Avalon Rare Metals Inc.

RESPONSE TO THE DEFICIENCY REQUESTS FOR THE THOR LAKE RARE EARTH ELEMENT PROJECT DEVELOPER'S ASSESSMENT REPORT

Submitted To:
MACKENZIE VALLEY ENVIRONMENTAL IMPACT REVIEW BOARD

October 2011

Response to the Deficiency Request for the Thor Lake Rare Earth Element Project Developer's Assessment Report

Avalon Rare Metals Inc. (Avalon) is pleased to provide the following responses to the deficiency request provided in Mackenzie Valley Environmental Impact Review Board's (MVEIRB) e-mail dated October 14, 2011.

This deficiency request provides specific direction from the MVEIRB to Avalon regarding the results of the conformity analysis and a requirement for additional information relating to the Terms of Reference Section 3.2.4.

MVEIRB Request #1(a)

Please provide details on the drilling programs used to characterize the geology of the project site showing the locations of the drillholes in plan view in relation to both the aboveground and underground proposed project components.

Avalon Response #1(a)

Avalon is pleased to provide the latest plan of all diamond drill holes in relation to the underground reserves and surface infrastructure (Attachment 1).

MVEIRB Request #1(b)

Please provide details on the drilling programs that explain the core sampling program including the core drillholes, core depths or elevations, and the core numbering system so that specific laboratory samples can be traced to physical locations.

Avalon Response #1(b)

All drill holes are logged by geologists in the camp, and sample intervals marked in the core. These sample intervals are typically 2 metres long on HQ or smaller sized core, and 1 metre long on PQ core. PQ core sample lengths are shorter because of the weight of the core and the resulting handling difficulties.

All samples are entered into an Access database custom designed to hold the drill core information. This database contains data from over 400 drill holes, with more than 35,000 individual samples. All samples are given a unique six digit number using sample tags provided by the third party analytical laboratory. Data contained in the database include sample numbers, drill hole numbers, drill hole locations, depths in the drill hole and results from chemical analyses. As well as the assay information, the database contains other downhole information such as magnetic susceptibility and density.

The drill holes are surveyed both on surface for collar location by a third party professional surveyor and also down the hole using downhole digital methods. The downhole survey is completed by the drill crew and Avalon geologists. As a result, using the collar survey and the downhole dip and azimuth from the digital downhole survey, the location of an individual piece of core is known within acceptable accuracy in 3D space.

The core is sampled using different methods according to the core size. Core sizes NQ and smaller are split using a mechanical splitter into halves, with half used for analysis and half retained as library core. Core size HQ is split in halves, and then one half split into quarters. One quarter is utilized for analysis, one quarter for library core and one half for metallurgy. The largest size drilled, PQ, is - for mineralized zones – subject to complete crush to -6 mesh (about 3.3 mm), a subsample is taken for analysis and the remainder is utilized for metallurgical testing. PQ core that is not believed to be mineralized is cut with a diamond saw, removing about one quarter of the core, which is sent for assay while the remaining core is boxed at site.

All library core is boxed, racked and stored at the Thor Lake site. Metallurgical core is stored in Yellowknife until ready to be shipped to SGS Canada Inc. (SGS) in Lakefield, Ontario or other metallurgical testing sites, for metallurgical work.

Core samples to be analysed are subjected to ALS Global laboratories' ME-MS81D analysis method, comprising fusion followed by multielement analysis including whole rock. The exception to this is that PQ core is not analysed by whole rock method. Any overlimits elements such as Nb, Ta and Zr are subject to XRF analysis that has greater analytical range.

Check analyses are completed on every tenth sample at ACME Laboratories in Vancouver, British Columbia. In-house standards are inserted at intervals of about every twenty samples in mineralized zones and at greater intervals in non-mineralized zones. "Blank" core are also inserted in the sample stream as part of the quality control system; diabase from the Thor Lake property, which has very low rare earth and other rare metal values, is used for this purpose.

Avalon has used various laboratories over time. The individual chemical elements analysed by each laboratory may vary slightly. As a result not all samples are analysed for exactly the same set of elements.

Further details of the drilling and geological methodology are available in the National Instrument 43-101 Resource report filed on Avalon's website and on Sedar, with the most recent dated March 13, 2011.

MVEIRB Request #1(c)

Please provide, in tabular form, details on all of the analytical or assay tests performed on core samples from the proposed project site as well as a statistical summary of the distributuion of the test results. The detailed results should allow the reader to trace specific cores to physical locations. The detailed results should specifically include information on U, Th and Be.

Avalon Response #1(c)

This information has been generated, scrutinized and reviewed by independent third party consultants, Roscoe Postal Associates in two different NI 43-101 compliant technical reports over the past two years. For the purpose of this response, Avalon has provided the most recent technical report completed by Roscoe Postal Associates on August 22, 2011 in Attachment 2.

In addition, Avalon is pleased to provide a statistical summary of the distribution of the test results also found in Attachment 2.

MVEIRB Request #1(d)

Please provide cross sections of Avalon's conceptualization of the geologic profiles of the proposed underground mine areas and access portals that include the drillholes used as a basis for the profiles. For completeness, please indicate on the cross sections any additional information that would assist the Review Board in its evaluation such as the locations of core samples sent to SGS for analysis, hydraulic conductivity data, and information on mapped fractures or joints.

Avalon Response #1(d)

Avalon is pleased to provide the requested geologic cross section profiles of the main mining areas in Attachment 3. A total of eleven cross sections are provided, complete with legend.

Detailed hydraulic conductivity data and mapped fractures and joints can be found in the DAR Appendix C.

MVEIRB Request #1(e)

Please explain the sources, reasons for selection, and sample preparation of the following six head samples listed in Table 2 of the SGS report and explain how these samples are representative of the expected production materials.

Master Comp 3	**F25, F28, F29, and F30 Head**
Avalon Head Sample 1	**F33 Head**
Avalon Head Sample 2	**F36 Head**
Avalon Head Sample 3	**F37 Head**
XPS PP Comp 2 Head	**XPS MPPX**
XPS PP Comp 3 Head	**XPS MPP Run 2 Head**

Avalon Response #1(e)

All the head samples utilized in metallurgical testing are comprised of drill core. The core is selected from drill holes that intercepted the Basal Zone (planned mining zone) of the Nechalacho deposit. Using the geologists' logs and the laboratory analyses, the Basal Zone of the Nechalacho deposit can be readily identified. All core are from the area of the deposit south of Thor Lake, using a variety of drill holes to be more representative of a larger area of the deposit; this is the only area in the present mine plan.

As a result, all samples are representative of the zone that is planned to be mined. It is critical for both metallurgical and environmental reasons that the samples be representative of the mining reserves.

The samples were all provided to the metallurgical laboratory as drill core in bags of individual samples. The metallurgical laboratory subjected the samples to two stage crushing followed by fine grinding prior to completing metallurgical flotation testing. The grain size targeted was 80% passing 38 micrometres leading into the flotation process.

The "Master Comp 3" sample is a composite of samples from the Upper Zone and Basal Zone mineralization in North and South Tardiff Lake. The analysis of Master Composite 3 shows 1.99% total rare earth oxides (TREO), 0.41% heavy rare earth oxides (HREO) and 21% HREO/TREO. These values are close to the average grade and heavy rare earth content of the probable reserve, thus demonstrating the applicability of the samples and their use in determining the metallurgical and environmental response of the Nechalacho deposit.

The "Avalon Head Samples 1, 2 and 3" are SGS' designations for the sub-samples of the corresponding composite samples tested in the Xstrata Process Support minipilot plant campaigns in Sudbury, Ontario. Hence, "XPS PP Comp 2 and 3 Heads" are the same as "Avalon Head Samples 2 and 3", respectively. These samples were made up from drill core only from the Nechalacho Basal Zone. They show 1.49 to 1.83% TREO, 0.35% to 0.48% HREO and 21% to 25% HREO/TREO, being typical values for the Basal Zone.

Core samples from the drill holes were crushed and blended to make the various composites for metallurgical testing. The drill holes were selected to represent spatial distribution of the mineralogy and grade of the ore to be processed. Various composites were tested to evaluate the applicability of the reagent scheme proposed for processing Nechalacho ore. Following bench flowsheet development, continuous Xstrata Process Support pilot plant campaigns were conducted to demonstrate the stability of the flowsheet and its ability to process different ores.

MVEIRB Request #1(f)

Please explain the sources, reasons for selection, and sample preparation of the 10 tailings samples listed in Table 2 of the SGS report and explain how these samples are representative of the expected production tailings.

Avalon Response #1(f)

For reference, a portion of the SGS Table 2 is reproduced as follows.

Table 2: Thor Lake Nechalach Samples Received

Received Sample ID	Reporting Sample ID	Description
Tailings		
F25 Comb Tls	F25 Tls	MC3 Tails
F28 Comb Tls	F28 Tls	MC3 Tails
F29 Comb Tls	F29 Tls	MC3 Tails
F30 Comb Tls	F30 Tls	MC3 Tails
F33 Comb Tls	F33 Tls	Head 1 Tails
F36 Comb Tls	F36 Tls	Head 2 Tails
F37 Comb Tls	F37 Tls	Head 3 Tails
Master Tls	Master Tls	Combined F25, F28, F29 + F30 Tails
XPS PP Comp 1 Tls	PP1 Tls	XPS MPP Run 1 Tails
XPS PP Comp 2 Tls	PP2 Tls	XPS MPP Run 2 Tls (XPS Comp 3 used for MPP2 as per J. Goode)

Source: Extracted from SGS Final Report: Table 2, Project 11806-007, August 30, 2011

On Avalon's behalf, SGS (Lakefield, Ontario) conducted numerous flotation tests on several samples to develop a suitable up-grading process for the Nechalacho rare earth mineralization. Certain samples from the test program have been evaluated to determine their response in the natural environmental.

Besides SGS, Avalon employed Xstrata Process Support (XPS) in Falconbridge (Sudbury), Ontario, to conduct flotation pilot plant (PP) operations on two of three bulk composite samples of Nechalacho mineralized material. XPS was selected for the pilot plant work because it was better able to pilot process the small mass (3 metric tonnes) of material that was available.

The first four of the tailings samples mentioned in Table 2 of the SGS report (F25 Comb Tls to F30 Comb Tls) were produced in locked cycle tests performed at SGS on Master Composite 3 (abbreviated as MC3). The four tests examined slight variations on the reagent scheme contemplated for the Nechalacho ore. MC3 was a composite of mineralized material as is described in the response to MVEIRB Request #1(e).

The Master Tls sample was made by blending the first four samples (F25 Comb Tls to F30 Comb Tls) to both measure the effect of blending tailings and to provide a large mass for special environmental tests.

Tests F33, 36, and 37 were conducted by SGS on the three bulk composite samples that were sent to XPS, of which two (Composites 1 and 3) were tested in the XPS pilot plant. The abbreviated description of these samples were provided by SGS; for example, "Head 1 Tails" is an abbreviation for the tailings from Composite 1.

XPS PP Comp 1 Tls and Comp 2 Tls were samples from the two XPS pilot plant campaigns, which were performed on Composites 1 and 3 respectively.

The samples were selected because they were the most representative tailings samples available. Avalon required that SGS test several tailings samples to thereby obtain a measure of the variability of the environmental response of the tailings under various process conditions and sample origin. Avalon considers it reassuring that all samples responded similarly and that all parameters were well within the Metal Mining Effluent Regulations (SOR/2002-222), enabled under the *Fisheries Act*.

MVEIRB Request #1(g)

Please explain the sources, reasons for selection, and sample preparation of the nine concentrate samples listed in Table 2 of the SGS report and explain how these samples are representative of the expected production concentrate.

Avalon Response #1(g)

The concentrate samples listed represent the products expected in the flotation recovery of the minerals of interest from the corresponding head samples. Concentrate samples labeled as "Mozley Conc" represent the products from further upgrading of the flotation concentrate by gravity separation. Gravity separation has been included in the flowsheet given its ability to upgrade the flotation concentrate and reduce the concentrate mass.

MVEIRB Request #1(h)

Please explain the sources, reasons for selection, and sample preparation of the 1 decant sample and 2 process simulation samples listed in Table 2 of the SGS report and explain how these samples are representative of the corresponding expected production steps.

Avalon Response #1(h)

For reference, a portion of the SGS Table 3 (not, as stated in the question, Table 2) is reproduced as follows.

Table 3: Solution Samples Received

Received Sample ID	Origin of Sample
CH-WT1 PLS+Wash	simulated end product from the hydromet program
RAR-1 Filtrate	simulated end product from the hydromet program after Ra removal by addition of $BaCl_2$, $Fe_2(SO_4)_3.5H_2O$, pH adjusted to 7
XPS Comp 2 Tls Decant Water (Final Tls Decant)	Solution decanted from PP2 Tls

Source: Extracted from SGS Final Report: Table 2, Project 11806-007, August 30, 2011

Decant Sample

Avalon employed Xstrata Process Support (XPS) in Falconbridge, Ontario, to conduct flotation pilot plant (PP) operations on two of three bulk composite samples (Comp 1 and Comp 3 only) of Nechalacho mineralized material. The decant solution from the second XPS Pilot Plant (PP2) which was performed on Composite 3 was shipped to SGS for environmental work.

This tailings decant sample was selected because it was deemed to be representative of tailings decant solution from an actual operation. The solution sample was decanted from drums of tailings by syphoning and shipped to SGS.

Simulation Samples

The full hydrometallurgical process includes sulphuric acid baking of the flotation concentrate followed by fusion of the acid bake residue with sodium hydroxide, then acid leaching of the caustic fusion residue. Initially, Avalon considered doing all of the hydrometallurgical processing at Pine Point. However, the company has since decided to only undertake the acid baking process at Pine Point.

In late 2010, Avalon designed a simulated hydrometallurgical plant effluent test to produce a residue that would simulate an integrated operation at Pine Point. The feed to the test comprised a mixture of double salt filtrate following an acid bake step, acid leach solution and wash from a caustic fusion and sulphuric acid leach and the corresponding leach residue. This mixture was neutralized with limestone and lime, with air sparging, then the pH taken back to 7. The slurry was filtered and submitted for environmental analysis as sample "CH-WT1 PLS+Wash". A portion of the sample was treated with barium for radium removal then filtered and labelled "RAR-1 Filtrate".

The sample of simulated hydrometallurgical plant effluent represents the effluent solution from a plant including acid baking and caustic cracking and NOT a simple acid bake plant. The result is that CH-WT1 PLS+Wash solution likely contains more contaminants than the effluent that would actually be produced at a Pine Point acid bake facility since the caustic cracking breaks down almost all the minerals and so puts more material into solution. Most importantly, caustic cracking puts sodium into the system which is not the case for the simple acid baking flowsheet. TDS and sulphate values in CH-WT1 PLS+Wash are likely elevated over what a split hydrometallurgical plant will produce.

For this worst case scenario, Avalon considers it reassuring that all solution samples gave analytical values well within the Metal Mining Effluent Regulations (SOR/2002-222), enabled under the *Fisheries Act*.

MVEIRB Request #1(i)

Please describe the pilot plant processes and demonstrate that these processes are representative of the expected production processes.

Avalon Response #1(i)

1. Pilot Plant Flowsheet Description

   I. **Grinding Desliming and Magnetic Separation Flowsheet**

   The ore is crushed to -6 mesh. This crushed material is fed to mill to grinding to -200 mesh. The grinding is performed at K_{80}= 40-50 μm. Low-intensity magnetic separation is to remove magnetics. Three cyclones in series are to de-slime the screen undersize. The actual desliming is performed at K_{80} = 6-8 μm. The slimes are rejected.

   II. **Flotation Flowsheet**

   The flowsheet consists of the following unit operation(Figure1):

   - Stage conditioning of the ground deslimed non-magnetics with depressants and collectors followed by bulk rougher scavenger flotation.
   - The combined bulk rougher plus scavenger concentrate is preconditioned with depressants and collectors followed by the first cleaner in open circuit cleaning where the first cleaner tailing is scavenged and discarded.
   - The cleaner scavenger concentrate is recycled to rougher conditioner.
   - The first cleaner concentrate is further cleaned three times.
   - The final cleaner concentrate is further upgraded in a gravity stage. Gravity tailing is thickened and recycled to rougher feed conditioner.

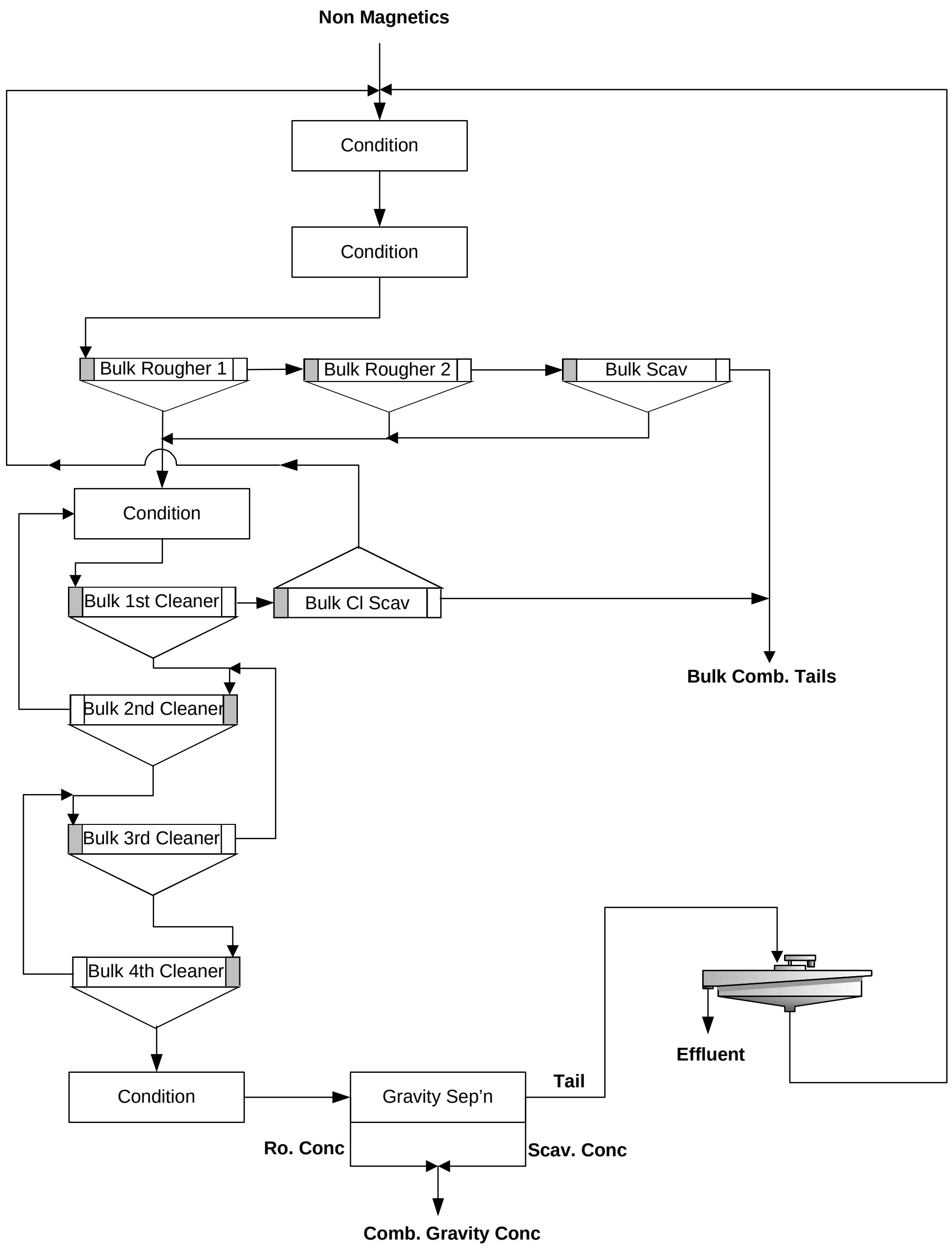


Figure 1. Flotation Flowsheet

2. The relationship of pilot plant flowsheet with that of plant:

   The Nechalacho mineral processing flowsheet was developed through extensive bench scale tests and locked cycle test. These tests were designed to find effective and selective collectors, modifiers, gangue depressants, slime dispersants and valuable minerals activators.

   The pilot plant flowsheet simulates that of full scale plant operation. The purpose of the pilot plant test was to:

   - Verify the results of the bench scale locked cycle test;
   - Demonstrate and confirm the reliability, stability and technical feasibility of the flow sheet developed in laboratory;
   - Provide full scale operation detail data to make flotation plant design criteria, thus reducing design and capital risk.
   - Demonstrate continuous integrated operation; It is unique in that it operates in an integrated fashion, all unit operations working to provide continuous feed or product typically until the generation of an expected concentrate;
   - Evaluate the impact of local water supply;
   - Quantify the impact of ore variability;
   - Demonstrate operational viability and produces the final product that can be expected, thus reducing technical risk;
   - Prove critical components of a metallurgical flow sheet;
   - Verify ability to meet environmental requirements thus reducing environmental risk.

Based on previously stated reasons, the flow sheet used in pilot plant test is the same as that of plant operation. The described flowsheet is the result of four years of metallurgical testing and has produced satisfactory results in terms of mass pull, concentrate composition and recoveries of the important metals. As a result, this is the process that Avalon has adopted for recovery of the rare earth and rare metal minerals from the Nechalacho rock.

ATTACHMENTS

Attachment 1: Drill hole and Geology plan map

Attachment 2: Part 1 of 2 RPA Avalon Thor Lake NI 43-101 Final August 22 2011

Part 2 of 2 RPA Avalon Thor Lake NI 43-101 Final August 22 2011

U Analysis

Th Analysis

Be Analysis

Attachment 3: Geologic Cross Section Profiles of the Main Mining Areas

Attachment 1

N
1 : 5000
0 50 100 150 200 250 300 350 400 450 500 550
Temporary Airstrip
Proposed Mine and Plant Facilities
Fred Lake
CAMP
Cressy Lake
Thor Lake
Inferred Resource
Thorn Lake
Tardiff Lakes
Probable Reserve UG Mining Area
Probable Reserve UG Mining Area
Long Lake
Ramp
415500 E
416000 E
416500 E
417000 E
417500 E
418000 E
6887500 N
6887000 N
6886500 N
6886000 N
6885500 N
PROJECT: Nechalacho
DATE: 2011/10/17
TIME: 16:25:14
SCALE: X = 1mm : 5000mm
Y = 1mm : 5000mm
Section/Plan Plan -100.00

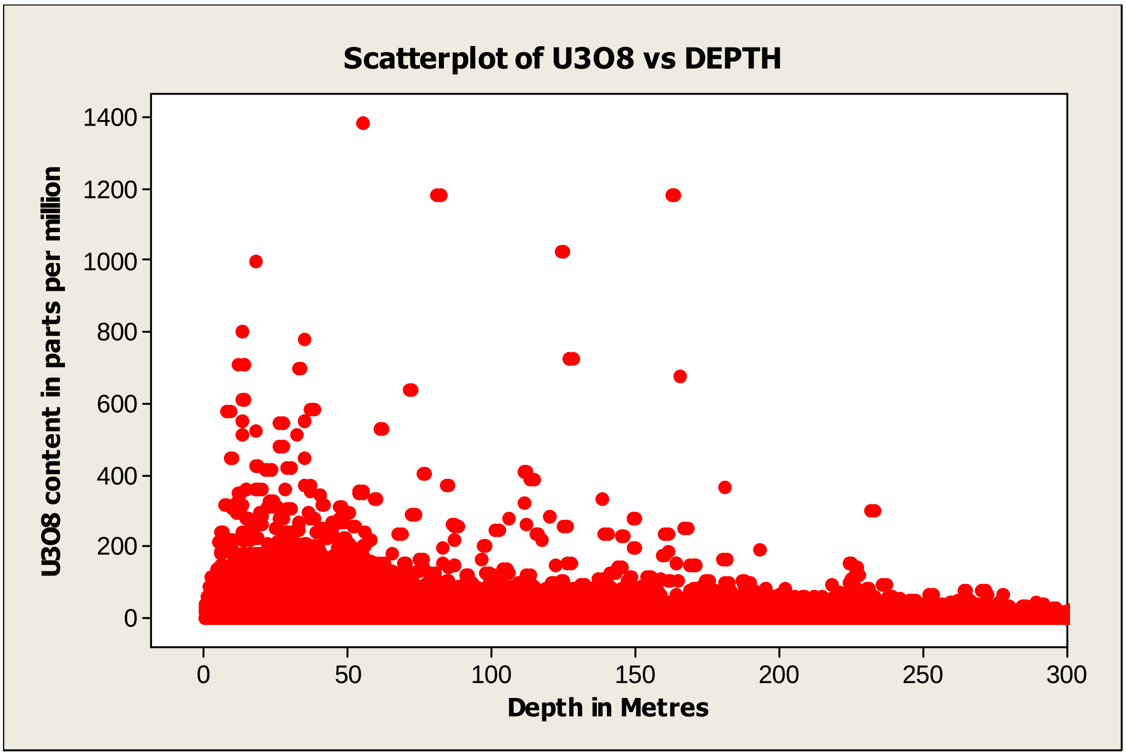
Attachment 2

Uranium statistics

The following table gives the uranium statistics expressed as U3O8 in parts per million. The total database includes 28,852 analyses of Basal Zone samples and over 7000 analyses of rocks outside the Basal Zone.

LENS	U3O8 Sample count	Mean	Median	StDev	Minimum	Maximum
Upper Zone	2762	42.9	26.8	63.9	0.0	1,382.0
Basal Zone	28852	32.2	22.8	45.6	0.7	1,875.0
Below Basal Zone	47	7.4	6.3	6.0	1.4	30.3
Unmineralized	4503	11.6	7.3	19.3	0.0	672.3
Diabase	14	21.2	3.0	62.1	0.0	236.1

The scatterplot of U3O8 versus depth indicates that, apart from the few random higher values, the U3O8 is less than 200ppm, and as noted above averages 30 ppm in the Basal Zone.

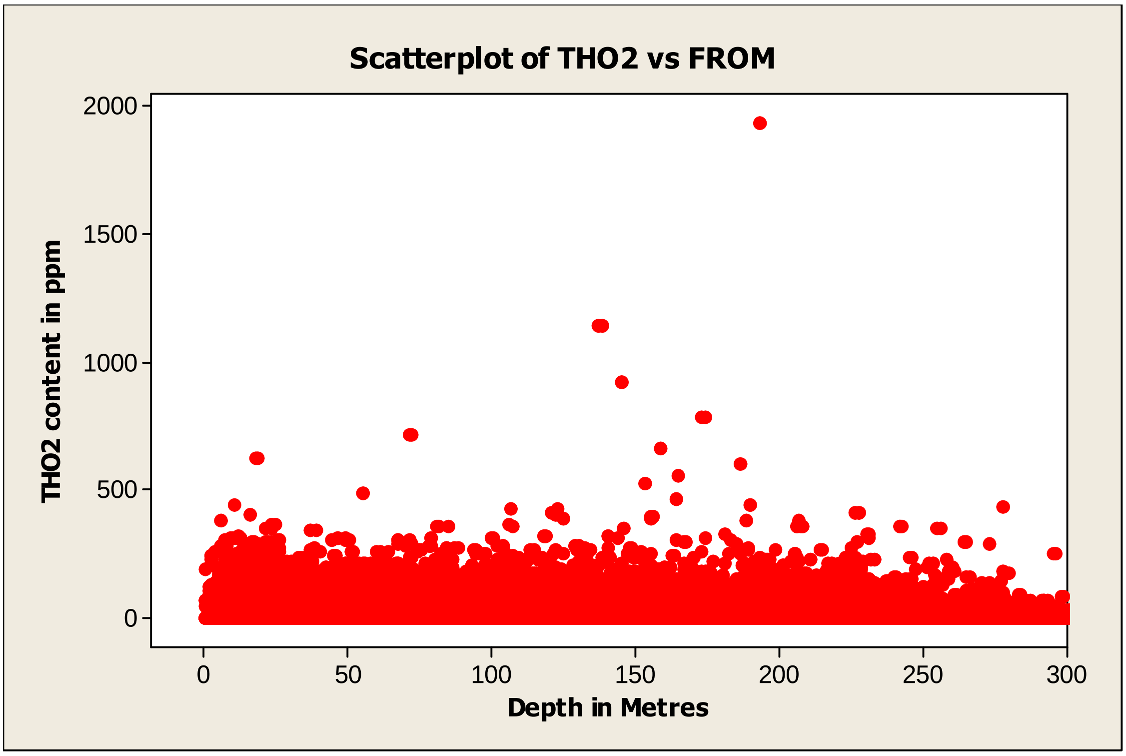


Thorium statistics.

The following table gives the thorium statistics, expressed as ThO2, in parts per million. Thus the total database includes 28,826 ThO2 analyses in the Basal Zone and 7,326 analyses outside the Basal Zone.

	ThO2					
LENS	**Sample count**	**Mean**	**Median**	**StDev**	**Minimum**	**Maximum**
Upper Zone	2762	52.8	34.5	56.2	0.0	622.1
Basal Zone	28826	108.1	78.1	110.7	78.1	2,258.9
Below Basal Zone	47	28.4	24.2	24.4	4.0	110.6
Unmineralized	4503	32.8	20.6	52.7	0.0	1,928.0
Diabase	14	13.8	13.4	9.5	0.0	29.8

The scatterplot below shows the variation of ThO2 in parts per million with depth and demonstrates that the maximum value, except for a few random higher values, is less than300 ppm and as shows above the average is about 108 ppm for the Basal Zone.

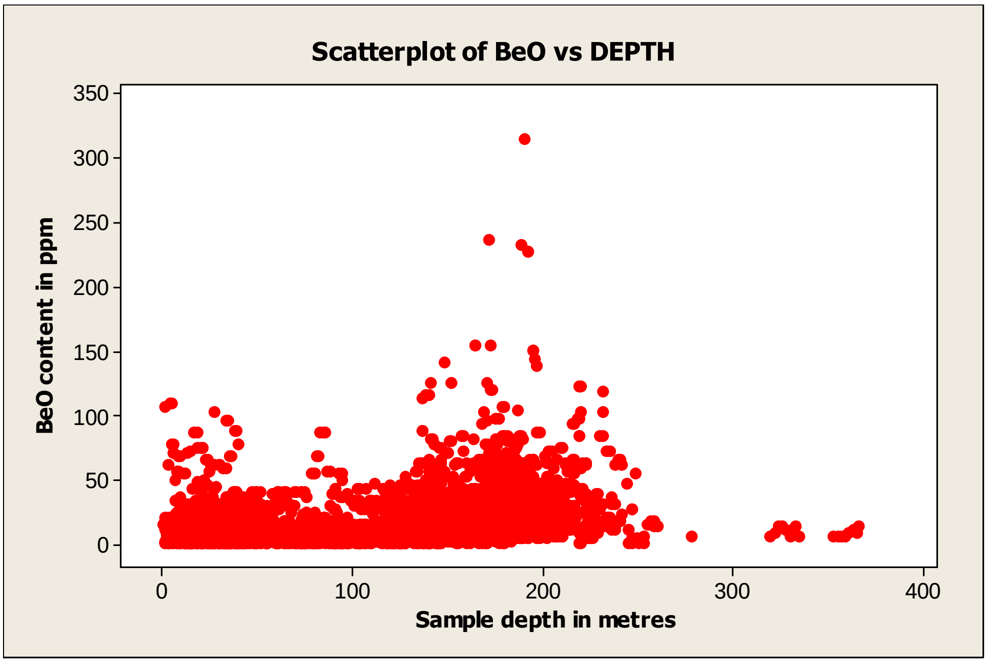


Beryllium statistics.

The following table gives the beryllium statistics, expressed as BeO, in parts per million. Thus the total database includes 7,326 analyses which average 17.5ppm BeO with a median of 13.7 ppm and a standard deviation of 17.2ppm.

	BeO					
LENS	Sample count	Mean	Median	StDev	Minimum	Maximum
Upper Zone	2762	11.1	9.1	11.1	1.1	109.4
Basal Zone	9459	12.2	9.1	14.5	0.0	246.2
Below Basal Zone	47	51.8	45.6	36.7	1.1	228.0
Unmineralized	4503	21.0	16.0	18.5	1.1	314.6
Diabase	14	16.7	11.4	11.2	2.3	31.9

The graph below gives the BeO values with depth, indicating that there are a few scattered values in excess of 100ppm and the vast quantity is less than 50pppm.



AVALON RARE METALS INC.

TECHNICAL REPORT ON THE THOR LAKE PROJECT, NORTHWEST TERRITORIES, CANADA

NI 43-101 Report

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ROSCOE POSTLE ASSOCIATES INC.

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TABLE OF CONTENTS

LIST OF TABLES

PAGE

LIST OF FIGURES

PAGE

1 SUMMARY

EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Avalon Rare Metals Inc. (Avalon) to prepare an independent Technical Report on the Thor Lake Project in the Northwest Territories (NWT), Canada, located approximately 100 km southeast of Yellowknife. This report was prepared for disclosure of the results of the updated Pre-feasibility Study (UPFS) completed by RPA. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the property from April 25 to 27, 2011.

Avalon is a Canadian mineral exploration and development company with a primary focus on rare metals and minerals, headquartered in Toronto, Ontario, Canada. Avalon trades on the Toronto Stock Exchange (TSX) under the symbol AVL, on the NYSE Amex in the United States and also trades on the Frankfurt Stock Exchange in Germany.

Starting in 1976, the Thor Lake Property (TLP) has been explored by a number of companies for Rare Earth Elements (REEs), niobium and tantalum. In May 2005, Avalon purchased from Beta Minerals Inc. a 100% interest and full title, subject to royalties, to the Thor Lake property. Wardrop completed a Preliminary Assessment of the Project in 2006. A Pre-feasibility Study (PFS) commenced in 2009, led by RPA (formerly Scott Wilson RPA), with results disclosed in a Technical Report dated July 29, 2011.

The Project comprises:

- An undeveloped Rare Earths deposit
- An exploration camp, with facilities suitable for summer and winter diamond drill programs
- 14.5 million tonnes of Mineral Reserves of REEs, Zirconium, Niobium and Tantalum
- Potential development of an underground mining operation with a 20 year mine life at 730,000 tonnes per year
- Significant additional Mineral Resources extending laterally within and beyond the Mineral Reserves

For the UPFS, RPA reviewed an update to the PFS carried out by Avalon technical personnel. Principal changes include:

- An updated Mineral Resource estimate
- A new mine design and Mineral Reserve estimate
- Updated product pricing, reflecting increases in prices for rare earths
- Elimination of the first four years at 365,000 tonnes per year – instead, ramping-up to full production as quickly as possible.

Most other aspects of the UPFS remain similar to the original PFS, including the assumption that the ore will be concentrated at Thor Lake and barged across Great Slave Lake (GSL) to Pine Point for hydrometallurgical processing.

CONCLUSIONS

In the opinion of RPA, the UPFS indicates positive economic results can be obtained for the Thor Lake Project, in a scenario that includes underground mining, preparation of a bulk concentrate at Thor Lake, and hydrometallurgical processing at a plant to be constructed at Pine Point. The final products will be a mixed rare earth oxide concentrate, a zirconium oxide concentrate, a niobium oxide concentrate, and a tantalum oxide concentrate.

RPA is of the opinion that the current drill hole database is sufficient for generating a resource model for use in resource and reserve estimation and that the recovery and cost estimates are based upon sufficient data and engineering to support a reserve statement. Economic analysis using these estimates generates a positive cash flow, which supports a reserve statement.

Specific conclusions by area of the UPFS are as follows.

GEOLOGY AND MINERAL RESOURCES

- Mineral Resources in the Upper and Basal Zones are estimated to consist of Indicated Resources of 88.5 Mt with grades of 1.53% total rare earth oxides (TREO), 2.68% ZrO_2, 0.37% Nb_2O_5, and 0.032% Ta_2O_5 and Inferred Resources of 223.2 Mt with grades of 1.31% TREO, 2.59% ZrO_2, 0.36% Nb_2O_5, and 0.027% Ta_2O_5.

- Mineral Resources are estimated at a cut-off Net Metal Return (NMR) value of $260 per tonne. This value was calculated using PFS price inputs.

- RPA reclassified a small quantity (330,000 tonnes, or 2% of Mineral Reserves) of Inferred Resources to Indicated.

MINERAL RESERVES

- Probable Mineral Reserves are estimated to be 14.5 million tonnes with grades of 1.53% TREO, including 0.40% heavy rare earth oxides (HREO), 2.90% ZrO_2, 0.38% Nb_2O_5, and 0.040% Ta_2O_5. Mineral Reserves were estimated at a cut-off value based on an NMR value of C$300 per tonne. Mineral Reserves are based on a 20-year underground mine design and stope schedule. RPA notes that the defined Mineral Resources extend considerably beyond the designed underground mine.

- RPA is of the opinion that the Mineral Reserve estimates have been compiled in a manner consistent with the CIM Guidelines and in accordance with NI 43-101. RPA considers the mining plan to be relatively simple and the mining conditions are expected to be good.

- There is potential to define additional Mineral Reserves within the current Indicated Resources. The areas not included in Mineral Reserves need only a mine design, schedule, and economic analysis.

MINING

- The deposit is relatively flat-lying, and will be mined with a combination of long hole stoping and drift & fill stoping. The minimum thickness used in the development of the Mineral Reserve estimate was five metres.

- Mining of the secondary stopes is dependent upon the use of a suitable backfill, assumed to be paste fill with 4% cement added as a binder. Initial testwork to demonstrate that a suitable paste fill can be generated has been undertaken.

PROCESSING – CONCENTRATOR

- Mineral processing testwork indicates that the TREO, ZrO_2, Nb_2O_5 and Ta_2O_5 can be recovered in a flotation circuit after crushing and grinding to 80% minus 38 µ with recoveries of 80% of the TREO, 90% of the zirconium oxide, 69% of the niobium oxide and 63% of the tantalum oxide to a flotation concentrate. The processing circuit also includes magnetic and gravity separation stages. The design basis for the PFS was to take 18% of the feed to the concentrate.

- The concentrate will be stored in covered containers at Thor Lake and shipped to the hydrometallurgical facility at Pine Point each summer using barges to cross Great Slave Lake.

- Tailings from the flotation plant will be stored in a Tailings Management Facility (TMF) located north-east of the mill site.

PROCESSING – HYDROMETALLURGICAL PLANT

- Metallurgical process testwork for the extraction of TREO, zirconium oxide, niobium oxide and tantalum oxide from the flotation concentrate was carried out and recoveries of 96% of the TREO, 93% of the zirconium oxide, 82% of the niobium oxide and 60% of the tantalum oxide were demonstrated in the laboratory.

- The hydrometallurgical plant will consist of a concentrate “cracking” process, using a combination of acid baking, caustic cracking, and leaching using sulphuric acid and sodium hydroxide as the primary reagents.

- The hydrometallurgical process plant will consume a significant quantity of reagents, which are brought to site by rail to Hay River and then by truck to the plant. A stand-alone sulphuric acid plant is included to provide acid for the process.

- The products from the hydrometallurgical plant will be a mixed rare earth oxides concentrate, and separate zirconium oxide, niobium oxide and tantalum oxide concentrates.

- The products will be shipped in one tonne capacity plastic sacks on pallets (or steel drums for the tantalum oxide) and will be taken by truck to the rail head at Hay River and then by rail to Vancouver or to a central location in the USA.

- Pine Point was selected as a reasonable location within the NWT for the hydrometallurgical facility, due to the existing disturbance at the brown-field site, reasonable logistics for concentrate and reagent transportation, and access to infrastructure. Both Avalon’s aboriginal partners and the Government of the NWT have expressed a preference for keeping the hydrometallurgical plant in the north. In RPA’s opinion, however, the cost of transporting the required reagents outweighs the cost of transporting the concentrate further south, and the Project is incurring an economic disadvantage by assuming a northern location for the hydrometallurgical plant.

- Tailings from the hydrometallurgical process will be stored in a TMF to be constructed within a historic open pit. Overflow water from the TMF will be stored in an adjacent historic open pit.

INFRASTRUCTURE – THOR LAKE

- The Thor Lake site is isolated and access will be limited to year-round aircraft, and summer barges. Winter ice roads on Great Slave Lake are also feasible, but are not included as an integral part of the PFS.

- A temporary barge dock and a materials storage area will be constructed on the shore of Great Slave Lake.

- A camp, offices, shops, yards, diesel tank farm, propane storage facility, and access roads to the TMF and the barge dock on Great Slave Lake will be developed.

- The initial site power will be provided by an 8.4 MW capacity diesel generating station. The diesel plant design is based upon having two spare units at any given time.

INFRASTRUCTURE – PINE POINT

- The Pine Point site is accessible by all-weather roads and highways.
- A temporary barge dock and yard at the shore of Great Slave Lake will be developed for the movement of concentrate and supplies.
- Offices, shops, yards, and access roads to the TMF and the temporary barge dock on Great Slave Lake will be developed.
- Power will be taken from the southern NWT power grid, with hydroelectricity taken from the Taltson Dam hydroelectric facility.
- The use of diesel generators to supplement the grid power is planned for times when hydroelectric power availability is limited at the expanded production rate.

ENVIRONMENT

- Baseline studies have been completed for the Project locations.
- Avalon has prepared and submitted a project description report, completed preliminary screening and commenced the Environmental Assessment process necessary for the permit application process in the NWT.
- Rock characterization studies indicate that the rock is not an acid producer.
- Mineralization in the Nechalacho deposit has uranium levels that are higher than average in naturally occurring granite, but below levels typically experienced in other rare earth deposits. The thorium levels in the Nechalacho deposit are anomalous, but given the lower radioactivity equivalency of thorium relative to uranium, the overall effect of typical Nechalacho mineralization as a rock mass is predicted to be very low. The rare earth concentration process planned at the Flotation Plant will concentrate the rare earths, including the low levels of thorium in the rock minerals. The overall radiation level in the concentrate is expected to be below Canadian TDGR (transportation of dangerous goods regulations), and will not require special handling as Dangerous Goods.
- In RPA's opinion, environmental considerations are typical of underground mining and processing facilities and are being addressed in a manner that is reasonable and appropriate for the stage of the Project.

ECONOMICS

- RPA notes that the rare earths prices used in the UPFS, while on average more than double those used in the PFS, have been outstripped by current price movements, which have increased by an order of magnitude. The prices are based on independent, third-party forecasts for 2015, based on supply and demand projections from 2011 to 2015. In RPA's opinion, these long-term price forecasts are a reasonable basis for estimation of Mineral Reserves, and are considerably more conservative than prices used by other rare earths companies whose projects are at an earlier stage of development.

- Given the extent of the Nechalacho deposit Mineral Resources, a significantly higher production rate would be reasonable, absent any market constraints. RPA expects that significant improvements in Project economics could be realized in a higher production rate scenario.

- Income taxes and NWT mining royalties on the Project are dependent on the selected method of depreciation of capital, and may also be reduced by application of credits accumulated by Avalon. In RPA's opinion, there is potential to improve the after-tax economic results, as the Project is advanced. RPA recommends that Avalon advance the Thor Lake Project to the Feasibility Study stage and continue the NWT permitting process. Specific recommendations by area are as follows.

RECOMMENDATIONS

GEOLOGY AND MINERAL RESOURCES

- NMR values in the block model should be updated to use UPFS price inputs. Cut-off NMR value should be updated to equal UPFS operating cost. RPA expects that the effect would be to add lower-grade mineralization to the resource total.

MINING

- Review of the stoping sequence and stoping plans to determine whether further increases in the feed grades in the early years are obtainable.

- Carry out additional paste fill design and testwork to determine the suitability of the tailings and to estimate the quantity of paste fill which can be generated from the tailings stream.

- Incorporate additional Indicated Resources into the mine plan as they become available.

- Investigate higher production rate scenarios.

PROCESSING – CONCENTRATOR

- Optimization of mass pull (affecting concentrate handling costs) vs. recovery (affecting revenue) for the concentrator should be carried out at the Feasibility stage.

- Perform a pilot plant demonstration of the flotation process.

PROCESSING – HYDROMETALLURGICAL PLANT

- Continue testwork to optimize the mineral cracking process, to fully define the process for the recovery of values from the flotation concentrate and run a pilot plant demonstration of the process.

- Conduct a trade-off study for site location of the hydrometallurgical plant.

INFRASTRUCTURE

- Review availability of grid power for both site locations as the Project is advanced.

ENVIRONMENT

- Continue the permitting process for the Project.

ECONOMICS

- Review the marketing considerations as they apply to the Project, with particular attention to the currently volatile rare earths prices

Avalon provided a budget (Table 1-1) for the completion of a Feasibility Study, environmental assessment and permitting, aboriginal engagement, metallurgical pilot tests and securing customer contracts as of July 2011. In the opinion of RPA, this budget is reasonable and appropriate for advancing the Project.

TABLE 1-1 PROJECT ADVANCEMENT BUDGET
Avalon Rare Metals Inc. – Thor Lake Project

Item	Cost (C$ millions)
Exploration/Upgrade Drilling & Geology	10.0
Metallurgical Testwork	11.2
Technical Studies & Support	4.5
Environmental Work	0.8
Sales & Marketing	1.5
Administration	5.5
Total	**33.5**

ECONOMIC ANALYSIS

A Cash Flow Projection has been generated from the LOM production schedule, capital and operating cost estimates and product price assumptions, and is summarized in Table 1-2. A summary of the key criteria is provided below.

ECONOMIC CRITERIA

PRODUCTION

- Mineral Reserves of 14.5 Mt at an average grade of 1.53% TREO, 0.38% Nb_2O_5, 2.90%$ ZrO_2 and 0.040% Ta_2O_5
- Underground mining using a combination of cut and fill, and long hole stoping
- Two years of construction followed by 20 years of production at 2,000 tpd of ore

- Production of a bulk flotation concentrate containing REO, ZrO_2, Ta_2O_5 and Nb_2O_5 at Thor Lake
- Barging 130,000 tonnes of concentrate across the Great Slave Lake to Pine Point annually in the summer
- Hydrometallurgical extraction of TREO, ZrO_2, Ta_2O_5 and Nb_2O_5 at Pine Point

REVENUE

- Concentration and Hydrometallurgical recoveries as indicated by testwork
- Metal price:
  - o Independent, third-party forecasts for 2015, based on supply and demand projections from 2011 to 2015
  - o No inflation after 2015 (assumed commencement of production)
  - o Average price per kg of REE is US$46.31
- Revenue is 69% from TREO, 15% from Nb_2O_5, 12% from ZrO_2 and 4% from Ta_2O_5.
- An exchange rate of C$0.95/US$
- Revenue is recognized at the time of production at the hydrometallurgical plant.

COSTS

- Pre-production capital of C$840 million
- Life of mine capital of C$902 million
- Average life of mine operating cost of C$269/t (mine, mill and hydrometallurgical plant)

TAXES AND ROYALTIES

- NWT mining royalty on value of minerals extracted
- Federal tax rate of 15% and a territorial tax rate of 11.5%

TABLE 1-2 CASH FLOW SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

		Total	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21
MINING																									
Operating Days					365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	
Plant Throughput	tpd				1,833	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	
Ore Mined	000 tonnes	14,539			669	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	
TREO	ppm	15,337			18,949	19,209	18,318	18,540	16,211	16,332	15,217	14,031	14,314	13,570	13,290	14,608	13,555	14,683	13,877	14,392	14,714	13,665	13,905	15,667	
Nb_2O_5	ppm	3,780			4,542	4,646	4,434	4,391	3,830	3,930	3,567	3,466	3,589	3,382	3,357	3,629	3,512	3,652	3,491	3,796	3,880	3,405	3,299	3,872	
Ta_2O_5	ppm	414			536	539	519	506	412	439	382	368	387	361	340	401	383	376	356	396	414	367	375	430	
ZrO_2	ppm	28,998			35,406	36,383	33,438	34,106	28,620	29,644	26,353	25,320	26,937	24,525	22,568	28,525	26,421	28,399	24,481	30,087	32,294	27,225	27,753	32,003	
CONCENTRATION – THOR LAKE																									
Ore Milled	000 tonnes	14,539			669	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	730	
TREO	ppm	15,337			18,949	19,209	18,318	18,540	16,211	16,332	15,217	14,031	14,314	13,570	13,290	14,608	13,555	14,683	13,877	14,392	14,714	13,665	13,905	15,667	
Nb_2O_5	ppm	3,780			4,542	4,646	4,434	4,391	3,830	3,930	3,567	3,466	3,589	3,382	3,357	3,629	3,512	3,652	3,491	3,796	3,880	3,405	3,299	3,872	
Ta_2O_5	ppm	414			536	539	519	506	412	439	382	368	387	361	340	401	383	376	356	396	414	367	375	430	
ZrO_2	ppm	28,998			35,406	36,383	33,438	34,106	28,620	29,644	26,353	25,320	26,937	24,525	22,568	28,525	26,421	28,399	24,481	30,087	32,294	27,225	27,753	32,003	
Concentrator Mass Pull	%	18%			18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	
Flotation Concentrate	000 dmt	2,617			120	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	
Moisture Content in Conc.	%	10%			10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Wet Weight of Flotation Conc.	000 wmt	2,879			132	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145	
Flotation Recovery																									
TREO	%	79.5%			79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	79.5%	
Nb_2O_5	%	68.9%			68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	68.9%	
Ta_2O_5	%	63.0%			63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	63.0%	
ZrO_2	%	89.7%			89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%	
HYDROMETALLURGY – PINE POINT																									
Plant Feed	000 tonnes	2,617			60	126	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	66
TREO Recovery	%	93.0%			93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Nb_2O_5 Recovery	%	80.0%			80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
Ta_2O_5 Recovery	%	50.0%			50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
ZrO_2 Recovery	%	90.0%			90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Production																									
TREO	tonnes	164,869			4,687	9,871	10,127	9,947	9,378	8,782	8,514	7,893	7,649	7,525	7,249	7,529	7,600	7,620	7,707	7,629	7,855	7,658	7,440	7,980	4,228
Nb_2O_5	tonnes	30,296			838	1,772	1,827	1,775	1,654	1,561	1,508	1,415	1,420	1,403	1,356	1,405	1,437	1,441	1,437	1,466	1,544	1,466	1,349	1,443	779
Ta_2O_5	tonnes	1,895			56	118	122	118	105	98	94	86	87	86	81	85	90	87	84	86	93	90	85	93	49
ZrO_2	tonnes	340,360			9,564	20,284	20,574	19,903	18,483	17,168	16,500	15,226	15,398	15,164	13,877	15,055	16,191	16,154	15,582	16,079	18,382	17,538	16,200	17,608	9,430
Total Tonnage Sold	tonnes	537,420			15,145	32,046	32,649	31,743	29,621	27,610	26,617	24,621	24,554	24,177	22,562	24,075	25,317	25,302	24,810	25,261	27,874	26,752	25,074	27,124	14,487
REVENUE																									
Prices																									
TREO	US$/kg	46.31			47.52	47.54	46.96	47.38	47.08	45.95	45.60	45.79	46.81	46.15	45.07	45.87	45.92	45.19	45.45	45.74	45.80	46.20	46.66	46.76	46.92
Nb_2O_5	US$/kg	55.86			55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86	55.86
Ta_2O_5	US$/kg	255.63			255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63	255.63
ZrO_2	US$/kg	3.77			3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77
Revenue																									
TREO	US$ Millions	7,636			222.75	469.28	475.57	471.27	441.52	403.54	388.23	361.42	358.06	347.27	326.69	345.34	349.00	344.37	350.30	348.94	359.74	353.82	347.16	373.16	198.37
Nb_2O_5	US$ Millions	1,692			46.79	99.00	102.04	99.18	92.39	87.21	84.26	79.05	79.29	78.35	75.74	78.51	80.24	80.51	80.29	81.90	86.27	81.87	75.34	80.60	43.52
Ta_2O_5	US$ Millions	484			14.43	30.26	31.08	30.12	26.97	25.01	24.14	22.04	22.17	21.98	20.60	21.76	23.02	22.30	21.52	22.10	23.81	22.98	21.82	23.66	12.64
ZrO_2	US$ Millions	1,283			36.05	76.47	77.56	75.03	69.68	64.72	62.21	57.40	58.05	57.17	52.32	56.76	61.04	60.90	58.74	60.62	69.30	66.12	61.07	66.38	35.55
Gross revenue	US$ Millions	11,096			320.02	675.02	686.25	675.60	630.56	580.49	558.84	519.90	517.58	504.77	475.34	502.36	513.31	508.08	510.85	513.56	539.12	524.79	505.39	543.80	290.08
Exchange Rate	C$/US$	1.053			1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.053
Losses in Handling	%	0.03%			0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Net revenue	US$ Millions	11,092			319.93	674.81	686.05	675.39	630.37	580.31	558.68	519.75	517.42	504.62	475.20	502.21	513.15	507.93	510.70	513.41	538.96	524.63	505.24	543.64	290.00
Net revenue	C$ Millions	11,676			336.77	710.33	722.15	710.94	663.55	610.85	588.08	547.10	544.65	531.18	500.21	528.64	540.16	534.66	537.57	540.43	567.32	552.24	531.83	572.25	305.26
Net Revenue Per Tonne Milled	C$/t milled	803			1,007	1,062	989	974	909	837	806	749	746	728	685,220	724,169	739,944	732,411	736,403	740,310	777,156	756,496	728,535	783,907	418,165
Net Revenue Per kg of Product Sold	US$/kg	20.64																							

TABLE 1-2 CASH FLOW SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

		Total	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21
OPERATING COSTS																									
Thor Lake																									
Mining	C$ Millions	560		12.98	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	27.37	
Processing	C$ Millions	385		9.40	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	18.80	
Surface Services	C$ Millions	95		2.32	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	
Administration	C$ Millions	167		4.08	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.15	
Power	C$ Millions	435		10.54	21.07	21.31	21.07	21.37	21.39	21.41	21.31	21.33	21.40	21.55	21.17	21.47	21.07	21.07	21.07	21.07	21.07	21.07	21.07	21.07	
Summer Freight	C$ Millions	156			7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43	7.43
Pine Point																									
Processing	C$ Millions	1,895			47.36	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	94.73	47.36
Surface Services	C$ Millions	26			0.62	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Administration	C$ Millions	29			0.70	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
Sales & Marketing	C$ Millions	164			3.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	8.19
Total Operating Costs	C$ Millions	3,912		39.31	140.15	193.08	192.84	193.14	193.16	193.18	193.08	193.10	193.17	193.32	192.94	193.24	192.84	192.84	192.84	192.84	192.84	192.84	192.84	192.84	65.64
Cost Per Tonne Milled	C$/t milled	269			$ 209	$ 264	$ 264	$ 265	$ 265	$ 265	$ 264	$ 265	$ 265	$ 265	$ 264	$ 265	$ 264	$ 264	$ 264	$ 264	$ 264	$ 264	$ 264	$ 264	$ -
Cost Per kg of Final Product	US$/kg	6.92			8.79	5.72	5.61	5.78	6.20	6.65	6.89	7.45	7.47	7.60	8.12	7.63	7.24	7.24	7.38	7.25	6.57	6.85	7.31	6.75	4.30
OPERATING CASHFLOW	C$ Millions	7,764		(39.31)	196.61	517.25	529.32	517.80	470.39	417.68	395.00	354.00	351.49	337.86	307.27	335.40	347.32	341.82	344.74	347.59	374.49	359.40	338.99	379.41	239.62
NWT Royalty																									
NWT Mining Royalty	C$ Millions	783			-	-	42.98	60.92	54.74	48.10	45.11	39.74	39.37	37.55	33.54	36.04	37.47	37.76	38.09	38.42	41.88	39.88	38.51	45.43	27.30
EBITDA	C$ Millions	6,981		(39.31)	196.61	517.25	486.34	456.88	415.65	369.58	349.89	314.27	312.12	300.31	273.74	299.37	309.85	304.07	306.64	309.16	332.61	319.53	300.48	333.98	212.33
CAPITAL COSTS																									
Mine	C$ Millions	123.06	47.81	46.90	11.30	1.00	1.00	3.11	2.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00 -	6.00	-	-
Concentrator	C$ Millions	211.17	69.74	113.02	23.38	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	5.00	5.00	2.00	2.00	2.00	- -	16.48 -	16.48
Hydrometallurgical Facility	C$ Millions	343.63	54.49	147.11	98.38	2.66	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	6.00	6.00	2.00	2.00	2.00	1.00	-	-
Indirect Costs	C$ Millions	80.66	44.88	35.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital	C$ Millions	-																							
Reclamation	C$ Millions	-	-	1.00	3.00	4.00	1.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(11)
Royalty Buy Out	C$ Millions	1.44	-	-	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contingency	C$ Millions	141.96	42.59	99.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Capital Costs	C$ Millions	901.91	259.49	443.17	137.51	7.66	6.00	9.11	6.94	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	13.00	13.00	5.00	5.00	5.00 -	5.00 -	16.48 -	27.48
PRE-TAX CASH FLOW																									
Net Cash Flow	C$ Millions	6,079	(259)	(482)	59	510	480	448	409	365	345	309	307	295	269	294	305	291	294	304	328	315	305	350	240
Cumulative Cash Flow	C$ Millions		(259)	(742)	(683)	(173)	307	755	1,164	1,528	1,873	2,182	2,489	2,785	3,053	3,348	3,653	3,944	4,237	4,542	4,869	5,184	5,489	5,840	6,079
Pre-Tax IRR		39%																							
Pre-Tax NPV	Discount Rate	C$ millions																							
	0.0%	6,079																							
	5.0%	3,171																							
	8.0%	2,222																							
	10.0%	1,772																							
TAXATION																									
Federal Tax	C$ (000)	$ 907	-	-	-	-	42.32	67.44	61.29	54.68	51.73	46.39	46.06	44.29	40.31	42.95	44.53	44.86	45.25	45.62	49.14	47.18	45.82	52.57	34.32
NWT Tax	C$ (000)	$ 696	-	-	-	-	32.78	51.71	46.99	41.92	39.66	35.56	35.32	33.96	30.90	32.93	34.14	34.39	34.69	34.98	37.68	36.17	35.13	40.30	26.31
Total Tax	C$ (000)	$ 1,602	-	-	-	-	75.10	119.15	108.28	96.59	91.38	81.95	81.38	78.25	71.21	75.89	78.66	79.25	79.93	80.60	86.82	83.35	80.95	92.87	60.63
AFTER-TAX CASH FLOW																									
Net Cash Flow	C$ Millions	4,477	(259)	(482)	59	510	405	329	300	268	254	227	226	217	198	218	226	212	214	224	241	231	225	258	179
Cumulative Cash Flow	C$ Millions		(259)	(742)	(683)	(173)	232	561	861	1,129	1,383	1,610	1,836	2,053	2,250	2,469	2,695	2,907	3,120	3,344	3,585	3,816	4,040	4,298	4,477
After-Tax IRR		34%																							
After-Tax NPV	Discount Rate	C$ millions																							
	0.0%	4,477																							
	5.0%	2,315																							
	8.0%	1,607																							
	10.0%	1,271																							

CASH FLOW ANALYSIS

The cash flow analysis in this report is based on the extraction of the Probable Mineral Reserves in a production plan which extends to the end of Year 20.

PRE-TAX

Considering the full Project on a stand-alone basis, the undiscounted pre-tax cash flow totals C$6,079 million over the mine life and simple payback occurs 2.4 years after the start of production. The pre-tax IRR is 39% and the pre-tax net present value (NPV) is as follows:

- C$3,171 million at a 5% discount rate
- C$2,222 million at an 8% discount rate
- C$1,772 million at a 10% discount rate

AFTER-TAX

Considering the full project on a stand-alone basis, the undiscounted after-tax cash flow totals C$4,477 million over the mine life and simple payback occurs 2.4 years after the start of production. The after tax IRR is 34% and the after tax net present value (NPV) is as follows:

- C$2,315 million at a 5% discount rate
- C$1,607 million at an 8% discount rate
- C$1,271 million at a 10% discount rate

The net revenue per kilogram of product is US$20.64, and the cost per kilogram of product (all products) is US$6.92. The average annual product production is 26,700 tonnes of products (8,200 tonnes of rare earth oxides).

SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Product Prices
- Exchange Rate
- Operating costs
- Capital costs
- TREO price
- ZrO_2 price

The sensitivity of the base case after-tax 8% NPV has been calculated for -20% to +20% variations in the above noted parameters. The project NPV is most sensitive to metal price and recovery followed by foreign exchange rate, operating costs, capital costs and individual product constituent prices.

The sensitivities are shown in Figure 1-1 and Table 1-3. The sensitivities to metallurgical recovery and head grade are identical to that of price (for all constituents combined) and are therefore plotted on the same line.

FIGURE 1-1 SENSITIVITY ANALYSIS

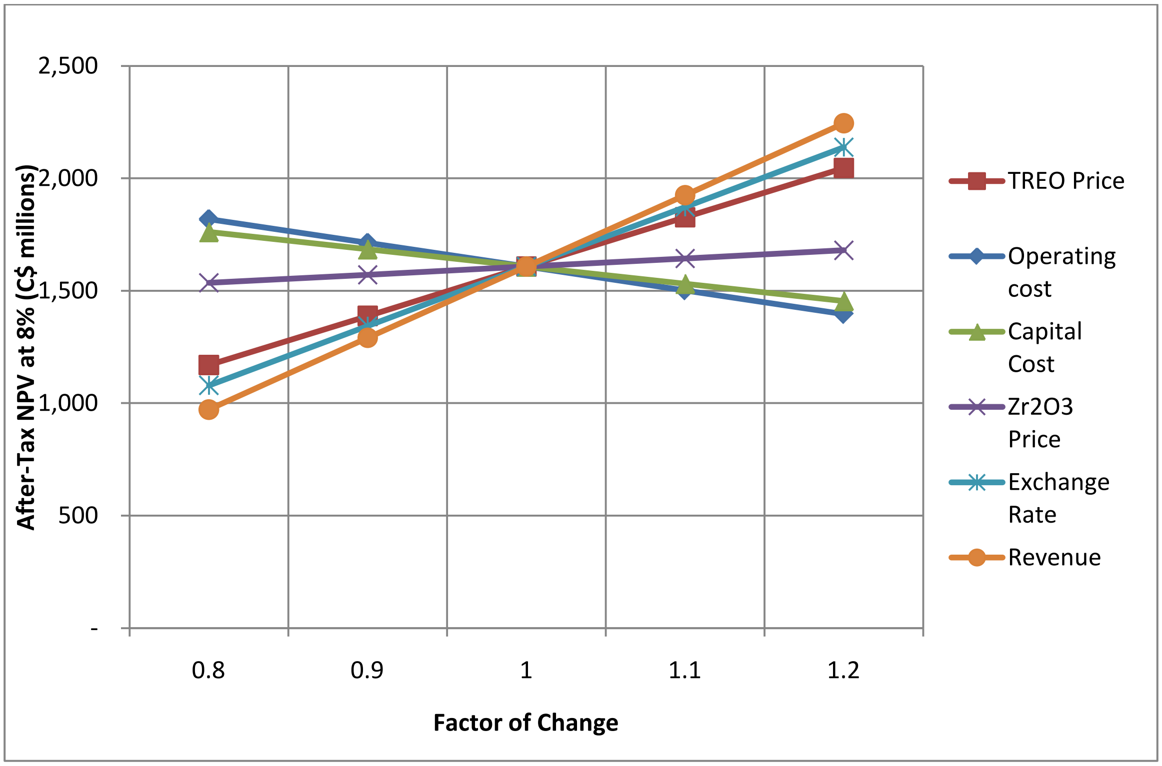


TABLE 1-3 SENSITIVITY ANALYSIS
Avalon Rare Metals Inc. – Thor Lake Project

Parameter Variables	Units	-20%	-10%	Base Case	+10%	+20%
ZrO_2 Price	US$/kg	3.02	3.39	3.77	4.15	4.52
TREO Price	US$/kg	37.05	41.68	46.31	50.95	55.58
Exchange Rate	C$/US$	0.84	0.95	1.05	1.16	1.26
Revenue	C$ billions	9.3	10.5	11.7	12.8	14.0
Operating Cost	C$/tonne	215	242	269	296	323
Capital Cost	C$ millions	722	812	902	992	1,082

NPV @ 8%	Units	-20%	-10%	Base Case	+10%	+20%
ZrO_2 Price	C$ millions	1,535	1,571	1,607	1,644	1,680
TREO Price	C$ millions	1,170	1,388	1,607	1,827	2,046
Exchange Rate	C$ millions	1,079	1,343	1,607	1,872	2,138
Revenue	C$ millions	972	1,290	1,607	1,925	2,245
Operating Cost	C$ millions	1,818	1,713	1,607	1,502	1,396
Capital Cost	C$ millions	1,761	1,684	1,607	1,531	1,454

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Thor Lake property is located in Canada's Northwest Territories, 100 km southeast of the capital city of Yellowknife and five kilometres north of the Hearne Channel on the East Arm of Great Slave Lake (GSL). The property is within the Mackenzie Mining District of the Northwest Territories and Thor Lake is shown on National Topographic System (NTS) map sheet 85I/02 at approximately 62°06'30''N and 112°35'30''W (6,886,500N, 417,000E – NAD83).

The Pine Point property is located 90 km east of Hay River in the Northwest Territories. It is located roughly 8 km south of the south shore of the Great Slave Lake and is accessible by Highway 5, which is an all season highway. It is a former Cominco mine and is the proposed location of the hydrometallurgical facilities of the Project.

LAND TENURE

The Thor Lake property consists of five contiguous mineral leases (totalling 4,249 ha, or 10,449 acres) and three claims (totalling 1,869 ha, or 4,597 acres). The claims were staked in 2009 to cover favourable geology to the west of the mining leases. Pertinent data for the mining leases are shown in Table 1-4 while the mineral claims data are shown in Table 1-5. The Thor Lake mineral leases have been legally surveyed and are recorded on a Plan of Survey.

TABLE 1-4 MINERAL LEASE SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Lease Number	Area (ha)	Legal Description	Effective Date	Expiration Date
3178	1,053	Lot 1001, 85 I/2	05/22/1985	05/22/2027
3179	939	Lot 1000, 85 I/2	05/22/1985	05/22/2027
3265	367	Lot 1005, 85 I/2	03/02/1987	03/02/2029
3266	850	Lot 1007, 85 I/2	03/02/1987	03/02/2029
3267	1,040	Lot 1006, 85 I/2	03/02/1987	03/02/2029
Total	**4,249**			

TABLE 1-5 MINERAL CLAIMS SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Mineral Claim Number	Mineral Claim Name	Claim Sheet Number	Mining District
K12405	Angela 1	85I2	Mackenzie
K12406	Angela 2	85I2	Mackenzie
K12407	Angela 3	85I2	Mackenzie

The mining leases have a 21-year life and each lease is renewable in 21-year increments. Annual payments of $2.47/ha ($1.00 per acre) are required to keep the leases in good standing. Avalon owns 100% of all of the leases subject to various legal agreements described below.

LEGAL AGREEMENTS, UNDERLYING ROYALTY INTERESTS

Two underlying royalty agreements exist on the Thor Lake property: the Murphy Royalty Agreement and the Calabras/Lutoda Royalty Agreement. The Murphy Royalty

Agreement is a 2.5% Net Smelter Return (NSR) royalty that applies to the entire Thor Lake property and has a provision for Avalon to buy out the royalty at the commencement for production. The Calabras/Lutoda Royalty Agreement totals 3% NSR.

ACCESSIBILITY

Depending upon the season, the Thor Lake Project is accessible either by boat, winter road and/or float, ski-equipped and wheeled aircraft (generally from Yellowknife or Hay River). During the transition periods to either winter or spring access to the area is difficult and a helicopter is the easiest way into the project site. At present, the nearest road access is the Ingraham Trail, an all season highway maintained by the government of the NWT. This trail is located approximately 50 km (direct line) from the property. Thor Lake has an existing permanent airstrip, which allows for a minimum of Twin-Otter-sized aircraft service from Yellowknife throughout the year. Plans to upgrade this airstrip to accommodate a Dash 8 or Buffalo types of aircraft, are included in this report for the proposed construction and operations activities.

HISTORY

The TLP area was first mapped by J.F. Henderson and A.W. Joliffe of the Geological Survey of Canada (GSC) in 1937 and 1938. The first staking activity at Thor Lake dates from July 1970 when claims were staked for uranium. In 1971, the GSC commissioned an airborne radiometric survey over the Yellowknife region that outlined a radioactive anomaly over the Thor Lake area (GSC Open File Report 124). Simultaneously, A. Davidson of the GSC initiated mapping of the Blatchford Lake Intrusive Complex. It has subsequently become clear that this radiometric anomaly is largely due to elevated thorium levels in the T-Zone within the TLP.

Four more claims were staked in the area in 1973. In 1976, Highwood Resources Ltd., in the course of a regional uranium exploration program, discovered niobium and tantalum on the Thor Lake property. From 1976 to 1979, exploration programs included geological mapping, sampling and trenching on the Lake (Nechalacho), Fluorite, R-, S- and T-zones. Twenty-two drill holes were also completed, seven of these on the Lake Zone. This work resulted in the discovery of significant concentrations of niobium, tantalum, yttrium and REEs. Results indicated a general paucity of uranium mineralization and that the anomalous radioactivity was due to thorium. Following this, and inconclusive lake bottom radiometric and radon gas soil surveys, Calabras, a private holding company, acquired a 30% interest in the property by financing further exploration by Highwood. This was done through Lutoda Holdings, a company incorporated in Canada and owned by Calabras.

Placer Development Ltd. (Placer) optioned the property from Highwood in March 1980 to further investigate the tantalum and related mineralization. Placer conducted magnetometer, very low frequency (VLF) electro-magnetic and scintillometer surveys on the Lake Zone. Thirteen holes were initially drilled in 1980. This was followed by five more in 1981 focused around drill hole 80-05 (43 m grading 0.52% Nb_2O_5 and 0.034% Ta_2O_5). Preliminary metallurgical scoping work was also conducted, but Placer relinquished its option in April of 1982 when the mineralization did not prove amenable to conventional metallurgical extraction.

From 1983 to 1985, the majority of the work on the property was concentrated on the T-Zone and included geochemical surveys, berylometer surveys, surface mapping, significant drilling, surface and underground bulk sampling, metallurgical testing and a detailed evaluation of the property by Unocal Canada. During this period, a gravity survey was conducted to delineate the extent of the Lake Zone.

In August of 1986, the property was joint-ventured with Hecla Mining Company of Canada Ltd. (Hecla). By completing a feasibility study and arranging financing to bring the property into production, Hecla could earn a 50% interest in the property. However, in 1990, after completing considerable work on the T-Zone, Hecla withdrew from the project. In 1990, control of Highwood passed to Conwest Exploration Company Ltd. (Conwest) and the Thor Lake project remained dormant until 1996, at which time Conwest divested itself of its mineral holdings. Mountain Minerals Company Ltd. (Mountain), a private company controlled by Royal Oak Mines Ltd., acquired the 34% controlling interest of Highwood following which Highwood and Mountain were merged under the name Highwood.

In 1997, Highwood conducted an extensive re-examination of Thor Lake that included a proposal to extract a 100,000 tonne bulk sample. Applications were submitted for permits that would allow for small-scale development of the T-Zone deposit, as well as for processing over a four to five year period. In late 1999, the application was withdrawn.

In 1999 Dynatec Corporation acquired the control block of Highwood shares. In 2000, Highwood initiated metallurgical, marketing and environmental reviews by Dynatec. In 2001, Navigator Exploration Corp. (Navigator) entered into an option agreement with Highwood. Navigator's efforts were focused on conducting additional metallurgical research at Lakefield in order to define a process for producing a marketable tantalum concentrate from the Lake Zone. These efforts produced a metallurgical grade tantalum/zirconium/niobium/yttrium/REE bulk concentrate. The option, however, was dropped in 2004 due to falling tantalum prices and low tantalum contents in the bulk concentrate.

Beta Minerals Inc. (Beta) acquired Highwood’s interest in the Thor Lake property in November 2002 under a plan of arrangement with Dynatec. In May 2005 Avalon purchased from Beta a 100% interest and full title, subject to royalties, to the Thor Lake property.

In 2005, Avalon conducted extensive re-sampling of archived Lake Zone drill core to further assess the yttrium and HREE resources on the property. In 2006, Wardrop Engineering Inc. (Wardrop) was retained to conduct a Preliminary Assessment (PA) of the Thor Lake deposits (Wardrop, 2009). In 2007 and 2008 Avalon commenced further drilling of the Lake Zone. This led to a further technical report on the property (Wardrop, 2009).

GEOLOGY

The Thor Lake rare metals deposit is hosted by the peralkaline Blachford Lake intrusion, an Aphebian-age ring complex emplaced in Archean-age supracrustal rocks of the Yellowknife Supergroup. The principal rock types in the intrusion are syenites, granites and gabbros and associated pegmatitic phases hosting rare metal mineralization. The key rock units in the vicinity of the mineralization are the Grace Lake Granite, the Thor Lake Syenite and an unnamed nepheline-sodalite syenite. The Grace Lake Granite surrounds the Thor Lake Syenite with the two separated by the enigmatic "Rim Syenite". It forms a distinct semi-circular ridge, locally termed the rim syenite that can be traced for a distance of about eight kilometers and is thought to be a ring dyke. In outcrop, Thor

Lake Syenite is seen to transition to Grace Lake granite with the appearance of quartz on the solidus in an otherwise felspathic rock. Thus the Grace Lake Granite and Thor Lake Syenite are believed to be closely related intrusives. The host of the Nechalacho mineralization, the nepheline-sodalite syenite, is within and below the Thor Lake Syenite, and exposed locally in the northwest part of the Thor Lake Syenite.

Five distinct zones or deposits of rare metal mineralization have been identified as being of potential economic interest: the Nechalacho deposit and smaller North T, South T, S and R Zones. The Nechalacho deposit is the largest, containing significant yttrium, tantalum, niobium, gallium and zirconium mineralization. Nechalacho is particularly notable for its enrichment in the more valuable HREEs such as europium, terbium and dysprosium, relative to LREEs such as lanthanum and cerium.

The nepheline-sodalite syenite that hosts the Nechalacho deposit has the following key distinctive features which contrast it to the Thor Lake Syenite and Grace Lake granite:

1. It has a distinct chemical composition showing undersaturation in quartz, with nepheline and sodalite variously as rock-forming minerals.
2. It has cumulate layering.
3. It contains agpaitic zircono-silicates including eudialyte.
4. It is the host to the Nechalacho zirconium-niobium-tantalum-rare earth mineralization.

This syenite is only exposed at surface in a window through the Thor Lake Syenite in the area encompassing Long Lake to Thor Lake. It is believed to dip underneath that Thor Lake Syenite in all directions. Also, the Nechalacho deposit mineralization, which occurs in the top, or apex, of the syenite, is also present in throughout this window through the Thor Lake Syenite. This unnamed syenite is referred to in this report as the "Ore (Nechalacho) Nepheline Sodalite Syenite".

The Nechalacho deposit is a tabular hydrothermal alteration zone extending typically from surface to depths of 200 to 250 metres, characterized by alternating sub-horizontal layers of relatively high and lower grade REE mineralization. HREE are present in the Nechalacho deposit in fergusonite ($(Y,HREE)NbO_4$) and zircon ($ZrSiO_4$), whereas the LREE are present in bastnaesite, synchysite, allanite and monazite. Niobium and tantalum are hosted in columbite as well as fergusonite.

There is a gradual increase in HREE from surface to depth with the lowermost sub-horizontal layer, which is also the most laterally continuous, being referred to as the Basal Zone. Thus typical proportions of HREO relative to TREO in Upper Zone can be 7 to 10% but in the Basal Zone averaging over 20% and reaching as high as 50% in individual samples. There is also a tendency for the Basal Zone, which undulates to some extent, to increase in HREO with depth.

The ore (Nechalacho) nepheline sodalite syenite consists of a layered series of increasingly peralkaline rocks with depth. A consistent downward progression is observed from hanging wall sodalite cumulates, through coarse grained to pegmatitic nepheline aegirine syenites which are locally enriched in zirconosilicates, to foayaitic syenite with a broad zone of altered eudialyte cumulates (referred to above as the Basal Zone). This upper sequence is strongly to intensely hydrothermally altered by various Na and Fe fluids. Pre-existing zircon-silicates are completely replaced by zircon, allanite, bastnaesite, fergusonite and other minerals. Below the Basal Zone cumulates, alteration decreases relatively quickly, with relict primary mineralogy and textures increasingly preserved. Aegirine and nepheline-bearing syenites and foyaitic syenites progress downward to sodalite foyaites and naujaite. Drilling has not extended beyond this sodalite lithology to date. Minerals related to agpaitic magmatism identified from this lower unaltered sequence include eudialyte, catapleite, analcime, and possibly mosandrite.

MINERAL RESOURCES

The Mineral Resource estimate for the Nechalacho deposit used in the PFS was updated with new drilling by Avalon, as disclosed on January 27, 2011 (Table 1-6). This updated estimate was used as the basis for the UPFS.

The technical data used for the Mineral Resource estimate was compiled, validated and evaluated by Avalon. Avalon also updated the 3D solids and interpolated grade values for oxides of the REE elements, Zr, Nb, Ga, Hf, Th and Ta into the block model.

RPA validated the data set and the wireframes, and reviewed the interpolation methodology and the block model. RPA also reclassified a small quantity of Inferred Resources to Indicated Resources.

In total, 291 drill holes (out of a database of 316 drill holes) were used for the estimate of which 45 are historic and 246 are Avalon diamond drill holes (drilled and sampled from 2007 to 2010). Complete REE analyses (plus Zr, Nb, Ga, and Ta) are available for six historic holes and all 246 Avalon holes. These holes and their related assays form the basis for the creation of two domains of REE mineralization: an upper light rare earth element-enriched domain, the Upper Zone, and a lower heavy rare earth element-enriched domain, the Basal Zone.

TABLE 1-6 MINERAL RESOURCE SUMMARY – JANUARY 27, 2011
Avalon Rare Metals Inc. – Thor Lake Project

Area	Tonnes (millions)	TREO (%)	HREO (%)	ZrO_2 (%)	Nb_2O_5 (%)	Ta_2O_5
Basal Zone Indicated						
Tardiff Lake	41.72	1.61	0.34	2.99	0.41	397
West Long Lake	16.11	1.42	0.31	2.98	0.38	392
Total Indicated	**57.82**	**1.56**	**0.33**	**2.99**	**0.40**	**396**
Basal Zone Inferred						
Tardiff Lake	19.18	1.66	0.36	3.08	0.42	423
Thor Lake	79.27	1.30	0.24	2.78	0.37	338
West Long Lake	8.82	1.16	0.21	2.71	0.33	346
Total Inferred	**107.26**	**1.35**	**0.26**	**2.83**	**0.37**	**354**
Upper Zone Indicated						
Tardiff Lake	23.63	1.50	0.15	2.09	0.32	194
West Long Lake	7.02	1.40	0.13	2.14	0.27	186
Total Indicated	**30.64**	**1.48**	**0.15**	**2.10**	**0.31**	**192**
Upper Zone Inferred						
Tardiff Lake	28.66	1.34	0.12	1.96	0.32	175
Thor Lake	81.66	1.24	0.12	2.54	0.36	206
West Long Lake	5.67	1.34	0.12	1.95	0.26	170
Total Inferred	**115.98**	**1.27**	**0.12**	**2.37**	**0.34**	**196**

Area	Tonnes (millions)	TREO (%)	HREO (%)	ZrO_2 (%)	Nb_2O_5 (%)	Ta_2O_5
Total Indicated						
Upper & Basal	**88.46**	**1.53**	**0.27**	**2.68**	**0.37**	**325**
Total Inferred						
Upper & Basal	**223.24**	**1.31**	**0.19**	**2.59**	**0.36**	**272**

Notes:
1) CIM definitions were followed for Mineral Resources.
2) HREO (Heavy Rare Earth Oxides) is the total concentration of: Y_20_3, Eu_20_3, Gd_20_3, Tb_20_3, Dy_20_3, Ho_2O_3, Er_20_3, Tm_20_3, Yb_20_3 and Lu_20_3.
3) TREO (Total Rare Earth Oxides) is HREO plus: La_20_3, Ce_20_3, Pr_20_3, $Nd_20_3$and Sm_20_3.
4) Mineral Resources are estimated using price forecasts for 2014 for rare metals prepared early in 2010 for the PFS. Rare earths were valued at an average net price of US$21.94/kg, ZrO_2 at US$3.77/kg, Nb_2O_5 at US$45/kg, and Ta_2O_5 at US$130/kg.
5) A cut-off NMR value of C$260 per tonne, equal to the PFS average operating cost, was used. NMR is defined as "Net Metal Return" or the in situ value of all the payable rare metals in the ore, net of estimated metallurgical recoveries and off-site processing costs.
6) An exchange rate of 1.11 was used.
7) ZrO_2 refers to Zirconium Oxide, Nb_2O_5 refers to Niobium Oxide, Ta_2O_5 refers to Tantalum Oxide, Ga_2O_3 refers to Gallium Oxide.
8) Mineral Resources are inclusive of Mineral Reserves.

RPA recognizes that both rare metals and rare earths contribute to the total revenue of the Nechalacho deposit.

An economic model was created, using metal prices, flotation and hydrometallurgical recoveries, the effects of payable percentages, and any payable NSR Royalties. The net revenue generated by this model is termed the Net Metal Return (NMR). This resource estimate is based on the minimum NMR value being equal to an operating cost of C$260 per tonne, a break-even cut-off value.

MINERAL RESERVES

A Mineral Reserve estimate for the Basal Zone of the Thor Lake Project has been reviewed by RPA as outlined in Table 1-7. The Mineral Reserve is based upon underground mining of the Basal Zone, concentration of the REOs and other products in a flotation concentrate and hydrometallurgical processing of the concentrates. The Mineral Reserves consist of a portion of the Indicated Resources within a mine design by Avalon, with dilution and recovery factors applied. Minor amounts of Mineral Resources from the Upper Zone beyond the Basal Zone were included in the estimation of the Mineral Reserves; these are generally in areas where the tops of the stope extend past the soft boundary between the Upper Zone and the Basal Zone.

TABLE 1-7 MINERAL RESERVE SUMMARY – JULY 7, 2011
Avalon Rare Metals Inc. – Thor Lake Project

	Tonnes (millions)	% TREO	% HREO	% ZrO_2	% Nb_2O_5	% Ta_2O_5
Probable Reserves	14.54	1.53	0.40	2.90	0.38	0.040

Notes:
1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated using price forecasts for 2015 for rare earth oxides (US$46.31/kg average), zirconium oxide (US$3.77/kg), tantalum oxide (US$255.63/kg) and niobium oxide (US$55.86/kg).
3. HREO grade is the total of Y_2O_3, Eu_2O_3, Gd_2O_3, Tb_2O_3, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3 and Lu_2O_3 grades. TREO grade comprises HREO plus La_2O_3, Ce_2O_3, Nd_2O_3, Pr_2O_3, and Sm_2O_3 grades.
4. An exchange rate of C$0.95/US$1.00 was used.
5. Mineral Reserves are estimated using a Net Metal Return (NMR) cut-off value of C$300/t.
6. A minimum mining width of five metres was used.
7. Totals may differ from sum or weighted sum of numbers due to rounding.

CUT-OFF GRADE

NMR values for Mineral Reserves were determined using UPFS pricing (US$46.31 per kg rare earths, vs. US$21.94 per kg in the PFS). Stopes in the mine design carry NMR values greater than US$300 per tonne.

MINING

Underground mining has been chosen for the development of the Basal Zone. The mining plan and the layout of some of the mine infrastructure has been modified from the PFS design, however, the planned operation is fundamentally the same. The operation is designed on the basis of a 2,000 tpd operation with a 20 year mine life. The production plan for the Nechalacho Deposit assumes that the ore will be concentrated at Thor Lake and barged across the Great Slave Lake (GSL) to Pine Point for hydrometallurgical processing.

Access to the deposit will be through a ramp collared to the west of Long Lake. The Nechalacho deposit is planned to be mined by underground methods to access the higher grade resources at the base of the deposit and to minimize the surface disturbance. Ground conditions are expected to be good and primary stopes are expected to be stable at widths of 15 m. In light of the high value of the resources in the Basal Zone, the use of paste backfill is proposed and mining will be done with a first pass of primary stopes followed by pillar extraction after the primary stopes have been filled.

Mining will be done with rubber tired mechanized equipment to provide the maximum flexibility. Broken ore will be hauled and deposited in an ore pass leading to the underground crushing chamber. The underground crushing circuit will include primary, secondary and tertiary crushing and screening. The -15 mm fine ore will be stored in a 1,000 t fine ore bin (FOB). From the FOB the ore will be transported to the mill on surface by a conveyor system. The conveyor will be hung from the back of the main access decline.

The key design criteria set for the Thor Lake mine were:

- Mine and process plant capacity of 2,000 tpd (730,000 tpa)
- 669,000 tonnes in year one, 730,000 tpa thereafter
- 20 year mine life
- Production from Basal Zone
- Mechanized mining
- Underground crushing
- Conveyor haulage of ore to mill
- Paste backfill for maximum extraction

The mine plan was developed by Avalon and reviewed by RPA. Whereas the PFS included material from a single area of the Basal Zone and overlying upper zone, the current plan is to mine in three areas of the Basal Zone with the stoping sequence targeting the higher grade areas first.

The mining approach will be to mine a sequence of 15 m wide primary stopes followed by extraction of the intervening 16 m wide secondary stopes after the primary stopes are backfilled with a paste backfill.

Stopes have been designed with flat footwalls and oriented in each of the three areas to maximize the ore extraction and minimize dilution due to the variations in the footwall of the Basal Zone. Access to the stopes will be through a system of access ramps located outside the Indicated Resource in the Basal Zone. The access ramps would connect to a centrally located ore pass and ventilation raises to surface.

Mine ventilation will be achieved with surface fans forcing air into the mine at a central intake ventilation raise and with the airflow being regulated to ventilate the east and west areas of the mine with exhaust air up the main ramp and up a ventilation raise at the eastern edge of the planned mining area.

Recovery of the secondary stopes is planned by long hole mining with a top and bottom access. To reduce dilution, the primary stopes will be filled with paste fill and a one metre thick skin will be left on each stope wall. It is expected that half of the skin will break due to blasting, but this loss of ore is offset by the reduction in dilution due to backfill.

GEOTECHNICAL ANALYSIS

The available geotechnical information from the TLP was reviewed to provide preliminary stope sizing recommendations. Geotechnical information for the PFS design recommendations is based on geotechnical logging completed in conjunction with the Avalon 2009 exploration drill program.

The results suggest that the rock masses encountered at the TLP are generally good quality and that there is little variation with depth. General observations include the following:

- Drill core recovery was consistently close to 100% suggesting that few zones of reduced rock mass quality were encountered.
- Rock Quality Designation (RQD) values were generally in the 90% to 100% range.
- Rock Mass Rating (RMR) values were generally ranged between 60 and 80 and would be typical of a good quality rock mass.

MAIN DECLINE

The main access ramp will be driven from a location near the mill at a grade of -15%. From surface to a location below the fine ore bin the main access will be approximately 1,600 m in length. The decline design includes one transfer point for the conveyor. The decline will be driven as a 6.5 m high by 5.0 m wide to accommodate the overhead conveyor system and access for men and equipment. The conveyor is planned to be a 76.2 cm wide conveyor belt to handle 100 tph of -15 mm crushed rock.

UNDERGROUND LAYOUT

Stope access headings will be driven off three access ramps. The ramps are required to access the three different stoping areas. In addition there will be development required to access the individual stopes. To cover a 15 m vertical cut in three lifts with a maximum 20% grade (for the stope access) these access drifts will be 75 m long for each stope. The stopes will be accessed with a ramp to the upper cut elevation and then the floor will be slashed for each lift to terminate with a 20% decline to the lowest lift.

Raise development will include the main intake ventilation raise, the exhaust raise and ore pass. Bulk development will include the crusher excavation and fine ore bin.

STOPING

Stopes will be mined in a primary and secondary sequence. Primary stopes will be 15 m wide, while the secondary stopes will be 16 m wide to leave extra space and ensure the maintenance of good ground conditions in the secondary extraction sequence. There will be a one metre skin between primary and secondary stopes to minimize backfill dilution. For mineralized up to 18 m high the stopes will be excavated in an overhand cut and fill sequence in one lift. Each cut will be developed using a 5 m x 5 m heading followed by the slashing of walls resulting in a 15 m x 5 m cut. Adjacent primary stopes will be developed simultaneously.

Development of secondary stopes will begin once the adjacent primary stopes have been filled. The secondary stopes will be developed with a five metre to six metre wide drift down the centre of the stope and the remaining width will be slashed and remote mucked. In the secondary stopes, a one metre thick skin will be left on each side to reduce the amount of dilution from backfill. In the course of blasting, it is assumed that a portion of the skin will fail and report to the muck pile.

Ore will be hauled from the stope by LHD or by truck to the ore pass feeding the run-of-mine (ROM) bin located ahead of the crusher.

UNDERGROUND EQUIPMENT

The underground mining fleet will consist of 6 m^3 load-haul-dump trucks (LHDs), two boom jumbos, 30-tonne to 40-tonne haul trucks, and other ancillary equipment. A long hole drill rig will be required for the mining of secondary stopes.

UNDERGROUND INFRASTRUCTURE

The mine crushing and screening will take place underground in a set of chambers. The crushing plant will consist of a coarse ore bin, primary crusher, gyratory crusher, screen, secondary crusher, and a fine ore bin. Discharge conveyors from the fine ore bin will feed the main conveyor, which would feed the rod mill on surface.

VENTILATION

The ventilation plan is to isolate the eastern mining fronts from the west. Air flow into the east mining fronts will exhaust through the east exhaust raise and air flow through the west will exhaust up the ramp in addition to the regulated airflow through the crusher station. A series of regulators at the base of the intake raise on the west and the exhaust raise in the east will regulate flow with a planned 150,000 cfm air flow on the west end and 200,000 cfm air flow on the east.

In light of the sub-zero temperatures and the need to maintain the mine in an unfrozen state to prevent freezing of water lines and/or groundwater, the mine air will be heated using direct fired mine air heaters located at the mine air intake. The estimated propane consumption from late October to late April each year is approximately two million litres.

The mine is not expected to be a “wet” mine and groundwater inflows are expected to be low, with a maximum estimated 50 gpm of groundwater inflow into the mine. The estimate of groundwater inflow has been based upon the observations of the numerous core drill programs and observations from the test mine previously developed at the Thor Lake site.

The planned production rates yield a mine life of 18 years for the Basal Zone Probable Mineral Reserves. The production schedule is shown in Table 1-7.

RECOVERY METHODS

The flotation and hydrometallurgical plant process is based on metallurgical design data provided by J. R. Goode and Associates (Goode), consultant to Avalon Rare Metals Inc., which in turn were collated from testwork completed by SBM Mineral Processing and Engineering Services LTD at SGS Lakefield Research Limited in 2009. The grinding circuit design is based on test data provided by Starkey & Associates Inc. in 2009. The process design criteria developed from these data are summarized below.

PROPOSED PROCESS FACILITIES

The proposed process comprises crushing, grinding, flotation plants located at Thor Lake and a Hydrometallurgical facility near Pine Point on the south shore of Great Slave Lake. The facility will initially process mineralized material mined at a rate of approximately 1,800 tpd in the first year and will ramp up to process 2,000 tpd from the second year onwards.

The proposed process facilities at Thor Lake comprise a crushing plant, sized for the ultimate tonnage, located in the mine and designed to reduce rock from run-of-mine size to -15 mm. Crushed material is stored in a fine ore bin excavated in the rock, and conveyed up the mine access incline to a rod mill – ball mill grinding circuit. Ground ore is conditioned then de-slimed in a series of three hydrocyclones, and pumped to magnetic separation circuit. This circuit comprises a first magnetic separator, a regrind mill to process the concentrate and a cleaner magnetic separator. Non-magnetic product is pumped to a thickener.

Thickener underflow is diluted and conditioned ahead of rougher-scavenger flotation. Scavenger tails are initially sent to a tailings storage facility but will be processed for paste backfill production for the mine after the initial couple of years operation. Flotation concentrates are cleaned in four counter-current stages to produce a cleaner concentrate which is subjected to gravity separation then thickened and dewatered in a filter press. The gravity tailings are reground and returned to rougher flotation.

Dewatered concentrate is conveyed to special containers able to hold 40 t of concentrate. Filled containers are stored until concentrate transportation is scheduled at which time they are taken across Great Slave Lake to the dock at Pine Point and transported to the hydrometallurgical facility.

In the proposed operation, full concentrate containers are stored at the hydrometallurgical facility and retrieved and placed in a thaw shed as required. The concentrate is thawed and then dumped into reclaim system that conveys the material into the hydrometallurgical plant. Concentrate is “cracked” using a combination of acid baking, caustic cracking, and leaching using sulphuric acid and sodium hydroxide as the primary reagents.

The solid residue from the cracking system is combined with other waste streams and sent to the hydrometallurgical tailings storage facility. The solution arising from the cracking process is subjected to double salt precipitation, solution pre-treatment and solvent extraction processes to isolate the values. Products are precipitated as basic salts, processed and dried to yield hydrated oxides which are packaged for shipment to markets. Products are be trucked to Hay River for on-shipment by rail.

The principal design criteria selected for the PFS are tabulated below in Table 1-8.

TABLE 1-8 PRINCIPAL PROCESS DESIGN CRITERIA
Avalon Rare Metals Inc. – Thor Lake Project

General		
Processing rate	tpa	730,000
	tpd	2,000
Feed grade	% ZrO2	2.84
	% TREO	1.50
	% HREO	0.39
	% Nb2O5	0.37
	% Ta2O5	0.040
Flotation Plant		
Operating time	hr/a	8,000
Processing rate	tph	91.2
(Ball mill, flotation cells, gravity units, and filters added)		
Underground crusher product	100% passing mm	15
Grinding circuit		Rod and ball mill
Final grind	80% passing micrometres	38
Slimes-free non-magnetics	% feed	18
Final concentrate mass	% feed	18
Recovery to final concentrate	% ZrO2 in feed	89.7
	% TREO in feed	79.5
	% HREO in feed	79.5
	% Nb2O5 in feed	68.9
	% Ta2O5 in feed	63
Hydrometallurgical Plant		
Operating time	hr/a	7,582
Processing rate	tph	17.4
Acid bake temperature	°C	250
Acid addition	kg/t concentrate	700
Caustic crack temperature	°C	600
Net caustic addition	kg/t concentrate	140
Post double salt precipitation SX feed rate	m^3/h - expansion throughput	83
(All SX units sized for expansion, some driers added for expansion)		
Recovery to final products	% ZrO_2 in concentrate	90
	% TREO in concentrate	93
	% HREO in concentrate	93
	% Nb_2O_5 in concentrate	80
	% Ta_2O_5 in concentrate	50
Sulphuric Acid Plant		
Annual average capacity	tpd 100% acid	700

PROJECT INFRASTRUCTURE

The Thor Lake site is an undeveloped site with no road access and the only site facilities are those that have been established for exploration over a number of years. The proposed Pine Point site is a brownfields site with good road access to the property boundary but few remaining local services.

The surface facilities will be organized into a compact unit to reduce the need for buses and employee transportation within the site. All facilities will be connected by corridors to provide pedestrian access in all weather conditions between the mill/power house/shops/offices and accommodation units.

THOR LAKE TAILINGS MANAGEMENT FACILITY

The tailings management facility design was prepared by Knight Piésold for the PFS. The design basis and criteria for the Tailings Management Facility (TMF) are based on Canadian standards for the design of dams. In particular, all aspects of the design of the TMF have been completed in compliance with the following documents:

- Canadian Dam Association (CDA) Dam Safety Guidelines (CDA 2007)
- The Mining Association of Canada (MAC) Guide to the Management of Tailings Facilities (MAC 1998)

The principal objective of the TMF design is to ensure protection of the environment during operations and in the long-term (after closure) and achieve effective reclamation at mine closure. The pre-feasibility design of the TMF has taken into account the following requirements:

- Permanent, secure and total confinement of all tailings solids within an engineered facility
- Control, collection and removal of free draining liquids from the tailings during operations, for recycling as process water to the maximum practical extent
- The inclusion of monitoring features for all aspects of the facility to ensure performance goals are achieved and design criteria and assumptions are met

TAILINGS AND WATER MANAGEMENT

The tailings and water management strategy for the Thor Lake pre-feasibility design consists of a closed loop system to minimize impact to the natural hydrologic flows within the Thor Lake watershed area. All tailings solids and fluids as well as impacted water from the Process Plant will report to the Tailings Basin. The TMF design currently proposed includes a Polishing Pond. Excess water from the Tailings Basin will be treated (if necessary) and discharged from the Polishing Pond to Drizzle Lake. Ultimately, all water from the TMF will return to Thor Lake via Drizzle and Murky Lakes. Fresh water for operations will be drawn from Thor Lake and reclaim water will be drawn from the Tailings Basin. The pre-feasibility water balance has assumed that the process water feed to the Process Plant will consist of 50% fresh water and 50% recycled water from the Tailings Basin.

PROCESS FACILITY SITE

In addition to the process facility there will be a requirement for:

- Administration Offices
- Dry and lunch room
- Warehouse
- Shops
- Assay/Metallurgical Lab
- Reagent storage, mixing tanks
- Container storage area

The hydrometallurgical plant is to be located in an old borrow pit located on the east side of the tailings facility. There is a network of roads that connect the plant site to the main access roads but it will be necessary to upgrade short sections of the road for plant access.

A temporary dock will be installed annually at the Pine Point landing site. Two barges tied end to end will serve as the dock. These barges would then be the dock for access to the barges to be loaded and unloaded.

PINE POINT TAILINGS MANAGEMENT FACILITY

For the UPFS, the tailings disposal option at Pine Point has been changed to use one of the existing open pits. The change was made based upon the cost of the lined facility atop the existing tailings and concerns related to potential impacts upon the existing tailings.

Tailings produced in the plant will be pumped to the L-37 historic pit, which will act as the Hydrometallurgical Tailings Facility (HTF) for contained disposal. Excess water from the supernatant pond will be pumped to the nearby N-42 historic pit for infiltration into the Presqu'ile aquifer.

MARKET STUDIES AND CONTRACTS

Avalon collected historical price information, supply/demand analysis, and forecasts for the future. The sources of price information include the websites of Metal-Pages^{TM} and Asian Metal, reports by BCC Research (BCC) and Roskill, a Canadian Imperial Bank of Commerce (CIBC) March 2011 forecast, analysis by TD Newcrest, verbal communication with Kaz Machida, a metal trader in the Japanese market, and private reports to Avalon by Industrial Minerals Company of Australia Pty Ltd (IMCOA), authored by Dudley Kingsnorth.

RARE EARTH ELEMENT PRICING

The market for rare earths products is small, and public pricing information, forecasts, and refining terms are difficult to obtain. The pricing methodology used for the PFS was updated, and compared to independent third-party forecasts.

RPA believes that CIBC's forecast dated March 6, 2011 (see Table 1-9) is reasonable, or even conservative, as it pre-dates significant price movements in Q2 2011. In RPA's opinion, the CIBC prices are suitable for use in estimation of Mineral Reserves.

While the prices used in the PFS were higher than current prices at the time, RPA notes that UPFS prices for all products are lower than current. The prices are based on independent, third-party forecasts for 2014, price performance since 2009, as well as supply and demand projections and world inflation rates from 2009 to 2015. Since the Project schedules production commencing in 2015, RPA is of the opinion that these long-term price forecasts are a reasonable basis for estimation of Mineral Reserves.

TABLE 1-9 CURRENT VERSUS FORECAST PRICES FOR REO
Avalon Rare Metals Inc. – Thor Lake Project

Rare Earth Oxide	Avalon July 29, 2010 2014 Forecast FOB China (US$/kg)	Actual June 13, 2011 Inside China MP (US$/kg)	Actual June 13, 2011 FOB China MP (US$/kg)	CIBC March 6, 2011 2015 Forecast FOB China (US$/kg)
La2O3	4.06	23.00	148.00	17.49
Ce2O3	2.08	29.00	149.00	12.45
Pr2O3	43.87	147.00	239.00	75.20
Nd2O3	46.06	208.00	318.00	76.78
Sm203	5.58	11.00	129.00	13.50
Eu2O3	1,086.10	3,332.00	2,990.00	1,392.57
Gd2O3	13.70	112.00	203.00	54.99
Tb4O7	1,166.09	2,623.00	2,910.00	1,055.70
Dy2O3	254.59	1,257.00	1,485.00	688.08
Ho2O3	66.35	485.00	-	66.35
Er2O3	48.92	-	295.00	48.92
Lu2O3	522.93	910.00	-	522.83
Y2O3	23.22	55.00	163.00	67.25

Sources:
1. Avalon's July 29, 2010 price forecast for 2014 is from Avalon's 43-101 Technical Report issued July 29, 2010
2. The Actual prices from June 13, 2011 Inside China are from Metal Pages with an exchange rate of 6.482RMB =1US$
3. The Actual prices from June 13, 2011 FOB China are from Metal Pages.
4. Avalon's 2015 forecast is drawn from CIBC's March 6, 2011 rare earth industry overview except for the elements Ho, Er and Lu which have been maintained from Avalon's July 29, 2010 forecast.

CONTRACTS

At this time Avalon has not entered into any long term agreements for the provision of materials, supplies or labour for the Project. Avalon has entered into a negotiation agreement with the Deninu Kue First Nation (DKFN), Yellowknives Dene First Nation (YKDFN) and subsequently signed a similar agreement with the Lutsel K'e Dene First Nation (LKDFN). This type of initial agreement (often referred to as a memorandum of understanding (MOU), is done in order to frame the negotiations toward an impacts and benefits-type agreement. Avalon has commenced negotiations on Accommodation Agreements, with LKDFN, YKDFN and DKFN, with the objective of concluding these agreements in 2011.

The construction and operations will require negotiation and execution of a number of contracts for the supply of materials, services and supplies.

ENVIRONMENTAL STUDIES, PERMITTING AND COMMUNITY IMPACT

Environmental baseline studies were completed for the Thor Lake site by Stantec Inc. in January 2010. Based on the baseline studies and the PFS project plan, EBA Engineering Consultants Ltd. provided a list of potential effects and mitigation measures. Using EBA's list, Avalon has since submitted Developers Assessment Report to the Mackenzie Valley Environmental Impact Review Board and is awaiting final conformity checks.

The construction and operation of the TLP (all components) will require a Type A Water License for all water uses, and a Type A Land Use Permit. The Mackenzie Valley Land and Water Board (MVLWB) is the regulatory body responsible for permit issuances under the authority of the Mackenzie Valley Resource Management Act, the Mackenzie Valley Land Use Regulations, and the Northwest Water Regulations.

Other environmental permits/approvals anticipated to be required for the TLP include:

- A Navigable Waters Protection Act (NWPA) approval for the seasonal docking facilities; and

- A Section 35.(2) Fisheries Authorization or Letters of Advice from the Department of Fisheries and Oceans (DFO) under the federal Fisheries Act.

Reclamation and closure of all the Nechalacho Mine and Flotation Plant facilities will be conducted in accordance with the terms and conditions of the future MVLWB Land Use Permit and Water Licence, the "Mine Site Reclamation Policy for the Northwest Territories" and the "Mine Site Reclamation Guidelines for the Northwest Territories and Nunavut" (INAC, 2007).

The initial reclamation and closure plan prepared for the Nechalacho Mine and Flotation Plant site will be a living document that will be updated throughout the Project's life to reflect changing conditions and the input of the applicable federal and territorial regulatory agencies.

The Pine Point site has been previously reclaimed by industry and government since closure of the mine in 1987. As a result, it is anticipated that closure and reclamation activities associated with the main facilities to be located at the former Pine Point Mine site (Hydrometallurgical Processing Plant and tailings containment area), will be limited to those associated with returning these areas to the previously existing brownfields condition.

CAPITAL COST ESTIMATE

The capital cost estimate relies heavily on the PFS work, with minor adjustments, described below. PFS costs were compiled from work by Melis (mill costs and hydrometallurgical plant costs) and RPA. The UPFS capital estimate summarized in Table 1-10 covers the life of the project and includes: initial capital costs, expansion capital costs, and end-of-mine-life recovery of capital invested in initial fills for reagents, fuel and cement and in spare parts.

TABLE 1-10 CAPITAL COST ESTIMATE
Avalon Rare Metals Inc. – Thor Lake Project

Area	Units	Yrs 1-3	Yrs 4-23	LOM Total
Mine & Surface	C$ Millions	96.91	17.05	113.97
Concentrator & tailing	C$ Millions	215.22	5.03	220.26
Hydrometallurgical Facility	C$ Millions	299.97	43.66	343.63
Other Costs	C$ Millions	86.10	(4.00)	82.10
Contingency	C$ Millions	141.96		141.96
Total Capital Costs	C$ Millions	840.17	61.74	901.91

Working capital costs related to the time between the shipment from the site and the receipt of payment for the products is not included in the capital estimate in Table 1-10, but is included in the Project cash flow.

CAPITAL COST EXCLUSIONS

The capital costs do not include:

- Costs to obtain permits
- Costs for feasibility study
- Project financing and interest charges
- Escalation during construction
- GST/HST
- Any additional civil, concrete work due to the adverse soil condition and location
- Import duties and custom fees
- Costs of fluctuations in currency exchanges
- Sunk costs

- Pilot Plant and other testwork
- Corporate administration costs in Delta and Toronto
- Exploration activities
- Salvage value of assets
- Severance cost for employees at the cessation of operations

OPERATING COST ESTIMATE

The operating cost estimate from the PFS was reviewed and modified for increases in labour, fuel and supplies. The PFS estimate was compiled from work by Melis (flotation plant costs), Goode (hydrometallurgical plant costs) and RPA (mining and other costs). The average LOM operating costs and the annual estimated operating costs are shown in Table 1-11. The LOM average operating cost includes mining, processing at site and at the hydrometallurgical plant, and freight of the product to a point of sale.

TABLE 1-11 OPERATING COST ESTIMATE
Avalon Rare Metals Inc. – Thor Lake Project

	Annual Operating Cost (C$ millions)	Life of Mine Average (C$/t milled)
Thor Lake		
Mining	27.4	38.54
Processing (Power Removed)	18.8	26.51
Surface Services	4.6	6.54
Administration	8.2	11.49
Power	21.3	29.91
Summer Freight	7.4	10.73
Pine Point		
Processing	94.7	130.31
Surface Services	1.3	1.99
Administration	1.4	1.76
Sales & Marketing	8.0	11.28
Total Operating Costs	**193.1**	**269.07**

Operating costs is this section, including the costs at Pine Point, when shown on a per tonne basis are per tonne of ore milled at Thor Lake.

OPERATING COST EXCLUSIONS

The operating costs do not include:

- Any provision for inflation
- Any provision for changes in exchange rates
- GST/HST

- Preproduction period expenditures
- Corporate administration and head office costs in Delta and Toronto
- Site exploration costs or infill drilling or development for conversion of additional resources to Mineral Reserves.

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Avalon Rare Metals Inc. (Avalon) to prepare an independent technical report on the Thor Lake Project in the Northwest Territories, Canada, located approximately 100 km southeast of Yellowknife (Figure 2-1). This report was prepared for disclosure of the results of the updated Pre-feasibility Study (UPFS) completed by RPA. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the property from April 25 to 27, 2011.

Avalon is a Canadian mineral exploration and development company with a primary focus on rare metals and minerals, headquartered in Toronto, Ontario, Canada. Avalon trades on the Toronto Stock Exchange (TSX) under the symbol AVL, on the NYSE Amex in the United States and on the Frankfurt Stock Exchange in Germany.

Starting in 1976, the Thor Lake Property (TLP) has been explored by a number of companies for Rare Earth Elements (REEs), niobium and tantalum. In May 2005, Avalon purchased from Beta Minerals Inc. a 100% interest and full title, subject to royalties, to the Thor Lake property. Wardrop completed a Preliminary Assessment of the Project in 2006. A PFS commenced in 2009, led by RPA (formerly Scott Wilson RPA), with results disclosed in a Technical Report dated July 29, 2011.

The Project comprises:

- An undeveloped Rare Earths deposit
- An exploration camp, with facilities suitable for summer and winter diamond drill programs
- 14.5 million tonnes of Mineral Reserves of REEs, Zirconium, Niobium and Tantalum
- Potential development of an underground mining operation with a 20 year mine life at 730,000 tonnes per year.
- Significant additional Mineral Resources extending laterally within and beyond the Mineral Reserves.

For the UPFS, RPA reviewed an update to the PFS carried out by Avalon technical personnel. Principal changes include:

- An updated Mineral Resource estimate
- A new mine design and Mineral Reserve estimate

- Updated product pricing, reflecting increases in prices for rare earths
- Elimination of first four years at 365,000 tonnes per year – instead, ramping-up to full production as quickly as possible.

Most other aspects of the UPFS remain similar to the original PFS, including the assumption that the ore will be concentrated at Thor Lake and barged across Great Slave Lake (GSL) to Pine Point for hydrometallurgical processing. The two sites are shown in Figure 2-2.

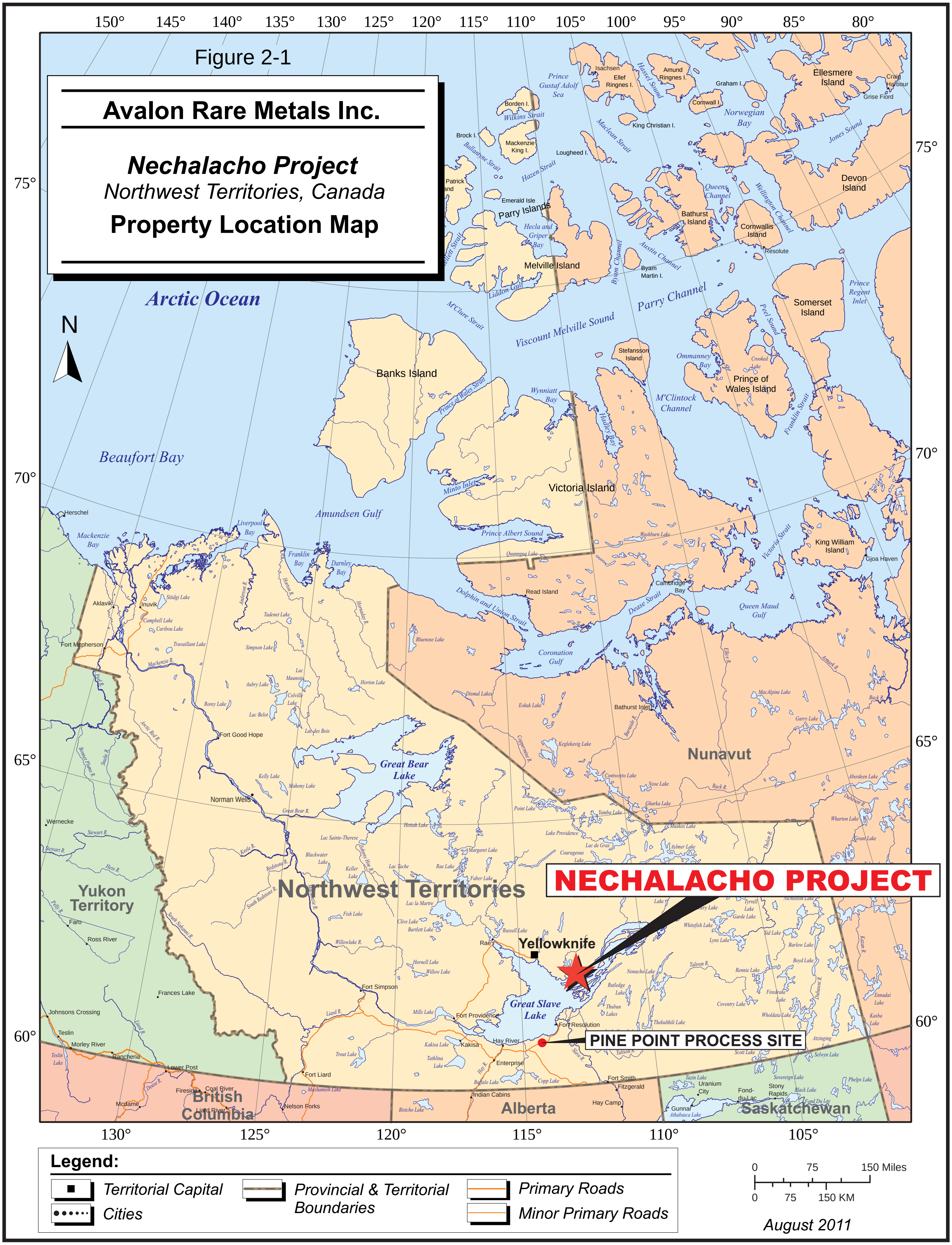


Figure 2-1
Avalon Rare Metals Inc.
Nechalacho Project
Northwest Territories, Canada
Property Location Map
Arctic Ocean
Beaufort Bay
N
Banks Island
Victoria Island
Melville Island
Somerset Island
Prince of Wales Island
Devon Island
Ellesmere Island
King William Island
Amundsen Gulf
Viscount Melville Sound
Parry Channel
Coronation Gulf
Queen Maud Gulf
Great Bear Lake
Great Slave Lake
Northwest Territories
Nunavut
Yukon Territory
British Columbia
Alberta
Saskatchewan
Yellowknife
NECHALACHO PROJECT
PINE POINT PROCESS SITE
Fort Resolution
Hay River
Fort Providence
Fort Simpson
Norman Wells
Fort Good Hope
Inuvik
Aklavik
Fort McPherson
Fort Smith
Fort Liard
Enterprise
Rae
Kakisa
Legend:
Territorial Capital
Cities
Provincial & Territorial Boundaries
Primary Roads
Minor Primary Roads
0 75 150 Miles
0 75 150 KM
August 2011

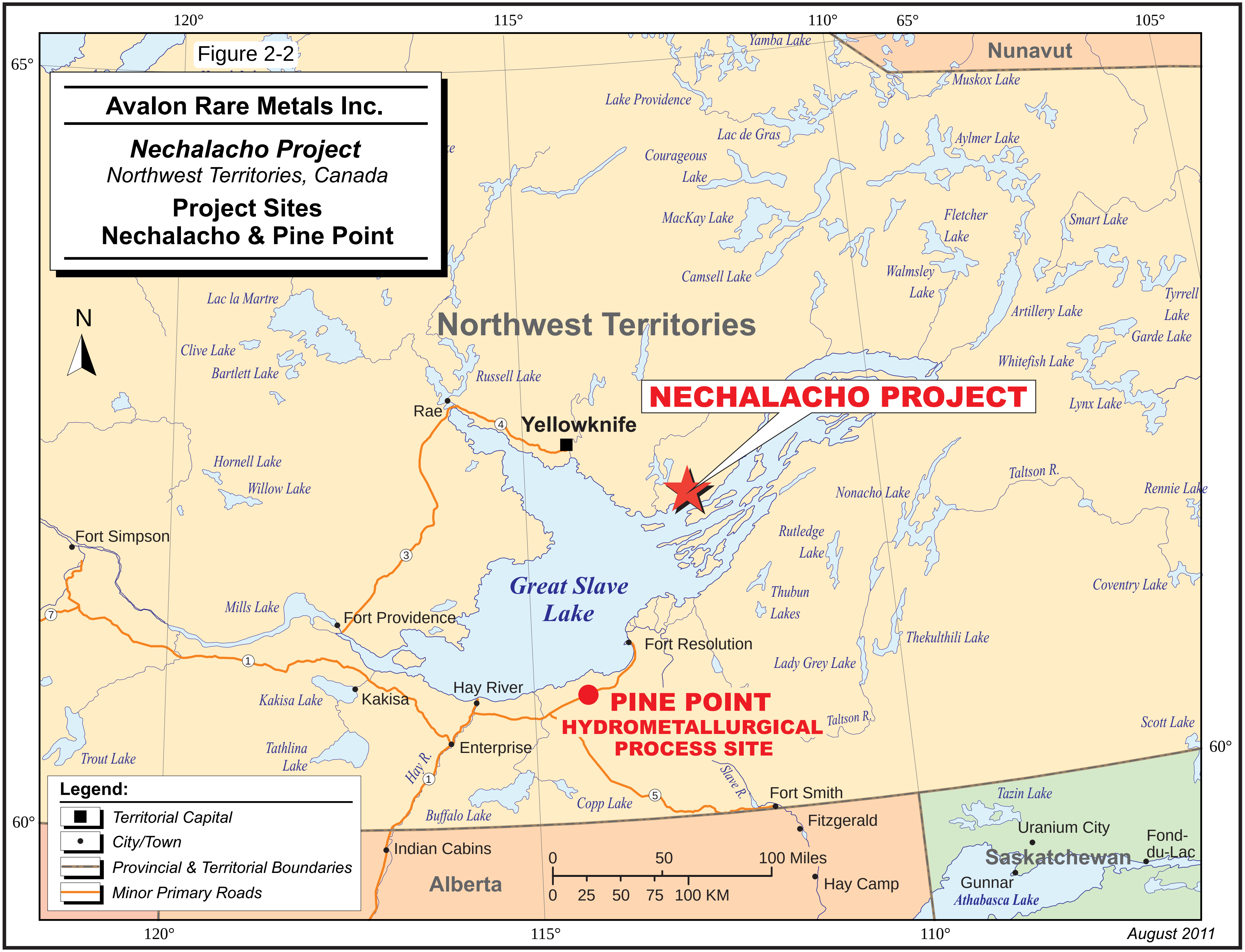


Figure 2-2
Avalon Rare Metals Inc.
Nechalacho Project
Northwest Territories, Canada
Project Sites
Nechalacho & Pine Point
Northwest Territories
Nunavut
Alberta
Saskatchewan
NECHALACHO PROJECT
PINE POINT
HYDROMETALLURGICAL
PROCESS SITE
Great Slave
Lake
Yellowknife
Rae
Fort Simpson
Fort Providence
Fort Resolution
Hay River
Kakisa
Enterprise
Fort Smith
Fitzgerald
Indian Cabins
Hay Camp
Uranium City
Fond-du-Lac
Gunnar
Athabasca Lake
Yamba Lake
Muskox Lake
Lake Providence
Lac de Gras
Aylmer Lake
Courageous Lake
MacKay Lake
Fletcher Lake
Smart Lake
Camsell Lake
Walmsley Lake
Tyrrell Lake
Artillery Lake
Garde Lake
Whitefish Lake
Lynx Lake
Lac la Martre
Clive Lake
Bartlett Lake
Russell Lake
Hornell Lake
Willow Lake
Nonacho Lake
Taltson R.
Rennie Lake
Rutledge Lake
Thubun Lakes
Coventry Lake
Thekulthili Lake
Lady Grey Lake
Mills Lake
Kakisa Lake
Tathlina Lake
Trout Lake
Buffalo Lake
Copp Lake
Slave R.
Hay R.
Scott Lake
Tazin Lake
N
120°
115°
110°
65°
105°
65°
60°
0 50 100 Miles
0 25 50 75 100 KM
Legend:
Territorial Capital
City/Town
Provincial & Territorial Boundaries
Minor Primary Roads
August 2011

RARE EARTH ELEMENTS

Rare earth elements comprise 15 lanthanide series elements in the periodic table (atomic numbers 57 through 71), and yttrium (atomic number 39). The locations of the rare earth elements and other products of the PFS are shown in the periodic table in Figure 2-3. The rare earth elements are divided into two groups:

- The Light Rare Earth Elements (LREE) or cerics, comprising of Ce, Pr, Nd, Pm, and Sm, and
- The Heavy Rare Earth Elements (HREE) or yttrics, comprising of Y, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu

Those elements possessing an even atomic number tend to be more plentiful than their odd-numbered neighbours and are preferred for commercial use. Despite their name, rare earths have a relatively high crustal abundance, however, economic concentrations of rare earth deposits are scarce. Chemical data for the rare earth elements are shown in Table 2-1.

LREO and HREO refer to oxides of light and heavy rare earth elements respectively. In this document, TREO (Total Rare Earth Oxides) refers to LREOs and HREOs collectively.

FIGURE 2-3 RARE EARTH ELEMENTS IN THE PERIODIC TABLE

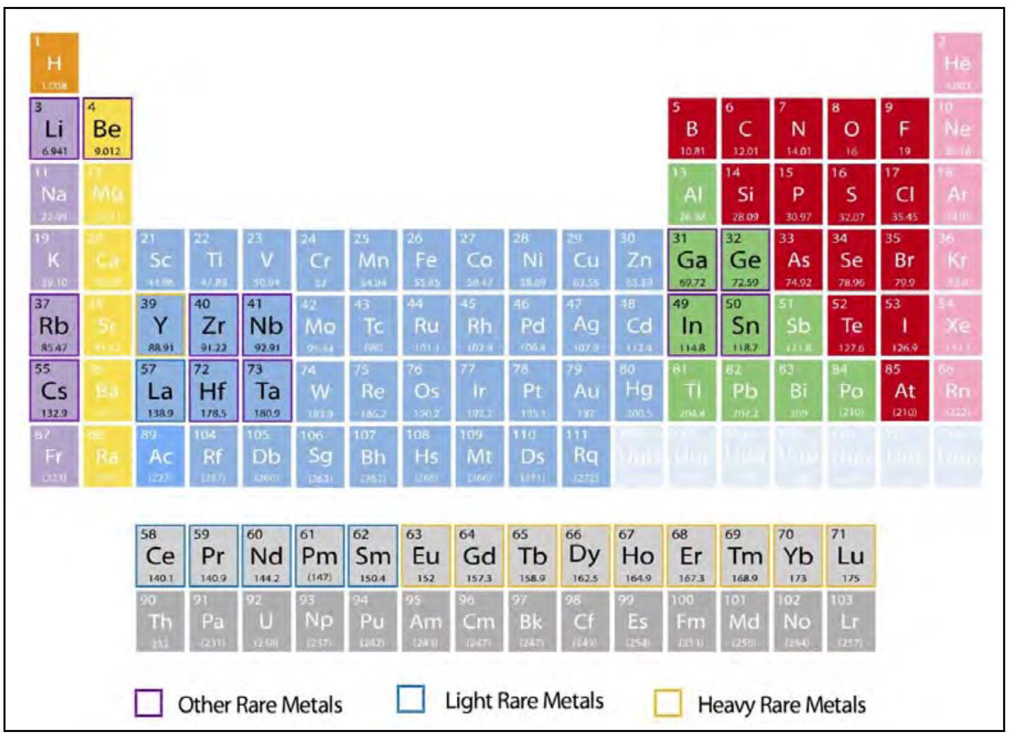


TABLE 2-1 RARE EARTH ELEMENT DATA
Avalon Rare Metals Inc. – Thor Lake Project

Classification	Symbol	Atomic Number	Valence	Atomic Weight	Crustal Abundance (ppm)	Oxides
Cerium Group (light rare earths)						
Lanthanum	La	57	3	138.92	29	La_2O_3
Cerium	Ce	58	3,4	140.13	70	CeO_2
Praseodymium	Pr	59	3,4	140.92	9	Pr_6O_{11}
Neodymium	Nd	60	3	144.92	37	Nd_2O_3
Promethium[1]	Pm	61	3	145	-	none
Samarium	Sm	62	2,3	150.43	8	Sm_2O_3
Europium	Eu	63	2,3	152	1.3	Eu_2O_3
Gadolinium	Gd	64	3	156.9	8	Gd_2O_3
Yttrium Group (heavy rare earths)						
Yttrium	Y	39	3	88.92	29	Y_2O_3
Terbium	Tb	65	3,4	159.2	2.5	Tb_4O_7
Dysprosium	Dy	66	3	162.46	5	Dy_2O_3
Holmium	Ho	67	3	164.92	1.7	Ho_2O_5
Erbium	Er	68	3	167.2	3.3	Er_2O_3
Thulium	Tm	69	3	169.4	0.27	Tm_2O_3
Ytterbium	Yb	70	2,3	173.04	0.33	Yb_2O_3
Lutetium	Lu	71	3	174.99	0.8	Lu_2O_3

[1] Does not occur in nature. It is radioactive and unstable.

APPLICATIONS OF RARE EARTH ELEMENTS

Rare earth elements are used in numerous applications in electronics, lighting, magnets, catalysts, high performance batteries and other advanced materials products. They are essential in these applications, with little to no potential for substitution by other materials. In some applications, selected rare earths may be substituted for each other, although with possible reductions in product performance. Table 2-2 illustrates some of the major applications for the rare earths to be produced at the Thor Lake Project.

TABLE 2-2 RARE EARTH ELEMENT APPLICATIONS
Avalon Rare Metals Inc. – Thor Lake Project

Rare Earths	Application	Demand Drivers
Nd, Pr, Sm, Tb, Dy	Magnets	Computer hard drives, consumer electronics, voice coil motors, hybrid vehicle electric motors, wind turbines, cordless power tools, Magnetic Resonance Imaging, and maglev trains
La, Ce, Pr, Nd	LaNiMH Batteries	Hybrid vehicle batteries, hydrogen absorption alloys for re-chargeable batteries
Eu, Y, Tb, La, Ce	Phosphors	LCDs, PDPs, LEDs, energy efficient fluorescent lamps
La, Ce, Pr, Nd	Fluid Cracking Catalysts	Petroleum production – greater consumption by 'heavy' oils and tar sands
Ce, La, Nd	Polishing Powders	Mechano-chemical polishing powders for TVs, computer monitors, mirrors and (in nano-particulate form) silicon chips
Ce, La, Nd	Auto Catalysts	Tighter NO_x and SO_2 standards – platinum is re-cycled, but for rare earths it is not economic
Ce, La, Nd,	Glass Additive	Cerium cuts down transmission of UV light, La increases glass refractive index for digital camera lens
Er, Y, Tb, Eu	Fibre Optics	Signal amplification

Source: Avalon Rare Metals Inc.

SOURCES OF INFORMATION

Site visits were carried out by Scott Wilson RPA, Melis and J.R. Goode and Associates (Goode) in September 2009 as part of the PFS. More recently, Tudorel Ciuculescu, P.Geo., of RPA visited the site from April 25 to 27, 2011. Discussions were held with personnel from Avalon in the course of reviewing the UPFS:

- Finlay Bakker, P.Geo., Senior Resource Geologist
- William Mercer, Ph.D., P.Geo., VP Exploration
- David Swisher, P.Eng., VP Operations
- Brian Delaney, P.Eng., Senior Project Manager
- Pierre Neatby, VP Sales and Marketing

The documentation reviewed, and other sources of information, are listed in Section 27, References at the end of this report.

This update relies heavily on the original PFS commenced in 2009. RPA was the lead consultant, and carried out a resource estimate, mine design, cost estimation and economic analysis. Melis Engineering Ltd. (Melis) carried out the design and cost estimates for the concentrator and capital cost estimates for the hydrometallurgical plant. Goode directed hydrometallurgical tests and carried out design and operating cost estimates for the hydrometallurgical plant. Knight Piésold carried out geotechnical studies, tailings and infrastructure designs. Stantec Inc. carried out an Environmental Baseline Study, and EBA Engineering Consultants Ltd. provided advice on the permitting process. Avalon provided marketing studies, which were reviewed by RPA.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the SI (metric) system. All currency in this report is US dollars (US$) unless otherwise noted.

µ	micron
°C	degree Celsius
°F	degree Fahrenheit
µg	microgram
A	ampere
a	annum
bbl	barrels
Btu	British thermal units
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia.	diameter
dmt	dry metric tonne
dwt	dead-weight ton
ft	foot
ft/s	foot per second
ft^2	square foot
ft^3	cubic foot
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
g/t	gram per tonne
gpm	Imperial gallons per minute
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
hr	hour
ha	hectare
hp	horsepower
in	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km/h	kilometre per hour
km^2	square kilometre
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
L/s	litres per second
m	metre
M	mega (million)
m^2	square metre
m^3	cubic metre
min	minute
MASL	metres above sea level
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
m^3/h	cubic metres per hour
opt, oz/st	ounce per short ton
oz	Troy ounce (31.1035g)
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
yd^3	cubic yard
yr	year

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by Roscoe Postle Associates Inc. (RPA) and J.R. Goode and Associates (Goode) for Avalon. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA and Goode at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Avalon and other third party sources.

For the purpose of this report, RPA has relied entirely on ownership information provided by Avalon. RPA has not researched property title or mineral rights for the Thor Lake Project and expresses no opinion as to the ownership status of the property.

RPA has relied on Avalon for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from Thor Lake Project. Avalon summarized this information from the Government of the Northwest Territories website and provided this to RPA in July 2011. This information was relied upon in Section 22, Economic Analysis, and in Section 1, Summary.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

LOCATION

The Thor Lake property is located in Canada's Northwest Territories, 100 km southeast of the capital city of Yellowknife and five kilometres north of the Hearne Channel on the East Arm of Great Slave Lake (GSL). The property is within the Mackenzie Mining District of the Northwest Territories and Thor Lake is shown on National Topographic System (NTS) map sheet 85I/02 at approximately 62°06'30''N and 112°35'30''W (6,886,500N, 417,000E – NAD83).

LAND TENURE

The Thor Lake property consists of five contiguous mineral leases (totalling 4,249 ha, or 10,449 acres) and three claims (totalling 1,869 ha, or 4,597 acres) (Figure 4-1). The claims were staked in 2009 to cover favourable geology to the west of the mining leases. Pertinent data for the mining leases are shown in Table 4-1 while the mineral claims data are shown in Table 4-2.

TABLE 4-1 MINERAL LEASE SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Lease Number	Area (ha)	Legal Description	Effective Date	Expiration Date
3178	1,053	Lot 1001, 85 I/2	05/22/1985	05/22/2027
3179	939	Lot 1000, 85 I/2	05/22/1985	05/22/2027
3265	367	Lot 1005, 85 I/2	03/02/1987	03/02/2029
3266	850	Lot 1007, 85 I/2	03/02/1987	03/02/2029
3267	1,040	Lot 1006, 85 I/2	03/02/1987	03/02/2029
Total	**4,249**			

TABLE 4-2 MINERAL CLAIMS SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Mineral Claim Number	Mineral Claim Name	Claim Sheet Number	Mining District
K12405	Angela 1	85I2	Mackenzie
K12406	Angela 2	85I2	Mackenzie
K12407	Angela 3	85I2	Mackenzie

The mining leases have a 21-year life and each lease is renewable in 21-year increments. Annual payments of $2.47/ha ($1.00 per acre) are required to keep the leases in good standing. Avalon owns 100% of all of the leases subject to various legal agreements described below.

LEGAL AGREEMENTS, UNDERLYING ROYALTY INTERESTS

Two underlying royalty agreements exist on the Thor Lake property: the Murphy Royalty Agreement and the Calabras/Lutoda Royalty Agreement, both of which originated with Highwood Resources Ltd. (Highwood), the original developer of the property.

The Murphy Royalty Agreement, signed in 1977, entitles J. Daniel Murphy to a 2.5% Net Smelter Return (NSR) payments. The Murphy Royalty Agreement applies to the entire Thor Lake property and the royalty is capped at an escalating amount indexed to inflation. There is a provision in the Murphy Royalty which would permit Avalon to purchase the royalty at the commencement of production. The Calabras/Lutoda Royalty Agreement, signed in 1997, entitles Calabras (Canada) Ltd. to a 2% NSR and Lutoda Holding Ltd. to a 1% NSR.

The cash flow supporting the Mineral Reserves in this Report includes the assumption that the NSR royalties have been purchased prior to the start of construction, and are therefore not included.

LEGAL SURVEY

The Thor Lake mineral leases have been legally surveyed and are recorded on a Plan of Survey, Number 69408 M.C. in the Legal Surveys Division of the Federal Department of Energy, Mines and Resources, Ottawa. The perimeter boundaries of the lease lots were surveyed as part of the leasing requirements.

ENVIRONMENTAL LIABILITIES

Highwood held a land use permit that allowed for clean up, maintenance and exploration on the property. The permit expired on October 26, 2002. Under the Mackenzie Valley Land and Water Resources Act and Regulations, the Mackenzie Valley Land and Water Board (MVLWB) administers land use permits. The Mackenzie Valley Resource Management Act (MVRMA) allows local and particularly aboriginal input into land and water use permitting. The MVRMA establishes a three-part environmental assessment process:

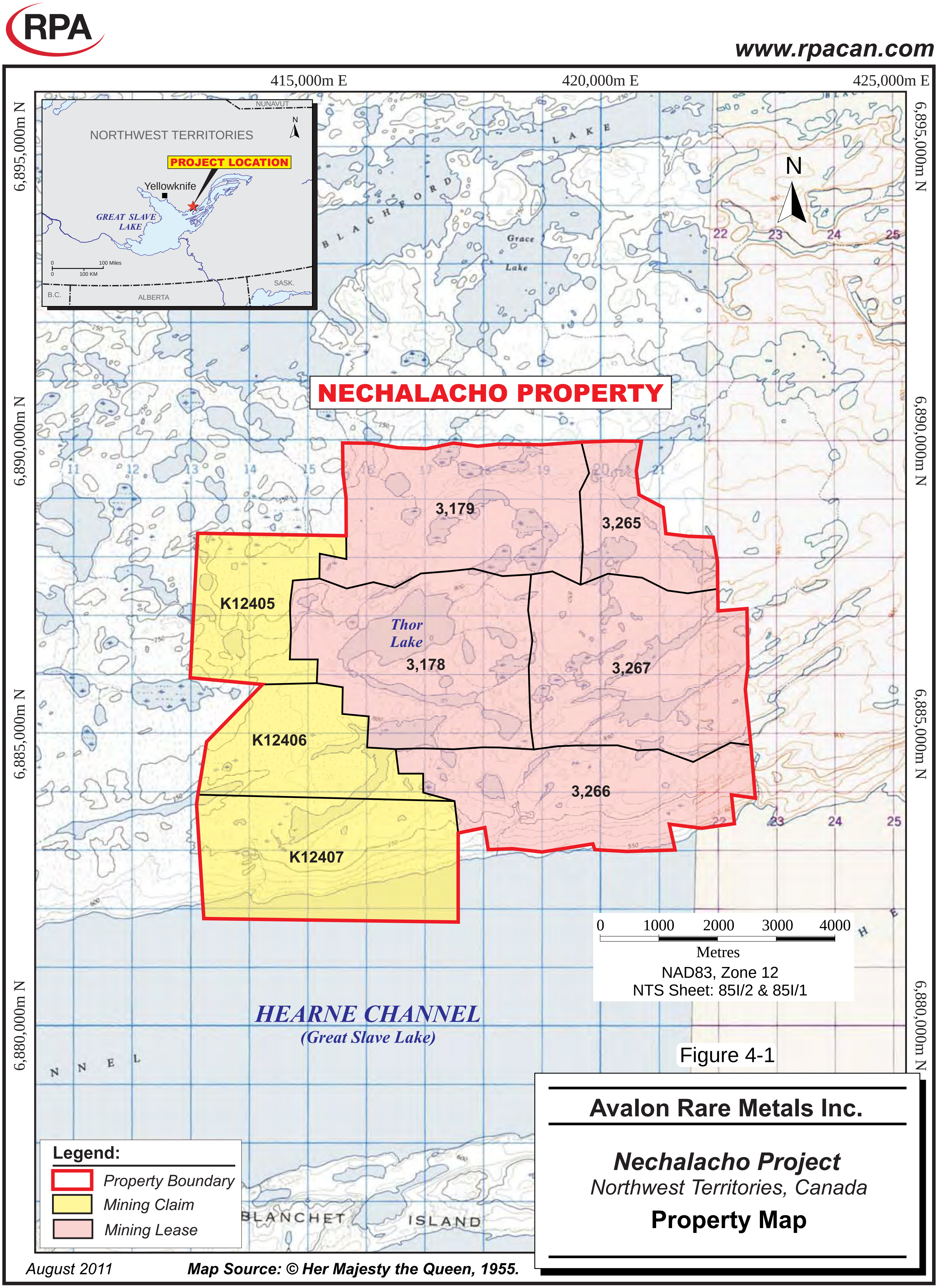
- Preliminary screening
- Environmental assessment
- Environmental impact review (panel review, if necessary)

For a production permit, the Thor Lake Project will require preliminary screening as well as an environmental assessment review.

Subsequent to the acquisition of the property and completion of community engagement meetings, Avalon applied to the MVLWB for an exploration permit. A two year permit was granted effective July 2007. It was under this permit that the drilling programs in 2007 to the present were conducted. The permit was renewed in July 2009 for a further two years and an amendment granted including the operation of two diamond drills. Avalon also received a new land use permit from the Mackenzie Valley Land and Water Board (MVLWB) covering its current activities at the site, as the existing permit was scheduled to expire on July 4, 2011. The new land use permit was issued by the MVLWB on June 23, 2011, for a period of five years beginning on July 5, 2011.

Past exploration on the Thor Lake property included underground bulk sampling, drilling and trenching. Accordingly, there is little surface disturbance from exploration activities. Apart from a trailer camp, miscellaneous buildings, a 60,000 gallon six tank farm, a tent camp and a core storage area located on the property, there are no other environmental liabilities left by past exploration activities. The diesel fuel remaining in the tank farm has been consumed during Avalon's recent exploration activities and the tanks will be repurposed for future operations. Parts of the trailer camp have been removed, while others have been refurbished and utilized for current camp and office facilities. A recent reclamation campaign removed over 6,000 cubic metres of historic waste piles for use in Avalon's completed airstrip.

The company has undertaken extensive general cleanup of material left from previous exploration utilizing First Nations labour. Access to the underground workings has been barricaded and the mine workings allowed to flood. Warning fencing has also been installed around the ramp entrance.


RPA
www.rpacan.com
415,000m E
420,000m E
425,000m E
6,895,000m N
6,890,000m N
6,885,000m N
6,880,000m N
NORTHWEST TERRITORIES
NUNAVUT
PROJECT LOCATION
Yellowknife
GREAT SLAVE LAKE
B.C.
ALBERTA
SASK.
NECHALACHO PROPERTY
Thor Lake
3,179
3,265
3,178
3,267
3,266
K12405
K12406
K12407
BLACHFORD LAKE
Grace Lake
HEARNE CHANNEL
(Great Slave Lake)
BLANCHET ISLAND
0 1000 2000 3000 4000
Metres
NAD83, Zone 12
NTS Sheet: 85I/2 & 85I/1
Legend:
Property Boundary
Mining Claim
Mining Lease
Figure 4-1
Avalon Rare Metals Inc.
Nechalacho Project
Northwest Territories, Canada
Property Map
August 2011
Map Source: © Her Majesty the Queen, 1955.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

Depending upon the season, the Thor Lake Project is accessible either by boat, winter road and/or float, ski-equipped and wheeled aircraft (generally from Yellowknife or Hay River). During the transition periods to either winter or spring access to the area is difficult and a helicopter is the easiest way into the project site. At present, the nearest road access is the Ingraham Trail, an all season highway maintained by the government of the NWT. This trail is located approximately 50 km (direct line) from the property. Thor Lake has an existing permanent airstrip, which allows for a minimum of Twin-Otter-sized aircraft service from Yellowknife throughout the year. Plans to upgrade this airstrip to accommodate a Dash 8 or Buffalo types of aircraft, are included in this report for the proposed construction and operations activities.

For a future mining operation, equipment can be barged to a landing site on the Hearne Channel on GSL during the summer. Temporary dock facilities will be constructed on the GSL to enable the loading and off-loading of cargo going to or coming from various sites. This material can then be transported approximately eight kilometres to the Nechalacho deposit via an existing access road (although upgrading will be required).

During the wintertime, heavy equipment and bulk materials can access the site using winter roads on the ice cover of GSL, but the UPFS does not include regular use of a winter road.

CLIMATE

Climate data for the Thor Lake area is available from regional weather stations located in Inner Whalebacks, Yellowknife, Lutselk'e, Fort Resolution, Fort Reliance and Pine Point, and from a weather station installed on site in 2008. Temperatures recorded for the area range from -50°C in the winter to +30°C in the summer. Maximum monthly rainfall recorded on site was 49.6 mm in September 2008, and maximum hourly rainfall was 4.8 mm in August 2009. Wind blows predominantly from the east-northeast during

November through June, while it is more dispersed during July through October. During 2009, highest wind speeds were recorded during May and June with monthly averages of 7.2 km/h. Maximum evaporation is expected in July and the evaporation rate is estimated to be between 73 mm and 83 mm. Monthly relative humidity measurements ranged from 91% in December 2008 to 60% in May 2009. Snow depths were highest at the East Thor course with 66 cm, while the site mean was 57 cm, with a snow water equivalent of 94 mm. Historically, the average annual snowfall is 152 cm for the region.

Most lakes in the area do not freeze to the bottom and process water will be available year-round. Freeze-up commences in late October and break-up of the majority of the lakes in the area is generally complete by late May. Great Slave Lake freezes later and stays ice-free longer than the smaller lakes.

The Pine Point area is characterized by short, cool summers and long, cold winters. The mean annual temperature is -17.5 ºC, and annual precipitation ranges from 300 mm to 400 mm. This eco-region is classified as having a sub-humid mid-boreal eco-climate.

LOCAL RESOURCES

INFRASTRUCTURE

Yellowknife (population 20,000) and Hay River (population 3,500) are two key transportation hubs in the NWT. Both communities have very good supporting infrastructure and are located in relatively close proximity to the TLP. The local economy is generally dependent upon government services although both communities act as transit sites for mining and mineral exploration activities throughout the NWT and Nunavut.

The TLP is situated in the Akaitcho Territory, an area that is subject to a comprehensive land claim negotiation involving communities belonging to the Yellowknives Dene, Lutsel k'e Dene and the Deninu Kue First Nations.

The Yellowknives Dene consists of two communities, known as N'Dilo and Dettah, each having over 250 residents. N'Dilo is located on Latham Island in the northern part of the City of Yellowknife. Dettah, accessible by road, is located southeast of Yellowknife, across Yellowknife Bay. The Yellowknives Dene asserts that TLP lies within their traditional territory known as the Chief Drygeese Territory.

The community of Lutsel K'e is located on Christie Bay on the East Arm of GSL and is accessible by air or boat. It has a population of over 250.

Fort Resolution is located on the southeast coast of the main body of GSL in Resolution Bay. The Deninu Kue First Nation is based in Fort Resolution and has a population of over 500. The community is serviced by road from Hay River and by air.

The town of Hay River, located on the south shore of GSL where the Hay River enters the lake, extends south from the lake along the west bank of the river. The largest aboriginal community in the Hay River area is the Katlodeeche First Nation, often referred to as the Hay River Reserve, which is located on the east bank of the Hay River across from the town. Hay River is accessible by air, rail and by using Highway 3 from Edmonton, Alberta.

Both the north and south sides of GSL are occupied by two groups of Metis. The North Slave Metis Association (NSMA) is located in Yellowknife, while the Northwest Territory Metis Nation is located in Fort Smith (and represents the communities of Fort Smith Metis, Fort Resolution Metis and Hay River Metis).

Yellowknife uses diesel and hydroelectric facilities to generate its power and at the present time this is the closest source of power to Thor Lake. However, there is no transmission line and the generating capacity is limited. A hydroelectric generating facility is located on the Taltson River approximately 200 km to the south of Fort Smith. The Taltson hydroelectric facility currently has 5 to 6 MW of unused power that could be utilized by Avalon for a hydrometallurgical plant. The power line from the Taltson facility passes through Pine Point.

Water is available at TLP from any one of the surrounding lakes. When mining commences, water tanks will be built to act as storage and as a reserve for fire protection at both sites. All water lines exposed to the elements will be insulated and heat traced.

Reliable phone and e-mail communications currently exist at the Nechalacho deposit and will be upgraded to serve the larger crews for future construction and operations activities. Similar communications will be installed for the hydrometallurgical plant facilities.

PHYSIOGRAPHY

The TLP is characterized by low relief, between 230 m and 255 m above sea level and relatively subdued topography. The area is a typical boreal forest of the Canadian Shield and is primarily covered by open growths of stunted spruce, birch, poplar and jack pine which mantle isolated, glaciated rocky outcrop. Approximately one third of the property is occupied by lakes and swamps; the largest lake is Thor Lake at 238 m above mean sea level and with a surface area of approximately 136 ha. Thor Lake is generally shallow with typical depths of the order of three to four metres.

Baseline environmental technical reports have been completed in December 2009.

6 HISTORY

The TLP area was first mapped by J.F. Henderson and A.W. Joliffe of the Geological Survey of Canada (GSC) in 1937 and 1938. According to National Mineral Inventory records of the Mineral Policy Sector, Department of Energy, Mines and Resources, the first staking activity at Thor Lake dates from July 1970 when Odin 1-4 claims were staked by K.D. Hannigan for uranium. The Odin claims covered what was then called the Odin Dyke and is now known as the R-Zone. Shortly after, the Odin claims were optioned to Giant Yellowknife Mines Ltd. and subsequently, in 1970, were acquired by Bluemount Minerals Ltd.

In 1971, the GSC commissioned an airborne radiometric survey over the Yellowknife region that outlined a radioactive anomaly over the Thor Lake area (GSC Open File Report 124). Simultaneously, A. Davidson of the GSC initiated mapping of the Blatchford Lake Intrusive Complex. It has subsequently become clear that this radiometric anomaly is largely due to elevated thorium levels in the T-Zone within the TLP.

Four more claims (Mailbox 1-4) were staked in the area in 1973. No description of any work carried out on the claims is available and both the Odin and Mailbox claims were allowed to lapse. No assessment work was filed.

In 1976, Highwood Resources Ltd., in the course of a regional uranium exploration program, discovered niobium and tantalum on the Thor Lake property. The property was staked as the Thor 1-45 claims and the NB claims were added in 1976 and 1977. From 1976 to 1979, exploration programs included geological mapping, sampling and trenching on the Lake, Fluorite, R-, S- and T-zones. Twenty-two drill holes were also completed, seven of these on the Lake Zone. This work resulted in the discovery of significant concentrations of niobium, tantalum, yttrium and REEs. Hole 79-1 intersected 0.67% Nb_2O_5, and 0.034% Ta_2O_5 over 24.99 m. Results also indicated a general paucity of uranium mineralization and that the anomalous radioactivity was due to thorium. Following this, and inconclusive lake bottom radiometric and radon gas soil surveys, Calabras, a private holding company, acquired a 30% interest in the property by financing further exploration by Highwood. This was done through Lutoda Holdings, a company incorporated in Canada and owned by Calabras.

Recognizing a large potential resource at Thor Lake, Placer Development Ltd. (Placer) optioned the property from Highwood in March 1980 to further investigate the tantalum and related mineralization. Placer conducted magnetometer, very low frequency (VLF) electro-magnetic and scintillometer surveys on the Lake Zone. Thirteen holes were initially drilled in 1980. This was followed by five more in 1981 focused around drill hole 80-05 (43 m grading 0.52% Nb_2O_5 and 0.034% Ta_2O_5). Preliminary metallurgical scoping work was also conducted, but Placer relinquished its option in April of 1982 when the mineralization did not prove amenable to conventional metallurgical extraction.

From 1983 to 1985, the majority of the work on the property was concentrated on the T-Zone and included geochemical surveys, berylometer surveys, surface mapping, significant drilling, surface and underground bulk sampling, metallurgical testing and a detailed evaluation of the property by Unocal Canada. During this period, a gravity survey was conducted to delineate the extent of the Lake Zone. Five holes were also drilled in the Lake Zone to test for high grade tantalum-niobium mineralization and to determine zoning and geological continuity. Two additional holes were completed at the southeast end of Long Lake to evaluate high yttrium and REE values obtained from nearby trenches.

In August of 1986, the property was joint-ventured with Hecla Mining Company of Canada Ltd. (Hecla). By completing a feasibility study and arranging financing to bring the property into production, Hecla could earn a 50% interest in the property. In 1988, earlier holes were re-assayed and 19 more holes were drilled into the Lake Zone, primarily in the southeast corner, to further test for yttrium and REE. In 1990, after completing this and considerable work on the T-Zone, including some limited in-fill drilling, extensive metallurgical testing conducted at Lakefield and Hazen Research Ltd. (Hazen) in Denver and conducting a marketing study on beryllium, Hecla withdrew from the project. In 1990, control of Highwood passed to Conwest Exploration Company Ltd. (Conwest) and the Thor Lake project remained dormant until 1996, at which time Conwest divested itself of its mineral holdings. Mountain Minerals Company Ltd. (Mountain), a private company controlled by Royal Oak Mines Ltd., acquired the 34%

controlling interest of Highwood following which Highwood and Mountain were merged under the name Highwood.

In 1997, Highwood conducted an extensive re-examination of Thor Lake that included a proposal to extract a 100,000 tonne bulk sample. Applications were submitted for permits that would allow for small-scale development of the T-Zone deposit, as well as for processing over a four to five year period. In late 1999, the application was withdrawn.

Royal Oak's subsequent bankruptcy in 1999 resulted in the acquisition of the control block of Highwood shares by Dynatec Corporation (Dynatec). In 2000, Highwood initiated metallurgical, marketing and environmental reviews by Dynatec.

In 2001, Navigator Exploration Corp. (Navigator) entered into an option agreement with Highwood. Navigator's efforts were focused on conducting additional metallurgical research at Lakefield in order to define a process for producing a marketable tantalum concentrate from the Lake Zone. These efforts produced a metallurgical grade tantalum/zirconium/niobium/yttrium/REE bulk concentrate. The option, however, was dropped in 2004 due to falling tantalum prices and low tantalum contents in the bulk concentrate.

Beta Minerals Inc. (Beta) acquired Highwood's interest in the Thor Lake property in November 2002 under a plan of arrangement with Dynatec. No work was conducted at Thor Lake by Beta and in May 2005 Avalon purchased from Beta a 100% interest and full title, subject to royalties, to the Thor Lake property.

In 2005, Avalon conducted extensive re-sampling of archived Lake Zone drill core to further assess the yttrium and HREE resources on the property. In 2006, Wardrop Engineering Inc. (Wardrop) was retained to conduct a Preliminary Assessment (PA) of the Thor Lake deposits (Wardrop, 2009). In 2007 and 2008 Avalon commenced further drilling of the Lake Zone.

After the PFS, described previously, Avalon prepared a technical report for the Nechalacho deposit (Avalon, March 2011, "Technical Report on the Nechalacho Deposit, Thor Lake Project, Northwest Territories, Canada").

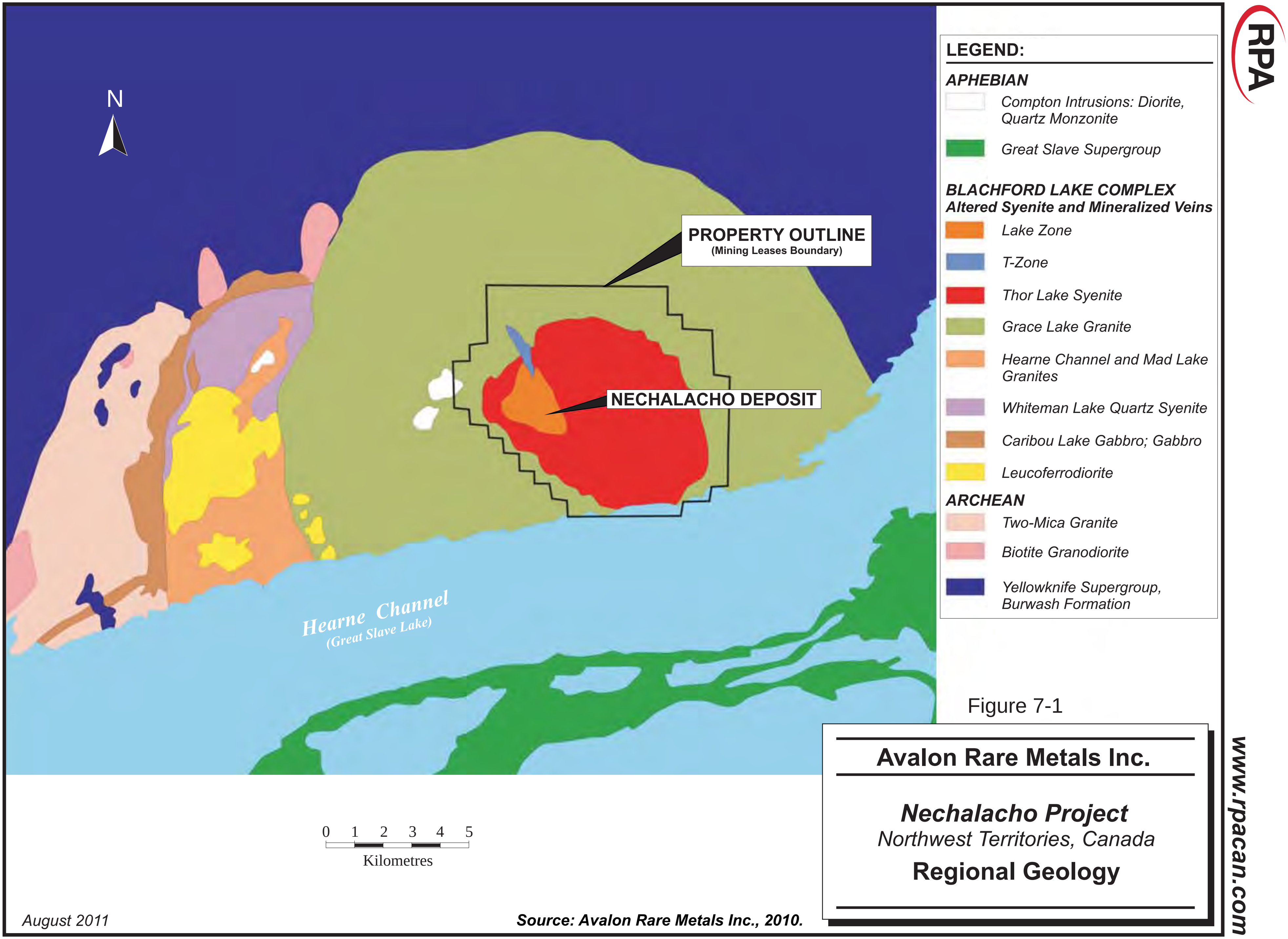
7 GEOLOGICAL SETTING AND MINERALIZATION

The geological setting of the Nechalacho deposit has been described in detail in the RPA Technical Report referred to previously (Scott Wilson RPA, 2010). The text below will summarize the main conclusions and update with Avalon's present geological thinking.

REGIONAL GEOLOGY

The following section is summarized from Trueman et al. (1988), LeCouteur (2002), Pedersen et al. (2007), and supplemented with observations made by Avalon geologists during the drill programs of 2007 to 2010.

The various Thor Lake mineral deposits occur within the Aphebian Blatchford Lake Complex (BLC), which includes Achaean Yellowknife Supergroup metasedimentary rocks of the southern Slave geologic province (Figure 7-1). The BLC has an alkaline character and intrusive phases vary successively from early pyroxenite and gabbro through to leuco-ferrodiorite, quartz syenite and granite, to peralkaline granite and a late syenite (Davidson, 1982). There appears to be successive intrusive centres with an earlier western centre truncated by a larger centre that consists of the Grace Lake Granite and the Thor Lake Syenite. Nepheline syenite underlies the Thor Lake Syenite on the Nechalacho deposit. This unit was recognized in drilling by Avalon during 2007 to 2010. Outcrops of the nepheline syenite within the area of the Nechalacho deposit display strong hydrothermal alteration and consequently the unit was not originally mapped as distinct from the Thor Lake syenite.


N
PROPERTY OUTLINE
(Mining Leases Boundary)
NECHALACHO DEPOSIT
Hearne Channel
(Great Slave Lake)
0 1 2 3 4 5
Kilometres
LEGEND:
APHEBIAN
Compton Intrusions: Diorite, Quartz Monzonite
Great Slave Supergroup
BLACHFORD LAKE COMPLEX
Altered Syenite and Mineralized Veins
Lake Zone
T-Zone
Thor Lake Syenite
Grace Lake Granite
Hearne Channel and Mad Lake Granites
Whiteman Lake Quartz Syenite
Caribou Lake Gabbro; Gabbro
Leucoferrodiorite
ARCHEAN
Two-Mica Granite
Biotite Granodiorite
Yellowknife Supergroup, Burwash Formation
Figure 7-1
Avalon Rare Metals Inc.
Nechalacho Project
Northwest Territories, Canada
Regional Geology
August 2011
Source: Avalon Rare Metals Inc., 2010.
RPA
www.rpacan.com

Davidson (1978) subdivided the BLC into six texturally and compositionally distinct plutonic units known as the Caribou Lake Gabbro, the Whiteman Lake Quartz Syenite, the Hearne Channel Granite, the Mad Lake Granite, the Grace Lake Granite and the Thor Lake Syenite. Based on exposed cross-cutting relationships of dykes and the main contacts, Davidson recognized a sequence of five intrusive events. The rocks of the last intrusive event, being compositionally and spatially distinct, are sub-divided by Davidson into the Grace Lake Granite and the Thor Lake Syenite.

Although these two units are defined as separate entities there are no known cross-cutting relationships and they are in fact believed by Avalon's geologists to be time-equivalent. It is now believed that the only real differences between the Thor Lake Syenite and Grace Lake Granite are their varying quartz contents and the degree of silica saturation. In fact, the two sub-units likely reflect a single early intrusive magma pulse which preceded a second related pulse of nepheline sodalite-bearing peralkaline magma. Until 2010, the hydrothermally altered apical portion of this nepheline syenite was believed to be exposed only under and between Thor and Long Lakes. Previously it was described as altered Thor Lake Syenite. Now the nepheline syenite unit has been encountered in drilling north of Thor Lake, and under Cressy Lake, thus establishing that it is more extensive than originally believed. Drilling of the Nechalacho deposit has also shown that the same nepheline-sodalite peralkaline syenite that underlies the Thor Lake Syenite is, in fact, a distinct intrusion. The nepheline syenite is now informally referred to as the "Nechalacho syenite".

Recent age-dating of the BLC supports the view that all of the intrusions are related since the main eastern and western intrusive centres have comparable ages. The Hearne Channel Granite has been dated at 2,175 +/-5 million years while the Whiteman Lake Syenite is dated at 2,185 +/-5 million years (Bowring et al, 1984) and the Grace Lake Granite is dated at 2,176+/-1.3 million years (Sinclair and Richardson, 1994).

Henderson (1985) reports that small dioritic plugs, which have been assigned to the Compton Lake Intrusive Suite, cross-cut the Grace Lake Granite. As well, diabase dykes of the 1,200 million year old Mackenzie swarm and the 2,000 million year old Hearne dyke swarm cut most of the members of the BLC.

Most of the Thor Lake Property is underlain by the Thor Lake Syenite and Nechalacho syenite within the central part of the Grace Lake Granite. The T-Zone deposits cross-cut both rock types whereas the Nechalacho deposit is confined to the area of the hosted in the underlying Nechalacho nepheline syenite.

The Grace Lake Granite is a coarse-grained, massive, equigranular, riebeckite-perthite granite with about 25% interstitial quartz. Near the contact between the Grace Lake Granite with the Thor Lake Syenite the two units are texturally similar and the contact appears to be gradational over a few metres. Because of their textural similarity and gradational contact relations, Davidson suggested that both rock types are derived from the same magma.

The Thor Lake Syenite is completely enclosed by the Grace Lake Granite. The most distinctive sub-unit is a fayalite-pyroxene mafic syenite which locally has a steep dip and is located close to the margin of the main amphibole syenite and the Grace Lake Granite. It forms a distinct semi-circular ridge, locally termed the rim syenite, which can be traced for a distance of about eight kilometres and has the appearance of a ring dyke, most prominent on the east side of the Thor Lake body. The rim syenite is clearly identifiable on the airborne magnetic map.

The nepheline-sodalite syenite hosting the Nechalacho deposit, here termed the Nechalacho nepheline sodalite syenite, has the following key distinctive features which contrast it to the Thor Lake Syenite and Grace Lake Granite:

1. It has a distinct chemical composition with under-saturation in quartz as shown by the presence of nepheline and sodalite as primary rock-forming minerals.
2. It displays cumulate layering.
3. It contains agpaitic zircon-silicates (including eudialyte).
4. It is the host to the Nechalacho zirconium-niobium-tantalum-rare earth element mineralization.

The Nechalacho Syenite is only exposed at surface in a small portion of the Thor Lake Syenite between Long and Thor Lakes. It is believed that the Nechalacho Syenite dips underneath the Thor Lake syenite in all directions. This is supported by drilling north of Thor Lake, within and close to Cressy Lake. Also, the Nechalacho mineralization occurs in the top, or apex, of the Nechalacho nepheline syenite.

The Nechalacho nepheline sodalite syenite consists of a layered series of rocks with increasing peralkaline characteristics at depth. A consistent, downward progression is noted from the hanging wall sodalite cumulates, through the coarse-grained or pegmatitic nepheline aegirine syenites (which are locally enriched in zircon-silicates), to foyaitic syenite within a broad zone of altered “pseudomorphs-after-eudialyte” cumulates (referred to as the Basal Zone). This upper sequence is also intensely altered by various Na and Fe hydrothermal fluids. Pre-existing zircon-silicates are completely replaced by zircon, allanite, bastnaesite, fergusonite and other minerals. Beneath the Basal Zone cumulates, mineralization decreases rapidly, but alteration decreases more gradually, with relict primary mineralogy and textures increasingly preserved. Aegirine and nepheline-bearing syenites and foyaitic syenites progress downward to sodalite foyaites and naujaite. Drilling has not extended beyond this sodalite lithology to date. Minerals related to agpaitic magmatism identified from this lower unaltered sequence include eudialyte, catapleite, analcime, and possibly mosandrite.

REGIONAL STRUCTURES

The BLC was emplaced in a setting that was initially extensional with a triple junction rift consisting of structures oriented at azimuths of 060 to 070 degrees, 040 degrees, and 330 degrees. These structures are readily seen on large-scale topographic and magnetic maps but their presence can be detected at the outcrop scale and within the distribution of the structurally influenced mineralized zones (R-, S-, and T-zones). The 060 to 070 degrees and the 040 degrees structures represent orientations of the failed “East Arm Aulacogen” now occupied by the Hearne Channel in the vicinity of the Nechalacho deposit. The presence of younger, Aphebian-age, metasedimentary and metavolcanic rocks of the Great Slave Supergroup to the south of Hearne Channel demonstrates that the two structures represent extensional fractures bordering a basin that was subsequently filled with sedimentary and volcanic rocks.

Later phases of tectonic movement were principally compressional and relate to closure of the rift, over-thrusting, nappe emplacement and recumbent folding in the East Arm, and collision of the Great Bear Magmatic terrain. Younger (Proterozoic) metasedimentary and metavolcanic rocks south of Thor Lake were deposited in the failed arm of the triple junction rift, and their position now represents the location of this feature.

DIABASE DYKES

Two ages of diabase dyke swarms are presently known as the Mackenzie and the Hearne. The Mackenzie dykes are dated at 1.27 billion years, have a north-northeast strike orientation and are part of the largest dyke swarm on Earth. Although there are Mackenzie dykes in the general vicinity of Thor Lake none are known to cut the Nechalacho deposit.

The Hearne dykes are dated at 1.902 billion years and trend ENE. Diabase dykes locally cut the Nechalacho deposit and these are interpreted as Hearne-age dykes. At present, the dykes are not well constrained as drill intercepts are infrequent, due to the near vertical nature of the dykes and the mainly vertical drilling. However, in a few cases, vertical drilling has gone down the interior of dykes, and also where there are multiple intercepts, the steep nature of the dykes is clear. At present, there is no evidence that the Hearne dykes are emplaced in fault structures that have experienced significant displacement. However, this possibility should not be ignored during the exploration program.

STRUCTURE AND TECTONICS

It is interpreted that the Nechalacho deposit is a virtually undeformed deposit where most of the features observed were generated by the magmatic and hydrothermal processes. In the least altered portions of the deposit, delicate primary textures are well preserved and no penetrative tectonic or metamorphic fabric is observed.

The distribution of most of the rock units and the mineralization generally follows a sub-horizontal pattern that can be traced for several hundreds of metres. However, the sub-horizontal pattern is interpreted to be locally disturbed by changes in elevation of up to 40 m. These changes in elevation may occur erratically or along linear trends. As noted above, the deposit is also cut by late diabase dykes, which are part of the ENE trending Hearne dyke swarm.

LATE TECTONIC FAULTS

Faults are present, and are generally less than a metre in thickness and are characterized by fault gouge, breccia, frequent red hematite, and variable amounts of carbonate-quartz veining. However, it is believed that these are minor local features relating to late release of pressure in the solidifying magma chamber.

LOCAL AND PROPERTY GEOLOGY

A detailed property geology map is shown in Figure 7-2.

As noted above, the mineralization in the Nechalacho deposit occurs as sub-horizontal layers of ore minerals with varying thicknesses. These layers may be subject to changes in elevation of the order of tens of metres over relatively short distances. The variation in level of specific zones of mineralization at the Nechalacho deposit is not well defined due to the drill spacing relative to the dimensions of the features. The Basal Zone, which is relatively continuous, can be traced over hundreds of metres close to one topographic level, and then may change gradually or abruptly to another level, some tens of metres higher or lower. The Basal Zone, overall, appears to form an irregular dome like structure some 1.5 km to 2 km across, with areas of shallower Basal Zone towards the centre and deeper Basal Zone towards the margins. However, this dome like shape is very imperfectly formed.

The broader Upper Zone is a zone of relative enrichment in zircon and rare earth and rare metal (Nb and Ta) elements within a wider alteration and mineralization package. It generally has a lower proportion of heavy rare earth elements when compared to the Basal Zone. The sub-zones of mineralization within the Upper Zone cannot be easily correlated from drill hole to drill hole, especially over distances of more than perhaps 100 m, and so are apparently less continuous than the Basal Zone.

Variations in elevation of the mineralized zones are probably due to one or more of at least three possible features:

1. Displacement along brittle structures.
2. Primary undulations of crystal layers due to slumping or turbidity currents within the magma chamber at the time of crystallization.
3. Lens-like features as observed in other similar deposits with more rock exposure (such as observed at Illimausaq, Greenland).

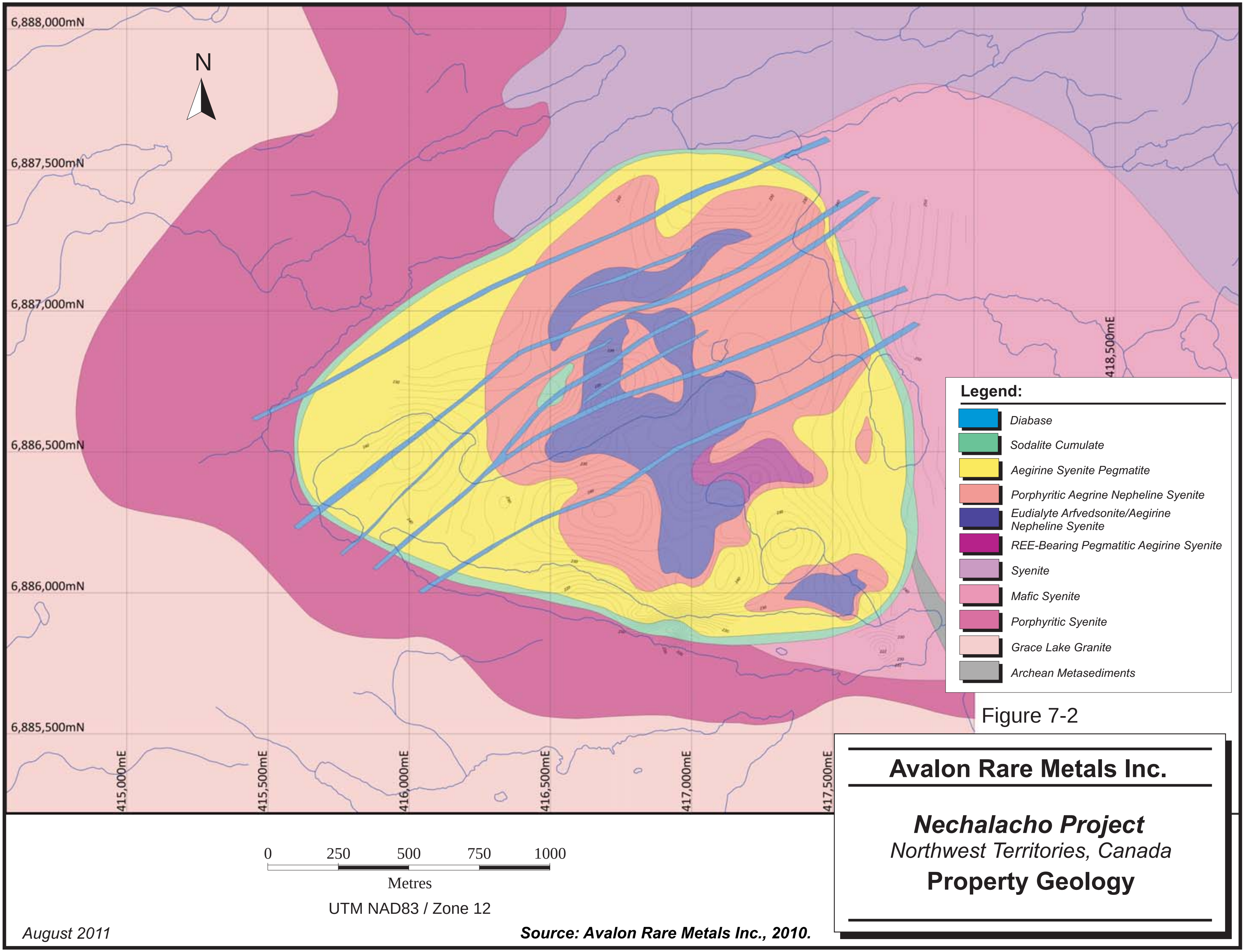


Figure 7-2

Avalon Rare Metals Inc.

Nechalacho Project

Northwest Territories, Canada

Property Geology

It is suggested that the changes in elevation of the Basal Zone may be due to one or both of the first two features listed above. The third type of feature – lenses - is very likely the explanation for the discontinuous nature of the Upper Zones at Nechalacho compared to the Basal Zone.

MINERALIZATION

Mineralization in the Nechalacho deposit includes Light Rare Earth Elements (LREE) found principally in allanite, monazite, bastnaesite and synchysite; yttrium, HREE and tantalum found in fergusonite; niobium in ferro-columbite; HREE and zirconium in zircon; and gallium in biotite, chlorite and feldspar in albitized feldspathic rocks. This mineralogy has been studied by SGS Minerals Services (SGS), XPS Process Services and McGill University utilizing optical microscopes, scanning electron microprobe analysis and Qemscan® equipment.

Detailed discussion of the character of the mineralization is included in Section 8 under the heading “Characteristics of the Nechalacho Deposit”. This includes presentation of the typical thicknesses of the Basal Zone.

TABLE OF MINERALS AND COMPOSITIONS

The abundance of the rare earth bearing minerals as a proportion of the rock is summarized in Table 7-1, with the mineralogy of the concentrates included for comparison purposes in Table 7-2.

TABLE 7-1 AVERAGE PERCENT OF ORE MINERALS
Avalon Rare Metals Inc. – Thor Lake Project

Average Percent of Ore Minerals	All Rock	Upper Zone	Basal Zone	Concentrate
Zircon	65.3%	62.8%	66.2%	63.0%
Fergusonite	3.7%	2.6%	4.3%	5.4%
Bastnaesite	3.8%	4.0%	3.4%	0.7%
Synchysite	4.1%	4.4%	3.8%	1.5%
Monazite	6.4%	9.4%	5.2%	5.5%
Allanite	12.3%	12.0%	13.3%	19.6%
Other REE	0.1%	0.1%	0.0%	0.1%
Columbite	4.3%	4.5%	3.8%	4.1%
Total	**100%**	**100%**	**100%**	**100%**

TABLE 7-2 PERCENT OF ROCK OR CONCENTRATE
Avalon Rare Metals Inc. – Thor Lake Project

	% of Rock Samples							% of Concentrate	
	11806 -001	11806 -002	11806 -006	11806 - 006UZ	XPS-UZ-Feed	11806 - 006BZ	XPS-BZ-Feed	11806-003	11806 -005
Zircon	11.00	13.10	3.79	4.36	7.07	9.35	6.93	35.69	31.25
Fergusonite	0.60	0.70	0.19	0.18	0.30	0.58	0.58	3.05	2.65
Bastnaesite	0.40	0.20	0.26	0.38	0.30	0.51	0.68	0.38	0.40
Synchysite	0.90	0.40	0.28	0.42	0.33	0.32	0.61	0.78	0.82
Monazite	1.50	1.10	0.31	0.59	1.15	0.41	0.40	2.87	2.99
Allanite	3.60	3.70	0.52	0.79	1.42	1.25	0.60	11.03	9.77
Other REE	0.00	0.00	0.01	0.02	0.00	0.02	0.00	0.06	0.06
Columbite	0.90	0.90	0.31	0.40	0.38	0.56	0.20	2.16	2.19
Total	**18.90**	**20.10**	**5.67**	**7.14**	**10.95**	**13.00**	**10.00**	**56.02**	**50.13**

Notes:
- 11806-001: Average of 30 drill core 2 m samples largely from Basal Zone
- 11806-002: Metallurgical head test sample
- 11806-003: Flotation concentrate
- 11806-005: Flotation concentrate, locked cycle tests
- 11806-006: Selected samples at 20 m down three drill holes through mineralization
- 11806-006UZ: Selected samples at 20 m down drill hole through mineralization, selected UZ samples, 1.28% TREO, 0.12% HREO
- 11806-006BZ: Selected samples at 20 m down drill hole through mineralization, selected BZ samples, 2.11% TREO, 0.50% HREO
- XPS-UZ-Feed: Upper Zone sample processed by XPS Minerals Services
- XPS-BZ-Feed: Basal Zone sample processed by XPS Minerals Services; 1.57% TREO, 0.33% HREO

The total content of ore minerals in the rock ranges from 5.7% to 20%. If samples considered un-mineralized (some of study 11806-006) are excluded then the range is from 7% to 20%.

Recalculating these abundances as a percent of the ore minerals is shown in Table 7-3.

TABLE 7-3 PERCENT OF ORE MINERALS
Avalon Rare Metals Inc. – Thor Lake Project

	% of Ore Minerals in Rock							% of Ore Minerals in Concentrate	
	11806 -001	11806 -002	11806 -006	11806 - 006UZ	XPS-UZ-Feed	11806 - 006BZ	XPS-BZ-Feed	11806 -003	11806 -005
Zircon	58.2%	65.2%	66.8%	61.1%	64.6%	71.9%	69.3%	63.7%	62.3%
Fergusonite	3.2%	3.5%	3.4%	2.5%	2.7%	4.5%	5.8%	5.4%	5.3%
Bastnaesite	2.1%	1.0%	4.6%	5.3%	2.7%	3.9%	6.8%	0.7%	0.8%
Synchysite	4.8%	2.0%	4.9%	5.9%	3.0%	2.5%	6.1%	1.4%	1.6%
Monazite	7.9%	5.5%	5.5%	8.3%	10.5%	3.2%	4.0%	5.1%	6.0%
Allanite	19.0%	18.4%	9.2%	11.1%	13.0%	9.6%	6.0%	19.7%	19.5%
Other REE	0.0%	0.0%	0.2%	0.3%	0.0%	0.2%	0.0%	0.1%	0.1%
Columbite	4.8%	4.5%	5.5%	5.6%	3.5%	4.3%	2.0%	3.9%	4.4%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note that the minerals occur in relative abundance from zircon, to allanite, to monazite, with fergusonite, bastnaesite and synchysite varying considerably from case to case.

A summary of the results given above shows that the Upper and Basal Zone mineralization both have similar distributions of minerals with the exception of the higher levels of fergusonite and zircon in the Basal Zone (which both relate to HREE). Other than this difference, the abundance of the minerals is similar in Upper and Basal Zones suggesting that the differences between these zones are in degree rather than absolute terms.

The economically interesting minerals in the Nechalacho deposit are fine-grained and form intimate admixtures which have, in the past, presented metallurgical difficulties.

The Nechalacho deposit alteration system varies between 80 m (L08-65) and 190 m (L08-127) in vertical thickness, with the alteration typically starting at the surface. The complete alteration system is enriched to varying degrees in REE, Zr, Nb and Ta, relative to unaltered syenite, with average values over the whole alteration package of approximately 0.75% to 1.0% Total Rare Earth Oxides (TREO). Within this alteration envelope, there are sub-horizontal zones of increased alteration accompanied by increased REE enrichment alternating with less enriched REE zones. Within the more intensely altered zones, the original textures and mineralogy of the host rock are no longer apparent.

These zones of increased alteration, which can vary in thickness from a few metres to tens of metres, can frequently contain TREO grades in the range of 2% and higher. The lowermost band, referred to here as the Basal Zone, contains the highest proportion of Heavy Rare Earth Oxides (HREO). Overall, the HREO proportion of the TREO within the 80 m to 190 m thick alteration system is typically between 7% and 15%. However within the Basal Zone this proportion can exceed 30%.

In general, the HREE relative to the LREE show a distinct vertical zoning with increasing HREE to depth. This is not always consistent in individual drill holes, but when averaged over a number of holes, the pattern becomes clear as illustrated in Figure 7-3. The distribution of REO and TREO with depth is also displayed in Figure 7-4.

This pattern of increasing HREE to depth is clearly important to the economics of any potential mine, as the HREE have higher average prices than the LREE.

Although gallium is anomalous in the intrusive relative to typical granites, it is not contained in the same minerals as the REE, and is in fact mainly in silicates such as chlorite, biotite and feldspar. As a result, the gallium actually varies inversely to the REE and is lower in REE and Zr enriched rocks than in the less mineralized rocks.

FIGURE 7-3 TREO, HREO, HREO/TREO AGAINST ELEVATION (Z1)

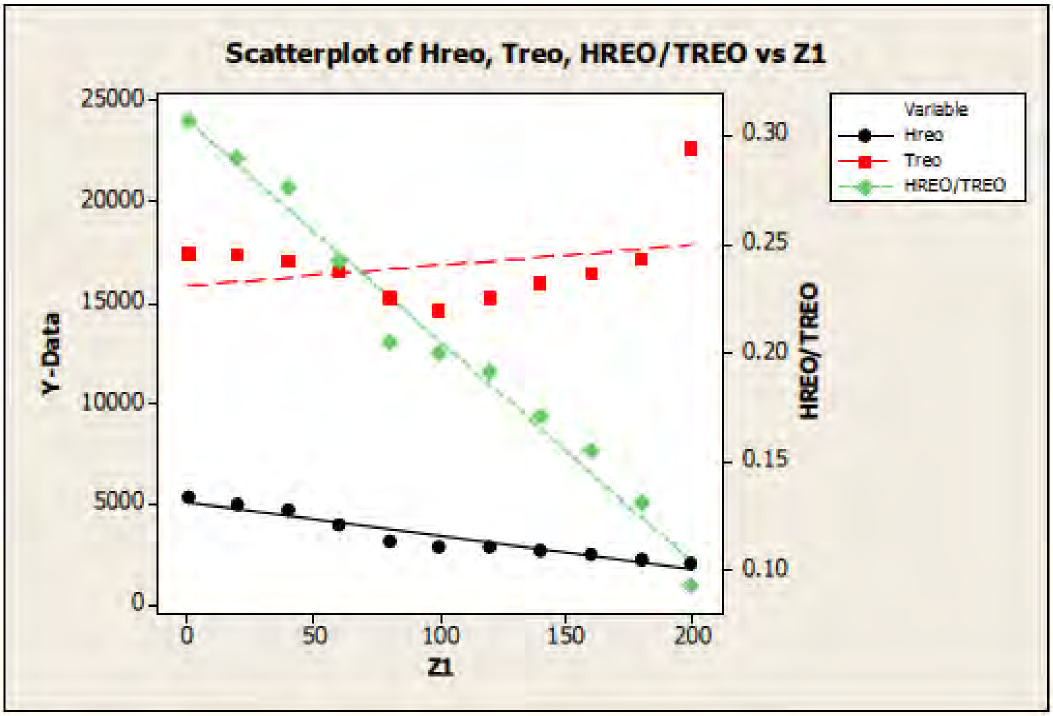
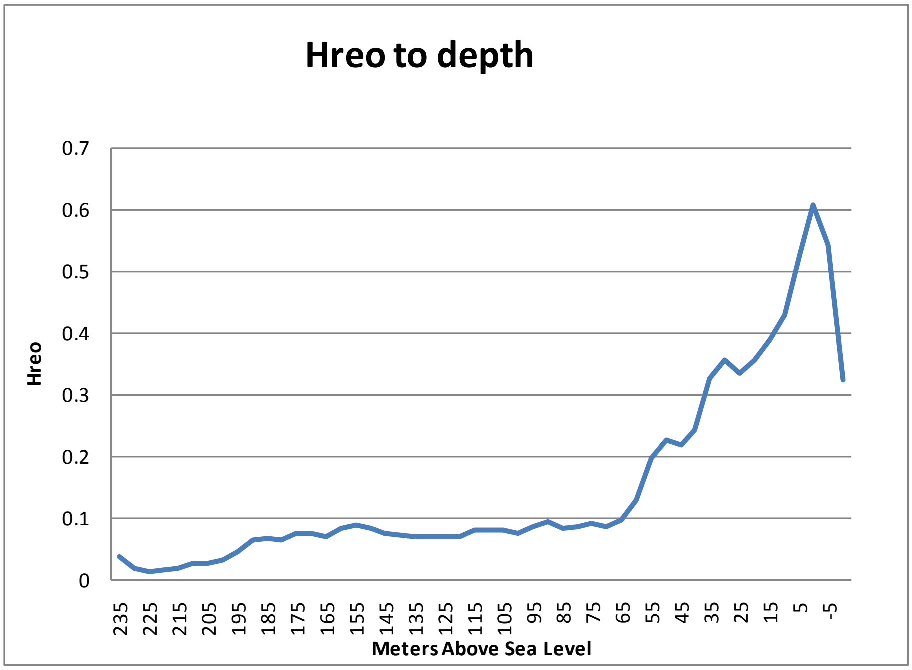
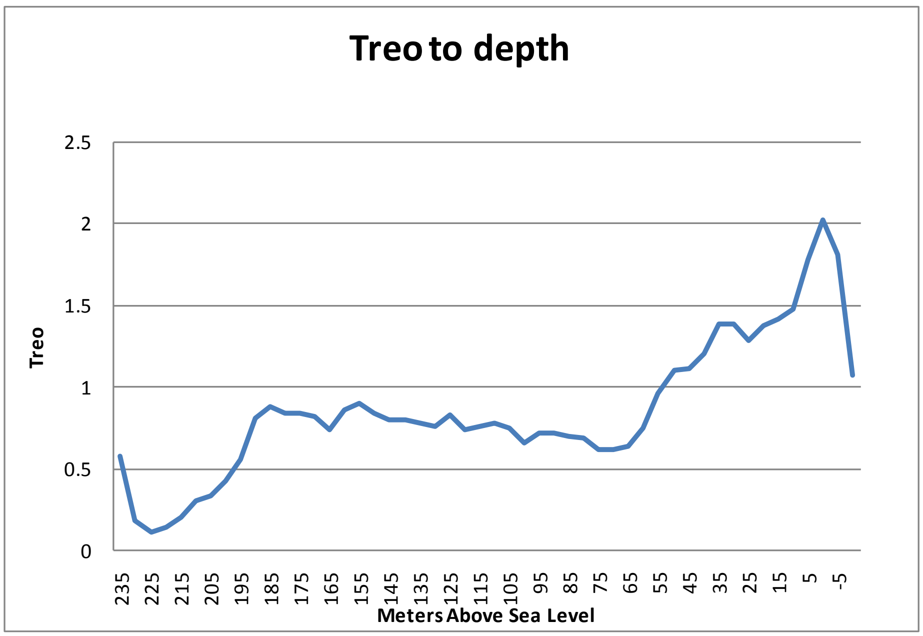


FIGURE 7-4 DISTRIBUTION OF REO COMPARED TO DEPTH





8 DEPOSIT TYPES

The mineral deposits at Thor Lake site bear many of the attributes of an apogranite (Beus, et al., 1962) originating as an apical or domal facies of the parental syenite and granite. The deposits are extensively metasomatized with pronounced magmatic layering and cyclic ore mineral deposition. The Nechalacho deposit essentially forms part of a layered, igneous, peralkaline intrusion.

According to Richardson and Birkett (1996) other comparable rare metal deposits associated with peralkaline rocks include:

- Strange Lake, Canada (zircon, yttrium, beryllium, niobium, REE)
- Mann, Canada (beryllium, niobium)
- Illimausaq, Greenland (zircon, yttrium, REE, niobium, uranium, beryllium)
- Motzfeldt, Greenland (niobium, tantalum, zircon)
- Lovozero, Russia (niobium, zircon, tantalum, REE)
- Brockman, Australia (zircon, yttrium, niobium, tantalum)

Richardson and Birkett further comment that some of the characteristics of this type of deposit are:

- Mineralizing processes are associated with peralkaline intrusions and the latter are generally specific phases of multiple-intrusion complexes.
- Elements of economic interest include tantalum, zircon, niobium, beryllium, uranium, thorium, REE, and yttrium, commonly with more than one of these elements in a deposit. Volatiles such as fluorine and carbon dioxide (CO_2) are typically elevated.
- End members may be magmatic or metasomatic although deposits may show the influence of both processes. Alteration in magmatic types is often deuteric and local while alteration in metasomatic types is generally more extensive.
- This type of deposit is typically large but low grade. Grades for niobium, tantalum, beryllium, yttrium and REE are generally less than 1%, while the grade for zircon is typically between 1% and 5%.
- These deposits display a variety of rare metal minerals including oxides, silicates, calcium phosphates and calcium fluoro-carbonates. Niobium and tantalum mineralization is typically carried in pyrochlore and less commonly in columbite.

The main chemical features of the Nechalacho deposit that contrast to those overall features are that uranium is not particularly high with anomalous but modest levels of thorium and the lack of beryllium mineralization. Beryllium is present in the North T deposit, a separate smaller deposit to the north with dissimilar geology.

The preferred genetic model is that of igneous differentiation within a closed-system with rare earth element concentration within a residual magma, aided by depression of the freezing temperature of the magma by fluorine and possibly CO_2.

CHARACTERISTICS OF THE NECHALACHO DEPOSIT

The Nechalacho deposit is the largest known mineralized body on the property. As exposed, it is approximately triangular in shape and covers a drilled area of about 2.9 square kilometers. It is known from diamond drilling that the mineralized zones are up to 200 m thick. Within the mineralized zones, the Basal Zone, unusually rich in heavy rare earths, is persistent over most of the area of the Nechalacho deposit of some 1.5 km north-south and east-west. The thickness of the zone is indicated in Figure 8-1.

The geological variation within the Nechalacho deposit is complex. Within the Avalon lease area the geology is dominated by a succession of syenites including the Ore (Nechalacho) Nepheline Sodalite Syenite and the Thor Lake Syenite. The latter is believed to have evolved into a more granitic unit known as the Grace Lake Granite. Together, these three phases form the eastern part of the Blatchford Lake Intrusive Suite of Davidson (1978).

The Ore (Nechalacho) Nepheline Sodalite Syenite consists of a series of cumulate rocks which pass upwards into porphyritic, mafic, laminated, and pegmatitic counterparts. Detailed descriptions of these rock types are provided in Table 8-1.

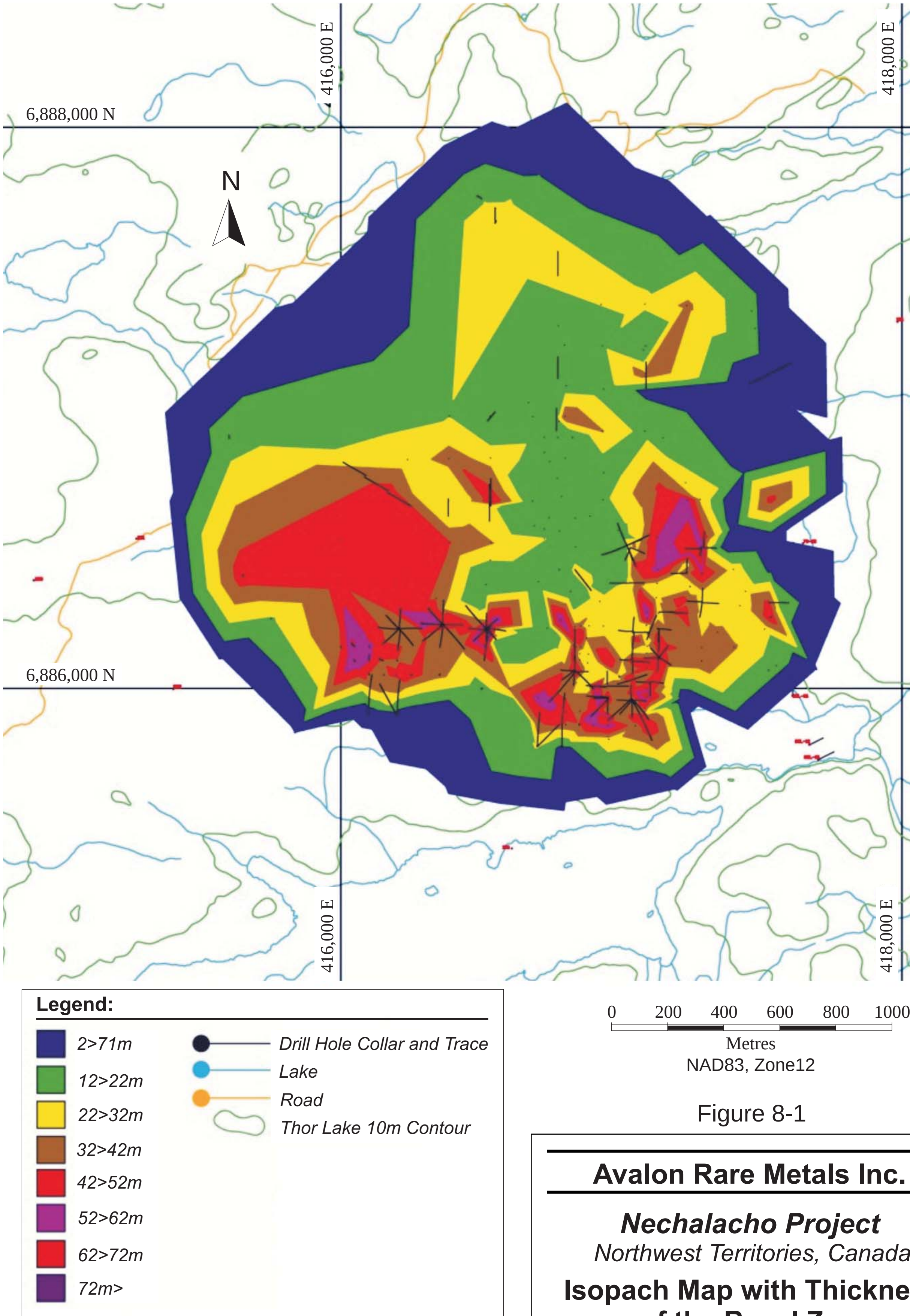


Figure 8-1

Avalon Rare Metals Inc.

Nechalacho Project

Northwest Territories, Canada

Isopach Map with Thickness of the Basal Zone

August 2011

Source: Avalon Rare Metals Inc., 2011.

The primary peralkaline rocks have been altered by pervasive hydrothermal and metasomatic fluids. This has resulted in the partial to complete replacement of the Nechalacho syenite unit in the areas of mineralization. During metasomatic replacement a new assemblage of biotite, magnetite, specularite, albite and/or chlorite is generated and these minerals tend to be associated with the rare metals and rare earth elements within the resource. The last events in the metasomatic sequence include the generation of microcline, albite and related silicification.

There is some suggestion that the early-formed rocks were affected by various forms of pre-solidification displacement such as magmatic re-sedimentation, magmatic scouring, and possibly foundering during cooling. The effect of these processes is to obscure lithological correlations from cross-section to cross-section and give the impression of structural displacement. In contrast, the metasomatic rocks generally show a good chemical correlation from section to section - this may be a reflection of pressure/temperature differences or a chemical disequilibrium boundary.

REE, Ta, Nb and Zr mineralization in the Nechalacho deposit occurs in broad, enriched sub-horizontal replacement zones, in addition to being widely disseminated over much of the deposit. Minerals hosting these elements are primarily zircon, fergusonite, ferro-columbite, allanite, monazite, bastnaesite and synchisite. The highest grades of HREEs, LREEs, niobium, and tantalum tend to occur in magnetite-hematite and zircon-rich areas within the sub-horizontal replacement zones.

The Nechalacho deposit is hosted by a layered magmatic peralkaline intrusion of aegirine syenites, nepheline syenites and related cumulates. REE-bearing minerals were originally deposited in-situ as disseminated grains, probably eudyalite, during cooling and as cyclic cumulate layers. Hydrothermal alteration of these original zircon-silicates has partially remobilized the REEs, particularly the LREEs as part of the process of metasomatism. For the LREEs, remobilization appears to be fairly local, but could also have been more extensive, depositing LREEs in zones away from their original site of crystallization. HREEs do not appear to be remobilized and their occurrence is considered to be in-situ.

TABLE 8-1 LITHOLOGIES
Avalon Rare Earth Metals Inc. – Thor Lake Project

UPDATED LITHOCODES, DECEMBER 2010

Alteration	Mineralization	Code	Lithology	Comments
		00	WATER	
		01	OVERBURDEN	
		90	DIABASE	
			Alkaline Rocks, Intrusive Suite 1	
		85	GRACE LAKE GRANITE	
		84	THOR LAKE SYENITE	
			a. Olivine Syenite	
			Peralkaline Rocks, Intrusive Suite 2	
strong to pervasive alteration common; primary minerals and textures commonly obliterated	magmatic and hydrothermal Zr-REE mineralization	79	SODALITE CUMULATE (ALTERED)	Roof series cumulates
		78	K-FELDSPAR AEGIRINE SYENITE (ALTERED)	
			a. Pegmatitic	
			b. Porphyritic	
			c. Zircono-silicate, REE- bearing	
		75	FOYAITE I (ALTERED)	Variable textures, +/- nepheline
			b- zircono-silicate bearing	
		70	TRACHYTOIDAL MICROSYENITE (ALTERED)	Fine grained, green-black to red with aligned fine white fspar
				(locally zircono-silicate bearing) (formerly "lujavrite")
		69	HETEROGENEOUS ZIRCONO-SILICATE SYENITE (ALTERED)	pseudomorphs in matrix, aegirine/arfvedsonite pseudomorphs commonly preserved, poikilitic K-feldspar (former upper zone MRZ) (2a). Strong biotite/chlorite alteration.

Table 8-1 continued

moderately altered; primary minerals altered, primary textures preserved		magmatic mineralization			
			67	ZIRCONO-SILICATE CUMULATES (ALTERED)	eudialyte/zircon pseudomorphs cumulate. Some remobilization. (former MRZ, 2b basal zone)
			65	HETEROGENEOUS SYENITE (ALTERED)	
			63	FOYAITE II	coarse-grained, foyaitic syenite underlying cumulate zone
fresh or weakly altered; primary minerals and textures commonly preserved				a - pegmatitic	
			61	K-FELDSPAR PEGMATITE	
			60	LAYERED SODIC SYENITES	fresh, green aegirine and white plagioclase (+/- nepheline)
				a. aegirine nepheline albite syenite	
				b. sodalite nepheline syenite	
				c. aegirine nepheline K-spar syenite	
			49	SPOTTED AEGIRINE AMPHIBOLE SYENITE	
			48	BIOTITE SODALITE AEGIRINE SYENITE	
			47	LAYERED BIOTITE SODALITE ALBITE SYENITE	
			45	FOYAITE 3	
			43	SODALITE AEGIRINE AMPHIBOLE PEGMATITE	
			99	UNKNOWN	
				a - pervasive albitization - unknown precursor	
				b - pervasive mafic alteration - unknown precursor	
				c - pervasive fluorite-illite metasomatism	
			96	FAULT	
			97	BRECCIA	
				a. Green breccia unit	
				b. other	

9 EXPLORATION

The Thor Lake Property has been systematically explored for several different metals over a period of 30 years (see History, Section 6). Exploration focus has shifted as new discoveries, such as beryllium, were made, or in response to price increases for tantalum, yttrium and HREE, or for example, because of improved methods of recovery of tantalum.

Since taking over the property in 2005, Avalon has sampled archived drill cores from the Nechalacho deposit to extend the area of known yttrium and REE. This led to completion of a technical report by Wardop in 2007. This technical report included a resource estimate and recommended further work including diamond drilling.

Starting in August 2007, Avalon has conducted continuous drill campaigns, except to stop for freeze-up and break-up periods. The details of these drilling campaigns are given in Section 10.

An airborne magnetic survey was completed in winter 2009 to aid in mapping the local geology and structure.

In addition to drilling and geophysics, Avalon has supported four M.Sc. theses (two from McGill University and two from Switzerland) and two PhD theses (McGill University and University of Windsor). These theses have aided in understanding the regional and local geology, and detailed mineralogy of the Nechalacho deposit. In addition, the company has supplied logistical support to a regional PhD thesis (Carlton University) on the whole Blachford Complex.

The exploration work completed on the property has led to the interpretation of the geology and mineralization given in Sections 7, 8 and 9.

10 DRILLING

Since 1977, diamond drilling has been carried out intermittently by various operators over five separate mineralized zones at Thor Lake. A total of 51 holes (5,648 m) had been completed on the Nechalacho deposit through to 1988 (see section on History). As the geology was poorly understood, the drilling frequently did not penetrate the Basal Zone, and the results are often not useful for the present resource model. Also, as noted elsewhere, modern quality assurance and quality control (QA/QC) practices were not followed and samples were analyzed for only four to six elements. Modern, cheap and reliable multi-element analytical methods were not available. Consequently the historic drilling, in general, is not useful for the resource estimation.

RECENT DRILLING

Avalon commenced diamond drilling in the Nechalacho deposit in July 2007. Drilling was organized into eight separate drill programs:

- July to October 2007: 13 holes totalling 2,550 m (BTW diameter)
- January to May 2008: 45 holes totalling 8,725 m, including 11 metallurgical holes totaling 2,278 m (NQ2 diameter)
- June to September 2008: 27 holes totalling 5,565 m (NQ2 diameter)
- February to May 2009: 26 holes totalling 5,474 metres (NQ2 diameter)
- July to October 2009: 44 holes totalling 9,098 metres (HQ diameter)
- January to April 2010: 33 holes totalling 7,970 metres (HQ diameter)
- January to April 2010: 10 holes totalling 11,512 metres (HQ diameter)
- July to October 2010: 41 holes totalling 11,512 metres (HQ diameter)
- July to October 2010: 22 holes totalling 4,676 metres (PQ diameter)
- January to April 2011: 65 holes totaling 12, 224 metres (PQ and HQ diameter)

The goal of the drilling was to continue to delineate zones of REE and Ta mineralization. The initial drilling (2007-2008) was completed largely at a spacing of approximately 150 m by 150 m. Eleven tightly-spaced inclined holes (L08-099 to L08-109) were drilled to obtain a mini-bulk sample for continued metallurgical work on REE-enriched zones. Six of the earlier holes were also re-assayed to test for the full suite of REE as was done on the recent drilling.

Starting with the February 2009 program, the drill spacing was reduced and this resulted in intercepts at approximately 50 m centres. This spacing also allowed the resource estimate to be upgraded from Inferred to Indicated Resources as recommended in the Wardrop report (March 2009). This drilling also focused on the south-eastern part of the deposit where the Basal Zone has higher TREO grades but also higher HREO grades (along with thicker intercepts). There was also an emphasis on utilizing drill setups for multiple intercepts of the Basal Zone in order to reduce drill moves, generate more structural information by intersecting the zones at an angle rather than vertically, and reduce the environmental impact with less drill moves and so less trail building and drill site clearing.

As the mineralized zone is subhorizontal, and many of the drill holes are vertical, the drilled widths approximate true widths for vertical holes. For angle holes, this varies according to the angle of the hole.

In January 2010, one drill was converted to larger PQ core, in order to acquire larger weights of drill core for metallurgical purposes.

Core from both the historic drilling and the current drilling programs is stored at the Thor Lake site. Archived core has been re-boxed where necessary, with all old core racks having been replaced with new ones. Core pulps and rejects are stored in a secure warehouse in Yellowknife and at site.

RECENT AND FUTURE DRILLING

A drilling program was completed during the summer of 2010 and winter of 2011 at the Nechalacho deposit. The program had five primary objectives:

- Delineation of additional high grade Indicated Mineral Resources near the main area of the existing Indicated Mineral Resources, concentrating on lake sites and swampy locations that are too wet to be tested under summer conditions.
- Step-out drilling from previous drill holes that had exceptional total rare earth and heavy rare earth contents (for example, drill hole L09-206 in the southwest extremity of the Nechalacho deposit).
- Testing of the lateral extent of the deposit south of Long Lake underneath un-mineralized cover rocks.
- Drilling of long angle holes under Long Lake from the south in order to increase the understanding of the presence or absence of structures such as brittle faults that may displace the ore zones.

- Condemnation and geotechnical drilling of specific locations including proposed tailings, airstrip and infrastructure sites.

The same 25hh-5 HQ-capable track-mounted drill rig continued on the project under contract from Foraco Drilling Limited. In addition, due to the increased depths of some targets, a second Foraco drill rig was added in February 2010. This rig was a Boyles 37A coring machine with 1000 metres depth capacity drilling HQ core.

To satisfy the resource estimation requirements for the Basal Zone (principally variography) an intercept spacing of 50 m horizontal was planned for Indicated Resources and an intercept spacing of 100 m was planned for Inferred Resources.

It is likely that the project will require the delineation of more than 20 years of resources in order to outline a number of years at overall grades higher than the average resource grade. It is known that higher grades of HREO are present in deeper intercepts of the Basal Zone and consequently the drilling is concentrating on those areas that are expected to give Basal Zone intercepts at deeper levels.

Results to date indicate that a second zone of significant Basal Zone mineralization with encouraging HREO values is developing at the west end of Long Lake (previously intercepted in drill holes L08-132 and L09-206 and now with drill hole L10-207). It is important to continue to outline this resource area as it may influence development plans for the underground ramp location.

Drilling has included two holes in each of Ring and Buck Lakes within the main proposed tailings area. In addition, one hole was drilled in Cressy Lake, which is a secondary tailings location. Other drill plans relating to condemnation drilling include:

- Three drill holes on the proposed airstrip
- One drill hole on the proposed infrastructure (plant, etc) site
- Three drill holes on the proposed ramp route

This drilling program will continue through 2011 and into 2012.

FIGURE 10-1 PLAN OF RESOURCE DRILLING

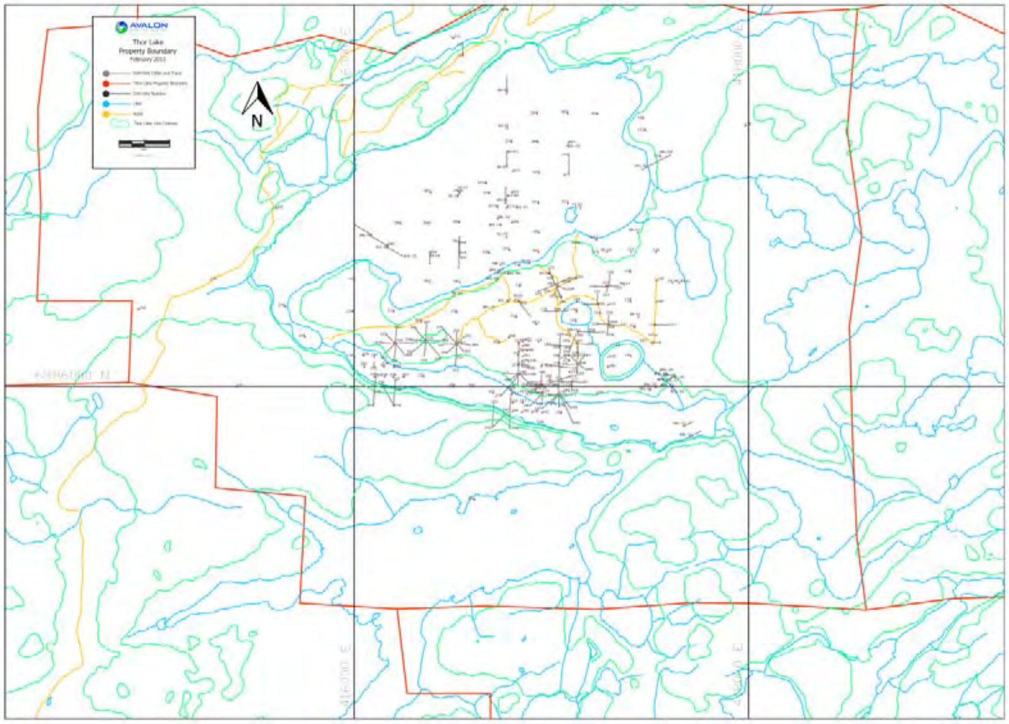
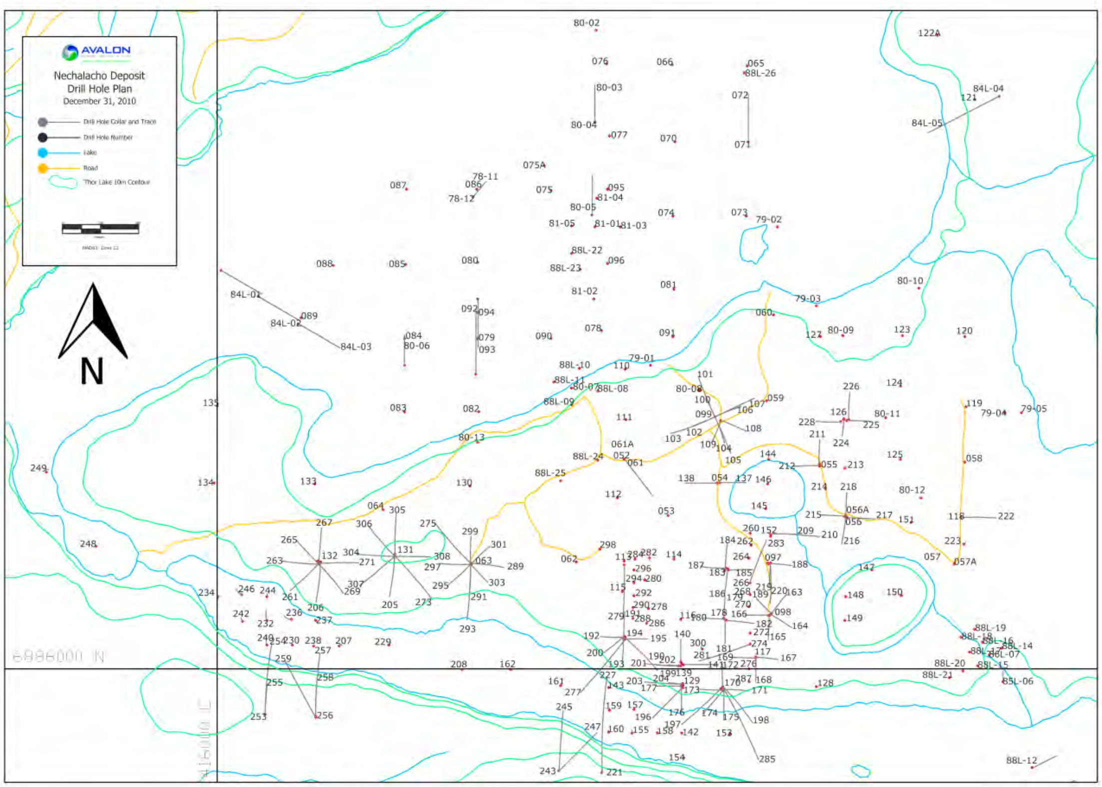


FIGURE 10-2 PLAN OF DRILLING INCORPORATED INTO BLOCK MODEL



CORE LOGGING AND CORE RECOVERY

The REE-bearing minerals in the Nechalacho deposit are generally not visible with the naked eye due to their disseminated and fine-grained nature. The dominant minerals identified easily are zircon and (infrequently) traces of bastnaesite although visual grade estimates of bastnaesite are rarely possible. To map the relative grades in the core Avalon utilizes a Thermo-Scientific Niton® XLP-522K hand held analyzer for assistance to the geologist while core logging. The NITON® energy-dispersive x-ray fluorescence (EDXRF) analyzers, commonly known as XRF analyzers, are able to quickly and non-destructively determine the elemental composition of the drill core.

A number of elements may be analyzed simultaneously by measuring the characteristic fluorescence x-rays emitted by a sample. EDXRF analyzers determine the content of a sample by measuring the spectrum of the characteristic X-rays emitted by the different elements in the sample when it is illuminated by X-rays, in the case of the XLP-522K, from a small, sealed capsule of radioactive material.

Due to variations in analysis conditions – the physical surface of the sample, the dampness of the sample, and the small window for analysis – the readings for individual elements cannot be considered as quantitative and representing long core lengths. However, the readings can assist the geologist to identify mineralized sections, and determine whether these sections are relatively higher or lower in heavy rare earth elements.

Tests were completed to compare Niton readings for a suite of economically important elements in Nechalacho drill core to laboratory assays for two metre lengths of drill core. One test involved 24 readings over a two metre length of drill core compared to the laboratory analyses for that interval. The second test was to complete between one and four readings per two metre interval on two drill holes and compare to laboratory assays. Statistics was used to compare the results from the Niton with the laboratory analyses.

For the test on the one core interval, a one-sample t-test was utilized to compare the Niton readings to analysis of the interval with the results illustrated in Table 10-1. The one-sample t-test tests the null hypothesis that there is no significant difference. If the t-test gives a p-value greater than 0.05 it is taken that there is no significant difference at the 95% confidence level. As can be seen in Table 10-1, the elements Sm, Nd, Y, Gd and Ce give strong indications of correlation between the assay values and Niton readings. Nb, La, Dy and Pr give weaker results and Fe, Eu, Ta, Tb and Th give unacceptable results.

The second test compared Niton readings with one to four per interval over two drill holes, L07-52 and 61A, which were used to compare laboratory analyses against individual Niton analyses using a two sample t test and regression for paired samples. This test also gave acceptable comparisons between the Niton equipment and laboratory values for Ce, Y, Sm, Nd and Gd. Note that the regressions for Ta and Zr gave acceptable regressions but unacceptable t tests suggesting that calibration might result in acceptable results.

Core recoveries are generally high at the Nechalacho deposit, due to the exceptionally competent nature of the rock, with average of 97% in the mineralization. As a result, the authors conclude that there is no bias in the sampling due to incomplete sample recovery. Also, there is no apparent bias in results between various core sizes suggesting that there is no issue with respect to a nugget effect on sampling. As a result the authors believe that there are no drilling, sampling or recovery factors that could materially affect the accuracy or reliability of the results.

TABLE 10-1 NITON TEST ANALYSES
Avalon Rare Metals Inc. – Thor Lake Project

2 sample t	Test 1 1 sample t-test	Test 2 2 sample p-score	Test 2 Paired t p-score	Test 2 Regression R^2
La		0.860*	0.801*	49.9%*
Ce	0.172*	0.798*	0.697*	46.0%*
Y	0.192*	0.627*	0.384*	54.0%*
Sm	0.559*	0.565*	0.348*	54.0%*
Nd	0.119*	0.456*	0.204*	58.0%*
Gd	0.180*	0.320*	0.090	47.0%*
Th	0.000	0.001	0.000	8.2%
Eu	0.034	0.000	0.000	14.2%
Tb	0.007	0.000	0.000	6.8%
Dy	0.090	0.000	0.000	35.2%*
Nb	0.119*	0.000	0.000	24.9%*
Ta	0.025	0.000	0.000	44.0%*
Zr		0.000	0.000	60.0%*

*Statistics suggesting strong correlation between instrument and laboratory

The interpretation of the data in the table is as follows:

Significant p-values (>0.05) for Test 1 and Test 2 t-tests suggest a good numerical correlation between the Niton content estimate and the chemical laboratory content estimate.

A high R^2 (and all regressions had significant p-values) for the regression, coupled with a high p-value in the t-test reinforces the significance of the correlation between the Niton instrument and the laboratory results.

A high R^2 coupled with a low p score on the t tests indicates that there is poor numerical correlation between the Niton instrument and the laboratory results, but a good fit on a regression line, implying that the variation in the Niton reading is proportional to the laboratory estimate but there is a systematic percent bias in the Niton readings (either high or low).

Note that handheld XRF units can suffer precision, bias or general inaccuracies when measuring extremes of contents – either very high or very low levels of an element.

Avalon concluded that Niton XRF analysis has been demonstrated to reflect laboratory analyses for the elements Y, Ce, Ne, Sm and Gd. Furthermore, with more effort in instrument calibration, acceptable results can be achievable for Ta and Zr. These conclusions are significant in that the relative amounts of light and heavy rare earths are reasonably represented by measurements of Ce and Y. Thus, the total rare earth grade and light rare earth (LREE) content can be estimated using the Ce values and the relative proportion of heavy rare earths (HREE) can be estimated using the Y grade. This can be supported in the case of LREE by the Nd values and in the case of HREE by the Gd values.

NITON HANDHELD ANALYZER FOR GRADE AND QUALITY CONTROL

Given the test results summarized above for using the Niton handheld analyzer on drill core, its use in mining grade control and metallurgical monitoring can be discussed.

As noted above, at Nechalacho the rare earth mineralization, with the exception of zircon, is invisible to the naked eye. Thus, underground grade control will be dependent upon chemical analysis. It is suggested that this may be achieved for underground grade control purposes by use of the handheld XRF analyzer. Use of such an instrument may enable the geologist to outline stopes on the basis of grade and also be able to recognize instantly HREE-rich and HREE-poor sections of the mineralization.

Analysis of rare metals such as rare earths, niobium, tantalum and zirconium is more complex than base metals. As a result, routine analysis during mining operations could be slower and more expensive than for base metals. Instant XRF analysis may be an efficient answer for this issue. The handheld XRF analyzers are limited in power output, and hence sensitivity and accuracy, due to safety concerns. An alternative is use of larger equipment that utilizes the same principles, but higher power output. An example is the InnovX X-50 Mobile XRF. This 50kV instrument has a 200 µA beam meaning that short assay times and better detection limits would be possible compared to 50 µA for a typical handheld machine. Preparation of a crushed and homogenized sample would enable almost instantaneous analysis for key elements representing LREE and HREE and ultimately, grade control. Similarly, it is believed that this equipment could be calibrated for use in the flotation plant operations. Finally, online XRF systems could be considered for processes that would benefit from this.

In short, Avalon expects to utilize instrumental XRF analysis to minimize the requirement for check analyses, lower costs and increase throughput in the flotation plant and also increase the efficiency of mine grade control geologists.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

SAMPLING METHOD AND APPROACH

A comprehensive core logging and sampling protocol was established in time for the July 2007 drilling program. This protocol has been strictly applied for all of the drilling programs since 2007. In addition, a comprehensive geotechnical logging protocol was introduced at the start of the summer 2009 drill program.

Drilling operations were supervised by J.C. Pedersen, P.Geo. Bruce Hudgins, P.Geo, maintained the geological database. Avalon's Vice-President, Exploration, Bill Mercer, Ph.D., P.Geo. (Ontario), P. Geol (NWT), monitored the QA/QC and provided overall direction on the project.

Core sizes range from BTW diameter for the initial 2007 drill program to NQ2 in the winter/summer 2008 program, NQ2 or HQ in the 2009-2010 programs and up to PQ in the 2010 program (Table 11-1).

TABLE 11-1 DRILL CORE SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Date	Number of Holes	Total Metres	Core Diameter
July – October 2007	13	2,550	BTW
January – May 2008	45	8,725	NQ2
June – September 2008	27	5,565	NQ2
February – May 2009	26	5,474	NQ2
July – October 2009	44	9,098	HQ
January - April 2010	33	7,970	HQ
January - April 2010	10	3,428	HQ
July – October 2010	41	11,512	HQ
July – October 2010	22	4,676	PQ
TOTAL	**261**	**58,998**	

Core is placed in standard wooden core boxes at the drill by the driller helper, with a wooden marker placed at the end of each core run marking the distance from the surface. Throughout the BTW-NQ programs drill rods were imperial lengths of 10 feet, and core markers were written in feet on one side of the wooden block, and using a metric conversion chart, written in metres on the opposite side of the block. The HQ drilling initially used both imperial and metric rods, so markers were in both feet and metres to ensure proper measurement. Imperial rods were used exclusively in the latter part of the 2009 drill program.

After inspection by the geologist at the drill, the boxes are closed with wooden lids and taken to the core logging facility at the camp by snowmobile in the winter and by boat and ATV in the summer. At camp, the boxes are opened by the geologist on outdoor racks. In good weather, logging and other geotechnical measurements are done outside; in poor weather and in winter, core is processed in a heated core shack.

Core is initially measured to determine recoveries, and marked incrementally every metre. This marking serves as a guide for magnetic susceptibility, RQD, and density measurements. Magnetic susceptibility is measured every metre with a hand-held 'KT-10 magnetic susceptibility metre'. Density is measured every five metres by weighing a section of drill core in air and then weighing by submersing the sample in water and comparing the difference between dry and submersed weight. A typical core sample for density measurement averages 10 cm in length. Geotechnical logging, comprising rock quality determinations (RQD) are performed for each run.

Core is generally very clean when brought to camp, and requires no washing except for occasional sprays of water when mud is present. The geologist marks out major rock units and completes a written description for the entire core sequence. Frequent readings using a handheld Thermo-Scientific Niton® XLP-522K hand held analyzer act as a guide to areas of mineralization and general chemistry of a specific interval. The final task is to mark out with a china marker specific sample intervals for the length of the entire drill hole.

On average, assay samples are two metres long except where, in the geologist's opinion, it is advisable to follow lithological boundaries. Due to the long widths of mineralization with the Basal Zone averaging over 20 m thick, even spaced sampling is not considered a significant factor in resource estimation. Consequently, individual samples can vary in length when encountering lithological changes, as efforts are made not to split across well-defined lithological boundaries. A list is made of all sample intervals as a record and also a guide to the core splitting technicians.

All geological, geophysical and geotechnical data is entered into a custom designed MS Access database, provided and maintained by Hudgtec Consulting. This database is backed up regularly to an external hard-drive in camp and remotely backed up to an ftp site maintained by Hudgtec Consulting. Hudgtec Consulting also uploads all geochemical and assay data to the same database. The geologists at site can access the drill database to review previous drill results.

Due to the strong hydrothermal alteration of all lithologies, identifying specific precursor lithologies has proven quite difficult, particularly in the early drill programs. Early lithological coding tended to incorporate hydrothermal alteration, commonly making it difficult to correlate units between drill holes. As more information became available from deeper drilling and specific textures and lithologies were compared to other unaltered, alkaline deposits elsewhere, such as Illimausaq in Greenland, a new lithological code was produced using, as a basis, the recognizable precursor lithologies. This has greatly advanced the understanding of the lithology, mineralogy, and to a lesser degree the petro-genesis of the deposit.

After all tests and core observations are completed, and prior to splitting, the core is photographed outdoors using a hand-held digital camera. Down-hole distance and hole number are marked so as to be visible in all photos. Core is generally photographed in groups of six boxes.

Starting in the 2009 summer drill program, drill core was also logged for geotechnical characteristics. This was initiated with the guidance of external geotechnical consultants (Knight-Piésold Consulting). Some of the holes were logged from top to bottom, while others were logged above, below, and within the Basal Zone, to determine rock quality characteristics of both the mineralized zones and country rocks. Efforts were made to select holes with varying orientations to provide comprehensive orientation characteristics of planar structural features. The geotechnical logging was done on core logging sheets and entered electronically in to a custom-designed Excel spreadsheet provided by Knight-Piésold Consulting. A total of 22 holes were logged in whole or in part (Table 11-2). Holes which were partially logged included the Basal Zone and a minimum 10 metre interval above and below.

TABLE 11-2 LIST OF HOLES WITH GEOTECHNICAL LOGS
Avalon Rare Metals Inc. – Thor Lake Project

Hole #	Comments	Interval (m)
L09-165	Entire Hole	2.22 - 179.0
L09-166	Entire Hole	1.8 - 148.25
L09-168	Entire Hole	2.0 - 167.0
L09-169	Entire Hole	0 - 169.0
L09-171	Entire Hole	4.56 - 177.41
L09-172	Includes Basal Zone	69.0 - 183.0
L09-173	Includes Basal Zone	133.0 - 190.0
L09-175	Includes Basal Zone	91.0 – 222.0
L09-176	Includes Basal Zone	101.0 – 195.0
L09-177	Includes Basal Zone	145.0 – 192.0
L09-178	Includes Basal Zone	74.0 – 147.0
L09-179	Entire Hole	7.0 – 178.61
L09-180	Includes Basal Zone	76.0 – 133.0
L09-181	Includes Basal Zone	125.0 – 173.0
L09-182	Includes Basal Zone	95.0 – 158.0
L09-184	Entire Hole	2.4 – 190.3
L09-188	Includes Basal Zone	77.0 – 143.0
L09-189	Includes Basal Zone	95.0 – 143.0
L09-190	Includes Basal Zone	87.0 – 183.0
L09-191	Entire Hole	10.0 – 198.85
L09-202	Entire Hole	4.47 – 187.0
L09-206	Includes Basal Zone	208.0 – 283.0

When the core has been logged and photographed, it is stored in core racks outside the core splitting tent, from which they are then brought in to the core shack to be split and sampled. Core photos are stored on the camp computer in addition to an external hard drive.

SAMPLE PREPARATION AND STORAGE FOR CONVENTIONAL CORE

All sample preparation from identification of sample intervals to bagging of drill core, was completed by employees of Avalon. Subsequent preparation such as crushing, grinding and further steps, were all completed by commercial laboratories as listed in Table 11-3. For the drill programs of 2007 – 2008, the core splitter broke the core into smaller lengths to fit into the mechanical core splitter, split the core in half, and placed one half in a plastic sample bag with the other half placed back into the core box in sequence, to serve as a permanent record.

Starting in 2009, it became standard practice when handling HQ core to initially split the core in half, then one half in quarters, with one quarter for assay, one quarter as library core and half core retained for metallurgical purposes. For core prior to 2009, limited metallurgical sampling was completed.

While the majority of the sample splitting has been with mechanical core splitter to produce a half core for a sample, some core has also been sawed and quartered when required for metallurgical testing or standard preparation, however this method was abandoned due to slow production.

The sample interval is marked on a sample tag in a three-part sample book and a tag with the corresponding sample number is placed in the sample bag. The sample bag is also marked with the corresponding sample number using a felt marker. The bag is then either stapled or zip-tied closed, and placed in a rice bag with two other samples. Most rice bags contain three samples to keep weight to a manageable level. The rice bag is then marked on the outside with corresponding sample numbers contained within, and a second number identifying the rice bag itself. A sample shipment form is then completed, generally in increments of 50 rice bags, which constitutes a single shipment.

The sample form is enclosed in an appropriately marked rice bag, with a duplicate paper copy kept in camp, and also kept on electronic file.

Starting in winter 2010, a second drill was added, also using HQ core. This core was sampled as above. From July 2010 on, this rig was converted to PQ diameter core in order to obtain more metallurgical sample. This core, weighing about 17 kg per metre, was initially sawn in order to acquire an assay sample of about 1.5kgs, with a second cut for a library sample of about 1.5 kg, leaving about 14 kg for metallurgical purposes. However, due to the hardness of the rock, it was deemed that sawing the core was impractical due to low productivity. Consequently a test was completed of coarse crushing the whole core to 3.3 mm in 1 metre samples. Then an assay sample and a library were split out and the remaining 3.3 mm material retained for metallurgical purposes.

Standards are inserted routinely, with a standard randomly chosen (designated “High”, “Medium” or “Low) and inserted every 25th sample. Blanks, composed of split drill core of unaltered and un-veined diabase dyke intersected in drilling beneath Thor Lake, are inserted every 40th sample.

Samples are shipped by air from Thor Lake to Yellowknife. The standard shipment is 50 rice bags, or a total of 150 samples per shipment. The rice bags are zip-tied for security, and are met and unloaded in Yellowknife by a representative of Discovery Mining Services (Discovery). Discovery takes the samples to their warehouse and inventories all samples and produces a manifest which is sent electronically to Thor Lake camp, and accompanies the shipment. The samples are then taken by Discovery to the core processing lab facilities of either Acme Labs or ALS. At this point, the laboratories take custody of the samples.

Core is sent to the preparation laboratory with specification that all core should be crushed to 90% passing 10 mesh with a supplementary charge if necessary. In the first program in 2007, two 250 gram (g) pulps were prepared from each sample, one for the primary laboratory, and one to be shipped to Avalon and used for the check analysis. As noted, for samples from drill holes completed in 2007, every sample was duplicated and sent to a secondary laboratory for check analyses. Subsequent to this (2008-2009), approximately every tenth pulp was sent for duplicate analysis in the secondary laboratory. Standards are inserted in the duplicate sample stream by Avalon employees prior to shipping to the secondary laboratory.

All remaining drill core is stored on site at Thor Lake. Core is racked at the exploration camp, and additional storage facilities have been utilized at the former Highwood mine site buildings at the T-Zone. Historic core, particularly T-Zone core, is stored at the mine site, while Nechalacho deposit core is stored at the camp storage. Since December 2009, Avalon has rented a storage location at Yellowknife airport, and laboratories are requested to return all pulps and rejects to Avalon. The material is stored in the location and a computer database held of the sample numbers and type. In addition, samples destined for metallurgical testing, including pilot plant testing, are stored in the Yellowknife facility.

ANALYTICAL PROCEDURES

Any assay results obtained prior to 2007 (holes 1 to 51) are referred to as the "older holes". These did not have internal Quality Assurance/Quality Control (QA/QC) and were analyzed for a limited set of elements; however, six of the old holes were re-assayed in 2008 for the complete suite of elements.

Avalon has changed the laboratories used for analysis over time. Table 11-3 summarizes the laboratory usage.

TABLE 11-3 LABORATORY SUMMARY
Avalon Rare Metals Inc. – Thor Lake Project

Program	Preparation Laboratory	Prime Laboratory	Secondary Laboratory
2007 Summer	Actlabs	Actlabs	Acme
2008 Winter	Acme	Acme	ALS
2008 Summer	Acme	Acme	ALS
2009 Winter	ALS	ALS	Acme
Through to			
2010 October	ALS	ALS	Acme

For the first year of drilling by Avalon (2007) the primary laboratory was Activation Laboratories Ltd. (Actlabs) of Ancaster, Ontario, and the secondary laboratory was Acme Analytical Laboratories Ltd. (Acme) in Vancouver. Samples were shipped to the Actlabs facility in Ancaster, Ontario for preparation, and a duplicate pulp was submitted to Acme in Vancouver for complete check analysis. The Actlabs procedures used are Codes 4B, 4B2-STD, 4B2-RESEARCH, 4LITHO and 4LITHORESEARCH.

The Actlabs method involved lithium metaborate/tetraborate fusion ICP Whole Rock package Code 4B and a trace element ICP-MS package Code 4B2. The two packages are combined for Code 4Litho. The fusion process ensures total metals particularly for elements like REE in resistate phases (this may not be the case for acid digestions, particularly for heavy rare earths and other elements contained in refractory minerals like zircon, sphene, monazite, chromite, gahnite and several other phases). If refractory minerals are not digested, a bias may occur for certain REE and high field strength elements with standard acid digestions. The trace element package using ICP-MS (Codes 4B2-STD or 4B2-RESEARCH) on the fusion solution provides research quality data whether using standard or research detection limits. Note that Eu determinations are semi-quantitative in samples having extremely high Ba concentrations (greater than 1%). This package is intended primarily for un-mineralized samples. Mineralized samples can be analyzed but the results will, be semi-quantitative for the chalcophile elements (Ag, As, Bi, Co, Cu, Mo, Ni, Pb, Sb, Sn, W and Zn).

For the 2008 winter and summer programs, the preparation laboratory was Acme in Yellowknife and the primary analytical laboratory was Acme Laboratory in Vancouver. A split of every tenth sample reject was sent to ALS Laboratory in Vancouver for check analyses. All core was analyzed by Acme using two analytical packages: Group 4A and Group 4B. ALS analyzed the samples with the MS81 method.

Acme's Group 4A is a whole rock characterization package comprising four separate analytical tests. Total abundances of the major oxides and several minor elements are reported using a 0.1 g sample analyzed by Inductively Coupled Plasma (ICP)-emission spectrometry following a lithium metaborate/tetraborate fusion and dilute nitric digestion. Loss on ignition (LOI) is by weight difference after ignition at 1,000°C.

Acme's Group 4B is a Total Trace Elements by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). This package comprises two separate analyses. Rare earth and refractory elements are determined by ICP mass spectrometry (MS) following a lithium metaborate/tetraborate fusion and nitric acid digestion of a 0.1 g sample (same decomposition as Group 4A). In addition, a separate 0.5 g split is digested in Aqua Regia and analyzed by ICP-MS to report the precious and base metals.

For 2008, secondary samples, comprising roughly every tenth reject sample supplied by Acme, were shipped to ALS Laboratories, where the samples are analyzed by the package MS81. This is a combination of lithium metaborate/ICP atomic emission spectrometry (ICP-AES) for whole rock values, lithium borate/ICP-MS for refractory mineral values and other elements, and aqua regia/ICP-MS for volatile elements.

Starting with the winter 2009 drilling campaign, all samples were prepared at ALS' preparation facility in Yellowknife, and a subsample shipped and analyzed at ALS Chemex in Vancouver by lithium metaborate/tetraborate fusion and dilute nitric acid digestion, followed by whole rock and 45 element multi-element ICP analysis (ALS sample method ME-MS81). All samples contained within intercepts above the 1.6% cut-off criteria and any additional samples exceeding analytical limits or of geological significance are re-run using similar ALS method ME-MS81H for higher concentration levels. ME-MS81H is a similar method but with greater dilution in the analytical procedure. Every tenth sample has a duplicate pulp prepared which, with inserted standards and blanks, was sent to Acme Analytical in Vancouver for check analyses. Results were monitored for key elements, and in cases of QA/QC issues, re-analysis was requested.

Values were reported by the laboratories in ppm and converted to rare earth and rare metal oxides by Avalon geologists (Table 11-4).

TABLE 11-4 OXIDE CONVERSIONS
Avalon Rare Metals Inc. – Thor Lake Project

Element	Symbol	Conversion to oxide		Oxide
Beryllium	Be	2.7758		BeO
Cerium	Ce	1.1713		Ce2O3
Dysprosium	Dy	1.1477		Dy2O3
Erbium	Er	1.1435		Er2O3
Europium (2)	Eu	1.1579		Eu2O3
Gadolinium	Gd	1.1526		Gd2O3
Gallium	Ga	1.3442		Ga2O3
Holmium	Ho	1.1455		Ho2O3
Lanthanum	La	1.1728		La2O3
Lutetium	Lu	1.1372		Lu2O3
Neodymium	Nd	1.1664		Nd2O3
Niobium	Nb	1.4305		Nb2O5
Praseodymium	Pr	1.1703		Pr2O3
Samarium	Sm	1.1596		Sm2O3
Tantalum	Ta	1.2211		Ta2O5
Terbium	Tb	1.1510		Tb2O3
Thorium	Th	1.0690		ThO
Thulium	Tm	1.1421		Tm2O3
Ytterbium	Yb	1.1387		Yb2O3
Yttrium	Y	1.2699		Y2O3
Zirconium	Zr	1.3508		ZrO2

SPECIFIC GRAVITY MEASUREMENT

Specific gravity is measured on core samples taken at 5 m intervals within the hole; each sample is approximately 10 cm long. Breaking the drill core (if necessary) only occurs after other tests that require undisturbed core (such as photography and geotechnical analysis) have been completed. The density method is as follows:

- Weigh the sample in air
- Weigh the sample suspended in water

A Mettler Toledo PL3001-S electronic scale is used for weighing in air (Figure 11-1). This scale has an accuracy of one decimal place.

A small metal can suspended beneath the balance, set up on a table with a hole for the suspension of the basket, is used to weigh the sample in water (the Mettler balance has a hook underneath for SG measurement purposes). The balance is zeroed with the can hanging in a large container of water (Figure 11-1). The calculation of the SG is as follows:

SG of sample = weight of sample in air/weight of sample in water.

FIGURE 11-1 WEIGHING OF SAMPLE IN AIR

FIGURE 11-2 WEIGHING OF SAMPLE IN WATER

SG measurements on the drill core according to lithology are summarized in the Table 11-5.

TABLE 11-5 STATISTICS OF SPECIFIC GRAVITY BY LITHOLOGY
Avalon Rare Metals Inc. – Thor Lake Project

Old Rock Units	New Rock Units	Rock description	#	Median	Mean	Min	Max	SD
1	65/63	Alkaline/Peralkaline	1,930	2.77	2.78	2.16	3.71	0.11
2	69/67	Mineralized rock	1,673	2.87	2.90	2.26	3.80	0.17
3	78bc	Altered syenite	1,222	2.74	2.76	2.16	3.68	0.13
4	78ab	Albitized syenite	628	2.67	2.70	2.29	3.73	0.12
5	78a	Feldspathite	738	2.63	2.65	2.16	4.38	0.12
6	84	Syenite	57	2.68	2.69	2.57	2.93	0.07
7	85	Granite	37	2.67	2.68	2.63	2.99	0.06
8	90	Diabase	8	2.87	2.88	2.80	2.97	0.06

Thirty two samples of drill core were submitted to ALS-Chemex for an independent check of the SG values. The same samples were checked at the Thor Lake camp site before shipment to ALS Chemex. ALS completed both water-only and wax-coated measurements on the core. The statistics are summarized in Table 11-6.

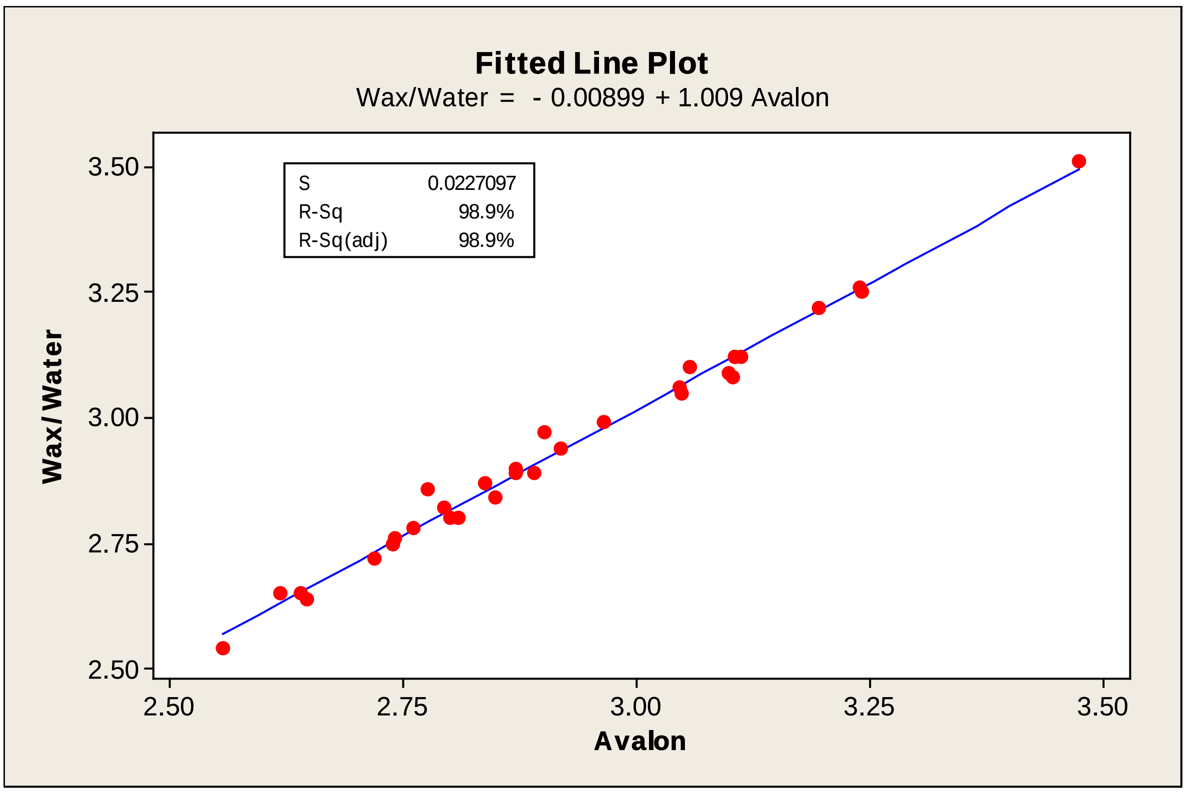
A t-test of the differences between these measurements gave a p-value of zero, indicating a significant difference at the 99% confidence level. However, the differences are only about 0.02 on values of 2.94, or 0.7% in terms of percent of ALS. This difference will have only a minor effect, if any, on the tonnage estimation and is considered to be acceptable.

TABLE 11-6 STATISTICS OF SPECIFIC GRAVITY (ALS CHEMEX)
Avalon Rare Metals Inc. – Thor Lake Project

Method	Mean (g/cc)	Std. Dev.	Median (g/cc)	Minimum (g/cc)	Maximum (g/cc)
ALS – Water	2.9441	0.22	2.91	2.56	3.51
ALS - Wax/Water	2.9388	0.22	2.90	2.54	3.51
Avalon - Water	2.9220	0.21	2.88	2.56	3.47

A regression line between densities as determined by Avalon and ALS Chemex also demonstrates excellent agreement (Figure 11-3).

FIGURE 11-3 DENSITY MEASUREMENTS ALS-CHEMEX VERSUS AVALON



CONCLUSIONS

It is the opinion of RPA that the sample preparation, security, and analytical procedures implemented by Avalon for the Nechalacho deposit meet industry standards.

12 DATA VERIFICATION

The following information was supplied, in part, by the client and edited by RPA. Bruce Hudgins P.Geo, of Hudgtec Consulting, reviewed this protocol and performed data quality control checks prior to incorporation of the final assay values into the database. Data verification and validation performed by RPA consist of checks done on assay data, conversion of metallic elements reported in the assay certificates to oxides, collar locations, inspection of drill hole paths, and GEMS project validation procedures. All the assay data added to the database after the RPA 2010 technical report was verified against assay certificates for 20 elements (rare earth elements, Y, Nb, Ta, Zr, U, Th), and no errors were found.

QUALITY ASSURANCE / QUALITY CONTROL

In 2007, Avalon commissioned CDN Laboratory from British Columbia to generate three certified reference materials (standards) called AVL-H, AVL-M or AVL-L. These standards would be inserted into the assay stream. Avalon then commissioned Dr. Barry Smee to review the round robin and assess the quality of the data.

In 2010, Avalon commissioned CDN Laboratory from British Columbia to generate a further standard called S-04-09. This standard would be inserted into the assay stream, alternating with the original three standards. Avalon then commissioned Dr. Barry Smee to review the round robin and assess the quality of the data. The Round Robin on the new standard included samples of the original three standards, rare earth certified standards, all randomized for the Round Robin. When inserted into the sample database, this standard was referred to as STD-H2.

The control samples inserted into the sample stream from drill holes 137 to 311 are presented in Table 12-1. The situation of the control samples in previous drill programs is presented in the RPA 2010 report.

TABLE 12-1 QA/QC CONTROL SAMPLE STATISTICS, L09-137 TO L10-311
Avalon Rare Metals Inc. – Thor Lake Project

	Samples	Analyses	Blanks	Standard-L	Standard-M	Standard-H	Standard-H2	Standards Total
Total No.	10,491	15,474	417	180	162	121	306	769
% of Samples			4.0	1.7	1.5	1.2	2.9	7.3
% of Analyses			2.7	1.2	1.0	0.8	2.0	5.0

Blanks were inserted on average at the rate of 4.0%, or one in 25 samples, and standards at the rate of 7.3%, or one in 13 samples. The rate of insertion of standards was varied according to whether the samples were from a mineralized zone or not with a standard every 10 samples in mineralization and every 40 samples outside mineralization. Some 10,491 samples were analyzed by ALS method MS81 and some 4,983, or 47%, were re-analyzed for method MS81H, for higher rare earth and Zr analytical limits. Samples were also analyzed for additional methods such as tests of XRF analysis for Zr, Nb and Ta. These additional analyses are not included in the statistics above.

The results of the standard analyses were checked against the certified or provisional means and tolerances listed in the standard certificates as well as against the lab's (ALS) own precision tolerance level of +/-10%. The three rare earth elements with the potential highest value (Nd, Tb and Dy) were routinely monitored along with the overall values for the total rare earths (TREE) and heavy rare earths (HREE).

Precision results of the QA/QC program for all labs, as measured by relative standard deviation (standard deviation/sample population mean) for, as an example standard AVL-H (also referred to as STD-H), average between 3.5% and 5.7% for all rare earth elements, Nb, Ta and Zr. The results for the largest groups of analyses, representing 524 analyses of the standard, are listed in Table 12-2.

TABLE 12-2 RELATIVE STANDARD DEVIATIONS, STANDARD AVL-H (2007-2010)
Avalon Rare Metals Inc. – Thor Lake Project

Sample Type	Method	Lab	N	Y %SD	La %SD	Ce %SD	Pr %SD	Nd %SD	Sm %SD	Eu %SD	Gd %SD	Tb %SD
AVL	MS81h	ALS	224	3.6	3.6	3.6	4.1	3.8	3.7	3.8	3.7	4.6
STD-H	4A-4B	Acme	89	7.1	6.6	7.1	6.0	5.4	5.0	6.0	7.9	6.2
STD-H	MS81	ALS	112	5.1	5.3	4.9	5.5	5.7	5.6	5.2	5.8	5.8
STD-H	MS81h	ALS	99	3.7	4.7	4.6	4.4	4.1	4.3	4.1	4.2	4.8
Sample Type	**Method**	**Lab**	**N**	**DY %SD**	**Ho %SD**	**Er %SD**	**Tm %SD**	**Yb %SD**	**Lu %SD**	**Nb %SD**	**Ta %SD**	**Zr %SD**
AVL	MS81h	ALS	224	3.9	4.6	4.5	4.4	4.1	4.8	4.0	4.2	4.1
STD-H	4A-4B	Acme	89	5.4	6.3	5.5	6.1	5.5	6.3	6.7	7.5	5.9
STD-H	MS81	ALS	112	5.1	5.7	5.0	5.6	5.3	5.4	6.7	7.4	15.6
STD-H	MS81h	ALS	99	3.4	4.1	5.0	4.5	4.7	4.4	5.9	5.5	4.4

The results indicate that AVL-H/STD-H (same standard but inserted with different designation in the drill logs) are basically identical in relative SD and that Acme's analyses show about 50% higher relative standard deviation than MS81H method of ALS. The latter laboratory's MS81 method shows slightly higher relative SD compared to MS81H. However, as the laboratories anticipate 10% relative standard deviation, all are within acceptable limits. Thus it is concluded that the precision results of both laboratories are within acceptable limits for analyses from 2007 to 2010.

Table 12-3 gives the calculated comparison of the means of the particular set of analyses of STD-H expressed as percentage of the overall mean of all analyses of that standard from 2007-2010. The total analyses, including those in Round Robin campaigns and routine batches, include at least eight laboratories and methods for the rare earths. Comparison of 112 analyses by MS81 (ALS), 323 analyses by MS81H (ALS), and 102 analyses by method 4A/B (Acme) indicate that the average differences are 101%, 99% and 95% respectively. Thus ALS results are very close to the mean of all labs, and Acme son average about 5% lower than all laboratories.

As part of the QA/QC program, Avalon employed Acme Analytical Laboratories (Vancouver) Ltd. to analyze duplicate rejects of every tenth drill core sample to confirm the primary laboratory's accuracy. Figures 12-1 and 12-2 illustrate the duplicate reject analyses for Acme and ALS for TREE and HREE.

The regression lines fitted to the data have coefficients of 0.9995 and 0.9848 with r2 of 0.9754 and 0.9765 respectively for TREE and HREE, indicating very close fit between the two data sets. The regression lines imply a systematic difference of less than 1% or TREE and about 1.5% for HREE, with Acme slightly lower than ALS. In the opinion of Avalon, these are acceptable differences and imply minimal bias in the analytical results.

Wardrop Engineering (2009) concluded that there was evidence that Acme's analyses for REE may be biased low by more than 5% (Thor Lake Resource Update, March 2009, NI 43-101 Report). Given the difference noted above between ALS and Acme analyzes, it is concluded that the ALS analyzes are acceptable for resource estimation purposes. However, the earlier resource estimations may be understating the grade of the deposit due to the slight low bias of the early analyses.

As well as ALS method MS81H being routine for mineralized intervals of drill core samples, Avalon has tested XRF analysis (lithium borate fusion followed by XRF, method XRF10) for Nb, Ta and Zr. The method has upper limits of 10% for Nb and 50% for Ta and Zr. The results of routine analyses of the standards utilized are summarized in Table 12-4.

TABLE 12-3 RELATIVE DIFFERENCE OF MEANS OF ANALYSES TO MEAN OF ALL LABORATORIES.

Avalon Rare Metals Inc. – Thor Lake Project

Samp_type	Laboratory	Type_phase	Lab_Method	N	% mean Y	% mean La	% mean Ce	% mean Pr	% mean Nd	% mean Sm	% mean Eu	% mean Gd	% mean Tb
AVL-H (STD-H)	ALS	2009-10 ALS insert of STD-H into MS81h batches	MS81h	224	101%	99%	99%	100%	99%	99%	104%	102%	100%
STD-H	ACME	2007-8 ACME	Method 4A,B	89	98%	90%	92%	94%	98%	93%	93%	96%	94%
STD-H	ACME	2009-10 Acme Checks	Method 4A,B	13	98%	95%	103%	95%	101%	92%	90%	92%	92%
STD-H	ALS	2009-10 ALS MS81	MS81	112	105%	102%	101%	99%	101%	102%	102%	100%	99%
STD-H	ALS	2009-10 ALS MS81H	MS81H	99	102%	99%	99%	100%	99%	99%	104%	102%	99%

Samp_type	Laboratory	Type_phase	Lab_Method	N	% mean Dy	% mean Ho	% mean Er	% mean Tm	% mean Yb	% mean Lu	% mean Nb	% mean Ta	% mean Zr
AVL-H (STD-H)	ALS	2009-10 ALS insert of STD-H into MS81h batches	MS81h	224	96%	98%	101%	98%	97%	101%	103%	100%	118%
STD-H	ACME	2007-8 ACME	Method 4A,B	89	94%	97%	91%	99%	98%	101%	114%	96%	126%
STD-H	ACME	2009-10 Acme Checks	Method 4A,B	13	93%	93%	92%	91%	98%	98%	109%	93%	123%
STD-H	ALS	2009-10 ALS MS81	MS81	112	97%	99%	100%	98%	100%	102%	106%	105%	
STD-H	ALS	2009-10 ALS MS81H	MS81H	99	96%	98%	101%	97%	97%	100%	103%	101%	118%