

**GEL COAL GAS ORIENTATION SURVEY,
In The
Moose River Basin Area, Ontario, CANADA**

Study For:

**James Bay Energy Inc.
170 Downay West, Ste 301
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Prepared by
ChemTerra International Consultants Ltd.
CALGARY

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Confidential



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EXECUTIVE SUMMARY

In this study the GEL surface prospecting gas technique was applied in an orientation survey to test and identify potential CBM areas for future CBM production.

The concept of this study is based on three facts:

- the Cretaceous low-rank coal seams have gas, preferably Methane (95%);
- the coal is in a shallow depth position;
- the coal has a portion of free gas, that could provide a seep signal at the surface from vertical, short distance gas migration.

The 3 test areas were selected based on known geological information, Kipling, Sanborn and McBrien Townships (Twps.) with 145 near-surface gas samples collected at these sites. Based on numerical data processing with the aim to recognize and reconstruct distinct gas families, a prominent Methane seep gas is identified.

Samples with elevated Methane seepage are in particular recognized in the Sanborn Twp. test area (Figure 4). Seepage is also recognized in samples further West in the McBrien Twp. (Figure 4). Both these test areas are in the coal basin.

The test area outside the coal basin, Kipling Twp, does not exhibit these seep rates. From these results it is concluded that the GEL surface exploration technique has potential to guide further exploration work by delineating favourable CBM trends.

However, these results are preliminary and limited in scale, and further work is recommended to demonstrate the degree of relation of these GEL surface features to productive or sweet-spot CBM areas. Since GEL records a surface seep signal, no depth target identification is possible, and a proposed or anticipated relation of the GEL anomalies with CBM potential is based on ruling out other methane sources at depth that could be present. Furthermore, GEL data interpretation relies on vertical gas migration, which is usually prominent, but not exclusive. Lateral gas migration towards to basin edge cannot be ruled out.

Therefore, CTI recommends conducting further survey data combined with more in-depth geologic data control to further evaluate and eventually confirm these encouraging test results.

Introduction and Scope of Study

This surface geochemical program using the *GEL* technique was conducted for James Bay Energy to investigate and test for Coal Bed Methane exploration sweet-spots. The main purpose of this program is the guidance from surface gas seep data for more detailed follow-up work in the attempt to further evaluate the Coal Bed Methane potential of shallow Cretaceous lignite deposits in the Moose River Basin, 400km north of the famous Sudbury mining area.

In this coal gas orientation study we apply CTI's in-house *GEL* technology, described in detailed in www.chemterra.com (update December 2003). The *GEL*-procedure is a surface gas technology highly sensitive to gas seepage because it allows for the discrimination and elimination of noise hydrocarbon (HC) common and ubiquitous in surface soils and sediments.

In this study, three survey areas of limited extent were selected to test possible gas seepage patterns in this coal basin (Figure 1): the areas are Sanborn Township (Twp.), and the McBrien Twp. These areas are within the limits of the coal basin, along or near the basin edge. The Southern, Kipling Twp area with sample # KLO-0 to KLO- 9 is outside the coal basin.

Coal Target

Detailed information on the type and property of coal is found in several reports (Atoka, 2003; Connolly and Ellsworth, 2003; Perry and Ryan, 2002, with only some key properties are reported here:

The coal in the work area occurs in four seams of about 2-9 feet thickness each with a combined average thickness of about 16 feet. Its depth is between around 200-400' depth. It has been described as soft to firm, of dull black color, variable ash contents about 2-50%, pretty consistent moisture content around 40-50%, Fixed Carbon around 30-50% and Volatile Matter around 45-60%.

All these descriptions and data clearly point to a lignite coalification stage, although occasionally a subbituminous stage is reported. In our opinion, the coal is clearly lignite stage, corresponding to a Vitrinite Reflectance (VR %) of 0.3-0.4%.

Thus, the coal appears to be in the low rank, well below coalification stages of major thermal gas generation.

It is speculated that the coal seams thicken and deepen in certain parts of the basin; increased maturity and gas content may be observed in these deeper sections.

Gas Contents and Gas Origin

Initial coal gas contents have been measured at around 14 Scf/t, which is low compared to many other CBM producing basins in North-America. However, given the total coal volume and the shallow depth only further geological data and tests, and economic constraints can outline or estimate the CBM production potential.

The coal gas composition has been described as 94-95% Methane with about 2% CO₂. The remainder to 100% is probably N₂. This is consistent with a shallow, immature coal gas typical for the low coal rank.

The origin of this gas in the coal is, the coal itself, i.e. source and reservoir gas are identical.

The bulk of this gas can be considered to be biogenic as the lignite's have not experienced any thermal stress that could generate the massive gas volumes seen in coals of high rank (i.e. >0.7% VR). This biogenic Methane probably slowly accumulated during the last several 10,000-100,000 years within the coal, similar to the large Medicine Hat shallow gas field of South-eastern Alberta, where – in contrast – large volumes of biogenic Methane gas accumulated in shallower sand reservoirs where vertical coal gas migration followed by conventional gas trapping in reservoir rocks.

An important observation on gas content is stated by Connolly and Ellsworth (2003): In contrast to typical coals of high rank with the bulk gas being adsorbed onto the coal matrix, these authors recognize in the Moose River Basin, a portion of free coal gas being present in the coal seams. This conclusion is made from anomalously high desorption values relative to adsorption values.

Concept of GEL Application in the Moose River Basin

The generation, migration, and natural mechanisms to store gas volumes in reservoirs is not static, but subjected to a dynamic equilibrium. Gas reservoir filling and gas reservoir destruction or gas loss are simultaneous processes, with the "creation" of a gas reservoir occurring when the rate of gas generation, migration and gas accumulation is faster than the factors leading to reservoir destruction and gas loss. Thus, some reservoir gas loss is a frequent and ubiquitous phenomenon, ultimately leading to the natural depletion of gas reservoirs over geological times (unless a gas generating mechanism exists to maintain a stable reservoir gas content). Studies have shown that the estimated half-life of a conventional gas reservoir is about 5-10 million years.

This continuous gas loss provides the basis for surface gas prospecting with enhanced surface gas seepage often observed in or over areas with productive trends at depth. Such areas of enhanced gas seepage are often indicative for deeper reservoir gas potential.

In the Moose River Basin the gas bearing coal seams appear to be a prominent target because the coal seams (gas source) is shallow, and, as stated by Connolly and Ellsworth (2003), a portion of free coal gas appears to present. This free coal gas is probably in equilibrium rate of continuous gas loss with rate of gas generation. Thus, gas seepage trends recognized from the surface could indicate areas of increased CBM potential, i.e. areas where the coal seams are thick with sufficient gas content, and a cleat-fracture system important for gas escape (and gas production).

GEL-Procedure: Unmixing of Gas Sources (Gas Family Reconstruction)

Surface HC gases are not exclusively derived from reservoir or sources at depth, but often originate from soil in-situ processes. Methane in the soil may, e.g., originate from active surface biodegradation and/or from seepage of reservoir methane further down in the sediment section. Thus, the obvious task in the evaluation of surface gases for seepage patterns is the identification of individual gas sources that contribute to (and define!) the spectrum of mixed gas compositions in the soil.

When gases of different sources and origins occur in soil environments, mixing of these gas sources is a normal process. The composition and chemical character of the collected soil gas samples is controlled and defined by the respective gas sources. The information on these sources can be numerically reconstructed from the raw composition data of the soil gases. Consequently, numerical unmixing techniques applied to mixtures reveal the various sources of the mixture in question. This unmixing is an important step with regard to soil gas data interpretation since the portion of hydrocarbons originating from seepage in these surface gas samples can be quantified. Thus, based on numerical unmixing routines seep-methane or seep-HC are discriminated from residual methane or methane originating from active soil in-situ biological processes.

Thus, rather than characterizing a surface gas sample by its measured (and complex) gas composition and magnitude readings, the *GEL* Technique describes a surface gas sample in terms of its gas sources and the proportion of these sources on the sample gas (von der Dick et al., 2002).

If active seepage is occurring in an area, this seepage has 3 pronounced effect on soil gas readings:

1. A seep gas family evolves from data processing and the seep gas composition is numerically reconstructed.
2. Active seepage increases the numerical affinity of a soil gas sample towards the seep gas.
3. Active seepage contributes to overall magnitude of HC gas yields in a soil sample. In case of a methane source, active seepage increases methane yields in a given sample.

In this study we use the *GasGEL* value to calculate and quantify active methane seepage by combining the seep affinity factor with the methane magnitude in the sample:

$$\text{GasGEL} = \text{Affinity to Seep gas (from model Results)} * \lg C_1 \text{ concentration}$$

"Affinity" of samples from the model results, on the Seep Gas Family ranges from 0.00 (0%) to 1.00 (100%). For instance, Loading of 1.000 represents a soil gas sample with 100% seep gas and no noise gases present. Thus, the *GasGEL* values are indicators for the Methane seep intensity.

As will be shown later, active seepage in the James Bay Lowlands area is dominantly Methane. The C_2 - C_4 gases, and part of the observed surface gas Methane in this area constitute noise gases of non-seepage origin. Therefore, it is essential to discriminate reservoir seep methane from methane derived from active biological soil in-situ processes.

Field Sampling and Analysis

Sampling in the fields involves CTI's normal procedure of sampling described in von der Dick et al. (2002) and at www.chemterra.com. The gas sampling in the James Bay work area was carried out in September/October 2003. 145 samples were taken in the field for soil gas analysis in CTI's Calgary lab (figure 1).

If possible, a free gas sample is taken from the soil at about 1.20 m depth. Due to the high water table in the survey area, much of the sampling had to be carried out at shallower depth just above the groundwater table.

After field collection, the samples were immediately shipped to CTI's Calgary lab for gas analysis of the following constituents:

C₁ (Methane); **C₂** (Ethane); **C₃** (Propane); **iC₄** (Iso-Butane); **nC₄** (n-Butane); **C₂=** (Ethylene); **C₃=** (Propylene); **C₄=** (Butylene); **HeNe** (Helium & Neon); **H₂** (Hydrogen)

The analysis was performed on HP 5890 Series II GC instruments equipped with capillary pre-, back-flush and analytical columns. With the exception of HeNe and the extreme methane samples, all gases are baseline separated to ensure highest lab precision. The lab equipment is exclusively designed and used to analyze soil gas samples with good precision even in the low ppb range.

Following the lab analysis the data were quality controlled, and legitimate samples were subjected to CTI's *GEL* procedure.

GEL Results

A total of 145 soil gas samples were taken in the work area during this phase and the gas yields are listed in Table 1. The magnitude of methane varies considerably from low Parts per Million (ppm) to more than 20%. Besides the methane, heavier (C₂-C₄) HC gas constituents are present at the low ppm level.

The raw field data of Table 1 were subjected to our proprietary numerical procedure for the detailed numerical analysis and discrimination of soil gas families. This way, the sources of the soil Methane can be further evaluated, in particular with regard to a possible seep signal.

Table 2 lists the composition (%) of the gas families retrieved from data processing of the Table 1 data:

	Family 1	Family 2	Family 3	Family 4
C1	100.00	0.00	0.00	13.53
C2	0.00	0.00	0.08	0.39
C2=	0.00	0.01	0.04	0.64
C3	0.00	0.02	0.01	0.40
C3=	0.00	0.00	0.01	0.61
C4=	0.00	0.01	0.01	0.08
iC4	0.00	0.01	0.00	0.09
nC4	0.00	0.01	0.01	0.08
HeNe	0.00	99.94	0.00	84.18
H2	0.00	0.00	99.85	0.00

Table 2

An important observation from the retrieved gas families is the presence of two methane origins or methane sources: A pure methane source is retrieved as a first family in Table 2; the composition is consistent with an expected seep gas from coal seams or from a typical reservoir methane gas a depth; the second source of methane in Table 2 (the 4th family) is obviously not related to deep sources because of the association of methane with typical non-reservoir, residual gases. It is also obvious that all higher HC gases such as C₂ –C₄ are of non-seep origin. They are clearly of soil-biogenic origin.

The majority of the methane gas in this survey belongs to the seep gas, and GasGEL values are relatively high from both high affinities and high methane concentrations. It is likely that CBM contributes to the seep magnitude in the soil, but a second methane source could be present, too, to account for the high seep rates. This second methane seep source should be pure methane gas stored in the sedimentary sediments package.

Figure 2 is a plot of the methane concentration vs. the GasGEL values; the graph shows a distinct curve at GasGEL values around 5-6, with GasGEL values > 5 belonging to the sample population with increased methane seepage. A second cross-plot shows the histogram of the GasGEL values (Figure 3). Two distinct populations are noted at values > 5 and 7.

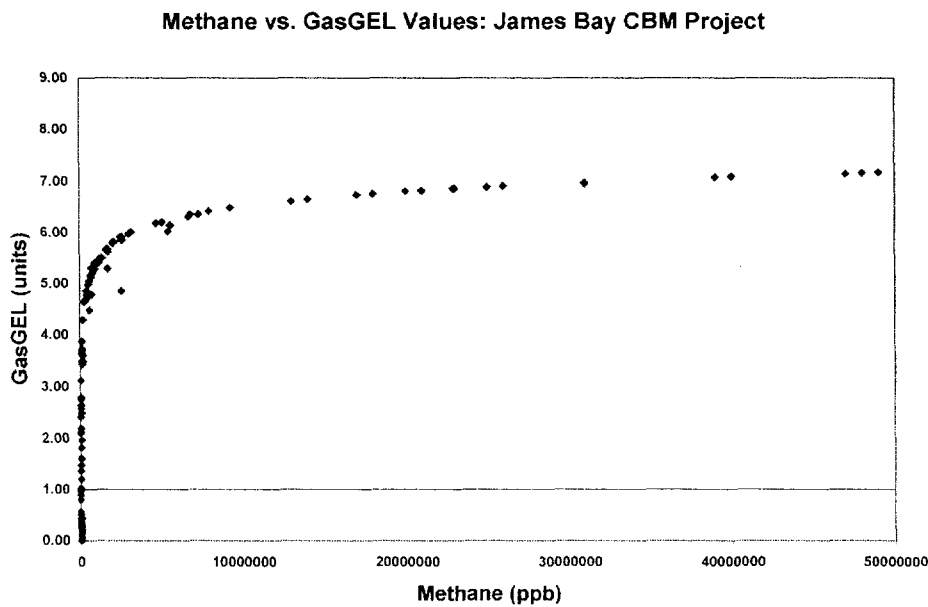


Figure 2

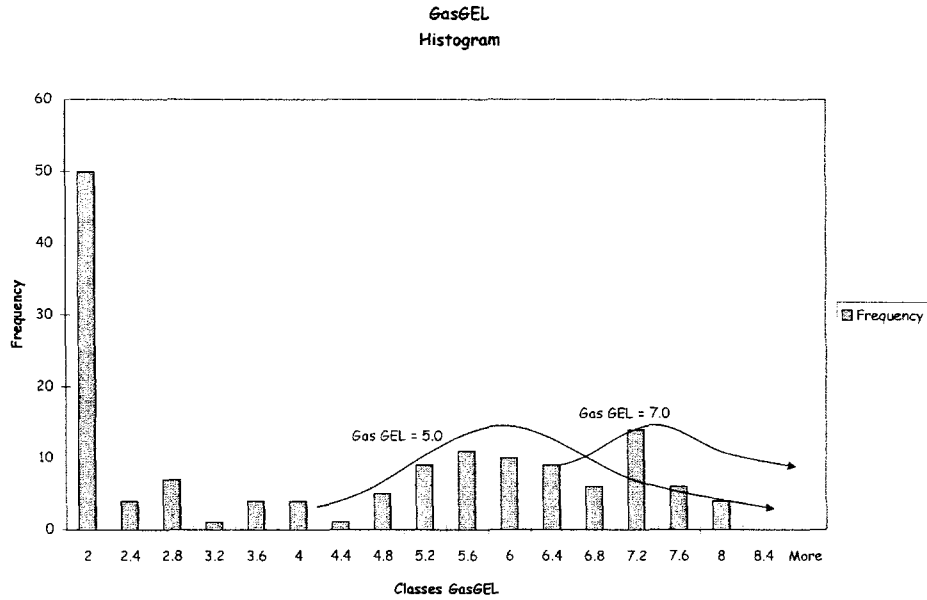


Figure 3

Anomalous GasGEL with the low and high cutoff values (> 5 and > 7) are listed in Table 2.

Plotting of the seep-anomalous data of Table 2 in Figure 4 reveals three distinct and significant seep pattern observations:

The area in UTM vicinity x411000; y5568000 (Sanborn Twp.) is highly anomalous; the seepage of Methane is strong and pronounced. The area further to the West in the McBrien Twp. (x362000; y5556000) has several sample sites showing pronounced seepage.

In contrast, samples # KLO-0 to KLO-9 taken outside the coal basin just West of Kipling (x411000; y5559000) have no signs for enhanced Methane seepage.

CLAIMaps III Township

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MCBRIEN GARDEN
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Layers

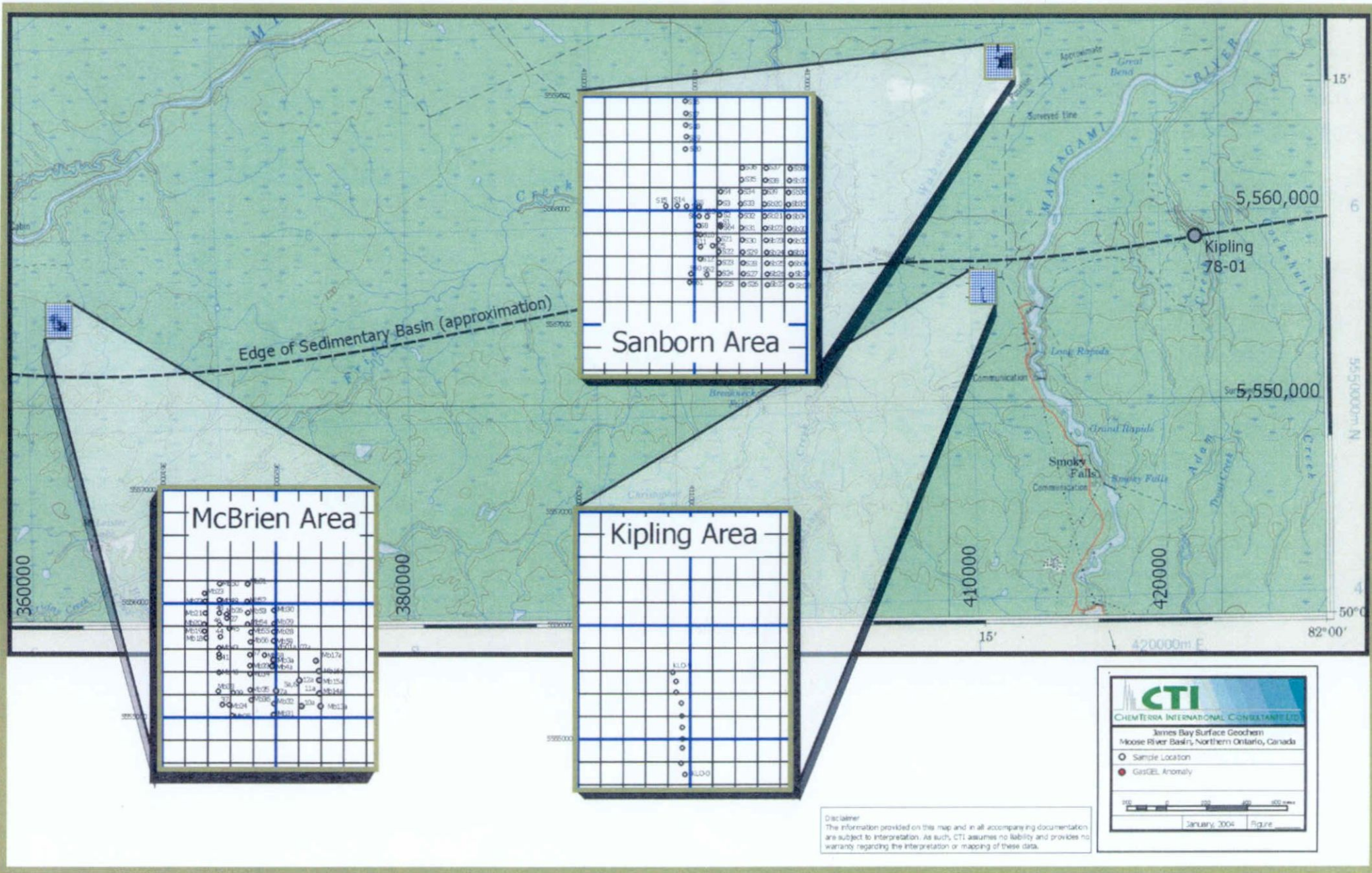
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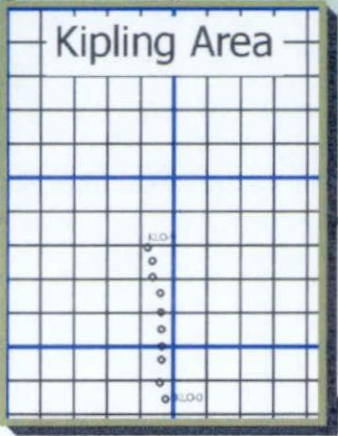
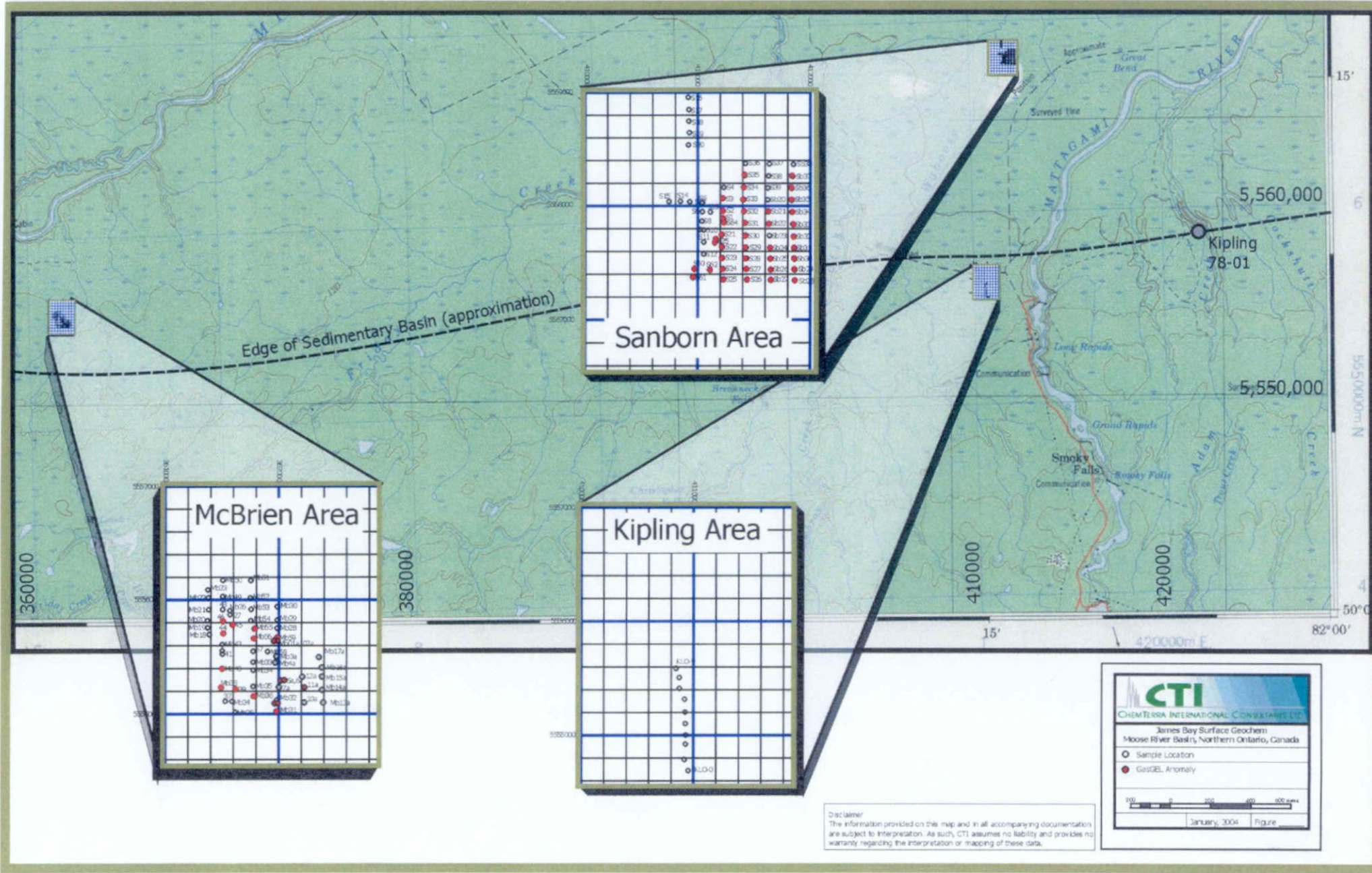
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James Bay Surface Geochem
 Moose River Basin, Northern Ontario, Canada

○ Sample Location
 ● GasCEL Anomaly

0 100 200 300 400 meters

January 2004 Figure



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James Bay Surface Geochem
 Moose River Basin, Northern Ontario, Canada

- Sample Location
- gasDEL Anomaly

0 100 200 400 800 meters

January, 2004 | Figure

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 The information provided on this map and in all accompanying documentation are subject to interpretation. As such, CTI assumes no liability and provides no warranty regarding the interpretation or mapping of these data.

Figures, Tables and Literature:

Figure 1:

Work area with sample locations

Figure 2:

Cross-plot of calculated GasGEL values (Methane seep intensities) with Methane soil gas concentrations. Note the deviation of the trend at GasGEL values around 5.

Figure 3:

Histogram of GasGEL values showing distinct seep populations.

Figure 4:

Mapped GasGEL anomalous seep samples in the three test areas NW and West of Kipling. Further explanations in text.

Table 1:

List of UTM's, raw gas data, and pertinent numerically calculated loadings data of the seep gas on individual field samples, and calculated GasGEL values for all samples.

Table 2:

List of GEL samples with anomalous Methane seep intensities.

Literature:

Atoka Coal Labs, Corp. Report Sanborn # 03-1 well, June 2003

Moose River CBM Project; Connolly, M.J., and Ellsworth, P.C., 2003

James Bay Lowlands CBM – Lignite Project; Perry, J.H., and Ryan, B., 2002

von der Dick et. al, 2002

Numerically reconstructed methane-seep signal in soil gases over Devonian Slave Point reefs, Northeast British Columbia, Canada: Surface micro-seeps and post-survey discovery.

In: Surface Exploration Case Histories: Applications of Geochemical, Magnetic, and Remote Sensing Methods to Exploration, Field Development, and Production.

AAPG – SEG Publication



To: James Bay energy
Graeme Scott
Toronto, On

From: Dane A Bosman
ChemTerra Intl.
100, 1732 – 11th Ave SW
Calgary, AB T3C 0N4

Re: Sample Analysis Certification

Dear Graeme:

The attached analysis data is a complete listing of all samples analyzed for the study titled:
Gel coal gas orientation survey in the
Moose River basin area, Ontario.

In total, 145 soil gas samples were analyzed for light Hydrocarbons (C1-C4), Nobel components (Neon and Helium) and Hydrogen (H2). All values listed are concentration in Parts Per Billion (ppb).

Yours truly,
ChemTerra Intl. Consultants Ltd.

Dane A Bosman
Operations Mgr.

James Bay Final Report Jan 2004.xls

Table 1

X	Y	CTI #	Sample #	Site	C1	C2	Ethy	C3	Prop	Buty	IC4	NC4	HeNe	H2	GasLoad	LgC1	GasGEL
410963	5555717	C1	KLO 0+0N	KLO 0+0N	7759	126	345	47	178	29	17	15	35008	25987	0.06	3.89	0.24
410930	5555807	C2	KLO 100N	KLO 100N	3169	53	72	29	50	14	6	6	32803	17013	0.04	3.50	0.14
410939	5555916	C3	KLO 200N	KLO 200N	2533	10	27	18	16	5	6	5	35620	4381	0.05	3.40	0.17
410933	5555013	C4	KLO 300N	KLO 300N	5592	20	35	11	27	10	7	7	37686	5205	0.10	3.75	0.37
410919	5555100	C5	KLO 400N	KLO 400N	412551	54	60	23	27	7	8	5	32827	4595	0.85	5.62	4.78
410924	5555214	C6	KLO 500N	KLO 500N	45642	18	40	16	24	7	5	5	33317	2575	0.52	4.66	2.41
410922	5555302	C7	KLO 600N	KLO 600N	41044	17	37	24	20	11	5	5	38674	2295	0.46	4.61	2.12
410904	5555422	C8	KLO 700N	KLO 700N	29250	44	43	46	26	5	5	7	28397	15946	0.36	4.47	1.61
410904	5555507	C9	KLO 800N	KLO 800N	6989	18	31	13	16	5	5	5	33236	3807	0.14	3.84	0.54
410883	5555580	C10	KLO 900N	KLO 900N	3509	16	29	13	29	6	7	7	38890	3437	0.06	3.55	0.22
411240	5567860	C11	S01	LO 0N	10000000	15	10	30	16	35	11	5	23782	3883	0.93	8.00	7.46
411244	5567956	C12	S02	LO 1N	762457	15	30	20	24	5	5	5	36186	7251	0.88	5.88	5.20
411246	5568062	C13	S03	LO 2N	31000000	15	10	40	42	8	6	17	28862	151416	0.93	7.49	6.95
411254	5568117	C14	S04	LO 3N	92806	75	93	88	56	29	10	13	28667	46361	0.50	4.97	2.49
411054	5568033	C15	S05	LO 4N	1458	65	74	52	59	30	6	5	31371	26756	0.00	3.16	0.01
411051	5567962	C16	S06	LO 5N	3890	25	52	19	45	8	6	7	30366	4385	0.08	3.59	0.28
411151	5567962	C17	S07	illegible	3213	16	16	15	10	5	5	5	34616	2560	0.07	3.51	0.24
411052	5567859	C18	S08	illegible	2851	14	19	14	15	5	5	5	34426	3233	0.06	3.45	0.21
411052	5567776	C19	S09	illegible	3178	28	11	30	9	5	5	5	30474	2931	0.07	3.50	0.24
411057	5567776	C20	S10	illegible	2454	12	14	14	8	5	5	5	28002	2966	0.06	3.39	0.21
411062	5567670	C21	S11	illegible	3624	14	17	23	15	5	5	5	37643	3596	0.07	3.56	0.25
411054	5567590	C22	S12	illegible	2754	28	26	22	18	5	5	9	34538	2000	0.05	3.44	0.17
410950	5558025	C23	S13	3W1+75N	53657	132	101	128	81	20	7	14	27821	17173	0.46	4.73	2.19
410850	5558025	C24	S14	3W1+75N	1919	15	20	20	14	5	5	5	33992	2587	0.04	3.28	0.13
410750	5558025	C25	S15	3W1+75N	560	15	21	6	7	5	5	5	32039	3049	0.01	2.75	0.03
410957	5558944	C26	S16	3W1N	3338	130	185	85	126	51	12	24	21650	39021	0.00	3.52	0.00
410945	5558848	C27	S17	3W0N	2563638	309	271	124	154	44	9	30	25038	593034	0.76	6.41	4.85
410953	5558755	C28	S18	3W1S	167303	82	155	76	105	32	10	8	27476	35735	0.67	5.22	3.49
410953	5558658	C29	S19	3W2S	34109	295	321	126	198	49	8	32	19696	233078	0.10	4.53	0.45
410949	5558557	C30	S20	3W3S	50901	27	46	27	31	5	9	6	25539	3902	0.59	4.71	2.75
411234	5567776	C31	S21	LO 100S	17000000	15	10	30	11	6	8	5	30777	4278	0.93	7.23	6.73
411231	5567657	C32	S22	LO 200S	49000000	15	10	40	23	10	13	5	30154	2758	0.93	7.69	7.17
411238	5567555	C33	S23	LO 300S	18000000	15	10	40	24	6	10	15	30653	3143	0.93	7.26	6.76
411234	5567456	C34	S24	LO 400S	1644697	15	49	20	30	5	7	5	37186	2346	0.91	6.22	5.67
411240	5567349	C35	S25	LO 500S	1739314	78	127	48	93	17	10	16	35176	4888	0.91	6.24	5.68
411440	5567360	C36	S26	L1E 500S	503524	15	70	30	60	5	11	7	32550	2882	0.87	5.70	4.99
411434	5567462	C37	S27	L1E 400S	1101635	67	80	30	62	10	7	10	36295	3867	0.90	6.04	5.42
411435	5567559	C38	S28	L1E 300S	385250	23	84	30	64	10	8	14	36941	3710	0.84	5.59	4.71
411434	5567663	C39	S29	L1E 200S	705663	49	56	30	34	5	11	10	15591	2024	0.91	5.85	5.30
411424	5567762	C40	S30	L1E 100S	4704859	18	16	37	28	6	6	6	28875	2455	0.93	6.67	6.18
411407	5567855	C41	S31	L1E 0+0	3050786	15	90	40	76	13	7	9	36020	3145	0.92	6.48	5.97
411428	5567963	C42	S32	L1E 100N	2616619	15	68	30	56	5	9	5	30553	3551	0.92	6.42	5.91
411442	5568068	C43	S33	L1E 200N	14000000	15	10	40	56	7	8	11	33157	4604	0.93	7.15	6.65
411434	5568156	C44	S34	L1E 300N	528613	22	66	30	51	5	7	6	35430	2433	0.87	5.72	4.99
411441	5568273	C45	S35	L1E 400N	40000000	15	10	20	15	17	14	7	24059	3592	0.93	7.60	7.09
411429	5568370	C46	S36	L1E 500N	803909	54	128	84	34	8	10	17	34543	3692	0.89	5.91	5.24
411632	5568365	C47	S37	L2E 500N	478500	15	40	90	32	5	6	7	29613	2353	0.88	5.68	4.97
411634	5568257	C48	S38	L2E 400N	53703	28	75	84	66	8	7	9	36139	2000	0.54	4.73	2.58
411629	5568160	C49	S39	L2E 300N	141350	41	85	38	67	9	6	10	29045	3505	0.75	5.15	3.88
410949	5567451	C50	S60	3W4S	1769759	133	135	50	99	22	8	12	30974	27410	0.90	6.25	5.62
410952	5567355	C51	S61	3W5S	1363251	130	135	47	95	24	8	17	15000	31859	0.90	6.13	5.50
411130	5567450	C52	S62	400m S of DDH	686891	34	58	15	56	7	5	6	26762	16820	0.88	5.84	5.12
411190	5567659	C53	S63	200m S of DDH	2068766	15	40	25	50	6	5	5	30465	9065	0.92	6.32	5.79
411240	5567855	C54	S64	DDH	39000000	15	10	40	22	23	9	7	28099	2801	0.93	7.59	7.08
361988	5555624	C55	MB01	missing	13000000	15	10	145	66	12	11	22	25643	17572	0.93	8.11	7.57
361888	5555624	C56	MB02	missing	3200776	15	103	35	41	9	7	9	23795	10590	0.92	6.51	6.01
361992	5555526	C57	MB03	missing	43048	73	25	29	28	7	8	8	20639	27057	0.43	4.63	1.97
361994	5555460	C58	MB04	missing	12686	209	137	92	125	29	18	30	23214	102993	0.06	4.10	0.26

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Table 1

362014	5555290	C59	MB05	missing	210000000	15	10	12500	29	5	99	52	14300	14354	0.93	8.32	7.77
362114	5555290	C60	MB06	missing	230000000	15	10	13754	19	5	106	56	17930	6528	0.93	8.36	7.80
362004	5555230	C61	MB07	missing	94818	81	106	80	119	10	18	14	17988	3585	0.74	4.98	3.70
361996	5555129	C62	MB08	missing	22909091	29	19	611	27	10	25	10	28636	3818	0.93	7.36	6.86
361896	5555129	C63	MB09	missing	174545455	22	15	4633	89	19	63	33	17494	27930	0.93	8.24	7.69
362220	5555123	C64	MB10	missing	717319	22	239	195	220	39	35	42	21818	83325	0.82	5.86	4.79
362218	5555231	C65	MB11	missing	7933657	15	10	338	58	5	15	11	19665	7030	0.93	6.90	6.42
362206	5555314	C66	MB12	missing	7652	39	42	49	45	8	19	8	31371	3364	0.14	3.88	0.56
362390	5555100	C67	MB13	missing	39869	21	35	32	48	12	7	7	16840	6956	0.57	4.60	2.63
362386	5555196	C68	MB14	missing	31524	74	63	41	54	9	12	9	16009	60679	0.27	4.50	1.21
362384	5555311	C69	MB15	missing	9838	42	55	37	51	13	7	9	15425	14452	0.20	3.99	0.80
362484	5555405	C70	MB16	missing	6016	81	106	76	113	17	17	20	18519	13895	0.08	3.78	0.31
362360	5555520	C71	MB17	missing	4617	30	50	28	45	11	5	7	21101	2659	0.12	3.66	0.43
361384	5555681	C72	MB18	L4E 050N	3950	48	78	52	64	9	7	12	15592	4153	0.09	3.60	0.33
361360	5555736	C73	MB19	L4E 100N	4156	44	72	31	69	11	8	9	21238	5879	0.09	3.62	0.31
361369	5555839	C74	MB20	L4E 200N	3282	40	65	27	64	6	8	10	20792	4736	0.07	3.52	0.24
361383	5555921	C75	MB21	L4E 300N	3220	96	97	73	93	17	16	17	20969	21882	0.02	3.51	0.06
361382	5555018	C76	MB22	L4E 400N	4376	91	145	73	126	21	13	19	22820	10647	0.04	3.64	0.14
361384	5555124	C77	MB23	L4E 500N	6200	45	68	44	67	11	14	12	24279	10817	0.11	3.79	0.41
361608	5555122	C78	MB24	L6E 500N	3010	32	50	35	51	11	5	8	27400	4676	0.05	3.48	0.19
361615	5555018	C79	MB25	L6E 400N	4772	21	38	20	31	5	7	7	20921	2100	0.14	3.68	0.51
361592	5555914	C80	MB26	L6E 300N	5915	126	150	55	116	18	15	21	17345	241351	0.02	3.77	0.08
361593	5555868	C81	MB27	L6E 250N	1599	38	51	36	49	10	20	10	19220	3591	0.01	3.20	0.03
361985	5555730	C82	MB28	L0 100N	138529	98	97	59	96	10	15	18	18115	23811	0.70	5.14	3.60
361998	5555827	C83	MB29	L0 200N	11805	41	48	31	44	7	7	7	23721	4383	0.25	4.07	1.02
361990	5555932	C84	MB30	L0 300N	2342	26	41	31	37	6	9	9	17127	4389	0.06	3.37	0.19
361989	5555024	C85	MB31	L0 400N	4834	48	43	36	39	5	5	9	19193	115197	0.04	3.68	0.13
361977	5555133	C86	MB32	L0 500N	4493	29	35	34	36	5	5	5	21534	8882	0.10	3.65	0.38
361777	5555630	C87	MB31	L1W 0N	2523074	15	10	31	19	5	5	5	24550	2292	0.92	6.40	5.91
361781	5555530	C88	MB32	1W 1+00S	47920	27	57	29	50	15	9	8	21058	3467	0.60	4.68	2.80
361779	5555413	C89	MB33	1W 2S	9071	18	33	23	30	5	5	5	24241	2000	0.23	3.96	0.90
361776	5555324	C90	MB34	1W 3S	35307	41	42	39	39	10	5	7	27614	29406	0.35	4.55	1.60
361762	5555221	C91	MB35	1W 4S	10484	151	81	61	57	14	17	16	15915	84152	0.07	4.02	0.29
361766	5555117	C92	MB36	1W 5S	100000000	15	10	4262	31	12	46	17	17983	10571	0.93	8.00	7.46
361521	5555123	C93	MB37	2W 5S	93225	58	57	42	90	9	7	7	21092	2909	0.73	4.97	3.64
361518	5555228	C95	MB39	2W 4S	139590909	25	17	13727	89	8	91	47	21415	3735	0.93	8.14	7.60
361513	5555349	C96	MB40	2W 3S	841878	22	63	100	77	10	17	13	25754	4730	0.90	5.93	5.34
361526	5555463	C97	MB41	2W 2S	48199	40	40	45	47	7	8	6	15000	2489	0.67	4.68	3.12
361520	5555522	C98	MB42	2W 1S	19544	39	57	46	52	15	9	8	20547	9109	0.34	4.29	1.47
361527	5555626	C99	MB43	2W 0N	390867	15	27	28	31	5	8	5	22341	6903	0.87	5.59	4.86
361528	5555721	C100	MB44	2W 1N	48000000	15	10	264	12	5	21	7	23035	3619	0.93	7.68	7.16
361628	5555721	C101	MB45	2W 1N	100000000	15	10	549	21	5	48	14	19508	9219	0.93	8.00	7.46
361529	5555830	C102	MB46	2W 2N	6823163	15	10	111	69	8	14	10	17441	5986	0.93	6.83	6.35
361526	5555930	C103	MB47	2W 3N	20817	33	58	28	67	7	12	7	22088	2000	0.42	4.32	1.81
361526	5555930	C104	MB48	2W 3N	2786	15	21	71	20	5	5	5	27740	2000	0.06	3.44	0.22
361530	5556033	C105	MB49	2W 4N	16865	21	30	39	25	5	5	5	28638	2000	0.32	4.23	1.36
361538	5556144	C106	MB50	2W 5N	81523	47	38	237	43	9	52	14	22562	2455	0.71	4.91	3.48
361748	5556121	C107	MB51	1W 5N	3069	15	20	19	22	5	5	5	32676	2000	0.07	3.49	0.24
361738	5556019	C108	MB52	1W 4N	3952	35	37	37	38	7	7	7	24105	5049	0.09	3.60	0.31
361738	5555910	C109	MB53	1W 3N	215741	15	78	55	78	13	7	9	19762	15896	0.80	5.33	4.29
361745	5555818	C110	MB54	1W 2N	115166	52	100	48	141	9	21	9	28469	4337	0.73	5.06	3.72
361768	5555728	C111	MB55	1W 1N	617388	15	116	51	141	11	13	9	19585	13132	0.89	5.79	5.17
361777	5555630	C112	MB56	1W 0N	910514	15	61	28	70	7	13	10	19307	6784	0.91	5.96	5.41
361781	5555530	C113	MB57	1W 1S	8631	15	27	23	27	5	5	5	20227	2000	0.25	3.94	0.97
361881	5555530	C114	MB58	1W 1S	40937	33	99	51	110	8	15	12	22722	3233	0.57	4.61	2.64
361985	5555823	C115	MB59	0W 0N	9239423	15	10	36	41	5	5	5	21398	3811	0.93	6.97	6.48
411060	5567954	C116	MB11 rpt?	L2W 100N	20000000	15	10	639	88	5	31	12	24377	4695	0.93	7.30	6.80
411060	5567854	C117	MB12 rpt?	L2W 0+0	47000000	15	10	205	59	5	22	13	22985	98364	0.93	7.67	7.14

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Table 1

411057	5567753	C118	MB13 rpt?	L2W 100S	21000000	15	10	68	67	9	24	20	34727	11918	0.93	7.32	6.82
411050	5567662	C119	MB14 rpt?	L2W 200S	23000000	15	10	61	46	5	12	10	22095	3739	0.93	7.36	6.86
411067	5567572	C120	MB15 rpt?	L2W 300S	540897	15	48	25	34	5	13	5	24421	9062	0.88	5.73	5.05
411049	5567454	C121	MB16 rpt?	L2W 400S	276638	15	48	27	45	5	10	5	20986	5976	0.85	5.44	4.64
411054	5567356	C122	MB17 rpt?	L2W 500S	1141197	15	96	44	72	5	16	10	18684	39052	0.89	6.06	5.40
410844	5567941	C123	MBR18	Drill road 1000S	5086432	15	153	36	46	5	10	5	19503	28295	0.92	6.71	6.20
410927	5567113	C124	MBR19	DR 800S	29649	79	137	74	115	8	24	15	16331	9533	0.47	4.47	2.10
411067	5567267	C125	MBR20	DR 600S	38972	82	149	56	146	7	23	12	23745	14695	0.46	4.59	2.13
411241	5567861	C126	MBR21	DR 0+0s	2093285	15	52	32	68	6	11	8	22666	7059	0.92	6.32	5.82
411643	5568060	C127	SB20	L4E 200N	596276	92	125	50	87	5	15	15	29349	95005	0.78	5.78	4.48
411651	5567941	C128	SB21	L4E 100N	21000000	15	110	40	80	6	14	21	50476	19008	0.93	7.32	6.81
411646	5567843	C129	SB22	L4E 0+0	1205183	49	144	49	112	6	18	15	34740	5914	0.90	6.08	5.49
411641	5567741	C130	SB23	L4E 100S	125529	83	188	44	147	9	22	15	36272	12064	0.67	5.10	3.43
411647	5567655	C131	SB24	L4E 200S	5572047	15	117	49	80	7	10	12	31205	119596	0.91	6.75	6.14
411642	5567542	C132	SB25	L4E 300S	5442133	15	87	77	73	5	10	9	34832	227291	0.89	6.74	6.02
411638	5567432	C133	SB26	L4E 400S	936933	15	51	20	38	7	9	7	22220	31565	0.88	5.97	5.28
411641	5567334	C134	SB27	L4E 500S	6706070	15	76	50	53	5	20	7	27226	45061	0.92	6.83	6.31
411843	5567344	C135	SB28	L6E 500S	25000000	15	10	40	58	9	58	10	31683	20724	0.93	7.40	6.89
411848	5567449	C136	SB29	L6E 400S	31000000	15	10	50	65	5	56	14	33678	38028	0.93	7.49	6.97
411846	5567547	C137	SB30	L6E 300S	2127623	15	110	30	62	6	11	7	27620	10718	0.92	6.33	5.81
411841	5567655	C138	SB31	L6E 200S	26000000	15	10	40	84	5	50	20	29712	11542	0.93	7.41	6.91
411833	5567751	C139	SB32	L6E 100S	6780146	15	138	50	130	7	21	8	29703	10414	0.93	6.83	6.34
411822	5567835	C140	SB33	L6E 0+0	7295075	15	87	50	86	6	22	20	26501	32712	0.93	6.86	6.35
411825	5567940	C141	SB34	L6E 100N	13000000	15	43	50	85	8	21	17	38102	15004	0.93	7.11	6.61
411821	5568053	C142	SB35	L6E 200N	110000000	15	10	50	29	64	72	6	36199	7522	0.93	8.04	7.50
411827	5568149	C143	SB36	L6E 300N	999420	30	122	30	76	7	6	18	32137	4921	0.90	6.00	5.39
411828	5568248	C144	SB37	L6E 400N	1725357	43	127	50	111	9	10	25	30962	149507	0.85	6.24	5.29
411835	5568349	C145	SB38	L6E 500N	2641455	15	108	40	88	9	12	10	20905	49805	0.91	6.42	5.85

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Table 3

X	Y	CTI #	Sample #	Site	C1	C2	Ethy	C3	Prop	Buty	IC4	NC4	HeNe	H2	GasLoad	LgC1	GasGEL
411240	5567860	11	S01	L0 0N	100000000	15	10	30	16	35	11	5	23782	3883	0.93	8.00	7.46
411244	5567956	12	S02	L0 1N	762457	15	30	20	24	5	5	5	36186	7251	0.88	5.88	5.20
411246	5568062	13	S03	L0 2N	31000000	15	10	40	42	8	6	17	28862	151416	0.93	7.49	6.95
411234	5567776	31	S21	L0 100S	17000000	15	10	30	11	6	8	5	30777	4278	0.93	7.23	6.73
411231	5567657	32	S22	L0 200S	49000000	15	10	40	23	10	13	5	30154	2758	0.93	7.69	7.17
411238	5567555	33	S23	L0 300S	18000000	15	10	40	24	6	10	15	30653	3143	0.93	7.26	6.76
411234	5567456	34	S24	L0 400S	1644697	15	49	20	30	5	7	5	37186	2346	0.91	6.22	5.67
411240	5567349	35	S25	L0 500S	1739314	78	127	48	93	17	10	16	35176	4888	0.91	6.24	5.68
411434	5567462	37	S27	L1E 400S	1101635	67	80	30	62	10	7	10	36295	3867	0.90	6.04	5.42
411434	5567663	39	S29	L1E 200S	705663	49	56	30	34	5	11	10	15591	2024	0.91	5.85	5.30
411424	5567762	40	S30	L1E 100S	4704859	18	16	37	28	6	6	6	28875	2455	0.93	6.67	6.18
411407	5567855	41	S31	L1E 0+0	3050786	15	90	40	76	13	7	9	36020	3145	0.92	6.48	5.97
411428	5567963	42	S32	L1E 100N	2616619	15	68	30	56	5	9	5	30553	3551	0.92	6.42	5.91
411442	5568068	43	S33	L1E 200N	14000000	15	10	40	56	7	8	11	33157	4604	0.93	7.15	6.65
411441	5568273	45	S35	L1E 400N	40000000	15	10	20	15	17	14	7	24059	3592	0.93	7.60	7.09
411429	5568370	46	S36	L1E 500N	803909	54	128	84	34	8	10	17	34543	3692	0.89	5.91	5.24
410949	5567451	50	S60	3W4S	1769759	133	135	50	99	22	8	12	30974	27410	0.90	6.25	5.62
410952	5567355	51	S61	3W5S	1363251	130	135	47	95	24	8	17	15000	31859	0.90	6.13	5.50
411130	5567450	52	S62	400m S of DDH	686891	34	58	15	56	7	5	6	26762	16820	0.88	5.84	5.12
411190	5567659	53	S63	200m S of DDH	2068766	15	40	25	50	6	5	5	30465	9065	0.92	6.32	5.79
411240	5567855	54	S64	DDH	39000000	15	10	40	22	23	9	7	28099	2801	0.93	7.59	7.08
361988	5555624	55	MB01	missing	130000000	15	10	145	66	12	11	22	25643	17572	0.93	8.11	7.57
361888	5555624	56	MB02	missing	3200776	15	103	35	41	9	7	9	23795	10590	0.92	6.51	6.01
362014	5555290	59	MB05	missing	210000000	15	10	12500	29	5	99	52	14300	14354	0.93	8.32	7.77
362114	5555290	60	MB06	missing	230000000	15	10	13754	19	5	106	56	17930	6528	0.93	8.36	7.80
361996	5555129	62	MB08	missing	22909091	29	19	611	27	10	25	10	28636	3818	0.93	7.36	6.86
361896	5555129	63	MB09	missing	174545455	22	15	4633	89	19	63	33	17494	27930	0.93	8.24	7.69
362218	5555231	65	MB11	missing	7933657	15	10	338	58	5	15	11	19665	7030	0.93	6.90	6.42
361777	5555630	87	MB31	L1W 0N	2523074	15	10	31	19	5	5	5	24550	2292	0.92	6.40	5.91
361766	5555117	92	MB36	1W 5S	100000000	15	10	4262	31	12	46	17	17983	10571	0.93	8.00	7.46
361518	5555228	94	MB38	2W 4S	110000000	15	10	10040	18	5	72	36	17067	2272	0.93	8.04	7.51
361618	5555228	95	MB39	2W 4S	139590909	25	17	13727	89	8	91	47	21415	3735	0.93	8.14	7.60
361513	5555349	96	MB40	2W 3S	841878	22	63	100	77	10	17	13	25754	4730	0.90	5.93	5.34
361528	5555721	100	MB44	2W 1N	480000000	15	10	264	12	5	21	7	23035	3619	0.93	7.68	7.16
361628	5555721	101	MB45	2W 1N	100000000	15	10	549	21	5	48	14	19508	9219	0.93	8.00	7.46
361529	5555830	102	MB46	2W 2N	6823163	15	10	111	69	8	14	10	17441	5986	0.93	6.83	6.35
361768	5555728	111	MB55	1W 1N	617388	15	116	51	141	11	13	9	19585	13132	0.89	5.79	5.17
361777	5555630	112	MB56	1W 0N	910514	15	61	28	70	7	13	10	19307	6784	0.91	5.96	5.41
361985	5555623	115	MB59	0W 0N	9239423	15	10	36	41	5	5	5	21398	3811	0.93	6.97	6.48
411060	5567954	116	MB11 rpt?	L2W 100N	200000000	15	10	639	88	5	31	12	24377	4695	0.93	7.30	6.80
411060	5567854	117	MB12 rpt?	L2W 0+0	470000000	15	10	205	59	5	22	13	22985	98364	0.93	7.67	7.14
411057	5567753	118	MB13 rpt?	L2W 100S	210000000	15	10	68	67	9	24	20	34727	11918	0.93	7.32	6.82
411050	5567662	119	MB14 rpt?	L2W 200S	230000000	15	10	61	46	5	12	10	22095	3739	0.93	7.36	6.86
411067	5567572	120	MB15 rpt?	L2W 300S	540897	15	48	25	34	5	13	5	24421	9062	0.88	5.73	5.05
411054	5567356	122	MB17 rpt?	L2W 500S	1141197	15	96	44	72	5	16	10	18684	39052	0.89	6.06	5.40
410844	5567941	123	MBR18	Drill road 1000S	5086432	15	153	36	46	5	10	5	19503	28295	0.92	6.71	6.20
411241	5567861	126	MBR21	DR 0+0s	2093285	15	52	32	68	6	11	8	22666	7059	0.92	6.32	5.82
411651	5567941	128	SB21	L4E 100N	210000000	15	110	40	80	6	14	21	50476	19008	0.93	7.32	6.81
411646	5567843	129	SB22	L4E 0+0	1205183	49	144	49	112	6	18	15	34740	5914	0.90	6.08	5.49
411647	5567655	131	SB24	L4E 200S	5572047	15	117	49	80	7	10	12	31205	119596	0.91	6.75	6.14
411642	5567542	132	SB25	L4E 300S	5442133	15	87	77	73	5	10	9	34832	227291	0.89	6.74	6.02
411638	5567432	133	SB26	L4E 400S	936933	15	51	20	38	7	9	7	22220	31565	0.88	5.97	5.28
411641	5567334	134	SB27	L4E 500S	6706070	15	76	50	53	5	20	7	27226	45061	0.92	6.83	6.31
411843	5567344	135	SB28	L6E 500S	250000000	15	10	40	58	9	58	10	31683	20724	0.93	7.40	6.89
411848	5567449	136	SB29	L6E 400S	31000000	15	10	50	65	5	56	14	33678	38028	0.93	7.49	6.97
411846	5567547	137	SB30	L6E 300S	2127623	15	110	30	62	6	11	7	27620	10718	0.92	6.33	5.81
411841	5567655	138	SB31	L6E 200S	26000000	15	10	40	84	5	50	20	29712	11542	0.93	7.41	6.91
411833	5567751	139	SB32	L6E 100S	6780146	15	138	50	130	7	21	8	29703	10414	0.93	6.83	6.34
411822	5567835	140	SB33	L6E 0+0	7295075	15	87	50	86	6	22	20	26501	32712	0.93	6.86	6.35
411825	5567940	141	SB34	L6E 100N	13000000	15	43	50	85	8	21	17	38102	15004	0.93	7.11	6.61
411821	5568053	142	SB35	L6E 200N	110000000	15	10	50	29	64	72	6	36199	7522	0.93	8.04	7.50
411827	5568149	143	SB36	L6E 300N	999420	30	122	30	76	7	6	18	32137	4921	0.90	6.00	5.39
411828	5568248	144	SB37	L6E 400N	1725357	43	127	50	111	9	10	25	30962	149507	0.85	6.24	5.29
411835	5568349	145	SB38	L6E 500N	2641455	15	108	40	88	9	12	10	20905	49805	0.91	6.42	5.85

Date: 2004-JUN-22

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933 RAMSEY LAKE ROAD, 6th FLOOR
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DONALD MCKINNON
BOX 1130
TIMMINS, ONTARIO
P4N 7M5 CANADA

Tel: (888) 415-9845
Fax: (877) 670-1555

Submission Number: 2.27446
Transaction Number(s): W0460.00516

Dear Sir or Madam

Subject: Approval of Assessment Work

We have approved your Assessment Work Submission with the above noted Transaction Number(s). The attached Work Report Summary indicates the results of the approval.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

NOTE: Future submissions that fail to locate the samples on the claim fabric may be rejected.

If you have any question regarding this correspondence, please contact BRUCE GATES by email at bruce.gates@ndm.gov.on.ca or by phone at (705) 670-5856.

Yours Sincerely,



Ron C. Gashinski
Senior Manager, Mining Lands Section

Cc: Resident Geologist

Donald Mckinnon
(Claim Holder)

Graeme Fenton Scott
(Agent)

Assessment File Library

Donald Mckinnon
(Assessment Office)



42J02NW2001 2.27446

MCBRIEN

200

ONTARIO
CANADAMINISTRY OF MINING
AND PETROLEUM
INDUSTRIES
REGISTRY DIVISIONMining Land Tenure
Map

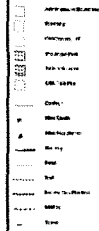
Date / Time of Issue: Tue Jun 22 09:13:53 EDT 2004

TOWNSHIP / AREA
MCBRIENPLAN
M-1004

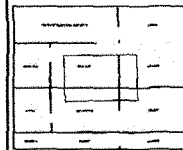
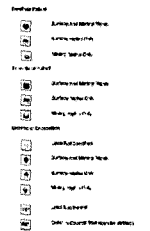
ADMINISTRATIVE DISTRICTS / DIVISION

Mining Division
Land Titles/Registry Division
Ministry of Natural Resources DistrictPorcupine
COCHRANE
HEARST

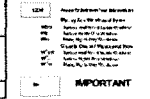
TOPOGRAPHIC



Land Tenure



LAND TENURE WITHDRAWAL



LAND TENURE WITHDRAWAL DESCRIPTIONS

Symbol	Code	Description
[Symbol]	100	RESERVED FOR FUTURE DEVELOPMENT (CROWN LANDS) - 100
[Symbol]	101	RESERVED FOR FUTURE DEVELOPMENT (PRIVATE LANDS) - 101
[Symbol]	102	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 102
[Symbol]	103	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 103
[Symbol]	104	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 104
[Symbol]	105	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 105
[Symbol]	106	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 106
[Symbol]	107	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 107
[Symbol]	108	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 108
[Symbol]	109	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 109
[Symbol]	110	RESERVED FOR FUTURE DEVELOPMENT (MIXED TENURE) - 110

2.27446
OTHER

UTM Zone 17

NAD83/94

General Information and Limitations

This map is a representation of the land tenure information as of the date of issue. It is not a guarantee of accuracy and should not be used for legal purposes.

The information on this map is derived from the Ontario Land Titles Registry and the Ontario Mining Act. It is not a guarantee of accuracy and should not be used for legal purposes.

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