2010 GEOCHEMICAL REPORT

ON THE MAMQUAM 1-3 CLAIMS

IN THE PACIFIC RANGES OF THE COAST MOUNTAINS

92 G/10

NEW WESTMINSTER MINING DIVISION

122 DEGREES 57 MINUTES 36 SECONDS WEST

49 DEGREES 39 MINUTES 0 SECONDS NORTH

CLAIMS: MAMQUAM 1-3

TENURE NUMBERS: 510555, 510559, 510564

OWNER/OPERATOR: KEN MACKENZIE

AUTHOR: KEN MACKENZIE FMC# 116450

SQUAMISH, B.C. MAY, 2011

EVENT NUMBER: 4851028

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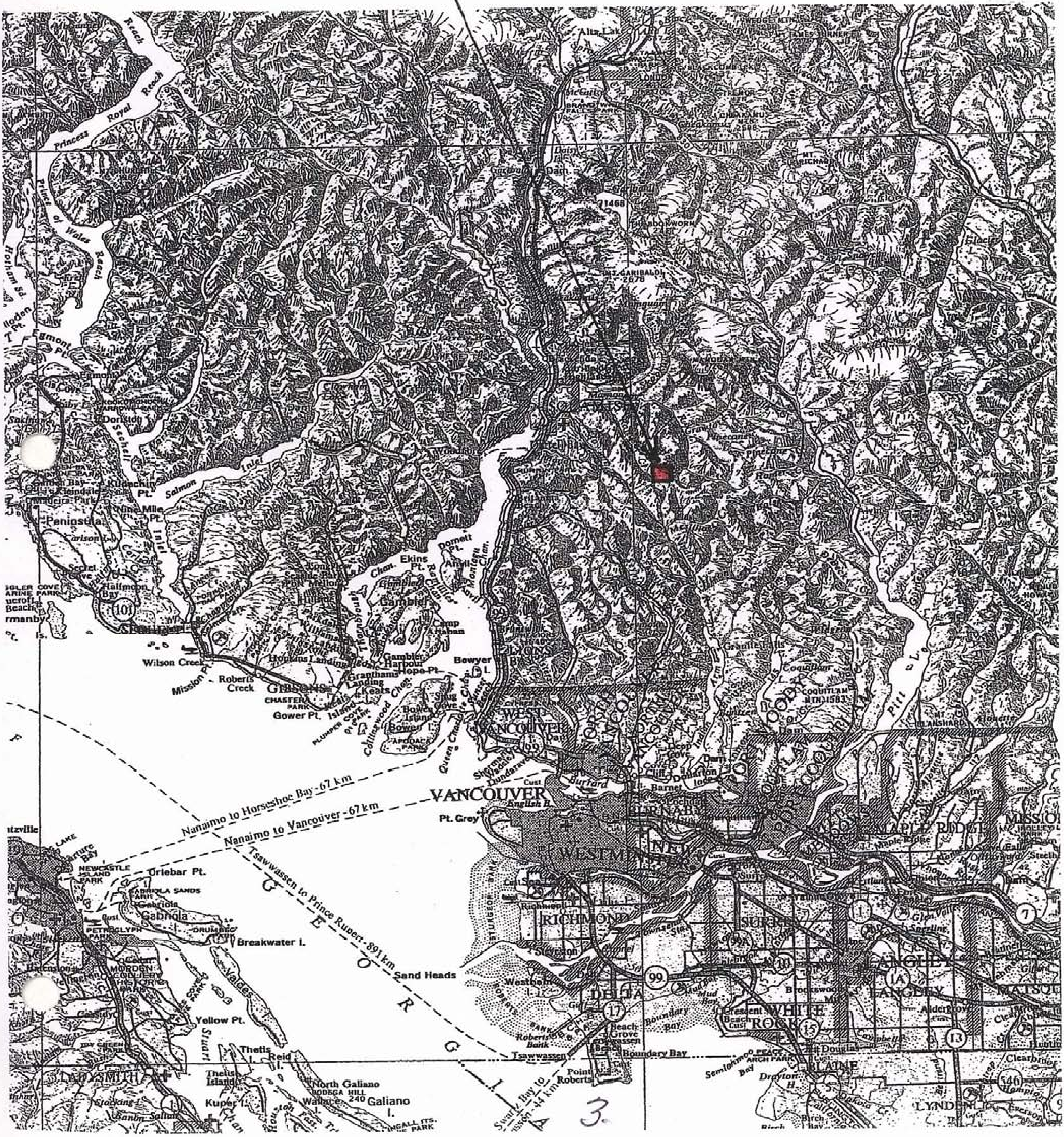
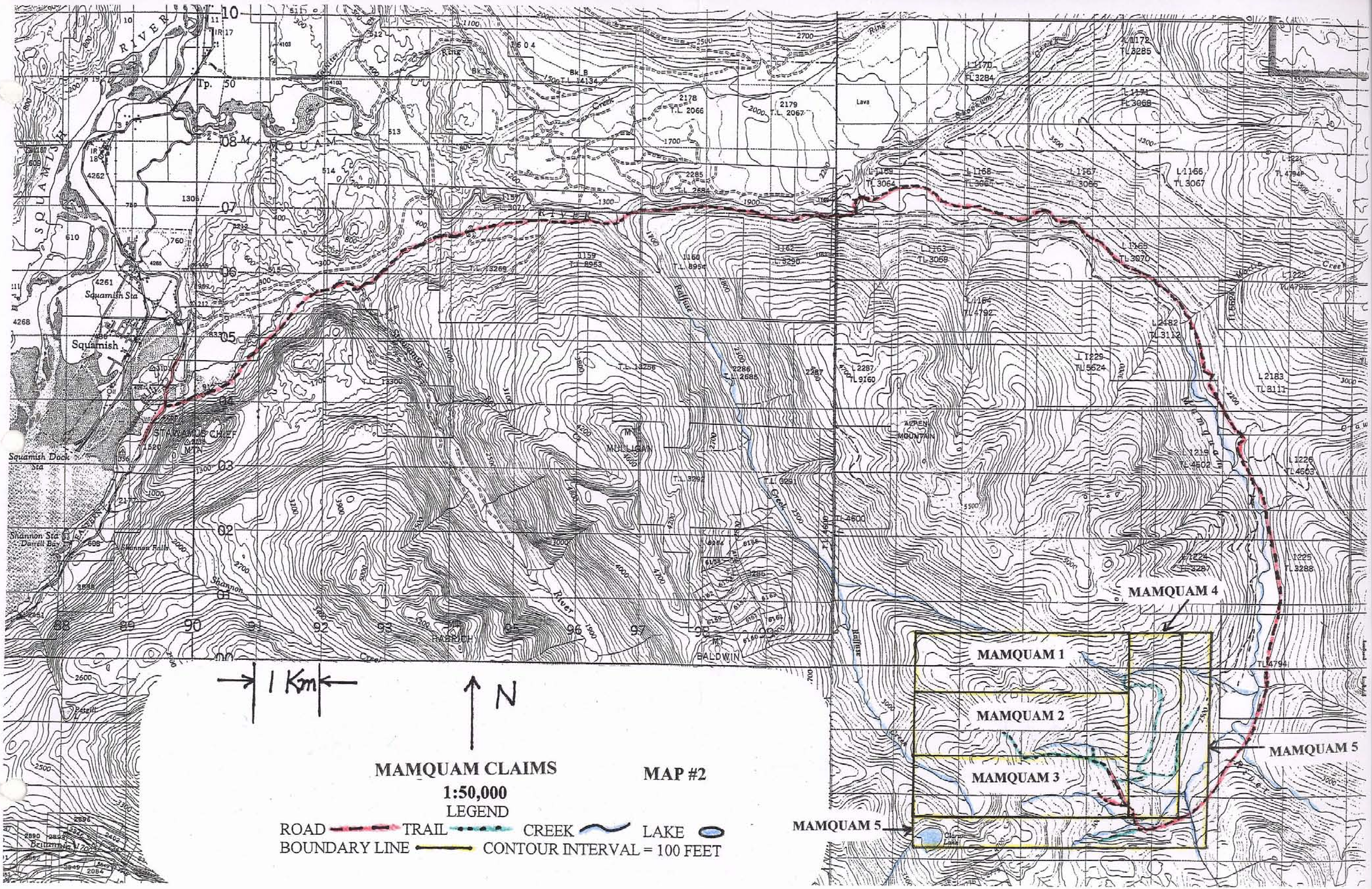
MAMQUAM CLAIMS **MAP #1**

1:600,000

0 10 20 30 40 50

Km




MAMQUAM CLAIMS
1:50,000
LEGEND
MAP #2
ROAD
TRAIL
CREEK
LAKE
BOUNDARY LINE
CONTOUR INTERVAL = 100 FEET
1 Km
N
MAMQUAM 1
MAMQUAM 2
MAMQUAM 3
MAMQUAM 4
MAMQUAM 5
MAMQUAM 5
Squamish
Squamish Sta
Squamish Dock Sta
STAWAMUS CHIEF MTN
Shannon Sta
Darrell Bay
Shannon Falls
MT MULLIGAN
ALPEN MOUNTAIN
MT BALDWIN
HABRICH
SQUAMISH
RIVER
M A M Q U A M
Britannia
Clarion Lake

N

MAMQUAM CLAIMS

1:20,000

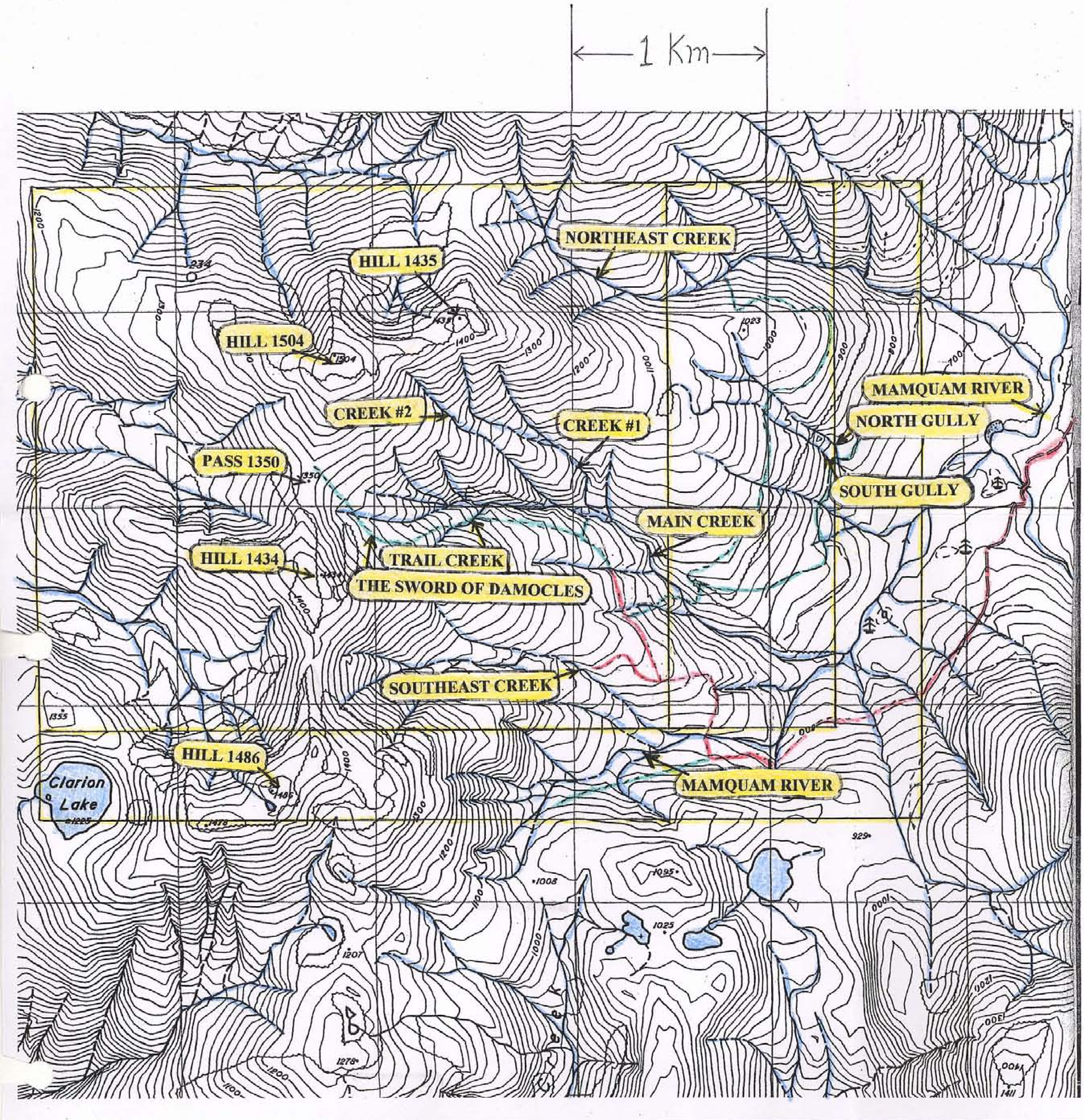
MAP # 3

PLACE NAMES, ROADS AND TRAILS

LEGEND

ROAD — TRAIL — CREEK OR RIVER — LAKE

BOUNDARY LINE — CONTOUR INTERVAL = 20 METERS



MAMQUAM 1-3 CLAIMS
INTRODUCTION

The Mamquam 1-3 claims are located in Pacific Ranges of the Coast Mountains near the headwaters of the Mamquam River. See Map #1 (the index map) for the location.

The property can be accessed by road from Squamish. Drive south from Squamish on highway 99 to the Mamquam main logging road, which is reached just beyond a bridge over the Stawamus River near the base of the Stawamus Chief (a well-known rock climbing area). Turn left (east) off the highway and follow the main road, which is marked in miles and in kilometres. Logging trucks or construction vehicles may be present on this road so drive carefully with your lights on and use a radio. The correct frequency is posted.

At approximately 2.5 miles the road crosses the Stawamus River, and continues on past a run of the river electrical generating plant (mile 6 to 8). At mile 9 the road crosses a bridge over the Mamquam River and stays on the north side of the river until the headwaters are reached.

In 2010 there was no logging activity beyond the 9 mile bridge but that may change in 2011.

At mile 15 the road narrows and becomes steep for a short section. If there is evidence of logging trucks on the road I stop there and make more calls than usual on the radio to ensure there are no loaded logging trucks coming down the hill while I'm proceeding up. There is also a fork in the road at mile 15. The mein road goes uphill to the left. The other road continues straight ahead but is decommissioned and cross-ditched.

At mile 18 there is a similar junction but this time you should continue straight ahead on the decommissioned, cross-ditched road that soon crosses the Mamquam River near its headwaters. The road is easily drivable with a four-wheel drive vehicle with sufficient clearance. Continue on the main road that parallels and then crosses a branch of the Mamquam flowing from the southwest. Continue uphill until the road splits. One road continues straight ahead and the other goes right (north). Both roads terminate on the property between 900 and 1000 metres of elevation.

Take the right fork and head north, roughly contouring around the mountain until a washout is reached, which is where you park.

These roads are shown on Map #2 (1:50,000 index map), which shows the property in relationship to the Mamquam River, Raffuse Creek, Clarion Lake, the Stawamus River and the town of Squamish.

There are three trails that begin from this north branch of the road. The first one is found at a low point in the road where a small creek flows through a culvert under the road. This trail descends from the road south of the creek then crosses the creek to travel north along the edge of the logging slash until the forest is entered. The trail then continues downhill beside the small stream until the main creek is reached. The main creek can be easily crossed at this site and the trail ascends the other bank passing over a recently fallen cedar tree which is gradually settling into the hillside. The trail then follows a small gully next to a glacial till slope failure. Once the logging slash is reached, the trail continues along the edge of the forest until an old logging road is encountered. This road can be followed uphill (west) and then north contouring around the mountain. Near the end of the road above the northeast creek, the trail enters the logging slash to the west and ascends through a thick growth of blueberries and small trees until the forest is reached again. From this site the trail proceeds north and west a short distance then descends the steep bank into the northeast creek.
The old logging road on the other side of the main creek can also be followed downhill (east and then north) until it reaches the lower gossan that contains the north and south gullies.

The other two trails can be accessed by parking before the washout and hiking to the end of the road where there is a turnaround. The first trail leaves the turnaround towards the north and descends steeply into the main creek.
The second trail leaves the turnaround towards the west and heads uphill through the logging slash until the forest is reached, where it continues parallel to the main creek until trail creek is reached. The route then continues in trail creek, or parallel to trail creek until sub-alpine glades are encountered. At this point the trail changes direction to the northwest until pass 1350 is reached.

There are numerous deer, black bears and the occasional cougar in the area. The animals use the roads and trails regularly so caution is advised. In addition, elk have been re-introduced to the Indian River watershed and I expect them to expand into the Mamquam River area in the near future. Bull elk can be very aggressive in the fall rutting season.

However, the most dangerous animals encountered in this area are other humans.

Many people drive the roads quickly and recklessly. Although I'm very careful, I've still had near misses with people on ATV's , motorcycles or other vehicles which were travelling at high speeds on the potholed, gravel roads.

Hunters are another special problem. Many hunters are knowledgeable and safety conscious but there are others who seem to shoot indiscriminately in all directions and these people are a major danger. I've even heard of hunters who shoot at a noise in the bush without seeing what they're firing at. Apparently this is called a sound shot.

In addition to the normal wild black bears that I encounter, conservation officers often release problem bears that have been habituated to humans into this area. For some strange reason the Department of Natural Resources thinks this is a safe place to release dangerous bears. These bears are not afraid of humans and view them as a source of food. Habituated bears are no longer accustomed to foraging in the woods and become very hunger and extremely aggressive. My greatest fear is that one day the Department of Natural Resources will release a grizzly bear into the Indian River or the Mamquam River area without public consultation or warnings.

There are three claims that cover this part of the Mamquam Property named Mamquam 1 to 3, and their tenure numbers are 510555, 510559, and 510564. Most of the property is covered with soil or glacial till so rock outcrops are scarce. As a result, prospecting has mainly been done by following the stream sediment geochemistry, and examining creek beds. Outcrops on or near old logging roads have also been prospected. Nearly all the mineralized rock found to 2005 was float, for which no source has been identified. However, since then low grade disseminated chalcopyrite has been identified in various outcrops of altered quartz diorite and in silicified andesites. High grade chalcopyrite has also been found in a fracture dilation in the south gully. This high-grade chalcopyrite was found by following float to its source.

There are two main rock types found on the property, Gambier Group metamorphosed volcanics that contain rhyolites, andesites, cherts, tuffs and volcaniclastics. There are also intrusive rocks such as quartz diorite and granodiorite. The two areas of metamorphosed volcanic rocks identified in the early 1980's have been found to be more extensive than previously thought. In addition, there are numerous rhyolite and some porphyry dykes in the area. These are the same rocks that are associated with the Britannia Mine so the model originally used was a volcanogenic massive sulphide type of mineralization. This model still applies, particularly now that a number of silicified mineralized rocks (float) have been found in the glacial till, which probably derive from a feeder zone. However, as more evidence of disseminated chalcopyrite and mineralized quartz veins are found, other models may also apply.

This report covers a total of 32 geochemical samples, 19 soil samples, 8 sediment samples, 2 bedrock samples and 3 rock float samples.

To date no massive sulphide, feeder zone, porphyry copper or quartz vein deposit of commercial value has been identified on the Mamquam property.

Map #3 is a 1:20,000 map that shows the roads, trails and place names used on all the Mamquam claims.

HISTORY OF THE MAMQUAM 1-3 CLAIMS

A detailed history of the Mamquam property was documented in my 2005 prospecting report. Please refer to that report for a more complete summary. This report on the history will provide only a brief description of the property to the end of 2009.

This property was discovered in 1979 using a dithizone field test combined with stream sediment analyses performed in commercial labs. The original model was a volcanogenic massive sulphide type of deposit similar to that found in the nearby Britannia mine. The highest geochemical values found at that time surrounded hill 1504. This area was thought to contain one or more massive sulphide lenses. This interpretation is still considered valid, and has been strengthened now that other types of mineralized rock have been found that indicate the presence of a feeder zone.

In addition, chalcopyrite disseminated in quartz diorite intrusive rocks has been discovered. The significance of this mineralization is unclear at this time, but disseminated mineralization can occur near massive sulphide lenses or it could be an indicator of a porphyry copper occurrence. The cluster of various sized pieces of rock float that appear to be part of a feeder zone found in or near trail creek contain copper, zinc, lead, gold and silver as well as other indicator elements.

The work performed from 2005 to 2009 has revealed new anomalous areas that have required additional staking as well as more detailed follow-up. The spring, seep and waterfall survey has been very successful in confirming previous results and extending anomalies to new areas. The various soil and bedrock grids have proven to be extremely good for outlining the gossans and better defining the anomalous areas found with stream geochemistry.

Highly anomalous levels of gold have been found in seven separate areas surrounding hill 1504.

In summary, based on the previous prospecting and geochemical investigations, the present model includes a massive sulphide occurrence with one or more feeder zones, one or more sulphide lenses, a possible porphyry copper occurrence and at least seven anomalous gold areas, all centered on hill 1504.

SUMMARY OF WORK PERFORMED ON THE MAMQUAM 1-3 CLAIMS IN 2010

All the prospecting trips into the Mamquam property in 2010 were day trips. Although the end of the road as shown in Map # 2 is over 40 km from Squamish, this is close enough to allow daily access. The road is severely potholed and is narrowing in many places as the trees grow on the shoulders and lean into the driving space. Each year road work is required so access to the claims can be maintained, mainly tree and brush removal.
In the past years a few large holes were filled with rocks. For 2010, all holes previously repaired with loose rocks did not enlarge and the road has remained solid and driveable. The medium sized rocks I used for these projects allow water to pass through the spaces without causing erosion.

On July 2, 2010 I drove to the end of the road, hiked uphill to the landing and took the trail that goes downhill into the main creek. I did some trail clearing until I reached the line 5498900 N. I then crashed through the blueberries in the logging slash along the line until I reached 0504000 E where I took M 167.

M 167 0504000 E 5498900 N
This was a soil sample, "A" level, black organic from about 37 centimetres deep. The sample was obtained from a linear depression that may have been a previous stream.
Significant results for M 167:

Al	4.42	%
As	9	ppm
Ba	150	ppm
Cd	2.5	ppm
Co	160	ppm
Cu	296	ppm
Mn	1.46	%
Mo	10	ppm
P	1710	ppm
Pb	110	ppm
Zn	137	ppm

The cobalt level in this sample is the highest found in a soil to date.

M 168 0503900 E 5498900 N

I continued heading west through the logging slash along line 5498900 N until I reached the next sample site at 0503900 E. There was "C" level soil available at this site which was coloured yellow-brown, just like the gossan readily seen in the main creek to the north. The sample was obtained from about 10 centimetres below the surface.

Significant results for M 168:

As	10	ppm
Ba	50	ppm
Cu	94	ppm
Fe	6.39	%
Mn	763	ppm
Mo	12	ppm
Zn	183	ppm

Once more I continued heading west along the line until I reached the cliffs that form the eastern boundary of the deep linear depression that lies below the trail and above the main creek. I had to detour to the south until I could continue heading west in order to reach 0503800 E.

M 169 0503800 E 5498870 N

This was a "C" level soil sample taken from the edge of the cliffs on a steep slope. It was obtained from about 15 centimetres deep and was a yellow-brown colour, similar to the last two samples.

Significant results for M 169:

As	51	ppm
Cu	312	ppm
Fe	7.47	%
Mo	10	ppm
P	1280	ppm
Zn	135	ppm

The arsenic level in this sample is the highest found in a soil to date.

I continued heading westward along the edge of the cliffs until I reached the trail, which was still covered in snow patches that were up to two metres deep in places.

M 170 0503700 E 5498870 N

Sample M 170 was taken from just below the trail on a steep slope at the top of the cliffs. There were numerous roots in the soil and it was not possible to reach the "C" level. I managed to get through the "A" level, but the sample ended up being a mixture of mainly "B" with some "A" soil included.

There were no significant results for M 170.

On July 5, 2010 I returned to the same place, hiked uphill to the landing and then headed south on Line 0504000 E until I reached 5498800 N. I was in the logging slash with a thick growth of blueberries and small trees.

M 171 0504000 E 5498800 N

A "C" level soil sample was taken from 20 centimetres deep. The soil was dry and brown.

Significant results for M 171:

As 6 ppm

I then continued westward on the line 5498800 N until I reached the next sample site.

M 172 0503900 E 5498800 N

I collected a "C" level soil sample that was coloured brown from about 20 centimetres deep.

Significant results for M 172:

As 7 ppm

Following the same line I went 100 metres to the next site

M 173 0503800 E 5498800 N

At this site, the soil was brown and dry, and contained a lot of roots. I managed to dig a hole about 25 centimetres deep, but could only find "A" level organic material, which was sampled.

Significant results for M 173:

As 5 ppm

Again I followed the same line for 100 metres.

M 174 0503700 E 5498800 N

"C" level soil was readily available at this site due to an overturned tree. The soil was a moist, brown-yellow, closer in colour to the nearby gossan than the previous three samples. The sample was taken from a hole 35 centimetres deep.

Significant results for M 174:

Au	0.18	ppm
Al	3.63	%
As	5	ppm
Ba	50	ppm
Fe	4.76	%

I stayed on the same line for another 100 metres, collected a sample and then returned down the trail to the truck.

M 175 0503600 E 5498800 N

Another overturned tree gave me access to "C" level soil which was wet, muddy and a gray-brown colour. The sample was collected from about 40 centimetres below the surface.

Significant results for M 175:

Au	0.02	ppm
As	5	ppm
Ba	50	ppm

On July 8, 2010 I parked at the low spot before the end of the road and descended into the main creek, climbed up the other side and then followed the old logging road to the first spur on the left. This spur was followed to the end and then I took the shortest route through the logging slash to the mature trees. Once in the forest, the going was much easier and I soon found a small stream flowing south that is not marked on the map. I followed the stream uphill until I came to a large open area that contained snow patches.

M 176 0504375 E 5499481 N

The sediments near the source of this stream were sampled and consisted of organic, black muddy material that was full of roots.

Significant results for M 176:

Au	0.035	ppm
As	12	ppm
Ba	340	ppm
Cd	2.5	ppm
Co	44	ppm
Cu	63	ppm
Mn	1.82	%
Mo	5	ppm
P	1240	ppm
Pb	126	ppm

From this site I traversed around the ridge heading south and then west until I came to another small stream that is probably the eastern branch of creek # 1.

M 177 0504175 E 5499388 N

I sampled a small basin where sediment had collected.

Significant results for M 177:

As	9	ppm
Ba	220	ppm
Mg	1.01	%
Mn	3040	ppm
Zn	207	ppm

I continued contouring around the mountain until I reached the junction of the north and south branches of creek #1. The exposed rock in this area is quartz diorite with the mafic minerals altered to chlorite.

M 178 0504052 E 5499366 N

I searched the north branch for a good spot to collect a sediment sample, but there was nothing to be found so I collected sediments from behind larger rocks, in small pools close to the banks and in cracks or crevices. Finding sufficient material took time and effort.

Significant results for M 178:

As	9	ppm
Ba	310	ppm
Cd	1.3	ppm
Cu	71	ppm
Mg	0.88	%
Mn	3760	ppm
Zn	211	ppm

<u>M 179</u> 0504052 E 5499366 N

This sediment was taken with great difficulty from the south branch of creek #1. Finding enough material for this sample was much harder than the previous one, but finally enough was collected.

Significant results for M 179:

As	10	ppm
Ba	140	ppm
Cu	68	ppm
Mg	0.96	%
Mn	2580	ppm
Zn	191	ppm

On July 15, 2010 Rainer Schwarz and I drove to the end of the road, hiked uphill until we were near trail creek and then climbed up through blueberries and wild azaleas to the site of M 180.

<u>M 180</u> 0503500 E 5498800 N

This soil sample is a continuation of the line 5498800 N. It was a "C" level soil with some "A" mixed in and was collected about 40 centimetres deep. The soil was mainly a light brown with some dark brown.

Significant results for M 180:

Au	0.017	ppm
As	13	ppm
Cu	63	ppm
Fe	3.97	%
Pb	40	ppm
Zn	146	ppm

We then headed downhill, crossed our trail and descended into the deep linear depression that runs parallel to the main creek (the strike is approximately 90 degrees). We entered the western end of the depression and then walked to the eastern end, often over rotten snow. At one polht I fell through the snow right up to my chest but I was able to cushion my fall with my arms. The GPS was lost in the fall and we didn't notice its loss until we needed another bearing. I returned to the fall site and recovered the GPS in perfect working order. The next four samples were taken at one hundred metre intervals as we moved westward up the depression.

<u>M 181</u> 0503800 E 5498925 N

This rock sample was collected from the north side of the linear depression. Iron, manganese and malachite staining was present in the fractures. The rock is an altered quartz diorite that contains white quartz, quartz-epidote alteration, epidote blebs, some pink feldspar, chlorite and disseminated sulphides mainly pyrite with some chalcopyrite.

Significant results for M 181:

As	14	ppm
Ba	120	ppm
Cu	403	ppm
Mg	1.48	%

<u>M 182</u> 0503800 E 5498925 N

This sediment was taken from the small stream that flows east in the bottom of the linear depression and then north to join the main creek. The sediment was mainly a rusty-coloured mud that contained some sand and gravel.

Significant results for M 182:

As	14	ppm
Ba	200	ppm
Cd	1.8	ppm
Cu	191	ppm
Fe	4.07	%
Mg	0.81	%
Mn	1855	ppm
P	1120	ppm
Pb	68	ppm
Zn	336	ppm

M 183 0503700 E 5498900 N

This sample was taken from the south side of the linear depression. At this site, no soil could be found but numerous rocks of various sizes were available. A random collection of these rocks which all looked similar were broken and combined in the sample. The rock consists mainly of quartz with some quartz-epidote alteration, chlorite and disseminated sulphides (probably marcasite with some chalcopyrite).

Significant results for M 183:

Au	0.012	ppm
As	6	ppm
Ba	50	ppm
Cu	59	ppm
Fe	3.66	%
Mg	1.7	%

M 184 0503600 E 5498950 N

This was a "C" level soil taken from the north side of the linear depression from a depth of 30 centimetres deep. The soil was coloured a light yellow-brown that is typical for the gossan.

Significant results for M 184:

Au	0.022	ppm
As	10	ppm
Ba	60	ppm
Cu	135	ppm
Fe	4.82	%
Mg	1.28	%
Pb	71	ppm

I returned to these claims on July 29, 2010 hiked uphill to the landing near the end of the road and then descended into the main creek. I ascended the main creek and creek # 2 until I was on the line 5499100 N. I climbed up the east bank of creek # 2, and found the site for M 185.

M 185 0503800 E 5499100 N

This "C" level soil was collected from a small bank of rock and soil left from an overturned tree. The soil was light brown and was removed from a hole about 60 centimetres deep.

Significant results for M 185

Au	0.024	ppm
Ag	1.6	ppm
As	40	ppm
Ba	110	ppm
Cu	189	ppm
Fe	8.5	%
Mo	15	ppm
P	1770	ppm
Pb	88	ppm
Zn	610	ppm

From here I returned to creek # 2 and ascended until I reached the first small creek from the west. I hiked up this creek until I reached the next sample site.

M 186 0503500 E 5499300 N

This sample was taken from the south bank of the small stream. It was a "C" level soil, coloured brown from about 20 centimetres deep.

Significant results for M 186:

Ag	1	ppm
As	11	ppm
Ba	50	ppm
Cd	1.7	ppm
Cu	86	ppm
Fe	9.31	%
Mg	1.17	%
Mo	11	ppm
P	1380	ppm
Pb	113	ppm
Zn	234	ppm

I then descended the slope heading south to the next sample site.

M 187   0503500 E   5499200 N

This brown "C" level soil was collected from a hole 20 centimetres deep.

Significant results for M 187:

As	6	ppm
Fe	6.27	%

From this point I headed back to a previous sample site (M 148 collected August 4, 2009). I decided to repeat this sample but at a slightly different place.

M 188   0503700 E   5499100 N

I found some "C" level soil near an overturned tree that provided a better sample than the previous one. The soil was brown from a hole approximately 20 centimetres deep.

Significant results for M 188:

As	10	ppm
Cu	591	ppm
Fe	6.39	%
La	80	ppm
Mg	0.86	%
Pb	46	ppm
Zn	180	ppm

The Lanthanum found in this soil sample is the highest level found in a soil to date.

On August 13, 2010 Michael Mackenzie and I drove to the end of the road, hiked up the trail past trail creek and over pass 1350. We then descended the other side and bushwhacked our way parallel to the west main creek below hill 1504 until we reached a small creek that is not marked on the map.

We were attempting to find and re-sample a creek that was investigated in the early 1980's. At that time I found a small pool that contained a high gold level combined with a high zinc reading. I think the creek we sampled on this trip is not the one we were looking for, but the geochemistry is similar so the other creek is probably nearby.

M 196 0501500 E 5499690 N

This sediment sample was taken from a small pool containing silt, sand and gravel.

Significant results for M 196:

Au	0.053	ppm
As	10	ppm
Ba	350	ppm
Cd	10.8	ppm
Cu	111	ppm
Mg	1.04	%
Mn	2170	ppm
Zn	2060	ppm

The zinc level recorded at this site is the highest found in a sediment to this date.

We then returned the way had come, crossing through pass 1350, but left the trail and contoured south towards hill 1434 where we found a small spring to sample.

M 197 0502794 E 5498958 N

The spring at this site starts in wet soil which was muddy-brown, with roots and was taken about 10 centimetres below the surface.

Significant results for M 197:

Au	0:012	ppm
As	19	ppm
Ba	150	ppm
Cd	4.7	ppm
Cu	142	ppm
Mg	1.12	%
Mn	4650	ppm
Pb	152	ppm
Zn	686	ppm

Rika Lyne and I drove to the end of the road on September 2, 2010 then hiked up the trail and ascended trail creek to its source.

M 198 0503121 E 5498718 N

The source of trail creek is a series of small pools. One of them contained silt and sandy sediments that were sampled.

Significant results for M 198:

Au	0.014	ppm
As	10	ppm
Ba	660	ppm
Cd	1.7	ppm
Cu	50	ppm
Mg	1.3	%
Mn	6680	ppm
Mo	5	ppm
Pb	77	ppm
Zn	249	ppm

We then contoured northwest along the slope until we reached previous sample M 156 which was collected on September 17, 2009.

We prospected the hillside above our previous sample and found two pieces of rock float that appeared to be mineralized.

M 199 0502865 E 5498785 N

This piece of rock float is an altered quartz diorite that contains mainly quartz and chlorite. It contains pyrite disseminated in the rock and in the fractures that are also stained with iron and manganese.

Significant results for M 199:

Au	0.018	ppm
As	7	ppm
Ba	100	ppm
Cd	8.2	ppm
Ca	2.04	%
Fe	4.86	%
Mg	1.06	%
Mn	1960	ppm
Zn	1455	ppm

M 200 0502861 E 5498825 N

This piece of rock float was found to the northwest of the last sample and consisted of a layered rock with dark and light bands. It also contained pyrite and possible chalcopyrite.

Significant results for M 200:

Au	0.015	ppm
As	8	ppm
Ba	170	ppm
Cu	177	ppm
Mg	1.26	%
Zn	180	ppm

Rika and I then contoured southeast around the hillside higher than the way we had come and we sampled a small dry intermittent stream bed above the source of trail creek.

M 201 0502893 E 5498673 N

This sample was a wet, brown "C" level soil from about 20 centimetres deep. The soil had larger rocks with fine material between as well as roots and particles of wood, which were removed as the sample was collected.

Significant results for M 201:

Au	0.025	ppm
As	10	ppm
Ba	50	ppm
Cu	74	ppm
Mg	0.79	%
Mn	2980	ppm
P	1810	ppm
Pb	63	ppm
Zn	137	ppm

After collecting this sample we headed back down trail creek until we found the continuation of an anomalous copper-magnesium line that I wanted to extend.

M 202 0503250 E 5498850 N

This sample was collected from the east bank of trail creek from some wet, yellow, muddy soil. The surface was cleaned off and the sample taken just below the surface (4-6 centimetres).

Significant results for M 202:

Au	0.012	ppm
As	11	ppm
Ba	90	ppm
Cu	115	ppm
Fe	5.08	%
Mg	1.85	%
Mn	1340	ppm
Pb	85	ppm
Zn	426	ppm

We then descended trail creek until we reached line 5498900 N where we collected two more samples to extend the line 200 metres westward.

M 203 0503500 E 5498900 N

This "C" level soil was taken from the east bank of trail creek. It was coloured yellow-brown and was collected from a hole 20 centimetres deep.

Significant results for M 203:

As	8	ppm
Ba	80	ppm
Cu	90	ppm
Fe	7.06	%
Mg	1.31	%
Mo	8	ppm
Pb	98	ppm
Zn	384	ppm

From this sample site we travelled 100 metres east to the site of M 204.

M 204 0503600 E 5498900 N

This sample was collected near the top of a glacial till slope failure. The soil was a wet, clay-like, whitish material with no organic layer above, probably "B" level. The surface was cleaned off and the sample obtained from a shallow hole.

Significant results for M 204:

Au	0.008	ppm
As	12	ppm
Ba	190	ppm
Cd	2.9	ppm
Cu	214	ppm
Fe	4.89	%
Mg	1.71	%
Mn	1355	ppm
P	1090	ppm
Pb	92	ppm
Zn	608	ppm

Adjacent to the soil sample hole we found a piece of rusty rock that had an irregular surface comprised of rounded bumps alternating with holes varying from pin pricks to 1.5 centimetres in diameter. Most of the holes were irregular or rounded in shape, but some were cubical. We've found that this surface texture is an extremely useful prospecting sign. A sample of this rock was taken and labelled M 205.

<u>M 205</u> 0503600 E 5498900 N

This rock float sample was composed mostly of medium sized quartz crystals and is probably another example of the quartz flooding found in this area. The major sulphide was pyrite, but some sphalerite and occasional flecks of chalcopyrite could also be seen with a hand lens.

Significant results for M 205:

Au	0.572	ppm
As	5	ppm
Cd	3.3	ppm
Cu	137	ppm
Fe	8.85	%
Pb	183	ppm
Zn	456	ppm

N

MAMQUAM 1-3 CLAIMS

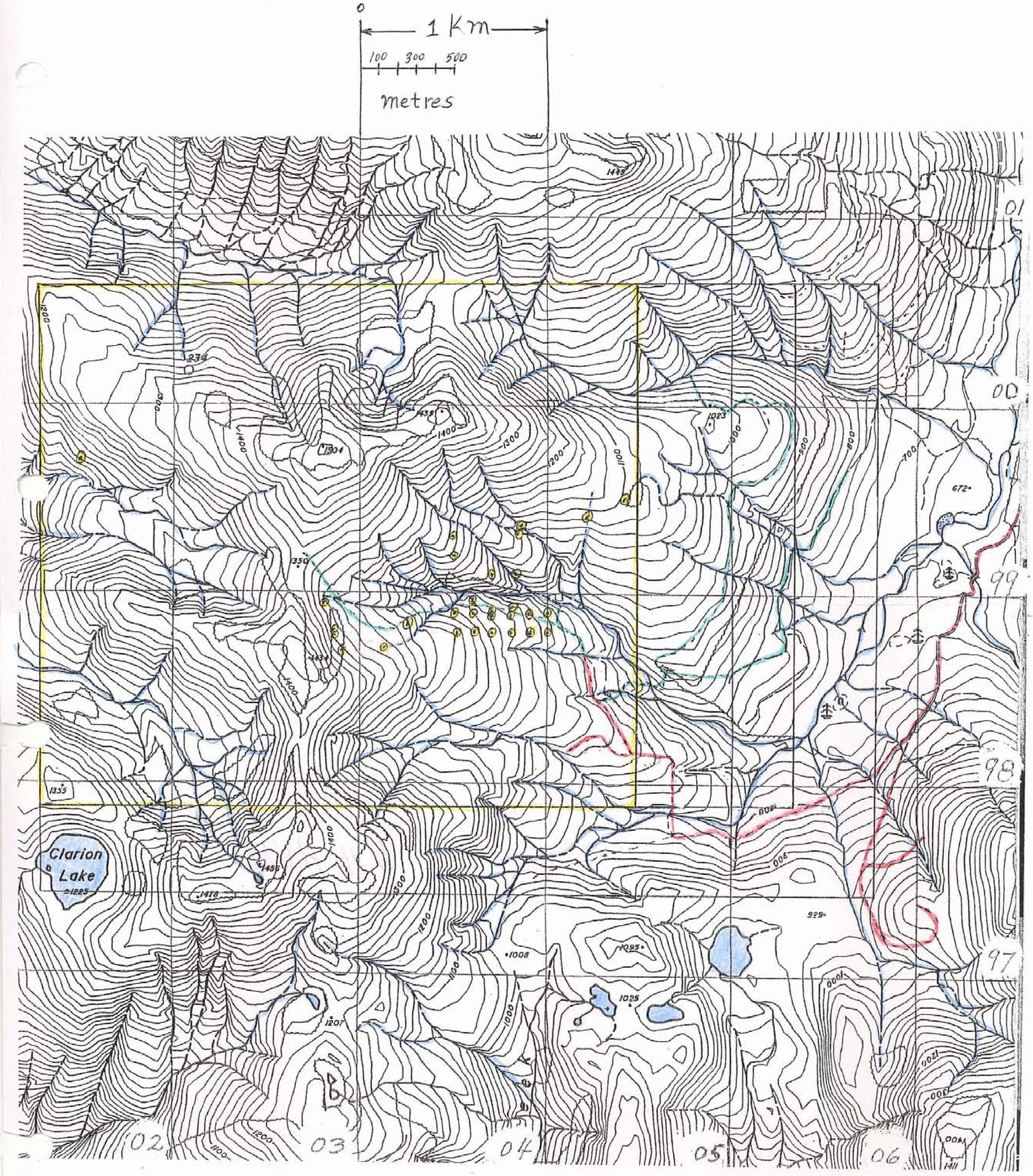
1:20,000 MAP # 4

2010 GEOCHEMICAL SURVEY SAMPLE SITE LOCATIONS

LEGEND:

CREEK LAKE ROAD TRAIL DATUM NAD 83

CONTOUR INTERVAL = 20 METRES CLAIM BOUNDARY 2010 SAMPLE SITE



2010 TECHNICAL DATA AND INTERPRETATION

This report covers a total of 32 geochemical samples, which includes 19 soil samples, 8 sediment samples, 2 bedrock samples and 3 rock float samples.
The location of each sample was obtained using a Garmin GPSmap 60Cx GPS, with the datum setting at NAD 83.
The object of this survey was to follow up on anomalies found in previous years, to extend soil survey lines initiated in 2008 and 2009, to sample gravel bars in all major creeks (particularly those at the base of waterfalls or in other pools) and to continue the survey of springs and seeps begun in 2009.

Each soil sample was obtained using the pick end of a steel rock hammer and a light steel garden trowel. The rock hammer was used to loosen soil and to dig around rocks so they could be removed from the hole. The trowel was used to remove loose soil from the hole and to obtain the sample once the correct level was reached. The holes were excavated widely to prevent upper soil layers from rolling into the hole and contaminating the lower soil layers. My general goal was to sample "C" level soils, but this was not possible at all sites. In areas that have a lot of roots in the soil I also use a pair of pruning shears and occasionally a small hand saw. If I encounter large roots, I try to dig around and under them or I move to another spot.

The sample number, location, description, depth and soil horizon were carefully recorded at each site and the soil obtained was placed in a labelled plastic zip-lock bag, which was sealed. The sealed plastic bag was then placed into a labelled paper bag that was used to protect the plastic bag and the sample from perforation and contamination. Each sample was then carefully placed into a pack and padded with extra clothing to prevent inadvertent damage. This system worked very well and all samples remained intact from the field to the laboratory.

Bedrock and rock float samples were examined, broken with a rock hammer and the fresh surfaces examined with a hand lens. A description was written in the field notes along with the GPS location. Representative samples of the rocks were bagged and transported as described for the soil samples. Rocks with sharp edges were given additional care and padding.

Once I had returned to Squamish, parts of each of the rock samples were removed from their labelled bags and examined again with a hand lens and a stereoscopic microscope. Only one sample was opened at a time, and the table and microscope stage were cleaned after each sample was examined in order to minimize contamination. Once the examination was completed, the pieces of sample were replaced in their bags, sealed and removed from the area before a new sample was reviewed.

Sediment samples were collected using the light steel trowel and a plastic container with a removable lid. The lid has about forty 5 millimetre holes drilled in it. The holes are spaced about 1.25 centimetres apart so the plastic is not weakened. The trowel, the plastic container and the lid are washed before and after collecting each sample so that contamination between samples is minimized. For this survey I was attempting to collect heavy minerals or metals so the preferred sites were gravel bars with rocks 2.54 centimetres or larger found at the base of waterfalls, in other pools or on the sides of creeks.
The trowel was used to dig through the rocks in order to collect the finer material between. The sand, silt and gravel were placed on the lid of the closed container and shaken or scraped with the trowel to filter the fine material into the container. The coarse material is discarded back into the creek. Many trowel loads are required to obtain a sample large enough for analysis. Once the container is about three-quarters full, the cleaned trowel is used to scoop most of the material into a labelled zip-lock plastic bag. The rest of the material still in the container is carefully washed into the bag until the last of the fine black material has been collected. The last material out of the container is the heaviest and therefore the most important. If this portion of the sample is lost, the entire procedure needs to be repeated so a complete sample can be obtained.

Once the sample is in the zip-lock bag, the bag is gently agitated so the heavier material will sink to the bottom. This also causes excess water to rise to the surface where it can be carefully poured out of the bag, while retaining all the heavy minerals or metals. Any black material that floats out with the water at this stage is likely to be quite light and usually organic in nature so the loss is not significant. The zip-lock bag is then sealed, placed in a second larger plastic bag and sealed again with a twist tie (zip-lock bags leak water). Both plastic bags are then placed in a labelled paper bag and the sample is packed upright, near the bottom of the pack in case of water leakage.

Sediment and soil samples should be protected from the sharp edges of tools or rock samples to avoid perforation, which can result in loss or contamination.

All samples were analysed by ALS Ltd. In North Vancouver, BC, and their reports can be found in appendix B. The company has also provided written material on the preparation of the soil, sediment and rock samples as well as their protocols for analyses. This material has been included in appendix C, along with a Quality Assurance Overview that covers quality assurance, quality control, external accreditation and certification, and external proficiency tests.

Microsoft office is the suite of software programs used to produce this report, which includes a database program "Access", a spreadsheet program "Excel", and a word processing program "word". All geochemical analysis results for each sample site are entered into a database. Sample types (rock, soil, sediment, rock float, etc.), collection dates and locations are also recorded. The database can be queried in many ways to produce relevant comparisons.

Map # 4 shows the site locations for all samples collected in this geochemical survey.

Map # 5 documents the sample sites and significant results found in the western area of the claims.

Map # 6 documents the sample sites and significant results found in the eastern area of the claims.

Map # 7 shows the sample numbers and site locations of all samples collected in the central area of the claims.

Map # 8 shows the sample numbers and site locations of all samples with significant results collected in the central area of the claims.

Map # 9 is a compilation of the copper contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010. Only soil, bedrock or loose rock that is likely locally derived has been contoured on maps # 9 to # 14.

Map # 10 is a compilation of the lead contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010.

Map # 11 is a compilation of the zinc contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010.

Map # 12 is a compilation of the magnesium contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010.

Map # 13 is a compilation of the barium contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010.

Map # 14 is a compilation of the molybdenum contours found in the geochemical surveys from 2008 and 2009, as well as the new results found in 2010.

Sites sampled in previous geochemical surveys are marked by a different symbol to those collected in the 2010 survey. Both symbols are shown in the legend of the element contour maps.

In the trail creek area and along line 5498900 N, the patterns on the contour maps are similar for copper, lead, zinc, magnesium and barium. They are all highly positive in the trail creek area with significant extensions of the anomalies to the east along line 5498900 N, which runs roughly parallel to the main creek and the gossan.

Five out of the six samples collected on line 5498800 N do not show the same consistently anomalous values for copper, lead, zinc, magnesium and barium, which probably means this line lies near the edge of the gossan. However the most westerly point on line 5498900 N, sample M 180, does show increased levels of gold, copper, lead and zinc, which are similar to the many other results found on or near the gossan.

Four samples have been collected on Line 5499100 N. All four are anomalous for copper, lead and molybdenum. In addition, three of the four samples are anomalous for zinc. These results are similar to those found on line 5498900 N. Both these lines should be extended and connected by samples on line 5499000 N, wherever possible. Line 5499000 N runs through the main creek canyon which has steep sidewalls so it may be difficult to get to some of the sites.

In spite of finding numerous pieces of rock float with anomalous molybdenum in the trail creek area (see my previous prospecting reports) most of the soil samples found there had only low molybdenum levels. However three consecutive samples on the east end of line 5498900 N were anomalous for molybdenum as were all four samples collected on line 5499100 N. I plan to extend both lines eastward and will also try to add further data points on line 5499000 wherever possible.

Follow-up to M 156 which was collected in my 2009 geochemical survey was conducted this year. The results can be seen on map # 5 which shows the significant results found in the western area of the claims. Samples were taken from below, both sides and above M 156. Although highly significant results were obtained, none of these samples were anomalous for silver, beryllium, calcium, strontium, lanthanum or uranium. However, there is one more small spring to the west of M 156 that has not been sampled yet and I hope to accomplish that in 2011. I also plan to extend my geochemical survey lines westward into this area and onto hill 1434 with the goals of finding the source of the anomalies discovered in M 156 and connecting up with my previous geochemical grid performed on hill 1434 in 1981 and reported in 1982.

CONCLUSION

The highly anomalous area on the low ridge between trail creek and the main creek has been extended to the east and the southwest. These soil anomalies should be compared to the many samples of highly mineralized rock float found in the trail creek area such as M 205.
In addition to the extensions of the copper, lead, zinc, barium and magnesium anomalies, consistent molybdenum anomalies have been found north and south of the main creek.

The spring and waterfall surveys continue to produce interesting anomalous results and will be used as a guide for future soil and bedrock geochemistry survey lines. In particular, M 176, M 196, M 197 and M 198 show poly-metallic anomalies (including gold) that require follow-up. It should be noted that the straight line distance between samples M 176 and M 196 is approximately three kilometres and there are numerous historical and recent anomalous results on, above and below this line (please see my previous reports).
The highly successful spring and waterfall survey will be extended to other areas in 2011.

Geochemical survey lines 5498900 N and 5499100 N are particularly interesting and I plan to extend both lines to the east and the west. In addition, as many samples as possible will be collected on line 5499000 N which lies between the other two lines.

In summary, this geochemical survey has produced more anomalous results that are consistent with a volcanogenic massive sulphide model, which includes one or more feeder zones. In addition, the copper and molybdenum results are further support for a possible porphyry copper-molybdenum occurrence on this property.

N

MAMQUAM 1-3 CLAIMS

1:10,000 MAP # 5

2010 GEOCHEMICAL SURVEY SIGNIFICANT RESULTS WESTERN AREA

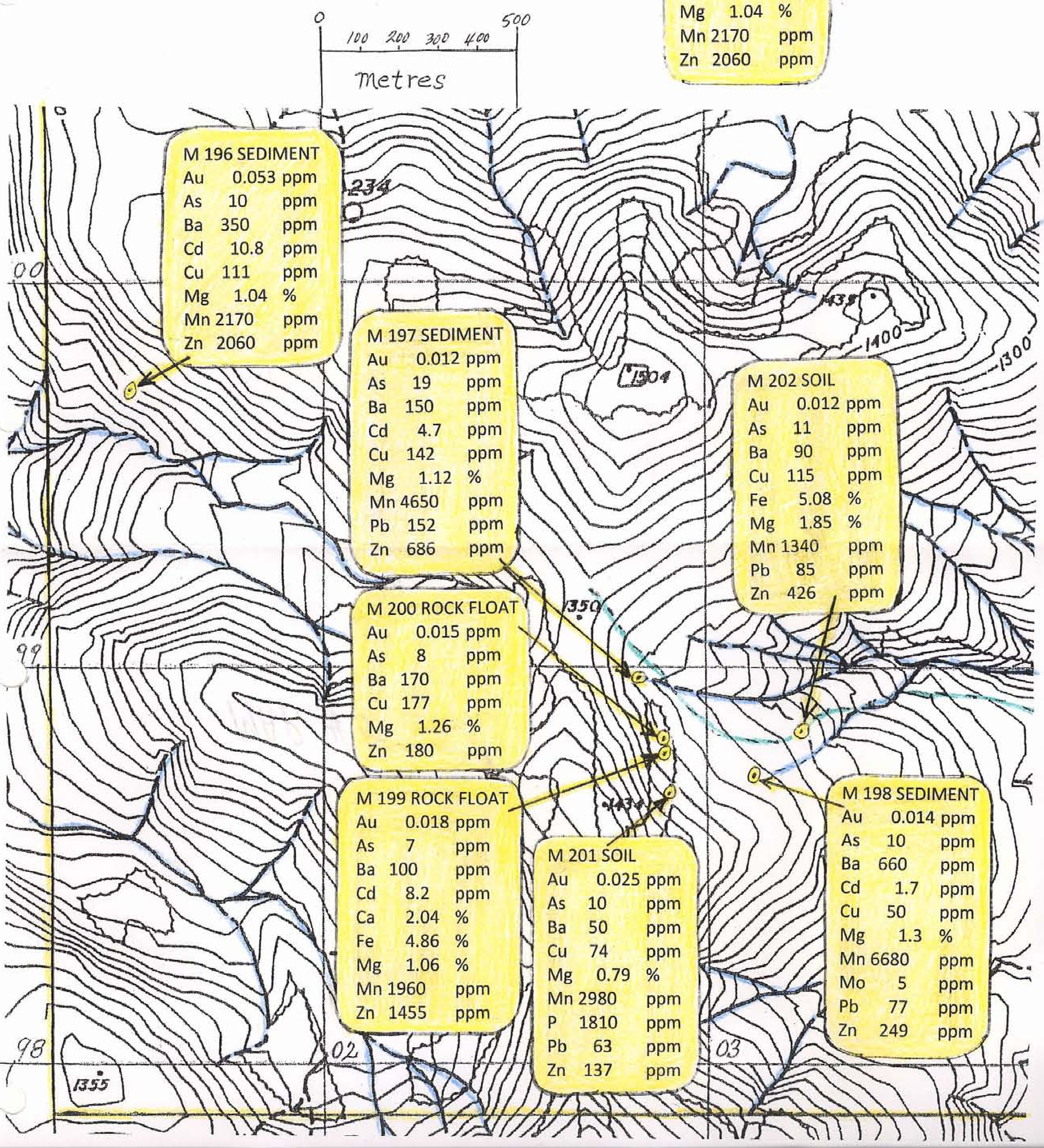
LEGEND:

CREEK — TRAIL — CLAIM BOUNDARY — DATUM NAD 83

CONTOUR INTERVAL = 20 METRES

2010 SAMPLE SITE

M 196 SEDIMENT
Au 0.053 ppm
As 10 ppm
Ba 350 ppm
Cd 10.8 ppm
Cu 111 ppm
Mg 1.04 %
Mn 2170 ppm
Zn 2060 ppm



N

MAMQUAM 1-3 CLAIMS

1:10,000

MAP # 6

2010 GEOCHEMICAL SURVEY SIGNIFICANT RESULTS EASTERN AREA

LEGEND:

CREEK — TRAIL — CLAIM BOUNDARY — DATUM NAD 83

CONTOUR INTERVAL = 20 METRES

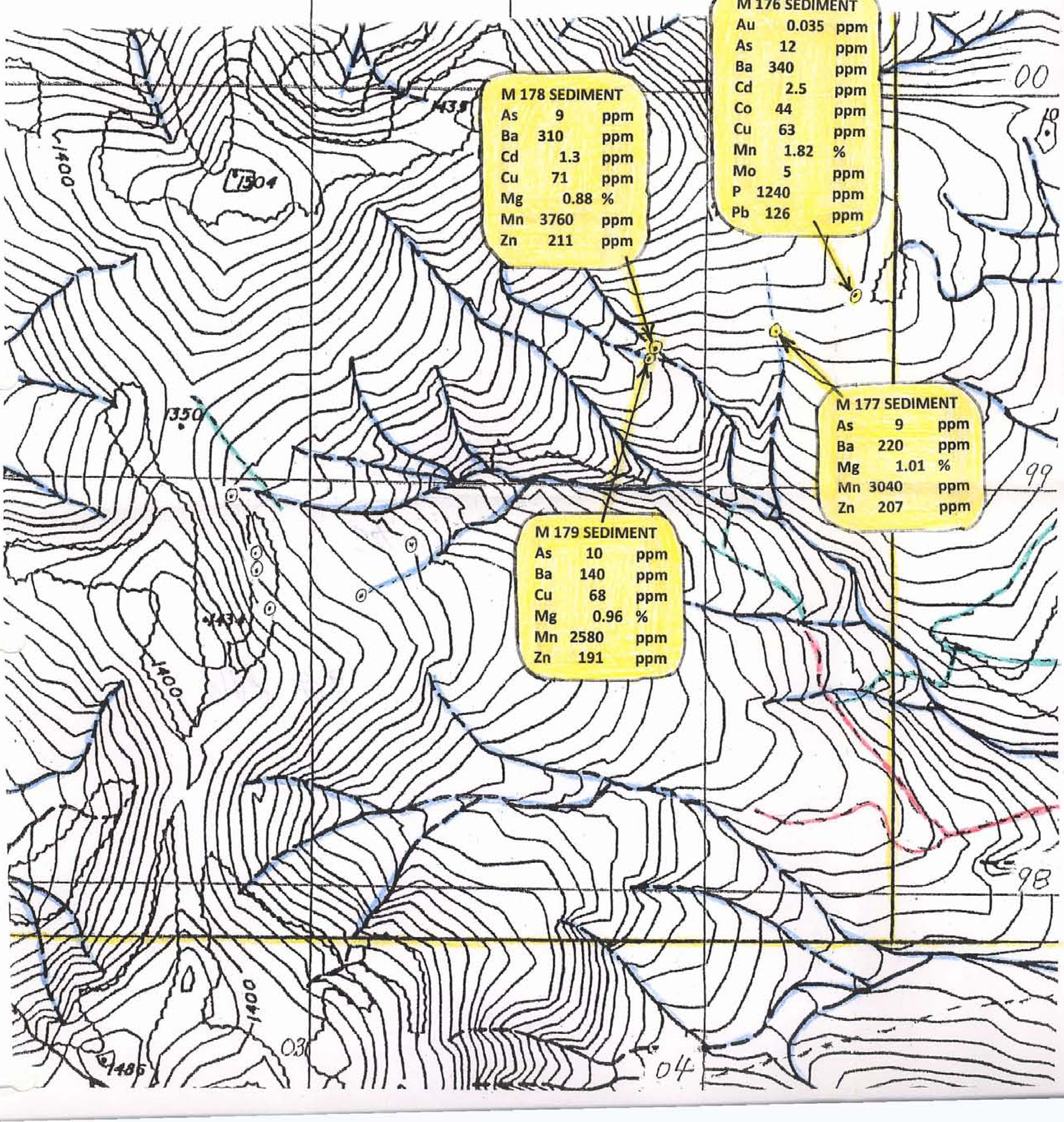
2010 SAMPLE SITE

M 177 SEDIMENT

As	9	ppm
Ba	220	ppm
Mg	1.01	%
Mn	3040	ppm
Zn	207	ppm

0 100 200 300 400 500

metres

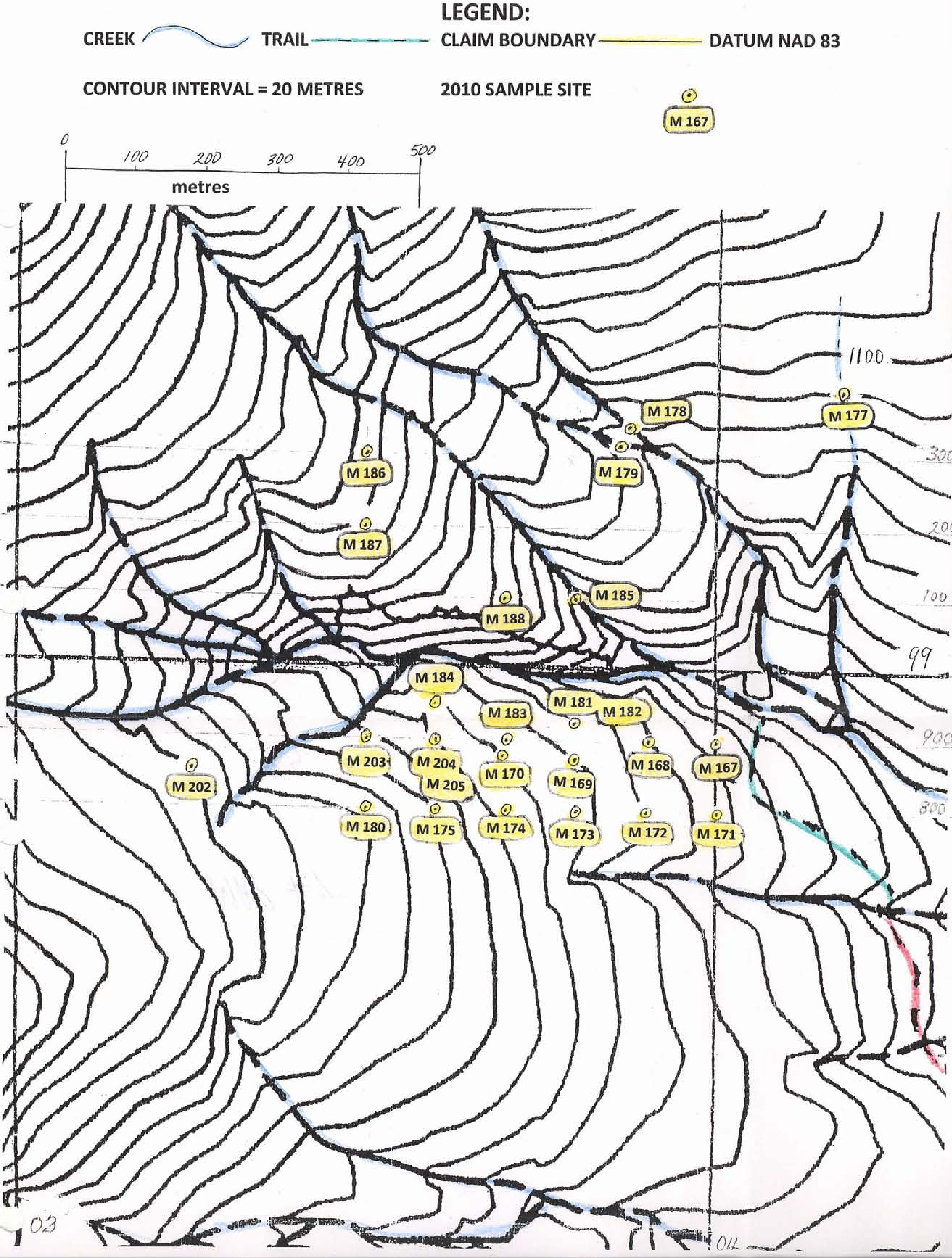


N

MAMQUAM 1-3 CLAIMS

1:5,000 MAP # 7

2010 GEOCHEMICAL SURVEY SAMPLE SITES CENTRAL AREA



N

MAMQUAM 1-3 CLAIMS

1:5,000

MAP # 8

2010 GEOCHEMICAL SURVEY SIGNIFICANT RESULTS CENTRAL AREA

LEGEND:

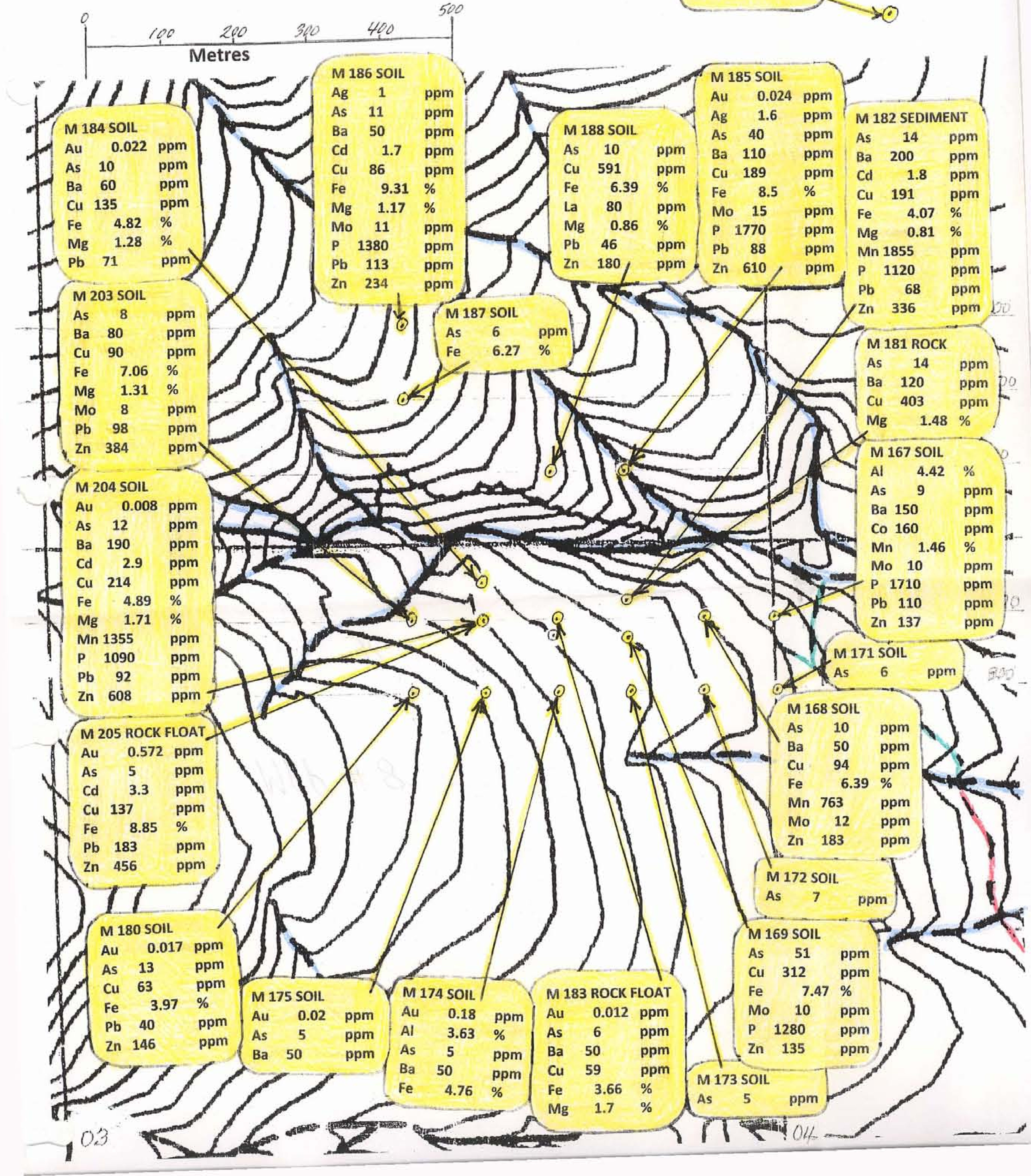
CREEK TRAIL ROAD CLAIM BOUNDARY

DATUM NAD 83

CONTOUR INTERVAL = 20 METRES

2010 SAMPLE SITE

M 171 SOIL
As 6 ppm



N

MAMQUAM 1-3 CLAIMS

1:5,000

MAP # 9

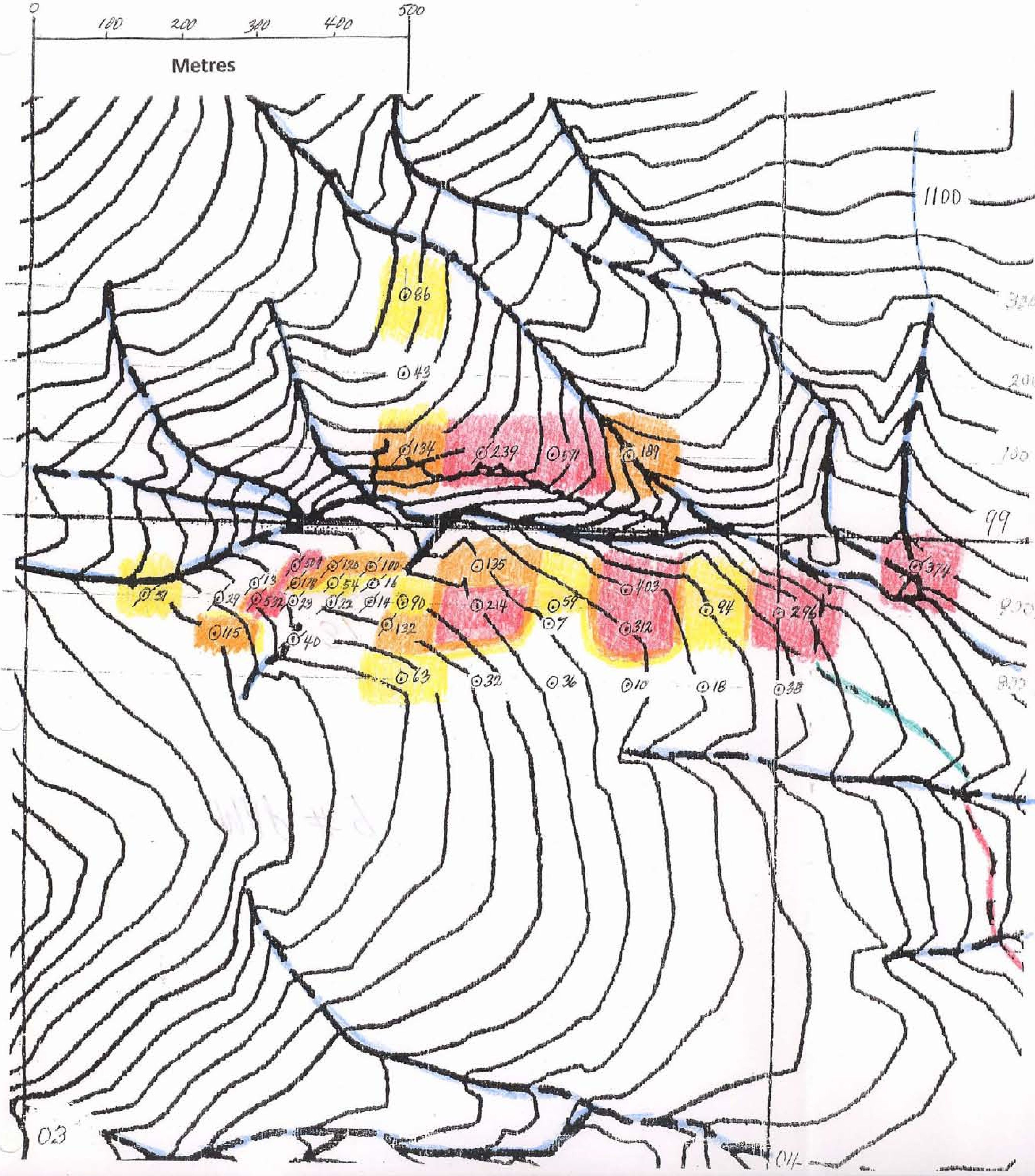
2010 GEOCHEMICAL SURVEY CENTRAL AREA-COPPER

LEGEND:

CREEK — TRAIL — ROAD — 2008-2009 SAMPLE SITES

DATUM NAD 83 — CONTOUR INTERVAL = 20 METRES — 2010 SAMPLE SITES

Cu 50-99 ppm — Cu 100-199 ppm — Cu > 199



N

MAMQUAM 1-3 CLAIMS

1:5,000

MAP # 10

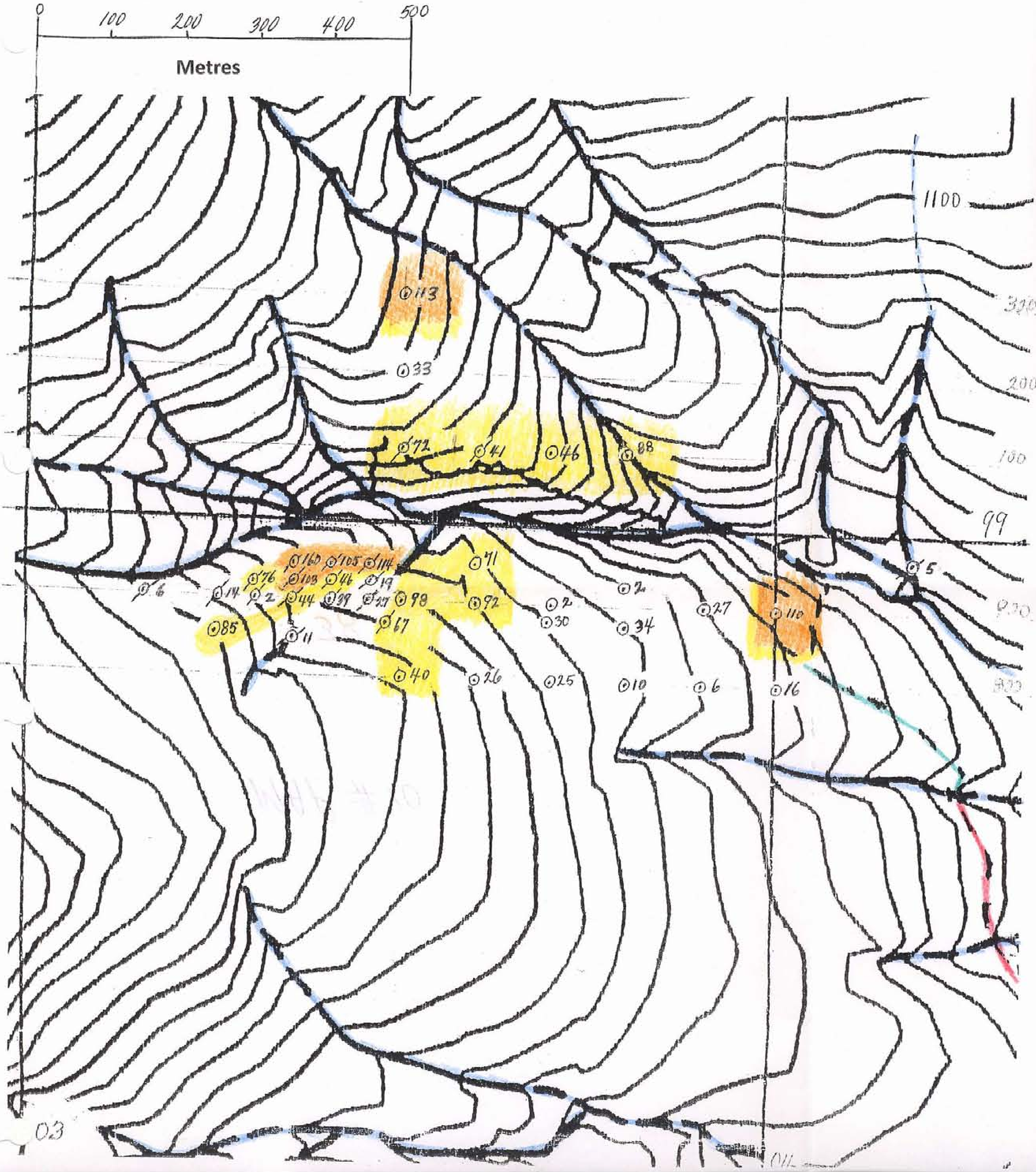
2010 GEOCHEMICAL SURVEY CENTRAL AREA-LEAD

LEGEND:

CREEK — TRAIL — ROAD — 2008-2009 SAMPLE SITES

DATUM NAD 83 — CONTOUR INTERVAL = 20 METRES — 2010 SAMPLE SITES

Pb 40-99 ppm — Pb 100-199 ppm — Pb > 199



N

MAMQUAM 1-3 CLAIMS

1:5,000 MAP # 11

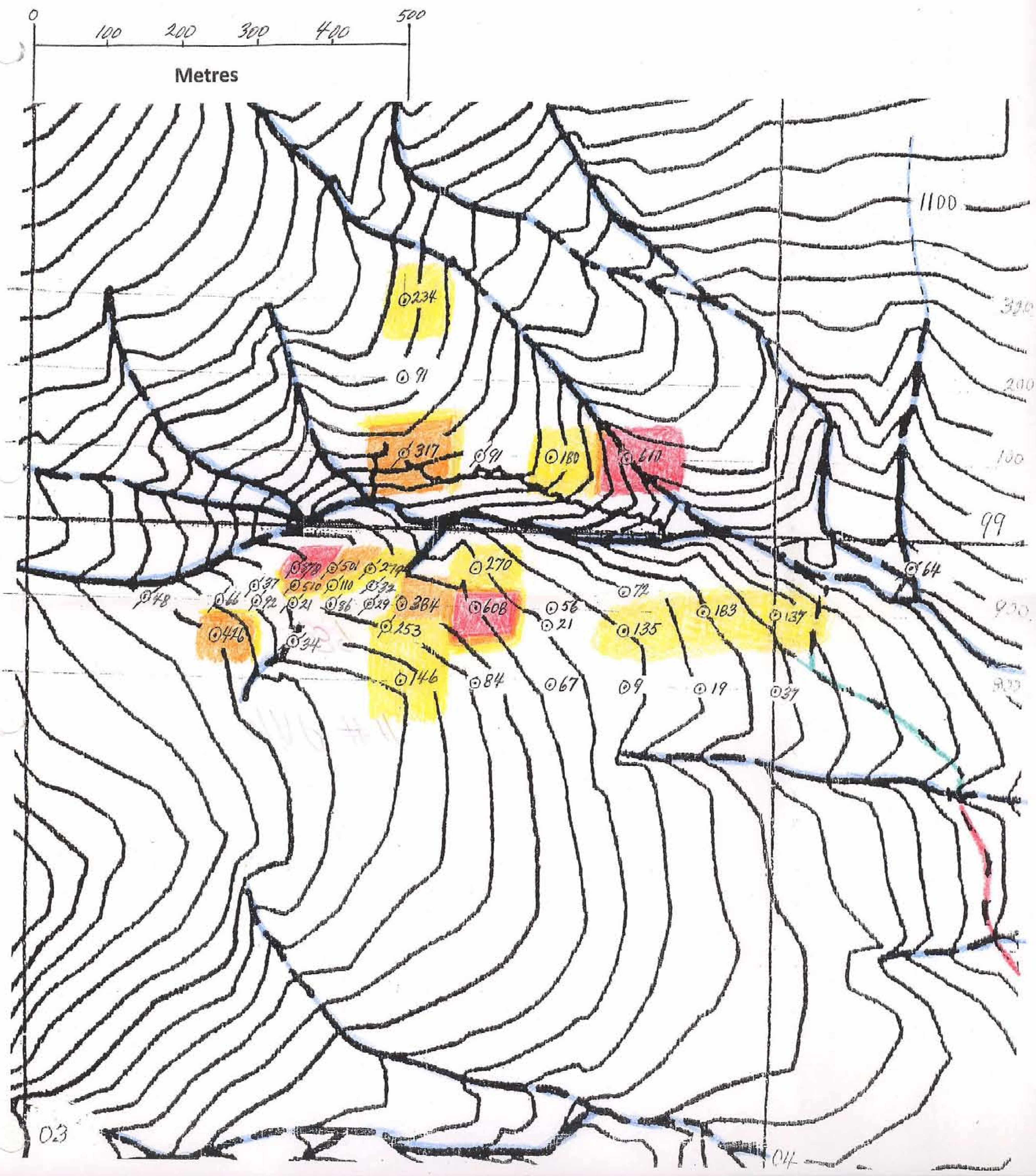
2010 GEOCHEMICAL SURVEY CENTRAL AREA-ZINC

LEGEND:

CREEK TRAIL ROAD 2008-2009 SAMPLE SITES

DATUM NAD 83 CONTOUR INTERVAL = 20 METRES 2010 SAMPLE SITES

Zn 100-299 ppm Zn 300-599 ppm Zn > 599



N

MAMQUAM 1-3 CLAIMS

1:5,000

MAP # 12

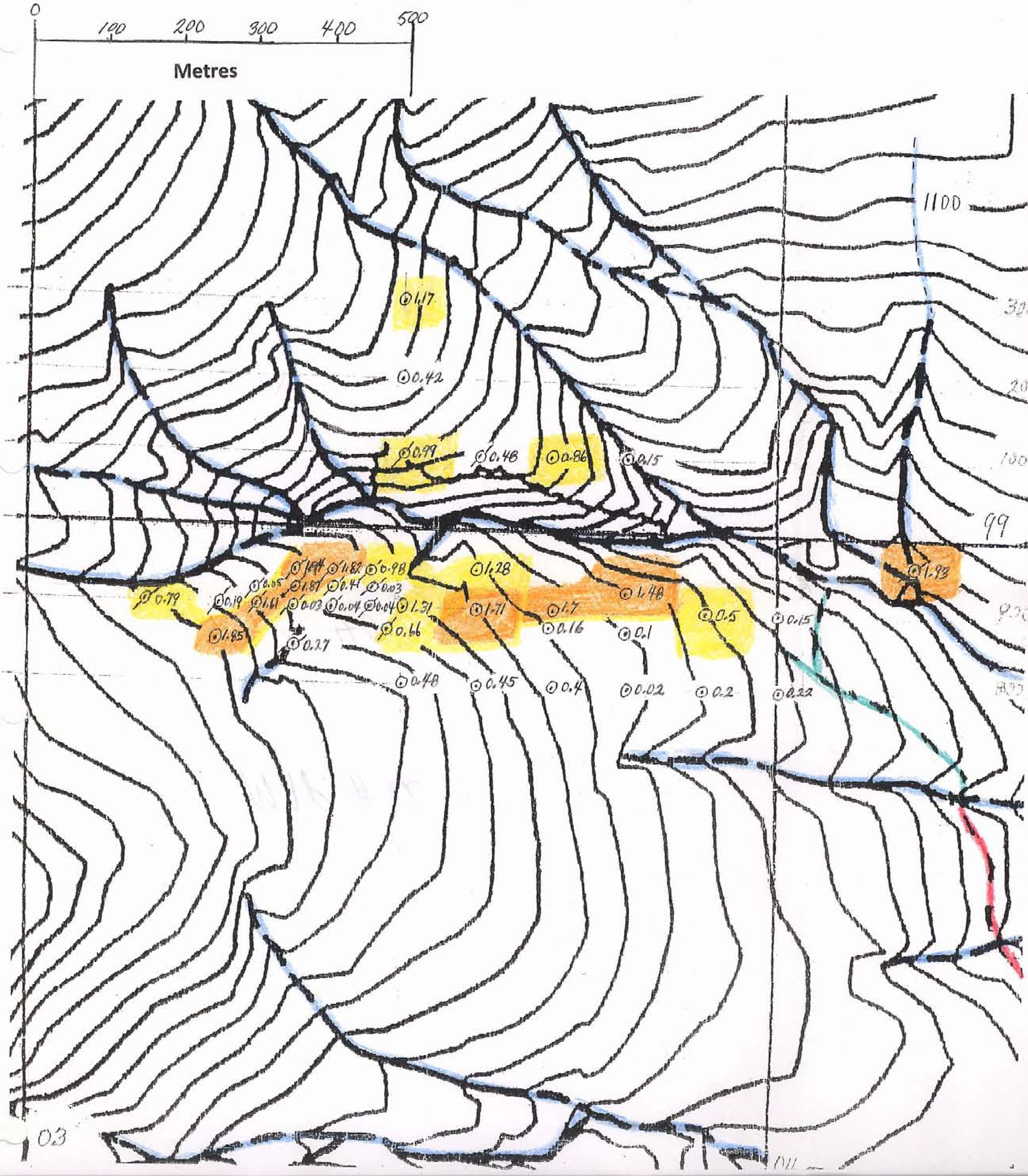
2010 GEOCHEMICAL SURVEY CENTRAL AREA-MAGNESIUM

LEGEND:

CREEK | TRAIL | ROAD | 2008-2009 SAMPLE SITES

DATUM NAD 83 | CONTOUR INTERVAL = 20 METRES | 2010 SAMPLE SITES

Mg 0.5-1.39% | Mg 1.4-2.79% | Mg > 2.79%



N

MAMQUAM 1-3 CLAIMS

1:5,000

MAP # 13

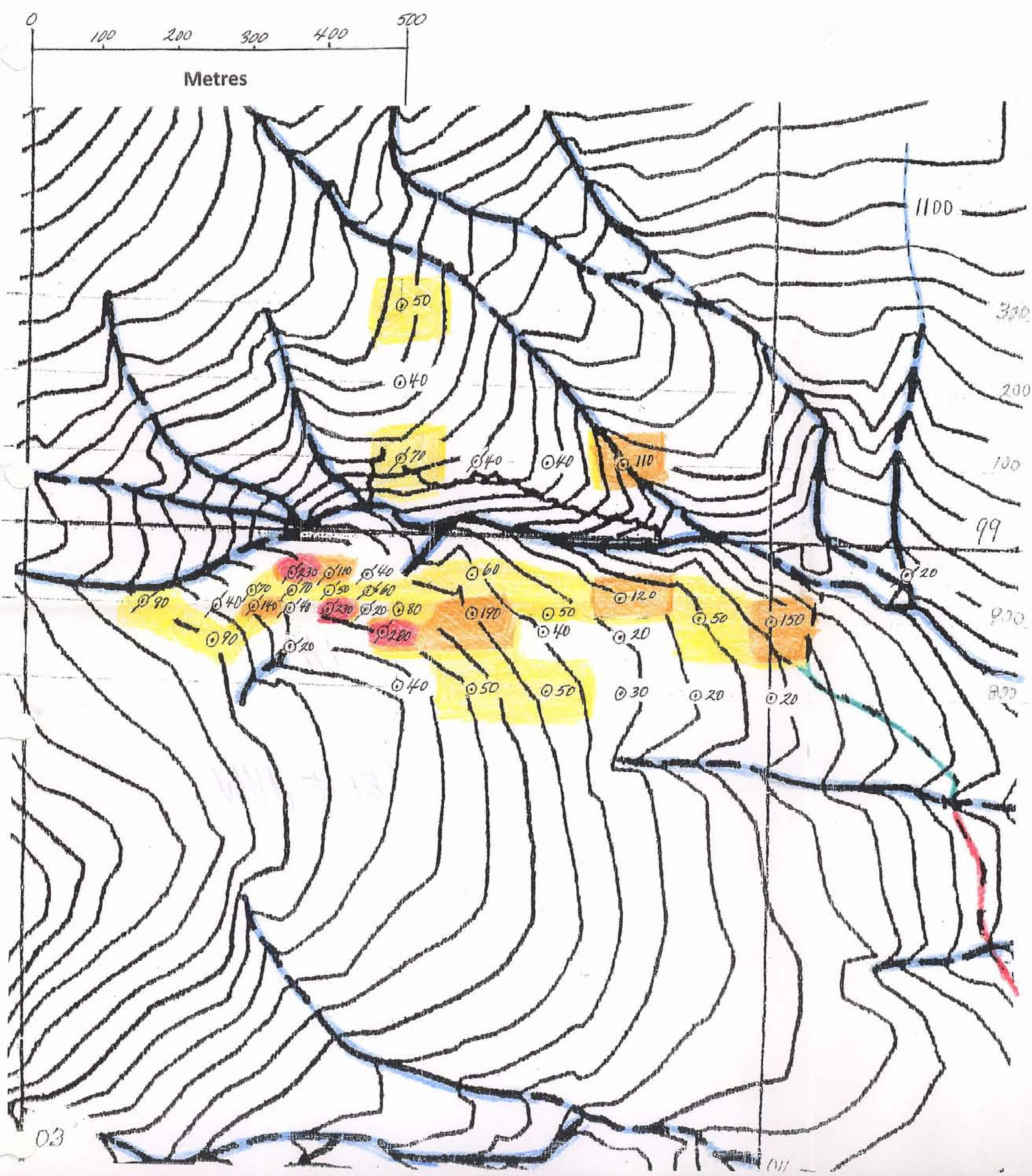
2010 GEOCHEMICAL SURVEY CENTRAL AREA-BARIUM

LEGEND:

CREEK — TRAIL — ROAD — 2008-2009 SAMPLE SITES

DATUM NAD 83 — CONTOUR INTERVAL = 20 METRES — 2010 SAMPLE SITES

Ba 50-99 ppm — Ba 100-199 ppm — Ba > 199 ppm



N

MAMQUAM 1-3 CLAIMS

1:5,000 MAP # 14

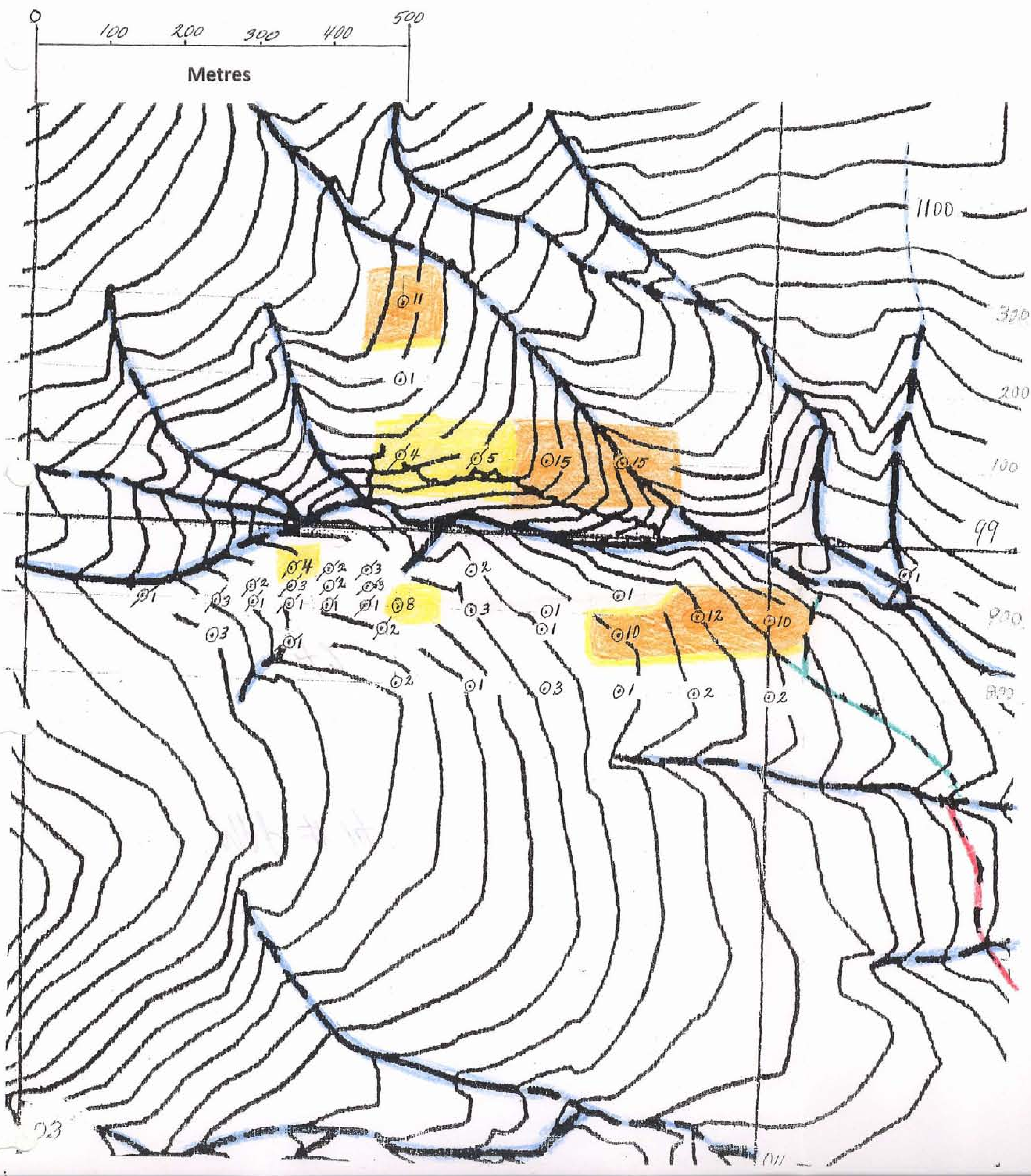
2010 GEOCHEMICAL SURVEY CENTRAL AREA-MOLYBDENUM

LEGEND:

CREEK TRAIL ROAD 2008-2009 SAMPLE SITES

DATUM NAD 83 CONTOUR INTERVAL = 20 METRES 2010 SAMPLE SITES

Mo 4-9 ppm Mo 10-19 ppm Mo > 19 ppm



MAMQUAM 1-3 GEOCHEMICAL REPORT
ITEMIZED COST STATEMENT FOR 2010

SCHEDULE

FOOD COSTS/PERSON/DAY	$12.00
VEHICLE TO MAMQUAM	$70.00
VEHICLE TO VANCOUVER	$45.00
PROSPECTORS/DAY	$500.00

ROAD AND TRAIL CLEARING 8.4 DAYS (PRORATED)

PROSPECTORS	8.4 DAYS @ $500	$4,200.00
VEHICLE	8.4 TRIPS @ $70	$588.00
FOOD	8.4 DAYS @ $12	$100.80

PROSPECTING EXPENSES

PROSPECTORS	12 DAYS @ $500	$6,000.00
VEHICLE	8 TRIPS @ $70	$560.00
FOOD	12 DAYS @ $12	$144.00

OTHER EXPENSES

TOTAL ANALYSES	32 SAMPLES @ $32.49	$1,039.68
FILING FEES	5-APR-2010	$351.45

SAMPLES TO ALS-NORTH VANCOUVER

2 TRIPS PRO-RATED FOR THE NUMBER OF SAMPLES

PROSPECTOR	1.185 DAYS @ $500	$592.59
VEHICLE	1.185 TRIPS @ $45	$53.33

REPORT PREPARATION

2009 GEOCHEMICAL REPORT	6.875 DAYS @ $500	$3,437.50

TOTAL **$17,067.35**

APPENDIX A

AUTHOR'S QUALIFICATIONS

K. R. MacKenzie, B.Sc., M.D.

Dr. MacKenzie is a retired physician who graduated from the University of British Columbia in 1963 with a B.Sc. in Chemistry and Mathematics. Geology 105 was taken as part of his undergraduate studies. He spent three summers working for the Geological Survey of Canada under Dr. J. O. Wheeler.
After graduating from U.B.C. in 1968 with a medical degree, Dr. MacKenzie has continued to prospect as a hobby.

Recent reading by the author includes:

The Rocks and Minerals of the World by C. Sorrell and G. Sandstrom.

Exploration and Mining Geology by William C. Peters.

Ore Deposits by C.F. Park, Jr. and R. A. MacDiarmid

A Field Guide to Rocks and Minerals by Pough

The Geochemistry of Gold and its Deposits by R. W. Boyle

Case Histories of Mineral Discoveries, Volume 3, Porphyry Copper, Molybdenum, and Gold Deposits, Volcanogenic Deposits (Massive Sulphides), and Deposits in Layered Rock by V. F. Hollister, Editor.

Porphyry Copper and Molybdenum Deposits West-Central B.C. by N.C. Carter.

Geology of the Porphyry Copper Deposits of the Western Hemisphere by Victor F. Hollister.

ATLAS OF ALTERATION by A.J.B. Thompson and J.F.H. Thompson, Editors.

ORE MINERAL ATLAS by Dan Marshall, C.D. Anglin and Hamid Mumin.

PORPHYRY DEPOSITS OF THE CANADIAN CORDILLERA
Editor: A. Sutherland Brown

THE GEOLOGY OF ORE DEPOSITS by John M. Guilbert and Charles F. Park, Jr.

GEOCHEMISTRY OF HYDROTHERMAL ORE DEPOSITS
by H. L. Barnes

GEOCHEMISTRY by Arthur H. Brownlow

FIELD GEOPHYSICS by John Milsom

XXIV INTERNATIONAL GEOLOGICAL CONGRESS
COPPER AND MOLYBDENUM DEPOSITS OF THE WESTERN CORDILLERA by C. S. Ney and A. Sutherland Brown

PRINCIPLES OF GEOCHEMICAL PROSPECTING
by H. E. Hawkes

GEOCHEMICAL EXPLORATION
by R. W. Boyle and J. I. Mcgerrigle

THE ELEMENTS by John Elmsley

APPENDIX B

ANALYSIS RESULTS FOR ALL SAMPLES

COLLECTED ON THE MAMQUAM 1-3 CLAIMS

DURING 2010

ALS Canada Ltd.
2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

MACKENZIE, KEN
O BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

Finalized Date: G-2010
This cop, .eported on
30-AUG-2010
Account: MACKEN

CERTIFICATE VA10112116

Project: MAMQUAM
P.O. No.:
This report is for 29 Soil samples submitted to our lab in Vancouver, BC, Canada on 12-AUG-2010.
The following have access to data associated with this certificate:

KEN MACKENZIE		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
SCR-41	Screen to -180um and save both

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

47

To: MACKENZIE, KEN
PO BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Minerals

ALS Canada Ltd.

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MACKENZIE, KEN
PO BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

Finalized Date: 28-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112116

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
[redacted]																
M-167		0.30	<0.005	0.9	4.42	9	<10	150	2.0	<2	0.54	2.5	160	8	296	2.67
M-168		0.48	0.005	0.2	2.89	10	<10	50	<0.5	<2	0.02	<0.5	10	9	94	6.39
M-169		0.64	<0.005	0.9	1.64	51	<10	20	<0.5	<2	0.01	<0.5	14	6	312	7.47
M-170		0.48	<0.005	<0.2	1.16	3	<10	40	<0.5	<2	0.04	<0.5	1	3	7	0.70
M-171		0.34	<0.005	0.2	1.88	6	<10	20	<0.5	<2	0.04	<0.5	1	5	38	3.00
M-172		0.50	<0.005	0.2	1.82	7	<10	20	<0.5	<2	0.08	<0.5	2	5	18	2.09
M-173		0.20	0.009	0.4	0.24	5	<10	30	<0.5	<2	0.44	<0.5	3	2	10	0.63
M-174		0.44	0.018	0.5	3.63	5	<10	50	<0.5	<2	0.05	0.5	4	11	36	4.76
M-175		0.64	0.020	0.3	2.05	5	<10	50	<0.5	<2	0.03	<0.5	4	7	32	2.93
M-176		0.56	0.035	<0.2	1.33	12	<10	340	<0.5	<2	0.44	2.5	44	2	63	2.30
M-177		0.68	<0.005	<0.2	2.31	9	<10	220	0.5	<2	0.28	0.9	17	7	46	3.15
M-178		0.58	<0.005	<0.2	2.50	9	<10	310	0.6	<2	0.34	1.3	16	7	71	3.76
M-179		0.56	0.007	<0.2	2.31	10	<10	140	0.5	<2	0.16	0.6	18	8	68	3.10
M-180		0.50	0.017	<0.2	1.97	13	<10	40	<0.5	<2	0.01	<0.5	3	6	63	3.97
M-182		0.72	0.009	0.2	2.15	14	<10	200	0.8	<2	0.33	1.8	25	6	191	4.07
M-184		0.56	0.022	<0.2	2.40	10	<10	60	<0.5	<2	0.03	<0.5	10	10	135	4.82
M-185		0.54	0.024	1.6	2.45	40	<10	110	<0.5	<2	0.01	0.6	3	7	189	8.50
M-186		0.56	0.005	1.0	3.36	11	<10	50	<0.5	<2	0.05	1.7	6	18	86	9.31
M-187		0.38	0.005	0.8	3.62	6	<10	40	<0.5	<2	0.03	<0.5	3	11	43	6.27
M-188		0.68	0.010	0.6	3.58	10	<10	40	<0.5	<2	0.08	0.9	9	13	591	6.39
[redacted]																

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ALS Minerals

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Finalized Date: 28-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112116

Sample Description / Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
[redacted]															
M-167	<10	1	0.04	30	0.15	14600	10	0.01	8	1710	110	0.13	<2	1	34
M-168	20	1	0.03	10	0.50	763	12	<0.01	3	430	27	<0.01	<2	4	5
M-169	10	1	0.05	10	0.10	295	10	0.01	5	1280	34	0.02	<2	9	3
M-170	10	1	0.04	<10	0.16	65	1	0.01	1	170	30	<0.01	<2	1	8
M-171	20	<1	0.02	<10	0.22	144	2	<0.01	3	340	16	<0.01	<2	1	6
M-172	20	<1	0.02	<10	0.20	117	2	0.01	2	300	6	<0.01	<2	2	12
M-173	<10	1	0.04	<10	0.02	25	<1	0.01	2	430	10	0.04	<2	<1	29
M-174	10	1	0.04	10	0.40	310	3	<0.01	4	620	25	0.02	<2	2	8
M-175	10	<1	0.05	<10	0.45	322	1	0.01	5	470	26	<0.01	<2	1	6
M-176	<10	<1	0.05	10	0.25	18200	5	0.01	5	1240	126	0.08	<2	1	36
M-177	10	1	0.05	10	1.01	3040	3	0.01	6	770	33	<0.01	<2	2	30
M-178	<10	<1	0.05	10	0.88	3760	3	0.01	7	620	27	0.02	<2	3	29
M-179	10	<1	0.05	10	0.96	2580	1	0.01	7	730	23	0.02	<2	3	13
M-180	10	1	0.05	10	0.48	298	2	<0.01	3	630	40	0.01	<2	3	3
M-182	<10	1	0.07	20	0.81	1855	1	0.01	10	1120	68	0.02	<2	4	17
M-184	10	1	0.10	10	1.28	731	2	0.01	8	690	71	<0.01	<2	5	4
M-185	<10	6	0.06	<10	0.15	260	15	0.01	1	1770	88	0.11	<2	3	5
M-186	10	<1	0.02	10	1.17	444	11	<0.01	6	1380	113	0.05	<2	7	5
M-187	10	1	0.03	<10	0.42	262	1	0.01	3	540	33	0.01	<2	3	7
M-188	10	<1	0.03	80	0.86	492	15	<0.01	8	770	46	0.03	<2	3	10

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PO BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

Finalized Date: 28-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112116

Sample Description	Method Analyte Units LOR	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2
[redacted]								
M-167		<20	0.01	<10	<10	20	<10	137
M-168		<20	0.03	<10	<10	124	<10	183
M-169		<20	<0.01	<10	<10	72	<10	135
M-170		<20	0.03	<10	<10	32	<10	21
M-171		<20	0.04	<10	<10	73	<10	37
M-172		<20	0.02	<10	<10	91	<10	19
M-173		<20	0.01	<10	<10	17	<10	9
M-174		<20	0.04	<10	<10	61	<10	67
M-175		<20	0.02	<10	<10	63	<10	84
M-176		<20	0.01	<10	<10	23	<10	83
M-177		<20	0.01	<10	<10	42	<10	207
M-178		<20	0.01	<10	<10	41	<10	211
M-179		<20	0.01	<10	<10	45	<10	191
M-180		<20	0.01	<10	<10	68	<10	146
M-182		<20	<0.01	<10	<10	48	<10	336
M-184		<20	0.01	<10	<10	61	<10	270
M-185		<20	<0.01	<10	<10	48	<10	610
M-186		<20	<0.01	<10	<10	80	<10	234
M-187		<20	0.02	<10	<10	75	<10	91
M-188		<20	0.03	<10	<10	72	<10	180

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Finalized Date: G-2010
This copy reported on 30-AUG-2010
Account: MACKEN

CERTIFICATE VA10112117

Project: MAMQUAM
P.O. No.:
This report is for 4 Rock samples submitted to our lab in Vancouver, BC, Canada on 12-AUG-2010.

The following have access to data associated with this certificate:

KEN MACKENZIE		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES
Au-AA23	Au 30g FA-AA finish	AAS

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To: MACKENZIE, KEN
PO BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 2?-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112117

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
[redacted]																
M-181		0.60	<0.005	0.7	1.79	14	<10	120	<0.5	<2	0.32	<0.5	9	11	403	2.84
M-183		0.52	0.012	0.7	1.75	6	<10	50	<0.5	<2	0.17	<0.5	8	14	59	3.66
[redacted]																

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Finalized Date: 26-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112117

Sample Description	Method Analyte Units LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
[redacted]																
M-181		<10	<1	0.16	20	1.48	798	<1	0.05	9	660	2	1.02	<2	4	24
M-183		10	<1	0.15	<10	1.70	685	<1	0.04	10	800	2	1.69	<2	4	3
[redacted]																

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Finalized Date: 26-AUG-2010
Account: MACKEN

Project: MAMQUAM

CERTIFICATE OF ANALYSIS VA10112117

Sample Description	Method Analyte Units LOR	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2
[redacted]								
M-181		<20	0.03	<10	<10	39	<10	72
M-183		<20	0.01	<10	<10	57	<10	56
[redacted]								

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Finalized Date: V-2010
This copy reported on
17-NOV-2010
Account: MACKEN

CERTIFICATE VA10163568

Project: M, X
P.O. No.:
This report is for 5 Rock samples submitted to our lab in Vancouver, BC, Canada on 5-NOV-2010.
The following have access to data associated with this certificate:

KEN MACKENZIE		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES
Au-AA23	Au 30g FA-AA finish	AAS

To: MACKENZIE, KEN
PO BOX 641
GARIBALDI HIGHLANDS BC V0N 1T0

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: [illegible]-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163568

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
M-199		0.82	0.018	0.8	1.72	7	<10	100	<0.5	<2	2.04	8.2	34	9	9	4.86
M-200		0.96	0.015	0.7	3.09	8	<10	170	<0.5	<2	1.18	0.9	19	11	177	3.98
M-205		0.64	0.572	0.8	0.83	5	<10	10	<0.5	<2	0.13	3.3	23	4	137	8.85
[redacted]																

Comments: ***Corrected Copy for Sample Description from X-18 to X-08***

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Finalized Date: 16-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163568

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
M-199		10	<1	0.39	10	1.06	1960	<1	0.03	12	850	4	2.47	<2	8	26
M-200		10	1	0.95	10	1.26	556	1	0.37	13	810	10	1.57	<2	5	106
M-205		<10	<1	0.26	<10	0.47	332	4	0.03	2	670	183	>10.0	<2	1	3
[redacted]																

Comments: ***Corrected Copy for Sample Description from X-18 to X-08***

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Finalized Date: 16-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163568

Sample Description	Method Analyte Units LOR	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2
M-199		<20	0.01	<10	<10	60	<10	1455
M-200		<20	0.26	<10	<10	100	<10	180
M-205		<20	<0.01	<10	<10	15	<10	456
[redacted]								

Comments: ***Corrected Copy for Sample Description from X-18 to X-08***

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CERTIFICATE VA10163569

Project: M, X

P.O. No.:

This report is for 16 Sediment samples submitted to our lab in Vancouver, BC, Canada on 5-NOV-2010.

The following have access to data associated with this certificate:

KEN MACKENZIE		

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
SCR-41	Screen to -180um and save both

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

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To: MACKENZIE, KEN
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GARIBALDI HIGHLANDS BC V0N 1T0

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Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 17-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163569

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
M-196		0.54	0.053	0.5	2.08	10	<10	350	0.7	<2	0.32	10.8	14	6	111	4.24
M-197		0.80	0.012	0.6	3.44	19	<10	150	0.9	<2	0.46	4.7	26	9	142	3.63
M-198		0.48	0.014	0.9	1.80	10	<10	660	<0.5	<2	0.35	1.7	34	5	50	2.51
M-201		0.72	0.025	0.6	2.66	10	<10	50	<0.5	<2	0.03	<0.5	21	8	74	3.74
M-202		0.62	0.012	0.2	3.75	11	<10	90	<0.5	<2	0.02	<0.5	14	10	115	5.08
M-203		0.68	0.005	0.5	3.70	8	<10	80	<0.5	<2	0.03	<0.5	10	12	90	7.06
M-204		1.02	0.008	0.3	2.22	12	<10	190	0.5	<2	0.37	2.9	17	9	214	4.89

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Finalized Date: 17-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163569

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
M-196		<10	1	0.08	10	1.04	2170	2	<0.01	29	920	33	0.01	3	3	23
M-197		10	1	0.13	10	1.12	4650	7	<0.01	12	1000	152	0.04	4	3	20
M-198		10	<1	0.05	10	1.03	6680	5	<0.01	6	350	77	0.01	<2	7	29
M-201		10	<1	0.11	10	0.79	2980	4	0.01	6	1810	63	0.07	<2	1	3
M-202		10	1	0.11	10	1.85	1340	3	<0.01	6	960	85	0.01	<2	6	4
M-203		10	1	0.07	10	1.31	904	8	<0.01	7	610	98	0.01	2	4	5
M-204		10	<1	0.13	10	1.71	1355	3	0.01	10	1090	92	0.80	<2	6	19

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Finalized Date: 17-NOV-2010
Account: MACKEN

Project: M, X

CERTIFICATE OF ANALYSIS VA10163569

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2
M-196		<20	0.01	<10	<10	44	10	2060
M-197		<20	0.03	<10	<10	53	<10	686
M-198		<20	0.01	<10	<10	36	<10	249
M-201		<20	0.02	<10	<10	52	<10	137
M-202		<20	0.01	<10	<10	59	<10	426
M-203		<20	0.01	<10	<10	72	<10	384
M-204		<20	0.01	<10	<10	57	<10	608

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APPENDIX C

SAMPLE PREPARATION, GEOCHEMICAL ANALYSIS, QUALITY ASSURANCE, QUALITY CONTROL, EXTERNAL ACCREDITATION AND CERTIFICATION, AND EXTERNAL PROFICIENCY TESTS

ALS Chemex

Sample Preparation Package – PREP-41
Standard Preparation: Dry sample and dry-sieve to –180 micron

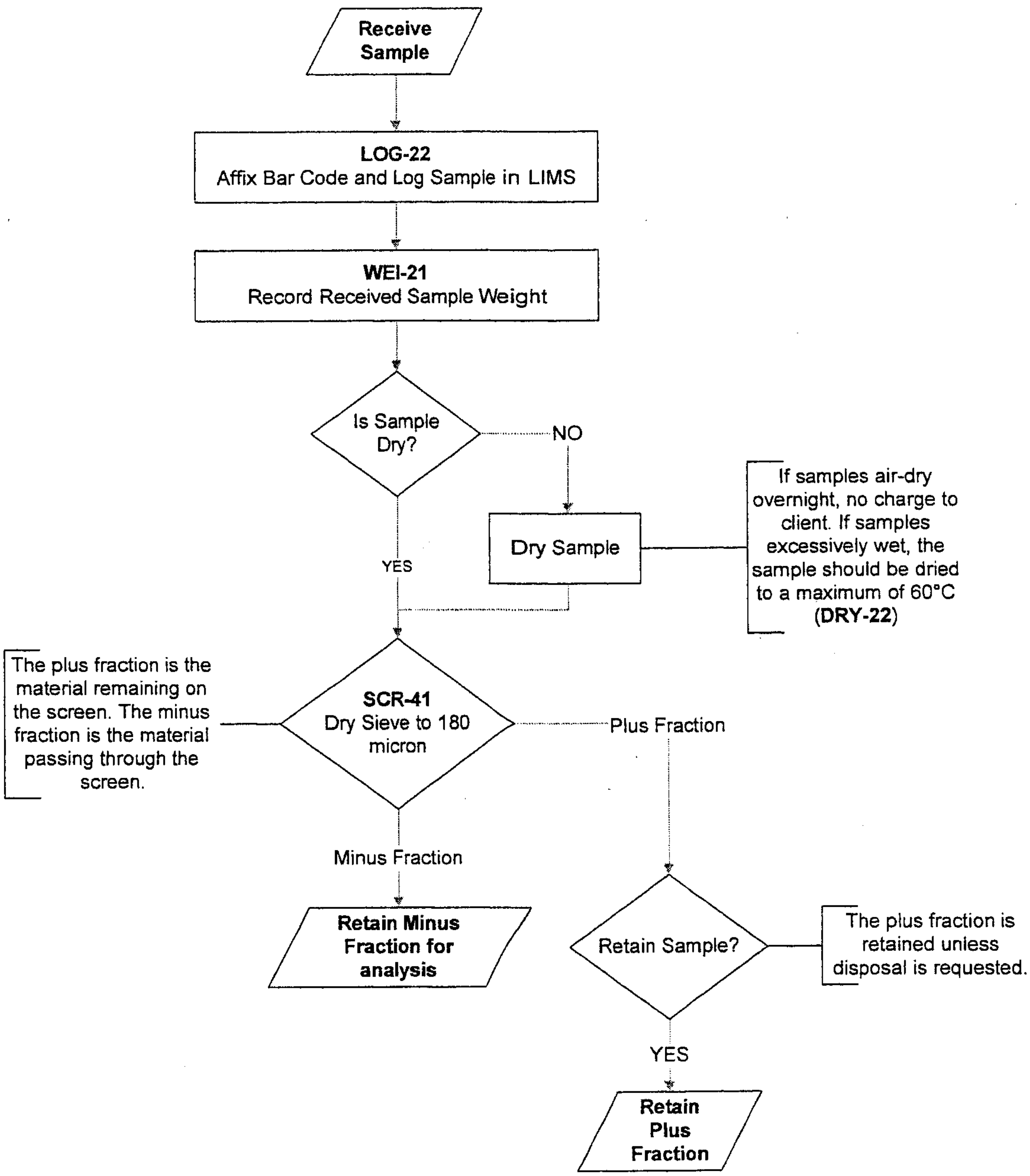
Sample preparation is the most critical step in the entire laboratory operation. The purpose of preparation is to produce a homogeneous analytical sub-sample that is fully representative of the material submitted to the laboratory.

An entire sample is dried and then dry-sieved using a 180 micron (Tyler 80 mesh) screen. The plus fraction is retained unless disposal is requested. This method is appropriate for soil or sediment samples up to 1 kg in weight.

Method Code	Description
LOG-22	Sample is logged in tracking system and a bar code label is attached.
SCR-41	Sample is dry-sieved to – 180 micron and both the plus and minus fractions are retained.

ALS Chemex

Sample Preparation Flowchart Package –PREP-41



65.

ALS Chemex

Geochemical Procedure - ME-ICP41
Trace Level Methods Using Conventional ICP-AES Analysis

Sample Decomposition: Nitric Aqua Regia Digestion (GEO-AR01)
Analytical Method: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)

A prepared sample is digested with aqua regia for in a graphite heating block. After cooling, the resulting solution is diluted to 12.5 mL with deionized water, mixed and analyzed by inductively coupled plasma-atomic emission spectrometry. The analytical results are corrected for inter-element spectral interferences.

NOTE: In the majority of geological matrices, data reported from an aqua regia leach should be considered as representing only the leachable portion of the particular analyte.

Element	Symbol	Units	Lower Limit	Upper Limit	Default Overlimit Method
Silver	Ag	ppm	0.2	100	Ag-OG46
Aluminum	Al	%	0.01	25	
Arsenic	As	ppm	2	10000	
Boron	B	ppm	10	10000	
Barium	Ba	ppm	10	10000	
Beryllium	Be	ppm	0.5	1000	
Bismuth	Bi	ppm	2	10000	
Calcium	Ca	%	0.01	25	
Cadmium	Cd	ppm	0.5	1000	
Cobalt	Co	ppm	1	10000	
Chromium	Cr	ppm	1	10000	
Copper	Cu	ppm	1	10000	Cu-OG46
Iron	Fe	%	0.01	50	

ALS Chemex

Element	Symbol	Units	Lower Limit	Upper Limit	Default Overlimit Method
Gallium	Ga	ppm	10	10000	
Mercury	Hg	ppm	1	10000	
Potassium	K	%	0.01	10	
Lanthanum	La	ppm	10	10000	
Magnesium	Mg	%	0.01	25	
Manganese	Mn	ppm	5	50000	
Molybdenum	Mo	ppm	1	10000	
Sodium	Na	%	0.01	10	
Nickel	Ni	ppm	1	10000	
Phosphorus	P	ppm	10	10000	
Lead	Pb	ppm	2	10000	Pb-OG46
Sulfur	S	%	0.01	10	
Antimony	Sb	ppm	2	10000	
Scandium	Sc	ppm	1	10000	
Strontium	Sr	ppm	1	10000	
Thorium	Th	ppm	20	10000	
Titanium	Ti	%	0.01	10	
Thallium	Tl	ppm	10	10000	
Uranium	U	ppm	10	10000	
Vanadium	V	ppm	1	10000	
Tungsten	W	ppm	10	10000	
Zinc	Zn	ppm	2	10000	Zn-OG46

ALS Chemex

Fire Assay Procedure – Au-AA23 & Au-AA24
Fire Assay Fusion, AAS Finish

Sample Decomposition:	Fire Assay Fusion (FA-FUS01 & FA-FUS02)
Analytical Method:	Atomic Absorption Spectroscopy (AAS)

A prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead.

The bead is digested in 0.5 mL dilute nitric acid in the microwave oven, 0.5 mL concentrated hydrochloric acid is then added and the bead is further digested in the microwave at a lower power setting. The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

Method Code	Element	Symbol	Units	Sample Weight (g)	Lower Limit	Upper Limit	Default Overlimit Method
Au-AA23	Gold	Au	ppm	30	0.005	10.0	Au-GRA21
Au-AA24	Gold	Au	ppm	50	0.005	10.0	Au-GRA22

ALS Chemex

QUALITY ASSURANCE OVERVIEW

Laboratory Accreditation and Certification

ISO 17025

ALS Chemex's North Vancouver laboratory has received ISO 17025 accreditation from the Standards Council of Canada under CAN-P-4E (ISO/IEC 17025:2005), the General Requirements for the Competence of Testing and Calibration Laboratories, and the PALCAN Handbook (CAN-P-1570).

Standards Council of Canada Accredited Laboratory Scope of Accreditation 579
Conseil canadien des normes Laboratoire accrédité Portée d accréditation 579 TM

The scope of the accreditation includes the following methods:

- Au-AA: Determination of Au by Lead Collection Fire Assay and AAS
- Au/Ag-GRA: Determination of Au and Ag by Lead Collection Fire Assay and Gravimetric Finish
- PGM-ICP: Determination of Au, Pt and Pd by Lead Collection Fire Assay and ICP-AES
- ME-ICP41: Multi-Element (Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Ti, Tl, U, V, W, Zn) Determination by Aqua Regia Digestion and ICP-AES
- ME-ICP61: Multi-Element (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sb, Sc, Se, Si, Sn, Sr, Ta, Te, Ti, Tl, U, V W, Y, Zn and Zr) Determination by 4-Acid Digestion and ICP-AES
- ICP81: Al, Co, CU, Fe, Mg, Mn, Ni, Pb, S and Zn by Sodium Peroxide Fusion and ICP-AES
- OG46: Ag, Cu, Pb, and Zn – Determination of Ores and High Grade Material Using ICP-AES Following an Aqua Regia Digestion
- OG62: Ag, Cu, Pb and Zn – Determination of Ores and High Grade Material Using ICP-AES Following a Four-Acid Digestion
- AA45: Ag, Cu, Pb and Zn – Determination of Base Meals Using AAS Following an Aqua Regia Digestion
- AA46: Ag, Cu, Pb, Zn and Mo – Determination of Ores and High Grade materials Using AAS Following an Aqua Regia Digestion
- AA61: Ag, Co, Cu, Ni, Pb and Zn – Determination of Base Metals Using AAS Following a Four-Acid Digestion
- AA62: Ag, Co, CU, Mo, Ni, Pb and Zn – Determination of Ores and High Grade Materials Using AAS Following a Four-Acid Digestion

Our Reno, Nevada and Val d'Or, Quebec labs are actively pursuing ISO 17025 accreditation for Au by Fire Assay methods.

ISO 9001

ALS Chemex laboratories in North America are registered to ISO 9001:2000 for the "provision of assay and geochemical analytical services" by QMI-SAI Global Quality Registrars.

The ISO 9001:2000 registration provides evidence of a quality management system covering all aspects of our organization. ISO 17025 accreditation provides specific assessment of our laboratory's analytical capabilities. In our opinion, the combination of the two ISO standards provides our clients complete assurance regarding the quality of every aspect of ALS Chemex operations.

Aside from laboratory accreditation, ALS Chemex has been a leader in participating in, and sponsoring, the assayer certification program in British Columbia. Many of our analysts have completed this demanding program that includes extensive theoretical and practical examinations. Upon successful completion of these examinations, they are awarded the title of Registered Assayer.

Quality Assurance Program

The quality assurance program is an integral part of all day-to-day activities at ALS Chemex and involves all levels of staff. Responsibilities are formally assigned for all aspects of the quality assurance program.

Sample Preparation Quality Specifications

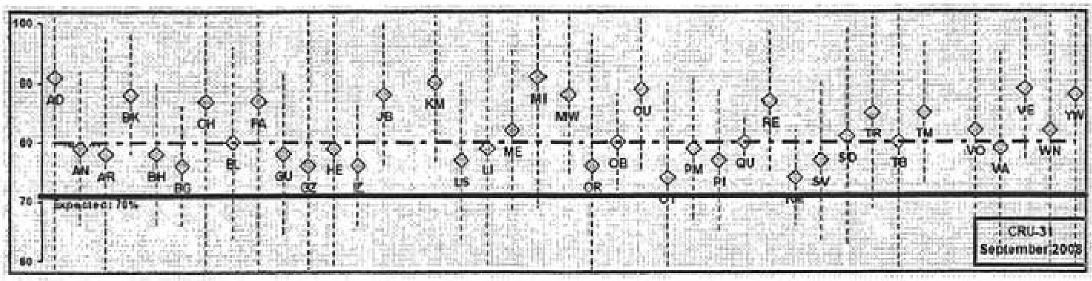
Standard specifications for sample preparation are clearly defined and monitored. The specifications for our most common methods are as follows:

- Crushing (CRU-31)
  > 70% of the crushed sample passes through a 2 mm screen
- Ringing (PUL-31)
  > 85% of the ring pulverized sample passes through a 75 micron screen (Tyler 200 mesh)
- Samples Received as Pulps
  >80% of the sample passes through a 75 micron screen (Tyler 200 mesh)

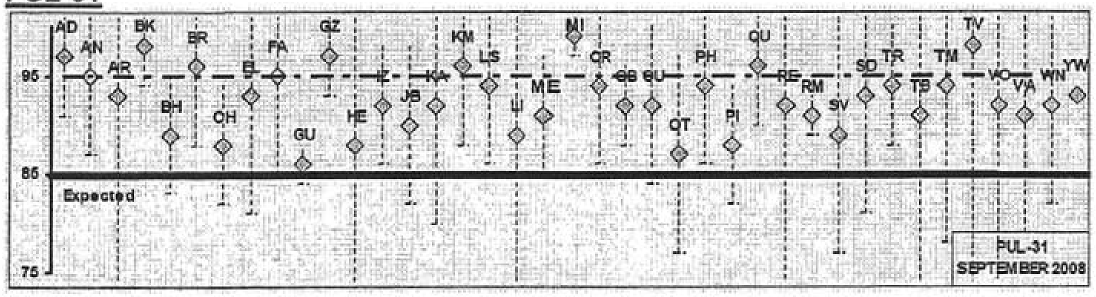
These characteristics are measured and results reported to verify the quality of sample preparation. Our standard operating procedures require that samples at every preparation station are tested regularly throughout each shift. Measurement of sample preparation quality allows the identification of equipment, operators and processes that are not operating within specifications.

QC results from all global sample preparation laboratories are captured by the LIM System and the QA Department compiles a monthly review report for senior management on the performance of each laboratory from this data.

CRU-31



PUL-31



Other Sample Preparation Specifications

Sample preparation is a vital part of any analysis protocol. Many projects require sample preparation to other specifications, for instance >90% of the crushed sample to pass through a 2 mm screen. These procedures can easily be accommodated and the Prep QC monitoring system is essential in ensuring the required specifications are routinely met.

Analytical Quality Control – Reference Materials, Blanks & Duplicates

The LIMS inserts quality control samples (reference materials, blanks and duplicates) on each analytical run, based on the rack sizes associated with the method. The rack size is the number of sample including QC samples included in a batch. The blank is inserted at the beginning, standards are inserted at random intervals, and duplicates are analysed at the end of the batch. Quality control samples are inserted based on the following rack sizes specific to the method:

Rack Size	Methods	Quality Control Sample Allocation
20	Specialty methods including specific gravity, bulk density, and acid insolubility	2 standards, 1 duplicate, 1 blank
28	Specialty fire assay, assay-grade, umpire and concentrate methods	1 standard, 1 duplicate, 1 blank
39	XRF methods	2 standards, 1 duplicate, 1 blank
40	Regular AAS, ICP-AES and ICP-MS methods	2 standards, 1 duplicate, 1 blank
84	Regular fire assay methods	2 standards, 3 duplicates, 1 blank

Laboratory staff analyse quality control samples at least at the frequency specified above. If necessary, they may include additional quality control samples above the minimum specifications.

All data gathered for quality control samples – blanks, duplicates and reference materials – are automatically captured, sorted and retained in the QC Database.

Quality Control Limits and Evaluation
Quality Control Limits for reference materials and duplicate analyses are established according to the precision and accuracy requirements of the particular method. Data outside control limits are identified and investigated and require corrective actions to be taken. Quality control data is scrutinised at a number of levels. Each analyst is responsible for ensuring the data submitted is within control specifications. In addition, there are a number of other checks.

Certificate Approval
If any data for reference materials, duplicates, or blanks falls beyond the control limits established, it is automatically flagged red by the computer system for serious failures, and yellow for borderline results. The Department Manager(s) conducting the final review of the Certificate is thus made aware that a problem may exist with the data set.

Precision Specifications and Definitions
Most geochemical procedures are specified to have a precision of ± 10%, and assay procedures ± 5%. The precision of Au analyses is dominated by the sampling precision.

Precision can be expressed as a function of concentration:

$$P_c = \left(\frac{DetectionLimit}{c} + P\right) \times 100\%$$

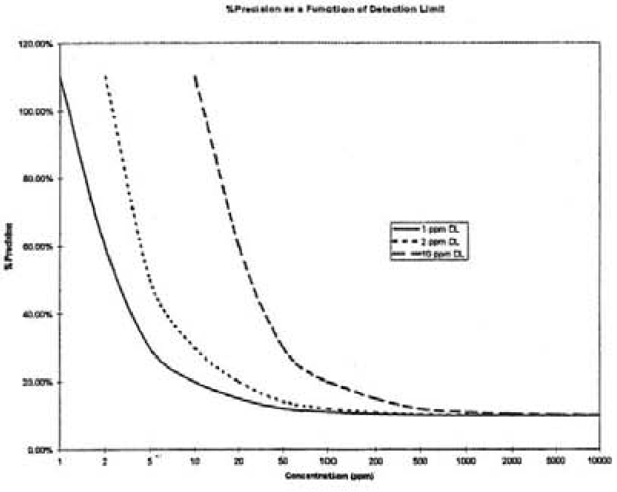
where P_c - the precision at concentration c

c - concentration of the element

P - the "Precision Factor" of the element. This is the precision of the method at very high concentrations, i.e. 0.05 for 5%.

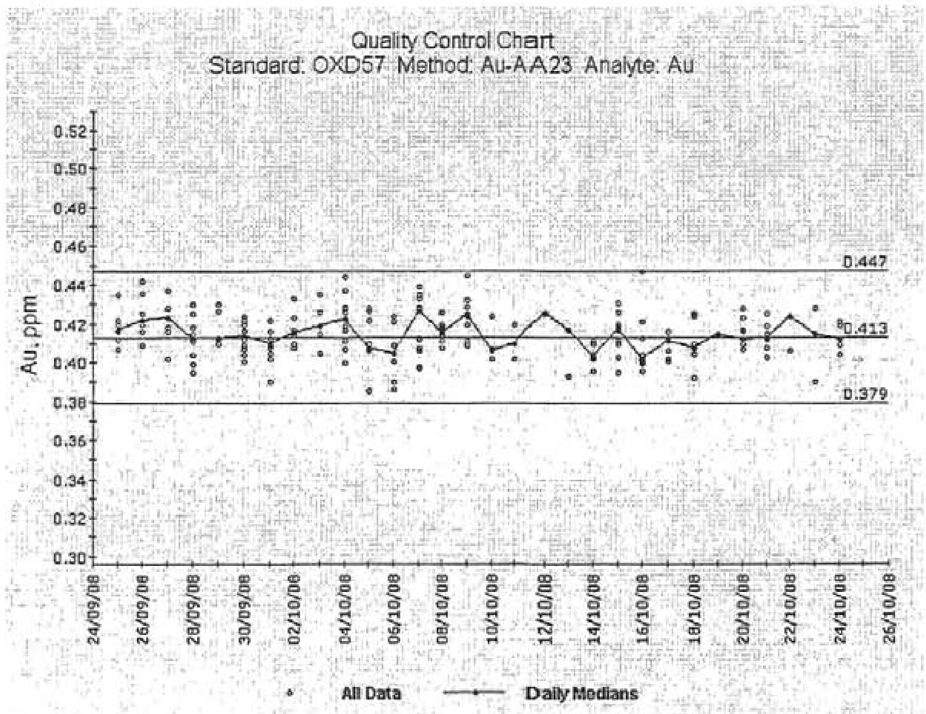
(M. Thompson, 1988. Variation of precision with concentration in an analytical system. Analyst, 113: 1579-1587.)

As an example, precision as a function of concentration (10% precision) is plotted for three different detection limits. The impact of detection limit on precision of results for low-level determinations can be dramatic.



Evaluation of Trends

Control charts for frequently used method codes are generated and evaluated by laboratory staff on a regular basis. The control charts are evaluated to ensure internal specifications for precision and accuracy are met. The data is also reviewed for any long-term trends and drifts.



External Proficiency Tests

Proficiency testing provides an independent assessment of laboratory performance by an outside agency. Test materials are regularly distributed to the participants and results are processed by a central agency. The results are usually converted to a Z-Score to rate the laboratory's result against the consensus value from all participating labs.

All ALS Chemex analytical facilities in North America participate in proficiency tests for the analytical procedures routinely done at each laboratory. ALS Chemex has participated for many years in proficiency tests organized by organizations such as Canadian Certified Reference Materials Projects, and Geostats as well as a number of independent studies organized by consultants for specific clients. We have participated also participated in several certification studies for new certified reference materials by CANMET and Rocklabs.

Feedback from these studies is invaluable in ensuring our continuing accuracy and validation of methods.

Quality Assurance Meetings

A review of quality assurance issues is held regularly at Technical and Quality Assurance Meetings. The meetings cover such topics as:

- Results of internal round robin exchanges, external proficiency tests and performance evaluation samples
- Monitoring of control charts for reference materials
- Review of quality system failures
- Incidents raised by clients
- Results of internal quality audits
- Other quality assurance issues

The Quality Assurance Department and senior laboratory management participate in these meetings.