

MARGARET ELIZABETH/ZIP PROJECT

Summary Report

Target Evaluation 97-053

EVALUATION SURVEY

**NTS MAP SHEET 105 H/3
Lat. 61° 08' - Long. 129° 27'**

MARGARET ELIZABETH AND ZIP CLAIMS

Report prepared by

VAN KRICHBAUM

Field work done AUG. 1 - SEPTEMBER 19, 1997

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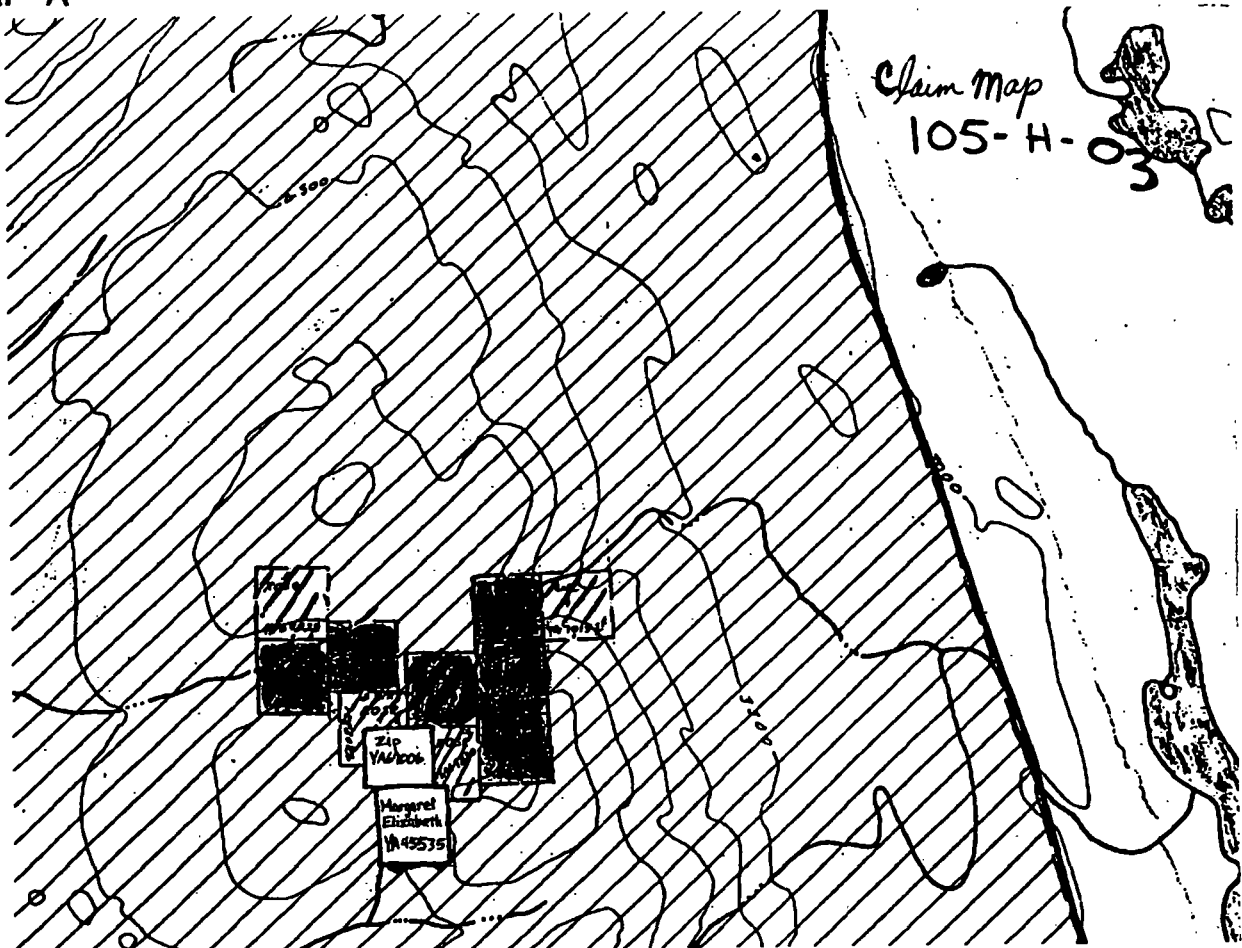
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Target Evaluation 97-053

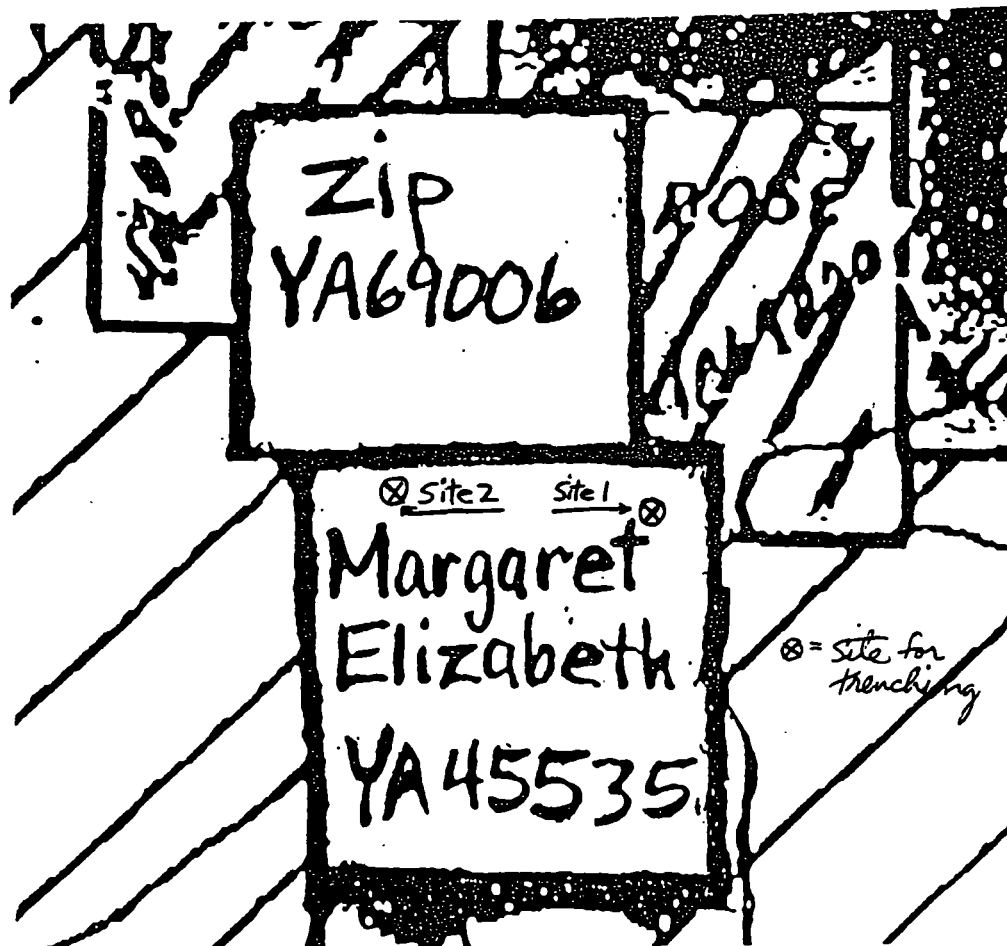
Project location & access

The Project location is on NTS map sheet 105 H/5 at the Zip (YA69006) and Margaret Elizabeth (YA45535) claims area. We accessed the area using a 4x4 truck on a mining road West from approximately Km. 132 (mile 82) on the Campbell Highway to the top of the mountain where the claims are located. We accessed the trenching sites using an Argo (ATV) on the claims sites and by foot. See Map A below for the general location, and Map B (page 3) for the specific sites trenching.

MAP A



Map B



Exploration Target

The exploration target was nephrite jade (actinolite/tremolite) boulder trains showing on the Margaret Elizabeth and Zip claims. Initial investigations suggested possible vein occurrences, and work was done to trench sample the sites to see if seams could be located. Site 1 is a considerable distance from the known nephrite vein occurrence on the Margaret Elizabeth claim, and much further from the large economic seams of nephrite on adjacent claims. It was hoped to locate similar economic veins on our claims.

Nephrite jade deposits in B.C. and Yukon are all associated with middle Paleozoic to Triassic rocks thought to have been part of the oceanic crust but now found as large allochthonous slabs thrust over continental rocks. All deposits of nephrite are associated with serpentinites intrusive into or in fault contact with suites of greenstone, chert, limestone, etc. that range in age from Late Devonian to Late Triassic, although most are Late Paleozoic age. One of the most important of these rock assemblages is the Cache Creek ophiolitic complex of Late Devonian or Early Mississippian age.

In Yukon, in the Campbell Range, Mississippian and Devonian sediments were intruded by serpentinites in narrow sill-like bands. Subsequent tectonic events led to the obduction or over-thrusting of these rocks onto the continental rocks in Mesozoic time. Since nephrite deposits are believed to have formed when the serpentinites were intruded or very shortly thereafter, final disposition of nephrite deposits probably rarely corresponds to the place of origin.

The formation of nephrite is associated with the faulting and intrusion of serpentinite. Metasomatic nephrite occurs between serpentinite and other rocks of various chemistry when there is permeation of calcium rich hydrothermal solutions at the contact. This results in material exchange between them and subsequent recrystallisation of both rocks at the contact reaction zone. Metasomatic nephrite is usually found in small lenticular fault bounded lodes or veins and is finely felted.

In the Frances Lake area, Mississippian and Devonian sediments are intruded by serpentinites in narrow bands that parallel the regional strike. They are conformable with the bedding planes, i.e. they are sill-like bodies. "Whiterock" contact reaction zones are usually present within the serpentinite, and undergo alteration with concurrent albitization and formation of nephrite, usually around the outside of the whiterock. The alteration of serpentine by calcium rich ground water also occurs at or near the serpentinite-calcium rich sedimentary rock contact. It is at these contacts that the metasomatic nephrite forms.

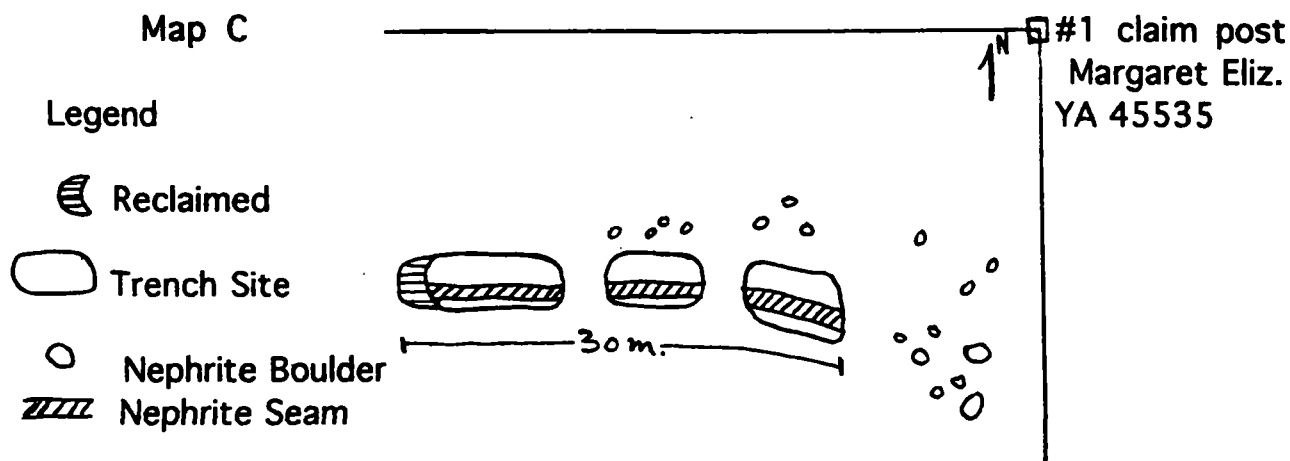
It is at such contact reaction zones on the Margaret Elizabeth and Zip claims that the project work was performed.

Work Performed

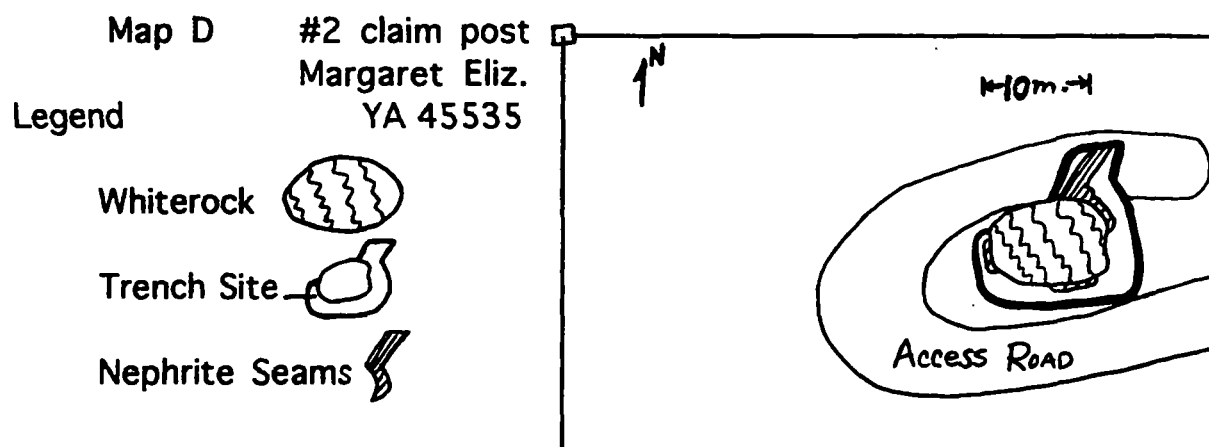
Work done at the project location was primarily trenching, measuring, mapping and sampling of the nephrite main occurrence. In addition, more nephrite boulder trains were also found by prospecting the immediate area on the Margaret Elizabeth and Zip claims. Weather was cooperative most of the time at the site while the work was being performed.

Trenching was done at two locations where indications seemed most likely for success. Trenching was done by Paul Amann (Paul Amann Industries) from Watson Lake using a Samsung 210 LC-1 track excavator with a "thumb" to facilitate rock handling.

At Site 1, approximately 30 meters (100 ft.) of trenching 6 meters (20 ft.) wide and 2 meters (6-8 ft.) deep was done. The material consisted of weathered rock and dirt at the surface. At a depth of about 1.2 meters (four feet) semi-solid rock was encountered, and by 2 meters (seven feet) solid rock was encountered. Scattered permafrost was found at a depth of 1 meters (feet). The site has a Northern aspect, and some permafrost was expected. As trenching got deeper, work became progressively more difficult and slow. Finally, progress became so slow that deeper digging was put off until next year to allow the permafrost to melt and possibly to obtain a larger excavator or cat tractor. Approximately 400 cubic meters of material was removed in trenching at Site 1 and placed beside the excavator to create pads to extend the trenching. Because nephrite was encountered along almost the entire trench, only the first 3 meters (13 ft.) were backfilled where no nephrite was encountered. Please refer to Map C below showing the trenching performed at Site 1.



At Site 2, a trench was dug most of the way around a 10 meter (35 ft.) diameter rodingite "whiterock" showing. The trench varied from 2-5 meters (7-17 ft.) wide and 2-3 meters (7-10 ft.) deep. This location was chosen because the project's planned second trenching site was in a location that would have required a lot of work just to get access to the site and the prospects appeared poor for locating a seam at that site. Because of the time limit for the track excavator, an alternative second site was chosen instead, one that had much easier access and greater chances of success, at a location near another known seam on the Margaret Elizabeth claim. Approximately 100 cubic meters was removed trenching at this site. Please refer to Map D below showing the trenching performed at Site 2.



Mapping the float and veins of nephrite was done to accurately determine dimensions of the deposits to establish the quantity, and sampling was done to establish quality for evaluation of the deposit.

Sawing and polishing of samples was done to determine qualities such as color, translucency, cracking, black spots and mottling to make accurate market determinations of unit price.

Reclamation of trench sites by backfilling was done at the end of one location where no nephrite was found. There was very little developed soil at this site. Separation of the top soil was virtually impossible, so replacement on top was not able to be done. The site was filled with material from the hole to the natural contour level, and smoothed out.

Results (general)

- Numerous metamorphic “whiterock” alteration assemblages and contacts between serpentine and limestone are evident at the project location. The contacts between the nephrite, serpentine, limestone and calc-silicate rocks are sharp, and in some places the nephrite seams exhibits complex smaller parallel sub-seams.

- At Site 1 the eastern end of the vein was not located, and the seam continued along strike. Such a linear vein system indicates it is either fault controlled or, more probably, the result of contact metamorphism. The nephrite seam curves southward at the eastern most end, indicating that deformation likely occurred later during plate tectonic emplacement of the land mass.

- The original geologic interpretation was that the serpentine occurred as an allochthonous ophiolitic thrust sheet. A newer proposed interpretation of the geology suggests that the nephrite may have formed in place instead of being a thrust sheet. My interpretation at Site 1 is that the serpentine intruded into the limestone in place, and then the whole unit was later emplaced at its present location.

- Sites 1 & 2 illustrated the common observation that nephrite seams are associated with “whiterock” alteration and serpentine contact zones.

- There were differences in the nephrite observed at these two sites in terms of color, amount of black spots, fracturing and schistosity.

- No other economic mineralization was found. There is an abundance of serpentine at the site, and it could possibly be economic for landscape material or for quarry material if any unfractured material can be found. Occasionally, small pockets of bowenite are found at the site, but are too small to be mined economically.

- More nephrite boulder trains were found on the two claims by carefully prospecting the immediate area. Because of their similarity to the Site 1 occurrence, chances are good that they also are associated with nephrite seams. More excavation needs to be done to determine if this is true, and the volume and value of those deposits.

Seam deposit volume data

The main nephrite vein itself at Site 1 was proven in excess of 30 m. long, and indications are that it may be even 50 m. long or more. The width of the seam remained surprisingly uniform over it's length, at a width of approx. 1.6 m (4-5 ft.). Dip was difficult to determine because of fractures in the seam, but the best estimate is 80° to the South. Due to the inability to dig with the trackhoe beside the seam because of rock and permafrost, the depth of the seam was not able to be determined. However, due to the long length and the uniform width of the seam, the depth is probably on the order of 10's of meters (30 m?). The approximate conservative volume estimate would be 800 cu. m. (50m.x1.6m.x10m.). At 3 tonnes per cubic meter, this represents a probable reserve of approx. 2400 tonnes (2700 tons) so far. The deposit could easily be twice that amount or more. The length and depth still need more excavation to accurately determine the size of this seam.

At Site 2 the exposed seam was much more irregular than at Site 1, and measurements are not easy to report. For a better idea of the deposit shape, please refer to Photo #1 below. The length exposed at Site 1 was only 6m. (20 ft.), as the trenching was very slow in the fractured rock. The max. width was 2m. (7 ft.), and the depth was not able to be determined, nor even to be closely estimated. An absolute minimum volume is at least 12cu. m. (6m.x2m.x1m. deep), or 36 tonnes (40 tons). Much work remains to be done at this site to determine volume estimates, but they most certainly will be much higher.

Photo #1



— Previous ac
Road Elev.

— Nephrite go
into White.

— Several
parallel seam
going under
access roa

Seam deposit quality data

At Site 1, the nephrite associated with the "serpentine contact alteration" zone is more schistose at both ends of the seam. The middle section of the seam is more solid, having more integrity. The seam has olive to bright green color, and a few to many "black spots." Some bright green chrome spotting is also present.

The Site 2 "whiterock" association produced nephrite that is more fracture free, less schistose, and a more desirable green color with fewer undesirable black spots and more desirable chrome spots than the nephrite associated with the "serpentine contact alteration" at Site 1.

Seam deposit evaluation

Site 1 has an estimated unit value of approx. \$6.00/kg. (2.75/lb.) based on current large volume market prices for that quality. If the assumptions are made that the seam is only as long as has been excavated, and it is excavated to a depth of 10 m., and only one half of the material is marketable, then the deposit has a conservative value of approx. \$7,000,000.00 (2400 tonnes x 1000 kg./tonne x \$6.00/kg. x 50%).

The volume at Site 2 was not able to be estimated accurately, however the unit value should be approx. \$8.00/kg. The absolute min. value of Site 2 is \$100,000 (12 tonnes x 1000 kg./tonne x \$8.00/kg.). It should be many times this estimate once the depth of the deposit is determined.

Site 1 represents the largest monetary value of the two excavated deposits due to its sheer volume. However, the smaller Site 2 deposit is of higher quality and has a higher unit value. It should also be more easily marketable.

Conclusions

- Two different trenches were done. A total of 700 cu. m. was excavated in the two trenches, and both trenches encountered a significant seam deposit of nephrite. Both seams remain open on strike. More trenching will be necessary to find the "ends " and depths of the two deposits.
- Two different deposit types were observed. One was the "whiterock" association deposit type which occurs on or within a mass of rodingite within serpentine. Nephrite was also found associated with the "serpentine contact alteration" deposit type which occurs with the alteration of serpentine by calcium rich ground water at or near the serpentinite-calcium rich sedimentary rock contact.
- More nephrite boulder trains were also found by prospecting the immediate area on the Margaret Elizabeth and Zip claims. Because of their similarity to the Site 1 occurrence, chances are good that they also are associated with nephrite seams. Excavation needs to be done to determine if more seams exist at those sites, and the volume and value of those expected deposits.
- A trend was observed that the "whiterock" association deposit type seems to produces nephrite with a more desirable brighter green color and is more fracture free, less schistose, and with fewer undesirable black spots and more desirable chrome spots than the nephrite found with the "serpentine contact alteration" deposit type at Site 1. Additional studies will be necessary to prove if this observation is a valid one in most cases.
- Site 1 represents the largest monetary value of the two excavated deposits due to its sheer volume. The two trenches uncovered nephrite seams with an estimated conservative value of over \$7,000,000.00 Canadian. However, the smaller Site 2 deposit is of higher quality and has a higher unit value. It should also be more easily marketable. With additional trenching of the two work sites and the other discovered boulder trains, the total estimated value is predicted to increase significantly.

Recommendations (general)

- The main recommendations are that the project be allowed to finish at the two existing sites, and that it be expanded to cover other sites on the two claims.

- It is recommended that trenching at Sites 1 & 2 be allowed to continue for the following reasons;

1. This project was reduced in nature due to the track excavator unavailability beyond 4 working days. Only \$5778.00 was spent out of the project budget estimate of \$12,000.00 for heavy equipment for trenching. This was despite the spectacular results achieved. No other track excavator with a "thumb" could be located that was available at that time.
2. Evaluation of the two existing sites was incomplete because of two main reasons First, both seams remain open on strike. In addition, the depths of both deposits were not determined.
3. Spectacular results were achieved in just 4 days of trenching. There is an excellent chance that similar results will continue.

- It is recommended that trenching be done at other sites for the following reasons;

1. Several more nephrite boulder trains similar to Site 1 were also found by prospecting the immediate area on the Margaret Elizabeth and Zip claims. Because of their similarity to the Site 1 occurrence, chances are good that they also are associated with nephrite seams.
2. All of the nephrite sites need to be assessed to get an accurate total evaluation of the nephrite resource on the Margaret Elizabeth and Zip claims.

Equipment recommendations

•Equipment recommendations to complete the project are the following:

1. Larger track excavator with a “thumb” than that used so far to strip the top cover, prepare trails on the claims, handle large rock and reclaim the trenches.
2. Cat with a ripper to facilitate trenching where fractured rock and permafrost are located.
3. Core drill capable of coring up to 5 m. (17 ft.) to examine the depth and make quality determinations of seams encountered.
4. Air or hydraulic rock chisels, splitters, and wedges to facilitate trenching where fractured rock are located. Due to the importance of fracture free quality in the nephrite unit price, blasting can not be used for trenching.
5. Small hand-held diamond saw to saw slots for wedging and make quality determinations of seam faces encountered.
6. Diamond field saw with a blade diameter of at least 30-36 inches to facilitate trenching where solid rock is located.

Appendix A - Daily journal

Week

FROM: _____

THURSDAY _____

FRIDAY

Aug 1 / 97

TO: _____

4x4, Agood trailer
 (3) to ME/Zip claim



EVENTS AND
 ALTERATIONS IN
 DAILY SCHEDULE

NOTES:

— Mark out boulder
 train at Site 1 in
 prep. for trenching
 Flag nephrite pieces
 + Collect a few samples to saw

1

— Mark out (flag) the
 boulder trains from
 the Whiterock site down²
 to the Jade Spring site
 + Collect a few samples to saw

— Mark out other previously
 undiscovered boulder trains
 on the Zip claim. Discuss
 possible site 2 trench
 site

— Flag route to road for
 Site 2 possible sites

4

5

6

AFTER SCHOOL COMMITMENTS

Week

FROM: _____

THURSDAY <u>Aug 7/97</u>		FRIDAY <u>Aug. 8/97</u>		TO: _____	
<u>14x4, Argo + trailer</u> <u>3) to M.E./Zip claims</u>		<u>(Truck)</u> <u>2) to Watson Lake</u>		EVENTS AND ALTERATIONS IN DAILY SCHEDULE	
<u>- Take trackhoe excavator operator Paul Amaan to M.E./Zip claims to eval. use of hoe for the trenchings needed.</u>		<u>- Go to Watson Lake for supplies to do the trenching work such as food, gas, diesel, chain saw files, etc.</u>		NOTES:	
<u>- Discuss feasibility of Sites 1 and 2 and cost rates and estimates for job.</u>					
<u>- Decide to go with the hoe instead of a cat because of rock handling ability, Reclamation, rock sorting, etc. because hoe has a "thumb"</u>					
				AFTER SCHOOL COMMITMENTS	

Daily Outlines

	Saturday MONDAY	Sunday Aug. 17/97 TUESDAY	Mon. Aug. 18/97 WEDNESDAY
		Saw + water pump Sawing at Camp ①	Saw + water pump Sawing at camp. ①
1		- Saw rock samples from Site 1 - some to lots of black spots (least at midseam) and schist cracks (least at midseam). Color was OK to good esp. near midseam. Translucency was good.	- Saw rock samples from possible Site 2 locations. Samples have lots of weathering. Kind hard to tell the quality of original seam material. Because of weathering quality was low to OK.
2			
3			
4			
5			
6			

THURSDAY <u>Fri. Aug. 22/97</u>	FRI. <u>Sat. Aug. 23/97</u>	SUN <u>Aug 24/97</u>
(1) Go to Watson Lake	4x4, Argo and trailer (3) to M.E./Zip claims	4x4, Argo and trailer (3) to M.E./Zip claims
<p>→ Go to Watson Lake for supplies such as food, chain saw mix, rock bar, look for wedges, etc. to get last minute supplies for the project to start Sat.</p>	<p>→ Truck here to Mile 82 road and unload Paul Amann also brought his 1 ton truck</p> <p>→ Walk here up mining road to the Marg. E./Zip Claims² and decide trenching strategy for Site 1</p>	<p>→ Trench below the west end of the boulder train and find jade seam! The seam is 4-5 feet wide and is about 5 feet down. Hard to remove any rock due to ice.</p>
	<p>→ Trench western end of Site 1 on M.E. claim past the start³ of the boulder showing to the west to see if there was any seam past the boulder train</p>	<p>→ Trench approx 40 ft. x 20 ft. x 6/SF</p> <p>→ Skip from 40-55 Ft</p> <p>→ Trench at 55 to 65 Ft to check seam. Seam still there, same depth + width as first trench</p>
	<p>→ No jade seam found⁴ below the end of the boulder train to the west of surface showing so trench was filled back in and smoothed out to original shape (reclaimed)</p>	<p>→ Trench at 75-100 Ft from west end. Same results the same but quality appears better, at least at the 75 foot end.</p> <p>→ Boulder train continues but terrain gets steeper & goes over small cliff</p>
		6

Daily Outlines

	MONDAY <u>Aug. 25/97</u>	TUESDAY <u>Aug 26/97</u>	WEDNESDAY <u>Aug. 27/97</u>
	4x4, Argo + trailer ③ to M.E./Zip claims	4x4, Argo + trailer ③ to M.E./Zip claims	4x4, Argo + trailer ③ to M.E./Zip claims
1	- Make decision to stop trenching at site 1 because Paul Amaan found out last night he has to go to the Sa Donabess mine probably for Thursday.	- Trench on North side of "Whiterock". Find an extension of the seam on the east side that goes below the access road.	- Take measurements of Sites 1 and 2. At Site 1 the west end of the trench is marked as "zero" and measurements are from this point.
2	- Decide to make site #2 at a large whiterock showing on Marg Elig. claim because of easy access. Prev. chosen site 2 not done due to length of time to get hoe to that site due to poor access (will take too long).	Necessary to dig up access road to follow the seam. However, the end of the seam is not found as it continued to the North.	- Walk the hoe to the road and take 2 rocks from Site 2 to the road in the bucket of the hoe.
4	- Move hoe, start to trench around "white rock" on the east side and follow it around the South to the West side.	- Quality + quantity appears very good. Seam on Whiterock face is 4.5 ft. wide, and lower seams head north. Lower seams appear to be either 1 four foot wide seam or 3-4 seams side by side. The going is too tough on the hoe - can't really excavate this from on top of the seam.	- Load rocks into the Argo trailer and take to the main camp.
5	- Nephrite found as small stringer veins on the S.E. corner to S. also on the west mid side. Very good color, appears to have mostly chrome green versus black spots - Nice!	- The seam will need to be accessed from the side to see what size it is, and where it goes to - also the whiterock needs "dismantled" to see where seam goes to the South	
6			

Week

FROM: _____

THURSDAY _____	FRIDAY <u>Sept. 5/97</u>	TO: _____	
	<p>(Truck)</p> <p>① Take rocks</p>	<div> <div>←</div> <div>EVENTS AND ALTERATIONS IN DAILY SCHEDULE</div> </div>	
	<p>Take 2 rocks from Site 2 (that the hoe brought down in the bucket) to Watson Lake for Ernie Hatzel to see. Ernie is to check with buyers to see if there is a market for this type of nephrite with whiterock contact material on it, and to give us another persons opinion on the seam quality.</p> <p>Ernie thinks the jade rock quality is good but not fantastic and it should be of interest to jade buyers</p>	<p>NOTES:</p>	
		<p>AFTER SCHOOL COMMITMENTS</p>	

Daily Outlines

	MONDAY _____	TUESDAY _____	WEDNESDAY <u>Sept. 10/97</u>
			Saw and water pump Sawing at Camp ①
1			- Saw rock from the two trench sites, esp. Site 2
2			- Site 1 Rock has black spots, an orientation of grain but not really schistose. Color is OK, not real bright though. Transparency is OK (medium)
			- Site 2 rock with whiterock rind has "green ball" + more colorless material around it. The whiterock seems to bleed into the nephrite for 2-4 inches in, reducing the amount of good jade in the boulder.
4			- Decide to get some larger sample rocks from Sites 1 and 2 for cutting to see if
5			1. Site 1 Rock can be found with less fibrous blade orientation
6			2. Site 2 rock has better ratios of recovery

Daily Outlines

	MONDAY <u>Sept. 15/97</u>	TUESDAY <u>Sept. 16/97</u>	WEDNESDAY <u>Sept. 1/97</u>
	4x4 truck (2) to M.E./Zip claims		4x4 truck (3) to M.E./Zip claims
1	- Roger + Larry go to the trench sites to see about getting a machine up the mountain to remove	- Larry goes back to Watson Lake to get Billy Close	- Roger, Larry + Billy go to the trench sites to see about getting a machine up the mountain to remove a few
2	a few larger sample rocks for test cutting to see if characteristics improve with size.		larger sample rocks for test cutting to see if the nephrite characteristics
	- Decide to bring up Billy Close of Watson Lake for a better opinion before getting a contractor to go up the mine road as it is steep in places.		improve with size. - Billy thinks a 5 ton truck / flatbed "will make it up esp. if chained up."
4			
5			
6			

THURSDAY Sept. 18/97	FRIDAY Sept. 19/97	TO: _____
(Hruch) (1) Go to Watson Lake	Contractors truck (3) to ME/Zip claims	EVENTS AND ALTERATIONS IN DAILY SCHEDULE
<p>— Arrange for Rob Pettit of R.A. Pettit General Contracting to try to go up to the trench sites to get a few larger rock samples for sawing</p> <p>— Truck is a 5 ton with a Hyab crane</p>	<p>— Roger, Rob Pettit of R.A. Pettit General Contracting in Watson Lake, and Larry go up the mine road but can't make it up the steepest part near the top as the truck starts skipping and loses traction.</p> <p>Have to abandon the attempt to get larger rock samples for sawing until a better method is found.</p>	NOTES:
	<p>— It will probably not be this year to get larger rock samples, if the only way is to use a Cat.</p>	
	<p>— Decide to try a 6x6 next if there is one available.</p>	AFTER SCHOOL COMMITMENTS

Appendix B. - Photographs

Terrain at
Site #1

Rolling slope,
easy access

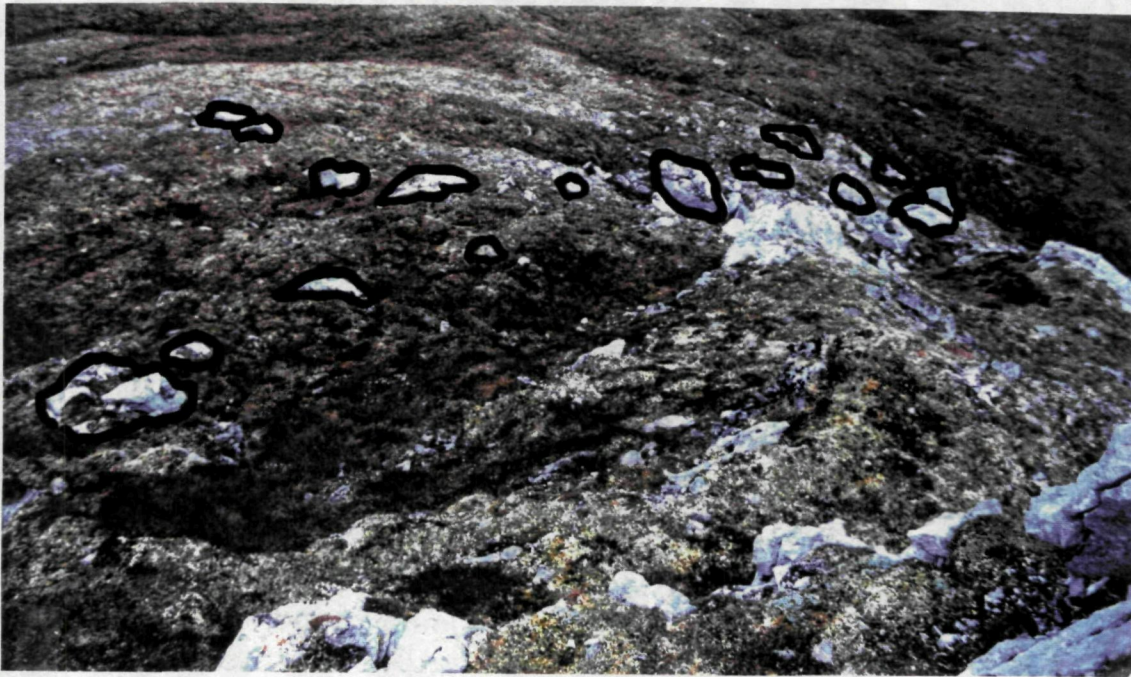
Showing the
back-filling
to grade for
reclamation
at West end
of the trench



Terrain at
Site #2

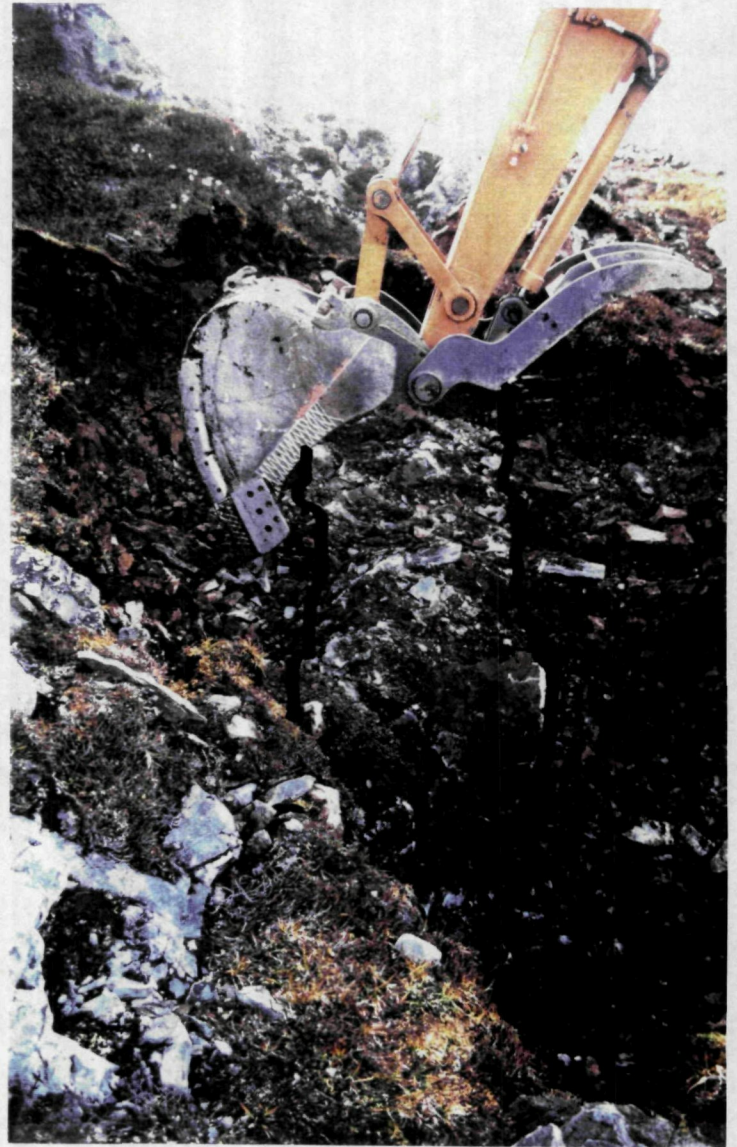
Steep, more
rocky, harder
to access + work

Appendix B. - Photographs

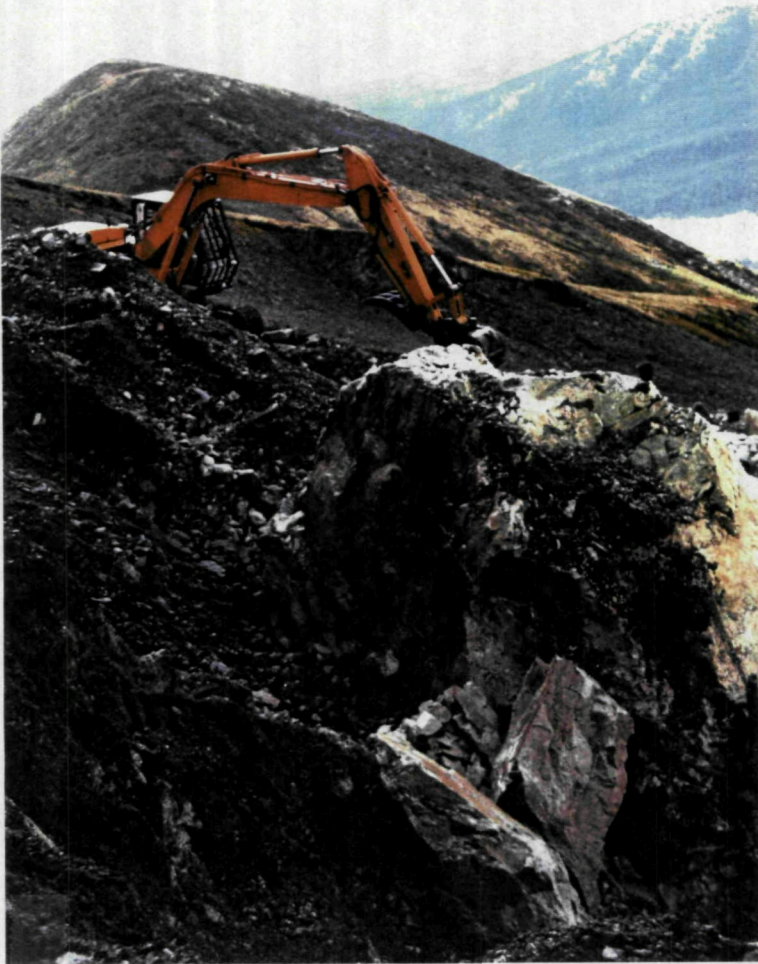


Nephrite ro
boulder train
(in black)
at Site #1
at East end
Seam. This
remains
untrenched

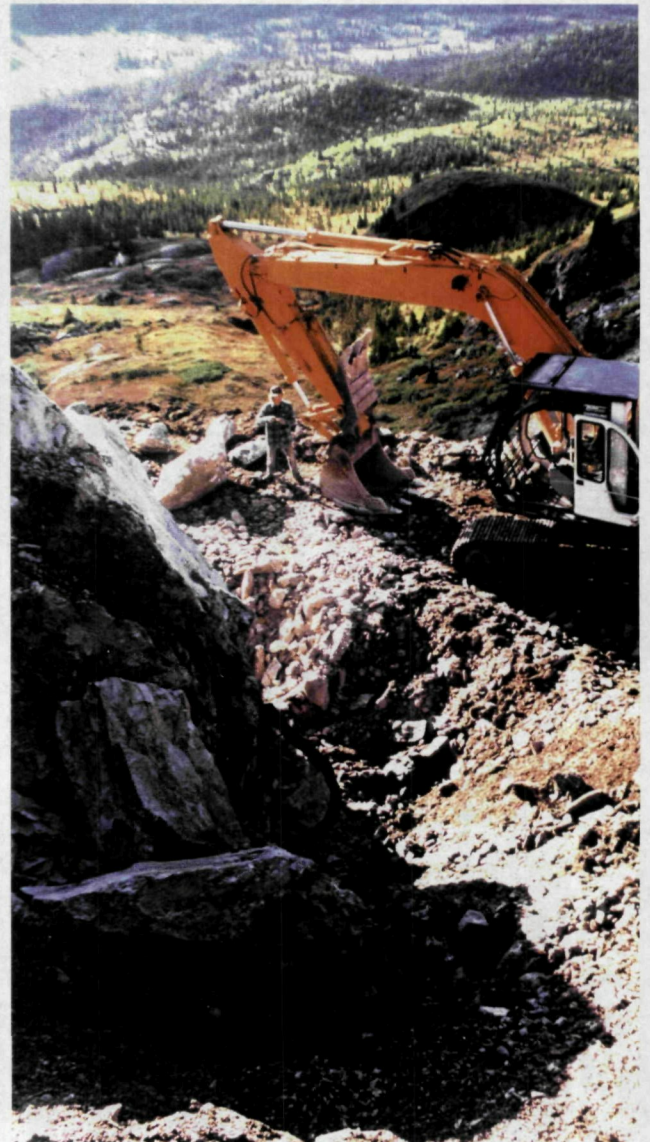
Nephrite Seam
uncovered in trench
at Site #1
Seam is delineated
in black.



Appendix B. - Photographs



*Trenching at Site #2
around the "Whiterock
alteration zone*



- Trenching at Site #2
- Nephrite Seam (in black) being uncovered

Appendix B. - Photographs



Site #2

Trenching showing
the versatility of the (upper)
"thumb" on hoe for rock handling



Site #1