TECHNICAL MEMORANDUM

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TO:	Craig Goodings and Brad Thiele	**DATE:**	March 20, 2007
	Meadowbank Mining Corporation	**JOB NO:**	04-1413-086/5000
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RE: GEOCHEMICAL ASSESSMENT OF POTENTIAL QUARRY ROCK ALONG THE PROPOSED MINE ACCESS ROAD MEADOWBANK GOLD PROJECT, NUNAVUT

1.0 INTRODUCTION

This memo presents an assessment of acid rock drainage (ARD) and metal leaching (ML) potential of rock from possible quarry sites along the proposed all-weather road that will extend from Baker Lake, Nunavut to the Meadowbank site 115 km north. Rock from these quarry sites may be used as sources of aggregate for road construction. The purpose of the geochemical investigation is to assess the potential for environmental effects associated with the aggregate sources proposed for road construction.

2.0 METHODOLOGY

2.1 Sample Collection

Three composite rock samples weighing 3 kg to 5 kg each were collected at each potential quarry site situated within 1 km on either side of the proposed access road. Quarry sites and sample locations are shown on Figure 2.1. A total of 53 samples were collected from 18 possible quarry sites. Most quarry site outcrops consisted of one relatively homogeneous rock type. Composite samples were obtained from eight to ten surface grab samples taken at approximately equal intervals along a 20- to 30-m sampling line along the outcrop. The grab sampling method and compositing aimed to capture spatial and compositional variability of the rock type. Each sample was described in terms of rock type, sulphide mineralogy (from visual observations), and weathering characteristics. Samples were labelled, bagged and submitted to Canadian Environmental and Metallurgical Inc. (CEMI) for chemical analysis. Sample information is presented in Table 2-1.

TABLE 2-1: Tehek Lake Access Road Quarry Site Sample Information

Station	Sample ID	Rock Type	UTM Easting	UTM Northing
2	P2-1	Granite	644423.03	7138286.52
	P2-2			
	P2-3			
3	P3-1	Granite	644406.41	7142138.95
	P3-2			
	P3-3			
4	P4-1	Granodiorite	642184.30	7147786.18
	P4-2			
	P4-3			
5	P5-1	Granite	640144.20	7153108.22
	P5-2			
	P5-3			
7	P7-1	Granite	637602.59	7157384.25
	P7-2			
	P7-3			
8	P8-1	Quartzite	632127.03	7163486.67
	P8-2			
	P8-3			
10	P10-1	Granite/ Gneiss/ Quartzite	629603.46	7168345.97
	P10-2			
	P10-3			
11	P11-1	Felsite	627331.65	7173274.47
	P11-2			
	P11-3			
11B	P11b-1	Andesite	628554.89	7171995.24
	P11b-2			
	P11b-3			

Station	Sample ID	Rock Type	UTM Easting	UTM Northing
13	P13-1	Metawacke	626109.60	7181610.53
	P13-2			
	P13-3			
15	P15-1	Metawacke	626346.94	7187253.35
	P15-2			
	P15-3			
16	P16-1	Metawacke	627254.83	7191532.29
	P16-2			
	P16-3			
17	P17-1	Mafic wacke/ granite gneiss	626295.35	7196394.00
	P17-2			
	P17-3			
18	P18-1	Mafic volcanic	627478.12	7201768.19
	P18-2			
19	P19-1	Granite	629135.09	7204235.90
	P19-2			
	P19-3			
20	P20-1	Granite	629915.19	7206339.46
	P20-2			
	P20-3			
21	P21-1	Granite	631131.53	7211751.80
	P21-2			
	P21-3			
22	P27-1	Granite	633030.14	7214160.31
	P27-2			
	P27-3			

2.2 Analyses

The suite of chemical analyses performed by CEMI includes whole rock and elemental solid phase chemistry, acid-base accounting (ABA) and analysis of metal leaching potential (shake flask extraction). These methods are described in the following sections.

2.2.1 Rock Chemistry

The chemical composition of each of the fifty-three samples was determined by whole rock analysis (via lithium metaborate fusion and nitric acid digestion), and by multi-acid digestion. All analyses were completed through ICP-MS scans of the digested solutions. Whole rock analysis provides total elemental weight percent compositions as oxides of major rock-forming elements, whereas multi-acid digestion provides elemental concentrations of trace metals.

2.2.2 Acid Base Accounting

Acid base accounting was performed on each of the 53 samples to evaluate the ARD potential of prospective quarry rock. These tests included determination of the following parameters: paste pH, acid potential (AP) through sulphur species analysis (total sulphur, sulphate sulphur and sulphide sulphur), bulk neutralization potential (NP) by the modified Sobek Method and carbonate neutralization potential (CaNP) through total inorganic carbon (TIC) analysis. Carbonate NP is used to assess the amount of readily-available acid neutralization that can be attributed to reactive carbonate minerals, as opposed to acid neutralization from slowly-reacting aluminosilicate minerals.

2.2.3 Metal Leaching

Shake flask extraction (SFE) testing was performed on a subset of twenty-four samples to determine the potential of the prospective quarry rock to leach metals to the receiving environment, as per the method outlined in Price (1997). Twenty-four hour SFE tests were conducted on rock samples (crushed to approximately minus 6.35 mm) using a 3 to 1 liquid to solid ratio. Leachates were filtered and analyzed for pH, conductivity, alkalinity, acidity and sulphate, as well as low-level metals by ICP-MS.

2.3 Comparative Guidelines

2.3.1 ARD Potential

Acid base accounting results were compared to guidelines presented by INAC (1992) for Northern Minesites. The potential of a geologic material to generate ARD is described by comparing the buffering capacity of the rock provided by neutralizing minerals (neutralization potential (bulk NP) in units of equivalent kg of calcium carbonate [$CaCO_3$] per tonne of rock), to the amount of acidity that can be generated by sulphide minerals (acid potential (AP), same units as NP), present in the rock. This ratio, the net potential ratio (NPR = NP/AP), is the principal indicator of ARD potential (INAC, 1992). The screening criteria are summarized in Table 2-2.

TABLE 2-2: Acid Rock Drainage Screening Criteria (INAC, 1992)

	Initial Screening Criteria	ARD Potential
Rock	NPR < 1	Likely Acid Generating (PAG)
	1 < NPR < 2	Uncertain
	2 < NPR	Acid Consuming Not Potentially Acid Generating (NPAG)

The net neutralization potential (NNP) was also evaluated for each sample (NNP = NP – AP). A negative NNP indicates a potential to generate acidic drainage whereas a positive NNP represents a propensity to neutralize any acid generated by the aggregate material.

Bulk NP measures the maximum potential buffering capacity including that which comes from less reactive aluminosilicate minerals such as micas and feldspars. For samples where aluminosilicate are more prevalent than reactive carbonate minerals, the bulk NP measurement can overestimate the effective NP of a sample. For these samples, the carbonate NP (CaNP, obtained from total inorganic carbon content) provides a more appropriate measure of available NP and consequently NPR (or ARD potential).

In addition to determination of ARD potential based on NPR, the relationship between paste pH and sulphide sulphur content was evaluated. Price (1997) suggests that materials having a sulphide sulphur content of less than 0.3 wt.% and a paste pH greater than 5.5 may be classified as non-acid generating except where the rock matrix consists of base poor minerals (*e.g.*, quartz), or where the sulphide minerals contain metals that may leach under weakly acidic to alkaline conditions.

2.3.2 Metal Leaching Potential

Since drainage from quarry rock and road base will contact the receiving environment, metal concentrations in leachate generated by SFE tests are compared to the Canadian Council of Ministers of the Environment's (CCME) Canadian Environmental Quality Guidelines (CEQG; updated 2002) for the protection of freshwater aquatic life. This comparison is an initial screening tool in the identification of potential constituents of concern rather than a representation of future drainage compositions. SFE testing results are used as indicators of which metals have a potential to leach from a particular material.

3.0 RESULTS

3.1 Geology

The following table summarizes the lithology, sulphides and iron staining of samples collected from each of the eighteen sample locations.

TABLE 3-1: Rock Sample Location and Lithology

Station ID	Primary Lithology	Visible Sulphides	Iron Staining	Notes on Texture, Fabric, Weathering
2	Granite	None	None	Medium-grained, fresh to slightly weathered
3	Granite	None	traces on fracture surfaces	Medium-grained, fresh to slightly weathered
4	Granite-Granodiorite	None	None to trace	Fine- to medium-grained, fresh locally up to 0.5 cm weathering rind
5	Granite	None	None to trace on some fractures	Fresh, weakly foliated
7	Granite	None	Traces of iron staining, mostly on fractures	Fresh, fine- to medium-grained, weakly foliated
8	Quartzite	None to very minor	Iron staining on some surfaces	Fresh, fine- to medium-grained, weakly foliated
10	Granite/ Gneiss/ Quartzite	None	None to trace	Fresh, medium-grained
11	Felsite	None	None to trace	Fresh to slightly weathered, fine grained

Station ID	Primary Lithology	Visible Sulphides	Iron Staining	Notes on Texture, Fabric, Weathering
11B	Andesite	-	-	Moderately weathered, fine-grained
13	Metawacke	None	None to trace	Fresh to slightly weathered, fine-grained
15	Metawacke	None	None to trace	Fresh to slightly weathered
16	Metawacke	Trace	Trace	Slightly weathered
17	Mafic wacke/ granite gneiss	None	Trace	Slightly weathered
18	Mafic Volcanic	None	Minor to trace	Slightly weathered
19	Granite	None to trace	None to trace	Fresh to slightly weathered
20	Granite	None	Traces on fracture surfaces	Fresh
21	Granite	None	Trace	Fresh
22	Granite	None	Trace	Fresh, weakly foliated

None of the samples exhibited visible sulphides in greater than trace amounts, and iron staining was generally minor.

The presence of iron-bearing sulphides, particularly pyrite, is noteworthy since their oxidation results in acid production. The following equation represents the oxidation of pyrite and generation of acidity:

$$FeS_2\,(s) + (7/2)H_2O + (15/4)O_2\,(g) \rightarrow Fe(OH)_3\,(s) + 2SO_4^{2-}\,(aq) + 4H^+\,(aq)$$

This equation shows that pyrite in contact with water and air will produce rust ($Fe(OH)_3$), sulphate (SO_4^{2-}) and acid (H^+). Under acidic conditions, with a lack of buffering, the mobility of most metals in water is enhanced. Common acid buffering minerals include calcium-rich carbonates, such as calcite and dolomite, and silicates, such as feldspars, chlorite and micas. The latter minerals have some potential to neutralize acid, although they are less reactive than carbonate minerals (Blowes and Ptacek, 1994).

3.2 Rock Chemistry

Results of whole rock and elemental analyses are shown in Tables 3-2 and 3-3, respectively.

Silica and aluminium contents are variable between rock types, with silica ranging from 47 to 96 %, and aluminium ranging from 2 to 17 %. Volcanic rocks described as felsite and andesite have the lowest amount of quartz, and quartzite has the highest. The lowest aluminium concentrations are found in quartzite; the remaining lithologies have similar amounts. In all rock types except quartzite, the high concentrations of silica and aluminium can likely be attributed to the presence of aluminosilicate minerals, such as feldspar, chlorite and mica. In quartzite, the silica content is associated with quartz which makes up most of this rock type. Its calcium content is low, reflecting a paucity of carbonate minerals.

Metawacke samples have an average CaO concentration of 0.02%, suggesting a low proportion of calcium carbonate minerals. Felsite and andesite samples tend to have elevated levels of calcium, suggesting the presence of calcium-rich carbonate minerals.

3.3 ARD Potential

Results of ABA analyses are provided in Table 3-4. All samples are non acid-generating (NPAG) with NPR values ranging between 0.2 and 446. The carbonate NP is generally very similar to bulk NP (Figure 3.1) suggesting that the NP is provided by reactive carbonate minerals. Forty two of the 53 samples have NPR values above 2 and are considered NPAG on the basis of their NPR value (Figure 3.2). The 11 samples of quartzite and granite from stations 8, 10, 21 and 22 have NPR values lower than 2 but are also characterized by very low sulphide sulphur, ranging between 0.03% and 0.08%, and near-neutral paste pH. These samples contain mostly base-poor minerals, but even if applying a more restrictive sulphide content of 0.1% to qualify the ARD potential, these samples are still considered NPAG.

3.4 Metal Leaching

Results of static leach tests are shown in Table 3-5 and are compared to the CCME freshwater CEQG. All stations had at least one exceedance of one or more of the following: pH, Al, Cu, Cr and/or Se. Table 3-6 summarizes the exceedances noted.

TABLE 3-6: Summary of Exceedances

Station	Sample ID	Rock Type	CCME Exceedances	ARD Potential (INAC, 1992)
2	P2-2	Granite	Al, Cu	NPAG
3	P3-2	Granite	Al, Cu, Se	NPAG
4	P4-2	Granodiorite	Cu, Se	NPAG
5	P5-2	Granite	Al, Cu, Se	NPAG
7	P7-2	Granite	Al, Cu, Se	NPAG
8	P8-2	Quartzite	pH, Cu, Se	NPAG
	P8-3		pH, Al, Cu, Se	NPAG
10	P10-2	Granite/ Gneiss/ Quartzite	pH, Al, Cu, Se	NPAG
	P10-3		pH, Al, Cu, Se	NPAG
11	P11-2	Felsite	Al, As, Cu, Se	NPAG
	P11-3		Al, Cu, Se	NPAG
11B	P11b-2	Andesite	Al, Cu, Se	NPAG
	P11b-3		Al, As, Cu, Se	NPAG
13	P13-2	Metawacke	Al, Cu, Se	NPAG
15	P15-2	Metawacke	Al, Cu, Se	NPAG
	P15-3		Al, Cu, Se	NPAG
16	P16-2	Metawacke	Cu, Se	NPAG
17	P17-2	Mafic wacke/ Granite gneiss	Cr, Cu, Se	NPAG
	P17-3		Cr, Cu, Se	NPAG
18	P18-2	Mafic Volcanic	Cu, Se	NPAG
19	P19-2	Granite	Se	NPAG
20	P20-2	Granite	pH, Al, Cu, Se	NPAG
21	P21-2	Granite	pH, Al, Cu, Se	NPAG
22	P27-2	Granite	pH, Al, Cu, Se	NPAG

Leachate pH values range from 4.4 to 8.0, with samples outside of the range of acceptable pH for CEQG and/or MMER corresponding to samples from stations 8, 10, 20, 21 and 22. Most samples exceed CEQG for aluminium, copper and selenium, while arsenic and chromium are exceeded in two samples each. Aluminium concentrations that exceed the pH-dependent CEQG range from 0.007 to 0.270 mg/L. Copper concentrations that exceed the hardness-dependent CEQG range from 0.003 to 0.025 mg/L. Selenium concentrations exceed the CEQG of 0.001 mg/L, while the arsenic and chromium exceedances are for concentrations of 0.006/0.008 mg/L and 0.002/0.003 mg/L, respectively. The following regulated metals were below laboratory detection limits in the leachate of all samples: cadmium, lead, mercury, silver and thallium.

4.0 SUMMARY AND RECOMMENDATIONS

The objective of this assessment was to evaluate the acid rock drainage (ARD) and metal leaching (ML) potential of the rock to be used as aggregate during the construction of the Tehek Lake access road for the Meadowbank Gold Project, Nunavut. A total of fifty-three samples were collected from <1 km on either side of the proposed access road route, including samples of both intrusive and extrusive igneous rocks, and metasedimentary rocks. Samples from stations 8, 16 and 19 contained trace amounts of visible sulphides, while the remaining samples did not.

Results of whole rock and elemental analyses confirm an abundance of aluminosilicate minerals within the majority of the rock types. Aluminosilicates, such as feldspar and mica, which are typically present in the rock types being studied, provide some amount of acid neutralization potential, although they are less reactive (slower reaction kinetics and lower buffering pH) than carbonate minerals such as calcite or dolomite.

ABA results indicate that all samples are non acid generating, based on their neutralization potential ratio (NPR above 2 as per INAC (1992) guidelines), or based on their very low sulphide sulphur content.

Rock leachate pH values range from acidic to alkaline. Six of 24 samples are outside of the freshwater CEQG range for pH. The following metals exceed the freshwater CEQG for at least two samples: aluminium, arsenic, chromium, copper and selenium. These exceedances do not necessarily imply non-compliance of actual on-site drainage water quality. Concentrations of these constituents are expected to decrease with time, as soluble salts are flushed from the excavated rock.

Although quarry sites 8, 10, 21 and 22 have a sulphide content that is expected to be too low to generate ARD, consideration should be given to avoiding these quarry sites as a precautionary measure. The quality of runoff contacting the open quarry sites and the excavated rock should be monitored during construction to document the effect of exposure of the quarry rock on receiving water quality.

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TABLE 3-2
Tehek Lake Access Road - Whole Rock Analysis Results
Meadowbank Gold Project
Meadowbank Mining Corporation

Sample ID	Rock Type	SiO2 (%)	Al2O3 (%)	Fe2O3 (%)	CaO (%)	MgO (%)	Na2O (%)	K2O (%)	TiO2 (%)	MnO (%)	P2O5 (%)	Ba (ppm)	Sr (ppm)	Zr (ppm)	Y (ppm)	Sc (ppm)	LOI (%)	Total (%)
P2-1	Granite	66.13	13.26	6.87	2.67	1.04	3.18	3.92	0.84	0.08	0.26	1255	696	367	29	13	1.09	99.57
P2-2		61.75	14.51	8.57	3.37	1.33	3.32	3.23	1.03	0.10	0.34	1225	1104	427	36	17	1.92	99.75
P2-3		63.46	14.27	7.52	2.98	1.22	3.24	3.74	0.92	0.10	0.31	1273	1053	371	34	14	1.73	99.75
P3-1		68.11	15.23	3.23	1.92	1.50	4.91	2.38	0.37	0.05	0.12	682	1173	159	12	<5	1.34	99.35
P3-2		71.58	13.75	2.45	1.76	0.79	4.29	2.95	0.29	0.03	0.10	741	1386	127	9	<5	1.09	99.32
P3-3		71.74	13.67	2.54	1.83	0.71	3.99	2.96	0.27	0.04	0.11	816	1390	144	6	<5	1.25	99.34
P4-1	Granodiorite	69.37	14.18	3.52	3.37	1.27	4.26	0.91	0.30	0.04	0.13	472	1743	85	<5	<5	1.71	99.30
P4-2		60.79	15.86	6.88	4.89	3.31	4.00	0.51	0.64	0.08	0.18	228	1887	143	8	12	2.30	99.68
P4-3		63.69	16.61	4.59	4.74	1.71	4.87	0.78	0.47	0.06	0.21	386	2284	292	5	7	1.51	99.52
P5-1	Granite	75.44	11.56	1.28	2.07	0.57	3.76	1.56	0.13	0.02	0.08	657	1125	206	<5	<5	2.38	99.05
P5-2		64.51	16.07	4.20	3.57	2.03	4.25	1.75	0.44	0.06	0.15	491	1447	171	7	7	2.34	99.59
P5-3		64.12	14.19	5.79	4.21	2.65	3.67	1.83	0.73	0.08	0.08	459	1311	72	5	9	2.04	99.58
P7-1		58.60	16.42	6.62	3.48	3.55	5.44	1.18	0.74	0.10	0.17	690	1636	128	10	14	3.12	99.67
P7-2		55.59	15.24	7.29	4.62	5.76	4.72	0.82	0.63	0.13	0.25	329	1658	106	12	19	4.45	99.71
P7-3		58.24	15.48	7.14	3.35	3.82	5.14	1.14	0.75	0.09	0.20	474	1297	181	10	16	4.08	99.62
P8-1	Quartzite	94.29	2.44	0.35	<0.01	0.04	0.03	0.46	0.08	<0.01	<0.01	142	660	44	<5	<5	0.68	98.46
P8-2		93.79	3.65	0.52	0.05	0.09	0.07	0.57	0.10	<0.01	0.02	273	963	55	<5	<5	0.61	99.60
P8-3		92.93	4.08	0.53	0.02	0.05	0.09	0.35	0.09	<0.01	0.06	270	2151	149	<5	<5	0.86	99.32
P10-1	Granite/ Gneiss/ Quartzite	94.19	3.07	0.65	0.05	0.05	0.12	0.26	0.07	<0.01	0.04	76	2596	75	<5	<5	0.69	99.47
P10-2		96.01	1.54	0.43	<0.01	0.03	0.07	0.12	0.02	<0.01	0.06	27	2119	36	<5	<5	0.41	98.89
P10-3		95.86	1.73	0.51	<0.01	0.04	0.08	0.23	0.03	<0.01	0.02	37	1776	43	<5	<5	0.54	99.22
P11-1	Felsite	47.29	13.94	10.06	8.06	8.70	2.54	<0.01	0.64	0.16	0.09	75	1898	50	8	37	8.11	99.81
P11-2		49.28	14.33	10.46	9.37	6.70	2.98	<0.01	0.83	0.17	0.11	118	2250	45	11	42	5.41	99.89
P11-3		47.95	13.93	11.21	7.27	7.21	2.50	0.06	0.89	0.16	0.10	91	2028	51	10	40	8.30	99.83
P11b-1	Andesite	51.81	11.07	13.11	9.29	5.47	2.26	0.09	0.98	0.20	0.09	65	624	32	12	43	5.36	99.81
P11b-2		50.81	13.07	14.56	7.83	6.25	2.17	0.06	1.21	0.21	0.11	68	641	66	20	41	3.51	99.87
P11b-3		49.82	12.70	12.13	8.58	6.20	2.67	<0.01	1.12	0.18	0.13	47	1981	75	11	43	6.14	99.89
P13-1	Metawacke	69.00	14.04	3.97	1.43	1.70	3.73	1.97	0.42	0.05	0.17	536	1734	167	<5	8	2.83	99.56
P13-2		68.28	14.08	4.01	1.50	1.84	3.81	2.08	0.44	0.06	0.13	569	1404	148	5	8	2.94	99.38
P13-3		68.87	13.60	4.02	1.85	1.63	3.64	1.91	0.42	0.05	0.13	535	1609	157	<5	8	3.09	99.43
P15-1		67.90	14.39	3.79	1.96	1.33	4.13	2.17	0.43	0.06	0.17	724	1841	157	<5	9	2.91	99.50
P15-2		67.62	14.40	4.16	1.50	1.89	4.44	1.81	0.44	0.06	0.17	627	1916	184	<5	7	2.60	99.37
P15-3		67.75	13.80	3.98	2.21	1.60	4.16	1.65	0.42	0.06	0.20	580	2701	168	7	10	3.07	99.26
P16-1		69.47	13.98	3.85	1.89	1.68	4.12	1.73	0.40	0.05	0.19	754	2926	184	<5	8	1.29	99.05
P16-2		70.53	13.91	3.56	3.39	1.33	1.75	1.69	0.40	0.08	0.18	1753	3448	203	<5	6	2.10	99.47
P16-3		70.28	14.17	3.64	3.02	1.45	2.32	1.54	0.38	0.06	0.23	1341	4226	182	<5	8	1.86	99.52
P17-1	Mafic wacke/ granite gneiss	68.06	16.06	1.30	1.76	1.11	9.30	<0.01	0.16	0.03	0.09	44	4504	306	<5	5	1.13	99.47
P17-2		62.55	10.07	4.18	7.20	6.42	6.05	<0.01	0.27	0.12	0.13	69	3757	1034	7	<5	2.00	99.46
P17-3		83.82	4.42	1.60	2.14	2.47	2.71	<0.01	0.13	0.04	0.10	209	2656	509	<5	<5	0.67	98.43
P18-1	Mafic Volcanic	67.39	14.13	4.81	2.57	2.39	3.24	2.22	0.42	0.07	0.20	873	3678	146	<5	13	1.56	99.47
P18-2		65.16	14.21	5.41	3.29	2.96	3.36	2.05	0.46	0.09	0.27	724	3539	160	<5	14	1.77	99.46
P19-1	Granite	71.72	13.17	2.58	1.29	0.79	3.92	3.81	0.29	0.05	0.18	905	3009	181	7	5	0.88	99.10
P19-2		75.60	12.43	1.46	0.65	0.30	3.65	4.30	0.14	0.03	0.12	516	3101	140	<5	<5	0.51	99.56
P19-3		75.03	11.90	1.71	0.76	0.39	4.07	4.20	0.19	0.03	0.14	605	2518	116	7	<5	0.59	99.34
P20-1		76.84	11.46	1.60	0.53	0.34	3.29	3.90	0.15	0.03	0.13	471	2769	112	<5	<5	0.81	99.41
P20-2		76.53	11.46	1.63	0.42	0.48	3.10	4.12	0.17	0.03	0.13	610	2888	146	<5	<5	0.99	99.44
P20-3		77.78	11.35	0.99	0.22	0.23	3.00	4.44	0.08	0.02	0.16	304	4523	110	<5	<5	0.56	99.33
P21-1		77.15	11.48	1.48	0.33	0.27	3.39	3.88	0.14	0.02	0.13	371	3844	156	<5	<5	0.67	99.38
P21-2		74.74	12.66	1.40	0.33	0.25	3.65	5.02	0.16	0.02	0.08	520	191	86	7	<5	0.80	99.19
P21-3		75.46	12.15	1.30	0.29	0.38	3.30	5.12	0.15	0.03	0.08	501	183	87	6	<5	0.66	99.00
P27-1		80.26	9.70	0.62	0.12	0.15	3.15	4.10	0.05	<0.01	0.04	57	123	45	<5	<5	0.40	98.61
P27-2		77.80	10.98	0.61	0.19	0.13	3.58	4.56	0.06	<0.01	0.04	89	151	53	<5	<5	0.42	98.42
P27-3		78.39	10.88	0.81	0.14	0.16	3.30	4.50	0.07	<0.01	0.05	96	148	133	5	<5	0.46	98.80

Notes:
< = less than detection limit
ppm (parts per million) = mg/kg

TABLE 3-3
Tehek Lake Access Road - Elemental Analysis Results
Meadowbank Gold Project
Meadowbank Mining Corporation

Sample ID	Rock Type	Ag (ppm)	Al (%)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Ca (%)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cu (ppm)	Fe (%)	Hg (ppb)	K (%)	Mg (%)	Mn (ppm)	Mo (ppm)	Na (%)	Ni (ppm)	P (ppm)	Pb (ppm)	Sb (ppm)	Sr (ppm)	Ti (%)	V (ppm)	W (ppm)	Zn (ppm)
P2-1	Granite	<1	7.41	1	1523	<0.5	<5	2.04	<1	20	247	<1	5.42	<5	3.43	0.60	709	3	2.58	10	1128	24	<0.2	312	0.47	59	<10	122
P2-2		<1	7.93	4	1398	<0.5	<5	2.58	<1	26	211	<1	6.58	<5	2.83	0.79	849	<2	2.66	12	1422	25	0.2	360	0.58	75	<10	146
P2-3		<1	6.91	3	1419	<0.5	<5	2.24	<1	22	239	<1	5.84	10	3.04	0.62	778	3	2.54	10	1213	19	<0.2	309	0.51	70	<10	127
P3-1	Granite	<1	8.51	1	807	<0.5	<5	1.47	<1	9	218	<1	2.61	5	2.23	0.93	363	2	3.88	11	514	5	<0.2	351	0.19	39	<10	64
P3-2		<1	8.01	<1	923	<0.5	<5	1.42	<1	7	265	<1	2.02	10	2.72	0.51	311	3	3.30	8	396	14	<0.2	407	0.16	32	<10	55
P3-3		<1	8.16	<1	1043	0.6	<5	1.52	<1	7	295	<1	2.03	<5	2.86	0.47	316	3	3.21	10	409	21	<0.2	430	0.15	33	<10	55
P4-1	Granodiorite	<1	8.26	<1	575	<0.5	<5	2.80	<1	11	306	<1	2.68	<5	0.97	0.80	369	3	3.45	10	443	5	<0.2	606	0.16	57	<10	48
P4-2		<1	8.55	<1	253	<0.5	<5	3.38	<1	25	288	2	5.18	<5	0.51	1.97	654	<2	2.95	41	666	<2	<0.2	725	0.30	107	<10	110
P4-3		<1	9.11	<1	446	<0.5	<5	3.38	<1	14	242	2	3.37	<5	0.80	1.00	484	<2	3.65	12	734	2	<0.2	847	0.22	71	<10	63
P5-1	Granite	<1	7.48	1	909	<0.5	<5	1.84	<1	4	226	14	1.21	<5	1.57	0.39	222	3	3.24	9	220	7	<0.2	311	0.07	20	<10	22
P5-2		<1	8.80	3	577	<0.5	<5	2.80	<1	16	231	30	3.34	<5	1.54	1.19	531	<2	3.31	27	560	<2	<0.2	458	0.23	77	<10	55
P5-3		<1	8.05	3	551	<0.5	<5	3.37	<1	30	238	55	4.67	<5	1.77	1.65	655	<2	2.98	62	300	11	<0.2	398	0.43	98	<10	78
P7-1	Granite	<1	9.05	4	778	<0.5	<5	2.69	<1	30	180	12	5.13	<5	1.05	2.16	811	<2	4.04	48	628	<2	<0.2	483	0.39	139	<10	107
P7-2		<1	8.54	3	377	<0.5	<5	3.61	<1	34	246	<1	5.66	<5	0.81	3.55	1049	<2	3.69	103	948	<2	<0.2	509	0.36	142	<10	132
P7-3		<1	8.48	10	551	<0.5	<5	2.52	<1	31	207	51	5.32	<5	1.02	2.19	778	<2	3.82	51	731	10	<0.2	356	0.25	141	<10	113
P8-1	Quartzite	<1	1.40	3	216	<0.5	<5	0.02	<1	<1	375	<1	0.36	<5	0.52	0.02	17	7	0.07	6	38	12	<0.2	20	<0.01	7	<10	5
P8-2		<1	1.64	4	336	<0.5	<5	<0.01	<1	<1	392	<1	0.34	<5	0.57	0.02	15	7	0.07	7	29	8	<0.2	25	<0.01	8	<10	3
P8-3		<1	1.74	2	359	<0.5	<5	0.01	<1	<1	383	<1	0.46	<5	0.59	0.02	14	7	0.07	6	47	17	0.2	28	<0.01	9	<10	2
P10-1	Granite/ Gneiss/ Quartzite	<1	1.50	12	101	<0.5	<5	0.06	<1	<1	437	<1	0.52	<5	0.50	0.02	17	8	0.10	9	41	8	0.2	35	<0.01	13	<10	<2
P10-2		<1	1.02	4	50	<0.5	<5	0.01	<1	<1	501	<1	0.43	<5	0.38	0.01	17	9	0.05	8	27	8	<0.2	23	<0.01	5	<10	<2
P10-3		<1	1.07	6	56	<0.5	<5	0.01	<1	1	517	<1	0.50	<5	0.41	0.02	18	8	0.07	9	23	5	0.2	22	<0.01	6	<10	<2
P11-1	Felsite	<1	8.38	29	104	<0.5	<5	6.19	<1	51	264	65	7.63	<5	0.27	5.42	1352	<2	2.25	132	196	<2	0.4	297	0.29	241	<10	77
P11-2		<1	8.40	11	142	<0.5	<5	7.23	<1	49	168	104	7.98	<5	0.23	4.21	1424	<2	2.52	61	247	<2	0.4	394	0.43	331	<10	71
P11-3		<1	8.15	11	132	<0.5	<5	5.74	<1	57	197	276	8.67	<5	0.40	4.57	1386	<2	2.34	78	249	<2	0.3	242	0.44	453	<10	92
P11b-1	Andesite	<1	6.60	2	84	<0.5	<5	7.44	<1	64	47	44	10.11	15	0.22	3.54	1695	<2	2.16	38	293	<2	0.4	377	0.58	436	<10	80
P11b-2		<1	7.75	6	101	<0.5	<5	6.16	<1	71	77	81	11.12	<5	0.23	4.02	1783	<2	2.11	52	441	<2	0.6	311	0.69	410	<10	102
P11b-3		<1	7.57	8	57	<0.5	<5	6.83	<1	61	149	62	9.43	<5	0.18	4.02	1540	<2	2.52	66	339	<2	0.5	222	0.63	376	<10	83
P13-1	Metawacke	<1	8.18	6	747	0.7	<5	1.20	<1	11	170	21	3.17	<5	2.10	1.11	467	<2	3.17	28	505	2	<0.2	273	0.08	79	<10	67
P13-2		<1	7.92	23	786	0.7	<5	1.23	<1	14	160	17	3.18	<5	2.15	1.18	488	<2	3.19	29	498	13	<0.2	240	0.08	79	<10	73
P13-3		<1	8.19	11	762	0.8	<5	1.56	<1	14	159	21	3.30	10	2.07	1.10	457	<2	3.13	30	529	21	<0.2	265	0.06	83	<10	75
P15-1	Metawacke	<1	8.48	1	993	<0.5	<5	1.67	<1	18	149	33	3.17	<5	2.38	0.88	574	<2	3.62	31	637	16	<0.2	335	0.23	84	<10	64
P15-2		<1	8.41	<1	845	<0.5	<5	1.32	<1	19	187	36	3.44	<5	2.03	1.22	504	<2	3.84	28	597	12	<0.2	352	0.21	87	<10	74
P15-3		<1	7.86	<1	750	<0.5	<5	1.87	<1	17	214	44	3.18	<5	1.88	1.01	542	<2	3.51	29	585	30	<0.2	384	0.18	86	<10	78
P16-1	Metawacke	<1	8.52	1	1064	<0.5	<5	1.65	<1	17	206	19	3.18	<5	2.13	1.14	498	<2	3.59	30	577	36	<0.2	379	0.24	80	<10	167
P16-2		<1	8.56	1	2436	<0.5	<5	2.92	1	14	208	20	3.05	<5	2.09	0.90	772	<2	1.63	25	550	43	0.3	415	0.24	77	<10	630
P16-3		<1	8.51	<1	1846	<0.5	<5	2.69	<1	16	233	24	3.03	<5	2.08	0.97	600	4	2.14	26	542	42	<0.2	408	0.24	77	<10	237
P17-1	Mafic wacke/ granite gneiss	<1	9.50	<1	68	1.9	<5	1.58	<1	9	206	<1	1.12	<5	0.10	0.74	256	<2	>5.00	15	109	10	<0.2	702	0.10	19	<10	57
P17-2		2	6.01	1	93	7.4	<5	6.07	<1	41	317	<1	3.31	<5	0.08	4.32	1008	<2	>5.00	42	181	22	<0.2	326	0.16	62	<10	257
P17-3		1	2.91	<1	304	2.0	<5	1.94	<1	17	546	2	1.44	<5	0.06	1.75	372	7	2.38	29	115	13	<0.2	139	0.08	24	<10	101
P18-1	Mafic Volcanic	<1	8.92	<1	1219	<0.5	<5	2.31	<1	23	322	36	4.01	<5	2.73	1.65	693	4	3.01	53	546	33	0.3	484	0.27	101	<10	100
P18-2		<1	9.01	1	1023	1.2	<5	3.01	<1	26	343	37	4.58	<5	2.75	2.04	871	3	3.11	68	754	34	<0.2	598	0.30	112	<10	105
P19-1	Granite	<1	7.83	1	1202	1.4	<5	1.14	<1	6	276	<1	2.04	<5	3.86	0.51	448	4	3.29	8	437	20	0.3	339	0.16	30	<10	46
P19-2		<1	8.23	<1	784	3.1	<5	0.69	<1	3	295	<1	1.34	<5	4.82	0.20	272	4	3.44	6	191	42	<0.2	229	0.09	13	<10	27
P19-3		<1	8.18	<1	956	1.4	<5	0.78	<1	4	314	<1	1.58	<5	4.42	0.30	335	11	3.66	6	270	24	<0.2	253	0.12	17	112	34
P20-1	Granite	<1	7.70	<1	716	3.4	<5	0.57	<1	3	385	<1	1.47	<5	4.25	0.25	334	7	3.01	7	229	28	<0.2	201	0.07	15	<10	33
P20-2		<1	7.86	1	956	3.7	<5	0.47	<1	3	333	15	1.53	<5	4.47	0.37	292	4	2.87	8	294	16	<0.2	225	0.07	17	<10	89
P20-3		<1	7.50	<1	481	3.4	<5	0.26	<1	1	325	<1	0.93	<5	4.97	0.15	209	6	2.70	5	119	22	<0.2	115	0.03	8	<10	22
P21-1	Granite	3	7.47	<1	561	2.2	<5	0.37	<1	2	350	1	1.27	<5	4.31	0.19	241	8	3.02	8	197	21	<0.2	123	0.08	12	<10	26
P21-2		<1	7.30	1	607	2.1	<5	0.28	<1	3	284	7	1.14	<5	4.36	0.16	182	6	2.85	6	182	27	<0.2	112	0.08	11	<10	32
P21-3		<1	6.86	<1	570	1.8	<5	0.26	<1	2	272	3	1.02	<5	4.45	0.24	229	5	2.56	8	176	24	<0.2	98	0.06	10	<10	31
P27-1	Granite	<1	5.80	<1	79	2.0	<5	0.12	<1	1	329	11	0.53	<5	3.61	0.10	86	8	2.49	4	19	52	<0.2	21	0.02	5	<10	23
P27-2		<1	7.14	<1	127	3.2	<5	0.18	<1	1	268	8	0.56	<5	4.47	0.09	68	5	3.11	5	30	29	<0.2	34	0.03	5	<10	19
P27-3		<1	6.67	2	129	2.1	<5	0.14	<1	1	343	13	0.68	<5	4.14	0.11	89	6	2.77	5	36	46	0.2	28	0.03	6	<10	21

Notes:
< = less than detection limit
ppm (parts per million) = mg/kg

Tehek Lake Access Road - Acid-Base Accounting Analysis Results
Meadowbank Gold Project
Meadowbank Mining Corporation

Sample ID	Rock Type	PASTE pH	S(T) (%)	S(SO4) (%)	S(S2-) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	ARD Potential* NPR
P2-1	Granite	8.9	0.04	<0.01	0.04	1.3	7.7	6.5	6.2	0.02	1.7	NPAG
P2-2		8.9	0.05	<0.01	0.05	1.6	10.9	9.3	7.0	0.08	6.7	NPAG
P2-3		8.8	0.03	<0.01	0.03	0.9	8.7	7.8	9.3	0.05	4.2	NPAG
P3-1	Granite	9.5	<0.01	<0.01	<0.01	<0.3	7.3	7.3	48.7	0.04	3.3	NPAG
P3-2		9.6	0.02	<0.01	0.02	0.6	5.8	5.2	9.3	0.03	2.5	NPAG
P3-3		9.4	0.03	<0.01	0.03	0.9	5.6	4.7	6.0	0.04	3.3	NPAG
P4-1	Granodiorite	9.5	0.04	<0.01	0.04	1.3	15.1	13.9	12.1	0.14	11.7	NPAG
P4-2		9.1	0.09	<0.01	0.09	2.8	11.1	8.3	3.9	0.05	4.2	NPAG
P4-3		9.4	0.07	<0.01	0.07	2.2	10.4	8.2	4.8	0.07	5.8	NPAG
P5-1	Granite	9.8	0.03	<0.01	0.03	0.9	29.1	28.2	31.0	0.34	28.3	NPAG
P5-2		9.7	0.06	<0.01	0.06	1.9	19.6	17.7	10.5	0.19	15.8	NPAG
P5-3		9.5	0.10	<0.01	0.10	3.1	18.2	15.1	5.8	0.17	14.2	NPAG
P7-1	Granite	9.6	0.04	<0.01	0.04	1.3	23.8	22.6	19.0	0.21	17.5	NPAG
P7-2		9.6	0.04	<0.01	0.04	1.3	43.7	42.5	35.0	0.46	38.3	NPAG
P7-3		9.4	0.23	<0.01	0.23	7.2	43.2	36.0	6.0	0.45	37.5	NPAG
P8-1	Quartzite	8.3	0.02	<0.01	0.02	0.6	0.6	0.0	1.0	<0.01	<0.8	NPAG
P8-2		7.2	0.03	<0.01	0.03	0.9	0.5	-0.4	0.5	<0.01	<0.8	NPAG
P8-3		6.3	0.03	<0.01	0.03	0.9	0.4	-0.5	0.4	<0.01	<0.8	NPAG
P10-1	Granite/ Gneiss/ Quartzite	8.4	0.03	<0.01	0.03	0.9	1.1	0.2	1.2	0.01	0.8	NPAG
P10-2		8.0	0.03	<0.01	0.03	0.9	0.5	-0.4	0.5	<0.01	<0.8	NPAG
P10-3		6.8	0.03	<0.01	0.03	0.9	0.2	-0.7	0.2	<0.01	<0.8	NPAG
P11-1	Felsite	8.9	0.07	<0.01	0.07	2.2	89.2	87.0	40.8	1.01	84.2	NPAG
P11-2		8.8	0.10	0.01	0.09	2.8	58.4	55.6	20.8	0.66	55.0	NPAG
P11-3		9.0	0.16	<0.01	0.16	5.0	98.9	93.9	19.8	1.14	95.0	NPAG
P11b-1	Andesite	9.0	<0.01	<0.01	<0.01	<0.3	66.9	66.9	446.0	0.75	62.5	NPAG
P11b-2		9.1	0.17	<0.01	0.17	5.3	17.0	11.7	3.2	0.14	11.7	NPAG
P11b-3		9.0	0.08	<0.01	0.08	2.5	71.4	68.9	28.6	0.80	66.7	NPAG
P13-1	Metawacke	9.5	0.16	<0.01	0.16	5.0	24.6	19.6	4.9	0.26	21.7	NPAG
P13-2		9.4	0.16	<0.01	0.16	5.0	27.4	22.4	5.5	0.31	25.8	NPAG
P13-3		9.7	0.11	<0.01	0.11	3.4	33.1	29.7	9.6	0.67	55.8	NPAG
P15-1	Metawacke	9.6	0.04	<0.01	0.04	1.3	36.6	35.4	29.3	0.43	35.8	NPAG
P15-2		9.3	0.08	<0.01	0.08	2.5	27.6	25.1	11.0	0.32	26.7	NPAG
P15-3		9.5	0.12	0.03	0.09	2.8	42.4	39.6	15.1	0.50	41.7	NPAG
P16-1	Metawacke	9.3	0.02	<0.01	0.02	0.6	7.6	7.0	12.2	0.05	4.2	NPAG
P16-2		8.6	0.07	<0.01	0.07	2.2	6.2	4.0	2.8	0.04	3.3	NPAG
P16-3		9.0	0.07	<0.01	0.07	2.2	11.1	8.9	5.1	0.08	6.7	NPAG
P17-1	Mafic wacke/ granite gneiss	10.1	<0.01	<0.01	<0.01	<0.3	16.9	16.9	112.7	0.18	15.0	NPAG
P17-2		9.7	<0.01	<0.01	<0.01	<0.3	24.1	24.1	160.7	0.24	20.0	NPAG
P17-3		9.6	<0.01	<0.01	<0.01	<0.3	3.9	3.9	26.0	0.01	0.8	NPAG
P18-1	Mafic Volcanic	9.3	0.01	<0.01	0.01	0.3	5.7	5.4	18.2	<0.01	<0.8	NPAG
P18-2		9.1	0.02	<0.01	0.02	0.6	5.6	5.0	9.0	<0.01	<0.8	NPAG
P19-1	Granite	9.2	<0.01	<0.01	<0.01	<0.3	3.4	3.4	22.7	<0.01	<0.8	NPAG
P19-2		9.4	<0.01	<0.01	<0.01	<0.3	2.9	2.9	19.3	<0.01	<0.8	NPAG
P19-3		9.3	<0.01	<0.01	<0.01	<0.3	3.0	3.0	20.0	<0.01	<0.8	NPAG
P20-1	Granite	7.9	<0.01	<0.01	<0.01	<0.3	2.4	2.4	16.0	<0.01	<0.8	NPAG
P20-2		7.8	<0.01	<0.01	<0.01	<0.3	2.0	2.0	13.3	<0.01	<0.8	NPAG
P20-3		8.3	<0.01	<0.01	<0.01	<0.3	1.4	1.4	9.3	<0.01	<0.8	NPAG
P21-1	Granite	7.9	<0.01	<0.01	<0.01	<0.3	1.5	1.5	10.0	<0.01	<0.8	NPAG
P21-2		7.7	0.04	<0.01	0.04	1.3	1.7	0.5	1.4	<0.01	<0.8	NPAG
P21-3		8.3	0.05	<0.01	0.05	1.6	1.9	0.3	1.2	<0.01	<0.8	NPAG
P27-1	Granite	8.2	0.03	<0.01	0.03	0.9	1.0	0.1	1.1	<0.01	<0.8	NPAG
P27-2		8.8	0.06	<0.01	0.06	1.9	2.4	0.5	1.3	<0.01	<0.8	NPAG
P27-3		7.7	0.08	<0.01	0.08	2.5	1.2	-1.3	0.5	<0.01	<0.8	NPAG

Method Detection Limit	PASTE pH	S(T) (%)	S(SO4) (%)	S(S2-) (%)	AP	NP	NET NP	NP/AP	TIC (%)	CARBONATE NP	ARD Potential NPR
CEMI	0.01	0.01	0.01	-	0.3	-	-	-	0.01	0.8*	-

Notes:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from calculated sulphide sulphur content: S(T) - S(S04), assuming total conversion of sulphide to sulphate.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET NP = Net neutralization potential = Tonnes CaCO3 equivalent per 1000 tonnes of material.

TIC = Total Inorganic Carbon as %C.

PAG = Potentially acid generating; NPAG non acid generating

Where S(SO4) is reported as <0.01%, it is assumed to be zero for the AP calculation (ie. if S(SO4) is less than 0.01%,AP is calculated from S(T) only).

Carbonate NP calculated from total inorganic carbon (TIC) assay. TIC value of 0.01 is used in calculation if TIC <0.01%.

Non-detect values assumed to be equal to one half the detection limit in calculations of average, median and standard deviation, where applicable.

* Classification of ARD potential based on guidelines provided by INAC (1992) and Price (1997). Samples having <0.1% total sulphur are considered NPAG

TABLE 3-5
Tehek Lake Access Road - Shake Flask Extraction Leachate Concentrations
Meadowbank Gold Project
Meadowbank Mining Corporation

CCME (CEQG) (freshwater aquatic life) (mg/L)**		**6.5 - 9.0**							**0.00010**	**0.005 - 0.1**	**0.005**						**0.000017**		**0.001 / 0.0089**	**0.002 - 0.004**	**0.3**
Metal Mine Effluent Regulation (MMER)[8] (mg/L)**		6.0-9.5									0.5									0.3	
									Dissolved Metals (mg/L)												
Sample ID	**Rock Type**	**pH** (s.u.)	**Conductivity** (uS/cm)	**Acidity - pH 4.5** (mg/L as CaCO3)	**Acidity - pH 8.3** (mg/L as CaCO3)	**Alkalinity** (mg/L as CaCO3)	**Sulphate** (mg/L)	**Calculated Hardness** (mg/L as CaCO3)	**Ag*** (mg/L)	**Al[1]** (mg/L)	**As** (mg/L)	**B** (mg/L)	**Ba** (mg/L)	**Be** (mg/L)	**Bi** (mg/L)	**Ca** (mg/L)	**Cd[3,*]** (mg/L)	**Co** (mg/L)	**Cr[2]** (mg/L)	**Cu[3]** (mg/L)	**Fe** (mg/L)
P2-2	Granite	7.8	95	<1.0	5.8	46.0	3	40.6	< 0.00025	**0.140**	0.001	< 0.05	0.005	< 0.001	< 0.001	15.4	< 0.0002	< 0.001	< 0.001	**0.007**	< 0.05
P3-2		7.7	57	<1.0	2.5	33.0	<1	25.7	< 0.00025	**0.120**	< 0.001	< 0.05	0.003	< 0.001	< 0.001	9.69	< 0.0002	< 0.001	< 0.001	0.002	< 0.05
P4-2	Granodiorite	7.7	68	<1.0	3.3	33.5	4	34.7	< 0.00025	0.099	< 0.001	< 0.05	0.006	< 0.001	< 0.001	12.6	< 0.0002	< 0.001	< 0.001	**0.013**	< 0.05
P5-2	Granite	7.8	82	<1.0	3.0	48.0	<1	39.6	< 0.00025	**0.190**	0.001	< 0.05	0.003	< 0.001	< 0.001	15.3	< 0.0002	< 0.001	< 0.001	**0.010**	< 0.05
P7-2		7.9	88	<1.0	0.8	48.5	<1	44.3	< 0.00025	**0.170**	0.001	< 0.05	0.004	< 0.001	< 0.001	16.7	< 0.0002	< 0.001	< 0.001	**0.005**	< 0.05
P8-2	Quartzite	**6.0**	3	<1.0	4.5	2.5	<1	0.2	< 0.00025	0.005	0.001	< 0.05	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	**0.003**	< 0.05
P8-3		**5.5**	6	<1.0	2.0	3.5	<1	0.3	< 0.00025	**0.007**	< 0.001	< 0.05	0.026	< 0.001	< 0.001	0.09	< 0.0002	< 0.001	< 0.001	**0.009**	< 0.05
P10-2	Granite/ Gneiss/ Quartzite	**5.7**	4	<1.0	2.0	2.5	<1	0.2	< 0.00025	**0.031**	0.003	< 0.05	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	**0.013**	< 0.05
P10-3		**4.4**	15	2.8	1.8	<1.0	<1	1.1	< 0.00025	**0.048**	< 0.001	< 0.05	0.025	< 0.001	< 0.001	0.29	< 0.0002	0.001	< 0.001	**0.010**	0.24
P11-2	Felsite	7.9	126	<1.0	2.0	51.5	16	60.0	< 0.00025	**0.150**	**0.008**	< 0.05	0.020	< 0.001	< 0.001	20.9	< 0.0002	< 0.001	< 0.001	**0.012**	< 0.05
P11-3		8.0	106	<1.0	2.5	63.0	<1	55.2	< 0.00025	**0.240**	0.002	< 0.05	0.033	< 0.001	< 0.001	19.2	< 0.0002	< 0.001	< 0.001	**0.009**	< 0.05
P11b-2	Andesite	7.9	97	<1.0	1.8	52.0	<1	50.8	< 0.00025	**0.160**	0.002	< 0.05	0.083	< 0.001	< 0.001	18.0	< 0.0002	< 0.001	< 0.001	**0.004**	< 0.05
P11b-3		8.0	105	<1.0	2.5	57.8	<1	53.8	< 0.00025	**0.160**	**0.006**	< 0.05	0.016	< 0.001	< 0.001	19.5	< 0.0002	< 0.001	< 0.001	**0.013**	< 0.05
P13-2	Metawacke	7.9	91	<1.0	3.3	38.8	<1	45.0	< 0.00025	**0.160**	0.003	< 0.05	0.010	< 0.001	< 0.001	15.9	< 0.0002	< 0.001	< 0.001	**0.006**	< 0.05
P15-2		7.8	137	<1.0	1.8	51.3	23	58.0	< 0.00025	**0.160**	< 0.001	< 0.05	0.007	< 0.001	< 0.001	21.1	< 0.0002	< 0.001	< 0.001	**0.025**	< 0.05
P15-3		7.7	110	<1.0	2.8	57.8	3	50.4	< 0.00025	**0.180**	< 0.001	< 0.05	0.005	< 0.001	< 0.001	18.4	< 0.0002	< 0.001	< 0.001	**0.018**	< 0.05
P16-2		7.4	138	<1.0	2.8	31.5	38	57.4	< 0.00025	0.078	< 0.001	< 0.05	0.025	< 0.001	< 0.001	20.4	< 0.0002	< 0.001	< 0.001	**0.016**	< 0.05
P17-2	Mafic wacke/ Granite gneiss	7.9	109	<1.0	3.3	59.0	3	53.8	< 0.00025	0.023	0.001	< 0.05	0.120	< 0.001	< 0.001	14.1	< 0.0002	< 0.001	**0.002**	**0.010**	< 0.05
P17-3		7.3	56	<1.0	3.0	32.0	3	30.1	< 0.00025	0.021	< 0.001	< 0.05	0.180	< 0.001	< 0.001	8.62	< 0.0002	< 0.001	**0.003**	**0.012**	< 0.05
P18-2	Mafic Volcanic	7.4	31	<1.0	2.5	12.3	1	8.1	< 0.00025	0.068	< 0.001	< 0.05	0.003	< 0.001	< 0.001	1.61	< 0.0002	< 0.001	< 0.001	**0.005**	< 0.05
P19-2	Granite	6.7	8	<1.0	1.5	4.5	<1	1.1	< 0.00025	0.026	< 0.001	< 0.05	0.001	< 0.001	< 0.001	0.32	< 0.0002	< 0.001	< 0.001	0.001	< 0.05
P20-2		**5.8**	4	<1.0	2.0	3.5	<1	0.2	< 0.00025	**0.048**	< 0.001	< 0.05	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	**0.004**	< 0.05
P21-2		**5.9**	12	<1.0	2.3	3.0	<1	0.2	< 0.00025	**0.071**	< 0.001	< 0.05	< 0.001	< 0.001	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	**0.003**	< 0.05
P27-2		**5.4**	21	<1.0	3.8	2.5	<1	1.0	< 0.00025	**0.270**	< 0.001	< 0.05	0.003	< 0.001	< 0.001	0.25	< 0.0002	< 0.001	< 0.001	**0.003**	< 0.05

									Dissolved Metals (mg/L)											
Method Detection Limit	**pH** (s.u.)	**Conductivity** (uS/cm)	**Acidity - pH 4.5** (mg/L as CaCO3)	**Acidity - pH 8.3** (mg/L as CaCO3)	**Alkalinity** (mg/L as CaCO3)	**Sulphate** (mg/L)	**Hardness** (mg/L as CaCO3)	**Ag** (mg/L)	**Al[1]** (mg/L)	**As** (mg/L)	**B** (mg/L)	**Ba** (mg/L)	**Be** (mg/L)	**Bi** (mg/L)	**Ca** (mg/L)	**Cd[3]** (mg/L)	**Co** (mg/L)	**Cr[2]** (mg/L)	**Cu[3]** (mg/L)	**Fe** (mg/L)
CEMI	0.01	2	1.0	1.0	1.0	1.0	-	0.00025	0.001	0.001	0.05	0.001	0.001	0.001	0.05	0.0002	0.001	0.001	0.001	0.05

Notes:

1. Freshwater Aquatic Life Guideline is pH, calcium and DOC dependent. Exceedances identified apply pH criterion.
2. Freshwater Aquatic Life Guideline for chromium depends on valence of chromium ion (Cr(III) = 0.0089 mg/L, Cr(VI) = 0.001 mg/L).
3. Freshwater Aquatic Life Guideline is hardness dependent.
4. Freshwater Aquatic Life Guideline listed for inorganic fluorides.
5. CEQG stipulates that concentrations that stimulate weed growth should be avoided.
6. Maximum authorized monthly mean concentration (based on **total** concentration).

CEQG Freshwater Guidelines and Criteria are based on **total** metal concentrations, except for aluminum (dissolved aluminum criteria).
< = less than the analytical detection limit.
* Laboratory detection limit exceeds the CEQG.
Non-detect values assumed to be equal to one half the detection limit in calculations of average, median and standard deviation, where applicable.

TABLE 3-5
Tehek Lake Access Road - Shake Flask Extraction Leachate Concentrations
Meadowbank Gold Project
Meadowbank Mining Corporation

CCME (CEQG) (freshwater aquatic life) (mg/L)**		**0.00010**					**0.073**		**0.025 - 0.15**		**0.001 - 0.007**		**0.001**							**0.0008**			**0.03**	
Metal Mine Effluent Regulation (MMER)[8] (mg/L)**									0.5		0.2												0.5	
Sample ID	**Rock Type**	***Dissolved Metals (mg/L)***																						
		Hg* (mg/L)	**K** (mg/L)	**Li** (mg/L)	**Mg** (mg/L)	**Mn** (mg/L)	**Mo** (mg/L)	**Na** (mg/L)	**Ni[3]** (mg/L)	**PO4** (mg/L)	**Pb[3]** (mg/L)	**Sb** (mg/L)	**Se** (mg/L)	**Si** (mg/L)	**Sn** (mg/L)	**Sr** (mg/L)	**Te** (mg/L)	**Th** (mg/L)	**Ti** (mg/L)	**Tl** (mg/L)	**U** (mg/L)	**V** (mg/L)	**Zn** (mg/L)	**Zr** (mg/L)
P2-2	Granite	< 0.02	4.4	0.003	0.50	0.009	0.0034	1.37	< 0.001	< 0.15	< 0.001	< 0.001	0.001	2.1	< 0.001	0.032	< 0.001	< 0.0005	< 0.001	< 0.0001	0.001	< 0.001	< 0.005	< 0.01
P3-2		< 0.02	2.1	< 0.001	0.37	0.018	< 0.0005	1.36	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.3	< 0.001	0.018	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P4-2	Granodiorite	< 0.02	1.5	< 0.001	0.79	0.012	< 0.0005	1.34	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.3	< 0.001	0.023	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P5-2	Granite	< 0.02	1.9	< 0.001	0.34	0.022	< 0.0005	0.91	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.9	< 0.001	0.026	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P7-2		< 0.02	1.0	< 0.001	0.63	0.010	< 0.0005	0.54	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.4	< 0.001	0.054	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P8-2	Quartzite	< 0.02	0.9	< 0.001	< 0.05	< 0.001	< 0.0005	0.17	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.4	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	0.020	< 0.01
P8-3		< 0.02	1.4	0.001	< 0.05	0.002	< 0.0005	0.10	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.2	< 0.001	0.003	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P10-2	Granite/ Gneiss/ Quartzite	< 0.02	1.1	< 0.001	< 0.05	< 0.001	< 0.0005	0.20	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.1	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P10-3		< 0.02	1.3	< 0.001	0.09	0.011	< 0.0005	0.14	0.002	< 0.15	< 0.001	< 0.001	**0.002**	0.8	< 0.001	0.004	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	0.012	< 0.01
P11-2	Felsite	< 0.02	1.3	0.001	1.90	0.007	< 0.0005	0.99	< 0.001	< 0.15	< 0.001	0.002	**0.002**	2.2	< 0.001	0.040	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	0.002	< 0.005	< 0.01
P11-3		< 0.02	1.0	0.002	1.75	0.007	< 0.0005	0.94	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.7	< 0.001	0.054	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	0.002	< 0.005	< 0.01
P11b-2	Andesite	< 0.02	1.0	< 0.001	1.42	0.007	< 0.0005	0.92	< 0.001	< 0.15	< 0.001	0.002	**0.002**	2.4	< 0.001	0.035	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	0.002	< 0.005	< 0.01
P11b-3		< 0.02	0.7	< 0.001	1.24	0.007	0.0088	0.84	< 0.001	< 0.15	< 0.001	0.001	**0.002**	2.1	< 0.001	0.025	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	0.002	< 0.005	< 0.01
P13-2	Metawacke	< 0.02	2.3	< 0.001	1.27	0.024	0.0028	0.75	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.3	< 0.001	0.110	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P15-2		< 0.02	5.1	0.001	1.29	0.039	0.0030	2.11	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.8	< 0.001	0.140	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0015	< 0.001	< 0.005	< 0.01
P15-3		< 0.02	3.9	0.001	1.08	0.035	0.0019	1.54	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.5	< 0.001	0.120	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0016	< 0.001	< 0.005	< 0.01
P16-2		< 0.02	4.1	0.002	1.55	0.037	0.0011	1.23	0.001	< 0.15	< 0.001	< 0.001	**0.002**	3.0	< 0.001	0.044	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0009	< 0.001	< 0.005	< 0.01
P17-2	Mafic wacke/ Granite gneiss	< 0.02	0.5	0.001	4.52	0.008	< 0.0005	2.59	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	12.4	< 0.001	0.100	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0092	0.002	< 0.005	< 0.01
P17-3		< 0.02	0.5	< 0.001	2.08	0.009	< 0.0005	1.68	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	7.9	< 0.001	0.100	< 0.001	< 0.0005	0.001	< 0.0001	0.0009	0.001	< 0.005	< 0.01
P18-2	Mafic Volcanic	< 0.02	3.3	0.002	1.00	0.011	0.0087	2.15	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.9	< 0.001	0.012	< 0.001	< 0.0005	0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P19-2	Granite	< 0.02	0.7	< 0.001	0.08	0.005	< 0.0005	0.92	< 0.001	< 0.15	< 0.001	0.003	**0.002**	1.3	< 0.001	0.002	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01
P20-2		< 0.02	0.4	< 0.001	< 0.05	0.002	< 0.0005	0.46	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.0	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0008	< 0.001	< 0.005	< 0.01
P21-2		< 0.02	0.6	< 0.001	< 0.05	< 0.001	< 0.0005	1.08	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	2.9	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.0001	0.0015	< 0.001	< 0.005	< 0.01
P27-2		< 0.02	1.2	< 0.001	0.08	0.009	< 0.0005	1.00	< 0.001	< 0.15	< 0.001	< 0.001	**0.002**	1.4	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.005	< 0.01

Method Detection Limit	***Dissolved Metals (mg/L)***																						
	Hg (mg/L)	**K (mg/L)**	**Li (mg/L)**	**Mg (mg/L)**	**Mn (mg/L)**	**Mo (mg/L)**	**Na (mg/L)**	**Ni[3] (mg/L)**	**PO4 (mg/L)**	**Pb[3] (mg/L)**	**Sb (mg/L)**	**Se (mg/L)**	**Si (mg/L)**	**Sn (mg/L)**	**Sr (mg/L)**	**Te (mg/L)**	**Th (mg/L)**	**Ti (mg/L)**	**Tl (mg/L)**	**U (mg/L)**	**V (mg/L)**	**Zn (mg/L)**	**Zr (mg/L)**
CEMI	0.02	1.0	0.001	0.05	0.001	0.0005	1.00	0.001	0.15	0.001	0.001	0.001	0.05	0.001	0.001	0.001	0.0005	0.001	0.0001	0.0005	0.001	0.005	0.01

NOTES:

1. Freshwater Aquatic Life Guideline is pH, calcium and DOC dependent. Exceedances identified apply pH criterion.
2. Freshwater Aquatic Life Guideline for chromium depends on valence of chromium ion (Cr(III) = 0.0089 mg/L, Cr(VI) = 0.001 mg/L).
3. Freshwater Aquatic Life Guideline is hardness dependent.
4. Freshwater Aquatic Life Guideline listed for inorganic fluorides.
5. CEQG stipulates that concentrations that stimulate weed growth should be avoided.
6. Maximum authorized monthly mean concentration (based on **total** concentration).

CEQG Freshwater Guidelines and Criteria are based on **total** metal concentrations, except for aluminum (dissolved aluminum criteria).
< = less than the analytical detection limit.
* Laboratory detection limit exceeds the CEQG.
Non-detect values assumed to be equal to one half the detection limit in calculations of average, median and standard deviation, where applicable.

REVISION DATE: 05/10/4 3:5pm By: WLi CADD FILE: N:\Bur-Graphics\Projects\2004\1413\04-1413-086\Drafting\cad\04-1413-086sk-38.dwg

7180000 N
7175000 N
7170000 N
7165000 N
7160000 N
7155000 N
7150000 N
7145000 N
7140000 N
7135000 N
7130000 N
620000 E
625000 E
630000 E
635000 E
640000 E
645000 E
650000 E

STATION 11
STATION 11B
STATION 10
STATION 8
STATION 7
STATION 5
STATION 4
STATION 3
STATION 2

GRID NORTH
TRUE NORTH
LOCAL MINE GRID NORTH
N

LEGEND

ACCESS ROAD

PROPOSED ALTERNATIVE ROAD

STATION 15 STATION ID

0 1000 2000 3000 4000 5000
Scale in Meters

PROJECT
CUMBERLAND RESOURCES LTD.

TITLE
QUARRY SITES AND SAMPLE LOCATIONS - SOUTH

Golder Associates

PROJECT No.	04-1413-086	
DESIGN	JK	03OCT05
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CHECK	JK	03OCT05
REVIEW	VB	03OCT05

FILE No. 04-1413-086sk-38
SCALE AS SHOWN REV. –

FIG 2-1A

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620000 E
625000 E
630000 E
635000 E
640000 E
645000 E
650000 E

7220000 N
7215000 N
7210000 N
7205000 N
7200000 N
7195000 N
7190000 N
7185000 N
7180000 N
7175000 N
7170000 N

MEADOWBANK
MINE SITE

STATION 22
STATION 21
STATION 20
STATION 19
STATION 18
STATION 17
STATION 16
STATION 15
STATION 13
STATION 11
STATION 11B

GRID NORTH
TRUE NORTH
LOCAL MINE GRID NORTH

LEGEND

ACCESS ROAD

PROPOSED ALTERNATIVE ROAD

STATION 15 STATION ID

0 1000 2000 3000 4000 5000
Scale in Meters

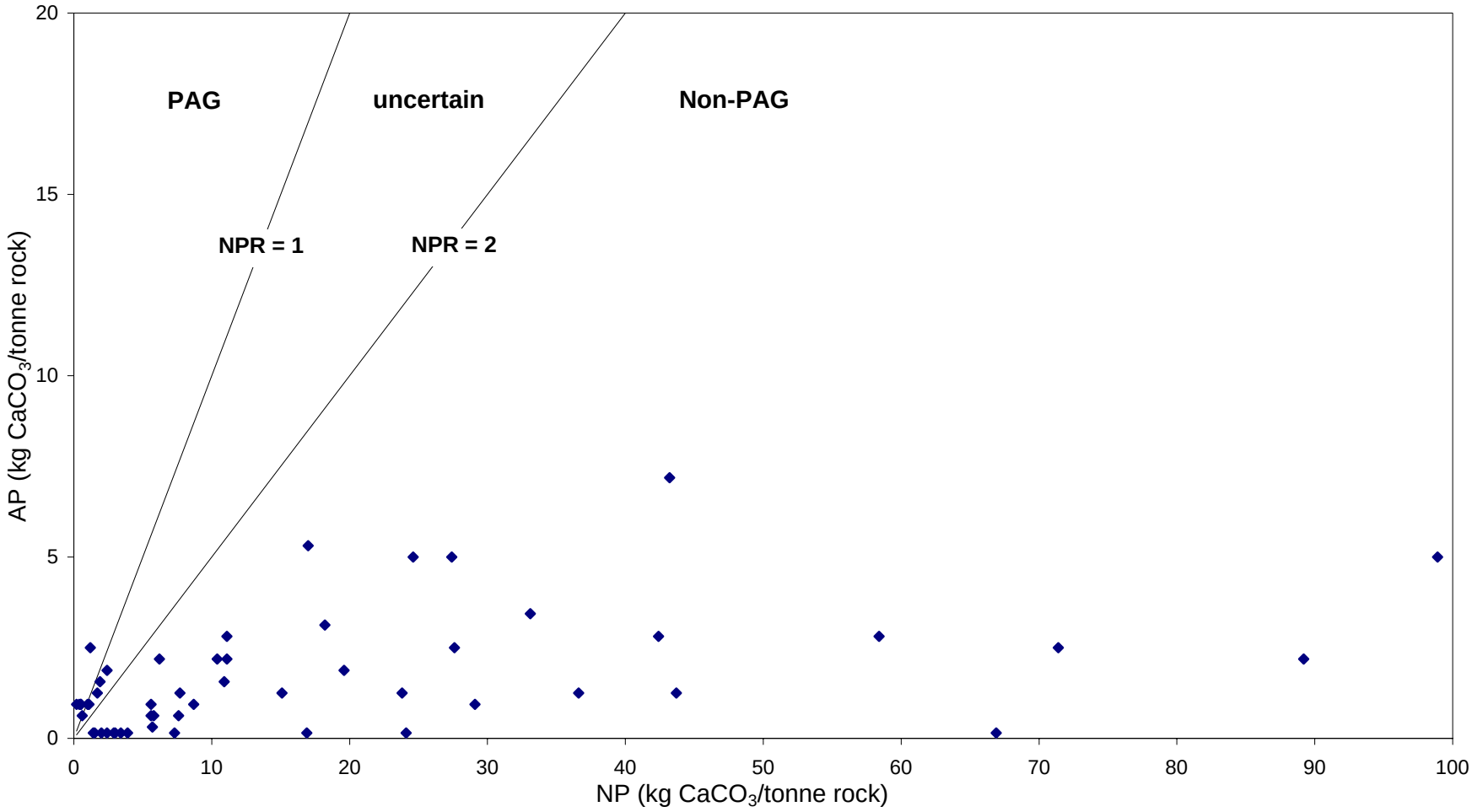
PROJECT
CUMBERLAND RESOURCES LTD.

TITLE
QUARRY SITES AND SAMPLE LOCATIONS - NORTH

Golder Associates

PROJECT No. 04-1413-086		FILE No. 04-1413-086sk-38
DESIGN	JK	03OCT05
CADD	WLI	03OCT05
CHECK	JK	03OCT05
REVIEW	VB	03OCT05
SCALE AS SHOWN		REV. –

FIG 2-1B



Golder Associates

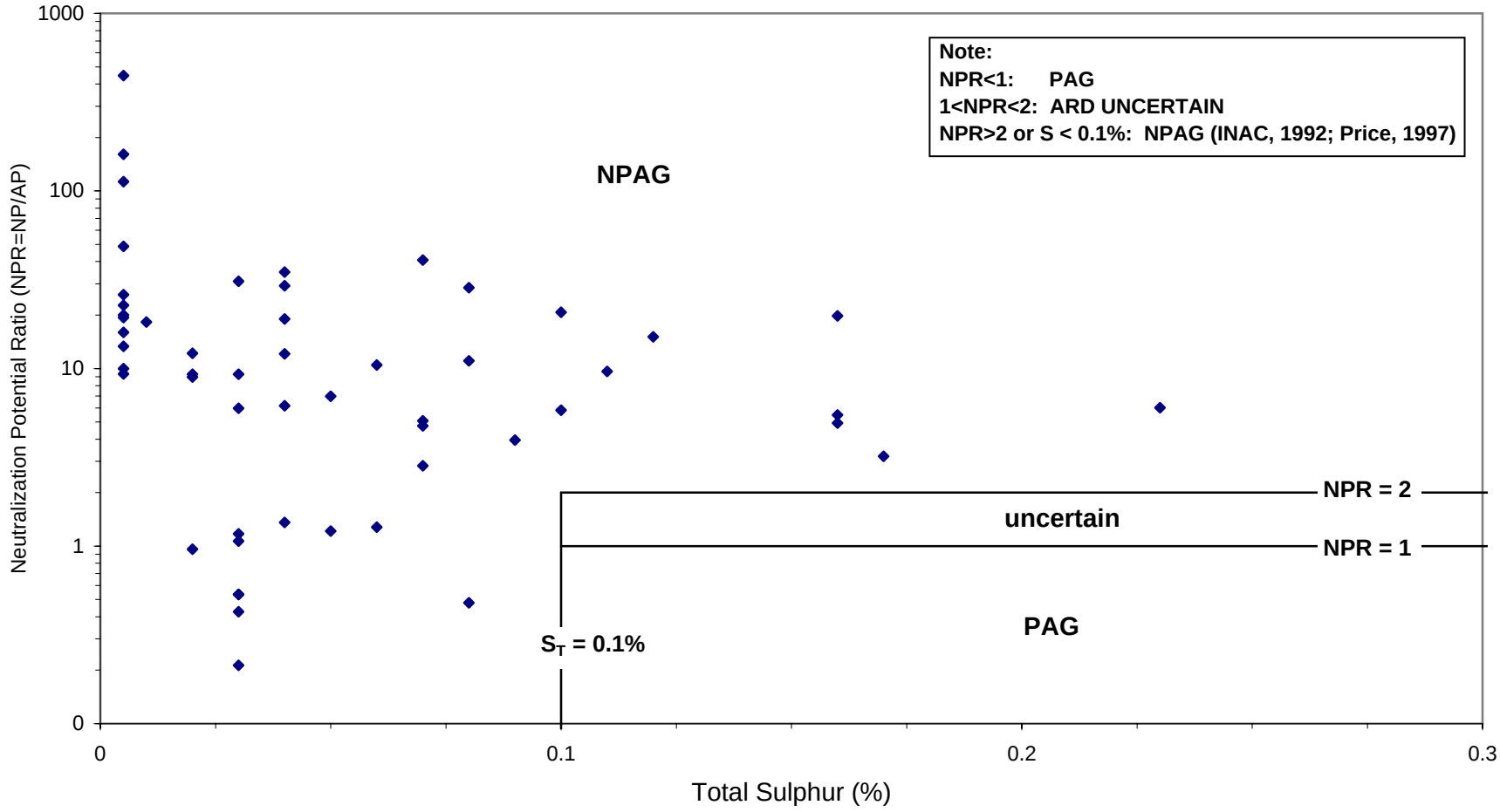
Quarry Access Road Geochemical Evaluation
Meadowbank Gold Project

CUMBERLAND RESOURCES LTD.

TITLE

Neutralization Potential (NP) vs. Acid Potential (AP)

DRAWN	JMC	DATE	September 2005	JOB NO.	04-1413-086/5000
CHECKED	VJB	SCALE	n/a	DWG. NO.	
REVIEWED	VJB	FILE NO.		FIGURE NO.	**3.1**



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Meadowbank Gold Project

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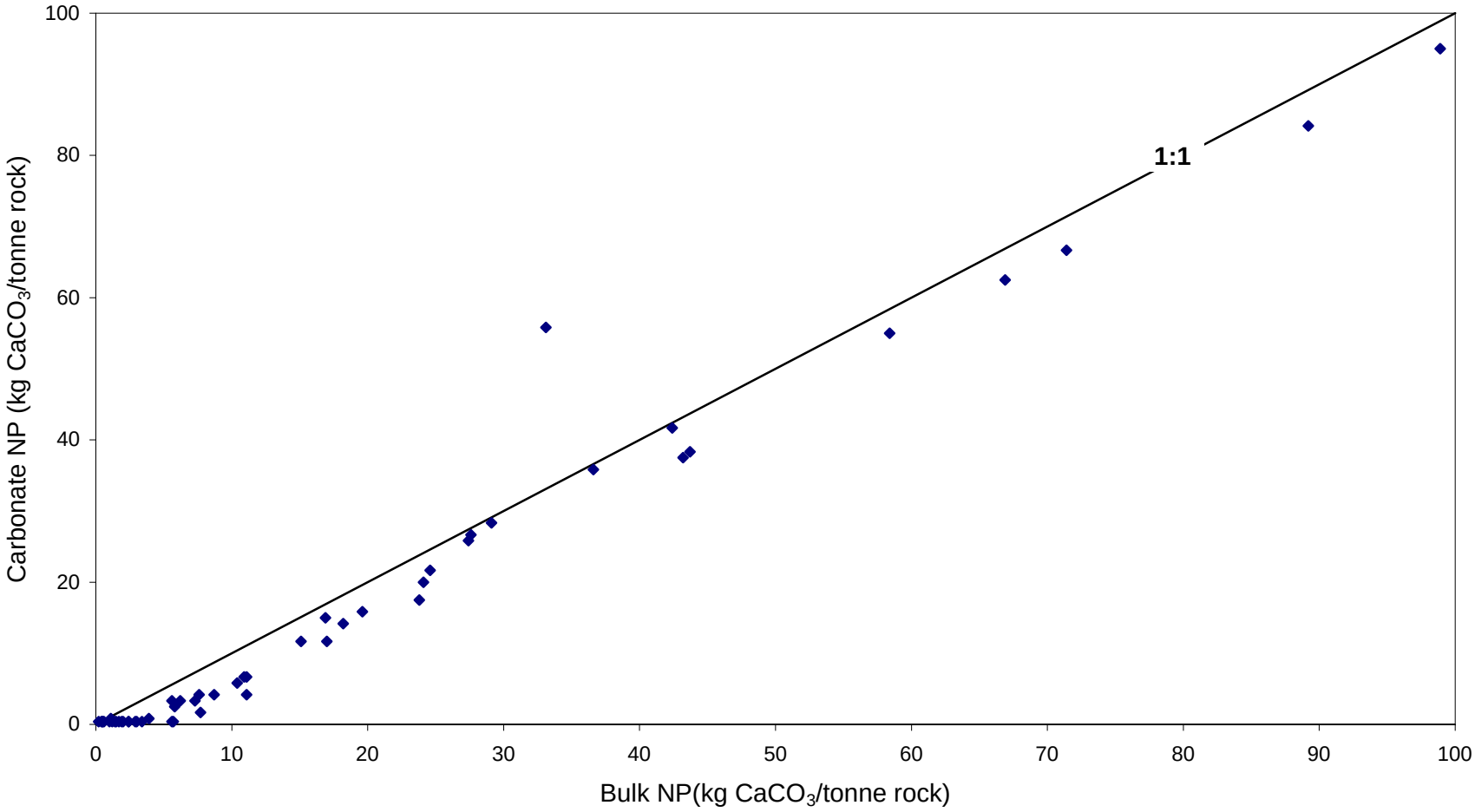
TITLE

Total Sulphur (%) vs. Neutralization Potential Ratio (NPR=NP/AP)

DRAWN	JMC	DATE	September 2005	JOB NO.	04-1413-086/5000
CHECKED	VJB	SCALE	n/a	DWG. NO.	
REVIEWED	VJB	FILE NO.		FIGURE NO.	**3.2**



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Quarry Access Road Geochemical Evaluation
Meadowbank Gold Project

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TITLE

Neutralization Potential Bulk NP vs. Carbonate Neutralization Potential

DRAWN	JMC	DATE	September 2005	JOB NO.	04-1413-086/5000
CHECKED	VJB	SCALE	n/a	DWG. NO.	
REVIEWED	VJB	FILE NO.		FIGURE NO.	**3.3**