	N5 - N6	Pierre
31	Dalny	10-36-02-26W1	366425	5448050	62F/02	192.6	204.2	N5 - N6	Pierre
32	Dalny	10-36-02-26W1	366425	5448050	62F/02	207.3	219.5	N5 - N6	Pierre
33	Dalny	10-36-02-26W1	366425	5448050	62F/02	222.5	234.7	N5 - N6	Pierre
34	Dalny	10-36-02-26W1	366425	5448050	62F/02	237.7	246.9	N6 - N7	Pierre
35	Dalny	10-36-02-26W1	366425	5448050	62F/02	249.9	262.1	N6 - N7	Millwood
36	Dalny	10-36-02-26W1	366425	5448050	62F/02	265.2	277.4	N6 - N7	Millwood
37	Dalny	10-36-02-26W1	366425	5448050	62F/02	280.4	292.6	N5 - N6	Millwood
38	Dalny	10-36-02-26W1	366425	5448050	62F/02	295.7	307.8	N4 - N5	Millwood
39	Dalny	10-36-02-26W1	366425	5448050	62F/02	310.9	323.1	N4 - N5	Millwood
40	Dalny	10-36-02-26W1	366425	5448050	62F/02	326.1	338.3	N4 - N5	Pembina
41	Dalny	10-36-02-26W1	366425	5448050	62F/02	341.1	353.6	N4 - N5	Pembina
42	Dalny	10-36-02-26W1	366425	5448050	62F/02	356.6	368.8	N4 - N5	Niobrara
43	Dalny	10-36-02-26W1	366425	5448050	62F/02	371.9	384.0	N4 - N5	Niobrara
44	Dalny	10-36-02-26W1	366425	5448050	62F/02	387.1	399.3	N4 - N5	Niobrara
45	Dalny	10-36-02-26W1	366425	5448050	62F/02	402.3	414.5	N4 - N5	Niobrara
46	Dalny	10-36-02-26W1	366425	5448050	62F/02	417.6	429.8	N3 - N5	Morden
47	Dalny	10-36-02-26W1	366425	5448050	62F/02	432.8	445.0	N3 - N5	Morden
48	Dalny	10-36-02-26W1	366425	5448050	62F/02	448.1	460.2	N3 - N5	Assiniboine
49	Dalny	10-36-02-26W1	366425	5448050	62F/02	463.3	475.5	N3 - N5	Keld
50	Dalny	10-36-02-26W1	366425	5448050	62F/02	478.5	490.7	N3 - N5	Belle Fourche
51	Dalny	10-36-02-26W1	366425	5448050	62F/02	493.8	506.0	N3-N4	Belle Fourche
52	Dalny	10-36-02-26W1	366425	5448050	62F/02	509.0	521.2	N3-N4	Belle Fourche
53	Dalny	10-36-02-26W1	366425	5448050	62F/02	524.3	536.4	N3-N4	Belle Fourche
54	Dalny	10-36-02-26W1	366425	5448050	62F/02	539.5	551.7	N3-N4	Westgate
55	Dalny	10-36-02-26W1	366425	5448050	62F/02	554.7	566.9	N3-N4, 5Y4/1	Ashville
56	Dalny	10-36-02-26W1	366425	5448050	62F/02	570.0	582.2	N3-N4, 5Y4/1	Swan River
57	Dalny	10-36-02-26W1	366425	5448050	62F/02	585.2	597.4	N3-N4, 5Y4/1	Swan River
58	Dalny	10-36-02-26W1	366425	5448050	62F/02	600.5	612.6	N4-N5	Swan River
59	Dalny	10-36-02-26W1	366425	5448050	62F/02	615.7	627.9	N4-N6	Swan River

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit		0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
1	2070	0.10	6.4	0.1	0.1	19.4	70	0.8	15.0	0.2	81
2	2070	0.12	6.8	0.4	0.1	27.8	70	0.8	17.5	0.2	102
3	2080	0.10	9.8	0.4	0.1	34.2	90	0.8	17.0	0.4	133
4	2080	0.14	23.0	0.4	0.3	49.8	80	0.8	19.0	1.4	150
5	2080	0.32	24.2	0.2	3.4	64.8	120	12.0	18.5	4.2	181
6	3050	0.16	11.2	0.6	0.7	35.0	100	3.6	18.5	0.6	113
7	3050	0.18	13.6	0.6	0.8	36.4	90	5.0	18.0	0.8	122
8	5670	0.22	12.6	0.6	0.5	38.2	120	3.8	22.0	0.8	142
9	5670	0.20	15.0	0.8	0.7	38.8	90	6.0	20.0	0.4	139
10	5800	0.18	12.6	0.6	0.5	37.8	80	3.8	17.5	0.4	119
11	7950	0.20	12.8	0.2	1.1	33.6	90	22.8	14.5	1.8	120
12	7950	0.20	13.8	0.8	0.8	36.2	70	11.8	24.5	0.8	108
13	9315	0.14	12.4	0.6	0.4	32.0	60	6.4	18.0	0.6	97
14	20500	0.14	12.6	0.6	0.7	32.4	60	7.2	18.5	0.8	112
15	20500	0.14	12.6	0.6	0.4	35.4	70	9.4	17.5	0.6	91
16	20500	0.12	12.4	0.6	0.3	29.2	60	5.6	19.5	0.2	81
17	20500	0.10	12.2	0.6	0.2	31.4	50	5.0	19.0	0.6	93
18	20500	0.12	8.8	0.6	0.3	28.8	70	3.8	18.0	0.4	90
19	20500	0.12	7.0	0.6	0.4	31.6	60	3.8	19.0	0.4	79
20	20500	0.10	6.6	0.6	0.2	27.0	90	2.8	15.5	0.4	82
21	2080	0.04	8.4	0.2	0.1	16.4	60	3.8	10.0	0.1	67
22	2080	0.06	4.4	0.4	0.1	11.4	70	1.6	10.0	0.1	75
23	2080	0.06	6.0	0.6	0.1	14.6	70	1.6	12.0	0.1	87
24	2080	0.04	8.6	0.6	0.1	16.2	70	1.2	16.0	0.1	98
25	2080	0.04	8.2	0.2	0.1	17.2	60	1.0	15.0	0.1	102
26	2080	0.02	6.6	0.4	0.1	16.8	70	0.8	13.0	0.1	97
27	2080	0.04	6.2	0.6	0.1	16.0	70	0.4	14.0	0.1	91
28	2080	0.02	5.8	0.8	0.1	15.2	70	0.6	13.0	0.1	86
29	2080	0.04	7.2	0.2	0.1	18.8	80	0.8	13.0	0.1	94
30	2080	0.04	8.4	0.4	0.1	17.8	70	0.6	12.5	0.1	92
31	2080	0.06	7.2	0.4	0.1	17.2	70	0.4	14.0	0.1	91
32	2080	0.06	5.8	0.4	0.1	14.4	60	0.6	12.5	0.1	88
33	2080	0.06	5.4	0.2	0.1	15.2	40	0.2	11.0	0.1	82
34	2080	0.08	6.4	0.4	0.1	17.6	60	0.6	10.5	0.1	84
35	3010	0.06	5.4	0.4	0.1	17.2	60	0.6	9.5	0.1	79
36	3010	0.10	9.8	0.8	0.1	26.4	100	0.6	15.5	0.1	110
37	3010	0.08	20.0	0.8	0.1	31.2	140	2.6	16.0	0.1	123
38	3010	0.10	10.2	0.6	0.2	34.2	90	0.6	16.5	0.2	144
39	3010	0.14	13.8	0.8	0.8	40.8	100	3.2	17.0	1.0	169
40	3020	0.24	13.6	1.0	2.6	45.2	100	7.2	21.5	1.6	170
41	3020	0.26	21.8	0.8	2.3	63.0	170	5.8	19.5	2.4	178
42	3050	0.22	29.0	1.0	1.1	56.6	180	2.8	19.0	2.8	201
43	3050	0.26	18.0	0.8	1.8	46.8	160	5.4	18.0	2.2	161
44	3050	0.12	8.4	0.8	0.5	29.0	80	2.2	21.0	0.2	122
45	3050	0.18	14.6	0.8	1.2	29.6	80	11.4	15.0	1.2	127
46	5670	0.26	28.0	1.6	1.7	35.6	120	17.0	15.0	0.6	228
47	5670	0.38	33.8	1.0	1.5	45.2	90	25.2	14.0	0.1	183
48	5770	0.42	28.8	1.2	1.6	51.6	90	25.4	14.0	0.6	167
49	5800	0.26	10.0	1.2	1.8	33.6	90	32.0	8.0	1.4	153
50	7970	0.16	9.4	1.0	1.1	24.2	70	12.8	9.5	0.6	124
51	7970	0.24	12.6	1.4	2.8	34.0	90	15.8	16.5	0.1	330
52	7970	0.26	13.8	1.0	1.1	41.8	80	12.6	17.5	0.1	152
53	7970	0.22	15.4	1.0	1.0	37.8	70	14.2	19.0	0.1	164
54	8000	0.20	13.2	1.0	0.9	29.4	70	7.4	16.5	0.1	155
55	7960	0.16	12.8	0.8	0.4	26.2	50	7.4	15.0	0.1	102
56	9315	0.16	10.2	0.8	0.4	24.8	60	5.4	16.0	0.1	99
57	9315	0.14	10.2	0.6	0.6	22.4	60	6.4	14.5	0.4	116
58	9315	0.14	8.6	0.6	0.6	23.8	50	4.2	16.0	0.1	124
59	9315	0.12	10.8	0.4	0.4	21.4	80	5.8	14.5	0.1	101

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation
			Easting	Northing		From	To		
Detection Limit									
60	Dalny	10-36-02-26W1	366425	5448050	62F/02	630.9	643.1	N4-N5, 5Y4/1	Swan River
61	Dalny	10-36-02-26W1	366425	5448050	62F/02	646.2	658.4	N4-N5, 5Y4/1	Jurassic
62	Dalny	10-36-02-26W1	366425	5448050	62F/02	661.4	673.6	N4-N5, 5Y4/1	Jurassic
63	Dalny	10-36-02-26W1	366425	5448050	62F/02	676.7	688.8	N4-N5, 5Y4/1	Jurassic
64	Dalny	10-36-02-26W1	366425	5448050	62F/02	691.9	704.1	N4-N5, 5Y4/1	Jurassic
65	Dalny	10-36-02-26W1	366425	5448050	62F/02	707.1	719.3	N4-N5, 5Y4/1	Jurassic
66	Dalny	10-36-02-26W1	366425	5448050	62F/02	722.4	734.6	N4-N5, 5Y4/1	Jurassic
67	Dalny	10-36-02-26W1	366425	5448050	62F/02	737.6	749.8	N4-N5, 5Y4/1	Jurassic
68	Dalny	10-36-02-26W1	366425	5448050	62F/02	752.9	765.0	N4-N6	Jurassic
69	Dalny	10-36-02-26W1	366425	5448050	62F/02	768.1	780.3	N4-N6	Reston
70	Dalny	10-36-02-26W1	366425	5448050	62F/02	783.3	795.5	N4-N6	Reston
71	Dalny	10-36-02-26W1	366425	5448050	62F/02	798.6	810.8	N4-N6	Reston
72	Dalny	10-36-02-26W1	366425	5448050	62F/02	813.8	826.0	N4-N6	Upper Amaranth
73	Dalny	10-36-02-26W1	366425	5448050	62F/02	829.1	841.2	N4-N6	Upper Amaranth
74	Dalny	10-36-02-26W1	366425	5448050	62F/02	844.3	856.5	N4-N6	Lower Amaranth
75	Dalny	10-36-02-26W1	366425	5448050	62F/02	859.5	871.7	N4-N6	Lower Amaranth
76	Dalny	10-36-02-26W1	366425	5448050	62F/02	874.8	880.9	N4-N6	Lower Amaranth
77	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	112.8	125.0	N6-N7, 5Y6/1	Pierre
78	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	128.0	140.2	N6-N7, 5Y6/1	Pierre
79	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	143.3	155.4	N6-N7, 5Y6/1	Pierre
80	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	158.5	170.7	N6-N7, 5Y6/1	Pierre
81	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	173.7	185.9	N6-N7, 5Y6/1	Pierre
82	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	189.0	201.2	N6-N7, 5Y6/1	Pierre
83	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	204.2	216.4	N6-N7, 5Y6/1	Pierre
84	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	219.5	231.6	N6-N7, 5Y6/1	Pierre
85	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	234.7	246.9	N6-N7, 5Y6/1	Pierre
86	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	249.9	262.1	N6-N7, 5Y6/1	Pierre
87	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	265.2	277.4	N5-N6	Niobrara
88	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	280.4	292.6	N5-N6	Niobrara
89	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	295.7	307.8	N4-N6	Niobrara
90	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	310.9	323.1	N3-N5	Niobrara
91	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	326.1	338.3	N4-N5	Niobrara
92	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	341.4	353.6	N4-N6	Morden
93	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	356.6	368.8	N4-N6	Morden
94	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	371.9	384.0	N4-N6	Morden
95	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	387.1	399.3	N3-N4	Morden
96	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	402.3	414.5	N3-N5	Morden
97	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	417.6	429.8	N3-N5	Keld
98	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	432.8	445.0	N4-N5	Favel
99	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	448.1	460.2	N4-N5, 5YR4/1	Ashville
100	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	163.3	475.5	N4-N5	Ashville
101	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	478.5	490.7	N4-N6	Ashville
102	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	493.8	506.0	N4-N6	Ashville
103	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	509.0	521.2	N4-N6	Ashville
104	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	524.3	536.4	N4-N6, 5YR4/1	Ashville
105	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	539.5	548.6	N4-N6	Swan River
106	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	615.7	927.9	5YR4/1	Jurassic
107	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	630.9	643.1	N4-N5, 5YR4/1	Jurassic
108	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	646.2	658.4	N4-N5, 5YR4/1	Jurassic
109	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	661.4	673.6	N4-N5, 5YR4/1	Jurassic
110	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	676.7	688.8	N4-N5, 5YR4/1	Jurassic
111	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	691.9	704.1	N4-N5, 5YR4/1	Jurassic
112	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	707.1	719.3	N4-N6, 5YR4/1	Reston
113	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	722.4	733.0	N4-N6, 5YR4/1	Reston
114	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	734.6	748.3	N4-N6, 5YR4/1	Reston
115	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	749.8	755.9	N4-N6, 5YR4/1	Reston
116	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	757.4	771.1	N4-N6	Upper Amaranth
117	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	774.2	787.9	N4-N6	Upper Amaranth
118	C.S. Napinka	05-03-04-25W1	370560	5458990	62F/07	789.4	821.4	N4-N5, 5GY4/1, 10R7/4	Upper Amaranth
119	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	134.1	146.3	5YR4/1, 5Y4/1	Pierre

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit		0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
60	9315	0.14	9.8	0.4	0.5	22.0	60	5.2	13.0	0.1	116
61	20500	0.10	9.2	0.6	0.7	17.4	60	5.4	15.0	0.1	112
62	20500	0.14	9.8	0.8	0.7	18.8	80	6.6	13.0	0.1	156
63	20500	0.16	13.8	0.6	0.9	24.6	80	6.8	17.0	0.2	206
64	20500	0.22	14.0	0.8	0.8	33.4	90	8.2	16.0	0.6	116
65	20500	0.18	11.6	0.4	0.7	30.6	80	6.6	18.5	0.8	105
66	20500	0.18	12.4	0.6	0.6	31.6	90	6.4	17.0	0.6	100
67	20500	0.14	9.2	0.6	0.5	28.0	80	5.2	14.5	0.2	102
68	20500	0.16	9.0	0.4	0.7	25.6	60	4.8	13.5	0.2	106
69	22640	0.18	10.2	0.8	1.1	31.8	60	6.8	21.5	0.1	167
70	22640	0.14	8.6	0.6	0.7	26.2	50	5.4	13.0	0.1	125
71	22640	0.12	7.0	0.4	0.4	24.8	60	3.8	12.5	0.2	68
72	22655	0.14	7.6	0.6	0.5	25.6	70	3.8	14.0	0.1	133
73	22655	0.12	8.0	0.6	0.3	24.8	70	3.4	11.0	0.2	79
74	22670	0.10	8.2	0.4	0.6	24.2	70	3.8	12.0	0.2	111
75	22670	0.14	10.0	0.6	0.6	30.6	80	4.4	13.0	0.8	120
76	22670	0.12	8.4	0.6	0.8	24.4	80	4.8	14.0	0.1	137
77	2080	0.04	9.8	0.6	0.1	18.6	90	0.8	14.0	0.1	97
78	2080	0.06	8.0	0.6	0.1	17.4	90	0.8	14.0	0.1	90
79	2080	0.06	8.0	0.4	0.1	18.0	70	0.8	14.0	0.1	96
80	2080	0.06	7.2	0.2	0.1	15.6	70	0.4	14.5	0.1	95
81	2080	0.06	5.8	0.6	0.1	14.4	60	0.6	13.0	0.1	90
82	2080	0.08	5.8	0.4	0.1	13.8	80	0.6	11.5	0.1	78
83	2080	0.12	4.6	0.4	0.1	20.6	80	0.6	13.5	0.4	96
84	2080	0.12	8.8	0.6	0.1	30.2	100	0.6	16.5	0.4	116
85	2080	0.10	10.6	0.4	0.1	34.6	100	0.6	21.0	0.2	128
86	2080	0.08	15.0	0.8	0.1	34.6	100	0.8	18.5	0.2	132
87	3050	0.10	13.0	0.6	0.1	34.4	120	0.8	19.5	0.2	142
88	3050	0.14	13.8	0.6	0.1	39.4	140	0.6	17.5	0.8	162
89	3050	0.22	20.6	1.0	1.4	54.0	180	4.0	18.0	2.0	177
90	3050	0.42	25.6	0.6	3.0	66.8	200	5.8	20.5	4.2	185
91	3050	0.26	14.8	0.8	1.8	38.4	120	5.6	17.5	1.8	124
92	5670	0.18	8.8	0.4	0.9	32.0	110	3.6	21.0	0.8	115
93	5670	0.28	18.0	0.8	2.4	39.0	130	13.6	17.0	1.4	244
94	5670	0.32	28.0	1.0	1.4	42.8	140	14.4	17.0	0.4	175
95	5670	0.48	34.0	1.6	1.9	51.6	120	29.4	13.0	0.4	168
96	5670	0.32	15.0	1.0	2.0	37.2	90	25.4	12.0	1.2	155
97	5800	0.20	7.0	0.6	1.4	26.2	90	22.6	8.5	1.0	123
98	7950	0.22	11.2	0.6	1.2	29.4	80	18.2	14.0	0.6	130
99	7950	0.24	12.6	0.6	1.8	37.4	90	16.6	32.5	0.6	208
100	7950	0.22	13.0	0.6	1.1	39.0	120	10.4	17.5	0.8	162
101	7950	0.24	14.8	0.8	1.0	36.6	100	12.4	15.5	1.2	112
102	7950	0.22	12.2	1.0	1.0	31.8	70	12.2	21.5	0.4	142
103	7950	0.18	9.4	0.6	0.8	27.6	60	6.6	16.5	0.2	134
104	7950	0.20	12.0	1.0	1.7	31.0	100	7.2	22.0	0.1	266
105	9315	0.20	12.6	0.8	0.5	29.8	90	8.0	21.5	0.2	94
106	20500	0.22	14.2	1.2	0.6	32.2	120	9.4	18.5	0.2	146
107	20500	0.18	11.4	0.8	0.5	31.8	100	8.2	19.5	0.4	96
108	20500	0.18	14.6	1.2	0.5	28.6	90	8.8	22.0	0.6	97
109	20500	0.18	10.8	0.8	1.0	31.0	100	7.6	18.0	0.1	178
110	20500	0.24	15.8	0.8	1.1	38.0	90	10.4	17.5	0.8	135
111	20500	0.22	14.4	0.4	1.4	35.2	110	9.6	16.0	0.6	196
112	22640	0.12	8.8	0.8	4.1	25.0	120	4.2	12.5	0.1	408
113	22640	0.10	5.2	0.2	0.6	23.6	110	2.6	11.5	0.2	95
114	22640	0.12	7.2	0.6	0.3	26.4	130	3.4	12.5	0.2	70
115	22640	0.16	9.4	0.6	0.6	28.2	130	5.0	13.0	0.2	99
116	22655	0.20	9.4	0.6	0.5	29.0	130	5.8	15.0	0.8	81
117	22655	0.10	5.6	0.6	0.4	19.4	90	4.2	12.0	0.1	69
118	22655	0.12	8.6	0.6	0.8	28.8	100	6.0	15.0	0.1	129
119	2080	0.12	6.8	0.6	0.5	24.8	140	4.6	22.0	0.1	85

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation
			Easting	Northing		From	To		
Detection Limit									
120	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	149.4	161.5	5YR4/1, 5Y4/1	Pierre
121	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	164.6	176.8	5YR4/1, 5Y4/1	Pierre
122	Owen McAuley	03-33-15-29W1	327625	5576325	62k/06	179.8	192.0	5YR4/1, 5Y4/1	Pierre
124	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	249.9	162.1	N4, 5YR4/1	Niobrara
125	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	265.2	277.4	N3-N4, 5YR4/1	Niobrara
126	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	280.4	292.6	5YR4/1	Favel
127	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	295.7	307.8	5YR4/1	Favel
128	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	310.9	323.1	5Y4/1, N4-N5	Ashville
129	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	326.1	338.3	5Y4/1, N4-N5	Ashville
130	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	341.4	353.6	5Y4/1, N4-N5	Ashville
131	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	356.6	368.8	5Y4/1, N4-N5	Ashville
132	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	371.9	384.0	5Y4/1, N4-N5	Ashville
133	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	387.1	399.3	5Y4/1, N4-N5	Ashville
134	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	402.3	414.5	5Y4/1, N4-N5	Ashville
135	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	417.6	429.8	5GY4/1, 5Y4/1, N4-N5	Swan River
136	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	432.8	445.0	5GY4/1, 5Y4/1, N4-N5	Swan River
137	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	448.1	460.2	5GY4/1, 5Y4/1, N4-N5	Swan River
138	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	463.3	475.5	5GY4/1, 5Y4/1, N4-N5	Jurassic
139	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	478.5	490.7	5GY4/1, 5Y4/1, N4-N5	Jurassic
140	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	493.8	506.0	5GY4/1, 5Y4/1, N4-N5	Jurassic
141	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	509.0	521.2	5GY4/1, 5Y4/1, N4-N5	Jurassic
142	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	524.3	536.4	5GY4/1, 5Y4/1, N4-N5	Jurassic
143	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	539.5	551.7	5GY4/1, 5Y4/1, N4-N5	Jurassic
144	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	554.7	566.9	N3-N5	L.Lodgepole
145	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	570.0	582.2	N3-N5	L.Lodgepole
146	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	585.2	597.4	N3-N5	L.Lodgepole
147	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	600.5	612.6	N3-N5	L.Lodgepole
148	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	615.7	627.9	N5-N8, 5YR4/1, 5Y8/1	Bakken
149	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	630.9	643.1	N5-N8, 5YR4/1	Three Forks
150	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	646.2	658.4	N5-N8, 5YR4/1	Birdbear
151	Owen McAuley	12-02-15-29W1	330300	5568925	62K/06	661.4	673.6	N5-N8, 5YR4/1	Birdbear
152	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	243.8	236.0	N4-N6, 5Y4/1	Pierre
153	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	259.1	271.3	N4-N6, 5Y4/1	Pierre
154	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	274.3	286.5	N4-N6, 5Y4/1	Pierre
155	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	289.6	301.8	N4-N6, 5Y4/1	Pierre
156	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	304.8	317.0	N6-N7	Pierre
157	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	320.0	332.2	N6-N7	Pierre
158	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	335.3	347.5	N6-N7	Pierre
159	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	350.5	362.7	N5-N6	Pierre
160	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	365.8	378.0	N5-N6	Pierre
161	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	381.0	393.2	N4-N6, 5Y4/1	Pierre
162	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	396.2	408.4	N5-N6, 5YR6/1	Millwood
163	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	411.5	423.7	N5-N6, 5YR6/1	Millwood
164	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	426.7	438.9	N4-N6	Pembina
165	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	442.0	454.2	N5-N6	Pembina
166	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	457.2	469.4	5YR4/1, 5YR6/1	Pembina
167	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	472.4	484.6	N5-N6, 5YR4/1	Niobrara
168	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	487.7	499.9	N5-N7	Niobrara
169	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	502.9	515.1	N5-N7	Niobrara
170	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	518.2	530.4	N5-N7	Niobrara
171	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	533.4	545.6	N3-N5	Niobrara
172	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	548.6	560.8	N3-N6	Niobrara
173	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	563.9	576.1	N3-N6	Keld
174	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	579.1	591.3	N3-N6	Favel
175	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	594.4	606.6	N3-N6	Ashville
176	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	609.6	621.8	N3-N6	Ashville
177	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	624.8	637.0	N3-N6	Belle Fourche
178	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	640.1	652.3	N3-N6	Ashville
179	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	655.3	667.5	N3-N6	Ashville

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit		0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
120	2080	0.06	19.0	0.6	0.1	33.2	100	1.8	22.5	0.6	127
121	2080	0.06	12.8	0.2	0.1	32.8	130	1.2	31.5	0.4	127
122	2080	0.08	16.4	0.4	0.3	35.2	110	1.6	19.0	0.8	133
124	3050	0.26	13.4	0.6	2.1	42.6	120	10.4	26.0	2.2	146
125	3050	0.42	37.0	1.0	2.7	46.6	120	33.2	25.0	1.4	228
126	5760	0.48	31.0	0.8	2.6	51.6	120	37.4	22.5	1.0	224
127	5760	0.34	19.6	0.8	2.1	43.8	130	37.2	16.0	1.6	199
128	7950	0.24	18.4	0.8	1.4	38.4	170	19.2	15.5	1.6	134
129	7950	0.28	25.2	0.8	1.3	42.8	160	18.0	33.5	1.2	188
130	7950	0.24	12.8	0.6	1.2	38.6	100	13.4	22.5	0.8	126
131	7950	0.14	14.0	0.6	0.5	31.6	80	10.0	20.5	0.6	106
132	7950	0.12	9.4	0.6	0.4	26.6	140	4.2	20.0	0.1	98
133	7950	0.12	6.8	0.4	0.3	24.4	60	2.8	76.0	0.1	94
134	7950	0.16	7.8	0.4	0.3	27.0	110	3.8	78.5	0.4	98
135	9315	0.14	9.2	0.8	0.4	27.4	70	5.2	252.0	0.2	105
136	9315	0.14	11.6	0.6	0.4	28.6	90	4.6	42.5	0.4	112
137	9315	0.14	10.0	0.8	0.4	28.0	60	4.8	18.5	0.2	101
138	20500	0.10	8.4	0.6	0.2	24.8	90	3.4	26.0	0.1	88
139	20500	0.12	9.4	0.6	0.3	30.8	100	4.4	37.5	0.2	93
140	20500	0.16	11.2	0.8	0.4	30.8	100	4.8	30.0	0.6	129
141	20500	0.16	13.6	0.8	0.5	32.4	140	7.6	98.5	0.8	104
142	20500	0.14	10.4	0.6	0.4	31.0	130	4.8	133.0	0.4	90
143	20500	0.14	7.8	0.6	0.5	31.2	80	5.6	26.0	0.6	94
144	39757	0.14	11.2	0.6	0.5	30.2	90	6.4	20.5	0.6	98
145	39757	0.18	14.2	0.4	0.8	29.4	70	8.8	41.5	0.6	99
146	39757	0.14	9.6	0.2	0.5	28.6	80	6.6	30.0	0.4	92
147	39757	0.18	13.0	0.6	1.0	33.0	120	8.8	37.0	1.0	115
148	40700	0.16	13.2	0.2	0.7	27.6	50	8.8	23.5	1.4	82
149	50600	0.20	13.8	0.2	1.0	34.4	70	6.8	23.0	1.0	103
150	52800	0.12	8.8	0.1	0.6	24.2	80	5.0	14.0	0.8	77
151	52800	0.12	7.8	0.4	0.6	21.2	40	4.6	12.5	0.4	59
152	2080	0.06	7.4	0.4	0.1	17.4	60	0.4	14.0	0.1	82
153	2080	0.06	7.6	0.2	0.1	16.4	80	0.2	14.5	0.1	81
154	2080	0.08	5.8	0.4	0.1	15.6	70	0.6	14.5	0.1	78
155	2080	0.08	5.8	0.6	0.1	18.0	80	2.6	17.0	0.1	86
156	2080	0.10	5.2	0.6	0.1	17.2	90	0.8	14.5	0.1	85
157	2080	0.08	5.8	0.6	0.1	15.6	80	0.6	13.5	0.1	77
158	2080	0.12	5.0	0.6	0.1	18.0	100	0.2	16.5	0.6	81
159	2080	0.12	5.0	0.8	0.1	21.2	90	0.8	22.0	0.2	86
160	2080	0.10	10.8	0.4	0.1	27.6	100	0.6	20.5	0.4	105
161	2080	0.12	12.0	0.6	0.1	30.6	120	0.8	20.5	0.6	107
162	3010	0.20	12.4	0.6	1.0	41.2	90	3.4	24.0	1.2	133
163	3010	0.28	19.0	0.6	3.1	45.6	180	14.2	46.5	3.6	159
164	3020	0.32	18.0	0.6	3.1	51.2	190	11.4	24.5	2.8	150
165	3020	0.24	23.0	0.6	2.0	47.2	160	10.8	21.0	3.2	140
166	3020	0.14	25.0	0.4	0.3	34.8	160	1.6	21.0	1.0	117
167	3050	0.36	20.0	0.8	5.8	53.6	190	10.4	17.5	5.0	161
168	3050	0.30	20.8	0.6	4.6	45.6	200	12.4	18.5	5.0	150
169	3050	0.16	15.4	0.6	1.0	32.0	140	3.4	17.0	1.0	95
170	3050	0.18	13.2	0.6	0.9	32.2	100	4.0	21.0	0.6	118
171	3050	0.34	32.2	0.8	1.9	40.6	160	17.6	19.0	0.8	165
172	3050	0.44	36.0	0.8	2.1	49.2	130	27.8	18.0	0.2	167
173	5800	0.32	21.6	0.6	1.6	36.6	120	25.4	14.5	1.0	140
174	5760	0.22	12.2	0.4	1.4	32.0	100	19.6	14.0	1.2	109
175	7950	0.24	17.0	0.6	2.1	36.6	120	12.4	58.0	1.2	134
176	7950	0.22	15.6	0.4	1.0	33.4	130	11.2	25.0	1.0	97
177	7970	0.22	14.2	0.6	1.0	35.8	170	8.0	39.0	0.8	107
178	7950	0.24	16.6	0.6	1.2	40.2	160	12.2	23.0	0.8	130
179	7950	0.18	10.6	0.6	0.6	28.2	80	5.6	17.0	0.2	74

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation
			Easting	Northing		From	To		
Detection Limit									
180	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	670.6	682.8	N4-N6, 5YR6/1	Ashville
181	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	685.8	698.0	N4-N6, 5YR6/1	Ashville
182	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	722.4	734.6	N5-N6	Jurassic
183	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	737.6	749.8	N4-N6, 5YR4/1	Jurassic
184	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	752.9	765.1	N4-N6, 5YR4/1	Jurassic
185	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	768.1	780.3	N4-N6, 5YR4/1	Jurassic
186	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	783.3	795.5	N4-N6, 5YR4/1	Jurassic
187	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	798.6	810.8	N4-N6, 5YR4/1	Jurassic
188	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	813.8	826.0	N4-N6, 5YR4/1	Jurassic
189	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	829.1	841.2	N4-N6, 5YR4/1	Jurassic
190	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	844.3	856.5	N4-N6, 5YR4/1	Jurassic
191	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	859.5	871.7	N4-N6, 5Y4/1	Jurassic
192	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	874.8	887.0	N4-N6	Jurassic
193	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	890.0	902.2	N4-N6, 5Y4/1	Jurassic
194	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	905.3	917.5	N4-N6, 5Y4/1	Jurassic
195	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	920.5	932.7	N4-N6, 5Y4/1	Jurassic
196	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	935.7	947.9	N4-N6, 5Y4/1	Reston
197	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	951.0	963.2	N4-N6, 5Y4/1	Reston
198	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	966.2	978.4	N4-N6, 5YR4/1	Reston
199	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	984.5	996.7	N4-N6, 5YR4/1	Amaranth
200	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	999.7	1011.9	N4-N6	Amaranth
201	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1015.0	1027.2	N4-N6, 10R5/4	Amaranth
202	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1034.8	1048.5	N4-N6, 10R5/4	Amaranth
203	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1050.0	1063.8	N4-N6, 10R5/4	Amaranth
204	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	1065.3	1072.9	N4-N6, 10R5/4	MC-3
205	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	94.5	106.7	N4-N6	Pierre
206	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	109.7	121.9	N4-N6	Pierre
207	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	125.0	137.2	N4-N6	Pierre
208	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	140.2	152.4	N4-N6	Pierre
209	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	155.4	167.6	N4-N6	Pierre
210	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	170.7	182.9	N4-N6	Pierre
211	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	185.9	198.1	N4-N6	Pierre
212	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	201.2	213.4	N4-N6	Pierre
213	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	216.4	228.6	N4-N6	Pierre
214	Poplar Antler	08-15-01-29W1	333750	5433625	62F/03	231.6	240.8	N4-N6	Pierre
215	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	106.7	118.9	N4-N5, 5YR4/1	Pierre
216	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	125.0	137.2	N4-N5, 5YR4/1	Pierre
217	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	140.2	152.4	N4-N5, 5YR4/1	Pierre
218	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	155.5	167.6	N4-N5, 5YR4/1	Pierre
219	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	170.7	182.9	N4-N5, 5YR4/1	Pierre
220	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	185.9	198.1	N5-N7	Pierre
221	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	201.2	213.4	N5-N7	Pierre
222	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	216.4	228.6	N5-N7	Pierre
223	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	231.6	243.8	N5-N7	Pierre
224	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	246.9	259.1	N5-N7	Pierre
225	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	262.1	274.3	N5-N7	Pierre
226	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	277.4	289.6	N5-N7	Pierre
227	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	292.6	304.8	N5-N7	Pierre
228	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	307.8	320.0	N6-N7	Pierre
229	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	323.1	335.3	N6-N7	Pierre
230	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	338.3	350.5	N4-N6	Pierre
231	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	353.6	365.8	N4-N6, 5Y4/1	Pierre
232	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	368.8	381.0	N3-N6, 5Y4/1	Pierre
233	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	384.0	396.2	N4-N6, 5Y4/1	Pierre
234	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	399.3	411.5	N4-N5	Pierre
235	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	414.5	426.7	N4-N5	Niobrara
236	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	429.8	442.0	5Y4/1, N4-N6	Niobrara
237	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	445.0	457.2	N4-N6	Niobrara
238	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	460.2	472.4	5Y4/1, N4-N6	Niobrara
239	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	478.5	490.7	5Y4/1, N4-N5	Niobrara

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit		0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
180	7950	0.18	11.4	0.6	0.7	28.6	80	5.4	18.5	0.4	90
181	7950	0.16	11.2	0.6	0.6	26.6	110	6.2	23.5	0.6	89
182	20500	0.14	9.6	0.6	0.6	23.0	100	5.2	20.5	0.4	76
183	20500	0.16	10.4	0.6	1.0	30.8	70	6.8	28.0	0.8	91
184	20500	0.20	14.2	0.6	1.3	30.2	100	7.6	20.5	1.2	117
185	20500	0.20	15.8	0.6	1.1	28.4	160	6.6	17.0	0.8	100
186	20500	0.14	12.8	0.2	1.1	24.8	140	6.2	24.5	0.8	110
187	20500	0.12	11.8	0.6	0.5	16.2	70	4.4	19.0	0.4	52
188	20500	0.16	11.6	0.4	0.8	28.6	110	7.2	20.0	0.6	106
189	20500	0.20	13.2	0.6	1.4	28.6	110	8.2	17.0	1.0	92
190	20500	0.10	6.8	0.4	0.3	19.0	80	4.2	16.5	0.2	52
191	20500	0.10	6.4	0.4	0.4	21.6	80	3.6	16.5	0.2	48
192	20500	0.10	8.0	0.6	0.3	21.2	120	3.6	17.0	0.2	57
193	20500	0.08	5.6	0.4	0.5	18.8	110	2.8	16.5	0.1	69
194	20500	0.18	9.2	0.2	0.5	27.2	130	5.2	16.0	0.6	61
195	20500	0.14	8.4	0.6	0.7	27.2	110	5.2	16.5	0.2	86
196	22640	0.12	6.0	0.6	0.6	24.8	90	3.8	14.0	0.6	66
197	22640	0.14	6.6	0.4	0.7	24.6	80	4.8	12.0	0.4	61
198	22640	0.12	7.4	0.2	0.6	25.0	100	5.2	13.5	0.4	67
199	22650	0.12	6.6	0.4	0.5	24.6	100	3.8	15.5	0.2	70
200	22650	0.16	9.2	0.6	0.7	28.0	100	7.0	14.0	0.6	77
201	22650	0.14	9.2	0.6	0.6	27.8	100	4.8	21.0	0.2	66
202	22650	0.14	8.8	0.2	0.5	27.4	70	3.8	11.5	0.6	60
203	22650	0.12	7.0	0.2	0.8	34.8	60	3.8	12.0	0.2	82
204	38800	0.16	7.2	0.2	1.0	32.8	80	5.2	12.0	0.8	72
205	2080	0.08	2.8	0.4	0.2	11.2	50	1.0	40.0	0.1	71
206	2080	0.10	4.0	0.4	0.3	17.0	60	1.8	16.5	0.2	84
207	2080	0.08	9.2	0.4	0.1	17.8	50	1.0	37.0	0.1	88
208	2080	0.06	9.4	0.4	0.1	19.0	60	0.8	21.5	0.1	94
209	2080	0.06	7.2	0.4	0.1	19.4	90	0.8	23.5	0.1	111
210	2080	0.06	9.0	0.4	0.1	19.2	110	1.0	16.5	0.1	93
211	2080	0.06	9.6	0.2	0.1	16.8	70	0.8	14.5	0.1	86
212	2080	0.06	9.8	0.2	0.1	19.8	80	0.6	14.5	0.1	84
213	2080	0.06	10.8	0.4	0.1	21.0	70	0.6	15.0	0.1	88
214	2080	0.06	9.2	0.4	0.1	20.2	70	0.6	16.0	0.1	89
215	2080	0.06	10.0	0.6	0.1	22.2	100	2.0	17.5	0.2	93
216	2080	0.04	8.6	0.2	0.1	30.0	50	4.4	14.0	0.4	74
217	2080	0.06	6.6	0.6	0.1	16.0	70	0.8	16.5	0.1	86
218	2080	0.20	7.2	0.2	0.1	19.2	100	1.2	15.0	0.1	88
219	2080	0.06	8.6	0.4	0.1	32.8	80	10.2	14.0	0.4	85
220	2080	0.06	8.2	0.4	0.1	18.4	80	2.2	17.0	0.1	85
221	2080	0.06	9.2	0.4	0.1	17.4	70	1.4	15.5	0.1	82
222	2080	0.06	9.4	0.2	0.1	17.4	80	0.8	16.0	0.1	77
223	2080	0.06	9.2	0.1	0.1	17.4	50	1.0	15.5	0.1	75
224	2080	0.08	7.6	0.4	0.1	16.8	70	3.4	13.5	0.1	77
225	2080	0.08	5.8	0.6	0.1	16.8	60	2.0	14.5	0.1	80
226	2080	0.08	4.6	0.2	0.1	17.0	50	0.4	11.0	0.1	79
227	2080	0.08	5.2	0.4	0.1	16.6	40	0.6	13.0	0.1	75
228	2080	0.10	5.4	0.6	0.1	19.4	60	0.6	12.5	0.1	79
229	2080	0.10	12.0	0.4	0.1	27.2	60	0.8	14.0	0.2	92
230	2080	0.22	12.2	0.6	1.9	32.6	80	7.2	16.0	1.8	119
231	2080	0.12	10.0	0.6	0.8	24.2	70	3.8	16.5	1.0	96
232	2080	0.12	10.4	0.4	0.7	24.2	80	3.0	17.0	0.8	97
233	2080	0.08	8.2	0.4	0.3	19.8	70	1.4	19.0	0.4	85
234	2080	0.26	19.6	0.8	1.5	54.6	130	5.2	21.0	2.4	138
235	3050	0.24	23.6	0.6	1.3	48.0	130	5.6	21.5	2.4	141
236	3050	0.10	7.0	0.2	0.2	18.8	60	1.0	12.5	0.2	83
237	3050	0.14	10.0	0.6	0.7	27.2	70	3.4	17.5	1.0	94
238	3050	0.08	8.2	0.2	0.1	19.4	70	1.0	14.0	0.1	80
239	3050	0.18	19.4	0.6	0.9	29.0	100	9.8	16.5	1.0	138

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Well Name	Location	Utm		Map	Measured Interval (m)		Colour	Formation
Detection Limit			Easting	Northing		From	To		
240	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	493.8	506.0	5Y4/1, N4-N5	Niobrara
241	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	509.0	518.2	5Y4/1, N4-N5	Favel
242	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	524.3	536.4	N3-N6	Favel
243	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	539.5	551.7	N3-N4	Ashville
244	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	554.7	566.9	N3-N5	Ashville
245	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	570.0	582.2	N3-N5	Ashville
246	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	585.2	597.4	N3-N5	Ashville
247	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	600.5	612.6	N3-N5	Ashville
248	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	615.7	627.9	N3-N5	Ashville
249	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	630.9	643.1	N3-N5	Ashville
250	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	646.2	658.4	N3-N5	Swan River
251	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	661.4	670.6	N3-N5	Swan River
252	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	734.6	746.8	N3-N4	Jurassic
253	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	749.8	762.0	N3-N4	Jurassic
254	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	765.0	777.2	N3-N4	Jurassic
255	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	780.3	792.5	N3-N5	Jurassic
256	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	795.5	807.7	N4-N5	Jurassic
257	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	810.8	823.0	N4-N5, 5Y4/1	Jurassic
258	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	826.0	838.2	N4-N5, 5Y4/1	Jurassic
259	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	841.2	853.4	N4-N5, 5YR6/1	Jurassic
260	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	856.5	868.7	N4-N5, 5YR6/1	Jurassic
261	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	871.7	883.9	N4-N5, 5YR6/1	Reston
262	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	887.0	899.2	N4-N5, 5YR6/1	Reston
263	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	902.2	914.4	N4-N5, 5Y4/1	Amaranth
264	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	917.4	929.6	N4-N5	Amaranth
265	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	932.7	944.9	N3-N5	Amaranth
266	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	947.9	960.1	N3-N5	Lower Amaranth
267	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	963.2	975.4	N3-N5, 5YR4/1	Lower Amaranth
268	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	978.4	1021.1	N3-N5, 5YR4/1	Charles
269	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1024.1	1036.3	N3-N5, 5YR8/1	MC-2
270	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1039.4	1051.6	N3-N5	MC-1
271	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1054.6	1063.8	N3-N5	MC-1
272	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1066.8	1079.0	N3-N5	MC-1
273	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1082.0	1097.3	N3-N5	U. Lodgepole
274	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1100.3	1112.5	N3-N5	U. Lodgepole
275	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1115.6	1127.8	N3-N5, 5Y6/1	U. Lodgepole
276	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1133.9	1146.0	N3-N5	U. Lodgepole
277	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1149.1	1161.3	N3-N5	U. Lodgepole
278	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1164.3	1176.5	N3-N6	L. Lodgepole
279	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1179.6	1191.7	N3-N6	L. Lodgepole
280	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1194.8	1207.0	N3-N5	L. Lodgepole
281	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1210.1	1222.2	N3-N5, 5Y4/1	L. Lodgepole
282	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1225.3	1237.5	N3-N5, 5Y4/1	L. Lodgepole
283	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1240.5	1252.7	N3-N5, 5Y4/1	L. Lodgepole
284	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1255.8	1268.0	N3-N5, 5Y4/1	Bakken
285	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1271.0	1283.2	N3-N5, 5R4/2	Three Forks
286	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1307.6	1319.8	N3-N5, 5YR4/1	Birdbear
287	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1322.8	1335.0	N5, 5YR4/1	Birdbear
288	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1338.1	1350.3	N3-N5, 5Y4/1	Duperow
289	Cleary SV Moore	11-13-01-28W1	346000	5433610	62F/03	1353.3	1359.4	N5, 5YR6/1	Duperow

Appendix 4 Continued
Black Shale Chip Samples - Ultra Trace ICP Data

Sample Number	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit		0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
240	3050	0.22	21.8	0.6	1.2	32.0	80	12.6	17.5	1.2	135
241	5760	0.28	23.6	0.8	1.6	37.4	110	13.2	18.5	1.0	183
242	5760	0.24	19.6	1.0	1.7	34.8	122	16.8	17.0	0.8	182
243	7950	0.28	16.4	0.2	2.0	37.2	110	24.8	13.5	1.2	174
244	7950	0.24	18.0	0.6	1.5	33.4	140	19.8	14.5	1.2	153
245	7950	0.20	17.0	0.6	1.4	29.0	100	13.2	15.5	0.6	146
246	7950	0.20	17.4	0.6	1.2	31.6	90	13.4	15.5	0.6	139
247	7950	0.20	17.6	0.4	1.0	34.6	90	15.6	15.0	0.8	113
248	7950	0.20	15.2	0.2	0.8	34.4	90	11.2	17.5	0.8	90
249	7950	0.22	19.2	0.8	0.9	36.8	100	14.8	19.5	0.8	100
250	9315	0.24	18.4	0.6	1.0	34.8	120	11.4	17.0	0.6	135
251	9315	0.20	15.4	0.6	1.0	31.0	100	10.8	16.5	0.8	88
252	20500	0.30	22.2	1.0	1.6	37.8	170	20.2	43.5	1.0	121
253	20500	0.24	22.4	0.6	1.3	34.8	150	14.4	53.5	1.2	106
254	20500	0.20	14.8	0.6	1.1	31.6	110	11.0	21.5	1.0	85
255	20500	0.18	15.6	0.6	1.0	27.6	160	9.8	23.5	0.8	97
256	20500	0.14	9.8	0.6	0.7	26.0	110	7.0	16.5	0.6	78
257	20500	0.16	9.8	0.6	0.8	29.4	100	8.6	39.5	0.2	77
258	20500	0.24	16.8	0.2	1.5	34.6	150	12.4	28.5	1.6	84
259	20500	0.08	7.0	0.6	0.3	12.0	70	4.2	13.5	0.2	36
260	20500	0.12	10.0	0.4	0.6	20.2	90	7.6	15.0	0.2	72
261	22640	0.14	9.8	0.2	0.7	23.6	110	7.0	15.5	0.6	63
262	22640	0.14	8.4	0.6	0.7	27.2	90	6.0	15.0	0.4	66
263	22650	0.12	7.8	0.8	0.5	23.2	100	4.4	12.0	0.4	48
264	22650	0.12	7.8	0.6	0.5	21.4	80	5.4	10.5	0.2	51
265	22650	0.16	9.2	0.6	0.6	26.6	80	6.6	13.5	0.2	66
266	22670	0.16	12.4	0.4	0.5	29.2	70	6.0	17.0	0.6	70
267	22670	0.14	11.6	0.8	0.5	27.2	80	6.4	20.5	0.4	81
268	36010	0.10	8.0	0.2	0.5	17.8	50	4.4	20.5	0.1	58
269	39100	0.08	6.6	0.4	0.3	18.0	60	4.0	10.5	0.1	44
270	39300	0.10	7.6	0.6	0.4	18.6	70	4.8	13.0	0.1	58
271	39300	0.14	7.8	0.2	0.6	19.2	60	4.6	14.0	0.2	73
272	39300	0.12	10.0	0.2	0.5	23.4	50	5.6	15.0	0.1	102
273	39710	0.12	6.0	0.2	0.6	18.4	50	4.6	17.5	0.1	71
274	39710	0.12	7.4	0.8	0.4	26.2	50	6.0	26.5	0.1	63
275	39710	0.12	10.0	0.6	0.6	23.2	50	5.2	21.0	0.6	68
276	39710	0.10	7.0	0.6	0.3	22.4	60	3.8	15.0	0.6	63
277	39710	0.14	7.8	0.4	0.5	24.8	50	6.0	16.5	0.2	65
278	39757	0.14	9.2	0.6	0.4	28.0	90	6.0	16.0	0.2	70
279	39757	0.08	5.8	0.2	0.3	16.2	40	4.4	23.0	0.2	53
280	39757	0.12	7.4	0.6	0.4	22.6	60	4.4	16.0	0.2	60
281	39757	0.10	7.2	0.4	0.4	21.4	60	4.6	16.0	0.1	59
282	39757	0.10	7.6	0.2	0.6	24.8	50	7.8	22.0	0.1	93
283	39757	0.12	8.0	0.2	0.5	25.4	50	6.4	20.0	0.2	73
284	40700	0.16	11.8	0.1	1.2	31.2	90	12.0	22.0	1.0	100
285	50600	0.12	8.4	0.2	0.8	25.4	60	7.4	15.5	0.8	98
286	52800	0.12	13.0	0.2	0.5	28.2	90	28.8	29.5	0.6	82
287	52800	0.06	4.6	0.1	0.5	13.2	40	6.8	28.5	0.2	50
288	53200	0.12	7.8	0.1	0.8	21.0	60	10.0	53.5	0.8	92
289	53200	0.06	6.0	0.2	0.5	11.4	40	6.0	19.5	0.2	47

Appendix 5
Black Shale Drill Core

Sample	Drillhole	Location	Utm		Map	KB	Measured Interval (m)	
Number	Number		Easting	Northing		Elev.	From	To
D1	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	11.4	17.0
D2	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	17.0	21.2
D3	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	21.2	28.6
D4	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	28.6	35.4
D5	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	35.4	39.6
D6	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	39.6	46.8
D7	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	46.8	51.0
D8	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	51.0	54.7
D9	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	54.7	58.4
D10	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	58.4	62.4
D11	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	62.4	66.3
D12	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	66.3	76.3
D13	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	76.3	80.3
D14	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	80.3	84.5
D15	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	84.5	88.4
D16	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	88.4	92.6
D17	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	92.6	96.1
D18	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	96.1	100.2
D19	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	100.2	104.4
D20	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	104.4	111.9
D21	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	111.9	116.8
D22	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	116.8	118.8
D23	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	118.8	147.9
D24	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	147.9	159.0
D25	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	159.0	167.8
D26	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	167.8	210.6
D27	M-10-78	04-10-23-15W1	465125	5645900	62J/14	284.0	9.0	9.9
D28	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	5.4	5.6
D29	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	14.8	15.1
D30	M-9-78	15-04-23-15W1	464225	5645450	62J/13	283.0	8.3	9.4
D31	M-6-78A	05-07-48-25W1	358950	5888075	63F/03	259.0	20.6	20.6
D32	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	25.7	26.3
D33	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	26.3	28.7
D34	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	28.7	29.9
D35	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	29.9	30.6
D36	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	30.6	31.8
D37	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	31.8	33.0
D38	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	33.0	34.2
D39	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	34.2	35.4
D40	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	35.4	45.3
D41	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	45.3	47.5
D42	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9
D42a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9
D43	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2
D43a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2
D44	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8
D44a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8
D45	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	48.8	51.7
D46	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	51.7	55.5
D47	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	55.5	58.9
D48	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0
D48a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0
D49	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	62.0	65.9
D50	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	65.9	69.3
D51	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	69.3	74.4
D52	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	11.9	14.2
D53	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	27.0	29.8
D54	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	152.8	152.8
D55	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	73.8	75.1

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Date Sampled	Sampled by	Colour	Period	Formation or Member	Formation Code
D1	Dec 14/95	M.F./R.B.	N4	Cretaceous	Ashville	7950
D2	Dec 14/95	M.F./R.B.	N4	Cretaceous	Ashville	7950
D3	Dec 14/95	M.F./R.B.	N4	Cretaceous	Ashville	7950
D4	Dec 14/95	M.F./R.B.	N4	Cretaceous	Ashville	7950
D5	Dec 14/95	M.F./R.B.	N4 - 5GY4/1	Cretaceous	Ashville	7950
D6	Dec 14/95	M.F./R.B.	N4 - 5GY4/1	Cretaceous	Ashville	7950
D7	Dec 14/95	M.F./R.B.	N4 - N6	Cretaceous	Ashville	7950
D8	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D9	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D10	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D11	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D12	Dec 14/95	M.F./R.B.	N4 - 5G4/1	Cretaceous	Ashville	7950
D13	Dec 14/95	M.F./R.B.	N4 - N8	Cretaceous	Ashville	7950
D14	Dec 14/95	M.F./R.B.	N6 - N8	Cretaceous	Ashville	7950
D15	Dec 14/95	M.F./R.B.	N4 - N8	Cretaceous	Ashville	7950
D16	Dec 14/95	M.F./R.B.	N4 - 5GY4/1	Cretaceous	Ashville	7950
D17	Dec 14/95	M.F./R.B.	N5	Cretaceous	Ashville	7950
D18	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D19	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D20	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Ashville	7950
D21	Dec 14/95	M.F./R.B.	5Y6/1 - 5GY6/1	Cretaceous	Swan River	9315
D22	Dec 14/95	M.F./R.B.	5GY6/1	Cretaceous	Swan River	9315
D23	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Swan River	9315
D24	Dec 14/95	M.F./R.B.	5Y4/1	Cretaceous	Swan River	9315
D25	Dec 14/95	M.F./R.B.	N4, N5, 5YR3/2	Cretaceous	Swan River	9315
D26	Dec 14/95	M.F./R.B.	N4 - N5	Cretaceous	Swan River	9315
D27	Jan 12/96	M.F./R.B.	N5	Cretaceous	Swan River	9315
D28	Jan 12/96	M.F./R.B.	N4 - N5	Cretaceous	Swan River	9315
D29	Jan 12/96	M.F./R.B.	N4 - N5	Cretaceous	Swan River	9315
D30	Jan 12/96	M.F./R.B.	N4 - N5	Cretaceous	Swan River	9315
D31	Jan 12/96	M.F./R.B.	5Y8/1, N7	Cretaceous	Niobrara	3050
D32	Jan 12/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D33	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D34	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D35	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D36	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D37	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D38	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D39	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D40	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D41	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D42	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D42a	Jan 12/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D43	Jan 12/96	M.F./R.B.	5Y6/1 - 5Y4/1	Cretaceous	Niobrara	3050
D43a	Jan 12/96	M.F./R.B.	5Y6/1, 5GY6/1, 10Y7/4	Cretaceous	Niobrara	3050
D44	Jan 12/96	M.F./R.B.	5Y4/1 - 5GY6/1	Cretaceous	Niobrara	3050
D44a	Jan 12/96	M.F./R.B.	5Y6/1 - 5Y8/4	Cretaceous	Niobrara	3050
D45	Jan 12/96	M.F./R.B.	5Y6/1 - 5Y4/1	Cretaceous	Niobrara	3050
D46	Jan 12/96	M.F./R.B.	5Y6/1 - 5Y4/1	Cretaceous	Niobrara	3050
D47	Jan 12/96	M.F./R.B.	5Y6/1	Cretaceous	Niobrara	3050
D48	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D48a	Jan 12/96	M.F./R.B.	5Y4/1, N5	Cretaceous	Niobrara	3050
D49	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D50	Jan 12/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D51	Jan 12/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D52	Jan 12/96	M.F./R.B.	5Y6/1, N2	Tertiary	Turtle Mountain	410
D53	Jan 12/96	M.F./R.B.	N1	Tertiary	Turtle Mountain	410
D54	Jan 12/96	M.F./R.B.	5Y6/1, 5Y4/1, 5Y8/4	Cretaceous	Pierre	2080
D55	Jan 12/96	M.F./R.B.	N1 - N2	Tertiary	Turtle Mountain	410

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Comments
D1	well indurated shale; fissile
D2	well indurated shale; fissile
D3	well indurated shale; fissile
D4	well indurated shale; fissile
D5	well indurated shale; fissile; 5GY4/1 between 11.4-11.6 m
D6	well indurated shale; fissile
D7	well indurated shale; fissile
D8	well indurated shale; fissile; some yellow precipitate
D9	well indurated shale; fissile
D10	well indurated shale; fissile
D11	well indurated shale; fissile
D12	well indurated shale; fissile
D13	well indurated shale; fissile; minor laminations of green to white precipitate; silty; minor pyrite(?)
D14	well indurated shale; fissile; minor green to white precipitate; siltstone to mudstone
D15	minor green to white precipitate; siltstone at top to shale at base; fissile
D16	shale; fissile; tiny black flecks (fish scales?); minor slickensides; green/white precipitate
D17	well indurated shale; fissile; minor yellow/green precipitate
D18	shale; fissile; sandy pods; sample of white fibrous material and yellow precipitate at 29.89 m
D19	shale; sandy pods & lenses; minor black pebbles; minor green/yellow precipitate
D20	well indurated shale; fissile; minor silty laminations
D21	coarse grained sandstone, 4-6 cm thick; massive sulphide sample(?)
D22	dark shale and silt; minor green (olive) yellow precipitate
D23	dark green (forest, 5GY5/2) precipitate; yellow green precipitate; black shale; silty
D24	siltstone. to shale; abundant green flecks and colouration - glauconite
D25	as above; rusty brown zone with black flecks; green/yellow precipitate; minor white precipitate
D26	as above; minor green/yellow precipitate; very poor recovery. - only 2 m of core; very clayey
D27	siltstone with clay; abundant woody fragments
D28	silty mudstone; abundant woody fragments (lignitic); minor yellow precipitate
D29	silty mudstone; abundant woody material; fissile
D30	silty mudstone; abundant woody material; minor yellow precipitate (small pebbles?)
D31	5-7 cm thick; black grey crystals; white acicular crystals, some yellow precipitate; slightly aquamarine
D32	siltstone; slightly laminated to massive
D33	siltstone; some slickensides?
D34	siltstone; olive-yellow tint
D35	siltstone; olive-yellow-green tint
D36	siltstone; slightly finer grained
D37	siltstone
D38	siltstone; @ 34.1 m - 1 cm bentonite bed (white to yellow)
D39	siltstone; grey
D40	silty mudstone; fissile
D41	silty mudstone; fissile to massive
D42	silty mudstone; yellow to olive brown precipitate, 2-4 cm thick
D42a	siltstone; yellow precipitate intervals @ 39.8, 40.1, 41.7, 41.8 m
D43	siltstone; some very dark grey intervals; Chondrites burrows
D43a	siltstone; yellow olive precipitate (along fractures?); @ 42.6, 42.9, 43.4, 43.6 m
D44	slightly silty mudstone; some slickensides
D44a	siltstone; yellow precipitate @ 46.1, 48.8 m
D45	silty mudstone; slightly laminated
D46	silty mudstone; yellow precipitate @ 42.4 m
D47	silty mudstone; abundant white specks
D48	silty mudstone; abundant white specks
D48a	silty mudstone; yellow olive brown precipitate @ 59.2 m; yellow precipitate (silty) @ 61.1 m
D49	black shale; massive; abundant shaly fragments (?)
D50	black shale; massive; abundant shaly fragments (?)
D51	black shale; massive; abundant shaly fragments (?)
D52	silty mudstone; massive
D53	lignitic shale; coaly
D54	mudstone; Chondrites burrows; pyrite nodules; yellow precipitate
D55	lignitic shale; coaly; brittle fracture; yellow brown coating

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)	
			Easting	Northing			From	To
D56	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	79.6	80.0
D57	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	5.2	9.8
D58	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	9.8	11.2
D59	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	11.2	13.4
D60	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	13.4	15.0
D61	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	15.0	28.3
D62	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	28.3	17.4
D63	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	17.4	19.1
D64	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	19.1	20.4
D65	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	20.4	22.3
D66	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	22.3	23.5
D67	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	23.5	25.7
D68	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	35.4	37.4
D69	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	37.4	38.7
D70	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	38.7	40.3
D71	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	42.6	43.8
D72	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	41.4	43.8
D73	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	40.3	43.8
D74	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	49.7	50.9
D75	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	48.4	49.7
D76	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	54.4	55.6
D77	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	50.9	54.4
D78	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	0.0	1.2
D79	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	1.2	5.0
D80	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	5.0	6.2
D81	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	6.2	7.4
D82	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	7.4	8.7
D83	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	8.7	9.9
D84	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	9.9	11.1
D85	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	11.1	12.3
D86	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	12.3	14.0
D87	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.0	14.6
D88	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.6	15.9
D89	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	15.9	17.1
D90	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	17.1	18.3
D91	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	19.5
D92	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	19.5	21.0
D93	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	21.0
D94	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	21.0	22.3
D95	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	22.3	23.5
D96	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	23.5	24.7
D97	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	24.7	25.9
D98	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	25.9	26.4
D99	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	26.4	28.2
D100	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	28.2	29.5
D101	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	29.5	30.6
D102	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	30.6	31.8
D103	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	31.8	33.2
D104	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	33.2	34.4
D105	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	34.4	35.8
D106	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	35.8	37.0
D107	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.0	37.6
D108	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.6	39.1
D109	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	39.1	40.3
D110	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	40.3	41.7
D111	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	41.7	42.9
D112	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	42.9	45.0
D113	M-2-80	04-18-18-04W1	570264	5598817	62J/09	251.5	286.5	287.5
D114	MOGC DALY	07-34-08-24W1	341475	5507425	62F/11	468.0	846.0	848.3

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Date Sampled	Sampled by	Colour	Period	Formation or Member	Formation Code
D56	Jan 12/96	M.F./R.B.	N1 - N2	Tertiary	Turtle Mountain	410
D57	Jan 17/96	M.F./R.B.	5Y4/1 - N4/N7	Cretaceous	Niobrara	3050
D58	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Niobrara	3050
D59	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Niobrara	3050
D60	Jan 17/96	M.F./R.B.	N4/N7 - 5Y4/1	Cretaceous	Niobrara	3050
D61	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D62	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Niobrara	3050
D63	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D64	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D65	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D66	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D67	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Niobrara	3050
D68	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D69	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D70	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D71	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D72	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D73	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D74	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D75	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D76	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D77	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Morden	5670
D78	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D79	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D80	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D81	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D82	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D83	Jan 17/96	M.F./R.B.	5Y4/1 - 5GY4/1	Cretaceous	Favel	5760
D84	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D85	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D86	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D87	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D88	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D89	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D90	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D91	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D92	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D93	Jan 17/96	M.F./R.B.	5Y4/1 - N5/N6	Cretaceous	Favel	5760
D94	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D95	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D96	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D97	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D98	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D99	Jan 17/96	M.F./R.B.	5Y4/1 - N4	Cretaceous	Favel	5760
D100	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D101	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D102	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D103	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D104	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D105	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D106	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D107	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D108	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D109	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D110	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D111	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D112	Jan 17/96	M.F./R.B.	5Y4/1	Cretaceous	Favel	5760
D113	Jan 24/96	M.F./R.B.	5Y4/1 - 5GY4/1	Ordovician	Winnipeg	74000
D114	Jan 24/96	M.F./R.B.	N2 - N3	Mississippian	Bakken	40700

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Comments
D56	lignitic shale; coaly; brittle fracture; minor yellow brown coating
D57	silty mudstone; fissile to laminated; light grey coating/weathering; minor yellow precipitate
D58	silty mudstone; minor grey coating
D59	silty mudstone
D60	silty mudstone; abundant grey coating; yellow precipitate as beds; very clayey
D61	silty mudstone; fissile; laminated
D62	silty mudstone; fissile; laminated
D63	silty mudstone; slight light grey coating
D64	silty mudstone; slight light grey coating
D65	silty mudstone; slight light grey coating
D66	silty mudstone; minor Chondrites; scattered yellow precipitate as layers
D67	silty mudstone; minor yellow precipitate layers
D68	slightly silty mudstone; blocky texture; massive
D69	silty mudstone; blocky texture
D70	silty mudstone; massive
D71	silty mudstone; massive
D72	silty mudstone; massive
D73	silty mudstone; massive
D74	silty mudstone; massive
D75	silty mudstone; massive
D76	silty mudstone; 1 cm white to yellow acicular crystals (coating?)
D77	silty mudstone; minor yellow precipitate
D78	silty mudstone; fissile to laminated; white specks
D79	silty mudstone; fossiliferous layers; white specks
D80	silty mudstone; white specks
D81	silty mudstone; white specks
D82	silty mudstone; white specks
D83	silty mudstone; containing abundant calcareous laminations (white); @ 9.1 m white calcareous bed
D84	silty mudstone; with abundant calcareous laminations (white); @ 10.8 m, 2 cm yellow rusty precipitate
D85	silty mudstone; fossiliferous?; minor yellow green precipitate
D86	silty mudstone; abundant white calcareous laminations
D87	silty mudstone; abundant white calcareous laminations and specks
D88	silty mudstone; abundant white specks
D89	silty mudstone; abundant white specks
D90	silty mudstone; abundant white specks
D91	silty mudstone; scattered white specks; bentonitic?; scattered black glossy flecks; abundant yellow precipitate with bentonite
D92	silty mudstone.; no abundant bentonitic beds; one yellow precipitate bed
D93	silty mudstone; bentonitic at 18.5, 18.9, 19.9, 19.2, 19.5 m; minor yellow precipitate
D94	slightly silty shale/mudstone; massive; well indurated; minor olive brown precipitate
D95	silty mudstone; minor yellow precipitate as nodules; white flecks
D96	silty mudstone; massive; white calcareous laminations and specks
D97	silty mudstone; massive with white calcareous laminations and specks
D98	silty mudstone; minor olive brown precipitate
D99	silty mudstone; dark brown fossiliferous fragments
D100	silty mudstone
D101	silty mudstone; abundant white specks
D102	silty mudstone; scattered olive yellow precipitate
D103	silty mudstone; scattered olive yellow precipitate
D104	silty mudstone; scattered olive yellow precipitate
D105	silty mudstone; scattered white calcareous laminations
D106	silty mudstone; scattered white calcareous laminations
D107	silty mudstone; massive
D108	silty mudstone; massive
D109	silty mudstone; minor olive brown precipitate
D110	silty mudstone; minor olive brown precipitate
D111	silty mudstone; yellow olive brown precipitate along bedding planes
D112	silty mudstone; yellow brown precipitate
D113	silty shale; massive; some laminated beds of calcite; yellow brown coating in lower 0.3 m; abundant pyrite
D114	black shale; fissile; 10-15 cm beds may be burrowed? (3-4 mm); sharp upper contact

**Appendix 5 Continued
Black Shale Drill Core**

Sample	Drillhole	Location	Utm		Map	KB	Measured Interval (m)	
Number	Number		Easting	Northing		Elev.	From	To
D115	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	7.8	7.9
D116	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	10.7	10.8
D117	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	15.8	18.1
D118	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.1	18.9
D119	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.9	19.9
D120	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	19.1	20.5
D121	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	0.0	1.5
D122	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	1.5	3.0
D123	COMRP96-21	05-11-47-17W1	443349	5876641	63G/04	269.7	116.5	115.8
D125	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	49.8	50.5
D126	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4
D127	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4
D128	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	53.4
D129	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	54.0
D130	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.0	54.6
D131	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.6	55.3
88-11-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	213.8	214.6
88-12-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	214.9	215.6
88-16-96	Com RP-97-25	14-32-42-21W1	401569	5835738	63C/09	267.3	206.7	206.7
88-38-96	F/B WL-96-154	01-04-57-14W1	469001	5971330	63G/14	275.0	91.4	98.5
88-40-96	F/B WL-96-149	13-12-56-14W1	472507	5964578	63G/14	267.0	116.7	117.7
88-41-96	F/B WL-96-134	15-33-52-14W1	469785	5932014	63G/11	271.6	149.8	154.4
88-42-96	F/B WL-96-138	08-19-31-15W1	456764	5918180	63G/05	283.3	178.6	179.6
88-43-96	F/B WL-96-139	09-14-51-16W1	453509	5917142	63G/05	271.9	171.7	173.2
88-44-96	F/B WL-96-133	02-34-53-16W1	451715	5940504	63G/12	276.0	163.2	173.5
88-45-96	F/B WL-96-131	08-33-53-16W1	450579	5941116	63G/12	272.8	151.0	152.8
88-46-96	F/B WL-96-130	08-19-53-15W1	456877	5937647	63G/12	272.8	215.7	219.8
88-47-96	F/B WL-96-127	13-12-56-14W1	472558	5964427	63G/14	265.0	115.5	116.3
88-49-96	M-3-96	13-28-34-10W1	511948	57569159	63G/06	256.1	237.9	237.9
88-73-96	M-1-96	13-24-50-14W1	474500	5909450	62O/15	266.7	163.8	164.5
88-74-96	M-6-96	04-23-14-01E1	616625	5561625	62I/03	250.5	19.4	19.4
88-75-96	M-8-96	02-22-13-06E1	665360	5552875	62I/02	240.1	70.7	72.3
88-85-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	433.2	433.4
88-86-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	417.2	417.3
88-87-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	339.2	339.3
88-89-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	36.9	37.6

**Appendix 5 Continued
Black Shale Drill Core**

Sample Number	Date Sampled	Sampled by	Colour	Period	Formation or Member	Formation Code
D115	Feb 21/96	M.F./R.B.	N1-N3	Cretaceous	Cretaceous	2010
D116	Feb 21/96	M.F./R.B.	5YR4/1-5YR2/1	Cretaceous	Cretaceous	2010
D117	Feb 21/96	M.F./R.B.	N1-N3	Cretaceous	Cretaceous	2010
D118	Feb 21/96	M.F./R.B.	N2-N4	Cretaceous	Cretaceous	2010
D119	Feb 21/96	M.F./R.B.	N2-N4	Cretaceous	Cretaceous	2010
D120	Feb 21/96	M.F./R.B.	N1-N2, 5YR4/1	Cretaceous	Cretaceous	2010
D121	Feb 21/96	M.F./R.B.	N1-N3	Cretaceous	Cretaceous	2010
D122	Feb 21/96	M.F./R.B.	N1-N3	Cretaceous	Cretaceous	2010
D123	Apr 17/96	M.F./R.B.	N2-N3	Cretaceous	Cretaceous	2010
D125	Apr 17/96	M.F./R.B.	5B6/2	Cretaceous	Cretaceous	2010
D126	Apr 17/96	M.F./R.B.	N4, 5YR6/1	Cretaceous	Cretaceous	2010
D127	Apr 17/96	M.F./R.B.	N4, 5YR6/1	Cretaceous	Cretaceous	2010
D128	Apr 17/96	M.F./R.B.	10R3/4	Cretaceous	Cretaceous	2010
D129	Apr 17/96	M.F./R.B.	N3-N4	Cretaceous	Cretaceous	2010
D130	Apr 17/96	M.F./R.B.	N3-N4, 5YR4/1, 5GY6/1	Cretaceous	Cretaceous	2010
D131	Apr 17/96	M.F./R.B.	N3-N4, 5YR4/1, 5GY6/1	Cretaceous	Cretaceous	2010
88-11-96		R.B.	black	Ordovician	Winnipeg	74000
88-12-96		R.B.	black	Ordovician	Winnipeg	74000
88-16-96		R.B.	black	Ordovician	Winnipeg	74000
88-38-96		R.B.		Ordovician	Winnipeg	74000
88-40-96		R.B.		Ordovician	Winnipeg	74000
88-41-96		R.B.		Ordovician	Winnipeg	74000
88-42-96		R.B.	green	Ordovician	Winnipeg	74000
88-43-96		R.B.		Ordovician	Winnipeg	74000
88-44-96		R.B.	green	Ordovician	Winnipeg	74000
88-45-96		R.B.		Ordovician	Winnipeg	74000
88-46-96		R.B.		Ordovician	Winnipeg	74000
88-47-96		R.B.		Ordovician	Winnipeg	74000
88-49-96		R.B.		Ordovician	Winnipeg	74000
88-73-96		R.B.	green-grey	Ordovician	Winnipeg	74000
88-74-96		R.B.	red-green	Ordovician	Pennitentiary	73520
88-75-96		R.B.		Ordovician	Winnipeg	74000
88-85-96		R.B.		Ordovician	Winnipeg	74000
88-86-96		R.B.		Ordovician	Winnipeg	74000
88-87-96		R.B.		Ordovician	Fort Garry	73800
88-89-96		R.B.		Cretaceous	Swan River	9315

Appendix 5 Continued
Black Shale Drill Core

Sample Number	Comments
D115	black shale; silty; white precipitate; minor pyrite; not well indurated
D116	brown to black clay; silty; abundant flecks of pyrite (<1 mm) crystals; minor white precipitate
D117	dark grey black to black silty clay; not well indurated; slight yellow oxide/stain; minor coal
D118	black to grey shale; slightly sandy; scattered woody fragments; minor white clay intervals
D119	black to grey shale; very dark black at base; slightly sandy/silty; white precipitate/fragments
D120	dark black silty clay to brown silty clay
D121	dark black, slightly silty clay; abundant coaly fragments; large pyrite nodules (1-3 cm); abundant pyrite flecks
D122	dark black, slightly silty clay; minor white beige interbeds; scattered woody fragments
D123	black coaly silt bed; pyretic (nodular with boxwork texture and disseminated)
D125	blue grey claystone; fissile
D126	brown siltstone; pyrite (nodules)
D127	large pyrite nodules; up to 3-4 cm in diameter
D128	red brown mineral; fine crystalline; <1 mm across; acts like a coating
D129	black coaly bed; light grey clay intervals; some quartz sand
D130	black coaly bed; red brown silt; some green grey interbeds
D131	black coaly bed; abundant interbeds of fine grained dark red silt/sand
88-11-96	shale
88-12-96	shale
88-16-96	siltstone to sandstone; shale
88-38-96	shaly siltstone
88-40-96	shaly sandstone
88-41-96	shaly siltstone
88-42-96	shale
88-43-96	shaly siltstone with some sand
88-44-96	shale with some sand
88-45-96	siltstone with sand
88-46-96	silty shale with some sand
88-47-96	sandstone
88-49-96	shale/mudstone
88-73-96	shale
88-74-96	mudstone
88-75-96	shale
88-85-96	mudstone
88-86-96	mudstone
88-87-96	mudstone
88-89-96	black shale

Appendix 6
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour	Formation
Detection Limit			Easting	Northing			From	To		
D1	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	11.4	17.0	N4	Ashville
D2	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	17.0	21.2	N4	Ashville
D3	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	21.2	28.6	N4	Ashville
D4	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	28.6	35.4	N4	Ashville
D5	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	35.4	39.6	N4 - 5GY4/1	Ashville
D6	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	39.6	46.8	N4 - 5GY4/1	Ashville
D7	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	46.8	51.0	N4 - N6	Ashville
D8	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	51.0	54.7	N4 - N5	Ashville
D9	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	54.7	58.4	N4 - N5	Ashville
D10	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	58.4	62.4	N4 - N5	Ashville
D11	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	62.4	66.3	N4 - N5	Ashville
D12	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	66.3	76.3	N4 - 5G4/1	Ashville
D13	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	76.3	80.3	N4 - N8	Ashville
D14	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	80.3	84.5	N6 - N8	Ashville
D15	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	84.5	88.4	N4 - N8	Ashville
D16	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	88.4	92.6	N4 - 5GY4/1	Ashville
D17	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	92.6	96.1	N5	Ashville
D18	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	96.1	100.2	N4 - N5	Ashville
D19	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	100.2	104.4	N4 - N5	Ashville
D20	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	104.4	111.9	N4 - N5	Ashville
D21	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	111.9	116.8	5Y6/1 - 5GY6/1	Swan River
D22	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	116.8	118.8	5GY6/1	Swan River
D23	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	118.8	147.9	N4 - N5	Swan River
D24	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	147.9	159.0	5Y4/1	Swan River
D25	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	159.0	167.8	N4, N5, 5YR3/2	Swan River
D26	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	167.8	210.6	N4 - N5	Swan River
D27	M-10-78	04-10-23-15W1	465125	5645900	62J/14	284.0	9.0	9.9	N5	Swan River
D28	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	5.4	5.6	N4 - N5	Swan River
D29	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	14.8	15.1	N4 - N5	Swan River
D30	M-9-78	15-04-23-15W1	464225	5645450	62J/13	283.0	8.3	9.4	N4 - N5	Swan River
D31	M-6-78A	05-07-48-25W1	358950	5888075	63F/03	259.0	20.6	20.6	5Y8/1, N7	Niobrara
D32	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	25.7	26.3	5Y4/1 - 5GY4/1	Niobrara
D33	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	26.3	28.7	5Y4/1	Niobrara
D34	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	28.7	29.9	5Y4/1	Niobrara
D35	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	29.9	30.6	5Y4/1	Niobrara
D36	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	30.6	31.8	5Y4/1	Niobrara
D37	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	31.8	33.0	5Y4/1	Niobrara
D38	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	33.0	34.2	5Y4/1	Niobrara
D39	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	34.2	35.4	5Y4/1	Niobrara
D40	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	35.4	45.3	5Y4/1	Niobrara
D41	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	45.3	47.5	5Y4/1	Niobrara
D42	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9	5Y4/1	Niobrara
D42a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9	5Y4/1 - 5GY4/1	Niobrara
D43	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2	5Y6/1 - 5Y4/1	Niobrara
D43a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2	5Y6/1, 5GY6/1, 10Y7/4	Niobrara
D44	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8	5Y4/1 - 5GY6/1	Niobrara
D44a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8	5Y6/1 - 5Y8/4	Niobrara
D45	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	48.8	51.7	5Y6/1 - 5Y4/1	Niobrara
D46	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	51.7	55.5	5Y6/1 - 5Y4/1	Niobrara
D47	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	55.5	58.9	5Y6/1	Niobrara
D48	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0	5Y4/1	Niobrara
D48a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0	5Y4/1, N5	Niobrara
D49	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	62.0	65.9	5Y4/1	Niobrara
D50	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	65.9	69.3	5Y4/1 - 5GY4/1	Niobrara
D51	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	69.3	74.4	5Y4/1	Niobrara
D52	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	11.9	14.2	5Y6/1, N2	Turtle Mountain
D53	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	27.0	29.8	N1	Turtle Mountain
D54	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	152.8	152.8	5Y6/1, 5Y4/1, 5Y8/4	Pierre
D55	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	73.8	75.1	N1 - N2	Turtle Mountain

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Formation Code	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
DetectionLimit		2	5.0	0.5	50	0.5	1.0	1	5	1.0	0.01	1	1
D1	7950	6	2.5	64.0	400	2.8	0.5	19	51	4.0	3.00	5	1
D2	7950	3	2.5	12.0	490	2.7	0.5	14	51	5.0	3.96	5	1
D3	7950	5	2.5	7.2	280	3.2	0.5	12	54	5.0	2.90	4	1
D4	7950	1	2.5	8.5	420	2.4	0.5	14	61	6.0	2.66	5	1
D5	7950	1	2.5	9.7	280	5.7	0.5	20	61	6.0	3.59	4	1
D6	7950	1	2.5	9.6	440	4.1	0.5	27	65	6.0	2.99	6	1
D7	7950	8	2.5	9.5	330	2.9	0.5	22	49	5.0	2.38	9	1
D8	7950	1	2.5	9.8	560	2.3	0.5	34	50	5.0	2.56	7	1
D9	7950	1	2.5	12.0	400	2.8	0.5	17	69	7.0	3.36	5	1
D10	7950	1	2.5	15.0	490	3.0	0.5	18	65	6.0	3.55	4	1
D11	7950	7	2.5	12.0	470	3.9	0.5	18	75	7.0	3.34	5	1
D12	7950	5	2.5	10.0	650	3.6	0.5	22	67	8.0	3.46	5	1
D13	7950	1	2.5	17.0	3400	0.3	0.5	19	56	4.0	4.78	7	1
D14	7950	1	2.5	8.0	840	0.3	0.5	18	61	5.0	3.59	7	1
D15	7950	1	2.5	6.9	530	0.3	0.5	16	64	6.0	3.03	6	1
D16	7950	1	2.5	11.0	490	1.6	0.5	18	75	8.0	3.60	5	1
D17	7950	11	2.5	5.9	600	1.6	0.5	19	74	8.0	7.47	6	1
D18	7950	1	2.5	6.8	500	2.4	0.5	15	75	8.0	3.31	6	1
D19	7950	1	2.5	4.6	430	0.3	1.0	12	68	6.0	10.10	4	1
D20	7950	1	2.5	7.4	560	0.3	0.5	17	91	9.0	3.31	7	1
D21	9315	1	2.5	52.0	25	0.3	0.5	41	10	0.5	21.80	1	1
D22	9315	2	2.5	7.3	600	0.3	0.5	25	57	5.0	2.90	7	1
D23	9315	5	2.5	5.9	320	0.3	2.0	18	48	4.0	19.40	5	1
D24	9315	1	2.5	7.9	340	0.3	0.5	28	51	3.0	4.53	14	1
D25	9315	8	2.5	15.0	370	4.8	0.5	25	97	8.0	9.07	8	1
D26	9315	1	2.5	10.0	320	0.3	0.5	33	58	2.0	1.61	20	1
D27	9315	6	2.5	2.5	200	0.3	0.5	13	89	0.5	0.32	29	1
D28	9315	1	2.5	36.0	25	0.3	2.0	10	86	0.5	2.74	19	1
D29	9315	1	2.5	5.3	25	0.3	0.5	20	42	0.5	0.31	17	1
D30	9315	5	2.5	11.0	25	0.3	0.5	12	100	0.5	2.72	32	1
D31	3050	98	2.5	1100.0	25	6.5	3.0	95	37	0.5	17.80	5	3
D32	3050	6	2.5	16.0	820	12.0	0.5	20	130	8.0	3.35	6	1
D33	3050	1	2.5	17.0	640	12.0	3.0	21	160	8.0	2.84	7	1
D34	3050	10	2.5	18.0	840	15.0	2.0	18	140	9.0	3.43	6	1
D35	3050	6	2.5	14.0	820	12.0	0.5	15	140	9.0	3.19	6	1
D36	3050	1	2.5	14.0	950	10.0	0.5	17	120	9.0	3.45	3	1
D37	3050	4	2.5	15.0	990	8.7	0.5	20	120	10.0	4.39	2	1
D38	3050	1	2.5	9.9	1000	6.0	0.5	20	130	10.0	3.36	5	1
D39	3050	5	2.5	9.7	1100	6.3	0.5	28	120	10.0	3.21	4	1
D40	3050	1	2.5	17.0	720	8.3	0.5	18	110	9.0	3.85	5	1
D41	3050	1	2.5	13.0	810	9.0	0.5	19	110	10.0	3.77	5	1
D42	3050	6	2.5	27.0	440	16.0	25.0	18	140	3.0	2.30	3	1
D42a	3050	1	2.5	50.0	420	7.0	15.0	18	56	2.0	4.39	2	1
D43	3050	6	2.5	24.0	360	16.0	19.0	21	170	4.0	2.57	4	1
D43a	3050	5	2.5	50.0	310	1.6	1.0	23	21	0.5	6.71	7	1
D44	3050	5	2.5	26.0	410	16.0	19.0	17	170	4.0	2.90	4	1
D44a	3050	10	2.5	48.0	430	5.1	9.0	20	110	3.0	8.95	4	1
D45	3050	1	2.5	22.0	330	20.0	24.0	23	160	4.0	2.35	3	1
D46	3050	25	2.5	28.0	360	16.0	21.0	20	150	3.0	2.19	2	1
D47	3050	7	2.5	24.0	280	18.0	26.0	18	130	3.0	2.28	2	1
D48	3050	3	2.5	21.0	200	14.0	28.0	15	130	2.0	2.20	2	1
D48a	3050	8	2.5	50.0	590	7.8	15.0	12	91	0.5	4.11	5	1
D49	3050	1	2.5	27.0	800	12.0	0.5	21	160	7.0	3.66	6	1
D50	3050	1	2.5	23.0	680	13.0	2.0	21	130	7.0	3.56	5	1
D51	3050	7	2.5	33.0	730	16.0	6.0	20	140	8.0	3.66	5	1
D52	410	1	2.5	17.0	1200	0.3	0.5	27	89	6.0	4.40	6	1
D53	410	1	2.5	11.0	310	2.3	2.0	10	22	2.0	1.15	1	1
D54	2080	11	2.5	59.0	850	4.2	2.0	26	490	5.0	7.38	5	1
D55	410	1	2.5	13.0	340	1.7	2.0	14	25	2.0	0.87	1	1

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
DetectionLimit	5	1	0.01	20	15.0	0.1	0.1	3	100	500	0.5	0.2
D1	3	1	0.79	12	84.0	0.8	9.2	2	100	250	2.1	15.0
D2	3	1	0.92	13	100.0	0.6	9.5	2	100	250	1.5	14.0
D3	3	1	0.96	13	110.0	0.5	9.2	2	100	250	0.3	13.0
D4	3	1	1.05	15	110.0	0.7	11.0	2	100	250	0.3	13.0
D5	3	3	1.05	14	110.0	0.7	9.8	2	100	250	1.5	12.0
D6	3	1	1.05	14	100.0	0.6	11.0	2	100	250	0.3	14.0
D7	3	4	0.93	13	76.0	0.5	8.5	2	100	250	0.3	11.0
D8	3	4	0.92	13	64.0	0.5	9.0	2	100	250	1.6	10.0
D9	3	4	1.02	13	130.0	0.4	13.0	2	100	250	0.3	12.0
D10	3	1	1.13	14	110.0	0.8	11.0	2	100	250	0.3	13.0
D11	3	1	1.11	14	110.0	0.9	11.0	2	100	250	1.4	13.0
D12	3	1	1.07	13	110.0	0.6	12.0	2	100	250	0.3	15.0
D13	3	1	1.26	13	82.0	0.7	9.3	2	100	250	2.1	15.0
D14	3	1	1.08	12	94.0	0.6	9.7	2	100	250	1.6	14.0
D15	3	1	1.06	11	100.0	0.5	12.0	2	100	250	2.3	16.0
D16	3	1	1.13	13	150.0	0.9	15.0	2	100	250	2.2	15.0
D17	3	1	1.09	10	100.0	0.7	14.0	2	100	250	0.3	15.0
D18	3	1	1.03	12	120.0	0.6	13.0	2	100	250	2.2	14.0
D19	3	1	0.75	12	110.0	0.5	12.0	2	100	250	0.3	12.0
D20	3	1	0.89	13	180.0	0.6	15.0	2	100	250	0.3	14.0
D21	3	1	0.07	150	7.5	2.0	1.2	2	100	250	1.3	1.3
D22	3	1	0.69	11	97.0	0.5	9.8	2	100	250	1.4	13.0
D23	3	1	0.22	11	110.0	0.3	9.6	2	100	250	1.7	9.0
D24	3	1	0.26	10	89.0	0.4	6.7	2	100	250	0.3	9.6
D25	3	1	0.49	16	120.0	0.6	16.0	2	100	250	1.9	16.0
D26	3	1	0.08	10	23.0	0.3	7.4	2	100	250	1.9	12.0
D27	3	1	0.10	11	7.5	0.8	17.0	2	100	250	3.1	23.0
D28	3	10	0.07	80	7.5	1.8	22.0	2	100	250	2.8	19.0
D29	3	1	0.06	10	7.5	0.5	8.9	2	100	250	1.9	8.0
D30	3	12	0.11	10	7.5	1.1	17.0	2	100	800	2.1	24.0
D31	3	24	0.02	350	7.5	58.0	2.7	2	100	250	1.2	6.1
D32	3	12	0.55	80	150.0	2.7	16.0	4	100	250	2.6	15.0
D33	3	16	0.48	16	120.0	3.5	15.0	2	100	250	1.0	14.0
D34	3	12	0.54	10	160.0	3.5	16.0	5	100	250	2.3	16.0
D35	3	12	0.55	12	140.0	2.1	16.0	2	100	250	1.8	15.0
D36	3	11	0.51	11	140.0	1.5	15.0	2	100	250	1.4	15.0
D37	3	10	0.52	170	170.0	1.4	17.0	2	100	250	1.7	15.0
D38	3	1	0.50	11	150.0	1.1	16.0	2	100	250	1.1	15.0
D39	3	1	0.49	11	160.0	1.2	16.0	2	100	250	1.7	14.0
D40	3	1	0.47	16	110.0	1.4	15.0	2	100	250	0.3	15.0
D41	3	1	0.51	11	150.0	0.9	16.0	2	100	250	2.9	16.0
D42	3	37	0.32	10	66.0	14.0	6.7	25	100	1100	0.6	5.7
D42a	3	51	0.61	11	36.0	34.0	7.1	41	100	250	0.3	10.0
D43	3	17	0.36	10	76.0	5.2	8.9	15	100	1400	1.0	7.6
D43a	3	27	1.06	11	31.0	14.0	9.7	16	100	250	1.7	13.0
D44	3	29	0.35	10	73.0	7.3	9.5	18	100	250	1.8	9.7
D44a	3	41	0.49	14	74.0	18.0	8.7	33	100	250	2.6	12.0
D45	3	44	0.33	110	83.0	8.8	8.2	17	100	250	1.4	7.5
D46	3	35	0.25	14	7.5	9.7	7.5	18	100	250	0.3	5.9
D47	3	64	0.30	10	31.0	9.9	6.9	19	100	1100	1.0	6.2
D48	3	78	0.27	150	55.0	7.7	5.6	14	100	1500	0.3	6.0
D48a	3	54	0.43	95	48.0	21.0	4.2	28	100	1100	1.2	8.7
D49	3	1	0.51	97	130.0	3.4	15.0	2	100	250	1.6	16.0
D50	3	12	0.50	12	130.0	2.1	14.0	10	100	250	0.3	16.0
D51	3	35	0.46	12	140.0	3.5	13.0	7	100	250	2.2	14.0
D52	3	1	1.12	11	110.0	1.4	14.0	2	100	250	1.6	10.0
D53	3	4	0.58	10	24.0	2.5	4.9	2	100	1000	0.3	2.8
D54	3	1	1.02	12	99.0	9.0	16.0	6	100	700	1.9	11.0
D55	3	4	0.54	10	7.5	1.6	4.4	3	100	250	0.3	4.2

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
DetectionLimit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
D1	5.8	93	63	42.0	72	23	6.5	1.2	1.00	3.0	0.54
D2	5.3	30	114	47.0	81	25	7.4	1.5	1.10	3.5	0.56
D3	5.1	39	25	41.0	67	28	6.0	1.1	1.00	2.8	0.43
D4	4.8	34	73	41.0	73	29	6.5	1.3	0.25	3.2	0.53
D5	3.7	30	118	36.0	61	23	5.4	1.2	1.00	2.9	0.44
D6	4.0	69	112	40.0	71	25	5.9	1.3	1.00	3.1	0.53
D7	3.8	110	70	42.0	72	30	6.9	1.4	1.30	3.7	0.59
D8	3.0	110	25	36.0	63	18	5.4	1.3	0.25	2.9	0.50
D9	3.2	32	111	42.0	70	24	6.1	1.3	0.25	3.1	0.44
D10	4.5	37	85	39.0	61	26	5.6	1.4	0.25	3.0	0.44
D11	4.5	36	104	40.0	64	30	5.5	1.3	0.25	2.6	0.46
D12	4.8	57	221	46.0	76	27	6.3	1.3	1.10	3.3	0.57
D13	7.0	90	119	51.0	81	29	6.5	1.3	1.20	3.4	0.56
D14	5.1	71	78	42.0	67	25	5.6	1.3	0.25	3.3	0.54
D15	4.6	45	97	45.0	70	30	5.9	1.4	0.90	3.1	0.48
D16	5.6	54	101	52.0	84	29	7.3	1.5	1.20	3.6	0.57
D17	5.5	48	140	51.0	79	31	6.8	1.4	0.25	4.1	0.64
D18	5.5	39	128	44.0	71	24	5.8	1.3	0.25	2.8	0.46
D19	5.6	32	105	44.0	68	25	6.0	1.4	0.25	3.3	0.55
D20	4.3	42	147	49.0	82	29	6.6	1.4	1.40	3.3	0.53
D21	1.1	400	25	6.2	11	6	0.9	0.3	0.25	0.6	0.08
D22	3.9	170	152	35.0	58	21	4.7	1.0	0.25	2.6	0.40
D23	1.9	63	91	35.0	56	16	4.8	1.1	0.25	2.5	0.38
D24	3.5	280	57	49.0	90	37	8.0	1.8	1.30	3.6	0.52
D25	6.2	96	151	59.0	96	31	8.5	1.9	0.25	3.6	0.56
D26	4.8	290	25	37.0	65	25	5.0	1.3	0.90	4.0	0.63
D27	9.4	150	25	110.0	220	64	16.0	3.8	2.80	7.7	1.21
D28	12.0	89	25	140.0	270	110	24.0	5.6	3.90	8.5	1.26
D29	7.8	260	25	52.0	93	52	13.0	3.2	2.20	7.0	1.05
D30	7.2	100	25	43.0	110	32	8.0	1.9	1.50	5.9	0.94
D31	2.4	190	25	3.9	11	5	0.5	0.2	0.25	0.9	0.14
D32	8.2	33	208	57.0	90	33	7.3	1.6	0.25	3.7	0.60
D33	7.0	32	240	47.0	90	33	6.2	1.4	1.50	3.3	0.42
D34	10.0	44	240	57.0	90	36	7.3	1.7	1.20	4.0	0.61
D35	6.5	38	162	54.0	89	33	7.1	1.5	1.00	3.5	0.53
D36	7.5	27	215	52.0	82	30	6.4	1.5	0.25	3.4	0.52
D37	8.5	22	177	51.0	78	33	6.6	1.6	0.90	3.5	0.57
D38	8.7	23	221	53.0	81	29	6.3	1.5	0.90	3.4	0.54
D39	7.1	100	141	51.0	78	31	6.6	1.5	0.25	3.4	0.53
D40	10.0	20	180	44.0	89	36	5.6	1.2	0.25	3.1	0.46
D41	11.0	24	176	53.0	84	32	7.0	1.6	1.10	3.7	0.59
D42	21.0	15	329	31.0	41	14	3.8	1.0	0.25	2.4	0.39
D42a	14.0	23	405	21.0	33	10	2.7	1.0	0.25	1.4	0.16
D43	13.0	19	232	47.0	69	31	6.2	1.6	1.00	3.7	0.57
D43a	5.2	17	134	19.0	31	10	2.2	0.6	0.25	0.4	0.09
D44	14.0	22	231	39.0	63	23	5.4	1.2	0.25	2.4	0.46
D44a	8.1	53	95	31.0	54	21	4.4	1.2	0.25	2.0	0.27
D45	14.0	31	188	32.0	53	18	4.6	1.1	0.80	2.5	0.43
D46	12.0	18	160	26.0	58	16	3.9	0.8	0.25	2.2	0.29
D47	16.0	25	212	28.0	44	18	3.8	1.0	0.60	2.0	0.37
D48	20.0	20	265	32.0	52	19	4.8	1.1	1.00	2.3	0.39
D48a	9.2	23	195	24.0	40	13	3.4	0.8	0.25	1.4	0.22
D49	13.0	65	143	75.0	120	52	11.0	2.5	1.60	4.9	0.79
D50	10.0	60	174	64.0	99	45	9.3	2.2	1.40	4.7	0.72
D51	11.0	44	227	57.0	88	33	8.3	1.9	1.10	4.1	0.68
D52	5.0	75	134	32.0	55	19	4.5	1.1	0.25	2.5	0.40
D53	3.2	34	51	8.1	13	6	1.3	0.3	0.25	1.0	0.18
D54	5.3	41	299	53.0	78	27	8.3	1.8	1.30	3.4	0.55
D55	2.2	43	25	12.0	22	7	1.7	0.4	0.25	1.0	0.16

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour	Formation
DetectionLimit			Easting	Northing			From	To		
D56	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	79.6	80.0	N1 - N2	Turtle Mountain
D57	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	5.2	9.8	5Y4/1 - N4/N7	Niobrara
D58	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	9.8	11.2	5Y4/1 - N4	Niobrara
D59	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	11.2	13.4	5Y4/1 - N4	Niobrara
D60	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	13.4	15.0	N4/N7 - 5Y4/1	Niobrara
D61	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	15.0	28.3	5Y4/1	Niobrara
D62	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	28.3	17.4	5Y4/1	Niobrara
D63	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	17.4	19.1	5Y4/1 - 5GY4/1	Niobrara
D64	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	19.1	20.4	5Y4/1 - 5GY4/1	Niobrara
D65	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	20.4	22.3	5Y4/1 - 5GY4/1	Niobrara
D66	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	22.3	23.5	5Y4/1 - 5GY4/1	Niobrara
D67	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	23.5	25.7	5Y4/1 - 5GY4/1	Niobrara
D68	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	35.4	37.4	5Y4/1	Morden
D69	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	37.4	38.7	5Y4/1	Morden
D70	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	38.7	40.3	5Y4/1	Morden
D71	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	42.6	43.8	5Y4/1	Morden
D72	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	41.4	43.8	5Y4/1	Morden
D73	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	40.3	43.8	5Y4/1	Morden
D74	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	49.7	50.9	5Y4/1	Morden
D75	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	48.4	49.7	5Y4/1	Morden
D76	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	54.4	55.6	5Y4/1	Morden
D77	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	50.9	54.4	5Y4/1	Morden
D78	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	0.0	1.2	5Y4/1 - 5GY4/1	Favel
D79	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	1.2	5.0	5Y4/1 - 5GY4/1	Favel
D80	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	5.0	6.2	5Y4/1 - 5GY4/1	Favel
D81	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	6.2	7.4	5Y4/1 - 5GY4/1	Favel
D82	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	7.4	8.7	5Y4/1 - 5GY4/1	Favel
D83	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	8.7	9.9	5Y4/1 - 5GY4/1	Favel
D84	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	9.9	11.1	5Y4/1	Favel
D85	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	11.1	12.3	5Y4/1 - N5/N6	Favel
D86	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	12.3	14.0	5Y4/1 - N5/N6	Favel
D87	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.0	14.6	5Y4/1 - N5/N6	Favel
D88	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.6	15.9	5Y4/1 - N5/N6	Favel
D89	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	15.9	17.1	5Y4/1 - N5/N6	Favel
D90	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	17.1	18.3	5Y4/1 - N5/N6	Favel
D91	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	19.5	5Y4/1 - N5/N6	Favel
D92	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	19.5	21.0	5Y4/1 - N5/N6	Favel
D93	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	21.0	5Y4/1 - N5/N6	Favel
D94	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	21.0	22.3	5Y4/1 - N4	Favel
D95	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	22.3	23.5	5Y4/1 - N4	Favel
D96	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	23.5	24.7	5Y4/1 - N4	Favel
D97	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	24.7	25.9	5Y4/1 - N4	Favel
D98	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	25.9	26.4	5Y4/1 - N4	Favel
D99	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	26.4	28.2	5Y4/1 - N4	Favel
D100	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	28.2	29.5	5Y4/1	Favel
D101	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	29.5	30.6	5Y4/1	Favel
D102	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	30.6	31.8	5Y4/1	Favel
D103	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	31.8	33.2	5Y4/1	Favel
D104	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	33.2	34.4	5Y4/1	Favel
D105	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	34.4	35.8	5Y4/1	Favel
D106	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	35.8	37.0	5Y4/1	Favel
D107	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.0	37.6	5Y4/1	Favel
D108	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.6	39.1	5Y4/1	Favel
D109	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	39.1	40.3	5Y4/1	Favel
D110	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	40.3	41.7	5Y4/1	Favel
D111	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	41.7	42.9	5Y4/1	Favel
D112	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	42.9	45.0	5Y4/1	Favel
D113	M-2-80	04-18-18-04W1	570264	5598817	62J/09	251.5	286.5	287.5	5Y4/1 - 5GY4/1	Winnipeg
D114	MOG DALY	07-34-08-24W1	341475	5507425	62F/11	468.0	846.0	848.3	N2 - N3	Bakken

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Formation Code	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
DetectionLimit		2	5.0	0.5	50	0.5	1.0	1	5	1.0	0.01	1	1
D56	410	1	2.5	26.0	260	2.0	2.0	7	24	2.0	2.34	1	1
D57	3050	5	2.5	23.0	740	12.0	3.0	17	140	7.0	3.30	5	1
D58	3050	1	2.5	26.0	710	12.0	5.0	18	120	6.0	3.28	5	1
D59	3050	1	2.5	22.0	690	12.0	2.0	15	150	7.0	3.18	5	1
D60	3050	1	2.5	25.0	590	10.0	7.0	17	120	8.0	3.47	5	1
D61	3050	11	2.5	29.0	400	18.0	14.0	17	82	5.0	3.12	3	1
D62	3050	4	2.5	19.0	420	14.0	10.0	15	88	5.0	2.84	5	1
D63	3050	1	2.5	23.0	720	17.0	6.0	17	120	7.0	2.91	6	1
D64	3050	1	2.5	16.0	370	14.0	14.0	14	84	6.0	2.97	5	1
D65	3050	1	2.5	23.0	590	16.0	6.0	16	110	6.0	2.90	6	1
D66	3050	1	2.5	17.0	540	8.7	10.0	14	100	6.0	4.04	5	1
D67	3050	6	2.5	15.0	770	10.0	0.5	38	140	9.0	3.50	7	1
D68	5670	1	2.5	11.0	1400	5.8	0.5	18	140	10.0	3.90	5	1
D69	5670	1	2.5	11.0	920	7.1	0.5	18	120	10.0	3.72	5	1
D70	5670	1	2.5	10.0	870	8.1	0.5	19	110	9.0	3.50	6	1
D71	5670	9	2.5	12.0	990	9.2	0.5	18	110	9.0	4.06	5	1
D72	5670	8	2.5	11.0	850	6.0	0.5	23	120	10.0	3.68	6	1
D73	5670	1	2.5	9.0	870	7.3	0.5	16	120	9.0	3.29	4	1
D74	5670	5	2.5	9.0	1100	7.7	0.5	16	110	9.0	3.36	5	1
D75	5670	7	2.5	8.7	810	8.3	0.5	19	120	10.0	3.68	2	1
D76	5670	1	2.5	13.0	680	6.3	12.0	18	81	7.0	3.88	3	1
D77	5670	1	2.5	20.0	790	9.2	1.0	26	110	9.0	4.05	5	1
D78	5760	8	2.5	28.0	260	12.0	23.0	22	68	5.0	3.18	2	1
D79	5760	9	2.5	31.0	370	14.0	22.0	21	65	6.0	3.54	2	1
D80	5760	1	2.5	28.0	360	9.7	19.0	18	67	7.0	3.55	2	1
D81	5760	5	2.5	23.0	290	11.0	21.0	15	60	4.0	2.74	2	1
D82	5760	1	2.5	18.0	300	9.9	28.0	13	39	3.0	2.05	2	1
D83	5760	1	2.5	20.0	300	9.4	27.0	14	51	3.0	2.13	1	1
D84	5760	1	2.5	21.0	330	9.7	25.0	16	56	4.0	2.65	2	1
D85	5760	1	2.5	14.0	230	12.0	31.0	13	32	1.0	1.56	1	1
D86	5760	6	2.5	16.0	220	15.0	32.0	13	34	2.0	1.38	1	1
D87	5760	1	2.5	9.3	210	9.8	42.0	12	18	1.0	0.86	1	1
D88	5760	5	2.5	18.0	160	15.0	26.0	14	49	3.0	1.77	2	1
D89	5760	5	2.5	15.0	160	18.0	34.0	14	35	2.0	1.44	1	1
D90	5760	6	2.5	15.0	130	21.0	32.0	14	27	1.0	1.28	1	1
D91	5760	6	2.5	7.5	160	9.7	30.0	10	31	2.0	1.21	2	1
D92	5760	11	2.5	19.0	360	11.0	12.0	18	140	5.0	3.25	3	1
D93	5760	7	2.5	31.0	130	0.3	2.0	4	2.5	0.5	1.44	7	1
D94	5760	9	2.5	26.0	420	19.0	11.0	19	78	4.0	3.30	4	1
D95	5760	9	2.5	30.0	380	12.0	12.0	16	62	4.0	3.40	3	1
D96	5760	1	2.5	38.0	420	11.0	11.0	36	81	6.0	3.52	4	1
D97	5760	1	2.5	26.0	320	10.0	13.0	17	67	5.0	3.29	3	1
D98	5760	1	2.5	24.0	330	8.8	19.0	14	56	4.0	3.02	2	1
D99	5760	1	2.5	30.0	430	10.0	17.0	17	69	5.0	3.73	3	1
D100	5760	1	2.5	30.0	370	9.0	13.0	18	83	6.0	3.97	2	1
D101	5760	1	2.5	29.0	380	8.0	10.0	16	79	6.0	3.95	2	1
D102	5760	1	2.5	28.0	390	8.7	10.0	19	86	7.0	4.18	4	1
D103	5760	6	2.5	27.0	390	8.6	11.0	18	79	7.0	4.06	2	1
D104	5760	8	2.5	26.0	320	8.2	11.0	16	75	6.0	3.75	3	1
D105	5760	1	2.5	30.0	450	10.0	11.0	19	78	6.0	3.54	4	1
D106	5760	1	2.5	27.0	360	8.4	10.0	17	74	7.0	3.93	3	1
D107	5760	1	2.5	26.0	300	9.3	11.0	17	75	6.0	4.12	3	1
D108	5760	6	2.5	24.0	300	11.0	18.0	16	73	5.0	3.32	3	1
D109	5760	4	2.5	24.0	260	10.0	17.0	15	69	5.0	3.12	2	1
D110	5760	1	2.5	20.0	260	8.6	20.0	14	54	4.0	2.76	2	1
D111	5760	7	2.5	28.0	390	9.8	15.0	17	72	5.0	4.05	3	1
D112	5760	1	2.5	37.0	420	9.7	13.0	20	74	6.0	4.86	4	1
D113	74000	1	2.5	110.0	320	7.4	11.0	40	120	4.0	10.50	3	1
D114	40700	17	2.5	30.0	390	11.0	3.0	53	120	8.0	3.12	3	1

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
DetectionLimit	5	1	0.01	20	15.0	0.1	0.1	3	100	500	0.5	0.2
D56	3	4	0.51	10	7.5	3.2	6.6	2	100	250	0.3	3.7
D57	3	12	0.43	11	140.0	2.3	14.0	9	100	250	0.3	15.0
D58	3	12	0.44	10	100.0	2.1	13.0	9	100	250	2.4	12.0
D59	3	14	0.47	11	130.0	1.9	15.0	7	100	250	1.9	15.0
D60	3	6	0.45	11	150.0	2.5	14.0	4	100	250	2.0	13.0
D61	3	136	0.35	10	91.0	8.8	8.7	11	100	250	0.3	8.7
D62	3	34	0.40	76	110.0	2.7	10.0	8	100	250	0.3	11.0
D63	3	17	0.51	12	130.0	2.3	13.0	7	100	250	1.5	16.0
D64	3	7	0.40	10	120.0	1.5	10.0	8	100	800	1.5	11.0
D65	3	8	0.48	11	120.0	1.4	12.0	2	100	250	0.3	13.0
D66	3	5	0.38	16	87.0	1.2	12.0	2	100	250	0.3	11.0
D67	3	9	0.56	16	140.0	1.4	16.0	2	100	250	3.8	15.0
D68	3	8	0.58	17	190.0	1.3	19.0	2	100	250	0.3	18.0
D69	3	1	0.57	16	170.0	1.2	17.0	2	100	250	2.7	17.0
D70	3	9	0.53	15	180.0	1.1	15.0	2	100	250	1.8	16.0
D71	3	13	0.53	15	160.0	1.3	16.0	2	100	250	1.4	16.0
D72	3	5	0.56	15	170.0	0.9	17.0	2	100	250	0.3	15.0
D73	3	8	0.53	15	140.0	0.9	15.0	2	100	250	0.3	17.0
D74	3	6	0.53	15	150.0	1.0	17.0	2	100	250	0.3	15.0
D75	3	11	0.53	15	170.0	0.8	17.0	2	100	250	1.5	16.0
D76	3	14	0.41	13	130.0	1.4	14.0	2	100	250	1.6	12.0
D77	3	13	0.47	17	130.0	1.9	15.0	2	100	250	0.3	14.0
D78	3	85	0.19	10	66.0	3.1	8.5	2	100	250	0.7	6.7
D79	3	78	0.28	12	120.0	3.5	10.0	2	100	250	0.3	8.2
D80	3	48	0.31	11	120.0	3.1	10.0	2	100	250	0.3	7.9
D81	3	56	0.33	160	72.0	3.1	8.4	2	100	1200	1.0	6.3
D82	3	51	0.30	10	49.0	2.4	5.6	2	100	1000	0.3	4.6
D83	3	41	0.38	10	83.0	3.0	6.7	2	100	1300	0.7	5.6
D84	3	45	0.43	11	66.0	3.2	8.2	2	100	250	0.3	6.5
D85	3	51	0.31	79	44.0	2.5	3.6	2	100	600	0.3	3.4
D86	3	58	0.30	60	34.0	2.6	4.1	4	100	1100	0.7	3.9
D87	3	36	0.30	10	7.5	1.7	2.4	2	100	1800	0.3	2.1
D88	3	38	0.42	10	60.0	3.1	6.1	2	100	1200	1.2	5.5
D89	3	53	0.34	10	44.0	2.5	4.2	2	100	700	0.3	3.3
D90	3	69	0.30	100	21.0	2.3	3.1	2	100	2000	0.3	3.2
D91	3	10	0.35	62	39.0	1.1	4.4	2	100	250	0.3	6.1
D92	3	4	0.52	12	93.0	1.5	16.0	2	100	250	1.7	10.0
D93	3	12	1.56	10	7.5	3.2	2.2	2	100	250	2.3	45.0
D94	3	37	0.45	11	81.0	2.5	9.5	2	100	250	0.3	9.7
D95	3	82	0.46	10	76.0	3.6	9.9	4	100	250	0.3	11.0
D96	3	58	0.43	140	90.0	4.0	11.0	2	100	250	0.3	9.0
D97	3	89	0.41	11	110.0	2.7	10.0	2	100	1400	0.3	8.9
D98	3	69	0.37	10	81.0	2.3	8.5	6	100	250	1.5	8.1
D99	3	66	0.41	11	100.0	2.7	12.0	2	100	1000	1.9	10.0
D100	3	53	0.44	130	130.0	2.1	14.0	2	100	250	0.3	11.0
D101	3	50	0.42	11	120.0	1.9	13.0	2	100	250	1.0	11.0
D102	3	56	0.48	11	140.0	2.2	14.0	2	100	250	1.4	11.0
D103	3	57	0.46	12	130.0	1.7	14.0	2	100	250	0.3	12.0
D104	3	53	0.43	11	130.0	2.0	14.0	2	100	250	0.3	11.0
D105	3	42	0.39	17	110.0	2.5	12.0	2	100	250	0.3	11.0
D106	3	57	0.43	11	130.0	2.0	13.0	2	100	1000	0.3	11.0
D107	3	62	0.45	11	110.0	2.0	13.0	2	100	250	1.4	11.0
D108	3	71	0.41	11	100.0	1.9	12.0	2	100	900	1.6	9.0
D109	3	79	0.39	10	110.0	2.1	11.0	2	100	250	0.3	8.5
D110	3	63	0.33	10	81.0	1.7	9.0	5	100	1000	0.6	7.4
D111	3	74	0.40	11	94.0	2.3	11.0	2	100	250	0.3	11.0
D112	3	78	0.48	140	100.0	2.6	13.0	2	100	250	1.6	13.0
D113	3	1	0.38	11	120.0	0.1	12.0	2	100	250	1.1	16.0
D114	3	128	0.98	370	180.0	6.9	16.0	64	100	250	0.9	11.0

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
DetectionLimit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
D56	3.4	35	25	9.1	15	5	1.4	0.4	0.25	2.1	0.35
D57	9.9	48	176	61.0	95	39	8.7	2.0	1.10	4.1	0.73
D58	8.6	46	196	61.0	93	41	8.7	2.1	1.40	4.2	0.69
D59	11.0	29	158	73.0	110	49	10.0	2.5	1.70	5.0	0.78
D60	8.7	28	161	55.0	89	33	7.8	1.9	0.90	3.9	0.65
D61	25.0	31	307	37.0	57	23	5.6	1.5	1.10	2.9	0.52
D62	8.7	50	178	45.0	72	31	7.0	1.5	1.00	3.7	0.58
D63	8.1	75	192	60.0	98	41	9.3	2.2	1.60	4.8	0.76
D64	8.4	46	162	47.0	71	32	7.0	1.7	1.00	3.6	0.56
D65	8.1	46	155	58.0	90	35	8.5	2.0	1.40	4.3	0.69
D66	5.2	34	96	42.0	79	34	5.5	1.3	0.25	3.1	0.43
D67	5.7	240	122	57.0	94	33	7.1	1.6	1.00	3.6	0.61
D68	7.6	29	205	60.0	96	37	7.4	1.9	1.20	3.9	0.65
D69	9.1	35	195	53.0	83	26	6.3	1.6	1.30	3.5	0.58
D70	9.9	34	195	49.0	80	30	5.9	1.4	1.00	3.1	0.53
D71	11.0	24	127	53.0	87	27	6.5	1.4	0.90	3.1	0.64
D72	7.3	31	188	54.0	83	33	6.7	1.4	0.90	3.7	0.56
D73	8.1	32	169	51.0	83	36	6.1	1.6	0.25	3.0	0.60
D74	7.8	22	168	53.0	87	31	6.5	1.5	1.10	3.2	0.55
D75	6.8	29	160	56.0	90	32	6.9	1.6	1.40	3.8	0.57
D76	12.0	33	122	41.0	63	17	4.9	1.3	0.80	3.0	0.50
D77	14.0	22	200	45.0	91	36	6.1	1.5	0.25	3.8	0.50
D78	22.0	23	211	26.0	48	15	3.3	0.8	0.25	1.6	0.24
D79	17.0	25	163	31.0	52	25	3.9	0.9	1.10	2.0	0.33
D80	15.0	18	190	32.0	49	19	3.7	1.0	0.25	2.1	0.37
D81	16.0	15	168	25.0	42	14	3.0	0.8	0.25	1.5	0.30
D82	14.0	24	131	21.0	32	10	2.2	0.6	0.25	1.1	0.20
D83	13.0	22	87	20.0	31	10	2.3	0.4	0.25	1.3	0.23
D84	12.0	24	134	26.0	41	16	3.0	0.8	0.25	1.6	0.29
D85	12.0	32	132	13.0	21	9	1.5	0.4	0.25	0.9	0.14
D86	16.0	20	157	15.0	22	8	1.6	0.3	0.25	1.0	0.19
D87	12.0	38	93	9.3	11	6	0.9	0.2	0.25	0.6	0.12
D88	11.0	33	144	20.0	32	11	2.3	0.6	0.25	1.3	0.25
D89	14.0	27	112	15.0	24	11	1.6	0.5	0.25	1.0	0.21
D90	14.0	29	124	13.0	19	5	1.3	0.4	0.25	0.9	0.16
D91	7.6	25	89	27.0	40	16	2.9	0.7	0.25	1.6	0.27
D92	7.3	25	214	41.0	68	26	5.2	1.3	1.10	2.9	0.52
D93	3.5	12	64	14.0	24	7	1.1	0.2	0.25	0.6	0.05
D94	12.0	23	216	34.0	54	24	4.1	1.0	0.60	2.1	0.38
D95	16.0	18	210	37.0	60	20	4.1	1.0	0.50	2.2	0.38
D96	15.0	140	200	33.0	73	28	4.4	0.9	0.25	2.1	0.36
D97	17.0	16	178	35.0	59	18	3.9	0.8	0.25	2.0	0.39
D98	16.0	17	133	28.0	47	16	3.2	0.8	0.25	1.6	0.31
D99	22.0	11	194	40.0	67	23	4.7	1.1	0.90	2.1	0.39
D100	18.0	11	134	44.0	73	24	5.5	1.3	0.80	2.6	0.44
D101	16.0	11	142	41.0	66	23	4.9	1.2	0.80	2.4	0.41
D102	15.0	10	159	44.0	75	27	5.4	1.3	0.70	2.7	0.44
D103	17.0	16	119	46.0	75	25	5.3	1.3	0.25	2.5	0.44
D104	16.0	11	149	45.0	73	19	5.2	1.3	0.80	2.5	0.37
D105	16.0	13	160	35.0	75	35	4.7	1.1	1.10	2.3	0.32
D106	15.0	9	144	42.0	69	23	5.2	1.1	0.25	2.6	0.38
D107	18.0	13	207	41.0	68	26	4.7	1.2	0.25	2.2	0.41
D108	20.0	11	199	38.0	61	19	4.4	1.1	0.70	2.1	0.38
D109	18.0	9	143	35.0	58	19	4.1	1.0	0.25	2.2	0.37
D110	16.0	15	119	29.0	47	15	3.3	0.8	0.25	1.7	0.32
D111	20.0	12	173	36.0	59	18	4.1	1.0	0.80	2.1	0.38
D112	31.0	25	204	62.0	95	35	6.9	1.5	1.40	4.1	0.70
D113	2.2	39	50	38.0	77	26	7.1	1.7	0.25	4.1	0.62
D114	68.0	33	25	44.0	68	24	5.5	1.9	0.90	2.9	0.50

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour	Formation
DetectionLimit			Easting	Northing			From	To		
D115	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	7.8	7.9	N1-N3	Cretaceous
D116	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	10.7	10.8	5YR4/1-5YR2/1	Cretaceous
D117	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	15.8	18.1	N1-N3	Cretaceous
D118	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.1	18.9	N2-N4	Cretaceous
D119	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.9	19.9	N2-N4	Cretaceous
D120	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	19.1	20.5	N1-N2, 5YR4/1	Cretaceous
D121	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	0.0	1.5	N1-N3	Cretaceous
D122	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	1.5	3.0	N1-N3	Cretaceous
D123	COMRP96-21	05-11-47-17W1	443349	5876641	63G/04	269.7	116.5	115.8	N2-N3	Cretaceous
D125	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	49.8	50.5	5B6/2	Cretaceous
D126	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4	N4, 5YR6/1	Cretaceous
D127	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4	N4, 5YR6/1	Cretaceous
D128	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	53.4	10R3/4	Cretaceous
D129	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	54.0	N3-N4	Cretaceous
D130	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.0	54.6	N3-N4, 5YR4/1, 5GY6/1	Cretaceous
D131	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.6	55.3	N3-N4, 5YR4/1, 5GY6/1	Cretaceous
88-11-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	213.8	214.6	black	Winnipeg
88-12-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	214.9	215.6	black	Winnipeg
88-16-96	Com RP-97-25	14-32-42-21W1	401569	5835738	63C/09	267.3	206.7	206.7	black	Winnipeg
88-38-96	F/B WL-96-154	01-04-57-14W1	469001	5971330	63G/14	275.0	91.4	98.5		Winnipeg
88-40-96	F/B WL-96-149	13-12-56-14W1	472507	5964578	63G/14	267.0	116.7	117.7		Winnipeg
88-41-96	F/B WL-96-134	15-33-52-14W1	469785	5932014	63G/11	271.6	149.8	154.4		Winnipeg
88-42-96	F/B WL-96-138	08-19-31-15W1	456764	5918180	63G/05	283.3	178.6	179.6	green	Winnipeg
88-43-96	F/B WL-96-139	09-14-51-16W1	453509	5917142	63G/05	271.9	171.7	173.2		Winnipeg
88-44-96	F/B WL-96-133	02-34-53-16W1	451715	5940504	63G/12	276.0	163.2	173.5	green	Winnipeg
88-45-96	F/B WL-96-131	08-33-53-16W1	450579	5941116	63G/12	272.8	151.0	152.8		Winnipeg
88-46-96	F/B WL-96-130	08-19-53-15W1	456877	5937647	63G/12	272.8	215.7	219.8		Winnipeg
88-47-96	F/B WL-96-127	13-12-56-14W1	472558	5964427	63G/14	265.0	115.5	116.3		Winnipeg
88-49-96	M-3-96	13-28-34-10W1	511948	5.8E+07	63G/06	256.1	237.9	237.9		Winnipeg
88-73-96	M-1-96	13-24-50-14W1	474500	5909450	62O/15	266.7	163.8	164.5	green-grey	Winnipeg
88-74-96	M-6-96	04-23-14-01E1	616625	5561625	62I/03	250.5	19.4	19.4	red-green	Pennitentiary
88-75-96	M-8-96	02-22-13-06E1	665360	5552875	62I/02	240.1	70.7	72.3		Winnipeg
88-85-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	433.2	433.4		Winnipeg
88-86-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	417.2	417.3		Winnipeg
88-87-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	339.2	339.3		Fort Garry
88-89-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	36.9	37.6		Swan River

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Formation Code	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm
DetectionLimit		2	5.0	0.5	50	0.5	1.0	1	5	1.0	0.01	1	1
D115	2010	1	2.5	7.9	360	0.3	2.0	31	40	0.5	0.64	11	1
D116	2010	9	2.5	76.0	85	33.0	0.5	38	55	2.0	17.30	3	1
D117	2010	5	2.5	2.1	210	0.3	0.5	20	64	2.0	0.47	19	1
D118	2010	1	2.5	5.1	62	0.3	0.5	26	31	0.5	0.50	13	1
D119	2010	1	2.5	2.7	220	0.3	0.5	22	26	0.5	0.65	10	1
D120	2010	20	2.5	30.0	680	0.3	0.5	38	71	1.0	3.75	6	1
D121	2010	1	2.5	0.5	300	0.3	0.5	20	85	3.0	0.47	13	1
D122	2010	1	2.5	4.5	100	0.3	0.5	18	65	2.0	0.60	11	1
D123	2010	1	2.5	82.0	190	0.3	1.0	21	120	0.5	11.70	15	1
D125	2010	20	2.5	42.0	640	0.3	0.5	58	280	10.0	4.68	9	1
D126	2010	1	2.5	20.0	220	0.3	0.5	93	54	3.0	23.50	6	1
D127	2010	34	2.5	25.0	25	0.3	0.5	50	16	0.5	25.10	7	1
D128	2010	1	2.5	4.5	25	0.3	0.5	22	43	0.5	0.42	16	1
D129	2010	8	2.5	6.8	100	1.7	0.5	27	30	0.5	2.35	12	1
D130	2010	4	2.5	6.8	130	0.3	0.5	20	37	0.5	1.33	13	1
D131	2010	1	2.5	8.1	240	2.7	0.5	18	71	6.0	2.50	4	1
88-11-96	74000	1	2.5	4.3	170	1.1	0.5	12	61	4.0	1.14	6	1
88-12-96	74000	1	2.5	2.3	25	0.3	0.5	47	11	0.5	0.19	4	1
88-16-96	74000	1	2.5	4.7	70	0.3	0.5	51	30	2.0	1.07	4	1
88-38-96	74000	1	2.5	5.6	150	0.3	0.5	31	37	0.5	1.34	8	1
88-40-96	74000	1	2.5	12.0	440	0.3	0.5	33	87	2.0	3.22	14	1
88-41-96	74000	1	2.5	5.8	300	0.3	0.5	13	97	6.0	1.51	9	1
88-42-96	74000	1	2.5	9.6	340	0.3	0.5	18	110	9.0	4.29	4	1
88-43-96	74000	1	2.5	11.0	270	0.3	0.5	33	59	4.0	3.03	4	1
88-44-96	74000	1	2.5	3.7	470	0.3	0.5	22	83	4.0	1.27	16	1
88-45-96	74000	1	2.5	11.0	410	0.3	0.5	27	100	7.0	3.91	10	1
88-46-96	74000	1	2.5	10.0	240	0.3	0.5	26	100	5.0	3.86	5	1
88-47-96	74000	1	2.5	10.0	330	0.3	0.5	25	120	4.0	1.82	15	1
88-49-96	74000	6	2.5	14.0	550	0.3	0.5	19	130	6.0	2.79	5	1
88-73-96	74000	1	2.5	4.4	360	0.3	0.5	18	110	9.0	4.52	5	1
88-74-96	73520	5	2.5	8.5	170	6.3	20.0	9	20	2.0	1.27	1	1
88-75-96	74000	1	2.5	22.0	530	0.3	0.5	32	130	6.0	5.07	4	1
88-85-96	74000	1	2.5	2.7	560	3.8	0.5	30	150	4.0	1.52	23	1
88-86-96	74000	1	2.5	1.8	540	3.6	0.5	21	160	5.0	1.26	13	1
88-87-96	73800	5	2.5	12.0	200	3.6	19.0	16	46	3.0	1.31	2	1
88-89-96	9315	1	2.5	4.9	240	0.3	0.5	18	62	2.0	0.75	23	1

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm
DetectionLimit	5	1	0.01	20	15.0	0.1	0.1	3	100	500	0.5	0.2
D115	3	11	0.02	11	16.0	0.4	16.0	2	100	250	1.3	7.1
D116	3	40	0.04	270	7.5	3.7	6.0	2	100	250	0.9	5.7
D117	3	8	0.04	10	23.0	0.6	9.0	4	100	250	2.3	9.7
D118	3	7	0.02	10	7.5	0.4	6.1	2	100	250	1.4	5.9
D119	3	8	0.02	10	7.5	0.4	8.2	2	100	250	0.8	5.4
D120	3	26	0.04	10	46.0	1.1	9.9	2	100	250	0.3	12.0
D121	3	6	0.05	260	7.5	0.7	16.0	2	100	250	1.6	15.0
D122	3	14	0.04	10	7.5	0.6	13.0	2	100	250	2.1	13.0
D123	3	40	0.06	150	7.5	7.2	14.0	5	100	250	1.8	24.0
D125	3	1	0.16	25	210.0	3.3	27.0	2	100	250	2.9	28.0
D126	3	5	0.06	520	60.0	0.9	6.8	2	100	250	1.1	6.4
D127	3	14	0.01	150	7.5	2.6	1.0	2	100	250	1.6	1.8
D128	3	10	0.04	10	16.0	0.8	6.2	2	100	250	2.4	12.0
D129	3	8	0.03	10	20.0	0.6	3.4	2	100	250	1.9	8.6
D130	3	8	0.03	10	7.5	0.5	3.4	2	100	250	1.5	9.0
D131	3	2	0.92	15	100.0	0.6	11.0	2	100	250	0.3	11.0
88-11-96	3	3	0.06	10	94.0	0.3	6.9	2	100	250	0.3	8.4
88-12-96	3	2	0.05	10	7.5	0.1	0.9	2	100	250	2.0	1.9
88-16-96	3	1	0.01	10	42.0	0.3	3.2	2	100	250	1.3	4.2
88-38-96	3	3	0.04	10	34.0	0.3	4.1	2	100	250	1.6	5.4
88-40-96	3	6	0.08	110	82.0	0.5	9.4	2	100	250	1.6	12.0
88-41-96	3	1	0.10	10	170.0	0.4	11.0	2	100	250	0.7	13.0
88-42-96	3	1	0.10	10	230.0	0.5	14.0	2	100	250	0.9	15.0
88-43-96	3	2	0.07	10	94.0	0.5	6.8	3	100	250	1.2	7.1
88-44-96	3	1	0.07	10	96.0	0.2	8.4	2	100	250	1.1	14.0
88-45-96	3	1	0.08	10	170.0	0.5	11.0	2	100	250	0.3	15.0
88-46-96	3	3	0.12	10	130.0	0.4	11.0	2	100	250	1.6	14.0
88-47-96	3	1	0.09	130	100.0	0.4	15.0	2	100	250	1.1	17.0
88-49-96	3	1	0.13	11	170.0	0.1	19.0	18	100	250	2.0	17.0
88-73-96	3	1	0.10	15	180.0	0.1	12.0	2	100	250	1.1	12.0
88-74-96	3	1	0.06	10	48.0	0.2	3.5	2	100	250	0.3	2.5
88-75-96	3	1	0.29	12	170.0	0.1	21.0	2	100	250	0.3	22.0
88-85-96	3	7	0.41	13	120.0	0.3	16.0	2	100	250	2.0	27.0
88-86-96	3	1	0.33	10	130.0	0.2	19.0	2	100	250	2.0	23.0
88-87-96	3	8	0.22	10	81.0	0.7	6.2	2	100	250	0.3	6.0
88-89-96	3	1	0.10	10	24.0	0.5	9.7	2	100	250	2.0	13.0

Appendix 6 Continued
Black Shale Drill Core Samples - Neutron Activation Data

Sample Number	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
DetectionLimit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
D115	11.0	410	25	8.0	18	7	2.9	1.1	0.90	5.5	0.93
D116	16.0	120	25	21.0	35	8	2.0	0.5	0.25	1.3	0.23
D117	6.2	220	25	43.0	67	21	4.3	1.1	1.20	4.2	0.75
D118	6.6	310	25	16.0	29	13	2.2	0.7	0.25	2.0	0.35
D119	8.2	230	25	18.0	40	14	3.2	0.9	0.60	2.0	0.28
D120	18.0	350	25	51.0	93	34	6.4	1.6	0.80	2.5	0.41
D121	12.0	170	97	60.0	110	45	7.8	2.0	1.60	5.6	0.69
D122	13.0	240	25	48.0	79	25	5.7	1.5	1.10	4.4	0.69
D123	7.4	100	25	17.0	28	7	2.6	0.8	0.25	2.5	0.44
D125	20.0	18	180	120.0	290	110	18.0	4.3	2.50	7.1	0.86
D126	1.8	140	25	48.0	47	16	3.1	0.7	0.25	2.1	0.36
D127	0.9	500	25	3.3	4	2.5	0.3	0.2	0.25	0.7	0.15
D128	3.7	250	58	15.0	23	2.5	1.6	0.6	0.25	3.0	0.50
D129	6.1	280	25	26.0	47	14	2.7	0.7	0.60	2.0	0.31
D130	8.1	230	25	25.0	42	11	2.5	0.7	0.80	2.0	0.35
D131	3.0	42	92	37.0	74	26	5.4	1.2	0.25	3.2	0.41
88-11-96	1.9	21	25	35.0	57	17	3.1	0.8	0.25	1.2	0.22
88-12-96	1.2	770	25	9.4	14	2.5	0.7	0.2	0.25	0.5	0.07
88-16-96	1.7	390	25	16.0	24	6	1.1	0.3	0.25	0.5	0.07
88-38-96	4.2	350	25	34.0	53	18	3.0	0.8	0.25	1.5	0.22
88-40-96	9.1	200	25	63.0	99	36	6.9	1.5	1.00	2.6	0.38
88-41-96	5.6	66	25	49.0	66	18	3.5	0.8	0.25	1.6	0.25
88-42-96	5.1	14	64	53.0	70	31	4.5	0.9	0.25	1.1	0.21
88-43-96	3.5	350	25	19.0	33	8	1.6	0.3	0.25	0.6	0.09
88-44-96	6.5	170	25	39.0	55	16	3.5	1.0	0.90	2.1	0.37
88-45-96	7.9	190	57	73.0	100	32	5.6	1.2	0.25	2.1	0.34
88-46-96	5.9	78	25	56.0	75	20	4.1	0.9	0.25	1.5	0.27
88-47-96	9.9	76	25	71.0	95	25	5.7	1.5	0.25	3.2	0.53
88-49-96	8.4	23	55	63.0	92	25	5.0	1.1	0.25	2.5	0.44
88-73-96	4.2	66	97	38.0	66	20	3.0	0.7	0.25	1.1	0.13
88-74-96	0.3	42	25	9.2	17	7	1.3	0.2	0.25	0.6	0.12
88-75-96	2.6	19	83	80.0	140	46	11.0	2.7	1.60	5.0	0.78
88-85-96	9.4	90	84	88.0	140	40	8.0	1.9	1.10	4.1	0.73
88-86-96	4.8	38	53	67.0	100	30	6.0	1.3	0.90	3.4	0.52
88-87-96	6.1	50	25	16.0	28	9	1.9	0.4	0.25	1.1	0.19
88-89-96	9.2	120	63	35.0	64	21	4.9	1.2	0.90	4.7	0.78

Appendix 7
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample	Drillhole	Location	Utm		Map	KB
Number	Number		Easting	Northing		Elev.
DetectionLimit						
D1	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D2	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D3	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D4	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D5	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D6	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D7	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D8	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D9	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D10	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D11	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D12	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D13	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D14	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D15	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D16	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D17	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D18	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D19	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D20	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D21	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D22	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D23	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D24	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D25	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D26	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0
D27	M-10-78	04-10-23-15W1	465125	5645900	62J/14	284.0
D28	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0
D29	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0
D30	M-9-78	15-04-23-15W1	464225	5645450	62J/13	283.0
D31	M-6-78A	05-07-48-25W1	358950	5888075	63F/03	259.0
D32	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D33	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D34	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D35	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D36	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D37	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D38	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D39	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D40	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D41	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5
D42	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D42a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D43	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D43a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D44	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D44a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D45	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D46	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D47	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D48	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D48a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D49	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D50	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D51	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0
D52	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Measured Interval (m)		Colour	Formation	Formation Code	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm
DetectionLimit	From	To				2	1	4	1	0.4
D1	11.4	17.0	N4	Ashville	7950	2	26	23	91	0.9
D2	17.0	21.2	N4	Ashville	7950	1	23	24	73	0.4
D3	21.2	28.6	N4	Ashville	7950	1	24	22	78	0.2
D4	28.6	35.4	N4	Ashville	7950	1	24	15	74	0.4
D5	35.4	39.6	N4 - 5GY4/1	Ashville	7950	2	29	22	81	0.6
D6	39.6	46.8	N4 - 5GY4/1	Ashville	7950	1	27	19	83	0.2
D7	46.8	51.0	N4 - N6	Ashville	7950	1	21	14	60	0.6
D8	51.0	54.7	N4 - N5	Ashville	7950	1	21	18	66	0.5
D9	54.7	58.4	N4 - N5	Ashville	7950	1	26	20	87	0.5
D10	58.4	62.4	N4 - N5	Ashville	7950	1	25	22	82	0.5
D11	62.4	66.3	N4 - N5	Ashville	7950	1	26	25	89	0.2
D12	66.3	76.3	N4 - 5G4/1	Ashville	7950	1	29	25	101	0.4
D13	76.3	80.3	N4 - N8	Ashville	7950	2	18	24	70	0.2
D14	80.3	84.5	N6 - N8	Ashville	7950	2	19	27	77	0.2
D15	84.5	88.4	N4 - N8	Ashville	7950	1	23	27	90	0.2
D16	88.4	92.6	N4 - 5GY4/1	Ashville	7950	1	26	31	99	0.2
D17	92.6	96.1	N5	Ashville	7950	1	26	37	108	0.2
D18	96.1	100.2	N4 - N5	Ashville	7950	1	30	30	104	0.2
D19	100.2	104.4	N4 - N5	Ashville	7950	1	24	29	100	0.2
D20	104.4	111.9	N4 - N5	Ashville	7950	1	26	27	113	0.2
D21	111.9	116.8	5Y6/1 - 5GY6/1	Swan River	9315	4	9	33	2	0.2
D22	116.8	118.8	5GY6/1	Swan River	9315	1	22	15	71	0.2
D23	118.8	147.9	N4 - N5	Swan River	9315	1	20	16	63	0.4
D24	147.9	159.0	5Y4/1	Swan River	9315	1	12	10	38	0.5
D25	159.0	167.8	N4, N5, 5YR3/2	Swan River	9315	1	21	23	111	0.2
D26	167.8	210.6	N4 - N5	Swan River	9315	1	13	10	31	0.2
D27	9.0	9.9	N5	Swan River	9315	3	10	25	8	0.7
D28	5.4	5.6	N4 - N5	Swan River	9315	9	20	60	11	0.2
D29	14.8	15.1	N4 - N5	Swan River	9315	2	12	7	15	0.5
D30	8.3	9.4	N4 - N5	Swan River	9315	6	8	28	11	0.2
D31	20.6	20.6	5Y8/1, N7	Niobrara	3050	34	53	198	9	1.1
D32	25.7	26.3	5Y4/1 - 5GY4/1	Niobrara	3050	8	47	24	132	0.2
D33	26.3	28.7	5Y4/1	Niobrara	3050	10	49	23	160	0.4
D34	28.7	29.9	5Y4/1	Niobrara	3050	10	51	24	156	0.2
D35	29.9	30.6	5Y4/1	Niobrara	3050	4	45	29	129	0.2
D36	30.6	31.8	5Y4/1	Niobrara	3050	5	40	26	146	0.2
D37	31.8	33.0	5Y4/1	Niobrara	3050	4	40	32	148	0.2
D38	33.0	34.2	5Y4/1	Niobrara	3050	2	37	24	147	0.2
D39	34.2	35.4	5Y4/1	Niobrara	3050	1	36	29	147	0.2
D40	35.4	45.3	5Y4/1	Niobrara	3050	6	39	29	129	0.2
D41	45.3	47.5	5Y4/1	Niobrara	3050	3	37	30	126	0.2
D42	38.4	41.9	5Y4/1	Niobrara	3050	23	65	13	222	1.0
D42a	38.4	41.9	5Y4/1 - 5GY4/1	Niobrara	3050	33	44	20	262	0.2
D43	41.9	45.2	5Y6/1 - 5Y4/1	Niobrara	3050	11	74	16	140	0.4
D43a	41.9	45.2	5Y6/1, 5GY6/1, 10Y7/4	Niobrara	3050	15	23	19	74	0.2
D44	45.2	48.8	5Y4/1 - 5GY6/1	Niobrara	3050	17	66	14	161	0.2
D44a	45.2	48.8	5Y6/1 - 5Y8/4	Niobrara	3050	27	82	14	93	0.2
D45	48.8	51.7	5Y6/1 - 5Y4/1	Niobrara	3050	24	58	14	142	0.2
D46	51.7	55.5	5Y6/1 - 5Y4/1	Niobrara	3050	34	55	15	157	0.5
D47	55.5	58.9	5Y6/1	Niobrara	3050	41	54	11	142	0.8
D48	58.9	62.0	5Y4/1	Niobrara	3050	47	49	10	167	0.5
D48a	58.9	62.0	5Y4/1, N5	Niobrara	3050	39	41	25	147	0.2
D49	62.0	65.9	5Y4/1	Niobrara	3050	6	53	23	121	0.2
D50	65.9	69.3	5Y4/1 - 5GY4/1	Niobrara	3050	3	58	27	136	0.2
D51	69.3	74.4	5Y4/1	Niobrara	3050	25	61	24	160	0.2
D52	11.9	14.2	5Y6/1, N2	Turtle Mountain	410	1	33	16	110	0.2

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
DetectionLimit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
D1	21	189	136	0.60	2.5	79	0.85	0.095	1.29	0.28	7.14	1.37	34	2
D2	18	176	139	0.25	2.5	86	0.72	0.140	1.09	0.26	6.73	1.48	37	2
D3	20	128	140	0.25	2.5	87	0.60	0.119	1.04	0.26	6.42	1.51	30	2
D4	19	120	162	0.25	2.5	98	0.49	0.106	0.91	0.29	6.46	1.78	28	2
D5	26	181	179	0.25	2.5	84	0.58	0.140	0.83	0.26	5.91	1.69	24	2
D6	24	142	156	0.25	2.5	89	0.43	0.092	0.91	0.31	6.48	1.86	24	2
D7	17	109	178	0.25	2.5	63	0.70	0.220	0.56	0.25	4.27	1.45	29	1
D8	20	94	143	0.25	2.5	70	0.28	0.059	0.65	0.27	5.48	1.60	20	1
D9	27	92	132	0.25	2.5	95	0.35	0.073	1.02	0.33	7.36	1.87	22	2
D10	29	195	181	0.25	2.5	92	0.50	0.110	0.99	0.28	7.03	1.93	24	2
D11	28	193	168	0.25	2.5	95	0.48	0.105	1.06	0.29	7.34	2.00	24	2
D12	27	184	134	0.25	2.5	101	0.48	0.101	1.11	0.30	7.22	1.94	29	2
D13	23	104	171	0.25	2.5	71	0.43	0.057	0.95	0.26	6.34	1.40	29	2
D14	24	150	128	0.25	2.5	95	0.38	0.050	0.91	0.31	6.65	1.69	26	2
D15	24	138	121	0.25	2.5	109	0.32	0.045	0.99	0.35	7.66	1.88	26	2
D16	28	416	120	0.25	2.5	119	0.36	0.070	1.06	0.35	8.30	1.99	29	2
D17	26	3141	140	0.25	2.5	120	0.90	0.169	1.30	0.31	8.55	1.91	35	2
D18	30	161	126	0.25	2.5	127	0.34	0.061	1.07	0.35	8.79	2.04	25	2
D19	24	4859	121	0.25	2.5	115	1.08	0.142	1.44	0.28	7.21	1.75	36	1
D20	27	165	117	0.25	2.5	138	0.26	0.049	1.02	0.38	9.35	2.28	28	2
D21	130	51	18	0.25	6.0	7	0.16	0.051	0.06	0.03	0.62	0.10	8	1
D22	18	312	85	0.25	2.5	79	0.26	0.039	0.62	0.29	6.59	1.36	18	2
D23	17	14811	72	0.50	2.5	73	1.87	0.071	1.68	0.25	4.90	1.22	25	2
D24	11	205	58	0.25	2.5	62	0.29	0.080	0.32	0.23	3.24	1.31	26	2
D25	27	1391	100	0.25	2.5	116	0.72	0.063	0.93	0.35	9.28	1.77	31	2
D26	14	243	41	0.25	2.5	42	0.16	0.029	0.12	0.33	3.95	0.67	20	1
D27	19	12	35	0.70	2.5	120	0.13	0.020	0.05	0.77	7.33	0.03	68	1
D28	43	20	43	0.25	2.5	83	0.25	0.029	0.11	0.71	10.72	0.11	89	1
D29	10	8	43	0.25	2.5	53	0.14	0.020	0.05	0.34	3.55	0.05	59	1
D30	20	26	35	0.60	2.5	109	0.18	0.009	0.06	0.70	7.17	0.04	32	1
D31	205	23	15	0.25	2.5	30	3.13	0.006	1.64	0.26	2.17	0.04	5	1
D32	48	105	127	2.50	2.5	418	1.14	0.077	0.80	0.40	9.38	2.41	29	2
D33	57	99	138	4.10	2.5	498	3.23	0.080	0.80	0.38	9.01	2.37	28	2
D34	59	95	131	3.70	2.5	493	2.04	0.080	0.72	0.36	8.26	2.28	29	2
D35	48	104	126	1.70	2.5	374	0.94	0.075	0.75	0.39	8.40	2.39	25	2
D36	48	93	128	1.10	2.5	274	0.40	0.076	0.84	0.38	8.23	2.53	24	2
D37	46	110	136	0.90	5.0	233	0.38	0.081	0.94	0.36	8.17	2.52	26	2
D38	42	90	148	0.25	2.5	230	0.25	0.065	0.85	0.40	8.60	2.67	25	2
D39	40	88	148	0.50	2.5	225	0.28	0.074	0.83	0.39	8.19	2.68	26	2
D40	45	115	133	1.10	2.5	191	0.38	0.072	0.86	0.39	8.73	2.38	25	2
D41	43	99	130	1.10	2.5	172	0.35	0.075	0.80	0.35	8.59	2.33	29	2
D42	70	636	499	15.70	2.5	570	27.82	0.077	0.32	0.17	3.49	1.38	24	1
D42a	57	684	389	17.00	2.5	630	15.40	0.066	0.82	0.34	5.97	1.12	14	1
D43	59	372	416	4.80	2.5	402	21.34	0.102	0.40	0.22	5.03	1.60	36	1
D43a	11	724	166	0.80	2.5	247	1.15	0.036	1.66	0.44	8.44	0.81	5	1
D44	66	290	410	8.00	2.5	512	20.66	0.066	0.32	0.24	5.74	1.39	24	1
D44a	44	468	274	2.10	2.5	363	9.89	0.061	0.29	0.33	6.77	2.99	16	1
D45	58	178	386	9.80	2.5	559	26.54	0.047	0.24	0.18	4.08	0.84	19	1
D46	68	156	375	13.30	2.5	603	27.55	0.040	0.23	0.17	4.00	0.79	19	1
D47	65	149	372	13.60	2.5	585	29.68	0.040	0.22	0.14	3.41	0.71	17	1
D48	69	192	400	15.50	2.5	546	32.36	0.085	0.21	0.13	3.00	0.76	24	1
D48a	40	366	269	7.60	2.5	1038	19.40	0.103	0.43	0.21	7.81	1.43	14	1
D49	55	140	135	0.60	2.5	405	1.33	0.183	0.79	0.37	8.57	2.45	47	2
D50	53	145	148	0.25	2.5	392	2.16	0.161	0.80	0.36	8.17	2.39	42	2
D51	71	117	165	2.60	2.5	449	4.67	0.135	0.62	0.33	7.27	1.95	35	2
D52	46	1092	194	0.25	2.5	117	0.95	0.058	0.99	0.37	7.93	2.29	19	1

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.
DetectionLimit			Easting	Northing		
D53	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0
D54	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0
D55	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0
D56	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0
D57	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D58	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D59	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D60	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D61	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D62	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D63	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D64	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D65	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D66	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D67	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D68	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D69	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D70	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D71	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D72	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D73	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D74	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D75	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D76	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D77	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0
D78	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D79	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D80	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D81	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D82	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D83	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D84	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D85	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D86	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D87	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D88	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D89	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D90	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D91	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D92	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D93	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D94	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D95	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D96	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D97	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D98	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D99	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D100	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D101	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D102	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D103	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D104	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D105	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D106	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D107	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D108	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Measured Interval (m)		Colour	Formation	Formation Code	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm
DetectionLimit	From	To				2	1	4	1	0.4
D53	27.0	29.8	N1	Turtle Mountain	410	2	15	18	15	0.2
D54	152.8	152.8	5Y6/1, 5Y4/1, 5Y8/4	Pierre	2080	1	48	30	223	0.2
D55	73.8	75.1	N1 - N2	Turtle Mountain	410	3	27	35	24	0.2
D56	79.6	80.0	N1 - N2	Turtle Mountain	410	3	16	18	8	0.2
D57	5.2	9.8	5Y4/1 - N4/N7	Niobrara	3050	5	60	22	129	0.2
D58	9.8	11.2	5Y4/1 - N4	Niobrara	3050	4	62	22	136	0.2
D59	11.2	13.4	5Y4/1 - N4	Niobrara	3050	7	56	24	116	0.2
D60	13.4	15.0	N4/N7 - 5Y4/1	Niobrara	3050	6	50	18	103	0.5
D61	15.0	28.3	5Y4/1	Niobrara	3050	94	75	16	243	0.2
D62	28.3	17.4	5Y4/1	Niobrara	3050	21	62	18	116	0.2
D63	17.4	19.1	5Y4/1 - 5GY4/1	Niobrara	3050	8	69	20	115	0.2
D64	19.1	20.4	5Y4/1 - 5GY4/1	Niobrara	3050	8	57	19	96	0.2
D65	20.4	22.3	5Y4/1 - 5GY4/1	Niobrara	3050	6	66	23	106	0.2
D66	22.3	23.5	5Y4/1 - 5GY4/1	Niobrara	3050	3	36	15	87	0.2
D67	23.5	25.7	5Y4/1 - 5GY4/1	Niobrara	3050	2	40	25	115	0.2
D68	35.4	37.4	5Y4/1	Morden	5670	1	37	31	150	0.2
D69	37.4	38.7	5Y4/1	Morden	5670	2	36	21	140	0.2
D70	38.7	40.3	5Y4/1	Morden	5670	4	35	24	119	0.5
D71	42.6	43.8	5Y4/1	Morden	5670	5	38	24	135	0.2
D72	41.4	43.8	5Y4/1	Morden	5670	2	35	23	129	0.2
D73	40.3	43.8	5Y4/1	Morden	5670	2	37	14	133	0.2
D74	49.7	50.9	5Y4/1	Morden	5670	2	37	25	124	0.2
D75	48.4	49.7	5Y4/1	Morden	5670	2	36	21	121	0.2
D76	54.4	55.6	5Y4/1	Morden	5670	5	30	13	91	0.2
D77	50.9	54.4	5Y4/1	Morden	5670	10	41	34	143	0.4
D78	0.0	1.2	5Y4/1 - 5GY4/1	Favel	5760	43	40	9	129	0.2
D79	1.2	5.0	5Y4/1 - 5GY4/1	Favel	5760	40	39	15	140	0.2
D80	5.0	6.2	5Y4/1 - 5GY4/1	Favel	5760	26	36	15	120	0.2
D81	6.2	7.4	5Y4/1 - 5GY4/1	Favel	5760	35	35	15	110	0.5
D82	7.4	8.7	5Y4/1 - 5GY4/1	Favel	5760	29	29	8	91	0.2
D83	8.7	9.9	5Y4/1 - 5GY4/1	Favel	5760	25	30	9	92	0.2
D84	9.9	11.1	5Y4/1	Favel	5760	23	30	14	91	0.2
D85	11.1	12.3	5Y4/1 - N5/N6	Favel	5760	32	31	3	90	0.7
D86	12.3	14.0	5Y4/1 - N5/N6	Favel	5760	34	38	10	109	0.2
D87	14.0	14.6	5Y4/1 - N5/N6	Favel	5760	17	19	3	49	0.2
D88	14.6	15.9	5Y4/1 - N5/N6	Favel	5760	24	44	7	99	0.2
D89	15.9	17.1	5Y4/1 - N5/N6	Favel	5760	24	38	3	84	0.4
D90	17.1	18.3	5Y4/1 - N5/N6	Favel	5760	37	38	6	87	0.2
D91	18.3	19.5	5Y4/1 - N5/N6	Favel	5760	3	40	11	52	0.2
D92	19.5	21.0	5Y4/1 - N5/N6	Favel	5760	2	85	19	109	0.2
D93	18.3	21.0	5Y4/1 - N5/N6	Favel	5760	8	7	37	52	0.2
D94	21.0	22.3	5Y4/1 - N4	Favel	5760	21	71	20	163	0.2
D95	22.3	23.5	5Y4/1 - N4	Favel	5760	51	49	21	149	0.2
D96	23.5	24.7	5Y4/1 - N4	Favel	5760	52	45	19	150	0.2
D97	24.7	25.9	5Y4/1 - N4	Favel	5760	54	45	14	140	0.8
D98	25.9	26.4	5Y4/1 - N4	Favel	5760	49	37	18	108	0.2
D99	26.4	28.2	5Y4/1 - N4	Favel	5760	42	41	18	136	0.2
D100	28.2	29.5	5Y4/1	Favel	5760	41	38	23	125	0.2
D101	29.5	30.6	5Y4/1	Favel	5760	34	36	17	106	0.2
D102	30.6	31.8	5Y4/1	Favel	5760	36	37	20	130	0.4
D103	31.8	33.2	5Y4/1	Favel	5760	37	37	28	99	0.2
D104	33.2	34.4	5Y4/1	Favel	5760	36	34	27	121	0.5
D105	34.4	35.8	5Y4/1	Favel	5760	37	35	21	120	0.4
D106	35.8	37.0	5Y4/1	Favel	5760	41	37	23	130	0.6
D107	37.0	37.6	5Y4/1	Favel	5760	48	41	19	132	0.2
D108	37.6	39.1	5Y4/1	Favel	5760	53	39	17	126	0.2

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
DetectionLimit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
D53	12	33	322	0.25	2.5	35	1.78	0.005	0.25	0.07	1.59	0.28	10	1
D54	79	274	235	1.70	2.5	535	1.70	0.377	1.29	0.28	7.24	1.72	35	2
D55	18	42	320	0.25	2.5	38	1.91	0.004	0.22	0.10	1.73	0.26	10	1
D56	13	62	290	0.25	7.0	40	1.68	0.004	0.22	0.09	1.39	0.23	17	4
D57	52	145	169	1.20	2.5	401	3.83	0.157	0.78	0.35	7.83	2.32	38	2
D58	54	184	177	1.20	2.5	399	4.87	0.186	1.06	0.33	7.43	2.20	43	2
D59	50	119	162	0.60	2.5	403	2.95	0.201	0.69	0.41	8.33	2.20	49	2
D60	48	152	216	0.80	2.5	342	7.14	0.143	0.64	0.34	7.78	1.91	34	2
D61	125	100	275	7.60	2.5	857	14.56	0.097	0.37	0.20	4.99	1.24	28	1
D62	52	141	288	3.00	2.5	343	11.05	0.115	0.82	0.26	6.12	1.58	32	1
D63	47	113	202	0.25	2.5	394	6.52	0.159	0.62	0.32	7.56	1.90	38	2
D64	41	174	256	0.80	2.5	306	13.87	0.127	1.58	0.24	5.77	1.49	32	1
D65	45	126	187	0.50	2.5	344	6.04	0.168	1.01	0.31	7.28	1.88	40	2
D66	30	238	211	0.80	2.5	268	10.94	0.088	3.03	0.25	6.29	1.70	26	2
D67	41	101	120	0.70	2.5	361	1.39	0.075	0.76	0.37	8.50	2.31	25	2
D68	42	98	148	0.25	2.5	266	0.28	0.080	0.89	0.40	9.28	2.29	26	2
D69	42	99	129	0.60	2.5	209	0.28	0.073	0.89	0.37	9.19	2.32	24	2
D70	40	88	114	0.70	2.5	178	0.25	0.068	0.77	0.34	8.32	1.13	22	2
D71	46	103	125	0.50	2.5	192	0.37	0.082	0.87	0.36	9.36	2.26	28	2
D72	39	99	131	0.25	2.5	205	0.23	0.073	0.83	0.38	9.21	2.50	25	2
D73	39	92	134	0.70	2.5	204	0.25	0.070	0.85	0.40	9.26	2.53	23	2
D74	41	92	133	0.25	2.5	202	0.25	0.072	0.82	0.38	9.16	2.43	24	2
D75	41	111	124	0.70	2.5	194	0.24	0.075	0.84	0.38	9.05	2.33	24	2
D76	31	387	240	0.70	2.5	149	10.66	0.055	0.98	0.26	6.80	1.66	20	1
D77	53	98	125	1.40	2.5	224	0.38	0.078	0.86	0.35	8.66	2.26	26	2
D78	95	68	317	2.60	2.5	244	26.06	0.072	0.36	0.15	4.46	1.02	14	1
D79	104	81	322	2.60	2.5	250	23.34	0.061	0.45	0.17	5.05	1.17	16	1
D80	59	86	317	1.80	2.5	173	20.52	0.050	0.59	0.18	5.45	1.28	16	1
D81	85	76	377	2.30	2.5	242	24.05	0.062	0.47	0.15	4.42	1.07	13	1
D82	54	71	417	1.20	2.5	148	31.85	0.053	0.54	0.11	3.13	0.80	10	1
D83	59	52	533	1.80	2.5	200	29.62	0.038	0.44	0.12	3.65	0.87	10	1
D84	51	63	469	1.00	2.5	169	27.78	0.039	0.58	0.14	4.02	0.96	12	1
D85	59	57	491	2.20	2.5	205	37.37	0.049	0.40	0.07	2.04	0.67	8	1
D86	69	57	517	2.30	2.5	230	37.48	0.059	0.33	0.08	2.20	0.76	10	1
D87	26	52	610	0.80	2.5	99	39.94	0.041	0.33	0.04	1.10	0.38	6	1
D88	59	56	416	1.70	2.5	220	30.89	0.040	0.54	0.11	3.37	1.05	11	1
D89	46	71	391	1.80	2.5	170	35.81	0.046	0.42	0.08	2.15	0.78	10	1
D90	60	63	419	1.80	2.5	230	36.05	0.038	0.30	0.06	1.65	0.75	8	1
D91	18	81	421	0.25	2.5	72	34.81	0.059	0.56	0.09	2.55	0.89	14	1
D92	50	114	290	0.25	2.5	160	14.53	0.123	0.57	0.30	7.12	2.02	28	1
D93	8	122	164	0.25	2.5	95	2.66	0.032	2.74	0.12	10.87	0.55	2	1
D94	78	78	225	2.00	2.5	209	12.07	0.091	0.54	0.22	6.34	1.63	17	1
D95	101	99	262	2.50	2.5	253	14.63	0.070	0.55	0.21	6.72	1.44	17	1
D96	90	97	300	2.70	2.5	281	12.41	0.055	0.47	0.23	6.25	1.53	18	2
D97	71	96	306	2.20	2.5	221	13.91	0.059	0.43	0.21	5.69	1.38	17	1
D98	59	109	405	1.70	2.5	166	19.51	0.053	0.53	0.18	4.82	1.20	13	1
D99	69	127	229	1.80	2.5	178	16.66	0.071	0.45	0.24	6.39	1.42	19	2
D100	60	132	178	1.20	2.5	164	12.26	0.054	0.50	0.29	7.91	1.68	20	2
D101	56	127	188	1.30	2.5	162	11.41	0.044	0.47	0.28	7.63	1.62	18	2
D102	58	134	168	1.30	2.5	170	10.08	0.044	0.51	0.30	8.09	1.72	19	2
D103	51	157	196	0.80	2.5	145	11.18	0.050	0.64	0.30	7.89	1.72	20	2
D104	54	158	177	1.40	2.5	152	12.14	0.050	0.64	0.27	7.61	1.69	22	2
D105	55	162	242	0.90	2.5	141	13.91	0.046	0.60	0.27	7.21	1.57	19	2
D106	58	137	227	1.50	2.5	159	11.05	0.047	0.52	0.29	7.89	1.70	20	2
D107	64	146	250	1.50	2.5	177	11.52	0.052	0.59	0.29	7.83	1.68	18	2
D108	58	174	221	1.60	2.5	161	17.84	0.064	0.53	0.23	6.14	1.37	18	2

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Drillhole Number	Location	Utm		Map	KB
DetectionLimit			Easting	Northing		Elev.
D109	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D110	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D111	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D112	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0
D113	M-2-80	04-18-18-04W1	570264	5598817	62J/09	251.5
D114	MOGC DALY	07-34-08-24W1	341475	5507425	62F/11	468.0
D115	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D116	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D117	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D118	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D119	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D120	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5
D121	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0
D122	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0
D123	COMRP96-21	05-11-47-17W1	443349	5876641	63G/04	269.7
D125	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D126	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D127	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D128	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D129	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D130	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
D131	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9
88-11-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5
88-12-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5
88-16-96	Com RP-97-25	14-32-42-21W1	401569	5835738	63C/09	267.3
88-38-96	F/B WL-96-154	01-04-57-14W1	469001	5971330	63G/14	275.0
88-40-96	F/B WL-96-149	13-12-56-14W1	472507	5964578	63G/14	267.0
88-41-96	F/B WL-96-134	15-33-52-14W1	469785	5932014	63G/11	271.6
88-42-96	F/B WL-96-138	08-19-31-15W1	456764	5918180	63G/05	283.3
88-43-96	F/B WL-96-139	09-14-51-16W1	453509	5917142	63G/05	271.9
88-44-96	F/B WL-96-133	02-34-53-16W1	451715	5940504	63G/12	276.0
88-45-96	F/B WL-96-131	08-33-53-16W1	450579	5941116	63G/12	272.8
88-46-96	F/B WL-96-130	08-19-53-15W1	456877	5937647	63G/12	272.8
88-47-96	F/B WL-96-127	13-12-56-14W1	472558	5964427	63G/14	265.0
88-49-96	M-3-96	13-28-34-10W1	511948	57569159	63G/06	256.1
88-73-96	M-1-96	13-24-50-14W1	474500	5909450	62O/15	266.7
88-74-96	M-6-96	04-23-14-01E1	616625	5561625	62I/03	250.5
88-75-96	M-8-96	02-22-13-06E1	665360	5552875	62I/02	240.1
88-85-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0
88-86-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0
88-87-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0
88-89-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Measured Interval (m)		Colour	Formation	Formation Code	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm
DetectionLimit						2	1	4	1	0.4
D109	39.1	40.3	5Y4/1	Favel	5760	49	37	17	124	0.8
D110	40.3	41.7	5Y4/1	Favel	5760	43	32	15	111	0.4
D111	41.7	42.9	5Y4/1	Favel	5760	54	38	16	118	0.5
D112	42.9	45.0	5Y4/1	Favel	5760	45	47	24	143	0.4
D113	286.5	287.5	5Y4/1 - 5GY4/1	Winnipeg	74000	1	12	21	36	0.2
D114	846.0	848.3	N2 - N3	Bakken	40700	87	213	88	68	3.2
D115	7.8	7.9	N1-N3	Cretaceous	2010	2	9	25	10	0.2
D116	10.7	10.8	5YR4/1-5YR2/1	Cretaceous	2010	29	126	53	46	0.5
D117	15.8	18.1	N1-N3	Cretaceous	2010	2	24	17	17	0.2
D118	18.1	18.9	N2-N4	Cretaceous	2010	1	7	6	5	0.2
D119	18.9	19.9	N2-N4	Cretaceous	2010	1	7	7	2	0.2
D120	19.1	20.5	N1-N2, 5YR4/1	Cretaceous	2010	13	31	24	35	0.5
D121	0.0	1.5	N1-N3	Cretaceous	2010	1	17	37	51	0.5
D122	1.5	3.0	N1-N3	Cretaceous	2010	2	14	33	32	0.2
D123	116.5	115.8	N2-N3	Cretaceous	2010	21	34	111	21	0.7
D125	49.8	50.5	5B6/2	Cretaceous	2010	5	88	25	90	0.2
D126	50.5	53.4	N4, 5YR6/1	Cretaceous	2010	2	39	31	46	0.2
D127	50.5	53.4	N4, 5YR6/1	Cretaceous	2010	12	11	30	3	0.2
D128	53.4	53.4	10R3/4	Cretaceous	2010	4	19	17	55	0.2
D129	53.4	54.0	N3-N4	Cretaceous	2010	4	13	13	26	0.5
D130	54.0	54.6	N3-N4,5YR4/1,5GY6/1	Cretaceous	2010	3	8	9	18	0.2
D131	54.6	55.3	N3-N4,5YR4/1,5GY6/1	Cretaceous	2010	1	21	11	65	0.2
88-11-96	213.8	214.6	black	Winnipeg	74000	1	26	13	15	0.2
88-12-96	214.9	215.6	black	Winnipeg	74000	1	6	8	2	0.2
88-16-96	206.7	206.7	black	Winnipeg	74000	1	12	3	6	0.2
88-38-96	91.4	98.5		Winnipeg	74000	1	73	12	13	0.2
88-40-96	116.7	117.7		Winnipeg	74000	2	22	14	12	0.2
88-41-96	149.8	154.4		Winnipeg	74000	1	17	3	21	0.2
88-42-96	178.6	179.6	green	Winnipeg	74000	1	97	3	66	0.4
88-43-96	171.7	173.2		Winnipeg	74000	1	11	5	14	0.2
88-44-96	163.2	173.5	green	Winnipeg	74000	1	24	12	15	0.2
88-45-96	151.0	152.8		Winnipeg	74000	1	21	15	26	0.2
88-46-96	215.7	219.8		Winnipeg	74000	3	26	18	17	0.6
88-47-96	115.5	116.3		Winnipeg	74000	2	29	21	24	0.7
88-49-96	237.9	237.9		Winnipeg	74000	3	70	143	35	8.8
88-73-96	163.8	164.5	green-grey	Winnipeg	74000	1	27	16	36	0.5
88-74-96	19.4	19.4	red-green	Pennitentiary	73520	1	4	3	8	0.2
88-75-96	70.7	72.3		Winnipeg	74000	1	21	23	73	0.2
88-85-96	433.2	433.4		Winnipeg	74000	2	18	30	29	0.2
88-86-96	417.2	417.3		Winnipeg	74000	1	16	19	26	0.2
88-87-96	339.2	339.3		Fort Garry	73800	2	22	35	3	0.2
88-89-96	36.9	37.6		Swan River	9315	3	15	16	39	0.2

Appendix 7 Continued
Black Shale Drill Core Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)

Sample Number	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
DetectionLimit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
D109	59	164	198	1.60	2.5	175	17.81	0.053	0.45	0.22	6.09	1.36	18	2
D110	49	250	226	1.30	2.5	142	23.26	0.050	0.41	0.19	5.07	1.19	16	1
D111	61	191	226	1.60	2.5	170	16.43	0.057	0.49	0.23	6.47	1.41	18	2
D112	79	183	214	1.90	2.5	250	12.97	0.221	0.53	0.25	6.66	1.45	37	2
D113	38	998	110	0.25	2.5	131	12.44	0.157	1.31	0.20	4.65	4.26	31	1
D114	342	114	77	0.25	2.5	838	1.70	0.077	1.33	0.30	6.77	5.32	37	3
D115	12	11	22	0.25	2.5	35	1.13	0.003	0.21	0.11	1.72	0.03	56	9
D116	299	37	15	0.25	2.5	74	0.16	0.006	0.17	0.11	5.02	0.48	13	6
D117	18	16	39	0.25	2.5	55	0.37	0.011	0.15	0.43	4.23	0.34	25	2
D118	8	5	42	0.25	5.0	16	0.62	0.003	0.10	0.14	1.83	0.04	11	1
D119	3	5	57	0.25	5.0	15	0.97	0.002	0.13	0.10	1.95	0.01	14	3
D120	51	30	39	0.25	8.0	102	0.91	0.009	0.28	0.16	4.73	0.48	23	3
D121	23	34	72	0.60	5.0	61	0.60	0.019	0.23	0.49	5.88	0.23	43	7
D122	15	24	71	0.25	2.5	49	0.68	0.015	0.24	0.43	5.30	0.19	38	6
D123	63	27	53	1.10	2.5	199	0.97	0.007	0.17	0.40	7.45	0.08	19	4
D125	125	103	56	0.25	7.0	203	0.31	0.075	1.11	0.75	15.38	3.69	59	3
D126	588	247	37	0.25	2.5	51	0.08	0.010	0.21	0.26	3.66	1.01	18	1
D127	186	11	3	0.25	2.5	3	0.01	0.002	0.01	0.10	0.40	0.01	4	1
D128	12	10	46	0.25	5.0	42	0.47	0.005	0.11	0.64	5.93	0.11	13	1
D129	21	11	19	0.25	2.5	24	0.10	0.006	0.11	0.26	3.48	0.35	11	1
D130	16	5	22	0.25	2.5	27	0.16	0.006	0.13	0.27	4.11	0.31	11	1
D131	20	100	162	0.25	2.5	88	0.42	0.100	0.80	0.27	6.32	1.74	26	2
88-11-96	31	17	61	0.25	2.5	40	0.10	0.012	0.86	0.21	5.06	3.91	10	1
88-12-96	4	5	11	0.25	2.5	4	0.02	0.005	0.05	0.06	0.33	0.31	4	1
88-16-96	10	19	17	0.25	2.5	20	0.02	0.006	0.18	0.09	1.66	1.82	2	1
88-38-96	17	35	43	0.25	2.5	27	0.04	0.011	0.23	0.20	2.30	2.30	12	1
88-40-96	70	105	75	0.25	2.5	55	0.08	0.017	0.66	0.32	5.17	4.27	23	1
88-41-96	21	41	80	0.25	2.5	71	0.11	0.016	1.19	0.30	7.78	6.42	17	2
88-42-96	33	66	80	1.20	2.5	74	0.18	0.019	1.55	0.29	9.86	7.16	11	3
88-43-96	22	32	22	0.25	2.5	33	0.07	0.009	0.46	0.13	3.67	3.96	4	1
88-44-96	17	39	64	0.25	2.5	46	0.08	0.012	0.56	0.28	4.51	4.48	22	1
88-45-96	24	54	73	0.25	2.5	66	0.14	0.020	1.38	0.32	7.11	4.97	18	3
88-46-96	32	37	78	0.25	2.5	87	0.18	0.017	1.25	0.34	9.17	7.32	14	2
88-47-96	99	86	109	0.70	2.5	111	0.14	0.023	1.12	0.49	10.17	7.43	28	3
88-49-96	56	82	102	0.25	6.0	129	0.26	0.044	1.23	0.49	14.13	8.43	17	2
88-73-96	29	65	63	0.25	2.5	72	0.19	0.016	1.73	0.26	8.93	6.60	10	3
88-74-96	7	142	42	0.25	6.0	22	21.36	0.019	10.80	0.08	1.67	1.27	7	1
88-75-96	61	248	137	0.25	5.0	127	0.68	0.186	1.42	0.51	14.98	5.62	44	2
88-85-96	38	38	96	0.80	2.5	98	0.08	0.030	0.52	0.44	9.61	3.41	30	2
88-86-96	30	45	84	0.60	2.5	133	0.10	0.029	0.75	0.60	11.18	7.84	20	2
88-87-96	23	99	53	0.25	2.5	41	18.46	0.034	5.45	0.16	2.94	2.65	8	1
88-89-96	14	37	46	0.50	2.5	56	0.20	0.015	0.15	0.43	5.26	0.53	18	2

Appendix 8
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour
Detection Limit			Easting	Northing			From	To	
D1	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	11.4	17.0	N4
D2	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	17.0	21.2	N4
D3	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	21.2	28.6	N4
D4	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	28.6	35.4	N4
D5	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	35.4	39.6	N4 - 5GY4/1
D6	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	39.6	46.8	N4 - 5GY4/1
D7	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	46.8	51.0	N4 - N6
D8	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	51.0	54.7	N4 - N5
D9	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	54.7	58.4	N4 - N5
D10	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	58.4	62.4	N4 - N5
D11	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	62.4	66.3	N4 - N5
D12	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	66.3	76.3	N4 - 5GY4/1
D13	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	76.3	80.3	N4 - N8
D14	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	80.3	84.5	N6 - N8
D15	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	84.5	88.4	N4 - N8
D16	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	88.4	92.6	N4 - 5GY4/1
D17	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	92.6	96.1	N5
D18	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	96.1	100.2	N4 - N5
D19	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	100.2	104.4	N4 - N5
D20	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	104.4	111.9	N4 - N5
D21	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	111.9	116.8	5Y6/1 - 5GY6/1
D22	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	116.8	118.8	5GY6/1
D23	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	118.8	147.9	N4 - N5
D24	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	147.9	159.0	5Y4/1
D25	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	159.0	167.8	N4, N5, 5YR3/2
D26	M-8-78	04-33-32-22W1	394500	5738125	62N/15	346.0	167.8	210.6	N4 - N5
D27	M-10-78	04-10-23-15W1	465125	5645900	62J/14	284.0	9.0	9.9	N5
D28	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	5.4	5.6	N4 - N5
D29	M-11-78	04-15-23-15W1	465125	5647575	62J/14	281.0	14.8	15.1	N4 - N5
D30	M-9-78	15-04-23-15W1	464225	5645450	62J/13	283.0	8.3	9.4	N4 - N5
D31	M-6-78A	05-07-48-25W1	358950	5888075	63F/03	259.0	20.6	20.6	5Y8/1, N7
D32	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	25.7	26.3	5Y4/1 - 5GY4/1
D33	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	26.3	28.7	5Y4/1
D34	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	28.7	29.9	5Y4/1
D35	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	29.9	30.6	5Y4/1
D36	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	30.6	31.8	5Y4/1
D37	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	31.8	33.0	5Y4/1
D38	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	33.0	34.2	5Y4/1
D39	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	34.2	35.4	5Y4/1
D40	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	35.4	45.3	5Y4/1
D41	M-10-77	14-32-03-06W1	555175	5457050	62G/08	379.5	45.3	47.5	5Y4/1
D42	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9	5Y4/1
D42a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	38.4	41.9	5Y4/1 - 5GY4/1
D43	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2	5Y6/1 - 5Y4/1
D43a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	41.9	45.2	5Y6/1, 5GY6/1, 10Y7/4
D44	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8	5Y4/1 - 5GY6/1
D44a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	45.2	48.8	5Y6/1 - 5Y8/4
D45	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	48.8	51.7	5Y6/1 - 5Y4/1
D46	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	51.7	55.5	5Y6/1 - 5Y4/1
D47	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	55.5	58.9	5Y6/1
D48	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0	5Y4/1
D48a	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	58.9	62.0	5Y4/1, N5
D49	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	62.0	65.9	5Y4/1
D50	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	65.9	69.3	5Y4/1 - 5GY4/1
D51	M-8-77	05-24-04-07W1	551300	5462425	62G/08	427.0	69.3	74.4	5Y4/1
D52	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	11.9	14.2	5Y6/1, N2
D53	M-11-70	08-25-01-24W1	368325	5435425	62F/02	556.0	27.0	29.8	N1

Appendix 8 Continued
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Formation	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit			0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
D1	Ashville	7950	0.14	129.0	0.6	0.4	25.4	20	1.0	20.5	0.2	47
D2	Ashville	7950	0.10	7.4	0.6	0.1	17.2	20	1.0	17.5	0.1	32
D3	Ashville	7950	0.10	4.2	0.6	0.1	20.0	10	0.6	17.5	0.1	38
D4	Ashville	7950	0.08	2.4	0.4	0.1	20.8	10	0.2	15.0	0.2	46
D5	Ashville	7950	0.16	5.2	0.6	0.3	25.4	30	1.0	16.5	0.1	33
D6	Ashville	7950	0.12	5.2	0.4	0.1	22.8	30	0.6	16.0	0.1	45
D7	Ashville	7950	0.08	5.6	0.4	0.1	16.0	20	0.6	11.5	0.1	39
D8	Ashville	7950	0.06	5.2	0.2	0.1	15.0	10	0.4	10.0	0.1	36
D9	Ashville	7950	0.08	7.6	0.2	0.1	21.2	10	0.2	15.5	0.1	46
D10	Ashville	7950	0.10	7.4	0.6	0.1	20.8	30	1.0	17.0	0.1	41
D11	Ashville	7950	0.10	5.8	0.6	0.1	21.4	30	0.8	20.5	0.1	45
D12	Ashville	7950	0.12	5.6	0.6	0.1	23.2	20	0.6	19.0	0.1	54
D13	Ashville	7950	0.16	11.8	0.6	0.1	12.8	30	1.6	20.5	0.1	37
D14	Ashville	7950	0.14	4.4	0.6	0.1	15.6	20	0.8	19.5	0.1	44
D15	Ashville	7950	0.16	3.0	0.2	0.1	20.0	10	0.6	19.0	0.1	54
D16	Ashville	7950	0.14	3.2	0.8	0.1	24.6	20	0.6	19.5	0.1	58
D17	Ashville	7950	0.14	1.6	0.8	0.1	21.6	20	0.6	18.5	0.2	43
D18	Ashville	7950	0.16	2.8	0.6	0.1	25.4	30	0.6	20.5	0.1	59
D19	Ashville	7950	0.12	1.8	1.2	0.1	18.2	5	0.2	13.5	0.1	56
D20	Ashville	7950	0.12	3.6	0.6	0.1	22.6	20	0.4	17.5	0.1	71
D21	Swan River	9315	0.02	0.1	0.2	0.1	0.1	40	1.2	11.0	0.4	1
D22	Swan River	9315	0.10	3.4	0.4	0.1	19.2	10	0.8	14.0	0.1	51
D23	Swan River	9315	0.04	2.6	3.0	0.1	10.4	5	0.1	0.3	0.1	2
D24	Swan River	9315	0.08	3.2	0.2	0.1	7.4	10	0.8	8.5	0.1	26
D25	Swan River	9315	0.12	5.8	0.8	0.1	15.4	30	0.6	14.0	0.2	42
D26	Swan River	9315	0.06	7.6	0.6	0.1	9.4	30	0.8	7.0	0.1	18
D27	Swan River	9315	0.02	0.1	0.8	0.1	4.4	50	1.6	16.0	0.2	1
D28	Swan River	9315	0.04	13.0	0.6	0.1	14.8	140	6.0	43.0	1.0	4
D29	Swan River	9315	0.04	0.1	0.4	0.1	7.8	30	1.6	3.5	0.2	9
D30	Swan River	9315	0.02	3.2	1.2	0.1	4.6	80	6.4	18.5	0.6	3
D31	Niobrara	3050	0.76	696.0	1.6	0.4	36.4	2890	28.8	177.0	34.0	4
D32	Niobrara	3050	0.26	10.0	0.8	2.3	39.4	80	8.6	17.5	1.6	101
D33	Niobrara	3050	0.32	5.0	0.6	4.1	45.6	80	11.0	17.5	2.6	101
D34	Niobrara	3050	0.40	5.6	0.4	3.9	50.0	90	11.0	15.0	2.8	108
D35	Niobrara	3050	0.24	4.4	0.2	1.8	40.8	80	4.6	13.0	1.4	89
D36	Niobrara	3050	0.22	5.8	0.6	1.0	38.6	70	5.0	17.0	0.6	98
D37	Niobrara	3050	0.24	7.8	0.6	1.0	38.4	90	4.8	17.0	0.4	105
D38	Niobrara	3050	0.16	3.6	0.2	0.4	32.8	80	1.6	17.5	0.1	104
D39	Niobrara	3050	0.16	4.8	0.6	0.4	32.8	80	1.0	19.0	0.2	113
D40	Niobrara	3050	0.20	5.8	1.0	1.0	34.8	60	6.2	18.5	0.6	79
D41	Niobrara	3050	0.20	5.4	0.8	0.8	33.8	70	4.0	19.5	0.2	88
D42	Niobrara	3050	0.64	11.0	0.6	18.5	65.4	110	26.4	10.0	12.2	194
D42a	Niobrara	3050	0.48	33.6	0.6	20.5	45.2	120	40.2	16.5	17.2	211
D43	Niobrara	3050	0.40	14.0	0.6	5.0	75.0	120	12.0	8.5	5.2	99
D43a	Niobrara	3050	0.10	43.0	0.6	0.8	19.2	50	18.4	16.0	6.6	64
D44	Niobrara	3050	0.44	10.6	0.8	10.0	70.0	110	20.4	11.5	7.0	123
D44a	Niobrara	3050	0.50	7.8	0.4	13.6	67.8	90	32.2	11.0	9.0	93
D45	Niobrara	3050	0.52	9.8	0.6	16.4	56.0	90	41.0	9.0	9.4	111
D46	Niobrara	3050	0.60	9.6	0.4	17.8	58.8	80	52.2	10.0	9.8	104
D47	Niobrara	3050	0.28	9.4	1.0	2.3	29.2	190	2.2	87.5	1.2	84
D48	Niobrara	3050	0.56	8.2	0.4	20.5	54.0	90	60.4	10.0	8.0	140
D48a	Niobrara	3050	0.36	43.0	0.8	8.6	40.0	80	48.4	21.5	18.8	137
D49	Niobrara	3050	0.20	13.4	0.6	0.9	56.0	90	6.6	19.0	3.0	83
D50	Niobrara	3050	0.18	9.8	0.8	0.5	57.0	110	4.2	21.0	1.6	95
D51	Niobrara	3050	0.28	9.2	0.6	2.7	60.2	100	28.2	18.0	3.2	94
D52	Turtle Mountain	410	0.20	11.4	0.6	0.5	32.6	210	1.8	17.5	0.6	61
D53	Turtle Mountain	410	0.08	3.6	0.8	0.1	14.4	2090	1.6	3.0	3.2	2

Appendix 8 Continued
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour
Detection Limit			Easting	Northing			From	To	
D54	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	152.8	152.8	5Y6/1, 5Y4/1, 5Y8/4
D56	CCDP K-T Turtle Mtn	13-17-01-23W1	388175	5433175	62F/02	597.0	79.6	80.0	N1 - N2
D57	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	5.2	9.8	5Y4/1 - N4/N7
D58	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	9.8	11.2	5Y4/1 - N4
D59	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	11.2	13.4	5Y4/1 - N4
D60	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	13.4	15.0	N4/N7 - 5Y4/1
D61	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	15.0	28.3	5Y4/1
D62	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	28.3	17.4	5Y4/1
D63	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	17.4	19.1	5Y4/1 - 5GY4/1
D64	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	19.1	20.4	5Y4/1 - 5GY4/1
D65	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	20.4	22.3	5Y4/1 - 5GY4/1
D66	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	22.3	23.5	5Y4/1 - 5GY4/1
D67	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	23.5	25.7	5Y4/1 - 5GY4/1
D68	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	35.4	37.4	5Y4/1
D69	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	37.4	38.7	5Y4/1
D70	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	38.7	40.3	5Y4/1
D71	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	42.6	43.8	5Y4/1
D72	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	41.4	43.8	5Y4/1
D73	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	40.3	43.8	5Y4/1
D74	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	49.7	50.9	5Y4/1
D75	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	48.4	49.7	5Y4/1
D76	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	54.4	55.6	5Y4/1
D77	M-10-77	14-32-03-06W1	555175	5457050	62G/08	381.0	50.9	54.4	5Y4/1
D78	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	0.0	1.2	5Y4/1 - 5GY4/1
D79	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	1.2	5.0	5Y4/1 - 5GY4/1
D80	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	5.0	6.2	5Y4/1 - 5GY4/1
D81	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	6.2	7.4	5Y4/1 - 5GY4/1
D82	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	7.4	8.7	5Y4/1 - 5GY4/1
D83	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	8.7	9.9	5Y4/1 - 5GY4/1
D84	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	9.9	11.1	5Y4/1
D85	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	11.1	12.3	5Y4/1 - N5/N6
D86	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	12.3	14.0	5Y4/1 - N5/N6
D87	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.0	14.6	5Y4/1 - N5/N6
D88	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	14.6	15.9	5Y4/1 - N5/N6
D89	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	15.9	17.1	5Y4/1 - N5/N6
D90	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	17.1	18.3	5Y4/1 - N5/N6
D91	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	19.5	5Y4/1 - N5/N6
D92	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	19.5	21.0	5Y4/1 - N5/N6
D93	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	18.3	21.0	5Y4/1 - N5/N6
D94	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	21.0	22.3	5Y4/1 - N4
D95	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	22.3	23.5	5Y4/1 - N4
D96	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	23.5	24.7	5Y4/1 - N4
D97	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	24.7	25.9	5Y4/1 - N4
D98	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	25.9	26.4	5Y4/1 - N4
D99	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	26.4	28.2	5Y4/1 - N4
D100	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	28.2	29.5	5Y4/1
D101	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	29.5	30.6	5Y4/1
D102	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	30.6	31.8	5Y4/1
D103	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	31.8	33.2	5Y4/1
D104	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	33.2	34.4	5Y4/1
D105	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	34.4	35.8	5Y4/1
D106	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	35.8	37.0	5Y4/1
D107	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.0	37.6	5Y4/1
D108	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	37.6	39.1	5Y4/1
D109	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	39.1	40.3	5Y4/1
D110	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	40.3	41.7	5Y4/1
D111	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	41.7	42.9	5Y4/1

Appendix 8 Continued
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Formation	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit			0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
D54	Pierre	2080	0.26	46.8	1.6	1.8	45.0	120	1.4	36.5	6.0	183
D56	Turtle Mountain	410	0.04	4.0	1.6	0.1	5.0	330	0.8	1.5	2.4	2
D57	Niobrara	3050	0.24	11.2	0.4	1.1	60.4	110	5.8	18.5	1.8	110
D58	Niobrara	3050	0.22	13.8	0.6	1.0	64.8	120	4.2	17.0	1.8	104
D59	Niobrara	3050	0.14	11.4	0.6	0.8	53.2	100	7.2	17.5	1.6	79
D60	Niobrara	3050	0.14	11.8	0.6	0.7	48.8	90	6.4	14.5	2.0	83
D61	Niobrara	3050	0.56	6.0	0.6	9.8	73.6	110	82.8	6.0	9.0	58
D62	Niobrara	3050	0.32	7.4	0.4	3.7	63.4	100	19.0	8.5	2.6	85
D63	Niobrara	3050	0.20	4.6	0.6	0.5	66.2	130	7.6	14.0	1.8	76
D64	Niobrara	3050	0.20	4.2	0.6	0.8	55.8	100	9.0	12.0	1.2	65
D65	Niobrara	3050	0.26	9.2	1.0	0.6	85.0	110	7.8	24.5	1.4	70
D66	Niobrara	3050	0.14	3.8	0.4	0.5	33.0	60	3.2	10.5	0.6	62
D67	Niobrara	3050	0.20	6.6	0.6	0.9	38.6	90	2.6	17.5	0.8	90
D68	Morden	5670	0.14	6.2	0.6	0.4	34.4	100	0.8	22.5	0.2	118
D69	Morden	5670	0.20	4.6	0.6	0.6	36.4	80	2.8	19.5	0.2	93
D70	Morden	5670	0.20	5.2	0.6	0.8	35.0	60	3.8	19.5	0.2	82
D71	Morden	5670	0.22	6.2	0.8	1.1	38.2	60	5.4	19.5	0.4	81
D72	Morden	5670	0.18	5.8	0.8	0.6	32.6	60	1.6	19.5	0.1	77
D73	Morden	5670	0.18	3.8	0.8	0.5	33.0	60	1.8	17.5	0.2	81
D74	Morden	5670	0.16	3.4	0.6	0.5	35.0	60	1.6	18.5	0.1	82
D75	Morden	5670	0.14	5.8	0.2	0.7	32.4	60	2.0	18.0	0.2	75
D76	Morden	5670	0.14	6.6	0.2	0.9	26.6	40	6.2	15.0	0.6	63
D77	Morden	5670	0.22	9.8	0.4	1.4	38.0	70	9.4	18.5	0.8	69
D78	Favel	5760	0.20	8.6	0.2	2.4	33.6	70	44.0	8.5	2.6	47
D79	Favel	5760	0.20	12.8	0.2	1.8	30.4	70	37.6	9.0	2.0	86
D80	Favel	5760	0.20	7.8	0.1	1.9	31.6	50	27.6	10.0	2.6	59
D81	Favel	5760	0.18	7.6	0.4	2.2	30.8	50	39.6	9.5	2.8	39
D82	Favel	5760	0.16	6.4	0.2	1.7	26.4	50	32.8	7.0	2.0	51
D83	Favel	5760	0.16	7.2	0.1	1.8	25.2	50	27.6	7.0	2.4	56
D84	Favel	5760	0.14	8.0	0.4	1.6	27.2	40	25.4	7.5	2.8	43
D85	Favel	5760	0.20	5.6	0.2	2.2	28.0	50	35.4	5.0	2.0	54
D86	Favel	5760	0.20	5.8	0.2	2.6	33.8	50	38.6	5.5	2.2	53
D87	Favel	5760	0.12	4.6	0.2	1.3	20.8	40	25.4	3.5	1.2	45
D88	Favel	5760	0.20	8.8	0.2	1.6	42.4	70	27.2	9.0	2.8	66
D89	Favel	5760	0.18	6.6	0.4	1.7	37.2	60	29.6	6.0	2.2	57
D90	Favel	5760	0.24	6.4	0.2	2.2	38.6	80	44.2	6.5	2.2	43
D91	Favel	5760	0.08	3.2	0.1	0.3	30.2	60	4.0	7.0	0.6	35
D92	Favel	5760	0.14	7.8	0.8	0.4	93.8	130	2.2	13.5	1.4	77
D93	Favel	5760	0.18	36.0	1.4	0.3	5.8	50	10.4	40.5	3.0	53
D94	Favel	5760	0.30	7.6	0.1	1.9	62.4	120	18.8	12.0	1.4	39
D95	Favel	5760	0.28	9.8	0.1	2.4	46.0	100	51.6	12.0	3.2	59
D96	Favel	5760	0.24	13.6	0.1	2.4	40.2	90	52.2	10.5	3.2	60
D97	Favel	5760	0.24	10.2	0.1	2.1	41.2	80	54.4	9.5	2.2	61
D98	Favel	5760	0.18	9.4	0.1	1.6	34.8	90	49.0	8.5	1.8	56
D99	Favel	5760	0.20	13.2	0.1	1.6	38.8	70	42.6	10.0	2.0	72
D100	Favel	5760	0.14	16.0	0.1	1.1	34.6	40	39.6	11.5	1.6	62
D101	Favel	5760	0.16	16.0	0.1	1.3	33.4	50	41.6	15.0	2.6	67
D102	Favel	5760	0.16	16.6	0.1	1.5	33.6	50	42.6	16.0	2.4	85
D103	Favel	5760	0.14	13.6	0.1	1.1	32.0	60	40.6	16.5	2.0	61
D104	Favel	5760	0.16	14.4	0.1	1.3	31.2	60	42.6	15.5	2.2	86
D105	Favel	5760	0.16	14.4	0.2	1.3	30.8	60	44.4	14.5	2.4	82
D106	Favel	5760	0.16	15.6	0.2	1.4	33.0	50	49.6	15.5	2.2	82
D107	Favel	5760	0.20	13.4	0.2	1.6	36.2	60	54.8	15.0	2.6	79
D108	Favel	5760	0.18	11.0	0.2	1.8	35.0	50	59.6	12.5	2.4	78
D109	Favel	5760	0.20	10.6	0.1	1.7	33.6	50	56.8	11.0	2.6	75
D110	Favel	5760	0.18	10.0	0.1	1.4	28.6	60	51.0	9.5	2.2	68
D111	Favel	5760	0.18	11.4	0.6	1.4	33.4	60	56.8	12.0	2.0	63

Appendix 8 Continued
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Drillhole Number	Location	Utm		Map	KB Elev.	Measured Interval (m)		Colour
Detection Limit			Easting	Northing			From	To	
D112	M-12-77	01-14-04-06W1	560900	5460500	62G/08	297.0	42.9	45.0	5Y4/1
D113	M-2-80	04-18-18-04W1	570264	5598817	62J/09	251.5	286.5	287.5	5Y4/1 - 5GY4/1
D114	MOGC DALY	07-34-08-24W1	341475	5507425	62F/11	468.0	846.0	848.3	N2 - N3
D115	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	7.8	7.9	N1-N3
D116	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	10.7	10.8	5YR4/1-5YR2/1
D117	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	15.8	18.1	N1-N3
D118	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.1	18.9	N2-N4
D119	F/B BL93-68	04-12-56-15W1	462712	5963706	63G/13	129.5	18.9	19.9	N2-N4
D121	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	0.0	1.5	N1-N3
D122	DAVIDSON L. CAMP	03-15-55-15W1	459750	5955250	63G/12	280.0	1.5	3.0	N1-N3
D123	COMRP96-21	05-11-47-17W1	443349	5876641	63G/04	269.7	116.5	115.8	N2-N3
D125	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	49.8	50.5	5B6/2
D126	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4	N4, 5YR6/1
D127	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	50.5	53.4	N4, 5YR6/1
D128	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	53.4	10R3/4
D129	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	53.4	54.0	N3-N4
D130	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.0	54.6	N3-N4,5YR4/1,5GY6/1
D131	COMRP96-19	07-23-47-17W1	444582	5879844	63G/04	262.9	54.6	55.3	N3-N4,5YR4/1,5GY6/1
88-11-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	213.8	214.6	black
88-12-96	Com RP-96-20	13-03-47-14W1	442665	5875661	63G/04	270.5	214.9	215.6	black
88-16-96	Com RP-97-25	14-32-42-21W1	401569	5835738	63C/09	267.3	206.7	206.7	black
88-38-96	F/B WL-96-154	01-04-57-14W1	469001	5971330	63G/14	275.0	91.4	98.5	
88-40-96	F/B WL-96-149	13-12-56-14W1	472507	5964578	63G/14	267.0	116.7	117.7	
88-41-96	F/B WL-96-134	15-33-52-14W1	469785	5932014	63G/11	271.6	149.8	154.4	
88-42-96	F/B WL-96-138	08-19-31-15W1	456764	5918180	63G/05	283.3	178.6	179.6	green
88-43-96	F/B WL-96-139	09-14-51-16W1	453509	5917142	63G/05	271.9	171.7	173.2	
88-44-96	F/B WL-96-133	02-34-53-16W1	451715	5940504	63G/12	276.0	163.2	173.5	green
88-45-96	F/B WL-96-131	08-33-53-16W1	450579	5941116	63G/12	272.8	151.0	152.8	
88-46-96	F/B WL-96-130	08-19-53-15W1	456877	5937647	63G/12	272.8	215.7	219.8	
88-47-96	F/B WL-96-127	13-12-56-14W1	472558	5964427	63G/14	265.0	115.5	116.3	
88-49-96	M-3-96	13-28-34-10W1	511948	57569159	63G/06	256.1	237.9	237.9	
88-73-96	M-1-96	13-24-50-14W1	474500	5909450	62O/15	266.7	163.8	164.5	green-grey
88-74-96	M-6-96	04-23-14-01E1	616625	5561625	62I/03	250.5	19.4	19.4	red-green
88-75-96	M-8-96	02-22-13-06E1	665360	5552875	62I/02	240.1	70.7	72.3	
88-85-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	433.2	433.4	
88-86-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	417.2	417.3	
88-87-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	339.2	339.3	
88-89-96	Com RP-94-9	04-24-38-23W1	389076	5792899	63C/07	313.0	36.9	37.6	

Appendix 8 Continued
Black Shale Drill Core Samples - Ultra Trace ICP Data

Sample Number	Formation	Formation Code	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit			0.20	0.2	0.2	0.1	0.2	10	0.2	0.5	0.2	1
D112	Favel	5760	0.32	15.0	1.0	2.2	46.4	70	51.2	18.5	2.4	75
D113	Winnipeg	74000	0.02	130.0	1.6	0.1	9.2	<10	1.2	13.0	0.1	19
D114	Bakken	40700	2.60	16.2	0.1	0.1	216.0	160	64.8	66.0	6.4	16
D115	Cretaceous	2010	0.04	0.2	0.2	0.1	5.8	20	0.8	0.3	0.1	1
D116	Cretaceous	2010	0.48	4.4	0.6	0.3	79.4	190	15.4	36.0	1.8	7
D117	Cretaceous	2010	0.08	0.1	0.2	0.1	18.0	30	1.2	6.5	0.2	4
D118	Cretaceous	2010	0.02	0.6	0.1	0.1	5.6	40	0.8	0.3	0.1	1
D119	Cretaceous	2010	0.01	0.6	0.8	0.1	5.8	310	0.6	0.3	0.2	1
D121	Cretaceous	2010	0.06	0.1	0.6	0.1	10.8	70	0.6	16.5	0.1	26
D122	Cretaceous	2010	0.08	1.0	0.6	0.1	9.2	80	1.0	14.5	0.2	15
D123	Cretaceous	2010	0.12	15.0	1.0	0.5	8.4	860	6.6	56.5	3.6	6
D125	Cretaceous	2010	0.32	30.8	1.2	0.1	78.4	20	5.0	18.5	1.6	62
D126	Cretaceous	2010	0.50	1.2	0.6	0.3	11.8	60	2.0	18.5	0.1	39
D127	Cretaceous	2010	0.08	0.1	0.1	0.1	0.1	230	4.4	14.0	0.6	1
D128	Cretaceous	2010	0.20	0.1	1.0	0.1	15.0	30	2.0	7.5	0.2	39
D129	Cretaceous	2010	0.12	3.8	0.1	0.1	8.6	120	3.0	6.5	0.2	21
D130	Cretaceous	2010	0.08	2.8	0.2	0.1	7.0	80	2.2	6.0	0.1	12
D131	Cretaceous	2010	0.08	4.4	0.1	0.1	19.0	20	0.2	13.0	0.1	41
88-11-96	Winnipeg	74000	0.24	1.4	0.1	0.1	22.4	90	0.1	7.5	0.2	7
88-12-96	Winnipeg	74000	0.24	0.1	0.1	0.1	2.8	5	1.2	2.0	0.1	1
88-16-96	Winnipeg	74000	0.20	1.4	0.1	0.1	11.6	40	0.8	4.0	0.1	3
88-38-96	Winnipeg	74000	0.16	2.6	0.1	0.1	85.2	140	1.4	5.5	0.2	9
88-40-96	Winnipeg	74000	0.18	5.4	0.2	0.1	20.2	90	2.4	10.0	0.1	8
88-41-96	Winnipeg	74000	0.08	0.8	0.2	0.1	17.4	80	0.2	5.5	0.1	12
88-42-96	Winnipeg	74000	0.18	3.6	0.4	0.1	131.0	110	1.0	9.5	0.1	44
88-43-96	Winnipeg	74000	0.08	1.6	0.2	0.1	11.0	40	0.8	4.0	0.1	7
88-44-96	Winnipeg	74000	0.08	1.6	0.2	0.1	22.8	60	0.8	3.5	0.1	7
88-45-96	Winnipeg	74000	0.38	2.6	0.1	0.1	24.2	30	1.4	6.5	0.1	12
88-46-96	Winnipeg	74000	0.28	3.8	0.8	0.1	25.0	150	1.8	8.5	0.1	9
88-47-96	Winnipeg	74000	0.20	2.2	0.2	0.1	30.2	80	1.0	10.5	0.8	12
88-49-96	Winnipeg	74000	6.78	4.2	0.1	0.1	69.4	30	1.0	43.0	0.1	20
88-73-96	Winnipeg	74000	0.52	2.0	0.1	0.1	24.4	80	0.8	11.0	0.1	32
88-74-96	Pennitentiary	73520	0.02	2.0	0.1	0.1	1.8	5	0.2	4.5	0.1	7
88-75-96	Winnipeg	74000	0.02	13.6	0.2	0.1	19.2	50	0.1	4.0	0.1	50
88-85-96	Winnipeg	74000	0.28	1.2	0.1	0.1	19.0	110	1.2	12.0	0.1	10
88-86-96	Winnipeg	74000	0.06	1.8	0.1	0.1	16.2	80	0.2	5.0	0.1	12
88-87-96	Fort Garry	73800	0.06	10.8	0.2	0.1	24.2	540	2.4	43.5	0.4	5
88-89-96	Swan River	9315	0.06	1.0	0.2	0.2	10.4	30	0.8	10.0	0.1	32

Appendix 9
Black Shale Outcrop Chip Samples

Sample Number	Well Name	Location	Utm		Date	Sampled By	Period	Formation or Member	Formation Code
			Easting	Northing	Sampled				
314	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Jun 4/96	J.B.	Cretaceous	Morden	5670
340	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Jun 4/96	J.B.	Cretaceous	Morden	5670
306	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Jun 4/96	J.B.	Cretaceous	Morden	5670
350	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Jun 4/96	J.B.	Cretaceous	Morden	5670
313	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Jun 4/96	J.B.	Cretaceous	Morden	5670
326	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Jun 4/96	J.B.	Cretaceous	Morden	5670
316	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Jun 4/96	J.B.	Cretaceous	Niobrara	3050
325	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Jun 4/96	J.B.	Cretaceous	Niobrara	3050
296	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Jul 10/96	J.B.	Cretaceous	Niobrara	3050
335	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Jul 10/96	J.B.	Cretaceous	Niobrara	3050
293	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Jul 18/96	J.B.	Cretaceous	Morden	5670
327	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Jul 18/96	J.B.	Cretaceous	Morden	5670
294	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Jul 19/96	J.B.	Cretaceous	Pembina	3020
328	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Jul 19/96	J.B.	Cretaceous	Pembina	3020
297	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Jul 23/96	J.B.	Cretaceous	Niobrara	3050
336	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Jul 23/96	J.B.	Cretaceous	Niobrara	3050
308	99-96-BR-2-2-2	15-13-04-07W1	554000	5456800	Jun 6/96	J.B.	Cretaceous	Pembina	3020
338	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Jun 5/96	J.B.	Cretaceous	Pembina	3020
318	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Jun 5/96	J.B.	Cretaceous	Pembina	3020
331	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Jun 5/96	J.B.	Cretaceous	Pembina	3020
309	99-96-BR-3-10-3	15-31-03-06W1	552300	5461850	Jun 5/96	J.B.	Cretaceous	Pembina	3020
330	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Jun 6/96	J.B.	Cretaceous	Pembina	3020
307	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Jun 6/96	J.B.	Cretaceous	Pembina	3020
348	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Jun 6/96	J.B.	Cretaceous	Pembina	3020
310	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Jun 6/96	J.B.	Cretaceous	Morden	5670
337	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Jun 6/96	J.B.	Cretaceous	Morden	5670
322	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
354	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
311	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
339	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020

Appendix 9 Continued
Black Shale Outcrop Chip Samples

Sample Number	Well Name	Location	Utm		Date	Sampled By	Period	Formation or Member	Formation Code
			Easting	Northing	Sampled				
300	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
342	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
305	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
344	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Jun 6/96	J.B.	Cretaceous	Pembina	3020
312	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Jun 7/96	J.B.	Cretaceous	Pembina	3020
341	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Jun 7/96	J.B.	Cretaceous	Pembina	3020
315	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Jun 7/96	J.B.	Cretaceous	Pembina	3020
349	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Jun 7/96	J.B.	Cretaceous	Pembina	3020
299	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
332	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
303	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
324	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
321	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
353	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
301	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
346	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
304	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
343	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
317	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
329	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
319	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
351	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
302	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
347	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
320	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
352	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Jun 10/96	J.B.	Cretaceous	Pembina	3020
295	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Jun 21/96	J.B.	Cretaceous	Morden	5670
333	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Jun 21/96	J.B.	Cretaceous	Morden	5670
88-80-96	Stony Mtn Q	13-09-13-03E1	628375	5550200		R.B./M.F./J.B.	Ordovician	Gunn	73530
88-82-96	Stony Mtn Q	13-09-13-03E1	628375	5550200		R.B./M.F./J.B.	Ordovician	Gunn	73530

Appendix 10
Black Shale Outcrop Chip Samples - Neutron Activation Data
Arithmetic Mean

Well Name	Location	Utm		Formation	Formation Code	Au	Ag	As	Ba	Br
		Easting	Northing			ppb	ppm	ppm	ppm	ppm
Detection Limit						2	5.0	0.5	50	0.5
99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	1	2.5	12.5	810	8.4
99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	12.0	710	6.6
99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	16.0	620	7.9
99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	8	2.5	21.0	295	16.5
99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	10	2.5	34.0	445	16.0
99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	1	2.5	12.0	820	6.3
99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	17	2.5	86.5	700	28.5
99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	2	2.5	27.5	545	7.7
99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	4	2.5	25.5	710	9.4
99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	10	2.5	26.0	155	17.0
99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	5	2.5	76.5	300	19.5
99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	17	2.5	145.0	530	29.0
99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	1	2.5	21.0	640	13.0
99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	10	2.5	115.0	700	19.0
99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	7	2.5	59.0	460	13.0
99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	4	2.5	97.0	555	4.2
99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	10	2.5	85.5	675	16.0
99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	7	2.5	31.5	640	13.0
99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	5	2.5	22.0	650	7.1
99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	51.5	500	16.0
99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	16.0	510	10.5
99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	28.5	745	18.5
99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	20.5	795	4.5
99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	21.5	820	11.0
99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	10	2.5	46.5	715	14.0
99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	55.0	685	20.0
99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	3	2.5	19.5	545	13.0
99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	6	2.5	24.0	545	8.8
99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	1	2.5	19.0	700	9.1
88-80-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	2.5	1.5	100	2.3
88-82-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	2.5	1.9	180	1.7

Appendix 10 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Arithmetic Mean

Well Name	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm
Detection Limit	1.0	1	5	1	0.01	1	1	5.0	1	0.01	20	15	0.1	0.1	3
99-96-BR-1-1	0.5	5	130	11	3.70	6	1	2.5	3	0.46	18	155	1.1	18.0	2
99-96-BR-1-2-1	0.5	6	125	11	4.57	6	1	2.5	12	0.41	19	155	1.4	20.5	2
99-96-BR-1-2-2	0.5	5	115	9	4.40	6	1	2.5	16	0.50	18	140	1.7	16.5	4
99-96-BR-1-3-1	26.0	11	190	4	2.02	3	1	2.5	15	0.10	16	51	5.2	7.9	19
99-96-BR-15-2-3	5.0	18	280	9	3.43	6	1	2.5	15	0.20	16	115	6.9	13.5	20
99-96-BR-19-2	0.5	8	130	11	3.69	7	1	2.5	7	0.40	144	145	1.1	18.5	2
99-96-BR-20-1-4	0.5	4	265	9	3.78	7	1	2.5	28	0.31	18	135	14.0	15.0	33
99-96-BR-22-1-1	3.0	12	130	8	2.82	8	1	2.5	5	0.23	17	125	3.4	15.0	2
99-96-BR-2-2-2	0.5	3	120	6	1.92	10	1	2.5	9	0.19	15	105	4.7	12.5	8
99-96-BR-2-3-2	25.5	14	215	5	2.39	3	1	2.5	29	0.10	77	61	10.2	9.2	89
99-96-BR-3-10-3	16.0	27	215	5	4.52	3	1	2.5	56	0.24	138	74	15.5	10.4	45
99-96-BR-3-10-4	1.3	9	395	8	2.68	8	1	2.5	50	0.37	16	98	25.0	14.5	51
99-96-BR-3-2	0.5	7	180	9	3.21	7	1	2.5	8	0.25	17	110	2.3	15.5	7
99-96-BR-3-7-3	0.5	6	245	10	2.35	9	1	2.5	29	0.26	18	120	18.5	15.0	42
99-96-BR-3-7-5	0.5	6	120	6	4.92	12	1	2.5	130	0.43	19	111	5.9	12.5	13
99-96-BR-3-7-7	0.5	5	74	3	3.05	14	1	2.5	205	0.21	20	44	5.4	20.0	2
99-96-BR-3-7-9	0.5	9	150	7	3.53	10	1	2.5	97	0.29	73	91	21.5	16.0	42
99-96-BR-4-6-1	1.3	12	150	10	4.23	6	1	2.5	25	0.27	18	125	12.5	15.5	19
99-96-BR-4-6-3	1.3	15	135	11	4.34	6	1	2.5	8	0.31	17	130	7.5	15.0	2
99-96-BR-5-1-1	0.5	6	150	8	3.56	8	1	2.5	40	0.30	17	100	12.5	15.0	32
99-96-BR-5-1-11	0.5	8	120	7	3.03	10	1	2.5	5	0.25	18	86	3.3	16.0	7
99-96-BR-5-1-13	0.8	7	150	7	2.13	9	1	2.5	33	0.25	14	125	8.8	13.5	33
99-96-BR-5-1-15	1.3	5	85	5	2.70	12	1	2.5	5	0.24	93	70	4.3	14.0	8
99-96-BR-5-1-17	0.5	9	140	6	2.61	10	1	2.5	7	0.26	16	104	3.9	13.5	12
99-96-BR-5-1-3	0.5	5	150	9	2.40	8	1	2.5	32	0.25	16	115	9.7	15.5	22
99-96-BR-5-1-5	1.3	5	125	8	2.99	7	1	2.5	55	0.33	17	130	16.5	15.0	34
99-96-BR-5-1-7	0.5	6	110	6	1.87	10	1	2.5	4	0.21	16	71	4.1	16.0	13
99-96-BR-5-1-9	0.5	6	110	6	3.74	10	1	2.5	10	0.30	18	86	3.6	16.5	7
99-96-BR-7-5	0.5	6	130	11	3.42	6	1	2.5	9	0.42	19	150	1.8	19.0	2
88-80-96	31.0	8	16	2.0	1.11	1	1	3	3	0.04	10	33.0	0.2	3.2	2
88-82-96	30.0	12	16	2.0	1.58	1	1	3	1	0.06	10	45.0	0.2	4.0	2

Appendix 10 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Arithmetic Mean

Well Name	Sn	Sr	Ta	Th	U	W	Zn	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	100	50	0.5	0.2	0.5	1	50	1	3	5	0.1	0.2	0.50	0.2	0.05
99-96-BR-1-1	50	415	0.8	15.5	8.8	1	91	50	88	34	5.9	1.2	0.25	2.8	0.43
99-96-BR-1-2-1	50	250	1.0	16.0	14.5	2	91	55	91	27	4.4	0.9	0.25	2.7	0.47
99-96-BR-1-2-2	50	250	1.8	14.5	14.5	2	89	54	94	29	4.5	0.9	0.25	2.4	0.34
99-96-BR-1-3-1	50	250	0.3	5.5	16.0	1	160	40	63	37	5.8	1.4	0.68	2.9	0.47
99-96-BR-15-2-3	50	250	0.9	13.5	8.2	1	127	51	97	40	8.4	1.8	0.25	3.8	0.48
99-96-BR-19-2	50	250	1.1	16.0	5.5	1	99	55	93	33	5.8	1.0	0.25	2.9	0.40
99-96-BR-20-1-4	50	250	0.3	11.5	18.0	2	25	52	93	47	10.0	2.2	0.25	3.0	0.43
99-96-BR-22-1-1	50	250	0.9	15.0	7.0	4	125	59	105	54	10.0	2.2	1.65	5.0	0.66
99-96-BR-2-2-2	50	250	1.5	9.1	28.0	1	76	31	64	35	5.9	1.4	0.53	3.3	0.51
99-96-BR-2-3-2	50	250	0.3	6.6	18.5	1	330	36	60	26	5.2	1.3	0.53	3.2	0.53
99-96-BR-3-10-3	50	250	0.3	7.4	21.0	1	355	39	65	28	5.8	1.5	0.68	3.7	0.62
99-96-BR-3-10-4	50	250	1.0	8.0	41.0	1	82	37	78	62	15.0	3.4	1.65	4.2	0.62
99-96-BR-3-2	50	250	0.5	14.5	5.0	2	57	57	100	41	6.5	1.3	0.83	2.7	0.45
99-96-BR-3-7-3	50	250	1.5	11.5	47.5	5	99	45	125	93	21.5	4.9	2.55	3.6	0.50
99-96-BR-3-7-5	50	250	0.3	16.5	38.5	1	80	74	96	34	5.7	1.1	0.25	2.5	0.44
99-96-BR-3-7-7	50	250	1.2	17.5	34.0	5	88	120	205	79	11.5	2.2	0.25	2.9	0.41
99-96-BR-3-7-9	50	250	0.7	16.0	53.5	3	170	48	61	20	3.4	1.3	0.25	2.8	0.43
99-96-BR-4-6-1	50	250	1.0	15.0	19.0	1	230	85	120	46	7.8	1.8	0.68	3.5	0.56
99-96-BR-4-6-3	50	250	0.9	13.5	18.0	1	175	48	61	22	4.5	1.1	0.25	3.4	0.47
99-96-BR-5-1-1	50	250	1.0	13.0	33.5	3	115	50	96	58	11.5	2.7	2.05	3.2	0.50
99-96-BR-5-1-11	50	250	1.4	19.0	15.5	1	140	105	170	53	9.1	1.9	0.25	5.0	0.76
99-96-BR-5-1-13	50	250	1.2	13.5	25.5	1	135	29	49	23	6.4	1.6	0.25	4.2	0.71
99-96-BR-5-1-15	50	250	1.4	18.5	12.0	1	120	56	94	37	7.3	1.7	0.25	3.8	0.56
99-96-BR-5-1-17	50	250	1.2	22.5	23.5	2	190	50	75	28	5.2	1.3	0.25	2.9	0.48
99-96-BR-5-1-3	50	250	1.4	9.3	27.0	3	170	39	115	77	16.0	3.5	2.30	4.5	0.69
99-96-BR-5-1-5	50	250	0.8	13.5	32.0	1	115	48	88	48	9.4	2.3	0.98	4.2	0.57
99-96-BR-5-1-7	50	250	0.5	14.5	10.3	1	160	55	93	42	8.5	2.0	0.25	4.7	0.66
99-96-BR-5-1-9	50	250	1.6	24.0	11.0	1	160	97	150	54	10.4	2.1	0.83	5.1	0.80
99-96-BR-7-5	50	250	1.3	15.0	9.5	1	47	49	84	43	6.2	1.2	0.25	3.0	0.45
88-80-96	100	250	0.3	2.3	0.3	30	25	11.0	19	7	1.6	0.4	0.25	0.7	0.13
88-82-96	100	250	0.3	3.0	0.9	41	25	13.0	21	9	1.7	0.3	0.25	0.8	0.15

Appendix 11
Black Shale Outcrop Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)
Arithmetic Mean

Well Name	Location	Utm		Formation	Formation Code	Mo	Cu	Pb	Zn	Ag
		Easting	Northing			ppm	ppm	ppm	ppm	ppm
Detection Limit						2	1	4	1	0.4
99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	3	40	30	73	0.2
99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	7	44	24	75	0.2
99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	9	36	27	71	0.3
99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	9	75	12	170	0.6
99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	7	97	25	149	0.2
99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	2	33	27	103	0.2
99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	16	140	35	50	0.3
99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	3	62	29	111	0.2
99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	6	60	17	53	0.5
99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	18	101	18	342	0.8
99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	51	133	13	359	0.7
99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	38	151	24	66	1.3
99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	6	41	25	69	0.2
99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	15	136	20	70	1.4
99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	126	99	19	74	0.7
99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	200	41	40	88	0.3
99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	73	168	24	176	2.2
99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	21	101	27	232	1.0
99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	4	56	23	192	0.4
99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	29	101	32	109	0.8
99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	4	59	25	146	0.3
99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	26	111	18	115	0.9
99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	6	39	61	126	0.4
99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	4	90	31	193	1.0
99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	24	83	24	121	0.2
99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	42	121	25	87	1.1
99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	6	83	19	168	1.2
99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	6	55	31	165	0.7
99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	5	40	26	63	0.3
88-80-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	5	3	12	0.6
88-82-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	3	3	13	0.2

Appendix 11 Continued
Black Shale Outcrop Chip Samples
ICP (inductively coupled plasma - atomic emission spectrometry data)
Arithmetic Mean

Well Name	Ni	Mn	Sr	Cd	Bi	V	Ca	P	Mg	Ti	Al	K	Y	Be
	ppm	ppm	ppm	ppm	ppm	ppm	%	%	%	%	%	%	ppm	ppm
Detection Limit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
99-96-BR-1-1	19	35	157	0.38	2.5	209	0.35	0.066	0.63	0.42	9.63	2.39	16	2
99-96-BR-1-2-1	19	46	168	0.25	2.5	193	0.68	0.064	0.59	0.41	9.76	2.37	12	2
99-96-BR-1-2-2	26	43	226	0.43	2.5	213	0.82	0.081	0.69	0.39	8.76	2.25	12	2
99-96-BR-1-3-1	57	550	429	4.20	2.5	312	23.65	0.101	0.28	0.15	3.31	1.58	27	1
99-96-BR-15-2-3	75	90	171	1.30	2.5	591	5.42	0.071	0.56	0.40	9.97	1.62	24	2
99-96-BR-19-2	25	90	129	0.38	2.5	192	0.28	0.070	0.64	0.40	9.31	2.28	14	2
99-96-BR-20-1-4	21	42	115	0.38	2.5	707	0.66	0.099	0.60	0.32	6.96	3.01	18	2
99-96-BR-22-1-1	43	93	131	0.25	2.5	361	2.62	0.124	0.87	0.37	7.93	1.97	33	2
99-96-BR-2-2-2	11	40	68	0.25	2.5	257	0.35	0.144	0.57	0.38	7.87	4.75	13	1
99-96-BR-2-3-2	91	402	405	22.80	2.5	747	20.93	0.086	0.29	0.17	3.82	1.39	26	1
99-96-BR-3-10-3	150	560	298	31.55	2.5	812	15.25	0.133	0.44	0.19	4.44	1.56	34	2
99-96-BR-3-10-4	35	61	101	0.90	2.5	922	0.48	0.104	0.53	0.38	7.26	2.98	27	2
99-96-BR-3-2	28	62	139	0.25	2.5	439	0.46	0.142	0.67	0.39	8.96	2.26	13	2
99-96-BR-3-7-3	25	74	64	0.65	4.3	620	0.30	0.200	0.55	0.36	6.44	3.17	29	1
99-96-BR-3-7-5	22	76	265	0.25	2.5	334	0.43	0.183	0.56	0.36	7.22	3.97	13	1
99-96-BR-3-7-7	13	97	118	0.50	2.5	255	0.99	0.081	1.53	0.32	8.94	1.20	23	1
99-96-BR-3-7-9	25	69	223	0.25	2.5	748	0.65	0.123	0.92	0.35	8.10	3.07	14	1
99-96-BR-4-6-1	20	79	110	1.50	2.5	523	0.93	0.183	0.79	0.34	7.28	2.15	25	1
99-96-BR-4-6-3	20	109	145	0.90	2.5	374	0.97	0.144	0.98	0.36	8.13	2.47	23	2
99-96-BR-5-1-1	19	64	140	0.75	2.5	495	0.97	0.261	0.64	0.33	7.27	3.57	32	1
99-96-BR-5-1-11	18	81	125	0.70	2.5	266	0.36	0.114	1.37	0.34	9.15	1.95	29	2
99-96-BR-5-1-13	23	56	58	0.43	2.5	384	0.36	0.059	0.77	0.38	8.07	3.48	20	2
99-96-BR-5-1-15	17	76	69	0.85	2.5	226	1.23	0.051	1.46	0.36	9.03	1.32	21	1
99-96-BR-5-1-17	19	57	84	0.38	4.3	324	0.30	0.079	0.62	0.38	8.88	4.52	14	2
99-96-BR-5-1-3	19	65	69	0.60	2.5	476	0.37	0.224	0.73	0.37	7.89	3.70	44	2
99-96-BR-5-1-5	16	57	224	0.25	2.5	457	1.76	0.154	0.62	0.30	6.94	3.59	33	1
99-96-BR-5-1-7	22	77	78	0.43	2.5	270	0.48	0.047	1.29	0.36	8.71	1.82	26	1
99-96-BR-5-1-9	19	81	179	0.65	2.5	241	0.44	0.079	1.44	0.38	8.89	1.77	30	1
99-96-BR-7-5	21	39	99	0.25	2.5	194	0.22	0.055	0.56	0.42	9.46	2.20	14	2
88-80-96	6	288	141	13.70	8.0	18	32.88	0.028	3.13	0.07	1.49	1.04	10	1
88-82-96	5	265	114	0.25	2.5	22	30.26	0.019	4.11	0.08	1.77	1.23	10	1

Appendix 12
Black Shale Outcrop Chip Samples - Ultra Trace ICP Data
Arithmetic Mean

Well Name	Location	Utm		Formation	Formation Code	Ag	As	Bi	Cd	Cu	Hg	Mo	Pb	Sb	Zn
		Easting	Northing			ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppm
Detection Limit						0.20	0.2	0.2	0.10	0.2	10	0.2	0.5	0.2	1
99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	0.19	9.0	0.4	0.05	31.4	45	3.2	19.0	0.4	34
99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	0.20	8.2	0.3	0.05	36.1	60	8.1	19.5	0.5	37
99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	0.27	10.9	0.2	0.15	29.3	55	8.5	17.5	0.9	33
99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	0.50	11.6	0.4	4.50	73.8	90	9.0	8.0	3.6	136
99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	0.20	20.6	0.5	1.30	89.4	145	7.1	15.5	5.1	102
99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	0.14	7.3	0.2	0.05	28.1	50	1.6	19.0	0.2	62
99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	0.60	70.2	0.7	0.08	134.3	260	16.2	19.5	8.1	25
99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	0.16	17.1	0.7	0.10	58.2	115	3.5	18.3	2.2	74
99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	0.63	19.7	0.5	0.08	55.3	150	5.7	11.5	2.1	32
99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	0.92	12.8	0.5	24.85	94.3	100	17.2	11.5	6.8	260
99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	1.02	44.4	0.7	34.95	130.5	130	49.6	12.3	11.8	247
99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	1.42	117.5	0.6	0.70	133.0	230	34.3	13.3	13.9	38
99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	0.18	12.3	0.3	0.13	36.9	105	5.6	16.3	1.4	37
99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	1.66	88.8	0.3	0.15	128.8	230	13.5	16.3	7.6	40
99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	0.84	47.4	0.6	0.20	89.1	105	115.0	13.3	3.0	45
99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	0.05	90.3	0.7	0.08	37.0	85	213.5	32.0	3.6	62
99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	2.33	67.1	0.4	0.18	152.8	265	68.4	19.5	12.7	126
99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	1.15	26.8	0.6	1.40	94.0	145	21.6	22.5	6.3	165
99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	0.17	17.4	0.6	0.55	48.4	105	4.3	20.5	5.2	124
99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	1.05	39.1	0.2	0.50	92.8	150	22.8	25.5	6.6	74
99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	0.34	11.9	0.6	0.45	63.2	110	3.9	20.3	1.5	103
99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	1.09	21.8	0.5	0.30	108.0	210	24.3	16.3	5.3	75
99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	0.37	17.4	0.4	0.45	35.7	95	7.5	57.0	2.3	92
99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	1.11	15.6	0.6	0.40	79.9	115	3.6	25.5	1.6	144
99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	0.49	38.3	0.5	0.40	77.7	145	22.3	19.0	5.6	83
99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	0.84	43.5	0.8	0.35	108.8	230	40.8	17.5	8.4	56
99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	1.30	13.9	0.5	0.40	80.4	120	6.0	14.8	2.0	127
99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	0.58	18.1	0.6	0.40	49.5	125	5.8	28.3	1.6	123
99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	0.20	11.1	0.4	0.05	33.2	55	5.7	17.5	0.9	26
88-80-96	13-09-13-03E1	628375	5550200	Gunn	73530	0.02	0.8	0.1	0.1	2.2	30	0.2	1.5	0.1	11
88-82-96	13-09-13-03E1	628375	5550200	Gunn	73530	0.01	0.4	0.2	0.1	2.0	10	0.2	2.5	0.1	12

Appendix 13
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation Code	Au ppb	Ag ppm	As ppm	Ba ppm	Br ppm
Detection Limit			Easting	Northing			2	5.0	0.5	50	0.5
314	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	1	2.5	13.0	820	7.8
340	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	1	2.5	12.0	800	9.0
A. Mean	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	1	2.5	12.5	810	8.4
306	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	13.0	760	6.1
350	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	11.0	660	7.0
A. Mean	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	12.0	710	6.6
313	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	14.0	640	6.6
326	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	18.0	600	9.1
A. Mean	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	1	2.5	16.0	620	7.9
316	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	4	2.5	20.0	250	14.0
325	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	12	2.5	22.0	340	19.0
A. Mean	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	8	2.5	21.0	295	16.5
296	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	4	2.5	35.0	360	15.0
335	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	16	2.5	33.0	530	17.0
A. Mean	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	10	2.5	34.0	445	16.0
293	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	1	2.5	15.0	730	6.9
327	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	1	2.5	8.9	910	5.7
A. Mean	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	1	2.5	12.0	820	6.3
294	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	18	2.5	90.0	770	27.0
328	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	16	2.5	83.0	630	30.0
A. Mean	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	17	2.5	86.5	700	28.5
297	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	3	2.5	28.0	510	7.0
336	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	1	2.5	27.0	580	8.3
A. Mean	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	2	2.5	27.5	545	7.7
308	99-96-BR-2-2-2	15-13-04-07W1	554000	5456800	Pembina	3020	6	2.5	26.0	770	8.7
338	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	1	2.5	25.0	650	10.0
A. Mean	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	4	2.5	25.5	710	9.4
318	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	9	2.5	26.0	50	16.0
331	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	11	2.5	26.0	360	18.0
A. Mean	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	10	2.5	26.0	205	17.0
309	99-96-BR-3-10-3	15-31-03-06W1	552300	5461850	Pembina	3020	1	2.5	73.0	330	18.0
330	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	8	2.5	80.0	270	21.0
A. Mean	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	5	2.5	76.5	300	19.5
307	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	23	2.5	140.0	500	27.0
348	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	11	2.5	150.0	560	31.0
A. Mean	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	17	2.5	145.0	530	29.0
310	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	1	2.5	19.0	550	12.0
337	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	1	2.5	23.0	730	14.0
A. Mean	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	1	2.5	21.0	640	13.0
322	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	15	2.5	120.0	590	19.0
354	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	5	2.5	110.0	810	19.0
A. Mean	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	10	2.5	115.0	700	19.0

Appendix 13 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm
Detection Limit	1.0	1	5	1	0.01	1	1	5	1	0.01	20	15	0.1	0.1	3
314	0.5	5	130	10	3.58	6	1	3	1	0.44	17	130	0.9	17.0	2
340	0.5	4	130	12	3.82	5	1	3	6	0.48	20	180	1.3	19.0	2
A. Mean	0.5	5	130	11	3.70	6	1	3	3	0.46	18	155	1.1	18.0	2
306	0.5	6	120	9	4.32	6	1	3	13	0.39	18	120	1.6	19.0	2
350	0.5	5	130	13	4.81	6	1	3	11	0.43	20	190	1.2	22.0	2
A. Mean	0.5	6	125	11	4.57	6	1	3	12	0.41	19	155	1.4	20.5	2
313	0.5	5	110	8	4.17	5	1	3	19	0.47	17	130	1.5	15.0	2
326	0.5	4	120	10	4.62	6	1	3	12	0.53	19	150	1.9	18.0	6
A. Mean	0.5	5	115	9	4.40	6	1	3	16	0.50	18	140	1.7	16.5	4
316	22.0	10	180	3	1.98	3	1	3	16	0.10	15	48	4.6	7.5	23
325	30.0	12	200	4	2.06	3	1	3	13	0.10	16	54	5.7	8.3	15
A. Mean	26.0	11	190	4	2.02	3	1	3	15	0.10	16	51	5.2	7.9	19
296	4.0	17	270	7	3.30	6	1	3	15	0.19	15	110	6.3	13.0	21
335	6.0	19	290	10	3.56	6	1	3	14	0.20	17	120	7.5	14.0	19
A. Mean	5.0	18	280	9	3.43	6	1	3	15	0.20	16	115	6.9	13.5	20
293	0.5	8	140	10	3.73	7	1	3	7	0.40	270	130	1.1	18.0	2
327	0.5	8	120	11	3.64	6	1	3	7	0.40	19	160	1.1	19.0	2
A. Mean	0.5	8	130	11	3.69	7	1	3	7	0.40	144	145	1.1	18.5	2
294	0.5	4	280	8	3.85	7	1	3	33	0.32	18	120	13.0	15.0	35
328	0.5	4	250	10	3.70	7	1	3	23	0.29	18	150	15.0	15.0	30
A. Mean	0.5	4	265	9	3.78	7	1	3	28	0.31	18	135	14.0	15.0	33
297	3.0	11	120	7	2.64	8	1	3	1	0.21	16	100	2.9	14.0	2
336	3.0	13	140	9	2.99	8	1	3	10	0.24	18	150	3.8	16.0	2
A. Mean	3.0	12	130	8	2.82	8	1	3	5	0.23	17	125	3.4	15.0	2
308	0.5	3	120	4	1.91	10	1	3	18	0.18	15	100	4.1	12.0	11
338	0.5	3	120	7	1.93	10	1	3	1	0.19	15	110	5.2	13.0	4
A. Mean	0.5	3	120	6	1.92	10	1	3	9	0.19	15	105	4.7	12.5	8
318	23.0	13	200	4	2.26	3	1	3	32	0.09	15	45	9.4	8.6	85
331	28.0	15	230	6	2.52	3	1	3	26	0.10	140	77	11.0	9.7	92
A. Mean	25.5	14	215	5	2.39	3	1	3	29	0.10	77	61	10.2	9.2	89
309	14.0	25	200	4	4.32	3	1	3	61	0.22	16	61	14.0	9.8	42
330	18.0	29	230	6	4.71	3	1	3	51	0.25	260	86	17.0	11.0	48
A. Mean	16.0	27	215	5	4.52	3	1	3	56	0.24	138	74	15.5	10.4	45
307	2.0	8	380	7	2.47	7	1	3	60	0.34	16	95	23.0	13.0	40
348	0.5	9	410	9	2.89	8	1	3	40	0.40	17	100	27.0	16.0	61
A. Mean	1.3	9	395	8	2.68	8	1	3	50	0.37	16	98	25.0	14.5	51
310	0.5	5	170	7	2.99	7	1	3	9	0.23	16	110	2.2	14.0	2
337	0.5	8	190	10	3.43	7	1	3	6	0.27	18	110	2.4	17.0	13
A. Mean	0.5	7	180	9	3.21	7	1	3	8	0.25	17	110	2.3	15.5	7
322	0.5	6	250	9	2.43	9	1	3	29	0.26	18	130	19.0	15.0	46
354	0.5	5	240	10	2.26	9	1	3	29	0.25	19	110	18.0	15.0	38
A. Mean	0.5	6	245	10	2.35	9	1	3	29	0.26	18	120	18.5	15.0	42

Appendix 13 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Sn ppm	Sr ppm	Ta ppm	Th ppm	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	100	50	0.5	0.5	0.5	1	50	1	3	5	0.1	0.2	0.50	0.2	0.05
314	50	580	0.3	15.0	8.9	1	81	49	93	33	6.1	1.3	0.25	2.8	0.49
340	50	250	1.4	16.0	8.6	1	100	51	82	35	5.7	1.1	0.25	2.7	0.37
A. Mean	50	415	0.8	15.5	8.8	1	91	50	88	34	5.9	1.2	0.25	2.8	0.43
306	50	250	0.5	15.0	15.0	1	85	53	93	28	4.6	0.8	0.25	2.6	0.49
350	50	250	1.5	17.0	14.0	4	96	57	88	25	4.2	0.9	0.25	2.7	0.44
A. Mean	50	250	1.0	16.0	14.5	2	91	55	91	27	4.4	0.9	0.25	2.7	0.47
313	50	250	1.7	13.0	14.0	1	91	52	100	31	4.6	0.7	0.25	2.3	0.38
326	50	250	1.8	16.0	15.0	3	86	56	87	27	4.4	1.0	0.25	2.5	0.30
A. Mean	50	250	1.8	14.5	14.5	2	89	54	94	29	4.5	0.9	0.25	2.4	0.34
316	50	250	0.3	4.9	16.0	1	170	38	65	38	5.9	1.4	0.25	2.8	0.47
325	50	250	0.3	6.1	16.0	1	150	41	61	36	5.6	1.3	1.10	3.0	0.46
A. Mean	50	250	0.3	5.5	16.0	1	160	40	63	37	5.8	1.4	0.68	2.9	0.47
296	50	250	0.3	13.0	8.3	1	93	50	100	48	8.6	1.8	0.25	3.8	0.49
335	50	250	1.6	14.0	8.0	1	160	52	93	32	8.2	1.8	0.25	3.8	0.47
A. Mean	50	250	0.9	13.5	8.2	1	127	51	97	40	8.4	1.8	0.25	3.8	0.48
293	50	250	0.3	17.0	5.9	1	110	56	100	36	6.2	1.1	0.25	3.3	0.46
327	50	250	1.9	15.0	5.1	1	87	53	85	30	5.4	0.9	0.25	2.5	0.34
A. Mean	50	250	1.1	16.0	5.5	1	99	55	93	33	5.8	1.0	0.25	2.9	0.40
294	50	250	0.3	12.0	19.0	3	25	54	100	53	11.0	2.4	0.25	3.1	0.50
328	50	250	0.3	11.0	17.0	1	25	50	86	40	9.0	1.9	0.25	2.8	0.36
A. Mean	50	250	0.3	11.5	18.0	2	25	52	93	47	10.0	2.2	0.25	3.0	0.43
297	50	250	0.3	14.0	7.0	4	120	56	110	57	10.0	2.2	1.50	4.9	0.66
336	50	250	1.5	16.0	6.9	4	130	62	100	50	10.0	2.2	1.80	5.0	0.66
A. Mean	50	250	0.9	15.0	7.0	4	125	59	105	54	10.0	2.2	1.65	5.0	0.66
308	50	250	1.2	8.7	28.0	1	68	30	68	36	6.2	1.5	0.25	3.3	0.54
338	50	250	1.8	9.4	28.0	1	83	32	59	34	5.6	1.3	0.80	3.3	0.48
A. Mean	50	250	1.5	9.1	28.0	1	76	31	64	35	5.9	1.4	0.53	3.3	0.51
318	50	250	0.3	6.4	19.0	1	280	35	65	25	5.3	1.2	0.25	3.3	0.56
331	50	250	0.3	6.8	18.0	1	380	37	55	27	5.1	1.4	0.80	3.0	0.49
A. Mean	50	250	0.3	6.6	18.5	1	330	36	60	26	5.2	1.3	0.53	3.2	0.53
309	50	250	0.3	6.7	20.0	1	340	37	67	33	5.9	1.4	0.25	3.7	0.61
330	50	250	0.3	8.1	22.0	1	370	41	62	22	5.6	1.5	1.10	3.7	0.62
A. Mean	50	250	0.3	7.4	21.0	1	355	39	65	28	5.8	1.5	0.68	3.7	0.62
307	50	250	0.9	7.9	40.0	1	83	35	79	64	15.0	3.3	1.60	4.0	0.60
348	50	250	1.0	8.0	42.0	1	81	38	77	60	15.0	3.5	1.70	4.3	0.63
A. Mean	50	250	1.0	8.0	41.0	1	82	37	78	62	15.0	3.4	1.65	4.2	0.62
310	50	250	0.3	14.0	4.7	1	25	54	100	39	6.4	1.3	0.25	2.5	0.49
337	50	250	0.8	15.0	5.2	3	89	60	99	43	6.5	1.3	1.40	2.8	0.40
A. Mean	50	250	0.5	14.5	5.0	2	57	57	100	41	6.5	1.3	0.83	2.7	0.45
322	50	250	1.2	12.0	49.0	9	100	46	130	89	22.0	5.1	2.60	3.7	0.51
354	50	250	1.8	11.0	46.0	1	97	44	120	96	21.0	4.7	2.50	3.4	0.49
A. Mean	50	250	1.5	11.5	47.5	5	99	45	125	93	21.5	4.9	2.55	3.6	0.50

Appendix 13 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation	Au	Ag	As	Ba	Br
Detection Limit			Easting	Northing		Code	ppb	ppm	ppm	ppm	ppm
							2	5.0	0.5	50	0.5
311	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	12	2.5	59.0	420	13.0
339	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	1	2.5	59.0	500	13.0
A. Mean	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	7	2.5	59.0	460	13.0
300	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	6	2.5	94.0	610	4.0
342	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	1	2.5	100.0	500	4.4
A. Mean	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	4	2.5	97.0	555	4.2
305	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	1	2.5	86.0	710	16.0
344	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	18	2.5	85.0	640	16.0
A. Mean	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	10	2.5	85.5	675	16.0
312	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	12	2.5	32.0	720	13.0
341	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	1	2.5	31.0	560	13.0
A. Mean	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	7	2.5	31.5	640	13.0
315	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	8	2.5	20.0	620	6.1
349	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	1	2.5	24.0	680	8.1
A. Mean	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	5	2.5	22.0	650	7.1
299	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	13	2.5	55.0	510	15.0
332	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	11	2.5	48.0	490	17.0
A. Mean	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	51.5	500	16.0
303	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	4	2.5	16.0	520	10.0
324	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	6	2.5	16.0	500	11.0
A. Mean	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	16.0	510	10.5
321	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	11	2.5	30.0	740	18.0
353	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	13	2.5	27.0	750	19.0
A. Mean	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	28.5	745	18.5
301	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	1	2.5	21.0	840	3.8
346	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	8	2.5	20.0	750	5.1
A. Mean	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	20.5	795	4.5
304	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	6	2.5	23.0	770	11.0
343	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	3	2.5	20.0	870	11.0
A. Mean	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	21.5	820	11.0
317	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	10	2.5	46.0	670	13.0
329	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	10	2.5	47.0	760	15.0
A. Mean	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	10	2.5	46.5	715	14.0
319	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	10	2.5	54.0	640	19.0
351	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	13	2.5	56.0	730	21.0
A. Mean	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	12	2.5	55.0	685	20.0
302	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	1	2.5	20.0	540	12.0
347	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	5	2.5	19.0	550	14.0
A. Mean	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	3	2.5	19.5	545	13.0
320	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	11	2.5	23.0	510	8.5
352	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	1	2.5	25.0	580	9.1
A. Mean	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	6	2.5	24.0	545	8.8
295	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	1	2.5	21.0	740	8.3
333	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	1	2.5	17.0	660	9.8
A. Mean	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	1	2.5	19.0	700	9.1
	88-80-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	2.5	1.5	100	2.3
	88-82-96	13-09-13-03E1	628375	5550200	Gunn	73530	1	2.5	1.9	180	1.7

Appendix 13 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Ca %	Co ppm	Cr ppm	Cs ppm	Fe %	Hf ppm	Hg ppm	Ir ppb	Mo ppm	Na %	Ni ppm	Rb ppm	Sb ppm	Sc ppm
Detection Limit	1.0	1	5	1	0.01	1	1	5	1	0.01	20	15	0.1	0.1
311	0.5	5	120	6	4.88	11	1	3	140	0.42	18	92	5.7	12.0
339	0.5	6	120	6	4.95	12	1	3	120	0.44	20	130	6.0	13.0
A. Mean	0.5	6	120	6	4.92	12	1	3	130	0.43	19	111	5.9	12.5
300	0.5	4	80	3	3.02	14	1	3	220	0.20	19	43	5.0	19.0
342	0.5	5	67	3	3.08	14	1	3	190	0.22	21	45	5.7	21.0
A. Mean	0.5	5	74	3	3.05	14	1	3	205	0.21	20	44	5.4	20.0
305	0.5	8	150	6	3.46	10	1	3	110	0.28	17	82	20.0	15.0
344	0.5	10	150	7	3.59	10	1	3	83	0.30	130	100	23.0	17.0
A. Mean	0.5	9	150	7	3.53	10	1	3	97	0.29	73	91	21.5	16.0
312	0.5	11	160	9	4.18	6	1	3	31	0.26	18	140	12.0	15.0
341	2.0	12	140	11	4.27	5	1	3	19	0.27	19	110	13.0	16.0
A. Mean	1.3	12	150	10	4.23	6	1	3	25	0.27	18	125	12.5	15.5
315	0.5	13	130	9	4.05	6	1	3	16	0.29	16	110	6.5	14.0
349	2.0	16	140	13	4.63	5	1	3	1	0.32	17	150	8.5	16.0
A. Mean	1.3	15	135	11	4.34	6	1	3	8	0.31	17	130	7.5	15.0
299	0.5	6	160	7	3.59	7	1	3	42	0.30	17	100	12.0	15.0
332	0.5	5	140	9	3.52	8	1	3	37	0.29	18	100	13.0	15.0
A. Mean	0.5	6	150	8	3.56	8	1	3	40	0.30	17	100	12.5	15.0
303	0.5	7	110	5	2.85	10	1	3	10	0.24	17	71	3.1	15.0
324	0.5	8	130	9	3.21	10	1	3	1	0.26	20	100	3.5	17.0
A. Mean	0.5	8	120	7	3.03	10	1	3	5	0.25	18	86	3.3	16.0
321	1.0	7	150	6	2.08	9	1	3	35	0.24	14	130	8.5	13.0
353	0.5	6	150	8	2.17	9	1	3	30	0.25	15	120	9.1	14.0
A. Mean	0.8	7	150	7	2.13	9	1	3	33	0.25	14	125	8.8	13.5
301	2.0	5	80	4	2.63	11	1	3	10	0.24	15	61	3.8	13.0
346	0.5	5	89	5	2.76	12	1	3	1	0.23	170	78	4.7	15.0
A. Mean	1.3	5	85	5	2.70	12	1	3	5	0.24	93	70	4.3	14.0
304	0.5	9	140	5	2.56	10	1	3	14	0.26	16	97	3.6	13.0
343	0.5	9	140	7	2.66	10	1	3	1	0.26	16	110	4.1	14.0
A. Mean	0.5	9	140	6	2.61	10	1	3	7	0.26	16	104	3.9	13.5
317	0.5	5	150	8	2.36	8	1	3	27	0.24	15	110	9.4	15.0
329	0.5	5	150	10	2.44	7	1	3	36	0.26	17	120	10.0	16.0
A. Mean	0.5	5	150	9	2.40	8	1	3	32	0.25	16	115	9.7	15.5
319	2.0	4	120	7	2.87	7	1	3	59	0.31	16	120	15.0	14.0
351	0.5	5	130	8	3.10	7	1	3	50	0.35	18	140	18.0	16.0
A. Mean	1.3	5	125	8	2.99	7	1	3	55	0.33	17	130	16.5	15.0
302	0.5	6	99	4	1.74	9	1	3	1	0.20	15	56	4.0	15.0
347	0.5	6	120	8	1.99	10	1	3	8	0.22	17	86	4.1	17.0
A. Mean	0.5	6	110	6	1.87	10	1	3	4	0.21	16	71	4.1	16.0
320	0.5	6	110	6	3.69	10	1	3	8	0.29	18	87	3.6	16.0
352	0.5	6	110	6	3.79	10	1	3	11	0.31	19	84	3.6	17.0
A. Mean	0.5	6	110	6	3.74	10	1	3	10	0.30	18	86	3.6	16.5
295	0.5	6	130	9	3.29	6	1	3	9	0.41	18	130	1.5	18.0
333	0.5	5	130	13	3.54	6	1	3	9	0.43	20	170	2.1	20.0
A. Mean	0.5	6	130	11	3.42	6	1	3	9	0.42	19	150	1.8	19.0
	31.0	8	16	2.0	1.11	1	1	3	3	0.04	10	33.0	0.2	3.2
	30.0	12	16	2.0	1.58	1	1	3	1	0.06	10	45.0	0.2	4.0

Appendix 13 Continued
Black Shale Outcrop Chip Samples - Neutron Activation Data
Duplicates and Arithmetic Mean

Sample Number	Se ppm	Sn ppm	Sr ppm	Ta ppm	Th ppm	U ppm	W ppm	Zn ppm	La ppm	Ce ppm	Nd ppm	Sm ppm	Eu ppm	Tb ppm	Yb ppm	Lu ppm
Detection Limit	3	100	50	0.5	0.5	0.5	1	50	1	3	5	0.1	0.2	0.50	0.2	0.05
311	24	50	250	0.3	17.0	40.0	1	100	76	100	36	6.1	1.2	0.25	2.6	0.49
339	2	50	250	0.3	16.0	37.0	1	59	72	91	32	5.3	1.0	0.25	2.3	0.38
A. Mean	13	50	250	0.3	16.5	38.5	1	80	74	96	34	5.7	1.1	0.25	2.5	0.44
300	2	50	250	2.1	17.0	34.0	1	150	120	220	93	12.0	2.1	0.25	2.8	0.46
342	2	50	250	0.3	18.0	34.0	9	25	120	190	65	11.0	2.3	0.25	2.9	0.35
A. Mean	2	50	250	1.2	17.5	34.0	5	88	120	205	79	11.5	2.2	0.25	2.9	0.41
305	42	50	250	1.1	16.0	54.0	1	150	47	64	24	3.6	1.2	0.25	2.9	0.45
344	42	50	250	0.3	16.0	53.0	6	190	48	57	16	3.2	1.3	0.25	2.7	0.40
A. Mean	42	50	250	0.7	16.0	53.5	3	170	48	61	20	3.4	1.3	0.25	2.8	0.43
312	21	50	250	1.0	15.0	19.0	1	210	83	130	49	8.2	1.9	0.25	3.5	0.53
341	17	50	250	1.0	15.0	19.0	1	250	86	110	42	7.3	1.6	1.10	3.4	0.59
A. Mean	19	50	250	1.0	15.0	19.0	1	230	85	120	46	7.8	1.8	0.68	3.5	0.56
315	2	50	250	1.5	13.0	17.0	1	170	46	64	24	4.7	1.0	0.25	3.4	0.44
349	2	50	250	0.3	14.0	19.0	1	180	50	58	20	4.3	1.1	0.25	3.3	0.49
A. Mean	2	50	250	0.9	13.5	18.0	1	175	48	61	22	4.5	1.1	0.25	3.4	0.47
299	33	50	250	1.1	14.0	34.0	5	99	50	100	64	12.0	2.8	2.00	3.4	0.54
332	30	50	250	0.9	12.0	33.0	1	130	50	92	51	11.0	2.5	2.10	3.0	0.46
A. Mean	32	50	250	1.0	13.0	33.5	3	115	50	96	58	11.5	2.7	2.05	3.2	0.50
303	2	50	250	1.5	18.0	15.0	1	140	100	180	57	9.3	1.8	0.25	5.0	0.78
324	13	50	250	1.2	20.0	16.0	1	140	110	160	49	8.9	1.9	0.25	5.0	0.73
A. Mean	7	50	250	1.4	19.0	15.5	1	140	105	170	53	9.1	1.9	0.25	5.0	0.76
321	31	50	250	1.0	13.0	25.0	1	130	29	51	23	6.8	1.6	0.25	4.3	0.76
353	34	50	250	1.4	14.0	26.0	1	140	29	46	22	5.9	1.5	0.25	4.1	0.65
A. Mean	33	50	250	1.2	13.5	25.5	1	135	29	49	23	6.4	1.6	0.25	4.2	0.71
301	9	50	250	0.7	18.0	11.0	1	100	55	97	39	7.5	1.8	0.25	3.8	0.55
346	7	50	250	2.1	19.0	13.0	1	140	57	91	35	7.1	1.5	0.25	3.7	0.56
A. Mean	8	50	250	1.4	18.5	12.0	1	120	56	94	37	7.3	1.7	0.25	3.8	0.56
304	19	50	250	0.9	23.0	23.0	3	180	49	77	31	5.4	1.3	0.25	2.9	0.50
343	5	50	250	1.4	22.0	24.0	1	200	50	73	24	4.9	1.2	0.25	2.8	0.45
A. Mean	12	50	250	1.2	22.5	23.5	2	190	50	75	28	5.2	1.3	0.25	2.9	0.48
317	20	50	250	1.2	9.2	27.0	5	170	39	120	87	17.0	3.6	2.10	4.5	0.75
329	23	50	250	1.6	9.3	27.0	1	170	39	110	66	15.0	3.4	2.50	4.5	0.63
A. Mean	22	50	250	1.4	9.3	27.0	3	170	39	115	77	16.0	3.5	2.30	4.5	0.69
319	33	50	250	0.3	13.0	32.0	1	110	45	93	46	9.5	2.4	1.70	4.4	0.65
351	35	50	250	1.4	14.0	32.0	1	120	50	82	49	9.3	2.2	0.25	3.9	0.49
A. Mean	34	50	250	0.8	13.5	32.0	1	115	48	88	48	9.4	2.3	0.98	4.2	0.57
302	12	50	250	0.8	14.0	9.6	1	120	53	97	43	8.5	2.1	0.25	4.6	0.68
347	13	50	250	0.3	15.0	11.0	1	200	57	89	40	8.4	1.8	0.25	4.7	0.64
A. Mean	13	50	250	0.5	14.5	10.3	1	160	55	93	42	8.5	2.0	0.25	4.7	0.66
320	4	50	250	1.4	23.0	11.0	1	180	96	160	54	11.0	2.0	1.40	5.3	0.89
352	9	50	250	1.7	25.0	11.0	1	140	98	140	53	9.7	2.1	0.25	4.9	0.70
A. Mean	7	50	250	1.6	24.0	11.0	1	160	97	150	54	10.4	2.1	0.83	5.1	0.80
295	2	50	250	2.4	15.0	9.5	1	69	48	88	44	6.5	1.2	0.25	2.8	0.51
333	2	50	250	0.3	15.0	9.5	1	25	49	79	41	5.9	1.2	0.25	3.1	0.38
A. Mean	2	50	250	1.3	15.0	9.5	1	47	49	84	43	6.2	1.2	0.25	3.0	0.45
	2	100	250	0.3	2.3	0.3	30	25	11.0	19	7	1.6	0.4	0.25	0.7	0.13
	2	100	250	0.3	3.0	0.9	41	25	13.0	21	9	1.7	0.3	0.25	0.8	0.15

Appendix 14
Black Shale Outcrop Chip Samples - ICP (inductively coupled plasma - atomic emission spectrometry data)
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation Code	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Detection Limit			Easting	Northing			2	1	4	1	0.4
314	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	3	40	30	74	0.2
340	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	3	39	30	72	0.2
A. Mean	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670	3	40	30	73	0.2
306	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	7	45	25	75	0.2
350	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	7	43	22	75	0.2
A. Mean	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670	7	44	24	75	0.2
313	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	10	37	29	73	0.4
326	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	8	34	24	69	0.2
A. Mean	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670	9	36	27	71	0.3
316	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	9	76	10	176	0.6
325	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	8	73	13	164	0.5
A. Mean	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050	9	75	12	170	0.6
296	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	7	98	26	150	0.2
335	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	7	95	24	147	0.2
A. Mean	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050	7	97	25	149	0.2
293	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	2	33	26	101	0.2
327	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	1	33	27	105	0.2
A. Mean	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670	2	33	27	103	0.2
294	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	16	139	33	49	0.2
328	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	16	141	36	51	0.4
A. Mean	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020	16	140	35	50	0.3
297	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	2	63	29	111	0.2
336	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	3	60	28	111	0.2
A. Mean	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050	3	62	29	111	0.2
308	99-96-BR-2-2-2	15-13-04-07W1	554000	5456800	Pembina	3020	6	60	19	53	0.7
338	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	5	60	14	53	0.2
A. Mean	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020	6	60	17	53	0.5
318	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	18	97	18	348	0.9
331	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	17	105	17	335	0.6
A. Mean	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020	18	101	18	342	0.8
309	99-96-BR-3-10-3	15-31-03-06W1	552300	5461850	Pembina	3020	52	136	10	365	0.7
330	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	50	129	16	353	0.6
A. Mean	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020	51	133	13	359	0.7
307	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	38	146	25	66	1.3
348	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	38	156	22	66	1.2
A. Mean	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020	38	151	24	66	1.3
310	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	6	42	24	70	0.2
337	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	5	40	25	68	0.2
A. Mean	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670	6	41	25	69	0.2
322	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	15	134	23	71	1.3
354	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	14	137	17	68	1.5
A. Mean	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020	15	136	20	70	1.4

Appendix 14 Continued
Black Shale Outcrop Chip Samples - ICP (inductively coupled plasma - atomic emission spectrometry data)
Duplicates and Arithmetic Mean

Sample Number	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
314	20	34	156	0.25	2.5	209	0.38	0.066	0.63	0.42	9.56	2.39	16	2
340	18	35	157	0.50	2.5	208	0.31	0.066	0.63	0.41	9.69	2.38	16	2
A. Mean	19	35	157	0.38	2.5	209	0.35	0.066	0.63	0.42	9.63	2.39	16	2
306	20	45	168	0.25	2.5	194	0.67	0.063	0.59	0.41	10.04	2.39	12	2
350	18	46	168	0.25	2.5	191	0.68	0.064	0.58	0.41	9.47	2.35	12	2
A. Mean	19	46	168	0.25	2.5	193	0.68	0.064	0.59	0.41	9.76	2.37	12	2
313	26	44	236	0.25	2.5	222	0.91	0.084	0.71	0.40	9.33	2.32	12	2
326	25	42	216	0.60	2.5	204	0.72	0.077	0.66	0.38	8.18	2.17	11	2
A. Mean	26	43	226	0.43	2.5	213	0.82	0.081	0.69	0.39	8.76	2.25	12	2
316	58	564	436	4.40	2.5	318	24.06	0.103	0.28	0.15	3.38	1.62	28	1
325	56	536	421	4.00	2.5	305	23.24	0.099	0.27	0.14	3.24	1.54	26	1
A. Mean	57	550	429	4.20	2.5	312	23.65	0.101	0.28	0.15	3.31	1.58	27	1
296	75	94	175	1.40	2.5	594	5.56	0.072	0.56	0.41	10.47	1.65	25	2
335	74	85	167	1.20	2.5	588	5.27	0.070	0.55	0.39	9.47	1.59	23	2
A. Mean	75	90	171	1.30	2.5	591	5.42	0.071	0.56	0.40	9.97	1.62	24	2
293	24	89	126	0.25	2.5	190	0.29	0.069	0.63	0.39	9.35	2.28	13	2
327	26	90	132	0.50	2.5	194	0.26	0.070	0.65	0.41	9.26	2.27	14	2
A. Mean	25	90	129	0.38	2.5	192	0.28	0.070	0.64	0.40	9.31	2.28	14	2
294	21	41	114	0.25	2.5	695	0.66	0.098	0.58	0.31	6.90	3.01	18	2
328	20	42	115	0.50	2.5	719	0.66	0.099	0.61	0.32	7.02	3.01	18	2
A. Mean	21	42	115	0.38	2.5	707	0.66	0.099	0.60	0.32	6.96	3.01	18	2
297	44	97	134	0.25	2.5	364	2.72	0.127	0.87	0.37	8.40	2.03	34	2
336	42	89	128	0.25	2.5	357	2.52	0.121	0.86	0.37	7.45	1.91	31	2
A. Mean	43	93	131	0.25	2.5	361	2.62	0.124	0.87	0.37	7.93	1.97	33	2
308	12	41	68	0.25	2.5	258	0.35	0.143	0.57	0.38	7.65	4.76	13	1
338	9	38	67	0.25	2.5	256	0.34	0.144	0.56	0.37	8.09	4.74	13	1
A. Mean	11	40	68	0.25	2.5	257	0.35	0.144	0.57	0.38	7.87	4.75	13	1
318	93	412	414	23.10	2.5	766	21.43	0.087	0.30	0.17	4.02	1.43	26	1
331	89	391	396	22.50	2.5	727	20.42	0.084	0.28	0.17	3.61	1.35	25	1
A. Mean	91	402	405	22.80	2.5	747	20.93	0.086	0.29	0.17	3.82	1.39	26	1
309	154	585	299	32.00	2.5	826	15.37	0.119	0.44	0.19	4.48	1.59	32	2
330	145	534	296	31.10	2.5	798	15.13	0.147	0.43	0.18	4.39	1.52	35	1
A. Mean	150	560	298	31.55	2.5	812	15.25	0.133	0.44	0.19	4.44	1.56	34	2
307	36	63	96	1.00	2.5	905	0.48	0.104	0.52	0.37	6.91	2.89	24	2
348	34	58	105	0.80	2.5	938	0.47	0.104	0.54	0.39	7.60	3.07	29	2
A. Mean	35	61	101	0.90	2.5	922	0.48	0.104	0.53	0.38	7.26	2.98	27	2
310	27	64	139	0.25	2.5	447	0.47	0.144	0.68	0.39	9.06	2.31	12	2
337	28	60	138	0.25	2.5	430	0.44	0.139	0.66	0.38	8.85	2.20	13	2
A. Mean	28	62	139	0.25	2.5	439	0.46	0.142	0.67	0.39	8.96	2.26	13	2
322	26	77	65	0.50	2.5	627	0.31	0.204	0.56	0.36	6.58	3.15	28	1
354	23	70	63	0.80	6.0	613	0.28	0.196	0.53	0.35	6.30	3.19	29	1
A. Mean	25	74	64	0.65	4.3	620	0.30	0.200	0.55	0.36	6.44	3.17	29	1

Appendix 14 Continued
Black Shale Outcrop Chip Samples - ICP (inductively coupled plasma - atomic emission spectrometry data)
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation Code	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Detection Limit			Easting	Northing			2	1	4	1	0.4
311	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	132	102	17	75	0.9
339	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	120	95	20	72	0.4
A. Mean	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020	126	99	19	74	0.7
300	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	203	39	38	89	0.2
342	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	197	42	41	87	0.4
A. Mean	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020	200	41	40	88	0.3
305	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	75	169	22	180	1.9
344	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	71	166	26	172	2.4
A. Mean	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020	73	168	24	176	2.2
312	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	21	99	29	235	0.9
341	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	20	103	25	228	1.1
A. Mean	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020	21	101	27	232	1.0
315	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	4	57	23	197	0.2
349	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	4	55	23	187	0.5
A. Mean	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020	4	56	23	192	0.4
299	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	28	100	33	106	0.9
332	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	30	101	31	111	0.7
A. Mean	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020	29	101	32	109	0.8
303	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	4	59	27	147	0.4
324	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	4	58	23	145	0.2
A. Mean	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020	4	59	25	146	0.3
321	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	26	111	18	117	0.7
353	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	25	111	18	113	1.0
A. Mean	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020	26	111	18	115	0.9
301	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	6	37	63	124	0.2
346	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	6	40	58	127	0.5
A. Mean	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020	6	39	61	126	0.4
304	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	3	86	34	190	0.7
343	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	4	93	28	196	1.2
A. Mean	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020	4	90	31	193	1.0
317	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	24	85	25	120	0.2
329	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	24	81	22	122	0.2
A. Mean	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020	24	83	24	121	0.2
319	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	42	119	23	87	0.7
351	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	41	123	26	87	1.4
A. Mean	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020	42	121	25	87	1.1
302	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	6	82	20	169	0.9
347	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	6	84	18	167	1.4
A. Mean	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020	6	83	19	168	1.2
320	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	6	55	30	167	0.5
352	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	5	54	31	162	0.9
A. Mean	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020	6	55	31	165	0.7
295	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	5	40	25	62	0.2
333	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	5	39	27	63	0.4
A. Mean	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670	5	40	26	63	0.3
88-80-96		13-09-13-03E1	628375	5550200	Gunn	73530	1	5	3	12	0.6
88-82-96		13-09-13-03E1	628375	5550200	Gunn	73530	1	3	3	13	0.2

Appendix 14 Continued
Black Shale Outcrop Chip Samples - ICP (inductively coupled plasma - atomic emission spectrometry data)
Duplicates and Arithmetic Mean

Sample Number	Ni ppm	Mn ppm	Sr ppm	Cd ppm	Bi ppm	V ppm	Ca %	P %	Mg %	Ti %	Al %	K %	Y ppm	Be ppm
Detection Limit	1	1	1	0.50	5.0	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
311	23	73	276	0.25	2.5	343	0.43	0.189	0.57	0.37	7.32	4.12	13	1
339	20	78	253	0.25	2.5	324	0.42	0.177	0.55	0.35	7.11	3.82	13	1
A. Mean	22	76	265	0.25	2.5	334	0.43	0.183	0.56	0.36	7.22	3.97	13	1
300	14	94	120	0.50	2.5	254	0.96	0.081	1.53	0.32	9.08	1.21	22	1
342	12	99	116	0.50	2.5	255	1.01	0.081	1.53	0.32	8.79	1.19	24	1
A. Mean	13	97	118	0.50	2.5	255	0.99	0.081	1.53	0.32	8.94	1.20	23	1
305	26	70	230	0.25	2.5	755	0.66	0.126	0.93	0.35	8.46	3.12	14	1
344	24	68	216	0.25	2.5	741	0.64	0.120	0.90	0.34	7.74	3.01	14	1
A. Mean	25	69	223	0.25	2.5	748	0.65	0.123	0.92	0.35	8.10	3.07	14	1
312	22	78	110	1.60	2.5	532	0.94	0.184	0.81	0.35	7.43	2.15	24	1
341	18	79	110	1.40	2.5	513	0.91	0.181	0.77	0.33	7.13	2.15	25	1
A. Mean	20	79	110	1.50	2.5	523	0.93	0.183	0.79	0.34	7.28	2.15	25	1
315	21	111	149	1.20	2.5	383	1.01	0.147	1.01	0.37	8.63	2.52	22	2
349	19	107	141	0.60	2.5	364	0.92	0.141	0.94	0.34	7.63	2.41	24	2
A. Mean	20	109	145	0.90	2.5	374	0.97	0.144	0.98	0.36	8.13	2.47	23	2
299	19	64	136	0.70	2.5	490	0.85	0.259	0.63	0.32	7.12	3.56	32	1
332	19	64	143	0.80	2.5	499	1.09	0.263	0.65	0.34	7.42	3.58	32	1
A. Mean	19	64	140	0.75	2.5	495	0.97	0.261	0.64	0.33	7.27	3.57	32	1
303	19	84	124	0.80	2.5	268	0.36	0.115	1.38	0.34	9.33	1.97	28	2
324	17	78	126	0.60	2.5	264	0.36	0.113	1.36	0.34	8.96	1.93	29	2
A. Mean	18	81	125	0.70	2.5	266	0.36	0.114	1.37	0.34	9.15	1.95	29	2
321	23	60	58	0.60	2.5	389	0.37	0.060	0.79	0.38	8.14	3.47	19	2
353	22	51	58	0.25	2.5	379	0.35	0.057	0.75	0.37	8.00	3.49	20	1
A. Mean	23	56	58	0.43	2.5	384	0.36	0.059	0.77	0.38	8.07	3.48	20	2
301	16	71	69	0.70	2.5	221	1.15	0.050	1.43	0.35	8.96	1.29	19	1
346	17	80	69	1.00	2.5	231	1.31	0.052	1.48	0.37	9.10	1.34	22	1
A. Mean	17	76	69	0.85	2.5	226	1.23	0.051	1.46	0.36	9.03	1.32	21	1
304	19	56	82	0.25	2.5	316	0.31	0.077	0.61	0.37	8.75	4.33	14	2
343	18	57	85	0.50	6.0	332	0.29	0.080	0.63	0.39	9.00	4.71	14	2
A. Mean	19	57	84	0.38	4.3	324	0.30	0.079	0.62	0.38	8.88	4.52	14	2
317	19	66	69	0.50	2.5	485	0.37	0.228	0.74	0.37	8.18	3.78	43	2
329	18	64	68	0.70	2.5	466	0.36	0.220	0.71	0.36	7.60	3.62	44	2
A. Mean	19	65	69	0.60	2.5	476	0.37	0.224	0.73	0.37	7.89	3.70	44	2
319	15	56	217	0.25	2.5	457	1.74	0.154	0.62	0.30	6.85	3.53	31	1
351	17	58	231	0.25	2.5	457	1.78	0.154	0.61	0.30	7.03	3.64	35	1
A. Mean	16	57	224	0.25	2.5	457	1.76	0.154	0.62	0.30	6.94	3.59	33	1
302	23	75	75	0.25	2.5	269	0.47	0.046	1.29	0.36	8.74	1.80	23	1
347	20	78	80	0.60	2.5	271	0.49	0.048	1.29	0.36	8.67	1.84	28	1
A. Mean	22	77	78	0.43	2.5	270	0.48	0.047	1.29	0.36	8.71	1.82	26	1
320	18	81	179	0.70	2.5	244	0.44	0.080	1.47	0.38	8.88	1.76	28	1
352	19	81	179	0.60	2.5	237	0.43	0.078	1.40	0.37	8.90	1.78	32	1
A. Mean	19	81	179	0.65	2.5	241	0.44	0.079	1.44	0.38	8.89	1.77	30	1
295	21	38	100	0.25	2.5	194	0.22	0.053	0.55	0.42	9.61	2.23	14	2
333	20	40	98	0.25	2.5	194	0.22	0.057	0.56	0.42	9.30	2.17	13	2
A. Mean	21	39	99	0.25	2.5	194	0.22	0.055	0.56	0.42	9.46	2.20	14	2
	6	288	141	13.70	8.0	18	32.88	0.028	3.13	0.07	1.49	1.04	10	1
	5	265	114	0.25	2.5	22	30.26	0.019	4.11	0.08	1.77	1.23	10	

Appendix 15
Black Shale Outcrop Chip Samples - Ultra Trace ICP Data
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation Code
Detection Limit			Easting	Northing		
314	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670
340	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670
A. Mean	99-96-BR-1-1	12-01-05-07W1	551150	5467900	Morden	5670
306	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670
350	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670
A. Mean	99-96-BR-1-2-1	08-02-05-07W1	551100	5467600	Morden	5670
313	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670
326	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670
A. Mean	99-96-BR-1-2-2	08-02-05-07W1	551100	5467600	Morden	5670
316	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050
325	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050
A. Mean	99-96-BR-1-3-1	16-02-06-08W1	540850	5478400	Niobrara	3050
296	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050
335	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050
A. Mean	99-96-BR-15-2-3	13-11-06-08W1	539800	5479900	Niobrara	3050
293	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670
327	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670
A. Mean	99-96-BR-19-2	04-06-03-05W1	563250	5447450	Morden	5670
294	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020
328	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020
A. Mean	99-96-BR-20-1-4	13-11-06-08W1	539650	5479800	Pembina	3020
297	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050
336	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050
A. Mean	99-96-BR-22-1-1	01-14-06-08W1	541150	5480200	Niobrara	3050
308	99-96-BR-2-2-2	15-13-04-07W1	554000	5456800	Pembina	3020
338	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020
A. Mean	99-96-BR-2-2-2	15-13-04-07W1	552300	5461850	Pembina	3020
318	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020
331	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020
A. Mean	99-96-BR-2-3-2	11-24-04-07W1	551900	5463150	Pembina	3020
309	99-96-BR-3-10-3	15-31-03-06W1	552300	5461850	Pembina	3020
330	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020
A. Mean	99-96-BR-3-10-3	15-31-03-06W1	554000	5456800	Pembina	3020
307	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020
348	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020
A. Mean	99-96-BR-3-10-4	15-31-03-06W1	554000	5456800	Pembina	3020
310	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670
337	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670
A. Mean	99-96-BR-3-2	16-03-05-07W1	549300	5468550	Morden	5670
322	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020
354	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020
A. Mean	99-96-BR-3-7-3	10-16-05-07W1	547250	5471300	Pembina	3020
311	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020
339	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020
A. Mean	99-96-BR-3-7-5	10-16-05-07W1	547250	5471300	Pembina	3020

Appendix 15 Continued
Black Shale Outcrop Chip Samples - Ultra Trace ICP Data
Duplicates and Arithmetic Mean

Sample Number	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit	0.20	0.2	0.2	0.10	0.2	10	0.2	0.5	0.2	1
314	0.18	9.0	0.4	0.05	31.6	50	3.0	19.0	0.2	34
340	0.20	9.0	0.4	0.05	31.2	40	3.4	19.0	0.6	33
A. Mean	0.19	9.0	0.4	0.05	31.4	45	3.2	19.0	0.4	34
306	0.20	8.2	0.2	0.05	36.6	60	8.4	19.0	0.6	36
350	0.20	8.2	0.4	0.05	35.6	60	7.8	20.0	0.4	38
A. Mean	0.20	8.2	0.3	0.05	36.1	60	8.1	19.5	0.5	37
313	0.26	10.8	0.2	0.10	28.6	50	8.2	17.5	0.8	33
326	0.28	11.0	0.2	0.20	30.0	60	8.8	17.5	1.0	33
A. Mean	0.27	10.9	0.2	0.15	29.3	55	8.5	17.5	0.9	33
316	0.50	11.4	0.6	4.40	73.8	100	9.0	8.0	3.6	128
325	0.50	11.8	0.2	4.60	73.8	80	9.0	8.0	3.6	144
A. Mean	0.50	11.6	0.4	4.50	73.8	90	9.0	8.0	3.6	136
296	0.20	21.4	0.6	1.30	91.0	140	7.4	15.5	5.2	103
335	0.20	19.8	0.4	1.30	87.8	150	6.8	15.5	5.0	101
A. Mean	0.20	20.6	0.5	1.30	89.4	145	7.1	15.5	5.1	102
293	0.14	6.6	0.2	0.05	28.0	40	1.6	19.0	0.2	62
327	0.14	8.0	0.1	0.05	28.2	60	1.6	19.0	0.2	62
A. Mean	0.14	7.3	0.2	0.05	28.1	50	1.6	19.0	0.2	62
294	0.60	70.6	0.6	0.10	136.5	260	16.2	19.0	8.4	26
328	0.60	69.8	0.8	0.05	132.0	260	16.2	20.0	7.8	24
A. Mean	0.60	70.2	0.7	0.08	134.3	260	16.2	19.5	8.1	25
297	0.16	17.8	0.6	0.10	58.8	120	3.6	18.5	2.2	77
336	0.16	16.4	0.8	0.10	57.6	110	3.4	18.0	2.2	71
A. Mean	0.16	17.1	0.7	0.10	58.2	115	3.5	18.3	2.2	74
308	0.64	20.6	0.4	0.10	57.6	140	6.0	12.0	2.2	32
338	0.62	18.8	0.6	0.05	53.0	160	5.4	11.0	2.0	31
A. Mean	0.63	19.7	0.5	0.08	55.3	150	5.7	11.5	2.1	32
318	0.92	12.4	0.8	25.20	96.6	100	17.2	11.5	6.8	265
331	0.92	13.2	0.2	24.50	92.0	100	17.2	11.5	6.8	255
A. Mean	0.92	12.8	0.5	24.85	94.3	100	17.2	11.5	6.8	260
309	1.02	42.8	0.8	35.30	130.0	140	49.8	12.0	11.8	259
330	1.02	46.0	0.6	34.60	131.0	120	49.4	12.5	11.8	234
A. Mean	1.02	44.4	0.7	34.95	130.5	130	49.6	12.3	11.8	247
307	1.46	123.0	0.6	0.80	137.0	230	35.0	13.0	14.2	38
348	1.38	112.0	0.6	0.60	129.0	230	33.6	13.5	13.6	38
A. Mean	1.42	117.5	0.6	0.70	133.0	230	34.3	13.3	13.9	38
310	0.18	12.6	0.2	0.20	37.0	100	5.8	16.0	1.4	38
337	0.18	12.0	0.4	0.05	36.8	110	5.4	16.5	1.4	36
A. Mean	0.18	12.3	0.3	0.13	36.9	105	5.6	16.3	1.4	37
322	1.64	87.0	0.2	0.10	128.0	220	13.2	16.0	7.6	40
354	1.68	90.6	0.4	0.20	129.5	240	13.8	16.5	7.6	40
A. Mean	1.66	88.8	0.3	0.15	128.8	230	13.5	16.3	7.6	40
311	0.86	47.2	0.6	0.30	90.0	100	113.0	13.5	3.0	46
339	0.82	47.6	0.6	0.10	88.2	110	117.0	13.0	3.0	44
A. Mean	0.84	47.4	0.6	0.20	89.1	105	115.0	13.3	3.0	45

Appendix 15 Continued
Black Shale Outcrop Chip Samples - Ultra Trace ICP Data
Duplicates and Arithmetic Mean

Sample Number	Well Name	Location	Utm		Formation	Formation Code
			Easting	Northing		
Detection Limit						
300	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020
342	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020
A. Mean	99-96-BR-3-7-7	10-16-05-07W1	547250	5471300	Pembina	3020
305	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020
344	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020
A. Mean	99-96-BR-3-7-9	10-16-05-07W1	547250	5471300	Pembina	3020
312	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020
341	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020
A. Mean	99-96-BR-4-6-1	13-19-07-10W1	512800	5492800	Pembina	3020
315	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020
349	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020
A. Mean	99-96-BR-4-6-3	13-19-07-10W1	512800	5492800	Pembina	3020
299	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020
332	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-1	15-31-03-06W1	554100	5456950	Pembina	3020
303	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020
324	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-11	15-31-03-06W1	554100	5456950	Pembina	3020
321	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020
353	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-13	15-31-03-06W1	554100	5456950	Pembina	3020
301	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020
346	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-15	15-31-03-06W1	554100	5456950	Pembina	3020
304	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020
343	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-17	15-31-03-06W1	554100	5456950	Pembina	3020
317	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020
329	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-3	15-31-03-06W1	554100	5456950	Pembina	3020
319	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020
351	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-5	15-31-03-06W1	554100	5456950	Pembina	3020
302	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020
347	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-7	15-31-03-06W1	554100	5456950	Pembina	3020
320	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020
352	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020
A. Mean	99-96-BR-5-1-9	15-31-03-06W1	554100	5456950	Pembina	3020
295	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670
333	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670
A. Mean	99-96-BR-7-5	16-33-03-06W1	668960	6568260	Morden	5670
88-80-96		13-09-13-03E1	628375	5550200	Gunn	73530
88-82-96		13-09-13-03E1	628375	5550200	Gunn	73530

Appendix 15 Continued
Black Shale Outcrop Chip Samples - Ultra Trace ICP Data
Duplicates and Arithmetic Mean

Sample Number	Ag ppm	As ppm	Bi ppm	Cd ppm	Cu ppm	Hg ppb	Mo ppm	Pb ppm	Sb ppm	Zn ppm
Detection Limit	0.20	0.2	0.2	0.10	0.2	10	0.2	0.5	0.2	1
300	0.04	91.0	0.8	0.10	36.8	80	216.0	32.0	3.6	63
342	0.06	89.6	0.6	0.05	37.2	90	211.0	32.0	3.6	61
A. Mean	0.05	90.3	0.7	0.08	37.0	85	213.5	32.0	3.6	62
305	2.40	68.6	0.2	0.30	156.5	240	69.2	20.0	13.0	129
344	2.26	65.6	0.6	0.05	149.0	290	67.6	19.0	12.4	123
A. Mean	2.33	67.1	0.4	0.18	152.8	265	68.4	19.5	12.7	126
312	1.24	28.2	0.6	1.50	102.0	150	22.6	23.5	6.8	171
341	1.06	25.4	0.6	1.30	86.0	140	20.6	21.5	5.8	158
A. Mean	1.15	26.8	0.6	1.40	94.0	145	21.6	22.5	6.3	165
315	0.16	17.0	0.6	0.60	49.2	100	4.2	20.0	5.2	125
349	0.18	17.8	0.6	0.50	47.6	110	4.4	21.0	5.2	123
A. Mean	0.17	17.4	0.6	0.55	48.4	105	4.3	20.5	5.2	124
299	1.10	39.8	0.2	0.50	96.4	150	18.2	26.5	6.8	79
332	1.00	38.4	0.2	0.50	89.2	150	27.4	24.5	6.4	68
A. Mean	1.05	39.1	0.2	0.50	92.8	150	22.8	25.5	6.6	74
303	0.34	11.2	0.6	0.50	74.2	90	4.0	21.5	1.6	105
324	0.34	12.6	0.6	0.40	52.2	130	3.8	19.0	1.4	101
A. Mean	0.34	11.9	0.6	0.45	63.2	110	3.9	20.3	1.5	103
321	1.06	21.0	0.2	0.30	106.5	200	24.0	15.0	5.2	75
353	1.12	22.6	0.8	0.30	109.5	220	24.6	17.5	5.4	75
A. Mean	1.09	21.8	0.5	0.30	108.0	210	24.3	16.3	5.3	75
301	0.38	18.2	0.6	0.50	36.6	90	8.4	59.0	2.4	93
346	0.36	16.6	0.2	0.40	34.8	100	6.6	55.0	2.2	91
A. Mean	0.37	17.4	0.4	0.45	35.7	95	7.5	57.0	2.3	92
304	1.12	15.8	0.4	0.40	81.4	120	3.4	25.5	1.6	144
343	1.10	15.4	0.8	0.40	78.4	110	3.8	25.5	1.6	143
A. Mean	1.11	15.6	0.6	0.40	79.9	115	3.6	25.5	1.6	144
317	0.50	38.8	0.6	0.40	79.2	150	22.6	19.0	5.6	85
329	0.48	37.8	0.4	0.40	76.2	140	22.0	19.0	5.6	81
A. Mean	0.49	38.3	0.5	0.40	77.7	145	22.3	19.0	5.6	83
319	0.86	44.2	0.8	0.40	111.5	220	41.6	18.0	8.6	58
351	0.82	42.8	0.8	0.30	106.0	240	40.0	17.0	8.2	54
A. Mean	0.84	43.5	0.8	0.35	108.8	230	40.8	17.5	8.4	56
302	1.32	13.6	0.6	0.40	79.4	120	6.2	14.0	2.2	130
347	1.28	14.2	0.4	0.40	81.4	120	5.8	15.5	1.8	124
A. Mean	1.30	13.9	0.5	0.40	80.4	120	6.0	14.8	2.0	127
320	0.58	18.0	0.6	0.40	49.4	100	5.8	28.0	1.6	122
352	0.58	18.2	0.6	0.40	49.6	150	5.8	28.5	1.6	123
A. Mean	0.58	18.1	0.6	0.40	49.5	125	5.8	28.3	1.6	123
295	0.20	10.8	0.6	0.05	33.8	40	5.8	17.5	1.0	26
333	0.20	11.4	0.2	0.05	32.6	70	5.6	17.5	0.8	25
A. Mean	0.20	11.1	0.4	0.05	33.2	55	5.7	17.5	0.9	26
	0.02	0.8	0.1	0.1	2.2	30	0.2	1.5	0.1	11
	0.01	0.4	0.2	0.1	2.0	10	0.2	2.5	0.1	12

Appendix 16
Neutron Activation Standards

Element	Au	Ag	As	Ba	Br	Ca	Co	Cr	Cs	Fe	Hf	Hg
Units	ppb	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
Detection Limit	2	5.0	1	50	1	1	1	5	1.0	0.01	1	1.0
LKSD-2	5	2.5	15	850	17	2.0	20	70	4.0	4.80	9	0.5
LKSD-2	1	2.5	12	910	19	0.5	18	63	4.0	4.85	7	0.5
LKSD-2	1	2.5	12	820	19	0.5	19	57	5.0	4.60	8	0.5
LKSD-2	1	2.5	14	790	21	0.5	21	64	4.0	4.75	10	0.5
LKSD-2	1	2.5	12	660	19	0.5	19	57	4.0	4.23	8	0.5
Provisional												
Values (Lynch, 1990)	3 (2)	0.8 (0.06)	11 (1)	780 (75)	18 (2)	1.6	17 (1)	57 (8)	3 (0.6)	4.3 (0.2)	7 (1)	160 (19)*
LKSD-4	1	2.5	27	230	52	0.5	13	38	0.5	3.30	5	0.5
LKSD-4	4	2.5	17	370	55	4.0	13	43	4.0	3.24	4	0.5
LKSD-4	3	2.5	18	460	64	0.5	64	31	2.0	3.47	3	0.5
LKSD-4	1	2.5	16	390	65	0.5	65	41	2.0	3.60	3	0.5
Provisional												
Values (Lynch, 1990)	2 (2)	<0.5	16 (1)	330 (55)	49 (6)	1.3	11 (1)	33 (6)	1.7 (0.6)	2.8 (0.2)	2.8 (0.5)	190 (17)*

Element	Ir	Mo	Na	Ni	Rb	Sb	Sc	Se	Sn	Sr	Ta	Th
Units	ppb	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	5	1.0	0.01	20.0	15.0	0.1	0.1	3.0	100	500	0.50	0.2
LKSD-2	2.5	0.5	1.55	400.0	88.0	1.1	14.0	1.5	50	250	0.25	14.0
LKSD-2	2.5	0.5	1.63	24.5	100.0	1.2	15.0	1.5	50	250	0.25	13.0
LKSD-2	2.5	0.5	1.57	23.0	74.0	1.2	15.0	1.5	50	250	0.25	14.0
LKSD-2	2.5	0.5	1.50	10.0	100.0	1.3	14.0	1.5	50	250	0.25	15.0
LKSD-2	2.5	5.0	1.34	10.0	60.0	1.5	12.0	1.5	50	250	0.25	13.0
Provisional												
Values (Lynch, 1990)	NA	<5	1.4	26 (4)	85 (10)	1.1 (0.1)	13 (2)	NA	5 (2)	220 (41)	0.8 (0.08)	13.4 (1)
LKSD-4	2.5	0.5	0.61	21.5	7.5	2.1	8.2	1.5	50	250	0.25	5.2
LKSD-4	2.5	0.5	0.64	20.5	7.5	2.2	8.6	1.5	50	250	0.25	5.7
LKSD-4	2.5	0.5	0.69	10.0	38.0	2.0	7.7	1.5	50	250	0.25	6.4
LKSD-4	2.5	28.0	0.67	94.0	31.0	2.0	7.7	1.5	50	250	0.25	6.6
Provisional												
Values (Lynch, 1990)	NA	<5	0.5	31 (5)	28 (10)	1.7 (.1)	7 (1)	NA	5 (1)	110 (38)	0.4 (0.04)	5.1 (0.7)

Analytical data for INAA of standards LKSD-2 and LKSD-4.

Values for standards are provisional and based on total contents as reported in Lynch (1990).

Bracketed figure represents the standard deviation.

An asterisk indicates the analysis is based upon a concentrated HNO₃-HCl partial dissolution.

NA-not available.

Appendix 16 Continued
Neutron Activation Standards

Element	U	W	Zn	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	0.5	1	50	0.5	3	5	0.1	0.2	0.50	0.2	0.05
LKSD-2	8.0	0.5	210	81.0	140	62	13.0	2.4	2.50	5.9	0.79
LKSD-2	7.7	0.5	200	77.0	110	53	11.0	1.8	0.25	4.8	0.68
LKSD-2	7.2	2	200	76.0	110	57	11.0	1.9	1.80	4.8	0.70
LKSD-2	9.6	0.5	260	76.0	140	66	10.0	2.2	1.80	4.8	0.73
LKSD-2	8.1	0.5	230	67.0	130	61	9.5	1.9	1.50	4.6	0.65
Provisional											
Values (Lynch, 1990)	7.6 (0.9)	<4	209 (18)	68 (6)	108 (12)	58 (4.6)	11 (1.1)	1.9 (0.2)	1.4 (0.2)	4 (0.5)	0.6 (0.1)
LKSD-4	35.0	0.5	170	31.0	65	41	5.7	1.1	0.25	2.6	0.39
LKSD-4	32.0	0.5	220	30.0	53	25	5.1	1.1	0.80	2.5	0.38
LKSD-4	47.0	0.5	270	34.0	56	26	4.9	1.4	0.90	2.9	0.52
LKSD-4	42.0	0.5	296	35.0	52	27	4.9	1.5	0.25	2.9	0.52
Provisional											
Values (Lynch, 1990)	31 (1.8)	<4	194 (19)	26 (2)	48 (6)	25 (2.4)	5 (0.9)	1.1 (0.3)	1.2 (0.7)	2 (0.2)	0.5 (0.1)

Analytical data for INAA of standards LKSD-2 and LKSD-4.

Values for standards are provisional and based on total contents as reported in Lynch (1990).

Bracketed figure represents the standard deviation.

An asterisk indicates the analysis is based upon a concentrated HNO₃-HCl partial dissolution.

NA-not available.

Appendix 17
ICP Standards

Element	Mo	Cu	Pb	Zn	Ag	Ni	Mn	Sr	Cd	Bi
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit	2	1	4	1	0.4	1	1	1	0.5	5.0
LKSD-2	1	37	53	233	0.6	29	1864	232	1.0	2.5
LKSD-2	1	36	47	227	0.5	28	1865	233	1.3	2.5
LKSD-2	1	42	47	244	1.1	29	1945	242	0.9	2.5
LKSD-2	2	38	55	209	1.0	26	1908	227	0.9	2.5
LKSD-2	1	39	50	206	1.1	27	2010	241	0.7	2.5
Provisional										
Values (Lynch, 1990)	<5	37 (4)	44 (4)	209 (18)	0.8 (0.06)	26 (4)	2020 (100)	220 (41)	0.8 (0.2)*	NA
LKSD-4	1	29	101	196	0.2	35	459	122	2.0	2.5
LKSD-4	1	30	102	198	0.2	34	454	124	1.9	2.5
LKSD-4	2	30	100	181	0.2	32	474	123	2.3	2.5
LKSD-4	2	32	101	186	0.5	33	490	124	1.8	2.5
Provisional										
Values (Lynch, 1990)	<5	31 (4)	91 (6)	194 (19)	<0.5	31 (5)	500 (30)	110 (38)	1.9 (0.5)*	NA

Element	V	Ca	P	Mg	Ti	Al	K	Y	Be
Units	ppm	%	%	%	%	%	%	ppm	ppm
Detection Limit	2	0.01	0.001	0.01	0.01	0.01	0.01	2	2
LKSD-2	72	1.97	0.127	1.03	0.28	6.13	2.06	42	1
LKSD-2	72	1.96	0.126	1.05	0.28	6.05	1.98	40	1
LKSD-2	76	1.98	0.132	1.06	0.30	6.38	2.16	46	2
LKSD-2	70	2.00	0.136	1.04	0.27	6.25	2.12	44	1
LKSD-2	77	2.08	0.142	1.12	0.28	6.83	2.23	46	1
Provisional									
Values (Lynch, 1990)	77 (8)	1.60	0.130	1.02	0.30	6.50	2.10	44 (7)	2.5 (0.6)
LKSD-4	44	1.55	0.139	0.52	0.16	2.57	0.59	22	1
LKSD-4	44	1.57	0.141	0.53	0.16	2.59	0.59	22	1
LKSD-4	44	1.58	0.155	0.55	0.16	2.59	0.65	24	1
LKSD-4	44	1.58	0.154	0.56	0.16	2.64	0.66	24	1
Provisional									
Values (Lynch, 1990)	49 (8)	1.30	0.130	0.54	0.30	3.10	0.60	23 (10)	1 (0.3)

Analytical data for ICP-AES analysis of standards LKSD-2 and LKSD-4.

Values for standards are provisional and based on total contents as reported in Lynch (1990).

Bracketed figure represents the standard deviation.

An asterick indicates the analysis is based upon a concentrated HNO₃-HCl partial dissolution.

NA-not available.

Appendix 18
Ultra Trace ICP Standards

ELEMENT	Ag	As	Bi	Cd	Cu	Hg	Mo	Pb	Sb	Zn
UNITS	ppm	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppm
Detection Limit	0.20	0.2	0.2	0.1	0.2	10.0	0.2	0.5	0.2	1
LKSD-2	0.88	8.0	1.0	0.8	33.2	180.0	1.2	38.5	0.1	174
LKSD-2	0.90	8.4	1.2	0.8	34.0	180.0	1.2	38.0	0.1	178
LKSD-2	0.88	9.0	1.4	0.8	33.8	210.0	1.4	38.5	0.1	174
LKSD-2	0.88	5.4	1.4	0.9	35.6	160.0	1.2	39.5	0.1	151
LKSD-2	0.92	9.2	1.6	0.9	36.8	180.0	1.4	40.5	0.1	171
Provisional										
Values (Lynch, 1990)	0.8 (0.06)	11 (1)	NA	0.8 (0.2)*	37 (4)	160 (19)*	2 (0.7)*	44 (4)	1.1 (0.1)	209 (18)
LKSD-4	0.28	9.6	0.2	1.9	28.0	160.0	1.6	91.0	0.8	156
LKSD-4	0.26	9.8	0.6	1.9	27.2	200.0	1.6	88.5	0.8	139
LKSD-4	0.28	9.4	1.0	2.3	29.2	190.0	2.2	87.5	1.2	84
Provisional										
Values (Lynch, 1990)	<0.5	16 (1)	NA	1.9 (0.5)*	31 (4)	190 (17)*	2 (0.6)*	91 (6)	1.7 (0.1)	194 (19)

Analytical data for UT-10 ICP-AES analysis of standards LKSD-2 and LKSD-4.

Values for standards are provisional and based on total contents as reported in Lynch (1990).

Bracketed figure represents the standard deviation.

An asterick indicates the analysis is based upon a concentrated HNO₃-HCl partial dissolution.

NA-not available.

Appendix 19
Miscellaneous Files
Formation Codes

NAME	CODE #	NAME	CODE #
Cenozoic	100	Lower Amaranth (Red Beds) Member	22670
Quaternary	200	upper shaly unit	22680
Recent	201	upper sandstone unit	22690
Pleistocene	300	base of upper sandstone unit	22700
Glacial Drift	310	lower sandy unit	22710
Base of Drift	320	'B' sand	22720
Tertiary	400	base of 'B' sand	22730
Turtle Mountain Formation	410	'A' sand	22740
Peace Garden Member	420	base of 'A' sand	22750
Goodlands Member	430	main sand	22760
Mesozoic	2000	base of main sand	22770
Cretaceous	2010	lower sand	22780
Cretaceous (Undifferentiated)	2011	base of lower sand	22790
Boissevain Formation	2070	Triassic	25000
Pierre Shale	2080	St. Martin Complex	25100
Coulter Member	2090	Paleozoic	30000
Odanah Member	3000	Permian	30200
Millwood Member	3010	Pennsylvanian	32000
Pembina Member	3020	Dando Evaporite	33840
Gammon Ferruginous Member	3030	base of Dando Evaporite	33850
Niobrara Unconformity	3049	MC-3a	33860
Niobrara Formation	3050	Mississippian	35000
upper chalky member	3060	Mississippian (Undifferentiated)	35010
lower calcareous shale member	3070	alteration zone	35020
Morden Unconformity	5669	base of alteration zone	35030
Morden Shale	5670	Madison Group	35430
Favel Unconformity	5759	Charles Formation	36010
Favel Formation	5760	Mission Canyon Formation	37600
Assiniboine Member	5770	Mission Canyon (Undifferentiated)	37610
Marco Calcarenite	5780	MC-3 Member	38800
base of Marco Calcarenite	5790	MC-3 Member (undifferentiated)	38810
Keld Member	5800	MC-3b	38820
Laurier Limestone Beds	5890	MC-3 Marker	38830
base of Laurier Limestone Beds	5900	MC-2 Member	39100
Mytiloides labiatus beds	5910	MC-2 Member (undifferentiated)	39110
base of Mytiloides labiatus beds	5920	upper MC-2	39120
Ashville Formation	7950	MC-2 Marker	39130
upper Ashville Formation	7960	lower MC-2	39140
Belle Fourche Shale Member	7970	MC-1 Member	39300
Base of Fish Scale Marker	7980	Lodgepole Formation (undifferentiated)	39700
lower Ashville Formation	7990	Upper Lodgepole (Unnamed)	39710
Westgate Member	8000	Flossie Lake Member	39715
Newcastle Sandstone Member	8010	Whitewater Lake Member	39750
Skull Creek Shale Member	8020	Upper Whitewater Lake	39755
Swan River Formation	9315	Lower Lodgepole	39757
Jurassic	20500	Lower Whitewater Lake	39760
Jurassic (Undifferentiated)	20501	Viriden Member	39800
Waskada Formation	20506	Upper Viriden (Crinoidal)	39805
Melita Formation	20510	Lower Viriden (Oolite)	39810
upper Melita Formation	20520	Sandhill	39815
lower Melita Formation	20530	First Oolite	39820
Reston Formation	22640	Second Oolite	39825
Amaranth Formation	22650	Third Oolite	39830
Upper Amaranth (Evaporite) Member	22655	Fourth Oolite	39840

Appendix 19 Continued
Miscellaneous Files
Formation Codes

NAME	CODE #	NAME	CODE #
Scallion Member (Cherty)	39850	Silurian71000
Routledge Shale Facies	39900	Silurian (Undifferentiated)71010
Daly Member	39910	Interlake Group71100
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Middle Daly (First Crinoidal)	39930	Chemahawin Member71120
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Devonian	50000	Ordovician (Undifferentiated)73010
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