Atlin-Taku Mineral Resource Assessment, Northwestern British Columbia (Parts of NTS 104F, J, K, L, M, N): Methodology and Results

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INTRODUCTION

The wise use of renewable and nonrenewable resources is an important issue for British Columbians. Government agencies and other groups in the province are committed to land-use processes that lead to the best possible decisions.

A common element in planning the administration of the land surface—or base—is to collect information that summarizes current and potential uses of an area under consideration for a change of use. This information should encompass all measures of value of the land, such as cultural, economic, environmental or wildlife. British Columbia has a well-established procedure for land-use assessment, which includes mineral potential assessment to consider both known and potential subsurface mineral resources. The province-wide **Level 1 Mineral Resource Assessment (MRA1)** was completed in the 1990s by the British Columbia Geological Survey (BCGS) of the Ministry of Energy, Mines and Petroleum Resources. Several additional regional assessments, such as North Coast, Central Coast and Lillooet, have been undertaken since then (MacIntyre et al*.*, 2003). These **Level 2 Mineral Resource Assessments (MRA2)** generally involved subdivision of existing tracts and redistribution of the Level 1 values to these new tracts or, in the case of Atlin-Taku, new assessments. The methodologies employed in the Level 1 and 2 assessments were described by MacIntyre et al. (2003).

The BCGS was asked by the Integrated Land Management Bureau of the Ministry of Agriculture and Lands to undertake a Level 2 Mineral Resource Assessment of the Atlin-Taku land-use planning area, which encompasses approximately 4 million hectares in northwestern BC (Figure 2). The primary purpose was to provide detailed up-to-date information on metallic and industrial mineral resource potential. Resource assessment was carried out by BCGS professionals and contractors in September 2008. Final results will be presented at a land-use planning workshop in late November 2008. This report summarizes the methodology used in the assessment and provides an initial review of the results, which are also available on the BCGS MapPlace website (http://www.mapplace.ca).

Figure 1. Experts discussing the mineral resource potential of a tract in the Atlin-Taku study area.

MINERAL POTENTIAL PROJECT

Early in 1992, the BCGS launched the Mineral Potential Project (Kilby, 1992; Kilby, 1996). Its purpose was to provide mineral potential information to the Commission on Resources and the Environment (CORE). The BCGS dedicated significant staff resources to the project, which resulted in the MRA1.

The first task of the Mineral Potential Project was to determine what information was needed in land-use negotiations and then develop a methodology to produce this information. A two-day workshop of participants with experience in producing and using a Mineral Resource Assessment (MRA) determined that MRA products must be quantitative rather than qualitative, provide a ranking of the land base, have expert input from the mining and exploration industries, be compatible with a geographic information system (GIS) and be available on the Web.

Quantitative, easily understood results were necessary because the Land Resource Management Plan (LRMP) process includes users with nontechnical backgrounds in the decision-making process; quantitative information is a preferred tool in socioeconomic analysis. Ranking of the land base was necessary because the new provincial Protected Areas Strategy required a protection target of 12% of the land area in every region, double the previous level. A major objective of the Mineral Potential Project was therefore to rank the relative mineral potential so that planners

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could identify areas with the lowest relative mineral potential.

The mining and exploration industries in BC have built an enormous knowledge base that is not public. Industry co-operation gave the BCGS access to some of this knowledge and allowed familiarization of the public-sector stakeholders with the strengths and limitations of MRAs. The provincial government required that all information for land-use planning be in GIS-compatible digital format. This ensured that information could be easily incorporated into the systems used by planners. In addition, storage in digital format provides for easy upgrades in the future. All data and map products referred to in this report are available through the MapPlace website.

Figure 2. Location of the Atlin-Taku land-use planning area.

MINERAL RESOURCE ASSESSMENT METHODOLOGY

Deposit Models

Descriptive models were developed as part of the Level 1 MRA for mineral deposits known and believed to exist in BC. This built on the work by the United States Geological Survey and others (Cox and Singer, 1986), and updated the models and refined the list of characteristics expected in BC deposits. Along with the descriptive models, a classification framework was established in which deposit types were ordered according to their genetic characteristics (Lefebure and Ray, 1995; Lefebure et al., 1995; Lefebure and Höy, 1996; Simandl et al., 1999).

Descriptive deposit models are essential to mineral resource assessment. They provide the standardization required to understand a given deposit type, with examples. The deposit descriptions identify geological, geochemical, geophysical, alteration and weathering features.

Geology Compilation

Mineral resource assessments rely on accurate, up-to-date geological information about the distribution of mineral resources in the Earth's crust. A major task during the 1990s was for the BCGS to compile the geology of the province at a scale of 1:250 000 (Kilby, 1994, 1995). All available information was compiled and digitized to form the final map product. More than 30 person-years were dedicated to the project. Compilations were produced in GIS digital format and are available over the Internet (http://www.mapplace.ca). The BCGS ensures that new geology from its field programs and other sources is updated for future mineral resource assessments.

Mineral Resource Assessment Tracts

Upon completion of the compilation, the area of the province was divided into mineral assessment tracts. These are based on common geological features; their boundaries correspond to existing geological contacts, such as faults or intrusive contacts. Tracts become the base unit areas for the assessments. The Level 1 Mineral Resource Assessment defined 794 tracts across the province. The size of tracts varies but they are intended for consideration at a regional scale (e.g., 1:250 000). The average size of tracts in the MRA1 assessment is about 100 000 ha. For each tract, permissible deposit types were determined and an estimate for the probability of their existence was made independently by several geologists.

Mineral Resource Estimation Process

Staff of the BCGS developed a Mineral Development Assessment process based on the United States Geological Survey's *Three Part Mineral Assessment Methodology* (Brew, 1992; Cox, 1993). The methodology used for Atlin-Taku was generally the same as earlier assessments, with minor differences that are described in this report. The Atlin-Taku assessment followed the Level 2 methodology described in MacIntyre et al. (2003). This methodology has been used since 2003 for area-specific assessments, such as the North Coast, Central Coast and Lillooet Land Resource Management Plan (LRMP) areas.

A six-step process is used for metallic mineral resource assessments:

1) compile geology
2) select mineral assessment tracts
3) tabulate discovered resources and construct deposit models
4) use a team of industry and government geological experts to estimate the number of undiscovered deposits by deposit type and tract
5) estimate quantities of metallic commodities remaining to be discovered using the Mark3B resource simula-

tion computer program developed by the United States Geological Survey (Root et al., 1992)

6) estimate the in-place value of each tract based on the undiscovered and known commodities it contains

For industrial mineral assessments, the first four steps are the same. However, due to their higher dependence than metallic minerals on low-cost infrastructure and access to markets, a relative ranking of industrial mineral deposit types was employed. Industrial mineral deposit types are given a relative ranking score from 1 to 100 based on their value and viability. This relative deposit value score is used to determine the importance of each tract with respect to undiscovered deposits. The estimates are then blended with the value of discovered industrial mineral deposits to produce the overall industrial mineral tract assessment ranking.

Deposit Model Data Preparation

The two inputs required for the computer simulation are

- the estimates of the potential for new discoveries; and
- the digital deposit models describing the grade and tonnage distribution of each deposit type.

The digital deposit model contains a list of realistic deposit grades and tonnages for the model types that might be found in the area being assessed (Grunsky, 1995).

Known Mineral Resources

In the Level 1 Mineral Resource Assessment, the final resource assessment value for each tract incorporated both the known and yet-to-be-discovered resources. For Level 2 assessments, such as Atlin-Taku, known resources were presented as a separate data layer and not used to rank tracts for their undiscovered resources potential.

Commodity Values

A dollar value was established for each commodity to allow the calculation of gross in-place values for each tract. In the Level 1 Mineral Resource Assessment, the dollar value used for each commodity was the average market value of that commodity for the 10-year period from 1981 to 1990. The dollar values used for the Level 2 Atlin-Taku Mineral Resource Assessment described in this report are based on September 2008 commodity prices.

Estimation Workshops

For all mineral resource assessments, government and industry experts are invited to workshops to contribute their knowledge of the area being assessed, based on their familiarity with specific deposit types.

Geological data form the basis of all discussions during the expert workshops. At the workshops, this basic information was provided both as paper maps at various scales and as online access to the MapPlace website. Other spatial geoscience datasets, such as geochemistry, mineral occurrences and tract outlines, were superimposed on the geology as overlays or plotted directly on the printed maps. For some datasets, such as geophysical information, it proved to be more important to have the supporting information available in its original format.

In addition to the information presented in map format, a compendium of the following information was provided to each group of estimators:

- descriptive deposit models
- graphs of the digital deposit models
- a list of deposit types with their median tonnages and grades
- a map displaying all tracts in the study area
- a list of tracts and their areas
- a list of resource-bearing deposits by tract
- a list of all MINFILE occurrences by tract with information on deposit type
- a tracking sheet for the group facilitator to log estimates made
- the PC-based MINFILE/pc database system

Six estimators participated in the Atlin-Taku expert estimation workshop—four from industry and two from government. This allowed the creation of two groups of experts, with each group doing estimates for specific deposit types on a tract-by-tract basis. All of these individuals had extensive knowledge of the Atlin-Taku area through years of exploration and geological mapping work in the area. This provided the basis for estimating the number of undiscovered deposits of each deposit type.

The Atlin-Taku assessment followed the methodology used in other land-use studies, such as those for Lillooet and Central Coast. When reviewing the results of the assessment, the user needs to remember the following points:

- The assessment only considered tracts that were within or intersected the Atlin-Taku boundary. Even if only a small part of the tract was actually within the study area, estimates were made for the entire tract, not just the area within the boundary.
- The per-hectare values used to rank the tracts were based on the entire tract, not just that portion within the Atlin-Taku boundary.
- The resource assessment ranked tracts according to their potential for the discovery of new resources. The assessment did not consider economic viability of these resources.

Tract Ranking

Final ranking of tracts for both the metallic and industrial minerals assessment were performed in the same way once the valued estimation information was merged with the area information. In the calculations, each tract was ranked using each of the six confidence interval values, and then the six rankings were weighted according to probability and combined to produce the final rank value. This was done to isolate the estimates at the various confidence levels so they would not bias the final ranking score. This practice prevents a high ranking at a low confidence level from overshadowing a lower ranking with a high confidence level.

For each of the variables (confidence interval levels), the tract was assigned a rank based on that variable normalized for the size of the tract (its area). The rank numbers ranged from 1, for the lowest ranking, to the total number of tracts for the highest ranked tract for that variable. In the case of Atlin-Taku, 67 tracts formed the assessment, so 67 was the highest ranking. The rank numbers for each variable were then weighted by their confidence value and summed to give a total score for each tract. For the final ranking, scores for each of the tracts were sorted from lowest to highest and assigned ordinal numbers from 1 to the total number of tracts, to give the final ranking.

The weightings assigned to the variables were 0.9 for the 90% confidence value, 0.5 for 50%, 0.1 for 10%, 0.05 for 5% and 0.01 for 1%.

ATLIN-TAKU MINERAL RESOURCE ASSESSMENT RESULTS

A new mineral resource assessment of the Atlin-Taku land-use planning area was initiated in September 2008, under a contract awarded to D.G. MacIntyre and Associates Ltd. Prior to the expert workshops, tract boundaries from the previous assessment were adjusted to reflect new geological knowledge. Some larger tracts were subdivided to make assessment more manageable and to better reflect the distribution of known mineral resources; these were CCPJ, CCPJ2, STTR3, STTR4 and OLLJ1 (Table 1).

Metallic Mineral Assessment

A metallic minerals expert workshop was convened at Smithers on September 11. This workshop involved six experts with specific knowledge of the geology and mineral resources of the study area and two facilitators, D. MacIntyre and W. Kilby. P. Desjardins of the BCGS assisted with organizing the workshops. It was not possible to complete a new assessment in the time allotted for the Smithers meeting, so a follow-up meeting was convened in Victoria on September 17

Table 1. Metallic mineral deposit types considered to be present in the Atlin-Taku land-use planning area.

Model Code	Model Name
C1	Placer Au
E4	Carbonate-hosted Au (Carlin type)
E7	Sandstone-hosted Pb-Zn
EC	Eskay Creek–type
H2	Sandstone/sedex Pb-Zn
H4–6	VMS merged
I	Epithermal Au-Ag veins
I4	Hot springs Au-Ag veins
J2	Stibnite veins and disseminations (combined)
J4	Gold-quartz / greenstone Au / turbidite-hosted Au veins
J5	Iron formation Au
K5	Polymetallic vein
M2	Replacement
N1	Cu skarn
N3	Zn-Pb skarn
N4	Fe skarn
N5	Au skarn
N6	W skarn
N7	Sn skarn
N8	Mo skarn
NICK	Serpentinite Ni
O1	Epithermal quartz-alunite Au
O2	Cu-Mo-Au porphyry
O4	Alkalic Cu-Au porphyry
O5	Intrusion-related Au
O8	Mo porphyry
O11	W porphyry
P3	Podiform chromite
P5	Alaskan PGE

At the workshops, estimators were asked initially to review a table of median grade and tonnage for a range of metallic deposit models. When estimating the number of undiscovered deposits, they were asked to use these median values for a typical deposit. A list of metallic deposit models is given in Table 1.

During the estimation process, experts had access to all available geophysical, geochemical and geological data. Online access to MINFILE and assessment reports by exploration companies was also made available. Each group reviewed the geology and mineral resource endowment of the study area on a tract-by-tract basis, providing estimates for the number of undiscovered deposits for each deposit model at confidence levels between 1 and 100%. Individual estimates included confidence ratings from other people at the assessment table. These ratings were used to weight the final combined estimate of undiscovered deposits of each deposit type.

The predicted number of undiscovered deposits was recast to the 90, 50, 10, 5 and 1% confidence levels. This provided input for the Mark3B resource simulation program developed by the United States Geological Survey (Root et al., 1992). Output from the program is in the form of predicted tonnes of metal at the 90, 50, 10, 5 and 1% confidence levels for each deposit type. The probability analysis is based on grade and tonnage data from BC deposits and. where appropriate, deposits elsewhere in the world.

Table 2. Metallic mineral potential tract rankings. Tract IDs with -1 and -2 extensions have been subdivided.

Rank	Tract ID	Area (ha)	Rank	Tract ID	Area (ha)
1	YTPZ4	17,141	35	STTR17	16,277
2	OIMJ3	72,260	36	OVPT1	5,140
3	OVN3	253,752	37	OLV1	30,422
4	OVEE1	50,205	38	STTR18	33,475
5	CCPZ5	24,048	39	CCPZ8	53,487
6	OIMJ2	10,391	40	CPPJ2-2	86,003
7	OVN2	24,850	41	STTR19	27,701
8	OVN5	7,999	42	STRPZ4	105,377
9	OSLJ1	115,680	43	STTR3-1	196,788
10	OVE3	28,792	44	OSJ2	19,494
11	CCPZ2	143,780	45	OIET2	120,458
12	OL1	31,096	46	STTR4-1	13,449
13	OSTR1	6,836	47	YTPZ6	9,691
14	CPPZ7	51,932	48	YTPZ5	51,222
15	OIK1	58,367	49	OIK2	70,141
16	CCPJ-2	116,686	50	STPZ11	46,298
17	OVE2	33,027	51	CCPZ9	66,911
18	OSLJ2	131,578	52	STPZ12	16,013
19	OIE3	29,833	53	STTR1	59,810
20	CPPZ1	90,667	54	YTPR1	61,579
21	STTR4-2	66,904	55	OS1	6,454
22	OSMZ1	53,413	56	STTR15	42,883
23	OIEK3	27,312	57	OLLJ1-1	74,076
24	CCPZ11	43,525	58	OIE5	10,601
25	OIMJ1	112,560	59	STTR16	23,464
26	OIE2	48,987	60	CCPJ-1	62,771
27	OIK3	51,890	61	SPTZ13	35,861
28	CCPZ4	63,993	62	OSJ1	31,191
29	CCPZ1	431,408	63	YTPZ2	48,163
30	OLLJ1-2	71,344	64	YTPR3	19,944
31	YTPZ7	13,855	65	CPPJ2-1	86,050
32	CCPZ10	40,656	66	STTR14	72,173
33	OIJE1	136,163	67	OIE4	4,653
34	OIKT1	20,460			

The predicted tonnages at the five different confidence levels were then given values using current commodity prices and totalled.

The tract value at the five confidence levels was then converted to a dollar value per hectare by dividing the predicted value of undiscovered resources by the tract area in hectares. The per-hectare values were used to rank the tracts from 1 (lowest) to 67 (highest) at the 90, 50, 10, 5 and 1% confidence levels. These rankings were weighted using the confidence level. This score was used to produce the final ranking (Table 2). This methodology was the same as in previous assessments. Tract rankings were divided into five groups on the basis of each group representing 20% of the total area (Figure 3). This was also consistent with previous assessments. The location of known resources is

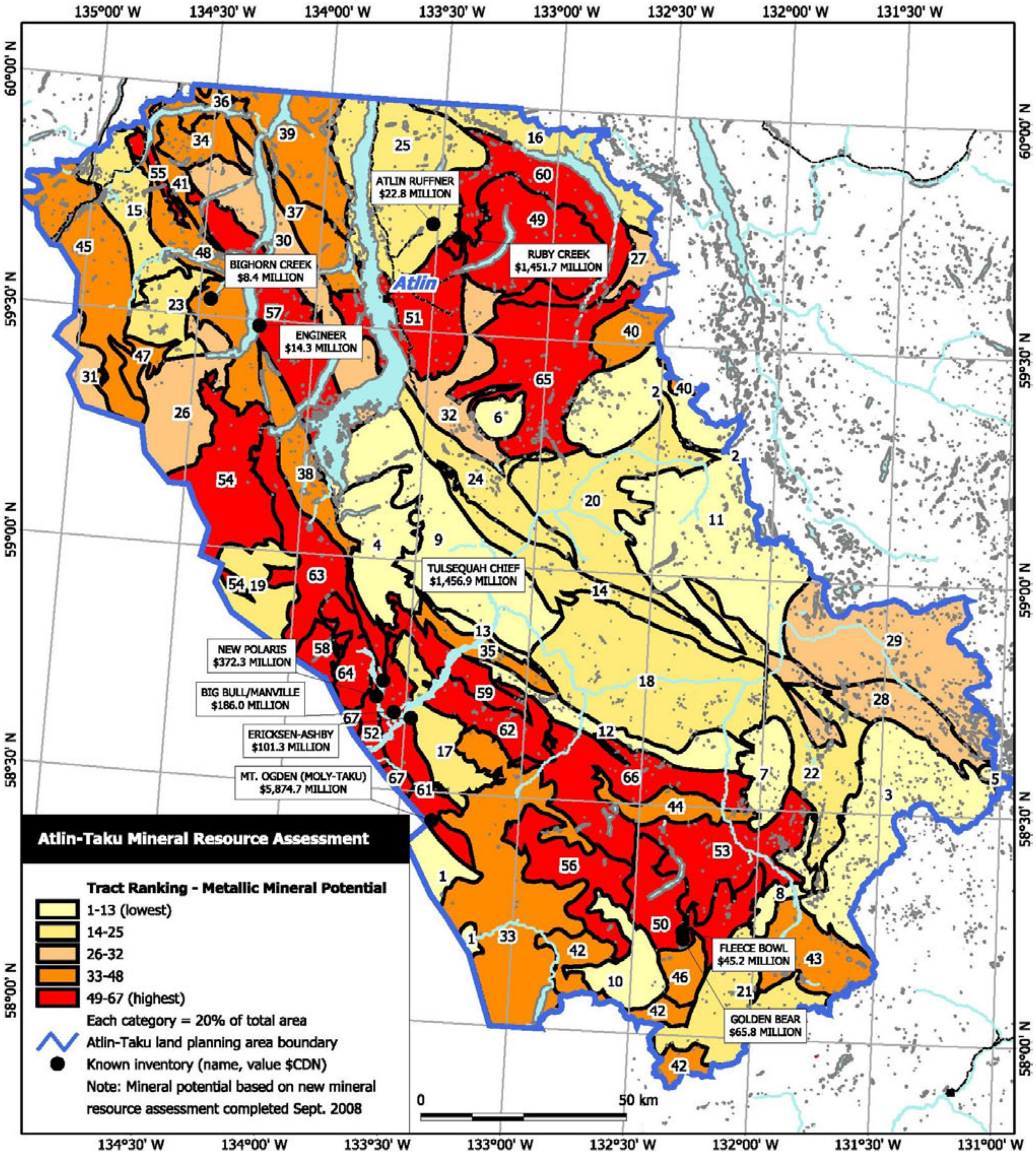

Figure 3. Metallic mineral potential and location of known resources in the Atlin-Taku land-use planning area See Table 2 for list of tracts and their ranking. Note that tracts included in the assessment have been clipped at the study area boundary for presentation clarity.

Table 3. Known metallic mineral inventory, Atlin-Taku land-use planning area.

MINFILE No.	UTM		Name	Commodities	Tonnes	Value (Million C$)	Year	Comment	Reference
	Easting	Northing							
104K 002	580980	6511483	Tulsequah Chief	Zn Cu Pb Ag Au	7,910,000	$1,456.92	2006	An initial mineable reserve, which is part of the overall geological reserve of 8.9 million tonnes	Schroeter (1998)
104K 003	579630	6507525	New Polaris	Au	1,670,000	$372.32	2007	Combined measured and Indicated reserves, based on 2 g/t cut-off grade	Schroeter et al. (2007)
104K 009	588477	6502983	Ericksen-Ashby	Ag Pb Zn	907,100	$101.27	1964	Year of reserves is questionable	MINFILE 104K 009
104K 013	595697	6478679	Mt Ogden (Moly-Taku)	Mo	217,704,000	$5,874.65	1981	Grade given was 0.3% MoS_2; conversion to Mo using the factor 1.6681	MINFILE 104K 013
104K 079	659005	6455376	Golden Bear (Grizzly)	Au	152,900	$65.80	1999	Combined resource	MINFILE 104K 013
104K 087	658767	6457224	Fleece Bowl (Kodiak C)	Au	276,000	$45.19	1999	Combined resource	MINFILE 104K 013
104M 006	530995	6600002	Bighorn Creek (Lawson)	Au	69,000	$8.44	1991	Rough estimate.	Baldys (1991)
104M 014	543328	6594556	Engineer (Total)	Au	20,000	$14.28	1993	Estimated reserves	Schroeter (1994)
104N 011	583110	6622918	Atlin Ruffner	Ag Pb	113,638	$22.76	1988	Reserves from the two zones from which underground development and production have taken place	McIvor (1989)
104N 052	589738	6620163	Ruby Creek	Mo	157,685,000	$1,451.73	2007	Combined proven and probable reserves using a 0.04% MoS_2 mining grade cut-off	Adanac Molybdenum Corporation (2007)
104K 008	584181	6504063	Big Bull (Main/60-62)	Cu Zn Pb Ag Au	888,000	$185.99	2006	Inferred and Indicated resource using cut-off NSR C$86	Redcorp Ventures Ltd. (2007)

Abbreviation: NSR, net smelter return

shown on Figure 3 and listed in Table 3. The calculated gross in-place value of known resources shown in Table 3 is based on commodity prices current as of the end of November 2008.

Industrial Mineral Assessment

A separate expert workshop was convened at Victoria on October 8, 2008 to reassess the 1996 industrial mineral estimates for the Atlin-Taku land-use planning area. This involved four experts from the BCGS, with D. MacIntyre as facilitator. New estimates were done for a number of deposit models not considered in the original 1996 assessment. These included rhodonite (Q02), schist-hosted emerald (Q07) and jade (Q01). The deposit models considered in the assessment are listed in Table 4.

For subdivided tracts, the existing 1996 estimates were redistributed following the methodology described in MacIntyre et al. (2003). The results of the industrial mineral assessment are presented in Table 5. Note that 15 tracts did not have any estimates for industrial mineral deposits and are given a rank of 0. Tract rankings, colour-coded by ranking group (each group representing 20% of the tract area), are shown on Figure 4.

Comparison to the Provincial Resource Assessment

In comparing the results of the 1996 mineral resource assessment with the Atlin-Taku assessment, the following observations can be made:

Tract rankings are relative to the Atlin-Taku land-use planning area only and are not provincial rankings. Tracts within the study area are ranked from 1 to 67, whereas the provincial ranking (MRA1) was from 1 to 794.

Table 4. Industrial mineral deposit types considered to be present in the Atlin-Taku land-use planning area and associated relative deposit value scores (RDVS) used to

Model Code	Model Name	RDVS
D6	Zeolites	22.5
E10	Sedimentary kaolin	42.5
E6a	Sparry magnesite	22.5
I13	U-Th pegmatite	50
J8	Vein barite	22.5
J9	Barite-flourite vein	22.5
L1	Pegmatite lithium-cesium-tantalum LCT	50
P6	Asbestos	10
P7	Serpentinite-hosted magnesite-talc	22.5
Q01	Jade	55
Q02	Rhodonite	75
Q07	Schist-hosted emerald	95
R2	Kyanite family	25
R6	Crystalline flake graphite	65
T1	Cement shale	15
T10	Pumice	40
T11	Perlite	22.5
T2	Expanding shale	25
T3	Dimension-stone granite	15
T4	Dimension-stone marble	17.5
T9	Limestone/dolostone	40
T9a	Limestone/dolostone (White)	25

The new assessment had the advantage of an additional 12 years of data collection (mineral exploration and BCGS mapping) since the last assessment.

Six new deposit models (E4, E7, EC, I4, J2 and O1; Table 2) were considered, and estimates made for these models were not part of the MRA1. This increase reflects increased knowledge of the mineral resource endowment of the area since 1996.

Unlike the earlier Level 1 assessment, the Level 2 assessment did not factor in the known resources in the tract ranking scheme. As shown in Figure 2, known resources are treated as a separate point layer in the assessment. This is consistent with other Level 2 assessments, such as the one carried out for the Lillooet Land Resource Management Plan (LRMP).

The assessment used current commodity prices to determine per-hectare values. The previous assessment used a 10-year average price. For some commodities, current prices are significantly higher than their historical range. Depending on the deposit model being considered, higher commodity prices can have a significant impact on tract rankings, again making comparison with the previous assessment difficult.

CONCLUSION

A new Level 2 mineral resource assessment of the Atlin-Taku land-use planning area was completed in September 2008. The new assessment follows an assessment

Table 5. Industrial mineral potential tract rankings. Tract IDs with -1 and -2 extensions have been subdivided.

Rank	Tract ID	Hectares	Rank	Tract ID	Hectares
0	CCPZ5	24,048	35	OIE3	29,833
0	OIE4	4,653	36	OLLJ1-2	71,344
0	OIEK3	27,312	37	OLLJ1-1	74,076
0	OIET2	120,458	38	OIK2	70,141
0	OIKT1	20,460	39	YTPZ2	48,163
0	OL1	31,096	40	OSLJ1	115,680
0	OLV1	30,422	41	OVEE1	50,205
0	OS1	6,454	42	CCPZ11	43,525
0	OSJ1	31,191	43	CCPJ-1	62,771
0	OVN2	24,850	44	CCPJ-2	116,686
0	OVN3	253,752	45	SPTZ13	35,861
0	OVPT1	5,140	46	YTPZ5	51,222
0	STTR16	23,464	47	CCPZ10	40,656
0	STTR18	33,475	48	CPPZ1	90,667
15	OIMJ3	72,260	49	OVE3	28,792
16	STTR1	59,810	50	STPZ11	46,298
17	OSMZ1	53,413	51	STTR17	16,277
18	STTR15	42,883	52	OVE2	33,027
19	CCPZ2	143,780	53	CCPZ4	63,993
20	STTR3-1	196,788	54	CCPZ8	53,487
21	OIMJ2	10,391	55	YTPZ7	13,855
22	STTR4-1	13,449	56	STRPZ4	105,377
23	STTR4-2	66,904	57	YTPR1	61,579
24	OSLJ2	131,578	58	STTR19	27,701
25	STTR14	72,173	59	STPZ12	16,013
26	OIE5	10,601	60	OSJ2	19,494
27	OIJE1	136,163	61	YTPZ4	17,141
28	CPPJ2-2	86,003	62	YTPZ6	9,691
29	CPPJ2-1	86,050	63	YTPR3	19,944
30	OIK3	51,890	64	OVN5	7,999
31	CCPZ1	431,408	65	OSTR1	6,836
32	OIE2	48,987	66	CCPZ9	66,911
33	OIK1	58,367	67	CPPZ7	51,932
34	OIMJ1	112,560			

completed in 1996 and includes new estimates for an expanded list of mineral deposit types. Sixty-seven tracts within the study area were given relative ranks that reflect their potential for the discovery of new resources in the future. Highest ranked tracts for metallic mineral potential are those where the geological framework is favourable for the presence of large-tonnage, low-grade porphyry Cu, Mo, W and Au deposits. Such deposits have a high value because of their relatively large size compared to, for example, smaller vein deposits

Users are cautioned, however, that mineral resource assessments use only currently available geological knowledge and expert views. These are, therefore, a snapshot in time that can change subject to additional information. They are also among the most challenging land-use assessments to complete, as they estimate a hidden subsurface re-

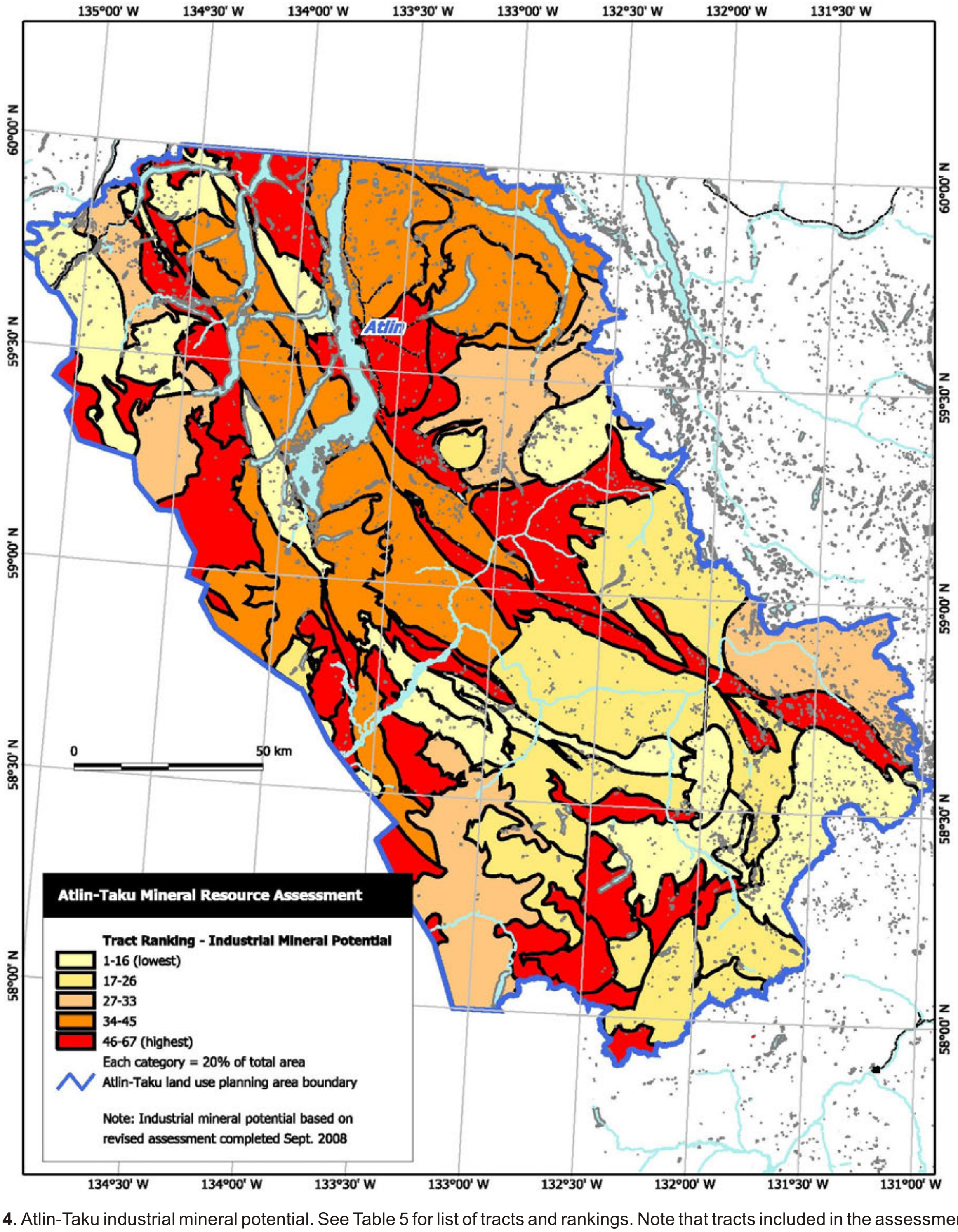

Figure 4. Atlin-Taku industrial mineral potential. See Table 5 for list of tracts and rankings. Note that tracts included in the assessment have been clipped at the study area boundary for presentation clarity.

source. The caution applies to both negative and positive uncertainty: the sudden discovery of diamonds in the Northwest Territories in the 1990s demonstrates the difficulty of predicting future resource discoveries. Areas currently considered to have low mineral potential may simply reflect lack of understanding of the geology and associated mineral resources.

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