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REPORT ON A HEAVY MINERAL SAMPLING SURVEY

North Anvil Range Joint Venture



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and
Metallgesellschaft Canada Limited

N.T.S. 105-K-6, 7

G. A. Jilson
CYPRUS ANVIL MINING CORPORATION
April, 1982

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Approximately 10 kg of sample was collected from each site, this being the residue of 20 - 50 kg of raw sediment. Experience shows that smaller samples give less reproducible results and larger samples cause problems during sieving at the laboratory (C. Fipke, personal communication). The samples were collected in large, doubled plastic bags with the sample number placed on each bag and on a wet proof paper slip between the bags. Samples were shipped to the laboratory of C.F. Mineral Research in Kelowna, B.C. in five gallon plastic pails which hold two samples each. Of 1,200 samples shipped this way in 1981, only two were lost and not a single sample was damaged. Shipping was by truck as air freight bills easily mount during routine programs, but it should be noted that this adds a two to four week delay in turnaround time.

Transport in the field was by helicopter (Hughes 500D being the optimum machine in Yukon), leapfrogging from site to site. Crews of two samplers were usually used; however, once the samplers were more experienced, they worked alone. A sample generally took at least 30 to 45 minutes to collect, but some particularly difficult ones took 1 1/2 to 2 hours. Communication between samplers and the helicopter by radio greatly expedited sampling and helped save helicopter time. Once routine operating efficiency was achieved, four to five samplers were serviced by one helicopter, depending on conditions, and they collected six to ten, mostly eight, samples each per day. One of the major operating problems was the accumulation of samples as they easily reached the practical operating payload of the 500D and a scheme of ferrying samples out of the sampling area during fuel-ups must be worked out. Clearly, the helicopter pilot was critical to the smooth operation of this type of program. The most common pilot problems were the difficulty of keeping the samplers' location in mind and planning refueling and sample movements efficiently. Surprisingly, contrary to popular opinion, almost any stream in the Yukon can be worked by a sufficiently skilled pilot and experienced sampler. The reason most missed samples were missed was inadequate silt due to organic sludge, usually the direct responsibility of the Yukon's more than healthy beaver population or the fact that particularly swift or steep streams may have no sediment finer than a small boulder accessible to the sampler. The 27 samples reported herein were collected in 1.5 days by two crews of two samplers, hence routine efficiency had not yet been reached.

Laboratory Methods

The samples were treated by two separate laboratories, namely C.F. Mineral Research of Kelowna, B.C., who were responsible for sample preparation, and Chemex Labs of North Vancouver, B.C., who were responsible for chemical analysis.

At the C.F. Minerals lab, the sample was wet sieved through 20, 35, 60 and, in some cases, 150 mesh screens using a patented apparatus designed by C.F. Minerals. The sieving procedure gravity stratifies the subsamples on each sieve; all but 1.5 litres of the resulting accumulation was discarded from each sieve. After sizing, that 1.5 litre subsample was run through a two stage heavy liquid separation using bromoform (S.G. \approx 2.8) and methylene iodide (S.G. \approx 3.2) to produce a light, intermediate and heavy fraction. Depending on the results of previous orientation work, one or more of these samples was separated electromagnetically into a nonmagnetic, paramagnetic and magnetic fraction using a combination of rotary magnetic separator for the latter fraction and then a Frantz isodynamic separator for the former two fractions. The settings used on the Frantz are proprietary.

INTRODUCTION

Twenty-seven heavy mineral samples were taken along the northeast margin of the Anvil Batholith in the vicinity of the North Anvil Range Joint Venture. The purpose of the sampling was:

- (a) to cover the Mt. Mye/Vangorda formation contact to provide both direct exploration and geochemical background information,
- (b) to evaluate the possibility of tin/tungsten deposits related to the Anvil Batholith,
- (c) to check high barium results obtained on an earlier survey at the Mt. Mye/Vangorda formation contact at the east edge of the Zan/Mx claims,
- (d) to evaluate the drainage basin in the north central portion of the area where a weak, probably hydromorphic, soil anomaly was found earlier (Jilson, 1974),
- (e) to evaluate the possibility of gold related to the Fe/Cu massive sulphide showing in Ace Canyon on the Lisa claims,
- (f) to check overall reproducibility of the technique.

METHODS AND PROCEDURES

Field Methods

Samples were collected from major streams with basins of 5 - 10 km² or larger, with the exception of areas where more detailed sampling was done to evaluate specific concepts.

Sediment was collected from the active channel of the stream at a site favorable to accumulation of heavy minerals. In most cases, the leading edge of a point bar or a back eddy downstream from a large boulder or other obstacle in the stream was used. At most sites, one hole was dug by shovel, with considerable effort made to clean the bottom of the hole and to minimize disturbance of the sediment. Experience shows these to be the major losses of heavy minerals by downward infiltration. After each shovel full was dumped into the sieve, the top and the bottom of the blade was carefully rinsed to remove any infiltrating heavies that accumulate or adhere there. The sample was sieved in water to which a small amount of soap is added to reduce surface tension without causing excessive foaming. A 20-mesh screen of 45 cm diameter constructed of stainless steel was used, with collection in an aluminum pan of about ten liters capacity. To eliminate or minimize chances of cross contamination, the screen, pan, shovel and any other tools were scrubbed carefully with soap after the sample was taken and before the next sample was taken at the next site. Care was taken to ensure that no activity is carried out upstream from the sample site. The nature of the technique and Yukon streams necessitates use of rubber gloves and boots by samplers - special care was taken to ensure the gloves are cleaned between samples as they are a potentially major source of cross contamination.

In the Anvil District, the -60 HN (passed through 60 mesh screen = -60, sank through heaviest liquid = H, and nonmagnetic, i.e. not affected by Frantz = N) fraction and -35 + 60 IP (passed through 35 mesh screen stopped on 60 mesh screen = -35 + 60, sank through lighter liquid but floated on heavier = I, paramagnetic, i.e. deflected by Frantz but not affected by rotary separator, = P) fraction gave best results. The former fraction accumulates most major sulphide ore minerals, pyrite, smithsonite, cerrusite, anglesite, barite and other Ba species, gold, silver, scheelite, cassiterite, diamond, as well as kyanite, sillimanite, rutile, most zircon, apatite, spinel and sphene, some carbonates, monazite and garnet; it is thus clearly directed at detrital dispersion by fine sand and smaller grains from exposed deposits or marginal mineralization. The latter fraction accumulates more rock forming minerals, such as pyroxenes and amphiboles, some micas, some lithics, and composite gossan fragments or precipitated FeMn oxide species, thus it is more sensitive to hydromorphic scavenging of metals and clastic dispersion from heavily oxidized deposits or transported gossans. The grain size of this fraction is mainly medium sand, theoretically this fraction might be expected to give more reproducible and meaningful results than a conventional silt sample, since the possible variable sources of metal are lessened by elimination of clays and organics and the upper and lower size limits restrict somewhat variations due to surface chemical effects.

The fractions were weighed to the nearest hundredth gram and the -60 HN checked by UV light for scheelite, then both fractions were shipped to Chemex Labs.

The cost for one fraction is about \$50 per sample, inclusive of all laboratory charges. The need for a second, different size fractions ups the cost to about \$70 per sample, since a second heavy liquid separation is needed. These costs are for separation alone.

The fractions were analysed by Chemex for the following elements:

-60 HN	Cu, Pb, Zn, Mo, Ag, As, Fe, Mn, Cd, Au, Ba, W, Sn, Sb, total extraction.
-60 HP	Cu, Pb, Zn, Mo, Ag, As, Fe, Mn, Cd, Sb, total extraction.
-35 + 60 IP	Cu, Pb, Zn, Mo, Ag, As, Fe, Mn, Cd, both total and partial extraction.

Due to the small size of many fractions compared to that needed for analysis, the following priority system was set up for -60 HN or any other fraction requiring several different digestions.

(1)	Au	1.0 gm
(2)	Cu, Pb, Zn, Mo, Ag, Cd, Fe, As	0.5 gm
(3)	Ba	0.2 gm
(4)	W	0.25 gm
(5)	Sb	0.5 gm
(6)	Sn	<u>0.25 gm</u>
		2.65 gm

Chemex's normal sample size was severely cut to the minimum their chief chemist felt would produce reproducible results at anomalous levels, with consequent increase of detection limits. About 70% of -60 HN fractions contain enough material for the complete analytical scheme.

Analysis of -60 HN Fraction

The sample was ground to -100 mesh maximum (75% of sample then at -150 mesh) so that a homogeneous set of subsamples could be taken per the above order of priority. Grinding was by ring grinder, except for samples weighing less than 3 grams, which were ground by hand using an agate mortar and pestal in order to minimize loss during grinding, in any case, sample loss was not great. While sample cross contamination during grinding is possible, Chemex claims it is not generally significant and the negative effect of grinding is more than offset by the risks of not grinding and facing the nugget effect in subsampling the fraction for gold.

Analysis for Au:

A 1.0 gram sample was fused in litharge, carbonate and siliceous flux. The resulting lead button containing any gold in the sample was cupelled in a muffle furnace to produce a precious metals bead.

Sample beads, plus standard and blank beads, were irradiated in a thermal neutron flux. The gamma emissions of the irradiated beads were counted utilizing a Ge (Li) detector and quantified for gold. The detection limit for a 1.0 gram sample is 10 ug/kg (ppb).

Analysis for Cu, Pb, Zn, Mo, Ag, Cd, Fe, Mn:

1. A 0.5 gram portion of the sample was weighed into a calibrated test tube. The sample was digested using hot 70% HClO_4 and concentrated HNO_3 . Digestion time = 2 hours.
2. Sample volume was adjusted to 25 mls. using demineralized water. Sample solutions were homogenized and allowed to settle before being analysed by atomic absorption procedures.
3. Detection limits using Techtron A.A.5 atomic absorption unit:

Copper	-	2.0 ppm
Molybdenum	-	2.0 ppm
Zinc	-	2.0 ppm
* Silver	-	0.4 ppm
* Lead	-	2.0 ppm
Manganese	-	10.0 ppm
Iron	-	4.0 ppm
Cadmium	-	0.2 ppm

* Ag and Pb are corrected for background absorption.

4. Elements present in concentrations below the detection limits were reported as one half the detection limit, i.e. Ag - 0.2 ppm.

Analysis for As:

An aliquot of the above digest was acidified, reduced with KI and mixed. A portion of the reduced solution was converted to arsine with NaBH_4 and the arsenic content determined using flameless atomic absorption.

Detection limit: 2 ppm.

Analysis for Ba:

A 0.20 gram sample was digested with a mixture of $\text{HF} - \text{HClO}_4 - \text{NH}_3$ acids to dryness. The baked residue is leached with 25 ml of 10% HCl with NaCl added to reduce ionization effects in the A.A. flame. Analysis is by AAS using an $\text{N}_2\text{O} - \text{C}_2\text{H}_2$ gas mixture.

Analysis for W:

A 0.25 gram sample was fused with potassium bisulfate and leached with hydrochloric acid. The reduced form of tungsten was complexed with toluene 3, 4 dithiol and extracted into an organic phase. The resulting color was visually compared to similarly prepared standards.

Detection limit: 4 ppm.

Analysis for Sb:

A 0.5 gram sample was digested with concentrated HCl in hot water bath. The iron was reduced to Fe^{+2} state and the Sb complexed with I^- . The complex was extracted with TOPO-MIBK and analysed via A.A. Correcting for background absorption $0.2 \text{ ppm} \pm 0.2$.

Detection limit: 0.8 ppm.

Analysis for Sn:

A 0.25 gram sample was sintered with ammonium iodide. The resulting tin iodide was leached with a dilute $\text{HCl} - \text{ascorbic acid}$ solution. The TOPO complex was then extracted with MIBK and analysed via A.A.

Detection limit: 4 ppm.

All of the above schemes should be considered total extractions.

Analysis of -60 HP Fraction

The -60 HP fractions were analysed using the same methods outlined above, where applicable.

Analysis of -35 + 60 IP Fractions

This fraction was not pulverized since the nugget effect causes no problem, and it was felt advisable to not alter the natural particle size distribution. Both a total and partial extraction were determined for comparative purposes. Total extraction for Cu, Pb, Zn, Mo, Ag, Fe, Mn, As is as outlined above.

Partial extraction was accomplished using 1.5N oxalic acid in a hot water bath for five minutes, followed by the A.A. finish outlined above.

RESULTS

Plates 1 and 2 present the results of the surveys in map view. Plate 3 summarizes much of the results by metal and fraction in histogram form. Appendix I gives the chemical results on individual fractions, together with weights of fractions and other information about the sample and sample site.

The number of samples is too small to allow definitive statements to be made but the patterns displayed on Plate 3 are a microcosm of some of the results of a larger survey and, as such, are worth discussion.

Table 2 attempts to put these results in perspective by comparing them to a larger set of samples which is from a slightly different lithologic and stratigraphic terrane. These thresholds are indicated on Plate 3 by arrows.

Reproducibility

Table 1 lists those samples taken at the same or close by sites in 1980 and 1981. Unfortunately, only three samples are exactly comparable, the remainder being slightly different fractions (-60 HNN in 1980 versus -60 HN in 1981; HNN indicates that a stronger Frantz field setting was used than is normal for the HN fraction) which should increase Ba, W and Au substantially and, not surprisingly, does.

Those three samples show fair reproducibility in most elements, with some notable exceptions. Silver is problematic; this is common with this method and may be due to a nugget effect involving supergene(?) native silver or another Ag-rich phase.

Gold in Sample 81G0007 and SOS29 is at least detectable in both samples, but a clear discrepancy exists; this is probably due to a nugget effect as well. Duplicate sampling with all heavy mineral techniques involving gold is a problem; this method reportedly gives more reproducible results than most but still has its problems. None of these samples is very high in gold and they are of good tests, comparisons elsewhere show general correspondence of high results, but it is by no means 100%. It is not wise to attach much significance to the difference between 1,000, 10,000 and 100,000 ppb Au, all may be equally anomalous.

This discrepancy in Ba between 81G0008b and SOS28 may be due to the fact that the samples are not quite in the same spot, SOS28 was taken up hill from 8b and above till benches, thus the higher value in 8b could be due to a decrease of the stream gradient or a source of barite in the till.

The summary impression of checks on this method is that Au and Ag pose persistent problems. The remaining elements, especially abundant base metals, generally give good correspondence, at least good enough that the order of anomaly almost always checks out.

TABLE 1

Comparison of Results of Samples Taken on the
Same Locations in 1980 and 1981

-60HN

<u>Sample No.</u>	<u>(ppm)</u>								<u>(ppb)</u>
	<u>Ba</u>	<u>Ag</u>	<u>Pb</u>	<u>Zn</u>	<u>Cd</u>	<u>Cu</u>	<u>Mo</u>	<u>W</u>	<u>Au</u>
81-G-0003	450	0.8	29	46	0.6	14	1	290	10
50535	1,290	0.4	48	46	0.5	24	2	>2,000	145
81-G-0004b	NSS	4.7	255	76	1.0	69	3	NSS	600
50534	NSS	1.3	76	74	0.7	51	<1	>2,000	<25
(Conventional Silt)	(1,220)	(0.2)	(22)	(144)	(0.6)	(18)	(2)	(3)	(<5)
81-G-0016	1,100	0.2	20	70	0.2	22	4	440	<10
50533	15,500	1.5	31	40	0.5	29	<1	>2,000	3,290
81-G-0006	708	2.6	208	104	1.8	18	4	150	<10
50532	1,240	3.9	110	170	1.6	93	4	790	<15
(Conventional Silt)	(960)	(0.5)	(104)	(530)	(2.7)	(19)	(2)	(3)	(15)
81-G-0008b	9,500	1.6	48	88	0.4	20	4	275	<10
50528	770	0.2	59	65	1.6	29	1	225	<15
(Conventional Silt)	(800)	(0.2)	(12)	(104)	(0.4)	(14)	(1)	(2)	(<5)
81-G-0007	NSS	1.2	48	84	0.4	365	2	NSS	60
50529	NSS	7.6	18	60	0.3	118	1	765	1,155
81-G-0009	>50,000	0.2	14	154	0.2	100	2	140	<10
50526	340,000	1.3	56	64	0.7	35	2	270	<5
(Conventional Silt)	(2,470)	(0.3)	(25)	(138)	(0.5)	(28)	(3)	(4)	(<5)
81-G-0033	2,950	7.4	146	170	0.8	196	2	85	40
50525	1,230	0.2	34	105	0.9	50	<1	1,035	440

TABLE 2

Geochemical Threshold (by Inspection of Histograms)

Based on 650 Samples

	<u>-60HN TOT</u>	<u>-60HP TOT</u>	<u>-35+60IP TOT</u>	<u>-35+60IP OX</u>	<u>-80 TOT</u>
Pb	120	125	90	40	40
Zn	300	800	600	200	400
Ag	2.0	1.2	1.3	0.3	1.0
Cu	300	150	140	60	100
Mo	14	15	15	5	10
Fe (%)	6.5	20.2	18.5	3.4	4.5
Mn	1,300	9,500	3,000	1,200	2,000
As	100	140	130	75	55
Sb	-	7.5	-	-	1,300
Ba	10,000 *	-	-	-	-
W	≈2,000(?)***	-	-	-	-
Sn	≈1,000(?)***	-	-	-	-
Cd	1.5	3.0	2.0	1.2	≈2.0
Au (ppb)	500 **	-	-	-	-

* Ba values below 50,000 ppm are not considered very high if black shales or Pb/Zn/Ba deposits are in the drainage basin.

** Au ranges to ≈100,000 ppb but any sample over 500 ppb is considered interesting.

*** Not from histograms, W values of ≈5,000 ppm not related to major mineralization are not uncommon, as are very high Sn results in major streams remote from mineralization.

Choice of Fraction

Several fractions were analysed in this survey in order to check which fraction and analysis gives best results in areas other than those draining the Anvil Range orebodies. Partial and total extractions were attempted on the -35 + 60 IP fraction (OX = 1.5 N warm oxalic acid TOT = perchloric + nitric acids) and the -60 HP fraction was tested to see if it would give the same information as the -35 + 60 IP, resulting in a \$22 per sample saving.

The oxalic acid leach did not disclose new anomalies or enhance relief of known anomalies over background, in fact, in several cases it actually suppressed anomalous response where other fractions show anomalies which are related to bedrock features. The -35 + 60 IP OX and TOT histograms for zinc provide an interesting comparison; the subanomalous population is clearly bimodal with a total extraction, while the trend is not so clear with a partial extraction. The higher peak on the TOT histogram proves to be mainly due to samples that drain the Mt. Mye/Vangorda contact and may reflect higher zinc in black shales at that horizon which soil sampling has shown previously (Jilson, 1974). Other problems with the oxalic acid leach relate to its susceptibility to time of leaching, which is difficult to control in a mass production laboratory, and its specificity for Fe oxides may have caused partly oxidized pyrite or sphalerite in that fraction not to contribute metal to the leachate.

The -60 HP fraction gave less than optimum results on the southwest side of the Anvil Range but it did indicate the major Pb/Zn deposits. As a long term cost savings, it was thought that this fraction might provide the same information as the IP but with slight suppression of anomaly relief. Plate 3 shows (as does other work to date) that the suppression is so complete that most low order anomalies become background, thus the -60 HP fraction should not be used further.

The -35 + 60 IP and -60 HN fractions continue to give optimum response in and near the Anvil Range, neither is sufficient but must be examined as a pair, each directed at its own objectives. Comparison with conventional silt samples collected over the years in this area suggests that down-stream dispersion and, in most cases, anomaly relief, is better with the heavy mineral technique, which makes it a more thorough survey when only one sample per drainage is collected during rapid reconnaissance. The cost of the method is high but it must be realized that the data is more comparable to that obtained by traversing streams at close intervals with conventional silts (except of course when it comes time to follow-up anomalies!). Due to the smaller number of samples and the more efficient use of helicopter time and labor, the method becomes quite competitive in terms of cost effectiveness.

The following paragraphs comment on the results by major metals.

Copper

Only one stream gives a very high copper response (81-G-0014). It and its neighbors 81-G-0015 and 7 give elevated copper values coincident with slight Zn, Au, As, Sb and Ag response. All these streams drain mainly Menzie Creek formation and upper Vangorda formation, thus the high copper may be due to high background from the basalts of Menzie Creek formation, or perhaps minor exhalative mineralization in interflow sediments. The stream from which sample 0014 comes also has a Tertiary (?) rhyolite plug which has some associated veinlets of barite and pyrite and could be the source of the Cu and Au values.

Zinc

High values in zinc are found in samples 6, 14, 22, 31, 32, 33 and 34. Most streams high in zinc drain known vein-type mineralization on the Mur claims or are part of the situation noted above. The obvious discrepancy between Zn response in the -60 HN and -35 + 60 IP fractions is not completely understood but probably relates to the ready oxidation of sphalerite such that the IP fraction contains oxidized or mostly oxidized grains or possibly Zn scavenged on Fe hydroxides, while the HN fraction contains only rarely preserved sphalerite or smithsonite.

The reason sample 81-G-0022 is slightly high in Pb and Zn, as well as Cu, Ag and As, is not understood, but may be due to a small vein near the batholith contact as seen commonly further to the southeast. This stream drains rocks near the favorable horizon and is immediately across the batholith from the Faro deposit.

As noted previously, streams draining the favourable horizon tend to be slightly higher in zinc. This is in accord with more detailed geochemical studies done to date. All these studies show that while zinc may be higher in that unit, there is no evidence of mineralization cropping out.

Lead

Any sample over 100 ppm should be regarded as interesting, especially if the barium content of the fraction is high. In this case, the high samples are 4b, 5, 6, 22, 31 and 33. Most high lead stations here are related to known lead-bearing veins in and near the batholith, with some uncertainty about sample 22 as noted above. Sample 4b may have detected the KD hill mineralization 5 km upstream, but that stream also crosses the Mt. Mye/Vangorda contact; soil sampling over the drainage basin has not provided much encouragement, although small anomalies were found (Jilson, 1974).

Silver

Samples 6, 4b and 33 are highest in silver. Again, silver anomalies may be mainly related to Pb/Ag-bearing veins in and near the batholith. Sample 0033 is quite far downstream from known mineralization and separated from it by a non-anomalous sample, thus a second source of Pb and Ag may be indicated (this sample is upstream from known showings in Ace Creek).

Barium

Only sample 9 is very high in Ba. This sample confirms the high Ba response found there last year. Of the three samples which checked tributaries to that stream, only sample 10 is relatively high and this is not comparable to Ba response from known stratiform Ba-Pb-Zn mineralization. Sample 10 is upstream from the favorable horizon, thus it is possible that a source of $BaSO_4$ occurs northeast of a line connecting samples 9 and 10. No lead or zinc response is coincident with the high Ba, however, sample 9 should be checked as Ba values over 5% characteristically give subdued Pb results from the same concentrate.

Tungsten and Tin

None of the samples is anomalous in tungsten but several are fairly high in tin. These samples cluster near the best Pb/Zn/Ag veining in the batholith, thus more complete sampling for Sn may be warranted. The Anvil Batholith is a prime target for tin-tungsten deposits but the results to date are inconclusive.

CONCLUSIONS

The heavy mineral survey has provided no support for the existence of mineralization related to the soil geochemical anomaly between the FOO and MX claims in the north central portion of the area.

Samples that were taken from streams draining the favorable horizon show elevated but subanomalous Zn and Ba results in some cases but, as expected, no subcropping mineralization is suggested by the data except for the possibility of barren barite near sample 9.

The high barium results in the central area were followed up by sampling the tributaries to that stream, none gave comparable results, suggesting the source of barium is just upstream from sample 9. Prospecting by the author in the creeks that samples 11 and 13 are on did not disclose any barite, but these results show that is not a surprise; my major conclusion here is that I should have gone the other direction.

The available gold results in Ace Creek lend no support to the possibility that the Fe/Cu-bearing sulphides in Ace Canyon contain gold.

The intention of evaluating the tin potential of the Anvil Batholith was scuttled by lack of time and inadequate sample material. The results obtained certainly do not detract from the possibility of tin-bearing mineralization in the batholith.

RECOMMENDATIONS

Further prospecting and soil sampling is needed near sample 9 to locate the source of barium in the heavy mineral concentrates. If the source is stratiform barite at the Mt. Mye/Vangorda contact, then deep drilling in the general area may be required to evaluate the mainly buried (both stratigraphically and tectonically) potential to the east.

The tin potential of the Anvil Batholith is still inadequately evaluated. This should be remedied when funding permits.

References

Jilson, G.A. (1974) Summary of Exploration on the Mt. Mye Prospect during 1970, 1971, 1972 and 1973; unpublished report, Kangaroo Exploration Corporation.

APPENDIX I

Analytical Results and
Sample Site Information

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 591100E
 -NORTHNG 919600N
 NTS- 105K06

PROJECT

 G

DATE SAMPLED: 15MAR82
 SAMPLERS : NM/

 * * * * *
 * SAMPLE * 81G0003 *
 * * * * *

SAMPLE
 81G0003

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CO PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SE PPM	HG PPM	AU PPB	WT g
-60 MN TOT	450	0.8	29	46	0.6	14	1	290	92	1.70	555	6	0.4		10	11.30
-60 HP TOT		0.1	15	90	0.1	15	2			4.48	2700	4	0.2			31.45
-35+60 IP OX		0.1	8	34	0.1	4	1			1.30	95	10				
-35+60 IP TOT		0.2	18	195	0.1	10	2			5.65	600	24				1.90

STREAM WIDTH= 0.6M WATER LEVEL= NORMAL FLOW RATE= SLOW TURBULENCE= SLIGHT GRADIENT= NOT RECORDED
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NOT RECORDED WATER COLOR= CLEAR SEDIMENT COLOR= BROWN

SAMPLE SITE= STABLE BOTTOM STREAM TYPE= MEANDR/STRAIGHT SAMPLE POSITION= NOT RECORDED

PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.9M
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = POOR
 LITTLE(<10%) 1 X X X X X X X X X X
 NONE 0 X X X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 6.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0003 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 594400E -----
 -NORTHNG 920100N
 NTS- 105K06 G
 SAMPLERS : NP/CH

 * * * * *
 * SAMPLE * 81G0004 *
 * * * * *

SAMPLE
81G0004

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SS PPM	HG PPM	AU PPB	WT G
-60 MN TOT	8400	1.4	21	68	0.6	25	3	540	80	2.05	655	10	2.4		50	7.89
-60 HP TOT		0.1	25	140	0.2	17	2			6.65	7000	15	3.6			15.99
-35+60 IP OX		0.1	1	42	0.1	6	1			1.45	480	14				
-35+60 IP TOT		0.1	27	325	0.4	35	5			8.50	1150	39				3.36

STREAM WIDTH= 4.5M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= BETWEEN BOULDERS STREAM TYPE= STRAIGHT SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= SLIGHT ORGANIC SLIME
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.9M
 ----- MODERATE(10-50%) 2 X SEDIMENT SORTING = GOOD
 LITTLE(<10%) 1 X DECAYED ORGANICS = LOW
 NONE 0 X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 7.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0004 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 09 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 598500E -----
 -NORTHNG 917400N
 NTS- 105K06 G

 * *
 * SAMPLE * 81G0006 *
 * *

S A M P L E 8 1 G 0 0 0 6 A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CO PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 MN TOT	700	2.6	208	104	1.8	18	4	150	940	2.80	615	20	4.8	<	10	5.20
-60 HP TOT		0.1	66	110	0.2	8				3.95	3750	15	0.6			11.53
-35+60 IP OX		0.2	500	770	5	20	2			11.50	1500	225				
-35+60 IP TOT		1	875	4900	7	80	15			55.00	6000	525				2.01

STREAM WIDTH= 3.0M WATER LEVEL= NORMAL FLOW RATE= SLOW TURBULENCE= SLIGHT GRADIENT= LOW
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= NOT RECORDED SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= MEANDERING SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= NOT RECORDED
 CONTAMINATION = NONE

SEDIMENT LOTS(>50X) 3 MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50X) 2 SEDIMENT SORTING = MODERATE
 LITTLE(<10X) 1 DECAYED ORGANICS = MODERATE
 NONE 0
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 19.0KM**2

NTS-105K06

 * *
 * SAMPLE * 81G0006 *
 * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 09 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 600500E ----- SAMPLERS : CH/NP
 -NORTHNG 920300N G
 NTS- 105K06

 * * * * *
 * SAMPLE * 81G0C08 *
 * * * * *

SAMPLE
81G0006

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 MN TOT	2300	0.2	92	84	0.8	28	4	30C	640	3.90	445	6	1.6	<	10	8.40
-60 HP TOT		0.1	29	115	0.1	20	2			5.55	296C	14	1.2			62.14
-35+60 IP OX		0.1	13	44	0.2	15	1			1.60	240	4				
-35+60 IP TOT		0.1	39	390	0.8	65	5			14.00	995	50				18.50

STREAM WIDTH= 0.9M WATER LEVEL= NOT REC'D FLOW RATE= MOOERATE TURBULENCE= SLIGHT GRADIENT= NOT RECORDED
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= NOT RECORDED STREAM TYPE= NOT RECORDED SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = PROBABLE EXOTIC TILL

SEDIMENT LOTS(>50%) 3 MODERATE(10-50%) 2 LITTLE(<10%) 1 NONE 0
 ----- BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 MAX. BOULDER SIZE= 0.0M
 SEDIMENT SORTING = GOOD
 DECAYED ORGANICS = LOW
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 2.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0C08 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 601100E ----- SAMPLERS : NH/
 -NORTHNG 918900N G
 NTS- 105K06

 * * * * *
 * SAMPLE * 81G0009 *
 * * * * *

S A M P L E 81G0009 A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	<50000	0.2	14	154	0.2	100	2	140	364	2.10	275	24	10.4	<	10	11.02
-60 HP TOT		0.1	47	145	0.3	29	2			4.80	3650	23	3			35.51
-35+60 IP OX		0.1	23	52	0.3	16	1			2.10	485	15				
-35+60 IP TOT		0.1	54	392	0.7	77	5			11.00	1075	59				2.97

STREAM WIDTH= 1.5M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= HIGH GRADIENT= STEEP
 ----- DEPTH= 1.5M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= ORANGE BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= NOT RECORDED SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= VARIABLE MODERATE FE HYDROXIDES/RUST
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.3M
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = VERY POOR
 LITTLE(<10%) 1 X X X X X X X X
 NONE 0 X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 13.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0009 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 604100E ----- SAMPLERS : NM/
 -NORTHNG 918800N G
 NTS- 105K07

 * * * * *
 * SAMPLE * 81G0010 *
 * * * * *

SAMPLE
81G0010

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	15400	0.4	58	230	0.2	150	6	85	104	4.65	645	10	0.8		380	3.57
-60 HP TOT		0.1	10	105	0.1	8	2			4.15	3590	5	0.4			18.83
-35+60 IP OX		0.1	6	86	0.1	12	1			2.20	670	6				
-35+60 IP TOT		0.2	12	252	0.2	38	4			2.10	1010	30				1.13

STREAM WIDTH= 0.9M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.0M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT CCLR= BROWN
 SAMPLE SITE= BACK EDDY STREAM TYPE= NOT RECORDED SAMPLE POSITION= CENTER
 PRECIPITATE OR STAIN= NOT RECORDED
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = MODERATE
 LITTLE(<10%) 1 X X X DECAYED ORGANICS = MODERATE
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 3.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0010 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 09 PROJECT DATE SAMPLED: 15MAR82
 ----- -EASTING 603800E ----- SAMPLERS : NM/
 -NORTHNG 918600N G
 NTS- 105K07

 * * *
 * SAMPLE * 81G0011 *
 * * *

SAMPLE		A S S A Y															R E S U L T S
81G0011		BA	AG	PB	ZN	CD	CU	MO	W	SN	FE	MN	AS	SB	HG	AU	WT
TEST		PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	X	PPM	PPM	PPM	PPM	PPB	G
-60	HN TOT	700	0.2	36	90	0.2	22	2	100	104	2.45	350	10	0.4	<	10	48.60
-60	HP TOT		0.1	17	72	0.1	12	1			3.03	2900	9	0.2			314.95
-35+60	IP OX		0.1	12	59	0.1	12	1			1.50	585	30				
-35+60	IP TOT		0.1	70	235	0.1	52	1			9.50	1100	57				6.35

STREAM WIDTH= 1.2M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.0M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= MEANDERING SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= NOT RECORDED
 CONTAMINATION = POSSIBLE EXOTIC TILL

SEDIMENT	LOTS(>50%)	3																
-----	MODERATE(10-50%)	2			X		X											
	LITTLE(<<10%)	1		X		X		X		X								
	NONE	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			BOULDERS	COBBLES	PEBBLES	GRANULES	SAND	SILT	CLAY									

MAX. BOULDER SIZE= 0.0M
 SEDIMENT SORTING = MODERATE
 DECAYED ORGANICS = MODERATE
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 6.0KM**2

NTS-105K07

 * * *
 * SAMPLE * 81G0011 *
 * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 603800E -SAMPLERS : CH/ND
 -NORTHNG 917000N G
 NTS- 105K07

 * * *
 * SAMPLE * 81G0013 *
 * * *

SAMPLE 81G0013 ----- A S S A Y R E S U L T S -----

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 MN TOT	800	0.6	70	108	0.2	30	2	140	344	3.45	490	114	1.6	<	10	21.42
-60 HP TOT		0.1	38	130	0.1	25	2			5.00	2740	30	1			113.56
-35+60 IP OX		0.1	11	49	0.1	13	1			1.25	360	14				
-35+60 IP TOT		0.1	51	405	0.2	80	2			13.00	1100	170				13.94

STREAM WIDTH= 1.8M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= HIGH GRADIENT= STEEP
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= MEANDERING SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 1.5M
 ----- MODERATE(10-50%) 2 X X X SEDIMENT SORTING = GOOD
 LITTLE(<10%) 1 X X X X DECAYED ORGANICS = LOW
 NONE 0 X X X X SAND SILT CLAY
 BOULDERS COBBLES PEBBLES GRANULES GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 3.0KM**2

NTS-105K07

 * * *
 * SAMPLE * 81G0013 *
 * * *

EX033

HEAVY MINERALS

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 06MAY81
 ----- -EASTING 603000E ----- SAMPLERS : CH/NP
 -NORTHNG 921400N
 NTS- 105K06

 * * * * *
 * SAMPLE * 81G0014 *
 * * * * *

SAMPLE
81G0014

----- A S S A Y R E S U L T S -----

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CO PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPS	WT G
-60 HN TOT	NSS	1.6	60	240	2	1600	2	NSS	NSS	7.50	350	44	NSS	5830		1.32
-60 HP TOT		0.6	50	1250	5.2	500	37			32.00	1090	120	25			5.62
-35+60 IP OX		0.1	1	360	0.2	65	7			4.90	740	11				
-35+60 IP TOT		0.4	10	1000	2.8	210	24			16.00	1100	57				13.45

STREAM WIDTH= 1.5M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= HIGH GRADIENT= MODERATE
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= MEANDERING SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.3M
 ----- MODERATE(10-50%) 2 X SEDIMENT SORTING = MODERATE
 LITTLE(<10%) 1 X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 8.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0014 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR62

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 15MAR62
 ----- -EASTING 605000E -----
 -NORTHNG 922700N
 NTS- 105K07 G

 * *
 * SAMPLE * 81G0C15 *
 * *

SAMPLE 81G0015

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	19000	0.8	78	98	0.2	280	4	14C	NSS	3.8C	430	12	4.4		52C	2.44
-60 HP TOT		0.5	73	280	1.7	160	6			15.00	2390	57	31			9.18
-35+60 IP OX		0.1	1	84	0.1	54	2			4.35	510	27				
-35+60 IP TOT		0.4	33	373	1.1	175	11			13.00	1125	83				6.02

STREAM WIDTH= 1.2M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.1M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= STRAIGHT SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = PROBABLE EXOTIC TILL

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE=
 MODERATE(10-50%) 2 X X X X X X X X SEDIMENT SORTING = VERY POOR
 LITTLE(<10%) 1 X X X X X X X X DECAYED ORGANICS = MODERATE
 NONE 0 X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 5.0KM**2

NTS-105K07

 * *
 * SAMPLE * 81G0015 *
 * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE C8 PROJECT DATE SAMPLED: 15MAR82
 ----- -EASTING 595000E -SAMPLERS : NM/
 -NORTHNG 920000N
 NTS- 105K06 G

 * * * * *
 * SAMPLE * 81G0016 *
 * * * * *

SAMPLE
81G0016

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	1100	0.2	20	70	0.2	22	4	440	48	3.60	860	4	3.2	<	10	7.68
-60 HP TOT		0.1	16	125	0.2	23	2			7.00	6750	22	2			14.94
-35+60 IP OX		0.1	12	57	0.2	15	1			1.80	415	10				
-35+60 IP TOT		0.1	26	365	0.5	53	3			10.00	1100	53				9.67

STREAM WIDTH= 3.0M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= NOT RECORDED SAMPLE POSITION= NOT RECORDED
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = POSSIBLE ROAD

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50%) 2 X X X SEDIMENT SORTING = GOOD
 LITTLE(<10%) 1 X X X DECAYED ORGANICS = MODERATE
 NONE 0 X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 14.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0016 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 596600E
 -NORTHNG 922400N
 NTS- 105K06

PROJECT

 G

DATE SAMPLED: 07MAY81
 SAMPLERS : NP/DC

 * * * * *
 * SAMPLE * 81G0017 *
 * * * * *

SAMPLE
 81G0017

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	1100	1.4	20	70	0.4	30	6	480	100	3.85	1040	4	0.4	<	10	3.96
-60 HP TOT		0.1	50	200	0.9	56	2			12.20	>10000	36	6.4			8.60
-35+60 IP OX		0.3	5	47	0.1	14	1			1.70	560	6				
-35+60 IP TOT		0.1	26	385	0.6	83	5			11.00	1250	79				4.58

STREAM WIDTH= 0.6M WATER LEVEL= NORMAL FLOW RATE= SLOW TURBULENCE= SLIGHT GRADIENT= LOW
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= STRAIGHT SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= MODERATE ORGANIC SLIME
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.3M
 ----- MODERATE(10-50%) 2 X X X X X X X X X
 LITTLE(<10%) 1 X X X X X X X X X
 NONE 0 X X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 4.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0017 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 07MAY81
 ----- -EASTING 597000E ----- SAMPLERS : NP/DC
 -NORTHNG 922400N
 NTS- 105KC6 G

 * * * * *
 * SAMPLE * 81G0018 *
 * * * * *

SAMPLE
81G0018

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	700	0.6	30	78	0.2	32	2	400	76	3.80	910	6	1.6	<	10	5.10
-60 HP TOT		0.1	28	155	0.3	30	2			8.40	7900	22	4.2			10.57
-35+60 IP OX		0.1	10	55	0.3	15	1			1.70	510	10				
-35+60 IP TOT		0.1	28	365	0.4	50	1			11.00	1200	45				6.26

STREAM WIDTH= 1.2M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN BLACK/DAR

SAMPLE SITE= POINT BAR STREAM TYPE= STRAIGHT SAMPLE POSITION= RIGHT SIDE

PRECIPITATE OR STAIN= SLIGHT FE HYDROXIDES/RUST
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.6M
 ----- MODERATE(10-50%) 2 X X X X X X X X X X
 LITTLE(<10%) 1 X X X X X X X X X X
 NONE 0 X X X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 6.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0018 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 594200E
 -NORTHNG 918800N
 NTS- 105K06

PROJECT

 G

DATE SAMPLED: 07MAY81
 SAMPLERS : CH/NM

 * * * * *
 * SAMPLE * 81G0019 *
 * * * * *

SAMPLE
 81G0019

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 MN TOT	500	0.6	74	90	0.6	16	4	100	NSS	2.90	800	4	1.8	<	10	2.52
-60 HP TOT		0.1	18	85	0.1	10	3			4.00	2900	5	0.8			6.20
-35+60 IP OX		0.1	7	38	0.4	7	1			1.55	300	5				
-35+60 IP TOT		0.2	13	184	0.2	11	2			7.44	1120	13				.90

STREAM WIDTH= 1.5M WATER LEVEL= HIGH FLOW RATE= SLOW TURBULENCE= SLIGHT GRADIENT= LCN
 ----- DEPTH= 0.6M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= MEANDERING SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = POSSIBLE ROAD

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50%) 2 X SEDIMENT SORTING = VERY POOR
 LITTLE(<10%) 1 X DECAYED ORGANICS = HIGH
 NONE 0 X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= NOT RECORDED
 ----- WEIGHT=
 BASIN AREA = 6.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0019 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT
 ----- -EASTING 591100E -----
 -NORTHNG 917300N
 NTS- 105K06

DATE SAMPLED: 07MAY81
 SAMPLERS : NP/DC

 * * * * *
 * SAMPLE * 81G0020 *
 * * * * *

SAMPLE
 81G0020

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	700	NSS	NSS	NSS	NSS	NSS	NSS	570	NSS	NSS	NSS	NSS	NSS	<	10	.92
-60 HP TOT		0.1	35	55	0.7	9	3			3.75	3740	3	0.1			4.20
-35+60 IP OX		0.1	5	21	0.1	3	1			1.45	165	8				
-35+60 IP TOT		0.2	8	139	0.2	8	3			5.90	910	8				.79

STREAM WIDTH= 4.5M WATER LEVEL= HIGH FLOW RATE= FAST TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.4M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN

SAMPLE SITE= OTHER STREAM TYPE= STRAIGHT SAMPLE POSITION= RIGHT SIDE

PRECIPITATE OR STAIN= MODERATE FE HYDROXIDES/RUST
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.9M
 ----- MODERATE(10-50%) 2 X SEDIMENT SORTING = GOOD
 LITTLE(<10%) 1 X DECAYED ORGANICS = MODERATE
 NONE 0 X

BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 0.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0020 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 587700E
 -NORTHNG 924000N
 NTS- 105K06

PROJECT

 G

DATE SAMPLED: 07MAY81
 SAMPLERS : CH/NM

 * * * * *
 * SAMPLE * 81G0022 *
 * * * * *

SAMPLE
 81G0022

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT		1.6	116	540	0.4	132	2	NSS	NSS	4.50	1000	580	NSS	<	17	.98
-60 HP TOT		0.1	27	215	0.1	37	1			5.65	4600	16	1.2			3.46
-35+60 IP OX		0.1	1	26	0.1	11	1			1.25	340	11				
-35+60 IP TOT		0.1	13	152	0.1	50	1			5.95	825	36				4.42

STREAM WIDTH= 2.4M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= SLIGHT GRADIENT= LOW
 DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= BACK EDDY STREAM TYPE= STRAIGHT SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.3M
 MODERATE(10-50%) 2 X SEDIMENT SORTING = MODERATE
 LITTLE(<10%) 1 X DECAYED ORGANICS = LOW
 NONE 0 X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 14.0KM**2

NTS-105K06

 * * * * *
 * SAMPLE * 81G0022 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 598700E
 -NORTHNG 899900N
 NTS- 105K03

PROJECT

 G

DATE SAMPLED: 16MAR82
 SAMPLERS : NM/

 * * * * *
 * SAMPLE * 81G0023 *
 * * * * *

SAMPLE
 81G0023

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT g
-60 HN TOT	7700	1	72	164	0.2	166	2	520	NSS	7.60	620	220	1.6		10	2.24
-60 HP TOT		0.1	44	120	0.1	28	2			5.68	2500	17	1.2			8.63
-35+60 IP OX		0.1	8	20	0.1	5	1			1.15	240	11				
-35+60 IP TOT		0.1	38	142	0.1	22	1			5.85	840	23				11.45

STREAM WIDTH= 1.8M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.1M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= NOT RECORDED

SAMPLE SITE= BACK EDDY STREAM TYPE= NOT RECORDED SAMPLE POSITION= NOT RECORDED

PRECIPITATE OR STAIN= NOT RECORDED
 CONTAMINATION = POSSIBLE ROAD

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.3M
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = POOR
 LITTLE(<10%) 1 X X X X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 9.0KM**2

NTS-105K03

 * * * * *
 * SAMPLE * 81G0023 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 07MAY81
 ----- -EASTING 604400E ----- SAMPLERS : CH/NM
 -NORTHNG 904500N G
 NTS- 105K07

 * * * * *
 * SAMPLE * 81G0025 *
 * * * * *

SAMPLE
81G0025

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	10000	0.8	68	114	0.2	188	2	400	NSS	5.55	635	430	NSS		10	2.26
-60 HP TOT		0.1	42	116	0.5	30	2			6.65	3450	24	1.8			11.79
-35+60 IP OX		0.1	10	40	0.1	11	1			1.70	290	10				
-35+60 IP TOT		0.1	32	300	0.4	44	1			11.00	1150	55				6.00

STREAM WIDTH= 1.8M WATER LEVEL= HIGH FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.4M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= SIDE BAR STREAM TYPE= BRAID/MEANDR SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = POSSIBLE CAMP SITE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 1.5M
 ----- MODERATE(10-50%) 2 X SEDIMENT SORTING = MODERATE
 LITTLE(<10%) 1 X DECAYED ORGANICS = LOW
 NONE 0 X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 7.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0025 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 606100E
 -NORTHNG 907600N
 NTS- 105K07

PROJECT

 G

DATE SAMPLED: 07MAY81
 SAMPLERS : NP/DC

 * * *
 * SAMPLE * 81G0026 *
 * * *

SAMPLE
 81G0026

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-150 HM TOT																.80
-60+150HM TOT																.37
-35+60 HM TOT																.10
-20+35 HM TOT																.04
-60 IM TOT																.01
-150 HN TOT	NSS	0.6	54	108	0.2	30	6	NSS	NSS	1.20	240	22	NSS		120	1.53
-60+150HN TOT	3600	0.6	28	56	0.2	16	4	750	20	2.20	790	22	1.6		1730	6.34
-35+60 HN TOT	1800	0.2	16	62	0.2	16	4	700	16	2.50	820	10	0.8	< 10		10.19
-20+35 HN TOT	1800	0.6	38	64	0.2	34	6			2.80	790	8				15.97
-60 IN TOT																2.74
-150 HP TOT																2.15
-60+150HP TOT																13.14
-60 HP TOT		0.1	22	115	0.5	22	3			6.00	4780	16	1.8			15.29
-35+60 HP TOT																14.46
-20+35 HP TOT																22.96
-60 IP OX		0.1	14	51	0.8	13	2			1.90	370	14				
-60 IP TOT		0.1	26	250	1	43	2			6.60	833	24				2.54

STREAM WIDTH= 3.0M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= HIGH GRADIENT= STEEP
 DEPTH= 0.4M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN BLACK/DAR
 SAMPLE SITE= BETWEEN BOULDERS STREAM TYPE= STRAIGHT SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X X X X X X X X
 MODERATE(10-50%) 2 X X X X X X X X
 LITTLE(<10%) 1 X X X X X X X X
 NONE 0 X X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 MAX. BOULDER SIZE= 1.2M
 SEDIMENT SORTING = VERY POOR
 DECAYED ORGANICS = NONE
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 WEIGHT=
 BASIN AREA = 17.0KM**2

NTS-105K07

 * * *
 * SAMPLE * 81G0026 *
 * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08
 ----- -EASTING 606400E
 -NORTHNG 907700N
 NTS- 105K07

PROJECT

 G

DATE SAMPLED: 07MAY81
 SAMPLERS : NP/OC

 * * * * *
 * SAMPLE * 81G0027 *
 * * * * *

SAMPLE
 81G0027

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPS	WT G
-150 HM TOT																.73
-60+150HM TOT																.30
-35+60 HM TOT																.11
-20+35 HM TOT																.03
-60 IM TOT																< .01
-150 HN TOT	3400	0.2	96	156	0.2	30	2	250	NSS	1.60	500	10	2		2370	1.98
-60+150HN TOT	3600	0.2	66	88	0.2	34	4	700	52	1.80	460	12	0.8		10	2.92
-35+60 HN TOT	3100	0.2	84	54	0.2	22	2	250	8	1.60	400	6	0.8		< 10	4.53
-20+35 HN TOT	3200	0.2	4	62	0.2	12	4			1.60	360	4				17.23
-60 IN TOT																5.51
-150 HP TOT																3.54
-60+150HP TOT																15.96
-60 HP TOT		0.1	15	115	0.1	13	3			3.00	2000	5	0.4			19.50
-35+60 HP TOT																34.82
-20+35 HP TOT																58.87
-60 IP OX		0.1	12	47	0.4	10	2			1.80	300	7				
-60 IP TOT		0.1	16	200	0.4	34	1			6.00	680	12				2.97

STREAM WIDTH= 1.2M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= BETWEEN BOULDERS STREAM TYPE= STRAIGHT SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.9M
 ----- MODERATE(10-50%) 2 X X X X X SEDIMENT SORTING = POOR
 LITTLE(<10%) 1 X X X X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 7.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0027 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 07MAY81
 ----- -EASTING 606500E ----- SAMPLERS : CH/NM
 -NORTHNG 906200N G
 NTS- 105K07

 * * * * *
 * SAMPLE * 81G0029 *
 * * * * *

SAMPLE
81G0029

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-150 HM TOT																.39
-60+150HM TOT																.25
-35+60 HM TOT																.08
-20+35 HM TOT																.07
-60 IM TOT																< .01
-150 HN TOT	NSS	0.3	135	105	0.3	27	3	NSS	NSS	1.65	430	66	NSS		70	1.29
-60+150HN TOT	3200	0.4	54	70	0.2	30	2	800	52	2.10	620	134	1.6	<	10	5.57
-35+60 HN TOT	2800	0.4	56	72	0.2	18	4	500	40	2.50	760	66	0.8		10	12.70
-20+35 HN TOT	3000	0.2	24	60	0.2	10	6			2.40	680	32				20.53
-60 IN TOT																3.04
-150 HP TOT																1.77
-60+150HP TOT																13.59
-60 HP TOT		0.1	24	95	0.4	22	2			4.10	2460	15	1			15.36
-35+60 HP TOT																31.90
-20+35 HP TOT																37.36
-60 IP OX		0.1	11	41	0.6	12	1			1.80	330	11				
-60 IP TOT		0.1	24	220	0.8	38	3			6.80	830	24				2.60

STREAM WIDTH= 6.1M WATER LEVEL= HIGH FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= LGW
 ----- DEPTH= 0.7M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= MEANDERING SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = PROBABLE CAMP SITE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.3M
 MODERATE(10-50%) 2 SEDIMENT SORTING = MODERATE
 LITTLE(<10%) 1 X X X X X
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 30.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0029 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 10JUN81
 ----- -EASTING 607600E -----
 -NORTHNG 906800N
 NTS- 105K07

 * * * * *
 * SAMPLE * 81G0030 *
 * * * * *

SAMPLE
81G0030

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PS PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	3300	0.2	48	60	0.2	26	2	420	28	2.30	370	20	0.8	<	10	10.52
-60 HP TOT		0.1	8	62	0.1	12	2			2.65	1850	5	0.2			47.09
-35+60 IP OX		0.1	3	26	0.1	7	1			1.20	375	3				
-35+60 IP TOT		0.1	16	147	0.3	29	1			7.15	985	17				18.85

STREAM WIDTH= 1.8M WATER LEVEL= NORMAL FLOW RATE= FAST TURBULENCE= SLIGHT GRADIENT= MODERATE
 ----- DEPTH= 0.4M
 PH = SUSPENDED MATTER= LIGHT/SLIGHTLY CLOUDY WATER COLOR= CLEAR GREEN SEDIMENT COLOR= BROWN BLACK/DAR
 SAMPLE SITE= SIDE BAR STREAM TYPE= MEANDERING SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= SLIGHT ORGANIC SLIME
 CONTAMINATION = POSSIBLE GOSSAN

SEDIMENT LOTS(>50X) 3 MAX. BOULDER SIZE= 0.3M
 ----- MODERATE(10-50X) 2 X X X X X SEDIMENT SORTING = VERY POOR
 LITTLE(<10X) 1 X X X X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 24.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0030 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZDNE 08
 ----- -EASTING 603800E
 -NORTHNG 914200N
 NTS- 105K07

PROJECT

 G

DATE SAMPLED: 10JUN81
 SAMPLERS : CH/DC

 * * * * *
 * SAMPLE * 81G0031 *
 * * * * *

SAMPLE
 81G0031

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PS PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 MN TOT	600	0.4	128	180	1.8	34	4	155	NSS	3.70	740	30	NSS	<	10	1.86
-60 HP TOT		0.1	44	115	0.1	5	2			2.33	1900	16	0.4			11.30
-35+60 IP OX		0.1	72	330	1.1	6	1			2.70	470	55				
-35+60 IP TOT		0.5	128	950	1.2	18	2			9.70	1150	180				3.00

STREAM WIDTH= 0.6M WATER LEVEL= NORMAL FLOW RATE= SLOW TURBULENCE= STILL GRADIENT= LCW
 ----- DEPTH= 0.8M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BLACK/DARKORANGE
 SAMPLE SITE= OTHER STREAM TYPE= MEANDERING SAMPLE POSITION= CENTER
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 X MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50%) 2 X X SEDIMENT SORTING = GOOD
 LITTLE(<10%) 1 X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 12.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0031 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 10JUN81
 ----- -EASTING 606800E ----- SAMPLERS : CS/NM
 -NORTHNG 916000N G
 NTS- 105K07

 * * * * *
 * SAMPLE * 81G0032 *
 * * * * *

SAMPLE
81G0032

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	950	0.2	54	276	1.2	36	2	140	NSS	2.55	780	12	2	<	10	1.79
-60 HP TOT		0.1	11	270	0.3	16	2			4.10	3250	10	0.2			10.26
-35+60 IP OX		0.1	10	465	1.5	11	1			1.65	1600	16				
-35+60 IP TOT		0.1	17	940	1.8	54	3			11.00	2000	46				11.76

STREAM WIDTH= 3.0M WATER LEVEL= HIGH FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.1M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= MEANDERING SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= SLIGHT ORGANIC SLIME
 CONTAMINATION = NONE

SEDIMENT LOTS(>50X) 3 X PAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50X) 2 X SEDIMENT SORTING = POOR
 LITTLE(<10X) 1 X X X X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 33.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0032 *
 * * * * *

EX033

HEAVY MINERALS

21APR82

LOCATION UTM-ZONE 08 PROJECT
 ----- -EASTING 609600E -----
 -NORTHNG 914500N
 NTS- 105K07

DATE SAMPLED: 10JUN81
 SAMPLERS : CH/DC

 * * * * *
 * SAMPLE * 81G0033 *
 * * * * *

SAMPLE 81G0033 ----- A S S A Y R E S U L T S -----

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MC PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	2950	7.4	146	170	0.8	196	2	85	112	3.25	485	166	2.4		40	6.96
-60 HP TOT		0.1	5	125	0.1	18	1			3.28	2000	10	0.1			55.00
-35+60 IP CX		0.1	5	139	0.5	14	1			3.70	1050	24				
-35+60 IP TOT		0.1	13	650	1.4	92	1			13.00	1900	61				28.60

 STREAM WIDTH= 3.0M WATER LEVEL= HIGH FLOW RATE= MODERATE TURBULENCE= MODERATE GRADIENT= MODERATE
 ----- DEPTH= 0.9M
 PH = SUSPENDED MATTER= NONE WATER COLOR= CLEAR SEDIMENT COLOR= BROWN
 SAMPLE SITE= POINT BAR STREAM TYPE= MEANDERING SAMPLE POSITION= RIGHT SIDE
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = POSSIBLE CAMP SITE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 1.5"
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = POOR
 LITTLE(<10%) 1 X X DECAYED ORGANICS = LOW
 NONE 0 X X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 41.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0033 *
 * * * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE 08 PROJECT DATE SAMPLED: 10JUN81
 ----- -EASTING 612300E -----
 -NORTHNG 917800N G
 NTS- 105K07

 * * *
 * SAMPLE * 81G0034 *
 * * *

SAMPLE
 81G0034

A S S A Y

R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPB	WT G
-60 HN TOT	850	0.4	48	128	0.6	28	2	100	68	2.70	415	8	0.2	<	10	20.86
-60 HP TOT		0.1	6	88	0.1	11	1			2.20	1540	4	0.1			192.22
-35+60 IP OX		0.1	10	186	0.2	10	1			2.00	565	9				
-35+60 IP TOT		0.2	15	570	0.5	44	1			12.00	1200	35				22.94

STREAM WIDTH= 2.4M WATER LEVEL= HIGH FLOW RATE= MODERATE TURBULENCE= SLIGHT GRADIENT= STEEP
 ----- DEPTH= 0.3M
 PH = SUSPENDED MATTER= LIGHT/SLIGHTLY CLOUDY WATER COLOR= CLEAR YELLOW SEDIMENT COLOR= GREEN
 SAMPLE SITE= SIDE BAR STREAM TYPE= MEANDERING SAMPLE POSITION= LEFT SIDE
 PRECIPITATE OR STAIN= VARIABLE SLIGHT ORGANIC SLIME
 CONTAMINATION = NONE

SEDIMENT LOTS(>50%) 3 MAX. BOULDER SIZE= 0.0M
 ----- MODERATE(10-50%) 2 SEDIMENT SORTING = POOR
 LITTLE(<<10%) 1 X X X X X
 NONE 0 X X X X X
 BOULDERS COBBLES PEBBLES GRANULES SAND SILT CLAY
 GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 55.0KM**2

NTS-105K07

 * * *
 * SAMPLE * 81G0034 *
 * * *

EX033

H E A V Y M I N E R A L S

21APR82

LOCATION UTM-ZONE C8
 ----- -EASTING 614500E
 -NORTHNG 911800N
 NTS- 105K07

PROJECT

 G

DATE SAMPLED: 10MAY81
 SAMPLERS : GJ/NP

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 * SAMPLE * 81G0035 *
 * * * * *

SAMPLE
 81G0035

A S S A Y R E S U L T S

TEST	BA PPM	AG PPM	PB PPM	ZN PPM	CD PPM	CU PPM	MO PPM	W PPM	SN PPM	FE %	MN PPM	AS PPM	SB PPM	HG PPM	AU PPM	WT G
-60 HN TOT	2000	0.6	26	56	0.2	24	2	105	12	2.50	270	18	0.4	<	10	10.15
-60 HP TOT		0.1	11	53	0.1	12	1			4.00	2500	2	1			61.68
-35+60 IP OX		0.1	4	30	0.1	11	1			1.80	370	3				
-35+60 IP TOT		0.3	22	155	0.2	80	1			13.00	1050	29				14.63

STREAM WIDTH= 2.4M WATER LEVEL= NORMAL FLOW RATE= MODERATE TURBULENCE= SLIGHT GRADIENT= LOW
 ----- DEPTH= 0.1M
 PH = SUSPENDED MATTER= LIGHT/SLIGHTLY CLOUDY WATER COLOR= WHITE/LIGHTBRDWN SEDIMENT COLOR= BROWN
 SAMPLE SITE= BACK EDDY STREAM TYPE= STRAIGHT SAMPLE POSITION= CENTER
 PRECIPITATE OR STAIN= NONE
 CONTAMINATION = POSSIBLE CAMP SITE

SEDIMENT	BOULDERS	COBBLES	PEBBLES	GRANULES	SAND	SILT	CLAY	MAX. BOULDER SIZE=	SEDIMENT SORTING =	DECAYED ORGANICS =
LOTS(>50%)	3							0.3M	VERY POOR	LOW
MODERATE(10-50%)	2	X	X	X	X	X	X			
LITTLE(<10%)	1	X	X	X	X	X	X			
NONE	0	X	X	X	X	X	X			

GJ-SORTING PARAMETER =
 GJ-COARSENESS PARAMETER =

SAMPLE STATUS= ROUTINE SAMPLE
 ----- WEIGHT=
 BASIN AREA = 9.0KM**2

NTS-105K07

 * * * * *
 * SAMPLE * 81G0035 *
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