Raven Underground Coal Project

Updated Project Description

Prepared for:

Compliance Coal Corporation

DBA Comox Joint Venture

Suite 550 – 800 West Pender Street
Vancouver, BC, V6C 2V6

Prepared by:

AMEC Earth & Environmental
a division of AMEC Americas Limited

Suite 600, 4445 Lougheed Highway
Burnaby, BC, V5C 0E4

AMEC File No: VE51897

May 2011

TABLE OF CONTENTS

Page

LIST OF ACRONYMS ..... **I**

1 INTRODUCTION **1**
1.1 Proponent 1
1.1.1 Project Management Team 2
1.1.2 Previous Raven Property Owners and Exploration History 6
1.2 Justification for the Proposed Raven Project 7
1.2.1 Global Coal Demand 7
1.2.2 Global Coal Supply 8
1.2.3 Coal Supply from the Proposed Project 8
1.2.4 Other Benefits of the Proposed Project 8
1.3 Regulatory Context 9
1.3.1 BC Environmental Assessment Act 9
1.3.2 Canadian Environmental Assessment Act 9
1.3.3 Other Permits and Approvals 12
1.4 Objectives and Guiding Principles 13

2 OVERVIEW OF THE PROJECT **14**
2.1 Property 14
2.1.1 Location 14
2.1.2 Access 16
2.1.3 Land Rights 16
2.2 Coal Resources 19
2.2.1 Geological Overview 19
2.2.2 Raw Coal 23
2.2.3 Clean Coal 23
2.3 Underground Mining 24
2.3.1 Model 24
2.3.2 Room-and-Pillar Mining 24
2.4 Onsite Processing 28
2.4.1 Crushing and Sizing 28
2.4.2 Raw Coal Stockpiles 30
2.4.3 Coarse and Fine Coal Fractions 30
2.4.4 Coarse and Fine Coal Cleaning Circuits 30
2.4.5 Fine Rejects 31
2.4.6 Clean Coal Product 31
2.5 Coal Transport 32
2.5.1 Transportation to Port Alberni 34
2.5.2 Berthing and Loading at Port Alberni 34
2.6 Support Facilities 35
2.7 Environmental Management 38
2.8 Project Economics 38
2.8.1 Project Schedule 38
2.8.2 Work Schedule 40
2.8.3 Capital Costs 41
2.8.4 Operating Costs 41

TABLE OF CONTENTS

Page

2.8.5 Financial Analysis 41
2.9 Alternatives 41

3 OVERVIEW OF THE ENVIRONMENT 42
3.1 Geosphere 42
3.1.1 Terrain 42
3.1.2 Soils 42
3.1.3 Geology 43
3.1.4 Geochemistry 46
3.2 Hydrosphere 47
3.2.1 Groundwater and Hydrogeology 47
3.2.2 Surface Freshwater and Hydrology 50
3.2.4 Marine Waters 52
3.3 Atmosphere 52
3.3.1 Climate 52
3.3.2 Air Quality, Noise, and Vibration 52
3.4 Biosphere 53
3.4.1 Vegetation and Wetlands 53
3.4.2 Terrestrial Wildlife 55
3.4.3 Fish and Aquatic Resources 56
3.4.4 Shellfish and Marine Resources 58
3.5 Human Environment 60
3.5.1 Local Communities 60
3.5.2 Non-Traditional Land and Resource Use 60
3.5.3 Local First Nations 63
3.5.4 Traditional Knowledge and Traditional Land Use (TK-TLU) 64
3.5.5 Archaeological Setting 64
3.6 Natural Hazards and Environmental Concerns 64
3.6.1 Earthquakes 64
3.6.2 Tsunamis 65
3.6.3 Forest Fires 65
3.6.4 Floods 65
3.6.5 Avalanches 66

4 POTENTIAL PROJECT IMPACTS AND ENVIRONMENTAL MANAGEMENT 67
4.1 Land Management 67
4.1.1 Topsoil and Till 70
4.1.2 Waste Rock 71
4.1.3 Coal Reject Stockpiles 71
4.1.4 Other Mine Wastes 71
4.2 Water Management 71
4.2.1 Underground Mine Water 76
4.2.2 Onsite Water 77
4.2.3 Acid Rock Drainage and Metal Leaching 77
4.2.4 Selenium Mobilization 77
4.2.5 Navigable Waters 78
4.2.6 Fish Habitat 79

TABLE OF CONTENTS

Page
4.2.7 Shellfish Resources ... 80
4.3 Air, Noise, and Vibration Management ... 80
4.3.1 Air Quality in the Mine ... 85
4.3.2 Air Quality from Coal Handling and Transportation ... 85
4.3.3 Noise and Vibration ... 85
4.4 Human Health and Well-Being ... 86
4.5 First Nations and Archaeology ... 91
4.6 Closure and Reclamation Activities ... 94

5 CONSULTATION AND ENGAGEMENT ... 95

6 CONCLUDING REMARKS ... 98

7 REFERENCES ... 99

LIST OF TABLES

Table 1.3-1: Canadian Environmental Assessment Act Triggers ... 10
Table 2.1-1: Undersurface Rights ... 18
Table 2.1-2: District Lots within Raven Property ... 18
Table 2.8-1: Preliminary Project Phase Activities ... 39
Table 3.2-1: Groundwater Wells Usage ... 50
Table 3.4-1: Potential Species at Risk ... 55
Table 4.1-1: Potential Impacts to Land, and Mitigation Strategies ... 70
Table 4.2-1: Potential Impacts to Water and Aquatic / Marine Resources, and Mitigation Strategies ... 76
Table 4.2-2: Summary of Navigable Waters ... 79
Table 4.3-1: Potential Impacts to Air, and Mitigation Strategies ... 81
Table 4.3-2: Potential Impacts to Noise Levels, and Mitigation Strategies ... 81
Table 4.4-1: Potential Impacts to Human Health and Well-Being, and Mitigation Strategies ... 90

LIST OF FIGURES

Figure 2.1-1: Proposed Raven Project Location ... 15
Figure 2.1-2: Proposed Raven Project Land Tenure ... 17
Figure 2.2-1: Coal Resources in Seam 150 ... 20
Figure 2.2-2: Coal Resources in Seam 360 ... 21
Figure 2.2-3: Coal Resources in Seam 340 ... 22
Figure 2.3-1: Underground Mine Layout for Seam 150 ... 26
Figure 2.3-2: Underground Mine Layout for Seam 360 / 340 ... 27
Figure 2.4-1: Mine Flowchart ... 29
Figure 2.5-1: Transportation Options ... 33
Figure 2.6-1: Conceptual Infrastructure ... 36

TABLE OF CONTENTS

Page

Figure 3.1-1: Regional Geology 44
Figure 3.1-2: Geological Cross-Section 45
Figure 3.2-1: Groundwater Well Locations 49
Figure 3.2-2: Surface Hydrology 51
Figure 3.4-1: Sensitive Ecosystem Mapping 54
Figure 3.4-2: Fish Distribution 57
Figure 3.4-3: Shellfish License Locations 59
Figure 3.5-1: Parks and Ecological Reserves 61
Figure 4.1-1: Terrestrial Spatial Boundaries 69
Figure 4.2-1: Aquatic Spatial Boundaries 73
Figure 4.2-2: Marine Spatial Boundaries, Baynes Sound, BC 74
Figure 4.2-3: Port and Marine Study Area Spatial Boundaries 75
Figure 4.3-1: Air Quality Spatial Boundaries – Mine Site 82
Figure 4.3-2: Noise Spatial Boundaries – Mine Site 83
Figure 4.3-3: Air Quality and Noise Spatial Boundaries – Port Facilities 84
Figure 4.4-1: Economic and Social Spatial Boundaries 88
Figure 4.4-2: Non-traditional Land Use Spatial Boundaries 89
Figure 4.5-1: Archaeology and Heritage Resources Spatial Boundaries 92
Figure 4.5-2: First Nations Asserted Territories 93

List of Acronyms

Abbreviation	Definition
ABA	acid base accounting
AIA	Archaeological Impact Assessment
AIR	Application Information Requirements
AMEC	AMEC Earth and Environmental
Application	Application for an Environmental Assessment under the BC *Environmental Assessment Act*
AOA	Archaeology Overview Assessment
ARCD	Alberni-Clayoquot Regional District
ARD	acid rock drainage
ASTM	American Society for Testing and Materials
BC	British Columbia
BCEAA	British Columbia *Environmental Assessment Act*
BC EAO	British Columbia Environmental Assessment Office
BCGS	British Columbia Geographic System
BC MAL	British Columbia Ministry of Agriculture and Lands
BC MEMPR	British Columbia Ministry of Energy, Mines, and Petroleum Resources
BC MOE	British Columbia Ministry of Environment
BC MOFR	British Columbia Ministry of Forests and Range
BC MoTI	British Columbia Ministry of Transportation and Infrastructure
BCTC	British Columbia Transmission Corporation
CABIN	Canadian Aquatic Biomonitoring Network
CCC	Compliance Coal Corporation
CDC	Conservation Data Centre
CEAA	Canadian Environmental Assessment Agency
CEA Act	*Canadian Environmental Assessment Act*
CEC	Compliance Energy Corporation
CEO	Chief Executive Officer
CFB	Canadian Forces Base
CJV	Comox Joint Venture
cm	centimetre
CMT	culturally modified tree
CPP	coal preparation plant
CVRD	Comox Valley Regional District
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EC	Environment Canada
EIS	Environmental Impact Statement
FISS	Fisheries Information Summary System

Abbreviation	Definition
FNEATWG	First Nations Environmental Assessment Technical Working Group
ha	hectare
ha-y	hectares per year
HADD	harmful alteration, disruption, or destruction
Hillsborough	Hillsborough Resources Ltd.
ICC	I-Comox Coal Incorporated
kcal/kg	kilocalorie per kilogram
km	kilometre
km^2	kilometre squared
kV	kilovolt
kW	kilowatt
LGI	LG International Investments (Canada) Limited
Ltd.	Limited
LRMP	Land and Resource Management Plan
LSA	Local Study Area
m	metre
m^3	cubic metre
m^3/t	cubic metre per tonne
met	metallurgical
ML	metal leaching
mm	millimetre
MPMO	Government of Canada's Major Projects Management Office
Mt	Mtonne
Mtpa	Mtonne per annum
NAG	non-acid-generating
NI 43-101	National Instrument 43-101
NPR	net potential ratio
NRCan	Natural Resources Canada
NTLU	non-traditional land and resource use
PAG	potentially acid-generating
PAPA	Port Alberni Port Authority
PCI	pulverized-coal-injection
proposed Raven Project (the)	proposed Raven Underground Coal Mine Project
RA	Responsible Authority
RDEA	Regional District Electoral Area
RMZ	Resource Management Zones
RMDRC	Regional Mine Development Review Committee
ROM	run-of-mine
RSA	Regional Study Area
SARA	*Species at Risk Act*
SEI	sensitive ecosystem inventory

Abbreviation	Definition
t	tonne
t/h	tonnes per hour
TC	Transport Canada
TK-TLU	Traditional Knowledge and Traditional Land Use
UBC	University of British Columbia
Weldwood	Weldwood of Canada Ltd.
YQQ	Comox Airport
~	approximately
^{o}	degree
^{o}C	degrees Celsius
%	percent

1 INTRODUCTION

Compliance Coal Corporation (CCC) dba the Comox Joint Venture (CJV) is proposing the development of an underground coal mine, the Raven Underground Coal Mine Project (proposed Raven Project) on Vancouver Island, British Columbia (BC). The purpose of this report is to present a detailed description of the proposed Raven Project and its potential to affect the environment. This report has been prepared in accordance with Environmental Assessment (EA) guidance materials prepared by the BC Environmental Assessment Office (BC EAO) (BC EAO 2006) and the Government of Canada's Major Projects Management Office (MPMO) (MPMO 2008).

Section 1 provides information on: the proponent and the history of exploration at the site (Section 1.1); the justification for the proposed Raven Project (Section 1.2); regulatory context (Section 1.3); and objectives of and guiding principles behind the proposed Raven Project (Section 1.4).

Subsequent sections of this report provide information on: project components and activities (Section 2); the environment surrounding the proposed Raven Project (Section 3); potential impacts of the proposed Raven Project on the environment; management practices to mitigate potential impacts (Section 4); and consultation and engagement activities (Section 5). Concluding remarks are presented in Section 6 and information sources referenced throughout the report are provided in Section 7.

1.1 Proponent

The Raven property is owned by the CJV, which consists of three companies: CCC (60 percent (%)); I-Comox Coal Inc. (ICC), a subsidiary of Itochu Corporation (20%); and LG International Investments (Canada) Limited (Ltd.) (LGI) (20%). The three companies have formed the CJV for the purpose of exploring and developing their coal and mineral interests on Vancouver Island. Under the CJV arrangement, CCC will be responsible for managing and operating the proposed Raven Project, and ICC and LGI will be responsible for the global marketing for the products produced from the Raven property on an exclusive basis.

CCC is a 100% subsidiary of Compliance Energy Corporation (CEC). Through the CJV, CCC manages 29,000hectares (ha) of coal rights in the Comox Coal Basin on Vancouver Island. CCC is currently focussed on exploring the Raven met (metallurgical) coal deposit, which consists of 3,100 ha of the Tsable River coalfield, which is located at the southern end of the Comox Basin. CEC developed and operated the Basin Coal Mine located near Princeton, BC. This mine is currently under Care and Maintenance.

CEC is a publicly listed Canadian company based in Vancouver, BC with interests in mining. CEC shares trade on the TSX Venture Exchange under the symbol CEC. The Company was incorporated under the *Company Act* of the Province of BC on 6 July 2000 as 610230 BC Ltd. and changed its name to Beanstalk Capital Corporation on 27 July 2000. On 19 December 2000, the Company was listed on the Canadian Venture Exchange as a "Capital Pool Company". On 7 May 2002, the Company announced that it had entered into an

agreement to acquire all of the issued and outstanding shares of CCC, a private company based in Vancouver, BC that had the right to develop the coal resources in the Tulameen Coal Basin located near Princeton, BC. On 30 August 2002, the Company completed the acquisition of CCC and as part of the acquisition, changed its name to CEC.

CEC's contact information is as follows:

Address: Suite 550, 800 West Pender, Vancouver, BC V6C 2V6

Telephone: 604-689-0489

Facsimile: 604-681-5910

E-mail: john@complianceenergy.com (John A. Tapics, President & Chief Executive Officer (CEO))

Internet: http://www.complianceenergy.com.

John A. Tapics, CEC's President and CEO will be the principal contact person for purposes of the EA.

1.1.1 Project Management Team

At the time of submission, the Project Management Team for the proposed Raven Project includes:

John A. Tapics, P.Eng. President & CEO, CEC

John A. Tapics graduated in 1975 with a B.Sc. Honours in Mining Engineering from Queen's University in Ontario, Canada. Mr. Tapics has over 30 years of mining and electricity industry experience including: four years as President and CEO of the Alberta Electric System Operator and Alberta's Balancing Pool with responsibility for operating Alberta's electricity market, transmission planning, system operations and managing power purchase agreements; and eleven years as an Officer of TransAlta Corporation, in charge of the Generation, and the Transmission and Distribution Business units. While at TransAlta, Mr. Tapics was responsible for the operation of 4,500 Megawatts of power capacity (3,700 Megawatts of coal fired thermal capacity, and 800 Megawatts of hydro). He directed the planning and economic delivery of 16 million tonnes (Mt) of coal annually from two mine sites to three power plants totalling 3,300 Megawatts. In addition, he was responsible for TransAlta's share of the 50/50 joint venture 800 Megawatt Sheerness Power Plant operated by ATCO Power. Mr. Tapics has served as a Director of the Coal Association of Canada, the Alberta Chamber of Resources, and the Western Electric Power Institute. He has been active with the Canadian Electricity Association, serving on the Generation and the Transmission Strategic Issues working groups; and the Canadian Institute of Mining and Metallurgy serving as the Calgary Branch Chairman.

James O'Rourke, Chairman, CEC

James C. (Jim) O'Rourke graduated in 1964 with a B.A.Sc. degree in Mining Engineering from the University of BC. Mr. O'Rourke gained valuable mine development and operating experience while involved in the start-up phase of five major mines during a period of 14 years while employed by Placer Development Ltd. He has over 30 years of extensive hands-on experience in mine evaluations, financing development, marketing and operations in Canada, the United States, South America and the Philippines. As President of Princeton Mining Corporation (1987-1997) he was responsible for the acquisition of the Similco open pit copper mine, the evaluation, financing and development of the Cassiar underground block cave mine and the acquisition, evaluation, financing and development the Huckleberry open pit copper mine in northern BC. The Huckleberry Project was completed on schedule at its budgeted cost of $140 million.

Mr. O'Rourke is currently President and CEO of Copper Mountain Mining Corporation and is leading the $437 million redevelopment of the old Similco Mine with a target of recommencing production in June 2011.

Mr. O'Rourke has served as a director of the Mining Association of Canada (1987-1990), the Vancouver Board of Trade (1990) and Chairman (1992) and Director (1987-Present) of the British Columbia Mining Association. Mr. O'Rourke is currently Chairman of CEC, and a director of numerous public and private companies in mining and property development.

Jim Defer, Chief Financial Officer, CEC

Jim Defer graduated in 1987 from the University of Manitoba with B. Comm. (Honours). Mr. Defer is a CA & a CBV and a member of the Institute of Chartered Accountants and Canadian Institute of Chartered Business Valuators. He joined the Company as Chief Financial Officer effective 01 March 2010. Mr. Defer has significant experience in investment banking, capital markets, corporate finance, as well as accounting, valuation and financial advisory services. Most recently, he was head of investment banking for a Vancouver based firm and has held senior managerial roles with two major accounting and auditing firms.

Pat Tsuen, Senior Business Manager and Project Developer, CEC

Pat Tsuen graduated in 1973 with a B.Sc. degree and in 1975 with a M.A. degree in Economics from the University of Alberta. He has over 25 years experience in managing power and energy-related projects worldwide, from business identification, to project development and project implementation, including site evaluation, permitting, evaluation of project technical, commercial and financial viability, energy purchase & supply contract negotiations, risk mitigation and structuring options for project financing. Mr. Tsuen was Vice President of Business Development for the BC International Power Group Inc. and Director of Business Development for Westcoast Energy (now part of the Spectra Energy Corp.). He has experience in energy marketing and trading in the BC, Pacific Northwest and California markets.

Timothy J. Bekhuys, R.P. Bio., P. Biol., Senior Associate, AMEC

Timothy Bekhuys is a biologist with over 20 years experience and extensive experience in mining EAs. Mr. Bekhuys is currently providing advice on environmental and permitting issues to Galore Creek Mining Corp. (GCMC) and the AMEC Earth and Environmental (AMEC) engineering team preparing the feasibility study for the Galore Creek Project. Mr. Bekhuys has successfully permitted projects through the BC *Environmental Assessment Act* (BC *EAA*) / Canadian Environmental Assessment Agency (CEAA) process in BC. He was the project manager for the Mt. Milligan Project which recently completed the BCEAA / CEAA process and is presently under construction; Mr. Bekhuys acted as a principal client liaison and provided strategic advice, government and First Nations liaison. Mr. Bekhuys was a senior peer reviewer for the Red Chris Environmental Impact Assessment, and was the Environmental Manager for the Gahcho Kue diamond mine EA. In addition, he was recently the Environmental Manager for the Oyu Tolgoi Copper-Gold Project in Mongolia, Sangdong Zinc Project in South Korea and Maoling Gold Project in China.

Bruce Ott, Ph.D., R.P. Bio., Senior Associate, AMEC

Bruce Ott has extensive and recent experience in the EA process and the approvals and permitting of mining projects in Western Canada. Dr. Ott is currently the biophysical coordinator for the proposed Wapiti Coal and Kitsault Molybdenum Projects, both in BC. Recently, Dr. Ott was the biophysical coordinator for the Mt. Milligan Project. Mr. Ott is currently assisting Imperial Metals with permit applications for their Red Chris Project, having served as biophysical coordinator for the project approval. He also served as co-Project Manager for the Star Diamond Project in Saskatchewan (Shore Gold Inc.) and Environmental Manager for the Jericho diamond project in Nunavut (Tahera Diamond Corporation). Dr. Ott also led the project approval and permitting process for the Pine Valley Coal Mine in Chetwynd, BC.

Peter Christensen, Principal Mining Engineer, Pincock Allen & Holt

Peter Christensen, Principal Mining Engineer of Pincock Allen & Holt (PAH) is Project Manager for conducting a bankable feasibility study on the proposed Raven Project. In addition to managing the technical due diligence of the proposed Raven Project for JV partners Itochu and LGI, Mr. Christensen has recently managed a conceptual and more advanced study for a large open cut coal project in Alaska. Mr. Christensen was also project managing a bankable feasibility of Wyoming Longwall Project currently shelved due to economic conditions. Prior to joining Pincock Allen & Holt, Mr. Christensen was Project Manager for Vale (Comox Valley Regional District (CVRD)) responsible for the Belvedere Project in Australia. The project at the time was in scoping / pre-feasibility evaluation stages as a potential 10 Mtonne per annum (Mtpa) plus underground coal mine. As well as managing the technical and economic components of the project, Mr. Christensen was also responsible for an exploration program consisting of over 80 holes (approximately (~) 60,000 metres (m)) and 80 kilometres (km) of seismic.

Dan Berkshire, Director of Exploration and Project Development, CEC

Dan P. Berkshire has worked extensively within the mineral industry since 1981, acting in many capacities including President and CEO of a public mineral exploration company. As well, since 1986, Mr. Berkshire has been providing drafting, logistical, and exploration support services exclusively to professional registered geologists and engineers. He is currently working in that capacity as Project Manager for the Comox Joint Venture Raven Coal Project. He has been involved in this project since its inception, having formed the Trent River Coal Partnership in 2002 to acquire and develop both the Hamilton Lake and Tsable Coal Fields – respectively now known as the Bear and Raven Projects. In 2004, Trent River first optioned then sold the Bear Project to CEC and then followed up in 2005 by selling its interest in the proposed Raven Project to CEC.

Candy-Lea Chickite, Community Liason, CEC

Candy-Lea Chickite, our "Community Liaison," is a member of the We Wai Kai Nation (Cape Mudge Indian Band) who has extensive current and historical knowledge of the First Nations in the vicinity of the proposed Raven Project area. She self-identifies as a Commercial Fisherman hoping to witness a revival of the industry she has a great appreciation of, and has participated in, for 28 years. Ms. Chickite comes to our project management team with proven experience and an impressive track record in establishing solid relationships with businesses, governmental / non-governmental agencies, and most notably the general public. She has acted in the capacity as a liaison between First Nations and Statistics Canada, has assisted in the planning and delivery of many events for several organizations in her community generally in the capacity as Chair of "Community Relations" with one epic event being a First Nations Elders' Gathering hosting 2000 attendees from all over BC, held supervisory positions within Statistics Canada and in Market Research companies overseeing various community surveys, and has been a public speaker / educator for nearly 20 years.

Owen Cullingham, President, O.R. Cullingham Resource Consultants Ltd.

Owen Cullingham graduated from the University of Calgary in 1971 with B.Sc. in Geology and has over 35 years of experience in coal exploration and resource assessment of met and thermal coal deposits. He wasthe Exploration Manager for the drilling programs for the proposed Raven Project and authored the National Instrument 43-101 (NI 43-101) coal resource report for Raven in 2007. His experience includes: property evaluations; computer geological modelling; resource and / or reserve determinations; coal quality assessment; field and mapping experience throughout Canada, and in the United States, S.E. Asia, Middle East, Central America and Colombia; background in structurally complex areas of the Rocky Mountains; interpretation of geophysical logs; coal-bed methane potential and evaluation; and, mining feasibility studies. In addition, Mr. Cullingham has managed major multidisciplinary exploration programs in Canada and Colombia and

initiated and conducted grassroots investigations in Central America, Africa and the Middle East.

1.1.2 Previous Raven Property Owners and Exploration History

The small Baynes Sound Mine was the first operation to explore minerals in the area of the Raven property. It opened in 1869 and mined an unknown quantity of coal before economic conditions forced its shutdown in 1877 (PAH 2010).

Canadian Collieries (Dunsmuir) Ltd. controlled mineral rights in the area from 1905 to 1957. They drilled 79 holes in the vicinity of the proposed Raven Project area. In the Cumberland area, however, they extracted ~14.5 Mt of coal from eight mines between 1888 and 1955; Union Bay housed a coal preparation plant, met coke ovens, and a shipping and bunkering terminal for these mines (PAH 2010).

The Tsable River Mine opened in 1949 in the immediate vicinity of the proposed Raven Project area, and extracted ~ 2.0 Mt of coal until its shutdown in 1966 (PAH 2010).

American Plywood Company (the forerunner of Weldwood of Canada Ltd. (Weldwood), itself the forerunner of West Fraser) purchased the assets in the early 1960s, primarily for the extensive forest land holdings. They drilled 16 holes in the vicinity of the proposed Raven Project area and constructed a test adit along the banks of Cowie Creek to further define the mineral resources. Weldwood relinquished some of its holdings to the Crown as a result of this work (PAH 2010).

Consolidated Brinco acquired an option from Weldwood in 1990 to explore for coal. They drilled 20 holes in the Tsable River coalfield (PAH 2010).

Hillsborough Resources Ltd. (Hillsborough) acquired Consolidated Brinco in 1991. They drilled 32 holes and carried out reflective seismic testing between 1996 and 2001. In 1997 they submitted an application for a test underground mine, to produce 100,000 tonnes (t) of coal for testing and export marketing purposes. The test mine was to be located in the northwest corner of Lot 88, South of the Tsable River (i.e., the site selected for the proposed Raven Project). An application for a test mine for a bulk sample up to 100,000 t does not require approval as it is below the reviewable limit but did require a mine permit from the BC Ministry of Energy, Mines and Petroleum Resources (BC MEMPR) and review by an all agency Regional Mine Development Review Committee (RMDRC). Hillsborough received approval for its test mine. Hillsborough prepared a NI 43-101 compliant resource report in 2001. Hillsborough did no further work at Raven after this and relinquished its option with Weldwood (PAH 2010).

CCC optioned the property from West Fraser in 2005 (Weldwood had changed its name to West Fraser in 2003). CCC continued exploration activities by running seismic lines (to define structure and basement rock), drilling (3 partial and 9 complete holes), extracting a bulk sample (13 t from a surface adit), and carrying out surface reconnaissance mapping. A NI 43-101 compliant resource report was prepared in 2007 (PAH 2010).

The CJV was formed in February 2009 for the purpose of exploring and jointly developing coal and minerals in the Comox Basin. In 2009, CCC continued exploration drilling activities (completed the 3 partial holes that were previously drilled, and drilled 41 new holes), initiated environmental studies, and engaged appropriate consultants to complete the geological model and mine planning studies. NI 43-101 compliant resource reports were prepared in June 2007 (ORCRC 2007) and October 2010 (PAH 2010).

1.2 Justification for the Proposed Raven Project

1.2.1 Global Coal Demand

Coal is a complex mixture of hydrocarbons and other constituents, and coals from different deposits differ greatly from one another in composition. The composition of any particular coal determines its use. Coals with high energy (i.e., high carbon content) and few impurities (e.g., moisture, ash, sulphur) are considered high-rank coals. The highest rank and hardest coal is anthracite, which is rare compared to other ranks of coal. The second highest rank (and also a "hard" coal) is bituminous coal, which can be further sub-divided into "thermal" coal and "metallurgical" coal (discussed further below). The third highest rank is sub-bituminous coal, which is softer and contains more moisture than bituminous coal. The lowest rank and softest coal is lignite, or "brown" coal (CAC 2010; WCA 2010).

Thermal bituminous coal, sub-bituminous coal, and lignite are primarily used to produce energy. These coals have relatively low carbon content and relatively high levels of impurities (e.g., moisture). These coals help produce ~40% of the world's electricity, making coal the single largest source of electricity worldwide. Coal is an abundant, affordable, and increasingly clean source of much needed energy (CAC 2010; WCA 2010).

Met bituminous coal is primarily used to produce "coke", which is one of two key ingredients (the other being iron ore) in steel manufacturing. Coke is a solid mass of almost pure carbon that is used as a fuel and as a reducing agent in the smelting of iron ore to molten iron metal. Coke is produced by heating met coal to ~1,100 degrees Celsius (°C) (in the absence of oxygen to prevent the coal from burning) to eliminate volatile components such as water, coal gas, and coal tar. Coke requires coals with specific characteristics, such as good caking properties (the ability to melt, swell and re-solidify when heated) and low impurity levels (e.g., moisture, ash, sulphur). The four main categories of met coal are: (i) hard coking coal; (ii) semi-hard coking coal; (iii) semi-soft coking coal; and (iv) pulverized-coal-injection (PCI) coal. Hard coking coal is the highest quality and has the highest sale value, but is also the rarest. Steel mills reduce overall costs by optimizing the integration of semi-soft and PCI coals (to the extent technologically feasible). Approximately 1.5 t of met coal are needed to produce one t of coke. In 2009, ~761 Mt of met coal (~507 Mt of coke) was used to help produce 1.2 billion t of steel worldwide (~70% of total worldwide steel) (CAC 2010; WCA 2010).

The majority of coal is utilized in power generation or iron and steel production, but it is also a useful commodity in a variety of other industries. Coal, coal by-products (e.g., coal tar,

coal gas), and their constituents recovered during refining (e.g., benzene, phenol, naphthalene, creosote, light oils, and ammonia) are used directly or indirectly to produce thousands of different products, including metals (e.g., aluminum, silicon), plastics, synthetic fibres (e.g., nylon, rayon), dyes, detergents, soaps, solvents, pharmaceuticals, agricultural fertilizers, cement, nitric acid, carbon fiber (an extremely strong but light weight reinforcement material), and activated carbon (used as a filter material in environmental purification and biomedical dialysis machines) (CAC 2010; WCA 2010).

The five largest coal users (China, USA, India, Japan and South Africa) account for 82% of total global coal demand (CAC 2010; WCA 2010).

1.2.2 Global Coal Supply

Coal is the world's most abundant and widely distributed fossil fuel. Globally, proven reserves of coal are estimated at close to one trillion t. Canada holds ~10 billion t of coal reserves, of which ~4 billion t is bituminous (CAC 2010; WCA 2010).

The world's largest coal producers are the United States, China, Australia, India, South Africa, and Russia (CAC 2010; WCA 2010).

1.2.3 Coal Supply from the Proposed Project

The proposed Raven Project has underground coal resources totalling ~131Mt of which 97 Mt are measured and or indicated and 34 Mt are inferred. The proposed Raven Project will produce ~30 Mt of run-of-mine (ROM) coal (~13 Mt of clean coal) over its 16 year life. Coal from the proposed Raven Project is high quality, with close to 90% of the clean coal being bituminous met semi-soft coking coal (~11.6 Mt). Approximately 10% of the bituminous met coal, which will be recovered in the coal preparation plant, will contain too much rock or ash to be used in the production of steel and can be sold as a high quality thermal coal. Alternatively, all of the Raven washed product could be marketed as high-quality thermal coal, if desired (PAH 2010).

Coal from the proposed Raven Project is expected to be largely shipped to the overseas markets in Asia, at market competitive prices. Asian and other Pacific Rim seaborne markets are currently enjoying strong demand with the most advantageous markets for the Raven coal being northeast Asia, primarily Japan and Korea (significantly closer to Port Alberni than other markets in China, Taiwan, or India). The proposed Raven Project also enjoys relatively short distances to South American markets on the west coast of Mexico and Chile (PAH 2010).

1.2.4 Other Benefits of the Proposed Project

Every year the Canadian coal industry contributes an estimated $5 billion to Canada's economy. Across Canada, the coal industry directly and indirectly supports thousands of jobs for heavy equipment operators, tradespeople, geologists, engineers, biologists, and accountants, among others (CAC 2010).

The proposed Raven Project will benefit the local economy over the entire estimated mine life of 16 years. During construction, the proposed Raven Project will employ approximately 200 people. Emphasis will be placed on hiring qualified local persons (PAH 2010).

During operations, the proposed Raven Project will create ~350 direct full-time positions at the site, other transportation and port jobs, and ~500 indirect jobs in the local economy. As the proposed Raven Project will not contain a permanent camp, the emphasis will be on employing local persons to ensure economic, training and other benefits are accrued in the local community (PAH 2010).

In addition, the proposed Raven Project will contribute to the potential revitalization of a local port facility (e.g., Port Alberni). The proposed Raven Project could be a potential major customer for local heavy equipment repair companies.

1.3 Regulatory Context

The proposed Raven Project has entered into a cooperative EA process with both the BC provincial government and the Canadian federal government. Provincial review remains independent of federal review, but the cooperative process is intended to minimize duplication wherever possible, and must be completed prior to the construction of the proposed Raven Project.

1.3.1 BC Environmental Assessment Act

The BC *EAA* identifies new projects that must be reviewed by the BC EAO prior to approval. A Project Description was submitted by CCC to BC EAO in August 2009. On 12 August 2009, the BC EAO issued an Order under section 10(l)(c) of BC *EAA* stating that the proposed Raven Project requires an EA Certificate (EAC). Pursuant to Part 3 of the *Reviewable Projects Regulation* (B.C. Reg. 370/02), review is required because the proposed Raven Project is a new mine facility that, during operation, would have a production capacity of greater than 250,000 t per year of clean and raw coal (combined). On 5 March 2010, the BC EAO issued an Order under section 11 of the BC *EAA* describing the scope, procedures, and methods for review of the proposed Raven Project.

1.3.2 Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (*CEA Act*) identifies new projects that must be reviewed by the CEAA prior to approval. An EA under section 5 of the *CEA Act* is required for the proposed Raven Project because: Fisheries and Oceans Canada (DFO) may issue authorizations for works or undertakings associated with the project; and the Port Alberni Port Authority (PAPA) may make federal lands available to allow the project to proceed. The proposed Raven Project is subject to a comprehensive study pursuant to section 16(d) of the *Comprehensive Study List Regulations* of the *CEA Act* because the proposed coal production capacity will be 3000 t per day or more.

Relevant sections of this Project Description are cross referenced to *CEA Act* triggers in Table 1.3-1 (questions are as outlined in MPMO 2008).

Table 1.3-1: Canadian Environmental Assessment Act Triggers

Question	Response	Section(s)
Environment Canada		
Canadian Environmental Protection Act		
• Would this project involve any of the following activities:		
◦ Dredge or fill operations which would result in the disposal of dredged material at sea?	No	
◦ Seafloor disturbance and / or the disposal of any substance at sea?	No	
◦ Disposal of any other substance into marine waters?	No	
• If "Yes", describe the material and the proposed disposal site.	n/a	
International River Improvements Regulations		
• Identify any proposed works or undertakings that will occur on international rivers or watercourses as defined by the *International Rivers Improvement Regulations*.	None	
Fisheries and Oceans Canada		
Fisheries Act		
"No one may carry out work or undertaking that prevents fish passage, results in the harmful alteration, disruption or destruction of fish habitat or results in the deposit of deleterious substances into fish-frequented waters without proper authority under the *Fisheries Act."*		
• Are fish (including aquatic species at risk) present at the site, upstream, or downstream?	Yes	Section 3.4.3
• Is fish habitat present at the site, upstream, or downstream?	Yes	Section 3.4.3
• Will any of the components or activities associated with the project affect fish and / or fish habitat in any of the following ways? In each case, explain why:	Yes	Section 4.2.6
◦ Interfere with the passage of fish?	Potentially	Section 4.2.6
◦ Result in the mortality to fish by means other than fishing?	Potentially	Section 4.2.6
◦ Affect the flow or level of fish-frequented waters such that fish and / or fish habitat may be impacted?	Potentially	Section 4.2.6
◦ Cause the harmful alteration, disruption or destruction of fish habitat?	Potentially	Section 4.2.6
• If the answer to any of the above questions is yes, describe what measures are being contemplated to avoid or mitigate impacts.		Section 4.2.6
• If no authorization under the *Fisheries Act* is anticipated, describe why.	n/a	
• Does the development involve the proposed deposit in waters frequented by fish of effluent or waste rock as provided for under the	n/a	

Question	Response	Section(s)
Metal Mining Effluent Regulations? If "Yes", describe the proposed disposal area including if it is fish frequented, its origin (e.g., natural or anthropogenic in origin), and whether it is confined by anthropogenic or natural structures.		
Transport Canada		
Navigable Waters Protection Act		
Transport Canada administers the *Navigable Waters Protection Act*, which regulates the construction of works built or placed in, on, over, under, through or across any navigable water, and provides a legal framework to deal with obstacles and obstructions to navigation.		
• Are new works or undertakings proposed to take place in, on, over, under, through or across any navigable water?	Yes	Section 4.2.5
• Are existing works that were not previously authorized under the *Navigable Waters Protection Act* to be modified on a watercourse or water body?	Yes	
• If "Yes", to either of the above questions, indicate and / or provide to the best extent that it is known at this time:		
• Description of work (e.g., bridge, boom, dam, culvert causeway, wharf, pier, jetty, docking / trans-shipment facility, water intake, pipeline crossing) including approximate dimensions.		Section 2.5
• Description of any associated activities (e.g., dredging, alteration of water bed and / or water banks).		Section 2.5
• Description of any ancillary and temporary works (e.g., cofferdams, detours, fencing, or temporary bridges) including approximate dimensions.		Section 2.5
• Name of watercourse or water body.		Section 3.2.4
• How water flow and level will be altered.	n/a	
• If the size of vessel to be handled at any proposed marine terminal will be larger than 25, 000 Dead Weight Tonnes.		Section 2.5
• Measures being contemplated to avoid affecting navigation.	will be finalized with Port Authority	
• Contingency plans for Horizontal Direct Drilling.	n/a	
• Any known navigational use of the watercourse or water body.		Section 4.2.5
• Photos taken upstream, downstream, and across the watercourse or water body of proposed crossing.	n/a	

1.3.3 Other Permits and Approvals

There is the option of applying for concurrent permits under the BC *EAA Concurrent Permitting Regulation*. At this time, however, CCC does not intend to apply for concurrent permits. Instead, CCC intends to develop information for key provincial and federal permits in draft form for review during the EA process.

All permits required under BC law were obtained prior to commencing exploration work. These permits apply to both Crown held coal rights and fee simple rights alike. A "Notice of Work" was filed detailing exploration activities and a permit was issued (permit # CX-8-008; Approvals 06-0801003-0517 and 09-0801003-0506) authorizing CCC to proceed with the exploration as planned.

The Crown coal licence at the proposed Raven Project is subject to an annual rental fee of $7 per ha or $994 per year until 2010 and then increasing to $10/hectares per year (ha-y) for a further 5 years and thereafter increasing by $5/ha-y for each 5 year period to a maximum of $25/ha-y. In BC, fee simple coal lands are subject to an annual mineral land tax of $1.25/ha. The annual mineral land tax for the 3,100 ha of fee simple coal lands contained within the proposed Raven Project area is ~$3,700.

There are no annual work requirements or annual payments other than the mineral land tax due to the government.

The application for a mine permit will require details of the underground mine work system, method of mining and roof support, ventilation and water management for the mine. In addition, detailed design of the wash plant, waste water process, coarse and fine rejects or slurry pond location, mine buildings design, acid rock drainage (ARD) prevention and final reclamation of the site will also be required.

Other potential requirements will include a Water License, Waste Management Permit, Heritage (archaeological) investigation permit (if an archaeological assessment is required) and an Explosives Storage License. These additional permits and licenses are applied for separately once the BCEAO has issued an EAC.

Other authorizations potentially required from the federal government include: Transport Canada authorization to allow road site access through crossing rivers and streams under the *Navigable Waters Protection Act*, Natural Resources Canada (NRCan) authorization for use of explosives for mining use under the *Explosives Act*, DFO authorization to potentially alter fisheries habitat; and other possible authorizations from Environment Canada (EC) such as those under the *Species at Risk Act (SARA)*. An access permit will be required from the BC Ministry of Transportation and Infrastructure (BC MoTI) to connect to the Island Highway if existing road access or railway access is not utilized. In the advent a rail load-out is required to transport coal to port, a spur line will likely be required which we understand will not require *Railway Act* approvals.

Key approvals for initial construction activity mayinclude licenses, permits, and approvals related to access, power, and set-up and operation of the construction workforce. A *Mines Act* permit will also be required for initial construction-related activity

1.4 Objectives and Guiding Principles

CCC's objective is to develop a project that will contribute social and economic benefits to First Nations, local communities and the province of BC, while minimizing potential environmental impacts. CCC looks forward to working with stakeholders and First Nations to achieve this objective. CCC is committed to a thorough EA that builds on the extensive work conducted to date, and to consulting with all stakeholders and First Nations to improve the design of the proposed Raven Project.

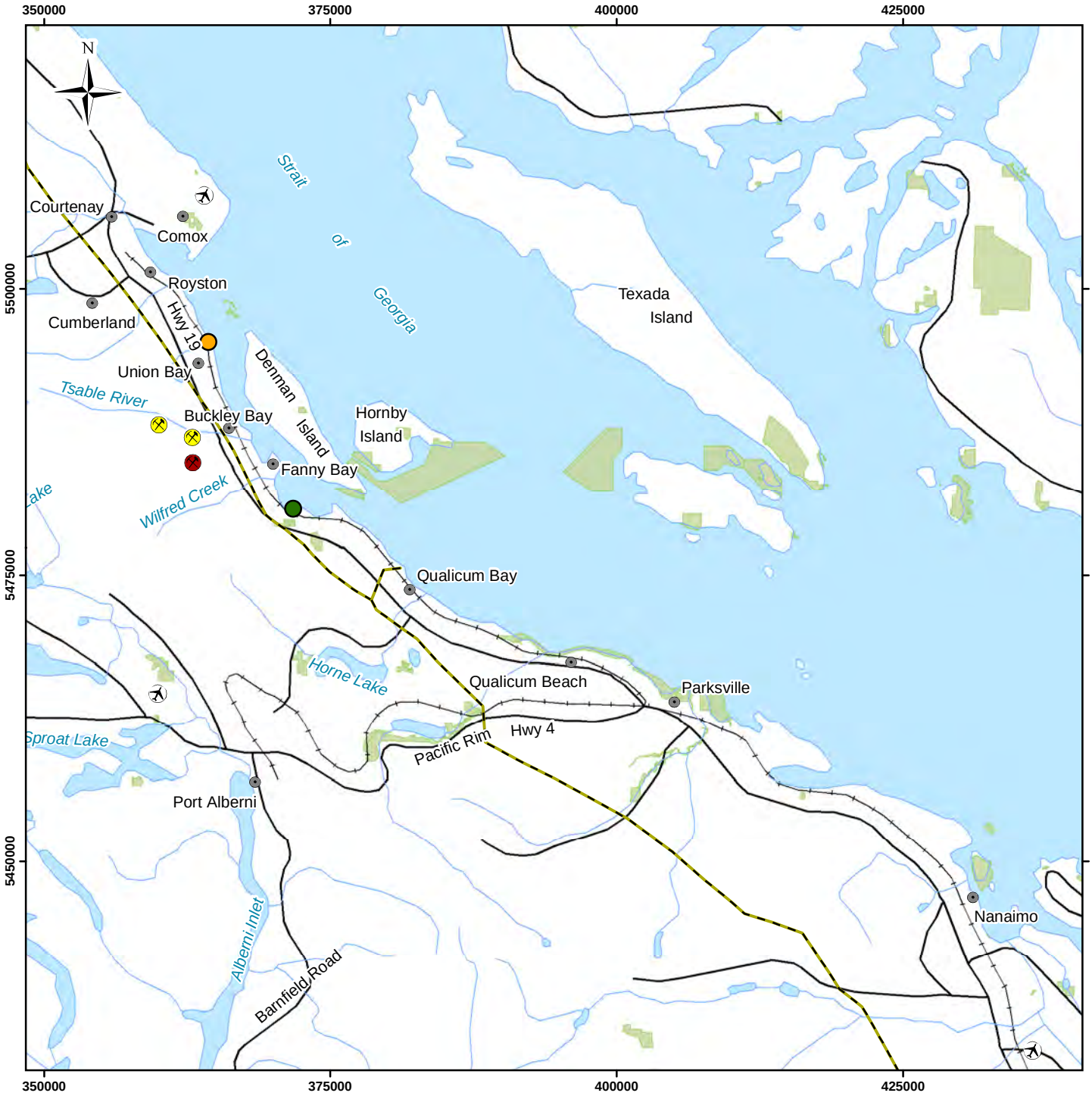
2 OVERVIEW OF THE PROJECT

The proposed Raven Project will mine approximately 30 Mt of coal from an underground mine on eastern Vancouver Island over a 16-year period. Sections below present detailed descriptions of: the proposed Raven Project property (Section 2.1); the coal resources at the property (Section 2.2); the methods, infrastructure, and equipment required for mining (Section 2.3), processing (Section 2.4), and transporting (Section 2.5) the coal; support facilities (Section 2.6); environmental management at the property (Section 2.7); and the economics of the proposed Raven Project (Section 2.8). Alternatives to the proposed Raven Project are discussed in Section 2.9.

2.1 Property

2.1.1 Location

The Raven property is located along the eastern coast of Vancouver Island, in the CVRD (~20 km south of the City of Courtenay). Coordinates at the centre of the proposed Raven Project footprint are 49°30'8.0742" latitude and 124°52 36.4074" longitude. The Raven property is located on NTS map sheets (1:50,000) 92F10W and 92F7W or within BC Geographic System (BCGS) (1:20,000) map sheets 092F056 (north) and 092F046 (south). The UTM's for the proposed Raven Project site (zone 10) are X: 362988.91, Y: 5484806.55. The Raven property is ~3100 ha (9 km by 3½ km). Coal resources are located in the Nanaimo Mining Division, and the Nelson and Newcastle Land Districts. The location of the Raven property boundaries and the draft proposed Raven Project footprint (~200 ha) are shown in Figure 2.1-1.



Legend

- Raven Coal Project
- Historic Mine Site
- Qualicum National Wildlife Area
- Coal Waste Pile
- Airport
- Populated Place
- Road
- Rail line
- Transmission Line
- Park or Protected Area

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse



Scale: 1:500,000

0 5 10 20
Kilometers

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Proposed Raven Project Location

DATE:	ANALYST:	**Figure** 2.1-1
April 15, 2009	EO	
JOB No: VE51897	QA/QC: LR	PDF FILE: 18-50-002_location_map.pdf
GIS FILE: 18-50-002		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-002_v2.mxd

2.1.2 Access

Access by road to the Raven property is via Provincial Highways 19 (The Inland Highway) or 19A (The Island Highway), and the Buckley Bay Mainline. Highway 19 runs the length of the eastern side of Vancouver Island; it parallels and in some places actually crosses the Raven property boundary. The Buckley Bay Mainline (restricted access road controlled by Island Timberlands) is the only exit from Highway 19 accessing the proposed Raven Project area; it runs parallel to and north of the Tsable River. Other local forestry and private logging and resource roads provide local access to the property, all of which have restricted access due to active logging and private land ownership. Provincial Highway 4 (The Pacific Rim Highway) runs between Highway 19 and Port Alberni.

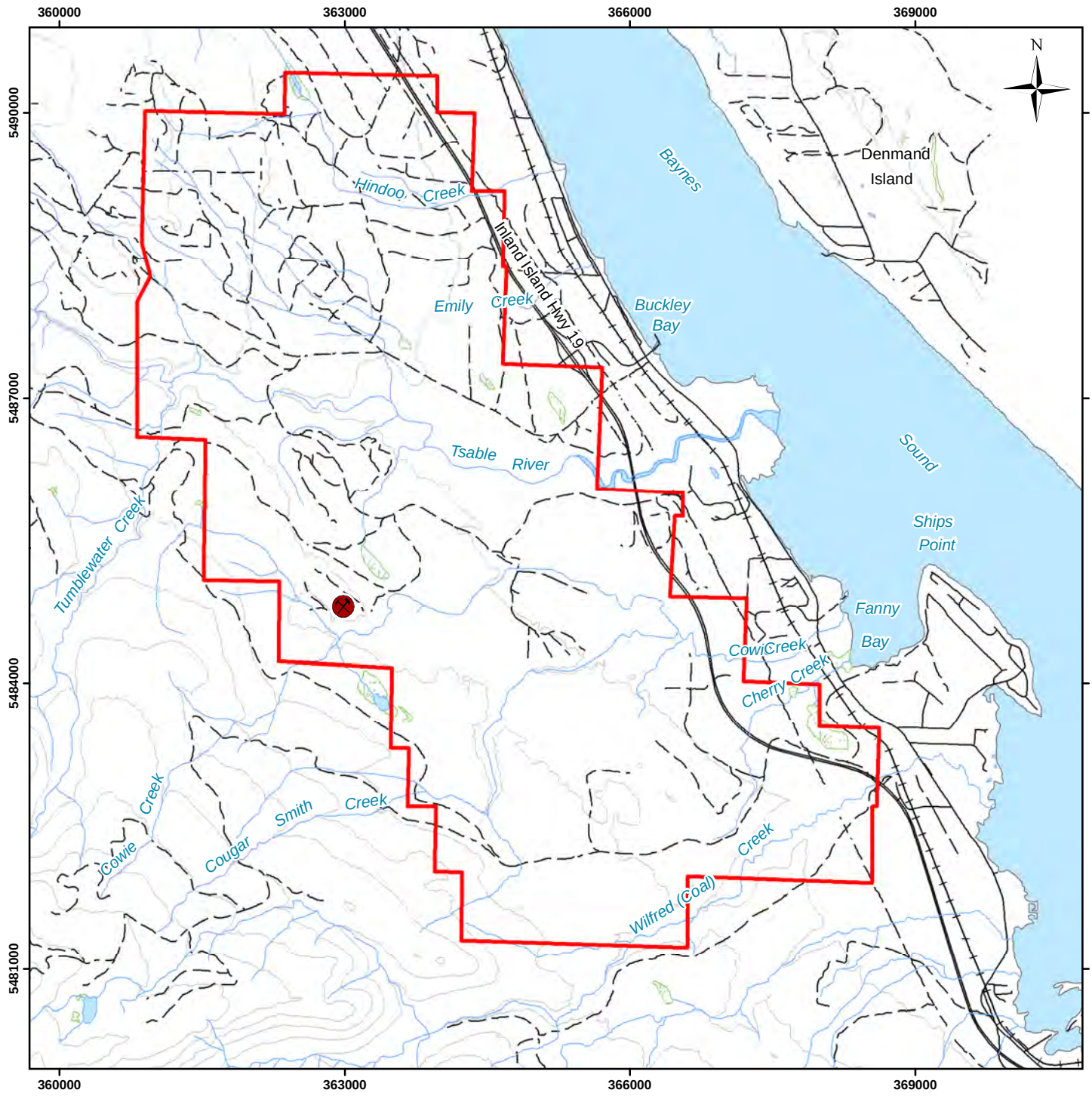
Access by rail is via the Southern Railway of Vancouver Island (formerly the Esquimalt and Nanaimo), which runs parallel to Highway 19, from Victoria to Courtenay (with a branch line from Parksville to Port Alberni, as well as connections to the continental railway network). The rail line is owned by the Island Corridor Foundation and operated under contract by Southern Rail, which provides rail freight and passenger services to various customers on Vancouver Island.

Access by sea is via ferry service. BC Ferries operates ferry service from Vancouver Island to the BC Lower Mainland, and to smaller islands in between (Denman Island, Hornby Island, and Texada Island).

Access by air is via the Comox Airport (YQQ). It is located ~34 km to the north, on a small peninsula east of the city of Comox; it is routinely serviced by West Jet, Central Mountain Air, Pacific Coastal, and some other private and charter companies.

2.1.3 Land Rights

The CJV holds undersurface fee simple coal and certain mineral rights, certain surface rights, and certain ancillary rights for 29,000 ha in the Comox Coal Basin on the east side of Vancouver Island and the Raven property (~3,100 ha) lies entirely within these fee simple lands (see Figure 2.1-2), except for a small fraction (~142 ha) held directly by the CJV through Crown coal licence tenure # 392561.



Legend

- Raven Coal Project
- Populated Place
- Road
- Railway Line
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Raven Coal Property Tenure

Reference
TRIM scale 1:20,000

Scale: 1:60,000
0 0.5 1 2
Kilometers

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Proposed Raven Project Land Tenure

DATE: July 6, 2009	ANALYST: EO	**Figure** 2.1-2
JOB No: VE51897	QA/QC: LR	PDF FILE: 18-50-006_prop_boundary.pdf
GIS FILE: 18-50-006		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-006.mxd

Surface access rights to explore, develop, mine, and win the coal resource are based on historical agreements with the Esquimalt and Nanaimo Railway Company who were the original owners of the land in fee simple. These access rights to the surface exist today across the proposed Raven Project area for surface owned by Island Timberlands, Timberwest and the Crown and are outlined in the Charges against the surface identified in Table 2.1-1.

Table 2.1-1: Undersurface Rights

Identification Number	
(i) Crown Coal License Tenure Number	
392561	
(ii) Undersurface Rights Charge Numbers	
EB7097	ED112818
325218G	R46807
325219G	R46809
325220G	EJ49175
325221G	EK101252
109233G	214494G
109265G	R46811
144622G	R46815
R46814	R46817
	R46818

A list of district lots situated within the Raven property boundary and relative coverage by the Raven property is listed below in Table 2.1-2.

Table 2.1-2: District Lots within Raven Property

District Lot Identification Number	**Coverage in Raven Coal**
Bk 198 Newcastle District	partial
Bk 267 Newcastle District	partial
DL 88 E & N Newcastle District	All
DL 106 E & N Newcastle District	All
Bk 1362 Newcastle District	All
DL 105 E & N Newcastle District	All
BK 234 Newcastle District	All
BK 263 Newcastle District	All
Sec 2A Nelson District	partial
Sec 1 Nelson District	All
Bk 34VL&M Nelson District	partial

District Lot Identification Number	Coverage in Raven Coal
DL 23G Nelson District	All
DL 22G Nelson District	All
BK 324 Nelson District	partial
Bk 527 Nelson District	partial
Bk 1359 Nelson District	partial
Bk 385 Nelson District	All
DL 30G Nelson District	All
BK 299 Nelson District	All
Bk 33VL&M Nelson District	partial
Bk 296 Nelson District	All
DL 29G Nelson District	All

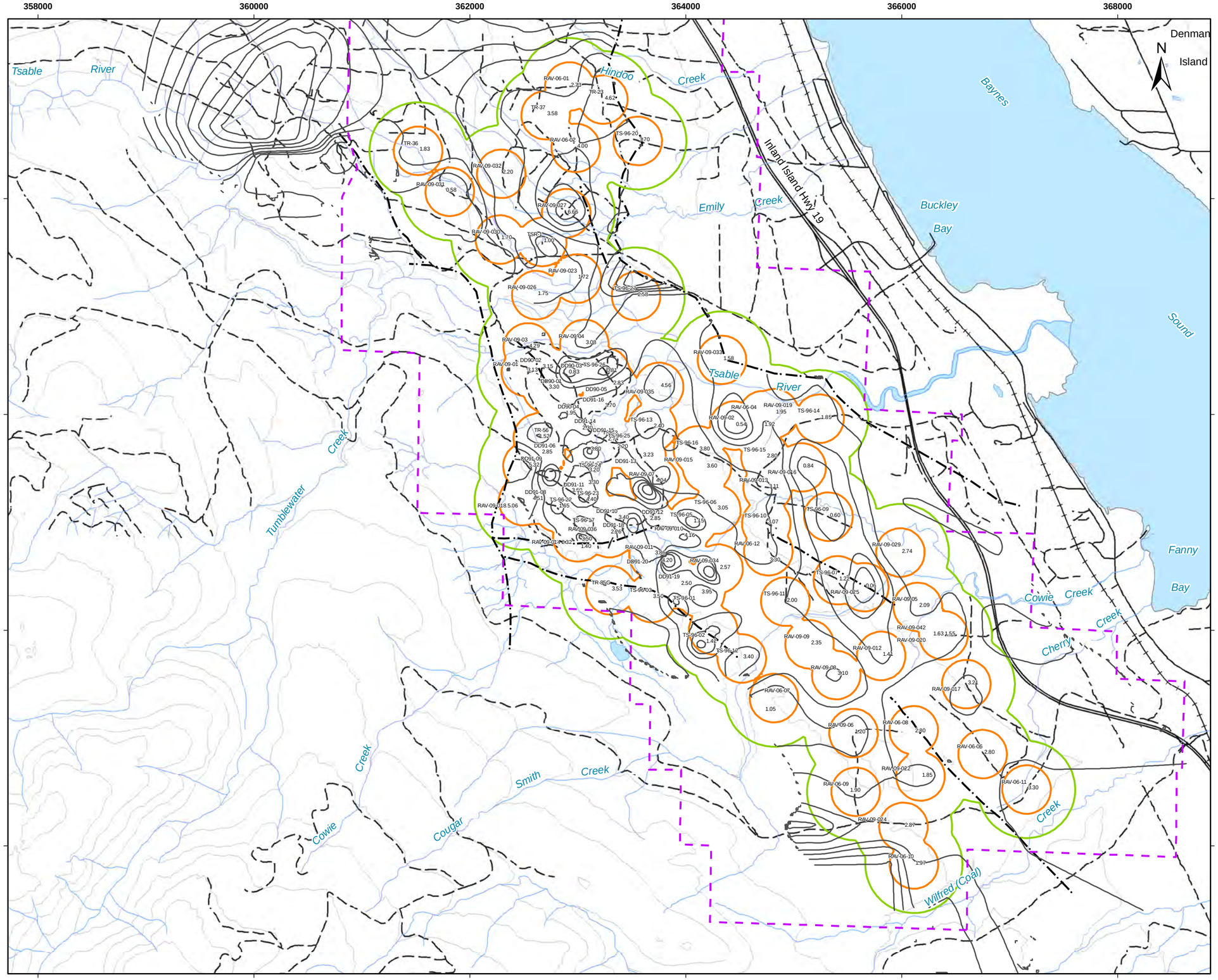
2.2 Coal Resources

2.2.1 Geological Overview

Coal-bearing rock (Deposit Type “Underground”) at the property is of Upper Cretaceous age and occurs in the Comox Formation. Broad folds and faulting of the coalfield has divided the coal resources into two distinct blocks (“Upper Plate” and “Lower Plate”). The Geology Type is classified as “Moderate”, bordering on “Complex” (PAH 2010).

The coal-bearing rock is divided into multiple coal zones, which are further sub-divided into multiple seams. Coal within two coal zones will be mined: Seam 150 (the lowermost mineable seam); Seam 360 (the intermediate mineable seam); and Seam 340 (the uppermost mineable seam) (PAH 2010). Coal resources in seams 150, 360, and 340 are shown in Figures 2.2-1, 2.2-2, and 2.2-3, respectively.

The geological setting that the coal resources occur in is discussed in more detail in Section 3.1.3.



Legend

- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Seam Thickness
- Reverse Fault
- Measured Limits
- Indicated Limits
- Raven Property Boundary

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

Resource Information: PAH Figure 17-3 - Seam 150 Resource Limits
LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

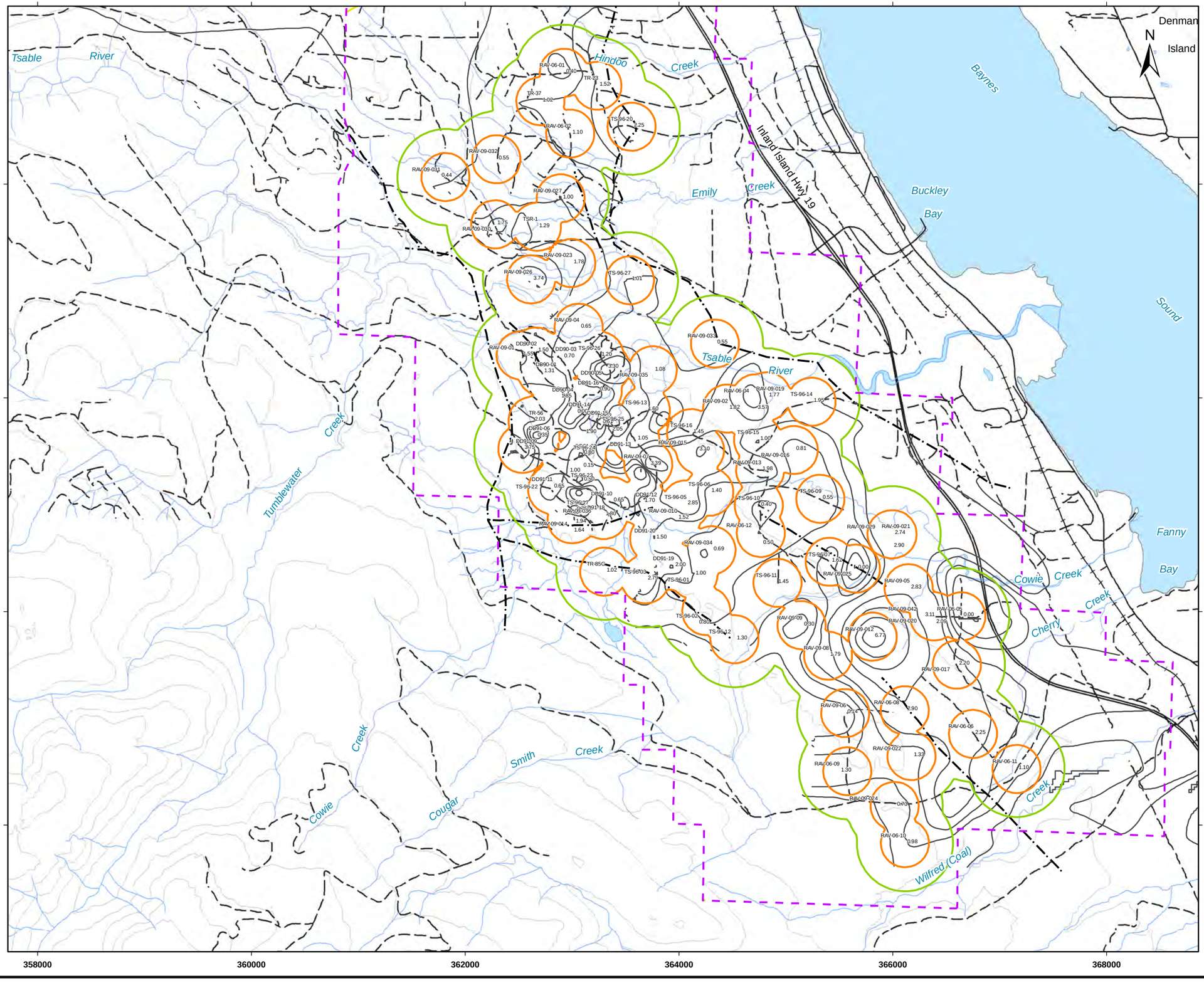
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Coal Resources in Seam 150

DATE: April 27, 2011	ANALYST: EO	**Figure** 2.2-1
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-028_seam_150_RL.pdf
GIS FILE: 18-50-028		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-028.mxd



Legend

- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Reverse Fault
- Seam Thickness
- Inferred Limits
- Measured Limits
- Indicated Limits
- Raven Property Boundary

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

Resource Information: PAH Figure 17-1 - Seam 360 Resource Limits
LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

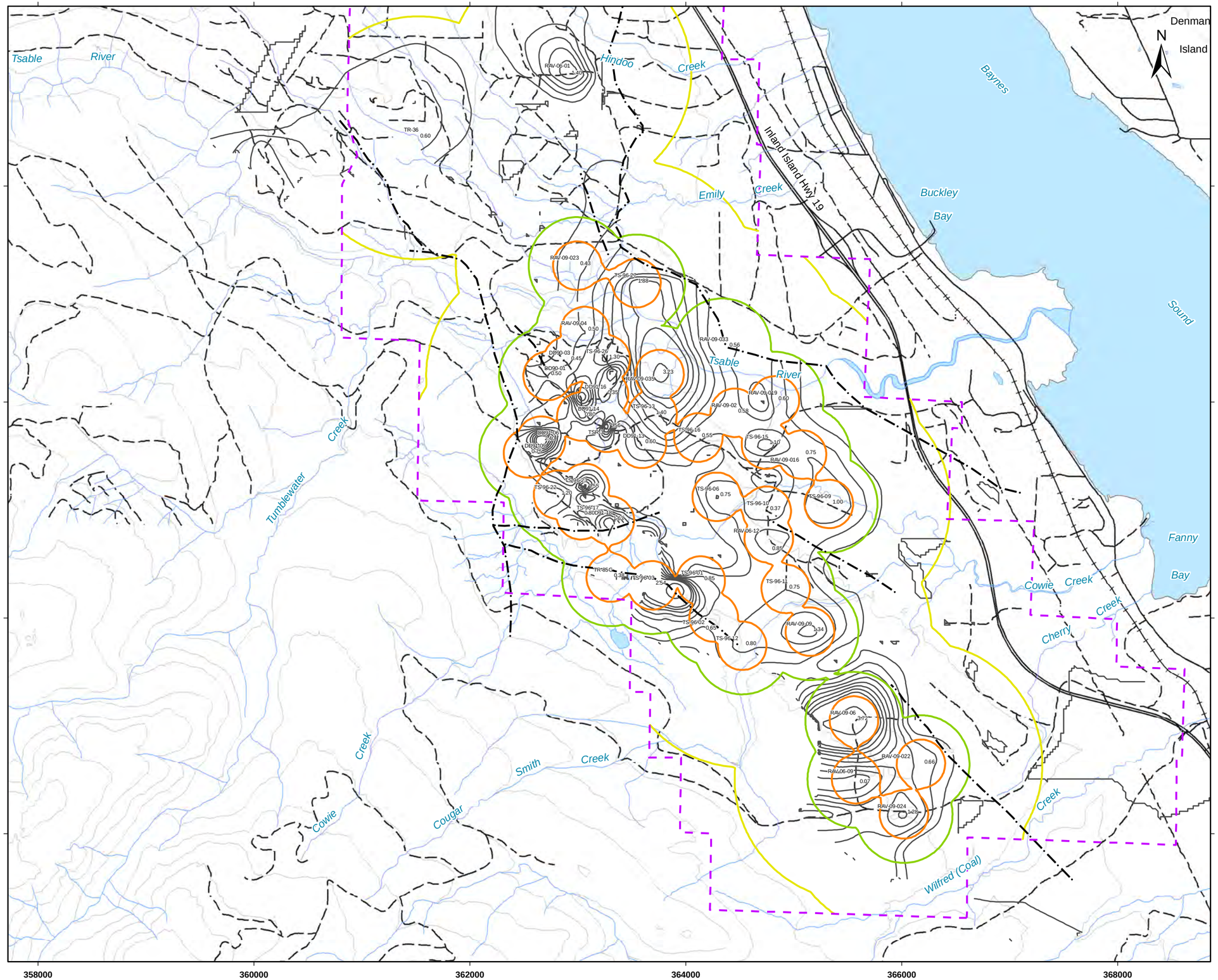
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Coal Resources in Seam 360

DATE: April 27, 2011	ANALYST: EO	**Figure** 2.2-2
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-026_seam_360_RL.pdf
GIS FILE: 18-50-026		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-026.mxd



Legend

- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Seam Thickness
- Reverse Fault
- Inferred Limits
- Measured Limits
- Indicated Limits
- Raven Property Boundary

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

Resource Information: PAH Figure 17-2 - Seam 340 Resource Limits
LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Coal Resources in Seam 340

DATE: April 27, 2011	ANALYST: EO	**Figure** 2.2-3
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-027_seam_340_RL.pdf
GIS FILE: 18-50-027		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-027.mxd

2.2.2 Raw Coal

Measured and Indicated underground resources for the main seams total ~97 Mt. Inferred resources total ~34 Mt. Reserves are constrained, however, by the mine plan. Based on a Pre-Feasibility Study (PAH 2010) that takes into account coal processing yield, process efficiency, and other factors (e.g., economics), the proposed Raven Project is estimated to produce ~30 Mt of ROM (i.e., proven, plus probable, plus dilution materials) coal. Over the total estimated mine life of ~16 years, this equates to ~1.9 Mt of raw coal per year (PAH 2010).

According to the American Society for Testing and Materials (ASTM) classification scheme, raw Raven coal is considered High Volatile Bituminous 'A' Coal (PAH 2010). Raven coal is considered unique in Western Canada because of its high volatile content and its strong met properties. Raw composite and incremental analyses of the main seams (dry basis) average 35% ash and 1.8% sulphur (PAH 2010).

2.2.3 Clean Coal

Raw coal often has relatively high ash and sulphur content and thus requires cleaning or washing. Quality testing suggests that the raw Raven coal, after cleaning, would be suitable for the met market as well as various thermal purposes. Washability testing indicates a reasonable product can be obtained without crushing to small size fractions (PAH 2010). Approximately 90% of the coal will be produced as a met (met (semisoft coking) coal and approximately 10% as a middling thermal coal product. Depending on future market demands, all of the washed coal product could be marketed as a high quality thermal coal. (PAH 2010).

After processing, the ~30.1 Mt of total ROM coal is estimated to yield ~13.2 (~11.6 met and ~1.6 thermal) Mt of clean coal. Over the total estimated mine life of ~16 years, this equates to ~0.8 Mt of clean coal per year (PAH 2010).

The basic target specification for the met coal product (PAH 2010) is:

- ~7.0% moisture (as-received);
- 10% ash (dry basis); and
- ~1.2% sulphur (dry basis).

The basic target specification for the thermal coal product (PAH 2010) is:

- ~7,000 kilocalorie per kilogram (kcal/kg) (dry basis);
- ~7.0% moisture (as-received);
- 15% ash (dry basis); and
- ~1.2% sulphur (dry basis).

2.3 Underground Mining

2.3.1 Model

A geologic mineable coal model was developed to determine the optimal mining methodology for the proposed Raven Project. Mineable blocks were defined by four criteria: coal seam thickness greater than 1.5 m; seam gradient less than 14 degrees (^{o}); cover depth less than 500 m; and block boundaries completely inside the Measured and Indicated resource area (within 450 m of a borehole intercepting the seam of interest). Mineable blocks are highly variable; many parameters (e.g., seam thickness, seam gradient, seam floor structure, interburden thickness, overburden thickness, geologic anomalies such as faults in the mineable seams) vary not only from block-to-block, but also within individual blocks. Coal blocks thus have irregular, typically non-rectangular shapes (PAH 2010).

2.3.2 Room-and-Pillar Mining

Based on the model, room-and-pillar mining with an undermining extraction technique where necessary (i.e., developing upper seam panels prior to lower seam panels when blocks occur in multi-seam environments) was selected for the proposed Raven Project (PAH 2010). Room-and-pillar mining is widely used in Canada and the US and is particularly suited to moderate, bordering on complex, geologies such as that at the Raven property (i.e., unexpected changes in block geometry due to changes in seam thickness and gradient). The longwall mining system was also identified as an option but was ultimately deemed ill-suited to conditions at the proposed Raven Project and thus was not assessed in the Pre-Feasibility Study (PAH 2010). Undermining extraction is widely used in multi-seam coal mines in Canada and the US, and is particularly suited to the Raven property. Other extraction methods that were identified as options were overmining, sequential mining, and staggered development; however these options were ultimately deemed ill-suited to conditions at the proposed Raven Project and thus were not assessed in the Pre-Feasibility Study (PAH 2010). The mine plan was developed using the pillar design programs ARMPS (authored by the National Institute of Occupational Safety and Health) and LAMODEL (PAH 2010).

The mine access slope (almost completely in coal) will be developed in the lowermost Seam 150 approximately central to the proposed Raven Project area; from there, north and south mains (and their associated branches of sub-mains and pillar extraction panels) will be developed. Two ramps will be driven from Seam 150 up to Seams 360 / 340: one ramp from near the bottom of the mine access slope in Seam 150, and the other ramp from the last section of the southeast sub-main. Ramps between Seam 150 and Seams 360 / 340 will be mined at a rate of 10 m per day. One super-section will be located in Seams 360 / 340.

Continuous miners will be used to mine coal from pillar extraction panels. Three production sections are proposed: two will be configured as super-sections equipped with two continuous miners, and the third as a standard section with a single continuous miner. A

continuous miner (the Joy 14CM15E or equivalent) mines between 10 and 28 t of coal per minute, at a height of 1.5 to 3.2 m. Average development cut dimensions are 5.5 m wide with 6 m advance (cut depth) before bolting. Maximum extraction height in both Seam 360 / 340 and 150 will be 3.2 m to ensure optimum safety and coal recovery (determined from ARMPS and LAMODEL results). Full extraction of a pillar maximizes coal recovery but the flexibility of the room-and-pillar mining system allows easy modification of pillar sizes to accommodate high-stress zones (e.g., caused by changing overburden loads). The designated mining blocks can be almost completely mined, with no wasted resource. (PAH 2010).

Shuttle cars (electric cable-powered trailing cars) will haul coal from the continuous miners to the belt-conveyor feeder breaker. Three shuttle cars will be assigned to each super section, and two will be assigned to the standard section. A shuttle car (the Joy 10SC32AA or equivalent) carries ~11 t of coal; it can operate in seam heights as low as 1.3 m (PAH 2010).

Roof bolters (crawler- or rubber tire-mounted, dry or wet bolters, equipped with dust collectors and pre-cleaners if necessary) are required to install ground support after coal is removed by the continuous miners. Two roof bolters will assigned to each super section and one will be assigned to the standard section. If bolts alone are inadequate, then secondary roof support may be required in some areas (e.g., additional or longer rod or cable bolts; truss bolts; cable slings; grout injection; wood and concrete cribs; yielding and rigid steel posts; yieldable concrete supports; steel and timber sets). If rib slabbing or sloughage is of concern, then rib support may be required in some areas (e.g., steel wire mesh installed with standard steel bolts in development-only areas; non-metallic “geo-mesh” installed with non-metallic fiberglass bolts in pillar extraction areas) (PAH 2010).

Other equipment that will be required includes a section power center, a section switch house, a feeder breaker, a diesel scoop, auxiliary fan(s), maintenance / parts trailers, and a section mantrip (PAH 2010).

Underground mine layouts for Seams 150 and 360 / 340 are shown in Figure 2.3-1 and Figure 2.3-2, respectively.

358000 360000 362000 364000 366000 368000

5488000 5486000 5484000 5482000

Tsable River
Hindoo Creek
Emily Creek
Inland Island Hwy 19
Baynes Sound
Denman Island
Buckley Bay
Fanny Bay
Cowie Creek
Cherry Creek
North Route
South Route
Tributary T1
Tributary T2
Tributary C1
Tsable River
Tumblewater Creek
Cowie Creek
Cougar Smith Creek
Wilfred (Coal) Creek

N

Legend

- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Potential Location of Site Facilities
- Mining Area - Seam 150

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

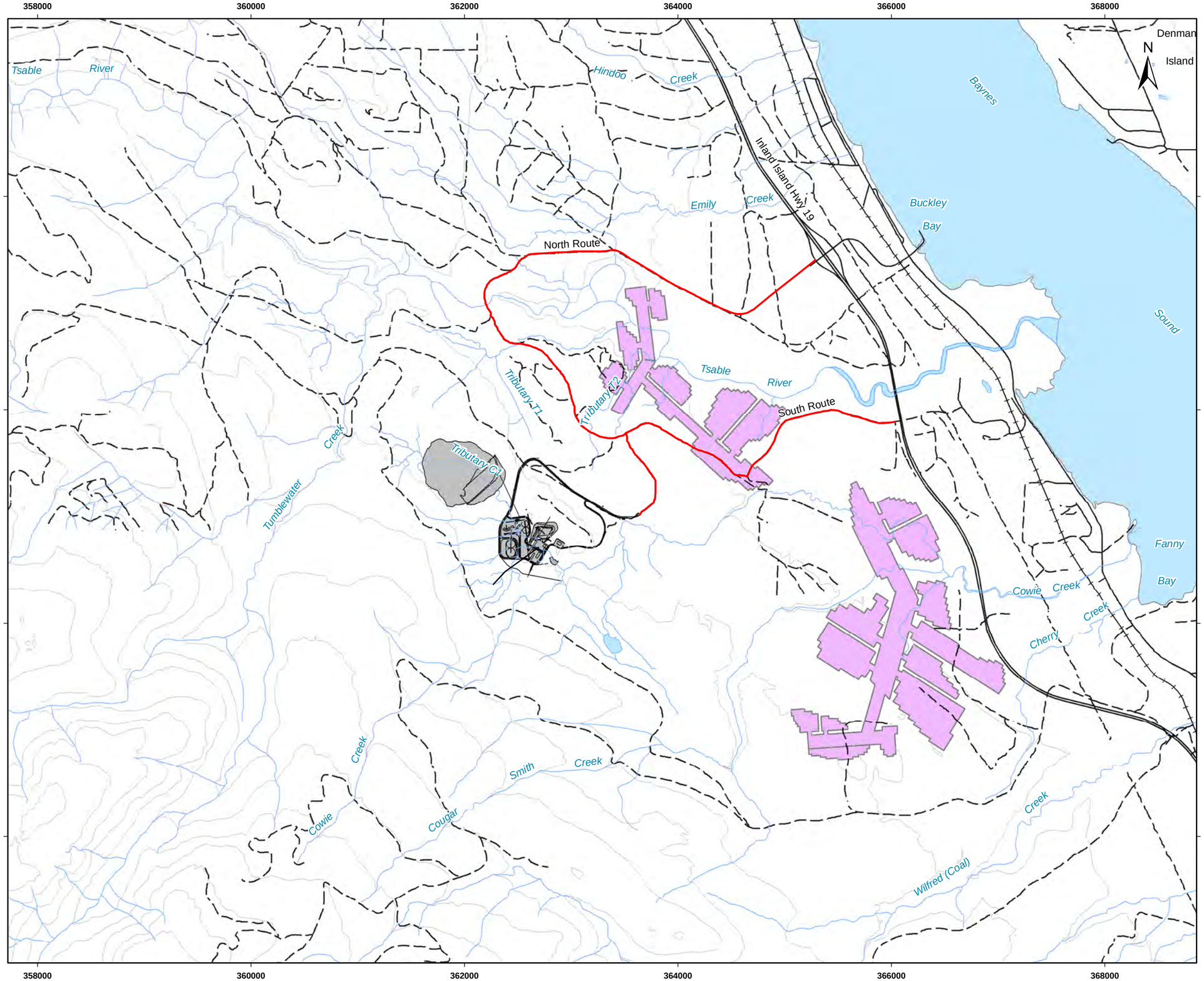
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Underground Mine Layout for Seam 150

DATE: March 13, 2011	ANALYST: EO	**Figure** 2.3-1
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-022_mining_area.pdf
GIS FILE: 18-50-022		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-eec-gis\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-022.mxd



Legend

- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Potential Location of Site Facilities
- Mining Area - Seam 360/340

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Underground Mine Layout for Seam 360/340

DATE: March 13, 2011	ANALYST: EO	**Figure** 2.3-2
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-023_mining_area.pdf
GIS FILE: 18-50-023		
PROJECTION: UTM Zone 10	DATUM: NAD83	

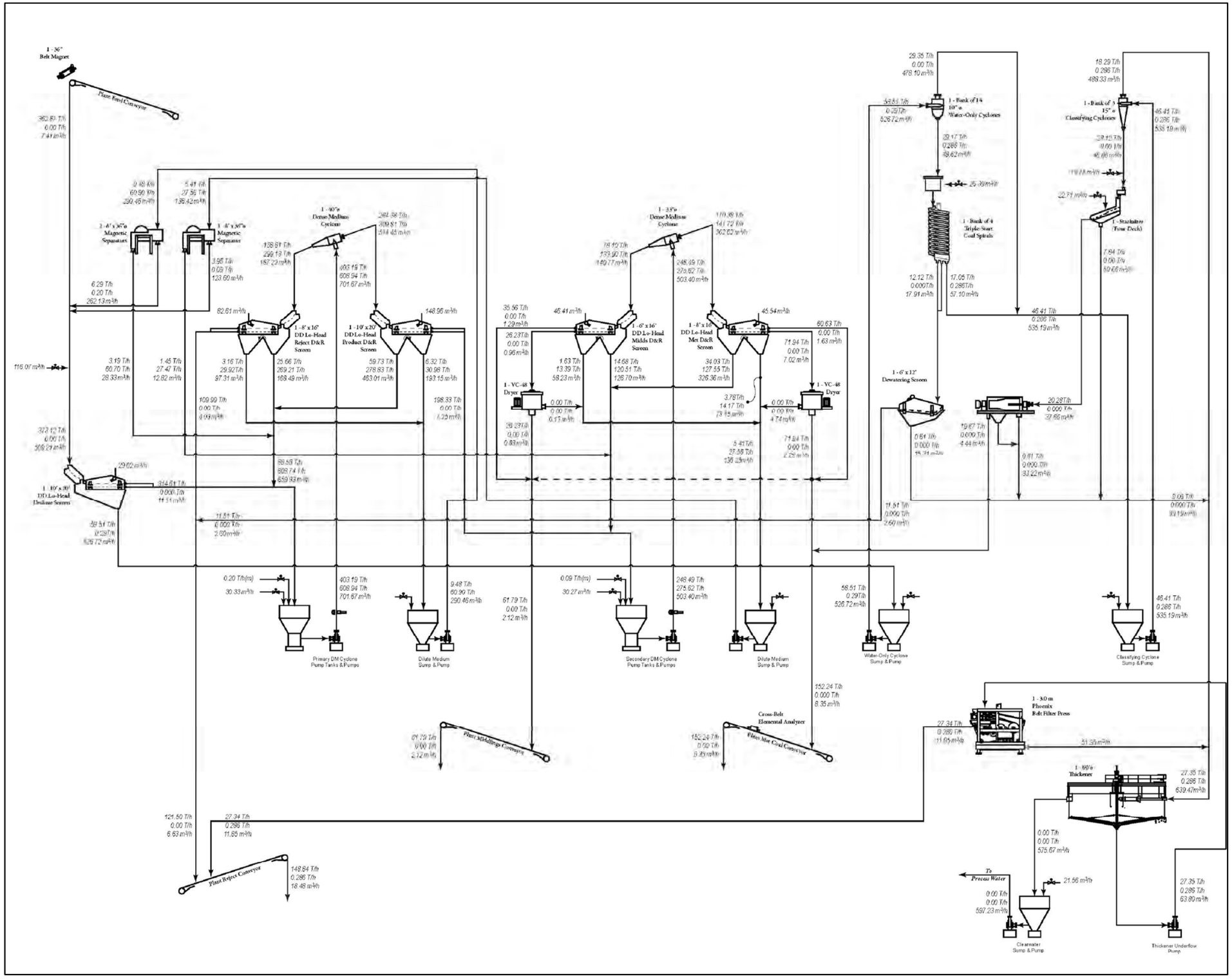
\\Bby-fs1\BBY-EE-GIS\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-023.mxd

2.4 Onsite Processing

ROM coal will be processed (i.e., crushed and cleaned) above ground on the Raven property, in a gravity-flow coal preparation plant (CPP). The cleaning process includes four circuits: primary dense-medium cyclones, secondary dense-medium cyclones, water-only cyclones, and water-only spirals. Ancillary equipment includes screens, classifying cyclones, mechanical dryers, pumps, a thickener, a belt filter press, and a product conveyor on-line ash analyzer. Three products (met coal product, middlings product, reject) are collected from the process dewatering equipment and sorted to appropriate stockpiles. Met coal will be produced whenever possible but a bypass system will allow clean coal to be diverted to a thermal stockpile should it not meet required specifications for the met market. Coal processing capacity is 363 tonnes per hour (t/h). The plant will operate 6,000 hours per year, making it capable of processing ~2.2 Mt of feed per year. The plant's maximum capacity is ~2.5 Mt of feed per year (PAH 2010). The overall coal processing schematic is shown in Figure 2.4-1.

2.4.1 Crushing and Sizing

The first step in processing is to eliminate coarse coal rejects from the ROM coal that will be processed in the CPP. This is accomplished by conveying ROM coal (sized < 200 mm; 800 t/h) from the mine access slope through a feed chute to an inclined grizzly screen (with 50 millimetre (mm) spacing between bars), and then feeding material that didn't pass through the screen to a rotary breaker (3.35 m x 7.31 m; fitted with 63.5 mm openings in the breaker plates). Material that remains greater than 50 mm after both the screen and the rotary breaker is discharged to the ground for disposal in the coarse rejects stockpile (PAH 2010).



Reference
Mine Flowchart: Pincock Allen & Holt

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Mine Flowchart

DATE: March 23, 2011	ANALYST: EO	**Figure** 2.4-1
JOB No: VE51897	QA/QC: KH	PDF FILE: 18-50-024_flowchart.pdf
GIS FILE: 18-50-024		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GISProjects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-024.mxd

2.4.2 Raw Coal Stockpiles

The second step in processing is to stockpile coal that is appropriate for cleaning. Raw coal from the rotary breaker (now sized 0 – 50 mm) is stockpiled for processing in the plant: rotary breaker discharge is conveyed to the top of a primary stacking tube, which is equipped with a diverter gate and chute to enable coal to be transferred to a secondary stacking tube. The separate stacking tubes permit raw coal stockpiles (25,000 t capacities) to be segregated based on anticipated product quality. Each stacking tube has five vibrating feeders and a raw coal reclaim tunnel. Raw coal is conveyed from the vibrating feeders into the preparation plant at a nominal rate of 363 t/h. Tramp metal in the raw coal feed is removed with a magnet (mounted over the conveyor head pulley) (PAH 2010).

2.4.3 Coarse and Fine Coal Fractions

The third step in processing is to separate the CPP coal feed into coarse and fine fractions for cleaning. Raw coal from the stockpiles (sized 0 – 50 mm) is conveyed to the plant, treated with process water (to facilitate de-sliming), and then fed into a de-sliming sieve bend. The sieve bend directs undersize coal to a de-sliming screen launder (and ultimately the fine coal cleaning circuit), and oversize coal to a double-deck de-sliming screen (upper deck with 10 mm square openings; lower deck with 0.6 mm slotted openings). The double-deck de-sliming screen, in turn, directs undersize coal from the bottom deck to the de-sliming screen launder (and ultimately the fine coal cleaning circuit), and coarse coal from both decks to the coarse coal cleaning circuit (PAH 2010).

2.4.4 Coarse and Fine Coal Cleaning Circuits

The fourth step in processing is to clean the coal: coarse coal is cleaned using two-stage dense-medium cyclones; and fine coal is cleaned using water-only cyclones and spirals.

Coarse coal from the double-deck de-sliming screen (sized 0.6 – 50 mm) is directed to the primary dense medium cyclone sump, where it is mixed with magnetite medium. This cyclone directs coal (drained and rinsed free of medium) to the secondary dense medium cyclone sump, and rejects (drained and rinsed of medium) to the plant reject conveyor. All medium *drained* from coal and rejects is recycled to a *concentrated* primary-medium sump. All medium *rinsed* from coal and rejects is recycled to a *dilute* primary-medium sump; dilute medium from the primary circuit is then treated in magnetic drum separators and ultimately used as dressing water for the de-sliming screen (PAH 2010).

Coarse coal from the primary cyclone (sized 0.6 – 50 mm) is directed to the secondary dense medium cyclone sump, where it is mixed with magnetite medium. This cyclone directs met coal (drained and rinsed free of medium) to a dedicated vibrating centrifugal dryer and conveyor, middlings (drained and rinsed free of medium) to a dedicated vibrating centrifugal dryer and conveyor, and rejects (drained and rinsed of medium) to the plant reject conveyor. All medium *drained* from coal, middlings, and rejects is recycled to a *concentrated* secondary-medium sump. All medium *rinsed* from coal, middlings, and rejects, and all *effluent* spun from the met coal and middlings in the centrifugal dryers, is

recycled to a *dilute* secondary-medium sump; dilute medium from the secondary circuit is then treated in magnetic drum separators and ultimately used as dressing water for the de-sliming screen (PAH 2010).

Fine coal from the de-sliming screen launders (sized 0 – 0.6 mm) is directed to the water-only cyclone sump, which is then pumped as a slurry to a single bank of 14 water-only cyclones. These cyclones direct overflow to the classifying cyclone sump, and underflow (diluted to the correct solids content) to a single bank of four water-only triple-start spirals. These spirals, in turn, direct clean coal to the classifying cyclone sump, and reject to a dewatering screen. The dewatering screen, in turn, directs undersize effluent to the thickener, and oversize reject to the plant reject conveyor (PAH 2010).

Fine clean coal slurry from the classifying cyclone sump is pumped to a single bank of three classifying cyclones. The classifying cyclones direct overflow to the thickener, and underflow (diluted with water) to a de-sliming stacksizer screen. The stacksizer screen, in turn, directs effluent to the thickener, and oversize product to a screenbowl centrifuge. The screenbowl centrifuge, in turn, directs coal (spun free of effluent) to the met coal conveyor, and effluent to the thickener (PAH 2010).

2.4.5 Fine Rejects

Key in the process is the elimination of coarse and fine coal rejects. Coarse rejects are separated out after the primary dense medium cyclones on a reject drain and rinse screen. This accounts for the bulk (~90%) of the coarse rejects generated in the CPP. The remainder of the coarse reject is the coarse fraction of reject material screened off from the Triple-Start coal spirals in the fine coal circuit.

The thickener receives fine reject material from the preparation plant; it uses flocculants to clarify the plant process water for reuse and concentrate the solids content of the fine settled sludge. The thickener directs underflow to a single belt filter press, where further additional consolidation of solids takes place. The belt filter press directs filter cake to the plant reject conveyor, and filtrate back to the thickener. The belt filter press eliminates the need for a tailings impoundment (PAH 2010).

Plant reject is conveyed overland to the Reject Disposal Area where the reject is discharged by a radial stacker and is spread and compacted by a bulldozer (PAH 2010).

2.4.6 Clean Coal Product

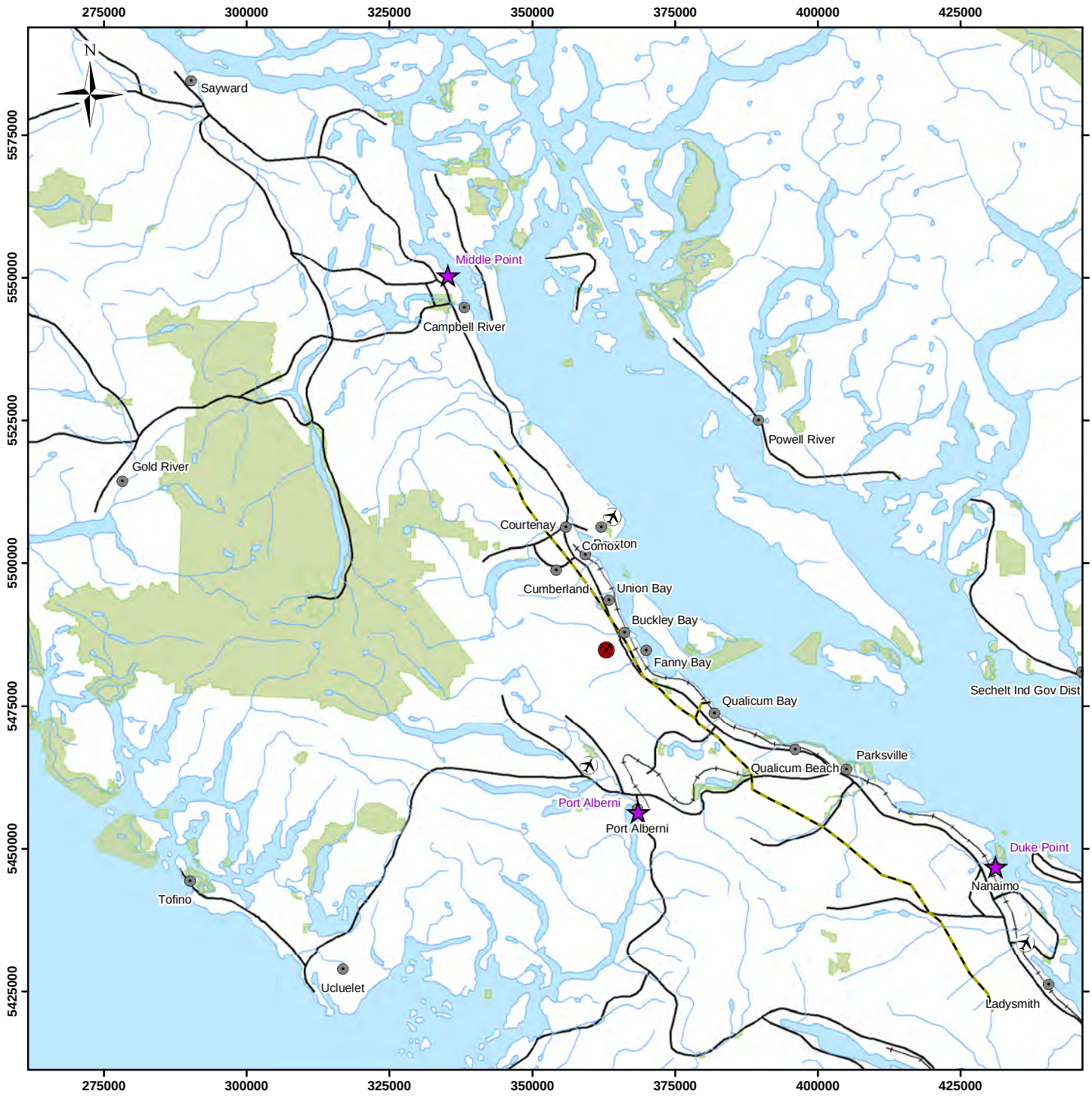
The final step in processing is to sort the clean coal product and prepare it for transport. Met coal from the plant is analyzed for impurities (ash and sulphur), which allows it to be segregated according to quality. Met coal is then conveyed to the clean coal radial stockpile (the low moisture content of the product eliminates the need for thermal drying). Based on the met coal analysis, coal from the radial stockpiles is then moved (front-end loader, feed-hopper, vibrating feeders, and conveyor system; rate of 400 t/h) to either a met stockpile or a thermal stockpile (each with a 50,000 t capacity). The stockpile arrangement allows coal

of varying quality to be blended to prepare both met quality and thermal quality products for shipment.

2.5 Coal Transport

Processed coal will be transported by road or by rail from the Raven property to port facilities, for final export to market. Likely markets include Japan, Korea, Central America, and South America; other potential markets (e.g., China, Taiwan, India) will likely obtain coal from alternative sources (PAH 2010).

A deepwater port (capable at a minimum of harbouring Panamax vessels with up to 75,000 t cargo weight) will be required to export the estimated quantities of coal being mined and processed at the proposed Raven Project. Port sites at Port Alberni, Duke Point, Middle Point, Gold River, Buckley Bay, Menzies Bay, and Tyee Spit (Campbell River) were considered options. Following extensive investigation, it was determined that Port Alberni and Duke Point were the most favourable options. Further analysis in the Pre-Feasibility Study identified Port Alberni as the preferred port site. Port Alberni's wharf structure is superior to Duke Point's dock structure, and there is a greater amount of uncertainty and risk at Duke Point than at Port Alberni regarding existing conditions and what can be constructed. Port Alberni can accommodate Panamax vessels but not Capesize vessels (PAH 2010). Transportation options are shown in Figure 2.5-1.



Legend

- Raven Coal Project
- Transport Options
- Airport
- Populated Place
- Road
- Rail line
- Transmission Line
- Park or Protected Area



Scale: 1:1,000,000

0 10 20 40

Kilometers

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Transportation Options

DATE:	ANALYST:	Figure 2.5-1
April 15, 2009	EO	
JOB No: VE51897	QA/QC: LR	PDF FILE: 18-50-011_transport_options.pdf
GIS FILE: 18-50-011		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-011.mxd

2.5.1 Transportation to Port Alberni

Access from the proposed Raven Project to Port Alberni by road is via Highway 19 and Highway 4 (~80 km travel distance). Contracted truck transportation (using twin-trailer arrangement Super "B" Train belly-dump highway trucks) would be used to transport the coal, which is similar to the approach taken by the nearby Quinsam Mine. The total length (~25 m), volumetric capacity (~53.5 cubic metres (m^3)), and weight (~42 t net weight of coal product) of these twin-trailer "B" trucks is similar to other trucks currently using Highways 19 and 4. Very little dust will be generated during travel (i.e., they'll be covered by tarps) or unloading (i.e., as they are bottom-dump units) of these trucks. Coal hauling operations are expected to be a 24 hour per day, 7 day per week activity; at least four different trucking contractors exist that are capable of providing the required service. The proposed road transportation route to Port Alberni is currently used extensively by trucks serving other industries and facilities on the Alberni Inlet. Truck transportation to port provides the greatest flexibility in meeting volume requirements, allow a range of alternative routes to be considered, and can effectively reach any port location on Vancouver Island, should port location change (PAH 2010).

Access from the proposed Raven Project to Port Alberni by rail is via the existing railway adjacent to the proposed Raven Project area (running between Courtenay and Nanaimo; owned by the Island Corridor Foundation; operated by Southern Railway of Vancouver Island) and the spur-line from Parksville to Port Alberni. The line has been in service for over 120 years, and would require significant rehabilitation to serve as a line for standard coal haulage (PAH 2010). Southern Railway and the Island Corridor Foundation are evaluating options for rehabilitating this line to enable freight service to be provided.

2.5.2 Berthing and Loading at Port Alberni

Port Alberni Port Authority (PAPA) has existing wharf structures that are available for coal storage and Panamax vessel berthing and loading.

Berthing of vessels will be at Berths 1 and 2 of the wharf. Depths of the berths at the PAPA wharf are marginally capable of accommodating Panamax vessels. Panamax vessels require depths of at least 12 m but bathymetric surveys of the wharf indicate depths of 6-8 m at the north end of Berth 2, and 12-14 m at the south end of Berth 1. Berths may require limited dredging (e.g., 0 – 2.5 m) in narrow areas along the face of the wharf and at the north end of the wharf to provide the required 12 m depth. Dredging will be minimized by positioning vessels toward the southern end of Berths 1 and 2; bows will face southward for ease of departure. The PAPA wharf is constructed of timber piling, timber caps and concrete deck panels. It is ~320 m in length and the majority of it is in satisfactory condition; however, there are several relatively small areas requiring pile and deck repairs. Construction activities will include: four new breasting dolphins (along the outboard face of the existing wharf to position ships ~9 m beyond the wharf face); a new mooring dolphin (~29 m south of the south end of the existing wharf); several new 100 t capacity mooring bollards (along the length of the wharf); and a new fendering system (several feet off the

face of the wharf, after the existing timber fender piles have been removed). Seismic resistance of the PAPA wharf as a whole does not meet code requirements. The proposed Raven Project's berthing and loading facilities have been designed to be structurally separate from the existing timber wharf (to avoid the extensive costs of upgrading the wharf) (PAH 2010).

Loading of vessels will be accomplished with a new rail-mounted travelling gantry shiploader (2000 t/h loading capacity). It will span 17 m between rails and travel longitudinally along the full length of the vessel (~235 m). It will be constructed within the footprint of the existing timber wharf, but on a new support structure (comprised of concrete crane rail beams and large-diameter, steel pipe piles extending down to bedrock) designed to resist lateral berthing, mooring and seismic loads. Rock anchors may be required to provide sufficient uplift capacity in the piling (PAH 2010). In addition to the travelling shiploader, a stationary shiploader situated near the southern end of the berths may be considered. If this option is chosen additional berthing dolphins will be required.

Coal in storage at the port will be loaded onto a dockside conveyor. The dockside conveyor will run the full length of the shiploader (on the land side of the land-side rail), and will be equipped with a tripper mechanism. The tripper mechanism rides on rails attached to the dockside conveyor support structure (towed by the shiploader as it travels), and transfers coal from the dockside conveyor to the shiploader (PAH 2010).

The shiploader will be operated from a control cab or from the deck of the vessel being loaded using a programmable logic controller to manage operations and assure proper sequencing and safety (PAH 2010).

2.6 Support Facilities

The proposed Raven Project is a Greenfield development and will require the development or upgrading of onsite facilities and infrastructure (i.e., in addition to the coal processing plant, described in Section 2.4). The onsite infrastructure is shown in Figure 2.6-1. Facilities that will be required to support the mining and processing activities taking place at the property are described below (all information obtained from PAH 2010).

362250
363000
5485500
5484750
N
North Route
South Route
Upper Embankment Stack Dump Coarse
Lower Embankment Coarse
Process Plant
Product Stockpile
Raw Coal Stockpile
Underground Coal Vent
Product Stockpile
Sample Analyzer
Administration Building
Product Stockpile
Change House
Wash Bay
Winch Support
Rotary Breaker
Sediment Pond
Bulk Storage
Warehouse
Resin Storage
Haz Mat Building

Legend
- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (20 m)
- Watercourse
- Waterbody
- Wetland
- Potential Location of Site Facilities

Scale: 1:7,000
0 100 200 400
Meters

Reference
LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds
Basedata: TRIM

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Conceptual Infrastructure

DATE: November 9, 2010	ANALYST: EO	**Figure** 2.6-1
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-004_mine_site.pdf
GIS FILE: 18-50-004		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-004_v8.mxd

Access to the site will be via existing two lane logging roads and the Buckley Bay Main (a controlled access logging road which connects to Highway 19, ~7.6 km away). A security checkpoint will be established near Highway 19. An employee parking lot will be developed near the logging road, and will serve as a bus transfer point. Bussing of the workforce to the mine facilities will minimize traffic on the logging roads. All vehicles (staff, coal haulage contractors, delivery contractors) travelling on access roads will be equipped with radio equipment to allow them to safely travel on the roads unaccompanied. Irregular deliveries and visitors will be accompanied to the facilities area. ~2.6 km of the Holiday Main will require minor upgrading. A southbound access ramp onto Highway 19 at the intersection with the Holiday Main will be required. Other small access roads in the facilities area will require construction, upgrades, or realignment.

Power to the site will be supplied via the BC Transmission Corporation (BCTC) 132 kilovolt (kV) transmission line, located parallel and to the east of Highway 19. Construction of a 5.1 km 132 kV transmission line along the Holiday Main to the facilities area will be required. A substation and connecting electrical switchgear will be required to connect to the BCTC transmission line, as well as grounding and fault detection equipment that meets regulatory standards.

A warehouse will be erected onsite for long-term storage of mine and processing plant supplies and consumable items. Short-term storage of frequently-used parts and supplies will be kept at the mine and processing plant as appropriate.

A hazardous materials (“hazmat”) building will provide temporary control for mining and processing chemicals and materials that require special management due to their hazardous nature.

A resin storage facility will segregate and provide climate control for ground control resins.

A maintenance shop will be located adjacent to the warehouse, and will provide three appropriately-sized bays for routine servicing and repairs to vehicles and equipment (major servicing and repairs will be performed offsite). A wash bay will prepare vehicles and equipment for repair and maintenance.

A compressor building will be located above the portal entries, with receivers located ahead of the mine entry and at shops on the surface. Independent compressor systems are included in the plant and maintenance shops (the main plant will serve as a back-up reserve for these facilities).

A covered bulk storage facility (or facilities) will be situated near the portal for ready access by the mining team and maintenance.

An administration building will be used for on-site personnel offices, communications, first-aid, and other administrative requirements.

A change-house with lockers for 250 employees will be required; a separate facility may be included with the plant, as underground clothing baskets and special equipment rooms are not needed.

Other surface facilities include: mine fans; dewatering and mine supply water systems; water supply pump stations and tanks (e.g., for firefighting, potable water); fuel and lubricant storage; waste water treatment (including sanitary wastes); and rock dust system. Drainage control for onsite freshwater runoff will be established around the facilities area.

CCC is committed to local hiring to the extent feasible for the proposed Raven Project. Since the proposed Raven Project related staff are housed in nearby communities there is no need for onsite accommodations.

2.7 Environmental Management

Environmental management is a critical component of any proposed new mining (or other) development. Management activities are required for land (e.g., topsoil, till, waste rock, coal rejects stockpiles, vegetation, wildlife habitat), water (e.g., mine water, seepage and runoff from waste rock and stockpiles, navigable waters, fish habitat), air (e.g., ventilation of mine workings, dusts), noise and vibration (e.g., from mining vehicles and equipment), and concerns raised by First Nations and other local communities. Potential impacts of the proposed Raven Project on the environment – and all management activities to mitigate these potential impacts – are discussed in Section 4 (Potential Project Impacts and Environmental Management).

2.8 Project Economics

2.8.1 Project Schedule

The engineering considerations for the Project are currently being evaluated and will continue through 2011. The Pre-Feasibility Study is complete. A Feasibility Study will be completed in the second quarter of 2011.

The EA process is currently underway. Following receipt of a section 10 Order from the BC EAO initiating the provincial and harmonized federal EA process, a draft AIRfor the Application for an EA Certificate under the *BCEAA* (Application) wasdeveloped and submitted to the BC EAO in December 2009. In May 2010 a Notice of Commencement was received from the CEAA requiring a comprehensive study be completed and an Environmental Impact Statement be submitted under the *CEA Act* and the draft AIR was amended to include the requirements of the CEAA . The draft AIR / EIS Guidelines is currently being reviewed by a Working Group made up of representatives from the provincial, federal and local governments and First Nations. Following receipt of the final AIR / EIS Guidelines,, Applications will be made shortly thereafter.

Approval (i.e., environmental approvals and permits) is expected to be received in the second quarter of 2012.

Procurement and construction activities will begin in mid-to-late2012 (quarters 3– 4). The portal access box-cut will be developed; portal entries will be driven to the first cross-cut of Seam 150 to allow a ventilation circuit to be established

Construction will begin in early 2013 with the development of the main access slope and the first super-section. The second super-section will begin development in late 2013 to early 2014 (~9 months after initiation of the main access slope). In late2013 to early 2014 (i.e., after sufficient advancement of the slope), rock slope access seams from Seam 150 to Seams 360 / 340 will be developed. In early2014, the single continuous miner section will commence in the northern district of Seam 340 / 360. The mine will be developed to the north and to the south once the bottom of the slope is reached. The proposed Raven Project will gradually ramp up to full production by the end of 2014 with the first year of steady state normal operation being 2015. In 2020, most of the mining in the northern district will be complete. At this time mining efforts will be re-focused toward the south. The total mine life is 16 years, meaning that operations will continue until 2029.

Decommissioning and closure activities will commence when operations cease in 2029.

Preliminary activities per each proposed Raven Project phase are summarized in Table 2.8-1.

Table 2.8-1: Preliminary Project Phase Activities

Activity
Construction
Employment
Access road
Transmission line
Equipment and machinery transportation to site
Land clearing
Excavating
Grading
Soil and till salvage, handling and storage
De-watering
Directional drilling
Dredging and disposal of dredged sediment
Infilling
Surface infrastructure installations
Underground access, conveyor and ventilation shaft or roadway development
Coal processing and handling facilities and infrastructure
Blasting
Temporary sump installation
Conveyors installation
Site set-up (first aid, safety, fire and security)
Environmental management for construction activities

Activity
Commissioning
Underground access
Drift
Surface infrastructure
Underground mine
Coal processing and coal facilities and infrastructure
Operation
Employment
Underground mining
Processing
Coal transportation
Water management
Soils and waste management
Coal bed methane gas management
Decommissioning and abandonment
Employment
Stream drainage restoration
Surface waste areas reclamation
Coal stockpile areas reclamation
Soil use for reclamation
Revegetation
Settling pond decommissioning
Mine access roads decommissioning and reclamation (if required by the private land owner)
Access road decommissioning and reclamation (if required by the private land owner)
Transmission line decommissioning and reclamation
Underground mine works
Equipment and machinery removal, recycling, disposal
Surface infrastructure dismantling, removal, recycling, disposal

2.8.2 Work Schedule

During construction, the mine will require a total workforce of ~200 people.

During operations, the mine, transportation and port will require a total direct workforce of up to ~350 people. The hourly workforce will consist of 200 people for mining and 25 people for processing; the salaried workforce will consist of 36 people for mining and 10 people for processing. There would be 8 security people, and transportation of the coal will provide another ~10 - 50 jobs depending upon the use of trucks or train. Approximately 21 people would be employed in the port operations. As many as 500 indirect jobs could be generated in the local economy (assuming an economic multiplier of 1.5).

The work schedule for the mine plan consists of three 9-hour shifts per day: coal production is scheduled for the day and evening shifts; maintenance and idle work is scheduled for the

night-shift. Development productivity will average ~48 m per shift in the super-sections, and ~30 m per shift for the standard section; in more adverse mining conditions (e.g., initial slope development), development productivity will average ~15 m per shift. Pillar extraction productivity will average ~60 m per shift (equivalent advancement) (PAH 2010).

2.8.3 Capital Costs

From the Pre-Feasibility Study, total capital costs to develop the proposed Raven Project (through 2015; excluding sustaining capital) are estimated at C$240.1 million. Sustaining capital costs are estimated atC$3.30 per saleable t (PAH 2010).

2.8.4 Operating Costs

The Pre-Feasibility Study has considered operating costs in several categories (PAH 2010). The workforce (combined hourly and salary, for both mining and processing activities) has been estimated to cost approximately C$27 million per year. Total costs for general mine maintenance, power, and fuel have been estimated at approximately C$2 million per year. Coal loading and transportation is estimated to cost C$8 per product t, and port costs are estimated to cost C$5 per product t. Operating costs have also been estimated on a per-t basis for parts, supplies, reagent chemicals, environmental activities, and general and administrative activities, among others.

2.8.5 Financial Analysis

A financial analysis was performed for two primary production scenarios over the life of the proposed Raven Project: the base scenario assumed production of primarily a semi-soft met coal (price estimated at US$126-141 per t) with a thermal coal by-product (price estimated at US$95-114 per t); (PAH 2010). Operating costs in the financial analysis were as outlined in Section 2.8.4.

The proposed Raven Project is fairly sensitive to price, with moderate sensitivity to operating costs; of the parameters evaluated, the proposed Raven Project is least sensitive to capital. Overall, results of the financial analysis show that, based on the production profile and cost assumptions, the proposed Raven Project provides a reasonable rate of return at modest discount rates (un-inflated, pre-tax basis) (PAH 2010).

2.9 Alternatives

CCC recognizes the importance of the EA process and consultation in mine planning; particularly in alternatives assessment. During the EA process, CCC has been committed to incorporating public and First Nations feedback on alternatives into the mine design process. Alternatives were considered for a number of components of the proposed Raven Project, including: mine infrastructure location; layout of mine infrastructure; location of mine access slope; access road alignment and location; transport of coal; location of load out facility; coal gas management; water disposal; water management; and power options.

3 OVERVIEW OF THE ENVIRONMENT

The proposed Raven Project is situated on eastern Vancouver Island, which has a unique environment. Sections below present detailed descriptions of: the terrain, soils, geology, and geochemistry (Section 3.1); groundwater, surface freshwater, and marine waters (Section 3.2); climate, air quality, and noise and vibration conditions (Section 3.3); non-human organisms such as vegetation, wildlife, fish and other aquatic and marine resources (Section 3.4); the social and economic setting, including First Nations with interests in the proposed Raven Project (Section 3.5); and natural hazards and environmental concerns (Section 3.6).

3.1 Geosphere

3.1.1 Terrain

The proposed Raven Project area is characterized by gently rolling hills to flat-lying, occasionally swampy areas. The area lies within the Nanaimo Lowlands physiographic province of southwest BC, a narrow coastal plain bounded by the Georgian Depression to the east and the Vancouver Island Ranges to the west (BC MOE 2010a). As such, the terrain slopes gently from the coastline near Fanny Bay to an undulating, terraced upland in the area of the proposed mine facilities site; farther upslope, the topography is hummocky to rolling with gentle to moderate slopes that comprise the foothills of the Beaufort Range. Linear, northwest-trending ridges become more prominent with closer proximity to the Beaufort Mountains (BC MOE 2010b). The proposed Raven Project area extends from a low of ~50 m to a high of 250 m (AGL 2007; AGRA 1997; ORCRC 2007).

Small gravel pits and rock quarries operated by the timber companies in support of road building are dispersed throughout the project area (AGL 2007; AGRA 1997; ORCRC 2007).

The proposed Raven Project area terrain has vegetative cover that provides important habitat for a variety of mammalian, avian, and other terrestrial wildlife. Vegetation in the proposed Raven Project area is discussed further in Section 3.4.1. Terrestrial wildlife is discussed further in Section 3.4.2.

3.1.2 Soils

Soils of eastern Vancouver Island consist of glacial, peri-glacial, and non-glacial deposits. Glacial deposits in the Tsable River-Fanny Bay area consist of a complex succession of till, glacio-fluvial sands and gravels, and marine silt and clay. Isolated glacial deposits (glacio-fluvial and terraced gravelly and silty sands) flank the Tsable River and occur between Cowie Creek and Cougar Smith Creek. Peri-glacial and non-glacial deposits include sand and gravel of the Capilano and Salish sediments and recent fluvial deposits associated with deposition in the channels of the Tsable River and Cowie Creek (BC MOE 1985, 2010b). Scattered exposures of gravel and sand occur within the clay unit in the highway corridor. Till and organics have not been mapped but they are highly variable in thickness as the underlying bedrock topography changes substantially throughout the area (BC MOE 1985, 2010b).

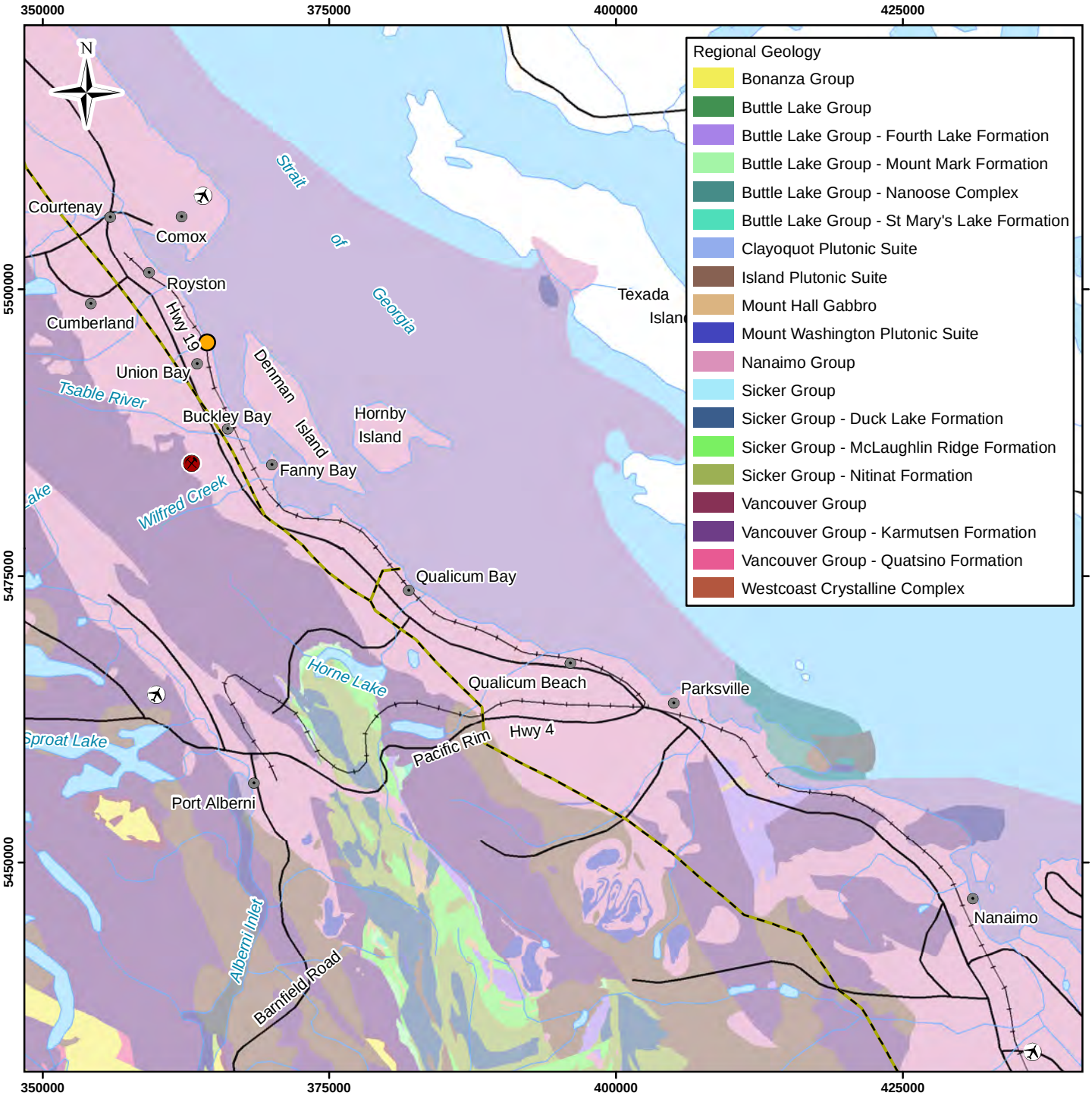
Soils of the proposed Raven Project area are highly variable: they range in composition from glacial till to glacio-fluvial deposits of sand and gravel, and in thickness from less than 2 m in the west to over 100 m in the south. Soil classifications according to the Canadian System of Soil Classification are *Orthic Homo-Ferric Podsol* and *Duric Humo-Ferric Podzols* (BC MOE 1985, 2010b). Surface exposures of rocks occur in creek and river valleys and occasional road cuts (ORCRC 2007).

3.1.3 Geology

Coal-bearing rock at the property is of Upper Cretaceous age, and contained within the Comox Formation (Cumberland Member) of the Nanaimo Group. The main economic coal resources occur at the southern end of the formation (a 9 km strip along the coastline, extending eastward under Baynes Sound and beyond), in the Tsable River Coalfield. The Tsable River Coalfield has a northeast regional dip (averaging 10-15^{o} slope, but close to horizontal in some areas on the eastern edge, and as steep as 26^{o} in some areas on the western edge of the coalfield, as it approaches the Beaufort Mountains). The Tsable River Coalfield also has broad folds and faulting as a result of compression forces, which has divided the coal resources into two distinct blocks: "Upper Plate" (overlying); and "Lower Plate" (underlying). The deposit has been classed as Deposit Type *Underground*, and Geology Type *Moderate*, bordering on *Complex* (PAH 2010).

The coal-bearing rock in the proposed Raven Project area is divided into five coal zones, which are further sub-divided into a total of 12 seams and sub-seams. Two of the zones (3 seams total) are of sufficient thickness and continuity that they are of economic interest: Zone 1 (containing Seam 150) is the lowermost seam, ~2.5 to ~3.0 m thick, and is comprised of thin coals, carbonaceous to coaly mudstones and thin partings of mudstones and siltstones; Zone 3 (containing upper Seam 360 and lower Seam 340) is, on average, ~30 m above Zone 1 (PAH 2010) and reaches mineable thicknesses of ~1.5 in localized areas. The irregular basement topography of the underlying Triassic Karmutsen Formation gives the coal seams of the Comox Formation variable thicknesses (ORCRC 2007).

Regional geology of the proposed Raven Project area is shown in Figure 3.1-1. A geological cross-section of the proposed Raven Project area, showing mineable seams of coal, is shown in Figure 3.1-2.



Legend

- Raven Coal Project
- Airport
- Populated Place
- Road
- Rail line
- Transmission Line

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse

Scale: 1:500,000

0 5 10 20

Kilometers

CLIENT: Compliance Coal Corporation

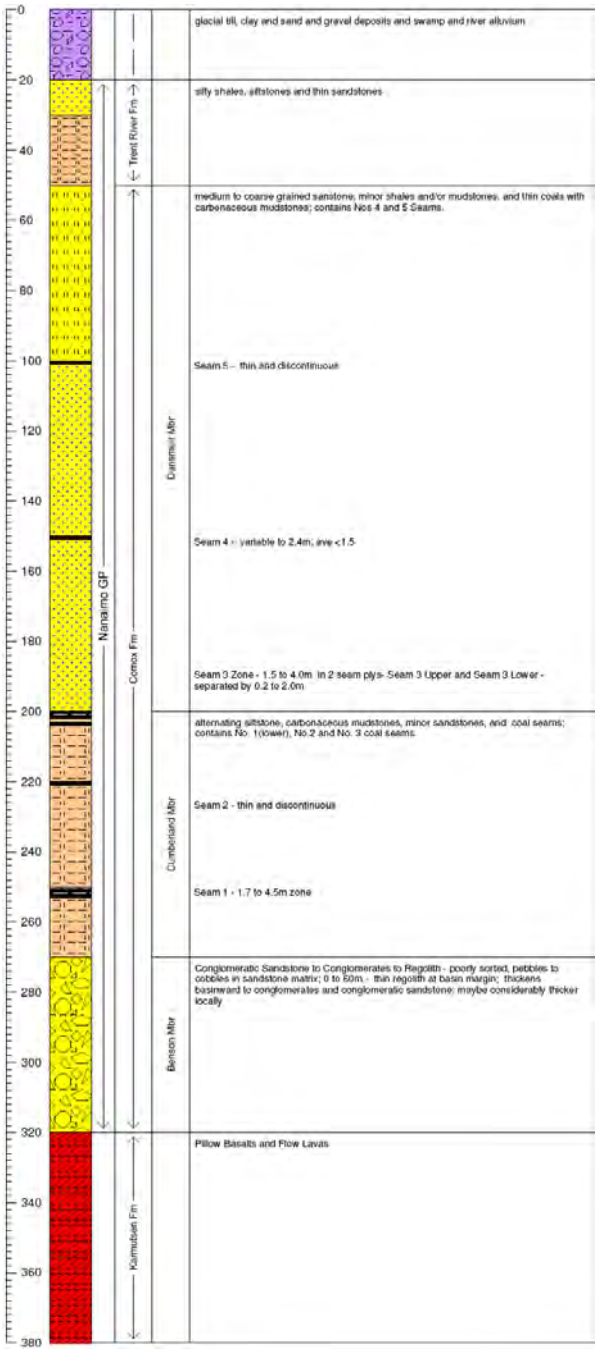
PROJECT: Raven Underground Coal Project

Regional Geology

DATE:	ANALYST:	Figure 3.1-1
May 2, 2011	EO	
JOB No: VE51897	QA/QC: LR	PDF FILE: 05-50-012_regional_geo.pdf
GIS FILE: 05-50-012		
PROJECTION: UTM Zone 10	DATUM: NAD83	

amec

\\Bby-fs1\BBY-EE-GIS\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\05_terrain-geology-soils\Baseline\05-50-012.mxd



CLIENT: Compliance Coal Corporation

Compliance Coal Corporation

PROJECT:

Raven Underground Coal Project

Geological Cross-Section

DATE:	ANALYST:	**Figure** 3.1-2
June 16, 2009	EO	
JOB No: VE51897	QA/QC: BO	PDF FILE: 18-50-007_Strat_section.pdf
GIS FILE: 18-50-007		
PROJECTION: NA	DATUM: NA	

amec

\\Bby-fs1\BBY-EE-GIS\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-007_v2.mxd

3.1.4 Geochemistry

The geochemistry of the materials at a mine site determines the extent to which ARD and ML may occur. Based on ABA, rock is classified as either potentially PAG or NAG. On May 2001 Golder Associates Ltd. (Golder) was retained by the T'Sable River Coal Corporation (TRCC) to provide mine waste management consulting services for the assessment of ML/ARD potential in waste rock from their proposed T'Sable River bulk sample project within the Raven Project area. ML/ARD potential at the proposed Raven Project site was assessed in 2001 to support a bulk coal sampling program (Golder 2001). The bulk sampling program would have produced about 22,000 m^3 of waste rock (approximately 55,000 t) (Golder 2001).

The general geology of the area is comprised of the coal-bearing Dunsmuir and Cumberland Members of the Comox Formation and the overlying Trent River Formation. The Trent formation will not be mined. The geological continuity of the rock units was verified by project geologists using geophysical logs (Golder 2001).

Two drill holes were sampled for ABA and metals analyses. Borehole TS96-10 was the source of samples for the Comox Formation. Eighty-five ABA samples were collected from this borehole (Golder 2001).

ABA results showed that pyritic sulphur was the most common sulphur species, followed by sulphate and then organic sulphur. Organic sulphur composed ~0.5 to 15% in samples from TS96-10 of the total sulphur. Nine of the 85 samples from TS96-10 had a NPR less than 2 and were classified as PAG (Golder 2001).

The available ML/ARD geochemistry data was limited. ABA testing as described above identified samples from two drill holes within the coal-bearing Comox Formation as PAG.

Starting from 2009 additional ML/ARD characterization work continued on representative Raven coal rejects and non-coal material. The above ML/ARD information from 2001 will be supplemented by the results from work started in 2009 and 2010.

The geochemistry approach includes the following:

- Ongoing discussion with provincial specialists;
- Coal rejects and other geological waste will be assessed for acid generating potential;
- ML/ARD characterization includes coal reject and waste rock / gob (roof fall) material
    - ABA (including Sobek neutralization potential (NP) and organic sulphur (S));
    - Shake flask extraction;
    - QXRD mineralogy;
    - Kinetic testing; and

- Predictive model to be developed.

Additional geochemistry sampling completed to date includes the following:

- 110 acid base accounting (ABA) samples were collected in late August from 13 drill cores in areas of the deposit that will be mined
- Core samples taken from the roof, floor and, where available, coal seams partings
- Sampled existing waste from the historic Tsable and Baynes Mines
- Tested rejects from the washability and float-sink testing
- Currently - additional reject testing to increasing ML/ARD characterization of reject materials

Including results from ABA testing of 91 reject samples which contain the results of ABA testing previously completed on high sulphur and met coal samples. There have been three rounds of ABA testing on reject material from the Raven Project.

The initial examination of the ML/ARD characteristics of coal reject from the Raven project began in January 2010. Coarse (+100 µm) and fine (-100 µm) rejects from washability and float-sink testing were submitted for acid-base accounting (ABA), shake flask extraction (SFE) and kinetic testing. Subsequently it was concluded that these materials had a higher sulphur content compared to the main met coal target area and were collected in an area not likely to be mined. Based on these considerations the kinetic testing of these rejects was terminated on April 30, 2010.

Static and kinetic testing of representative met coal reject samples was approved by Compliance Coal on April 29, 2010. These samples are a composite of numerous drillholes from the met coal target area; this rock volume has lower contents of sulphur than the samples previously tested. The composite sample was subjected to a secondary process for recovering thermal coal and/or middlings. These rejects are considered to be representative of the coarse and fine refuse material from the met coal target area. Testing is ongoing.

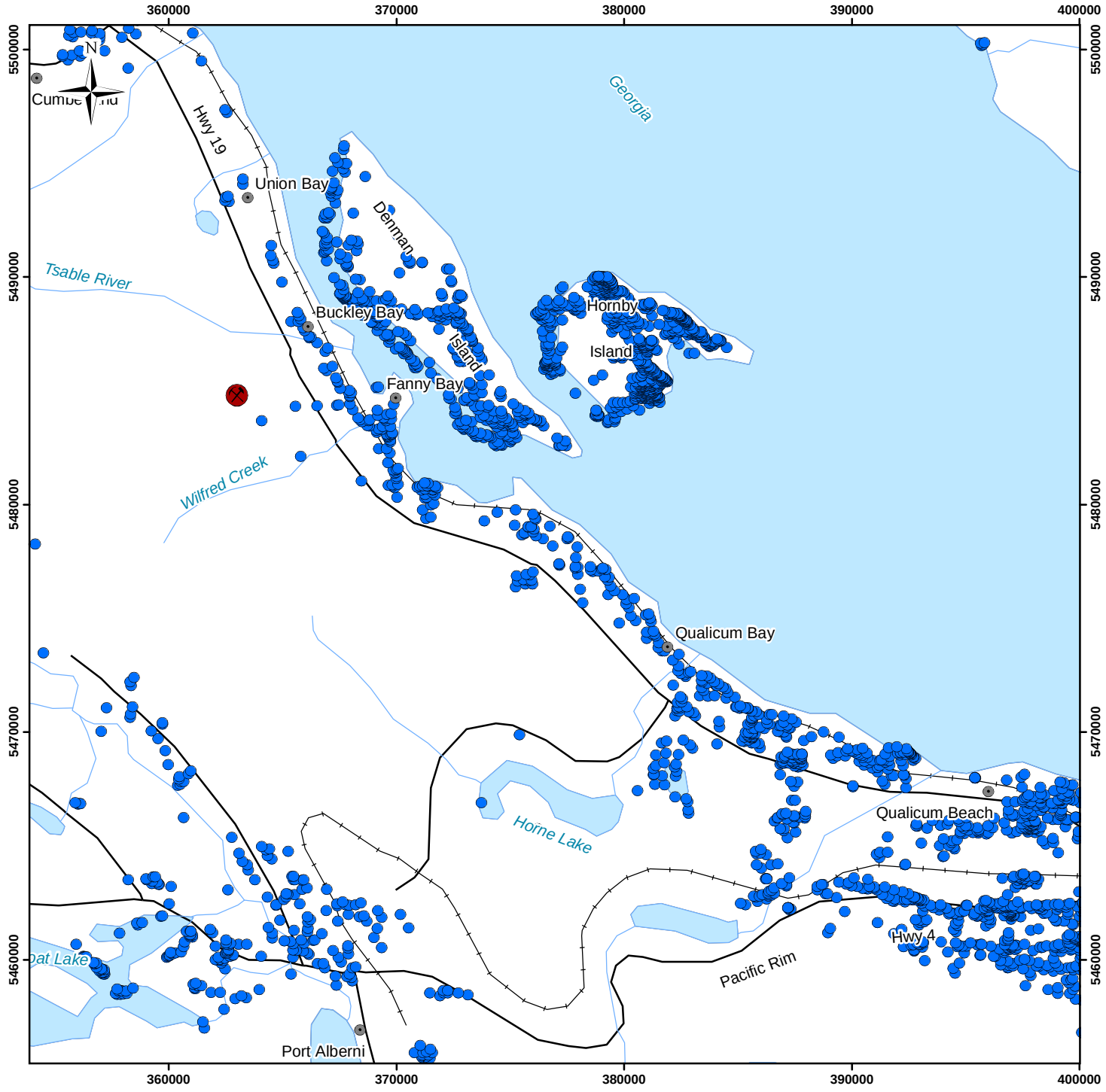
3.2 Hydrosphere

3.2.1 Groundwater and Hydrogeology

Hydrogeology is comprised of a surficial groundwater system and a bedrock groundwater system. The surficial groundwater system discharges through springs and seeps to swampy areas. The bedrock groundwater system discharges to and recharges rivers and creeks along fracture zones and permeable strata of the Trent River and Comox Formations (BC MOE 2010b). The main recharge area is assumed to be west of the proposed Raven Project site where shallow or exposed bedrock at higher elevations (>100 m) dips 5^{o} to 30^{o} to the east. The following hydrogeologic units and inferred hydrogeologic properties have been defined (AGL 2007; AGRA 1997; ORCRC 2007):

- Sand and gravel (Capilano Sediments) - aquifer;
- Marine clay (post-Voshon) and gravely, sandy till (Vashon till) - aquitard;
- Sands and gravels (Quadra Sediments) - aquifer;
- Glaciomarine clay and stony clay (Quadra Sediments) - aquitard; and
- Bedrock (Trent River and Comox Formation of the Nanaimo Group) - undefined.

Groundwater at the proposed Raven Project site has not been developed for drinking, irrigation or industrial uses. The Fanny Bay Waterworks District is the primary drinking water supplier to the area. The majority of drinking water in the Fanny Bay area comes from shallow groundwater wells ranging in depth from ~1.4 m to 8 m. Groundwater wells in the vicinity of the proposed Raven Project area are shown in Figure 3.2-1. Known well yields range from approximately 0.6 to 1.3 litres per second (AGL 2007; AGRA 1997; ORCRC 2007).



Legend

- Raven Coal Project
- Well Site
- Populated Place
- Road
- Rail line
- Watercourse
- Waterbody

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse

Scale: 1:250,000

0 2.5 5 10
Kilometers

CLIENT: Compliance Coal Corporation		
PROJECT: Raven Underground Coal Project		
Groundwater Well Locations		
DATE: May 20, 2009	ANALYST: EO	**Figure** 3.2-1
JOB No: VE51897	QA/QC: LR	PDF FILE: 18-50-002_well_site.pdf
GIS FILE: 18-50-005		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GISProjects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-005_v2.mxd

Table 3.2-1 includes a breakdown of groundwater wells by use.

Table 3.2-1: Groundwater Wells Usage

Groundwater Well Use	Number of Wells
Not in use	39
Abandoned	16
Commercial and Industrial	20
Community Water Supply	18
Domestic	1,515
Drinking Water Supply System	77
Irrigation	19
Municipal	6
Observation Well	11
Other	18
Test	3
Unknown Well Use	703
Water Utility	2

3.2.2 Surface Freshwater and Hydrology

The proposed Raven Project facilities are located primarily within the Cowie Creek watershed (23.5 square kilometres (km^2)) but also partly within the Tsable River watershed (~102.9 km^2). All surface waters flow to the east, draining into the ocean (AGL 2007; AGRA 1997; BC MOE 2010b; ORCRC 2007;).

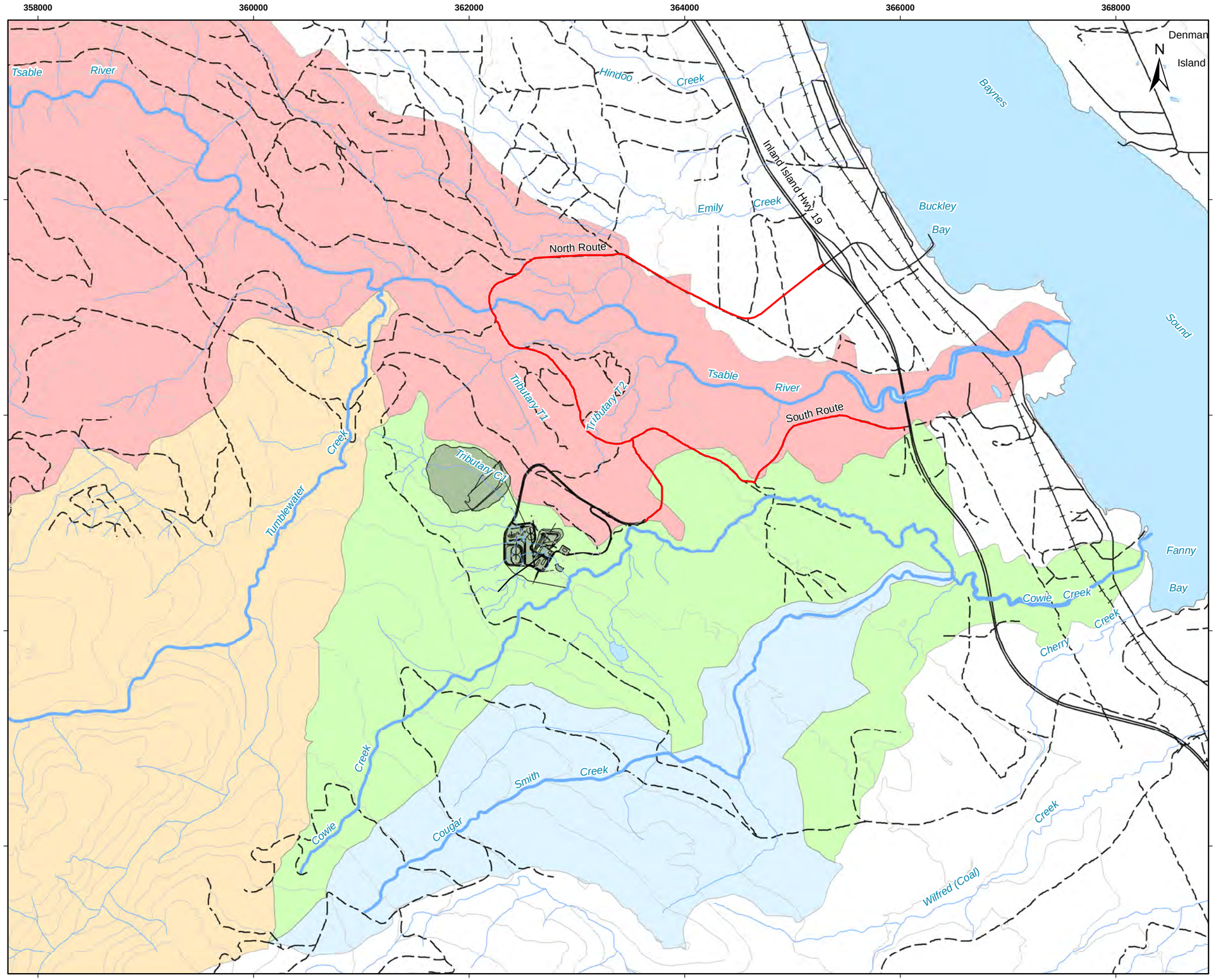
Cowie Creek (colloquially known as Cougar Creek) is located south of the proposed Raven Project facilities area; it is punctuated by ~12 log jams and multiple bedrock falls up 10 m in height between the headwaters and Baynes Sound. Cougar-Smith Creek is the major and only named tributary to Cowie Creek (AGL 2007; AGRA 1997; BC MOE 2010b; ORCRC 2007).

The Tsable River is located north of the proposed Raven Project facilities area; it is the largest and most prominent (25 km, fourth order) river and is frequently confined within a canyon (AGL 2007; AGRA 1997; BC MOE 2010b; ORCRC 2007).

Other creeks in the proposed Raven Project facilities area include Hindoo Creek and Wilfred Creek (AGL 2007; AGRA 1997; BC MOE 2010b; ORCRC 2007).

Watershed boundaries and major surface water features are shown in Figure 3.2-2.

Surface freshwaters provide habitat for fish and other aquatic resources; these organisms are discussed further in Section 3.4.3.



Legend

- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Potential Location of Site Facilities
- Cougar Smith Watershed
- Cowie Creek Watershed
- Tumblewater Creek Watershed
- Tsable River Watershed

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Surface Hydrology

DATE: March 15, 2011	ANALYST: EO	**Figure** 3.2-2
JOB No: VE51897	QA/QC: BO	PDF FILE: 10-50-014_wtrshed.pdf
GIS FILE: 10-50-014		
PROJECTION: UTM Zone 10	DATUM: NAD83	

\\Bby-fs1\bby-ee-gis\GIS\Projects\VE\VE51897_Raven_CoalMapping\18_Other\18-50-014_v2.mxd

3.2.4 Marine Waters

The proposed Raven Project lies on eastern Vancouver Island and thus in close proximity to the Strait of Georgia in the Salish Sea, which separates Vancouver Island from the mainland of BC. Specifically, the proposed Raven Project is ~5 km to the west of Baynes Sound, the narrow western off-shoot channel (~ 2 km wide) of Georgia Strait that separates Denman Island from Vancouver Island (AGL 2007; AGRA 1997; BC MOE 2010b; ORCRC 2007).

Coal will be shipped from Port Alberni, which is at the head of the Alberni Inlet. The Alberni Inlet is Vancouver Island's longest inlet (~40 km) and stretches west from Port Alberni to Trevor Channel and the Pacific Ocean.

Baynes Sound provides important habitat for shellfish and other marine resources. The Alberni Inlet provides important habitat for marine mammals and birds and other marine resources. All marine organisms are discussed further in Section 3.4.4.

3.3 Atmosphere

3.3.1 Climate

The proposed Raven Project area experiences climate typical of the southeast coast of Vancouver Island ("Coast Western Hemlock" Biogeoclimatic Zone of BC).

Summers are warm and dry, with northwest winds predominating. Average temperatures during the summer are between 14.2 - 17.6°C. The dry summers make the area susceptible to forest and brush fires and consequent fire closures (AGL 2007; AGRA 1997; ORCRC 2007).

Winters are cool and moist, with southeast winds predominating. Average temperatures during the winter are between 3 - 5.5°C. Annual precipitation is ~1200 mm, with the majority (~1,100 mm) falling as rain from October to March. Snow that does occur tends to melt fairly quickly (AGL 2007; AGRA 1997; ORCRC 2007).

3.3.2 Air Quality, Noise, and Vibration

Air quality and noise levels in the proposed Raven Project area are generally considered good as there are no major metropolitan cities nearby. General air quality data exist from the BC Ministry of Environment (BC MOE) and the YQQ weather station. However, there are no known air quality or noise level surveys specifically for the proposed Raven Project area, and there are some activities in the vicinity that have the potential to affect air quality and noise. Typically the activities and sources that affect noise are the same as those that affect air quality. These sources include: vehicles and equipment operated by nearby timber companies during logging activities; road traffic along Highway 19 and smaller roads; ferry and boat traffic along Georgia Strait and Baynes Sound; air traffic associated with YQQ and Canadian Forces Base (CFB) Comox; vehicles and equipment such as heating appliances from rural homes; and forest fires (AGL 2007; AGRA 1997; ORCRC 2007). Local communities in the vicinity of the proposed Raven Project area (i.e., that could also be potential sources of emissions) are discussed in Section 3.5.1.

3.4 Biosphere

3.4.1 Vegetation and Wetlands

Forest cover in the proposed Raven Project area ("Coast Western Hemlock" Biogeoclimatic Zone of BC) is limited (BC MOF 1991). The majority of the forest cover of the proposed Raven Project area has been clear cut (starting in the 1800s). The site is still currently used for logging and forestry operations and has been extensively modified, with numerous old graded rail and road tracks, pits, culverts and bridges present at the site. Cut blocks in the area are in second or third rotations and replanting has been a part of the process of reforestation (AGL 2007; AGRA 1997; ORCRC 2007). Forest cover is typically important for shading watercourses and providing habitat for selected terrestrial wildlife species (BC MOF 1991).

Other vegetation has been described as a sub section within the Eastern Variant, Very Dry Maritime Subzone of the Coast Western Hemlock Zone (BC MOF 1991). The warm, dry summers and moist, mild, low-snowfall winters of the area mean that growing seasons are long, and feature water deficits on zonal sites (BC MOF 1991). There is evidence of fire having played a role in the landscape (AGL 2007; AGRA 1997; ORCRC 2007).

Wetlands in the proposed Raven Project area appear to have been artificially created as a result of road construction; they may provide important habitat for some specialist species. ~85 to 90% of the watershed appears to have been clear cut at least once (AGL 2007; AGRA 1997; ORCRC 2007). Records of logging and replanting programs will be incorporated into the vegetation assessment of the area.

No endangered, threatened, or species of special concern are expected within the proposed Raven Project area, based on a search of the BC Conservation Data Centre (CDC) records. However, CDC records do not preclude the presence of species at risk in the area.

Sensitive Ecosystems have been identified by sensitive ecosystem inventory (SEI) mapping. These are provided in Figure 3.4-1. It should be noted all forested lands are part of a working forest and subject to logging in the future.

362000 364000 366000 368000

5488000 5486000 5484000 5482000

Inland Island Hwy 19

Baynes Sound

Buckley Bay

Emily Creek

North Route

Bridge

Tsable River

South Route

Creek

Tumblewater Creek

Ships Point

Fanny Bay

Cowie Creek

Cherry Creek

Smith Creek

Cougar Creek

Cowie Creek

Wilfred (Coal) Creek

N

Legend

- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Potential Location of Site Facilities
- Sensitive Ecosystem Inventory

Scale: 1:30,000

0 300 600 1200

Meters

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds
Sensitive Ecosystem Mapping: Ministry of Environment (2004)
Basedata: TRIM

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Sensitive Ecosystem Mapping

DATE:	ANALYST:	**Figure** 3.4-1
February 22, 2010	EO	
JOB No: VE51897	QA/QC: BO	PDF FILE: 06-50-004_SEI.pdf
GIS FILE: 06-50-004		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\06_vegetation\Baseline\06-50-004.mxd

3.4.2 Terrestrial Wildlife

Terrestrial wildlife in the proposed Raven Project area includes mammals, birds, amphibians and reptiles.

Mammals in the proposed Raven Project area likely include a full suite of large-, medium- and small- sized species (BC MOF 1991). Roosevelt elk are present and are a managed species. Black-tailed deer, cougar, wolf, black bear, red fox, marten and ermine may also be present. Short-tailed weasel may be present, as observations have been recorded ~7 km upstream from the mouth of the Tsable River (although this is well outside the proposed Raven Project's direct area of influence). Bats (e.g., Keen's long-eared myotis and Townsend's big-eared bat) are also unlikely, given the removal of old mature trees that provide roosting cavities.

Birds in the proposed Raven Project area include bald eagles (~15 observed within the proposed Raven Project's direct area of influence during a reconnaissance visit in April 2009; probably feeding on a deer carcass), and purple martin (unlikely to be suitable nesting areas within the proposed Raven Project's direct area of influence, but were observed flying over clear cuts; known to nest in martin houses at Buckley Bay).

Potential federal *SARA* species and BC Red- and Blue- Listed species in the proposed Raven Project area are presented in Table 3.4-1. Six of the eight potential species have been observed.

Table 3.4-1: Potential Species at Risk

Species	*SARA*	Red-listed	Blue-listed
Roosevelt Elk			observed in LSA
Water Shrew (*Brooksi* spp)		X	not observed
Purple Martin			observed flying over LSA; not nesting
Band-tailed Pigeon			observed in RSA
Red-legged Frog	Special Concern Schedule 1		observed in LSA
Western Toad	Special Concern Schedule 1		observed in LSA
Pacific Sideband Snail			observed in LSA
Coastal Cutthroat Trout			observed in LSA

Note: LSA-Local Study Area; RSA-Regional Study Area; *SARA-Species at Risk Act*

Wildlife studies will be focussed on providing a current inventory of species occurring in the proposed Raven Project's area of influence and region of potential concern. Mammal surveys will be limited to incidental observations of mammals and their sign during transects as well as snow tracking in the winter. Spring breeding bird surveys will be undertaken in order to compile a list of species probably breeding within the proposed Raven Project's

direct area of influence; some species may be present but not actually breeding within the area but using it to forage. Amphibians will be observed where they occur in water bodies or may be caught in minnow traps during fish surveys. Reptiles may be found during field studies and all incidental observations will be recorded.

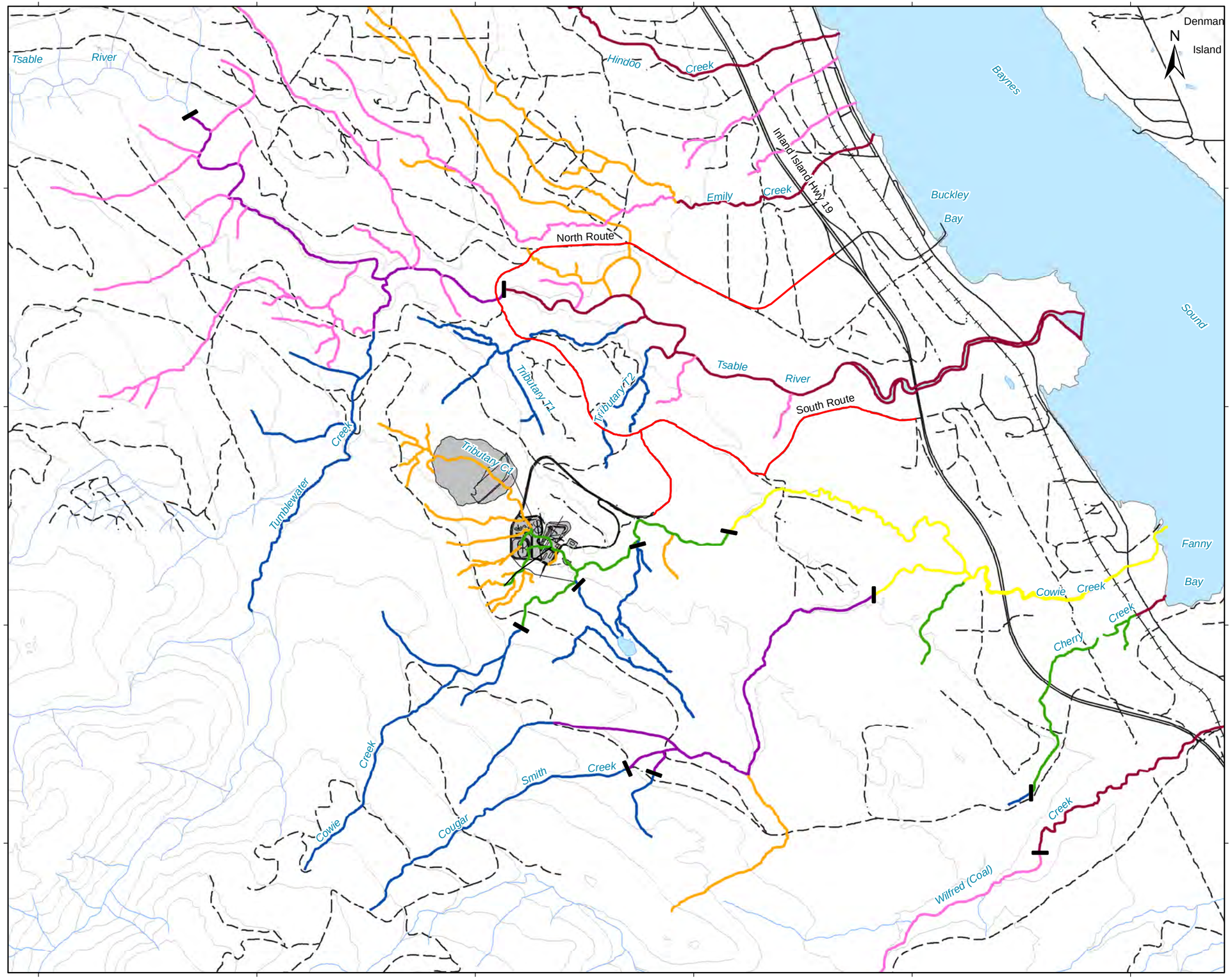
3.4.3 Fish and Aquatic Resources

Fish species presence and distribution in the proposed Raven Project area have been studied sporadically over 20 years. DFO conducted a fish sampling and habitat study in 1986. This was supplemented in 1990 and 1993 by studies associated with Highway 19. A number of forestry stream inventories have been conducted. From the synthesis of fisheries sampling studies, the proposed Raven Project area supports coast range sculpin (*Cottus* aleuticus), prickly sculpin (*Cottus asper*), rainbow trout / steelhead (*Oncorhynchus mykiss*), blue-listed coastal cutthroat trout (*Oncorhynchus clarkii*) (including anadromous cutthroat), coho salmon (*Oncorhynchus kisutch*) and chum salmon (*Oncorhynchus keta*). A summary of fish distribution is presented in Figure 3.4-2.

Fish habitat has been documented in studies conducted between 1986 and 2006. Spawning and rearing occur extensively in the lower 1.75 km of the Tsable River, and the lower 5.2 km (i.e., downstream of an anadromous barrier to fish movement) of Cowie Creek (AGL 2007; AGRA 1997; ORCRC 2007). Upstream of the anadromous barrier – in Cougar Smith Creek, for ~2 km – habitat is considered moderate for coho and cutthroat. Fish habitat in the creek is potentially limited by seasonal fluctuations in water levels. Fish habitat is anticipated to be altered by the proposed Raven Project and require a Section 35 (2) Authorization under the federal *Fisheries Act*.

Other aquatic and benthic invertebrates are present in water and sediments of the proposed Raven Project area. Specific information on abundance and diversity is currently unknown, however, as no previous studies characterizing the area have been identified (e.g., during environmental monitoring by BC MOE or the federal Canadian Aquatic Biomonitoring Network (CABIN)).

Periphyton and chlorophyll are present in water and sediments of the proposed Raven Project area. Specific information on abundance and diversity is currently unknown, however, as no previous studies characterizing the area have been identified.



Legend

- Barriers to Fish Passage
- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Fish Bearing Inferred
- Anadromous Fish Present
- Headwaters (Non-fish bearing)
- Ephemeral Headwater (Non-fish bearing in summer, inferred fish bearing in winter)
- Fish Bearing (Known)
  - Rainbow Trout
- Fish Bearing (Known)
  - Cutthroat Trout
- Fish Bearing (Known)
  - Coho Salmon
  - Chum Salmon
  - Steelhead Trout
  - Rainbow Trout
  - Cutthroat Trout
  - Prickly Sculpin
  - Coast Range Sculpin
- Potential Location of Site Facilities

Scale: 1:35,000

0 300 600 1200

Meters

Note

Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds
Fish bearing status based on:
Fisheries Information Summary System, BC MOE
AMEC Spring/Summer 2009 Fisheries Program

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

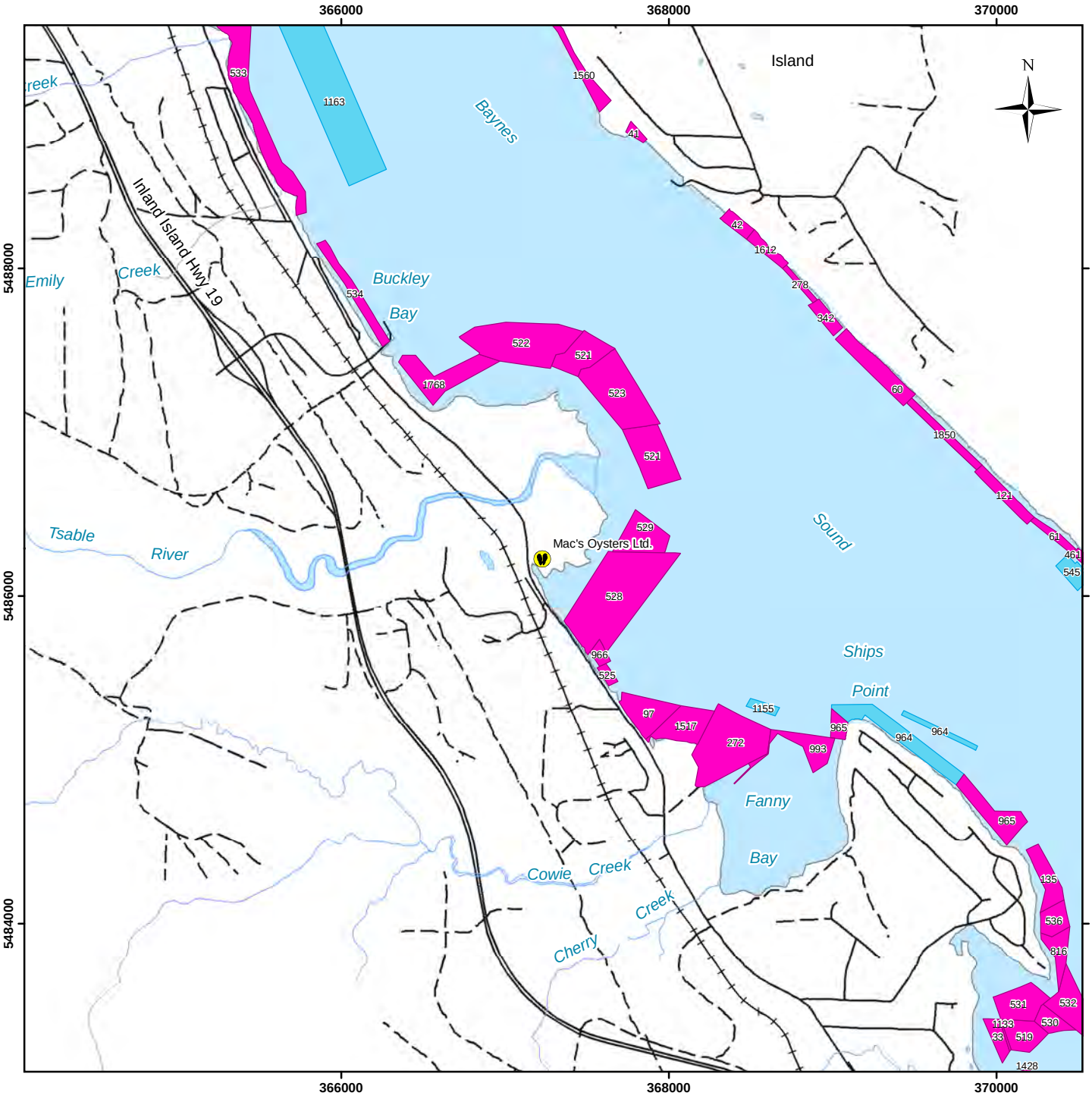
Fish Distribution

DATE: February 8, 2011	ANALYST: EO	**Figure** 3.4-2
JOB No: VE51897	QA/QC: BO	PDF FILE: 10-50-002_fish_bearing.pdf
GIS FILE: 10-50-002		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\BBY-EE-GIS\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\10_fisheries-aquatics\Baseline\10-50-002_v8.mxd

3.4.4 Shellfish and Marine Resources

Shellfish are an important resource in Baynes Sound (BCMNRO 2002). The Baynes Sound shellfishery is shown in Figure 3.4-3. In the Ships Point to Union Bay area there are 28 intertidal and 7 deep water shellfish licenses. Both manila clams (*Venerupsis philippinarum*) and Pacific oysters (*Crassostrea gigas*) are grown commercially. Approximately 3% of intertidal area is under clam netting. All the netting is between 1 and 2.5 m vertical elevation. Oysters are cultured on offshore trays suspended in the water. About 60 ha of Baynes Sound (1.5%) is under oyster culture (BC MNRO 2002). DFO will be consulted in conjunction with the BC EAO and BC MOE to determine if concerns exist for protection of shellfish habitat near the mouths of Cowie Creek and the Tsable River.



Legend

- Shellfish Processor
- Railroad
- Paved Road
- Gravel/Rough Road
- Watercourse
- Waterbody

Shellfish Farms

- Intertidal
- Deepwater

Reference
Shell fish data:
Land and Resource Data Warehouse
Basedata: TRIM

Scale: 1:35,000

0 250 500 1000
Meters

CLIENT:	Compliance Coal Corporation
PROJECT:	Raven Underground Coal Project

Shellfish License Locations

DATE: February 22, 2010	ANALYST: MY	**Figure** 3.4-3
JOB No: VE51897	QA/QC: BO	PDF FILE: 10-50-008_shellfish.pdf
GIS FILE: 10-50-008		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\10_fisheries-aquatics\Baseline\10-50-008.mxd

3.5 Human Environment

3.5.1 Local Communities

The proposed Raven Project would be located in the newly-created CVRD. The CVRD has a total population of ~59,000 (2006 census). The CVRD includes the municipalities of Courtenay, Comox and Cumberland (which together account for ~63% of the population), as well as a rural population and residents of Aboriginal reserves (CVRD 2010). Most of the population growth in the region (~7.1% between 2001 and 2006) has occurred in the municipalities. Social and economic conditions in the CVRD are not available, as it was formed in 2008 and the last census was in 2006. Prior to 2008, the area was part of the Comox-Strathcona Regional District. The closest major hospital to the proposed Raven Project is the Campbell River & District General Hospital, located in Campbell River (CVRD 2010).

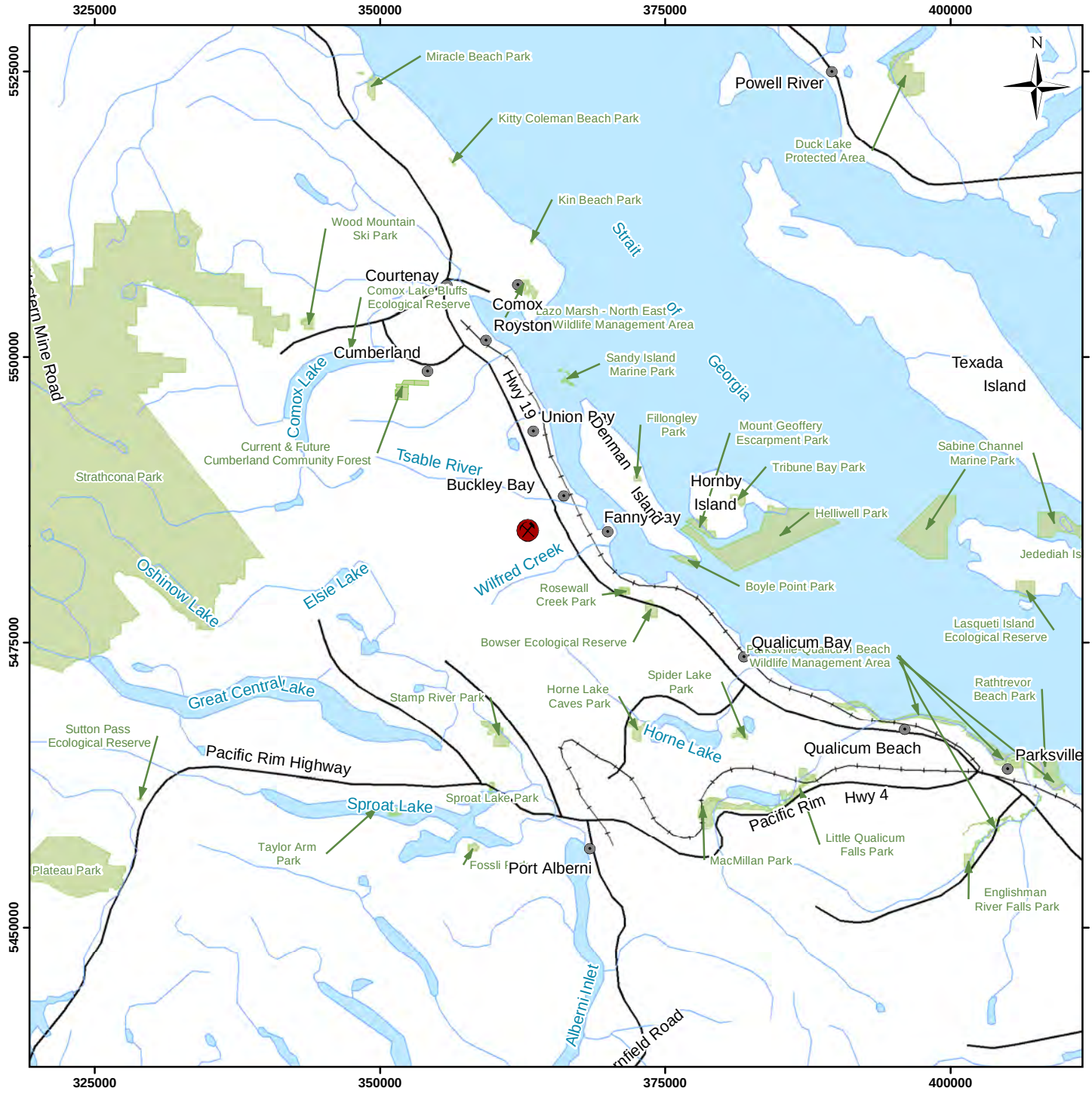
Outside of the CVRD, other communities that may have an interest in the proposed Raven Project include Port Alberni (~30 km south; population ~18,000), Parksville (~45 km south; population ~11,000), Campbell River (~65 km north; population ~30,000), and Nanaimo (~80 km southeast; population ~79,000). Vancouver Island's most populous region, Greater Victoria (population ~330,000) is ~165 km away. The two largest metropolitan areas in the vicinity of Georgia Straight are Metro Vancouver (population ~2.1 million, ~130 km away) and the Seattle-Tacoma-Bellevue Metropolitan Statistical Area (population ~3.4 million, ~220 km away).

3.5.2 Non-Traditional Land and Resource Use

Land and resources in the vicinity of the proposed Raven Project area are utilized by the public and corporations in a variety of ways. The area includes: traffic corridors; parks and ecological reserves; recreational and tourism sites; resource management zones; hunting, fishing and trapping resources; timber resources; agricultural land resources; military sites; biodiversity corridors; and utilities and energy corridors and resources. The proposed Raven Project area is zoned Upland Resource Area in the Rural Comox Valley Official Community Plan (CVRD 2010) for forest, recreation, habitat and biodiversity land uses.

The main traffic corridor on Vancouver Island is Highway 19, which runs the length of the island. Traffic counts for Highway 19 south of Courtenay and Comox indicate an average traffic of about 8,300 vehicles per day; although traffic volumes are about 20% higher in the summer. Since 2000, average annual daily traffic has been increasing at an average rate of 1.6% per year.

Parks and environmentally sensitive areas are not found within 5 km of the proposed Raven Project area. They do occur throughout the region, however, in the vicinity of Courtenay, Cumberland, and Comox (CVRD 2010) and along the coastline communities of Royston, Union Bay, Buckley Bay, Fanny Bay and Ships Point, to Qualicum Beach and Parksville to the southeast and Port Alberni to the south (Figure 3.5-1).



Legend

- Raven Coal Project
- Populated Place
- Road
- Railway Line
- Watercourse
- Waterbody
- Park or Protected Area

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse

Scale: 1:500,000

0 5 10 20

Kilometers

CLIENT: Compliance Coal Corporation		
PROJECT: Raven Underground Coal Project		
Parks and Ecological Reserves		
DATE: April 14, 2009	ANALYST: EO	**Figure** 3.5-1
JOB No: VE51897	QA/QC: SB	PDF FILE: 17-50-001_parks.pdf
GIS FILE: 17-50-001		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE9999_Raven_CoalMapping\17_non-traditional-res\Baseline\17-50-001.mxd

Recreational and tourism activities do not occur specifically within the proposed Raven Project area. Forest service roads proximate to the site, however, may provide access to informal recreational trails for activities such as hiking, cycling, walking, horseback riding, all terrain vehicle riding, cross country skiing and snow shoeing. The oceanside community of Fanny Bay, situated on Baynes Sound, is home to the world-famous Fanny Bay Oysters, exporters of farm-raised Pacific oysters and Manila clams; their processing plant provides pre-arranged tours of their facility. Scenic drives and the numerous small communities with rich history located along the Island Highway in this area attract numerous tourists. The proximity of the area to the Denman and Hornby Islands also provides another tourist destination.

Resource Management Zones (RMZ) have been developed in the Vancouver Island Land Use Plan. None of the RMZs are located within the proposed Raven Project area. The closest RMZ, located ~5 km east of the project on the coast, is Baynes Sound. Baynes Sound is one of Canada's most productive shellfish growing areas and is BC's most significant oyster producing area. This area, which was given a high planning priority in the 2000 Vancouver Island Land Use Plan, is managed by the Baynes Sound Coastal Plan for Shellfish Aquaculture (BC MNRO 2002).

Fishing within the proposed Raven Project area is unlikely (due to controlled gated access for the entire site) and illegal (due to the fee simple nature of the land tenure). Fishing is presumed to occur to the east of the proposed Raven Project area, along various water courses as well as the coastline (Deep Bay provides access to the coho and Chinook salmon ground; Baynes Sound is a well known shellfishery).

Hunting is permitted in the proposed Raven Project area (BC MNRO 2010). There is one certified active guide outfitter that overlaps the proposed Raven Project area (#100674, operated by G. Venus out of Campbell River) (BC MOE 2010b). Wildlife species that may currently be hunted by the licensed guide outfitter include black bear, grizzly bear, cougar, deer, elk, mountain goat and wolf. There is also one inactive guide outfitter (#700396) that is located within 5 km of the proposed Raven Project area.

Trapping is permitted in the proposed Raven Project area. There are two trapline areas registered within 5 km of the proposed Raven Project area. Trapline TR0106T600 is active and the other trapline is inactive. Wildlife species that may currently be trapped include river otter, beaver, marten, mink, wolf, muskrat, raccoon, and squirrel. Trapping seasons vary depending on the species but generally begin between early October and mid-November, and end between mid-February and June.

Timber resources occurring in the area include second / third growth conifers and some deciduous birch (ORCRC 2007). There are no timber sale licences within the proposed Raven Project area as they are fee simple lands.

Agricultural land (zoned under the Land Use Plan for the CVRD (CVRD 2010)) is located approximately 5 km north and south of the proposed Raven Project area.

Military sites in the proposed Raven Project area include CFB Comox, Canada's only Air Force base in BC. The base, referred to as 19 Wing, is situated in the heart of the Comox Valley. The base was constructed in 1942 to protect the strategic Pacific coastline from a possible Japanese invasion. The base has two operational squadrons: the Maritime Patrol Squadron (using five CP-140 Aurora airplanes) conducts surveillance missions over the ocean to look for illegal fishing, migration, drugs, pollution, and foreign submarines; the Transport and Rescue Squadron (using six CC-115 Buffalo aircraft and five CH-149 Cormorant helicopters) carries out search and rescue operations in the busiest region in Canada, stretching from the B.C.-Washington border to the Arctic, and from the Rocky Mountains to 1,200 km out into the Pacific.

The BC Hydro Biodiversity Corridor runs on a north-south axis, west of Highway 19 and proximate to the proposed Raven Project area (CVRD 2010). This greenway corridor provides wildlife and plants with protected habitat, food, shelter and a means for migrating from one habitat to another.

A high-voltage power line corridor (which contains four high-voltage lines)runs parallel to and off the eastern edge of the proposed Raven Project area (ORCRC 2007). Hydroelectric energy development occurs on the Campbell River and Puntledge River near Comox (BC MNRO 2000). Additional electrical energy needs are furnished by high voltage transmission lines from the Lower Mainland, and by diesel-electric generation at remote communities.

The Vancouver Island natural gas pipeline runs parallel to and off the eastern edge of the project area (ORCRC 2007). The pipeline transports natural gas from northeast BC to Vancouver Island.

Undeveloped energy resources on Vancouver Island include: thermal coal and coal-bed methane deposits in the sedimentary basins along the eastern coast (including the proposed Raven Project site), low-head hydro-electric development and industrial co-generation (BCMNRO 2000). The sedimentary basins underlying the eastern edge of Vancouver Island and extending beneath Georgia Basin have potential for hydrocarbons, mainly natural gas. Offshore oil and gas resource development is under a provincial moratorium.

3.5.3 Local First Nations

First Nation and Aboriginal groups that could potentially be affected by the proposed Raven Project include the following:

- Qualicum First Nation;
- We Wai Kai Nation;
- Wei Wai Kum First Nation;
- Xwémalhkwu (Homalco) First Nation;
- K'ómoks First Nation;
- Sliammon First Nation;

- Members of the Hul'qumi'num Treaty Group (Cowichan Tribes, Chemainus First Nation, Penelakut Tribe, Lyackson First Nation, Lake Cowichan First Nation and the Halalt First Nation);
- Hupacasath First Nation; and
- Tseshaht First Nation.

While BC EAO has not included the Maa-Nulth First Nations in the section 11 Order, the Agency has included all First Nations of the Maa-Nulth Treaty Society:

- Uchucklesaht Tribe;
- Ucluelet First Nation;
- Toquaht First Nation;
- Huu-ay-aht First Nation; and
- Ka:'yu:'k't'h/Che:k'tles7'et'h' First Nations.

The Metis Nation BC has also been included.

The BC EAO may at any time notify the proponent, in writing, that one of more First Nations are to be added to the definition of "First Nations" as set out in section 1 of the section 11 Order; and in so doing may identify any modifications to any of the procedures and obligations contained in the section 11 Order, having regard to status of the existing procedures and obligations at the time the additions to the definition are made.

3.5.4 Traditional Knowledge and Traditional Land Use (TK-TLU)

There are no aboriginal land reserves within the proposed Raven Project's area of influence. For more information on First Nation Statement of Intent Boundaries, see Section 4.5. Baseline First Nations social and economic studies have not been identified for the proposed Raven Project.

3.5.5 Archaeological Setting

There are archaeological sites in the vicinity of the proposed Raven Project. The majority of these sites have been identified in coastal or riverine settings.

3.6 Natural Hazards and Environmental Concerns

3.6.1 Earthquakes

Earthquake activity in western Canada is relatively common. West of Vancouver Island is the Cascadia subduction zone, where the small Juan de Fuca plate is moving towards North America at ~2-5 centimetres (cm) per year. Strain from the two plates interacting with one another causes ~300 small earthquakes per year in southwestern BC, and larger earthquakes less frequently (e.g., once per decade on average; a magnitude 7.3 earthquake

occurred on central Vancouver Island in 1946. The epicentre was in the Forbidden Plateau area of central Vancouver Island, just to the west of the communities of Courtenay and Campbell River (NRCan 2010).

3.6.2 Tsunamis

Tsunamis can be associated with earthquakes. Tsunamis are rare events and not all earthquakes will generate a tsunami. The Georgia Basin and the east coast of Vancouver Island are generally considered low-risk areas for tsunami waves generated as a result of distant off-shore earthquakes. Baynes Sound and Port Alberni are in BC Tsunami Notification Zones E and C, respectively (BC MPSSG 2010). The Atlas of Canada rating for Tsunami Run-up potential is low (less than 2 meters) for Baynes Sound and high (1 to 15 or more metres) for Port Alberni. Port Alberni experienced substantial tsunami damage on 27-28 March 1964 as a result of a major earthquake (9.2 magnitude) in Alaska..

3.6.3 Forest Fires

Fires are unpredictable natural hazards that depend on short- and long-term local climatic conditions (temperature, precipitation, humidity, wind speed), which determine the dryness of combustible materials such as timber and other vegetation. There is evidence of fire having played a role in the landscape of the proposed Raven Project area. The Wildfire Management Branch of the BC Ministry of Forests and Range (BC MOFR) is tasked with managing wildfires on both Crown and private lands outside of organized areas such as municipalities or regional districts (BC MOFR 2010). Wildfires occur in eastern Vancouver Island on a yearly basis. According to the BC Wildfire Management Branch historical wildfires on eastern Vancouver Island from 1999 to 2009 were small mostly covering from up to 2.0 ha. The largest recorded fire near the proposed Raven Project mine site appears to have occurred in 1999 covering between 2 to 10 ha. The largest fire near the proposed Port Alberni port facility appears to have occurred in 2008 covering between 25 and 100 ha.

3.6.4 Floods

Floods are inherent to natural systems and are important to the functioning of aquatic ecosystems but present a hazard to land development in a flood plain. The magnitude of a flood depends on the abilities of local watersheds to handle high-magnitude or sustained precipitation or snow melt events. At the proposed Raven Project site precipitation is low during the summer months and high during the winter months resulting in stream hydrographs that are typically storm driven. Surface facilities for the proposed Raven Project are located in the drainage of a small tributary in the upper Cowie Creek watershed where flood flows are less than lower in the watershed. Site topography allows for management of flood flows and diversion of water away from the proposed Raven Project facilities. According to the City of Port Alberni bylaw no. 4288, Port Alberni floodplain area is defined as all lands bounded on the south by the Somass River, on the east by Kitsuksis Creek Floodway and Gertude Street north thereof, on the north by Compton Road, Golden Street and Georgia Road and on the west by the City boundary.

3.6.5 Avalanches

Avalanches are unpredictable natural hazards that are triggered when natural forces or human activity cause a critical escalation of a snow pack on a mountain. Avalanche risk on Vancouver Island depends on topography, annual snow fall and snow pack stability. Avalanche risk may vary from low to high in various locations through the proposed Raven Project mine site along the transport route to the proposed Port Alberni port facility.

4 POTENTIAL PROJECT IMPACTS AND ENVIRONMENTAL MANAGEMENT

Environmental management is a critical component of any proposed new mining (or other) development. Management activities are required for land (e.g., topsoil, till, waste rock, coal rejects stockpiles, vegetation, wildlife habitat), water (e.g., mine water, seepage and runoff from waste rock and stockpiles, navigable waters, fish habitat), air (e.g., coal bed methane gas, dusts), noise and vibration (e.g., from mining vehicles and equipment), and concerns raised by First Nations and other local communities. Sections below present detailed descriptions of:

- Potential impacts of the proposed Raven Project on soils, vegetation, terrestrial wildlife, and land use, and the land management activities that CCC will implement to mitigate these potential impacts (Section 4.1);
- Potential impacts of the proposed Raven Project on freshwater and aquatic resources, and navigable waters, and the water management activities that CCC will implement to mitigate these potential impacts (Section 4.2);
- Potential impacts of the proposed Raven Project on air quality and noise, and the management activities that CCC will implement to mitigate these potential impacts (Section 4.3);
- Potential impacts of the proposed Raven Project on human health and well-being, and the management activities that CCC will implement to mitigate these potential impacts (Section 4.4);
- Potential impacts of the proposed Raven Project on First Nations interests and archaeological sites, and the management activities that CCC will implement to mitigate these potential impacts (Section 4.5); and
- Closure and reclamation activities (Section 4.6).

Zones of influence of the proposed Raven Project on the environment (represented by the Local Study Areas (LSA) and the Regional Study Areas (RSA) for each environmental component) are provided in appropriate subsections throughout Section 4, with mapping at appropriate scales.

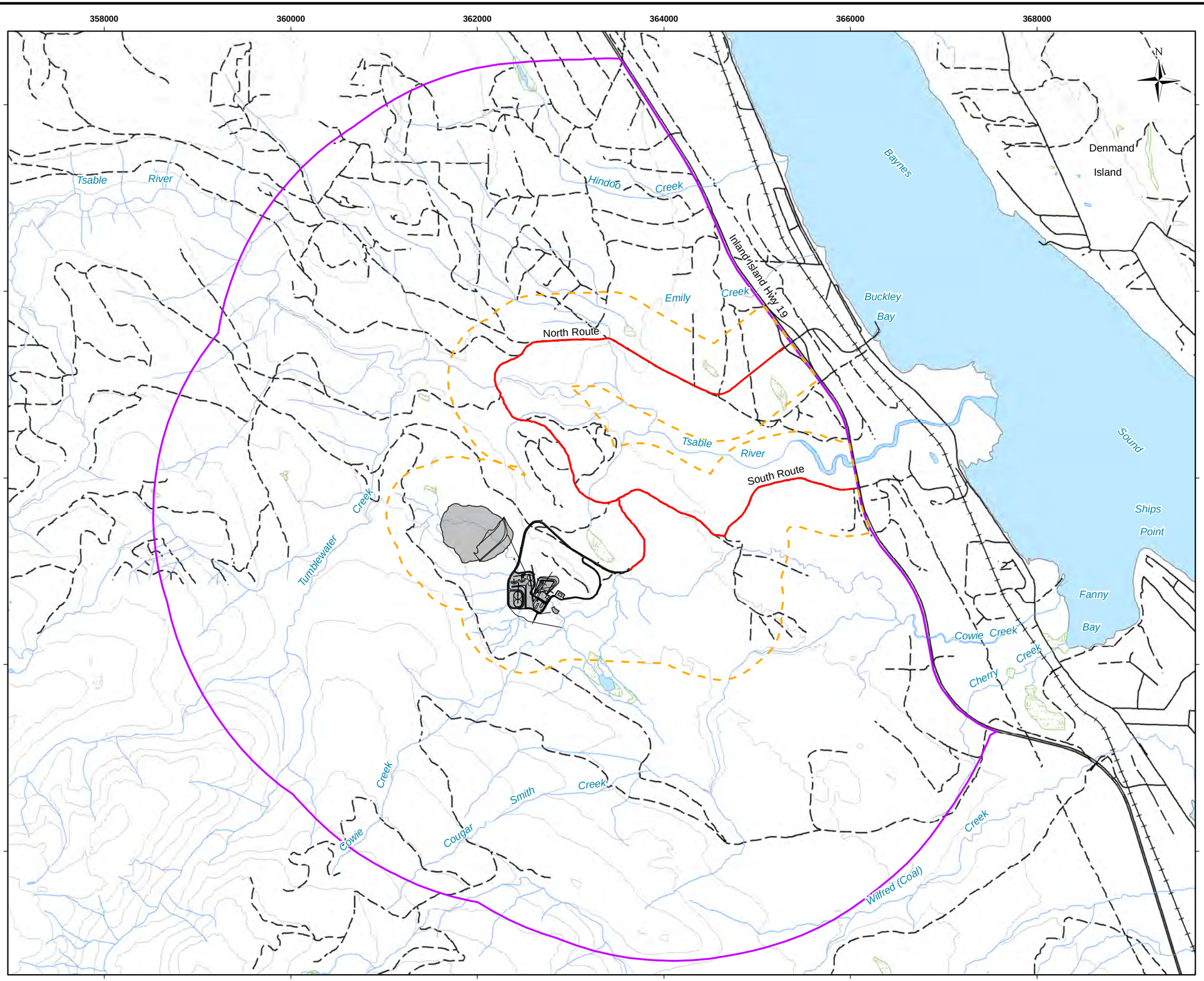
Potential effects and impacts are expected to change as the proposed Raven Project proceeds through the Feasibility Study and EA process and most importantly, as additional First Nations and public consultation issues are identified. Preliminary mitigation strategies were derived from professional judgement based on knowledge of the site and similar mining projects, discussions with key regulatory agencies and a public consultation comments to date.

4.1 Land Management

Land quality, land usability, and the health of wildlife and vegetation that are dependent on the land could potentially be affected by mine construction and operation.

A comprehensive soils management plan will be implemented for the proposed Raven Project, to safely and efficiently manage the quantity and quality of all underground and above-ground rock and soil materials.

The zones of influence for the potential effects of the proposed Raven Project on terrain, soils, and surficial geology are shown in Figure 4.1-1. The LSA boundary for terrain, soils, surficial geology, vegetation and wildlife includes the footprint area for the proposed Raven Project, plus a 500 m buffer. The LSA is based on the maximum potential extent of unmitigated effects on soils and terrain from subsidence, potential effects of fugitive dust on soil chemistry, vegetation and wildlife health. The RSA boundary extends in an arc ~4 km from the mine site, into the hills above the mine site, and down to the Island Highway. The RSA was set so as to encompass all the vegetation community types that may potentially be affected by the proposed Raven Project development and that may be used by wildlife in the area. It is also the maximum probable extent of unmitigated effects on larger ranging species such as elk. This boundary of 4 km was based on professional judgement and experience. The RSA is based on 1:50,000 soils mapping by BC MOE.



Legend

- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Terrestrial LSA
- Terrestrial RSA
- Potential Location of Site Facilities

Scale: 1:40,000

0 500 1000 2000

Meters

Note:

Wiildlife and vegetation included in terrestrial study area

Reference

TRIM scale 1:20,000

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Terrestrial Spatial Boundaries

DATE: February 22, 2010	ANALYST: EO	**Figure** 4.1-1
JOB No: VE51897	QA/QC: TB	PDF FILE: 11-50-001_terra_study_area.pdf
GIS FILE: 11-50-001		
PROJECTION: UTM Zone 10	DATUM: NAD83	

\\Bby-fs1\bby-ee-gis\GIS\Projects\VE\VE51897_Raven_CoalMapping\11_wildlifeBaseline\11-50-001_v5.mxd

Table 4.1-1 summarizes some of the specific issues and the associated mitigation strategies.

Table 4.1-1: Potential Impacts to Land, and Mitigation Strategies

Potential Impact	Mitigation / Management Strategy
Erosion, waste piles and drainage pattern changes	• Soil and waste rock management plan; • Re-establish drainage patterns on mine closure where practical; • Good construction and operating practices to limit or prevent erosion; sediment collection ponds to limit export of sediment; revegetation on closure; • Progressive reclamation / revegetation where possible; and • Reclamation trails (pilots) during operations.
ARD from the waste rock piles	• Dispose of PAG rock in such a manner as to limit ML/ARD. ARD is discussed further below.
Soil quality degradation Wildlife habitat and migration corridors	• Minimize the mine footprint, particularly permanent loss habitat to the extent practical consistent with safe and efficient mining; • Stockpile overburden for reclamation purposes; and • Maintain primary wildlife movement (North-South) movement corridor (BC Hydro Biodiversity corridor).
Abundance and diversity of vegetation Vegetation quality Abundance and diversity of wildlife Wildlife health	• The mitigation strategies outlined for dust, air, and noise will ensure that adverse health effects to vegetation and wildlife are minimized; and • All real or perceived potential health effects associated with altered land use, land quality, or habitat will be investigated collaboratively by experienced wildlife biologists, botanists, and toxicologists.

4.1.1 Topsoil and Till

The area for the surface infrastructure facilities will be stripped of topsoil and till. Non-weathered till material will be used as fill during development. Topsoil that is removed from the proposed Raven Project footprint will be stored in a dedicated area of the site. The slopes of the topsoil stockpile will be less than 2:1 and will be stabilized immediately after placement with an appropriate seed reclamation mix (i.e., fall rye / winter wheat and native grasses). Soil horizons will be professionally evaluated prior to removal to determine growth potential. Metal concentrations in topsoil will be quantified. All substrate and glacial till / weathered bedrock till materials that is removed from the proposed Raven Project footprint will be stored in a dedicated area of the site, and will be kept separate from the topsoil storage area.

4.1.2 Waste Rock

Waste rock generation will be minimized as the mine is underground rather than open-pit or other surface mining method. Waste rock will be appropriately characterized as either PAG or NAG. PAG and NAG waste rock will be segregated if necessary and effectively blended for disposal in the waste dump (i.e., produce an ideal blend versus segregated blend). As part of project feasibility, detailed engineering will be completed for the design and locations of the waste rock dump and stockpiles.

4.1.3 Coal Reject Stockpiles

Coarse and fine coal rejects will be obtained as described in Section 2.3. Coarse rejects and fine rejects will be combined in a stockpile. Conceptually, a large enough area to contain coal rejects from 100% met coal production has been allowed for as a contingency.

4.1.4 Other Mine Wastes

Hazardous waste from the operation would be stored on site in a sealed containment area where any spills would be 100% contained; final disposal would be contracted to a hazardous waste disposal service. The highest volume of hazardous waste generated would be waste oil from heavy equipment and light vehicles. The waste oil would be collected, stored in a double walled tank dedicated to waste oil, placed within bermed fuel storage containment areas, and recycled by a contractor or through the supplier. Waste grease, engine coolant and any other waste fluids would also be collected, stored within containment, and removed from the site by a contractor for recycling or disposal. Waste solvents would be minimized through the use of a solvent recycling unit; waste solvent would be sent to the retailer for recycling.

Non-hazardous construction and industrial waste would be recycled where possible (e.g., scrap metal) or land filled. An onsite landfill permit will be sought as part of permitting for the proposed Raven Project.

It is not anticipated there will be a camp onsite for either construction or operation. Any food waste would be incinerated daily and the ashes land filled. Sewage waste would be handled through an onsite treatment facility, during both construction and operation. Surface water and shallow groundwater quality will not be compromised.

4.2 Water Management

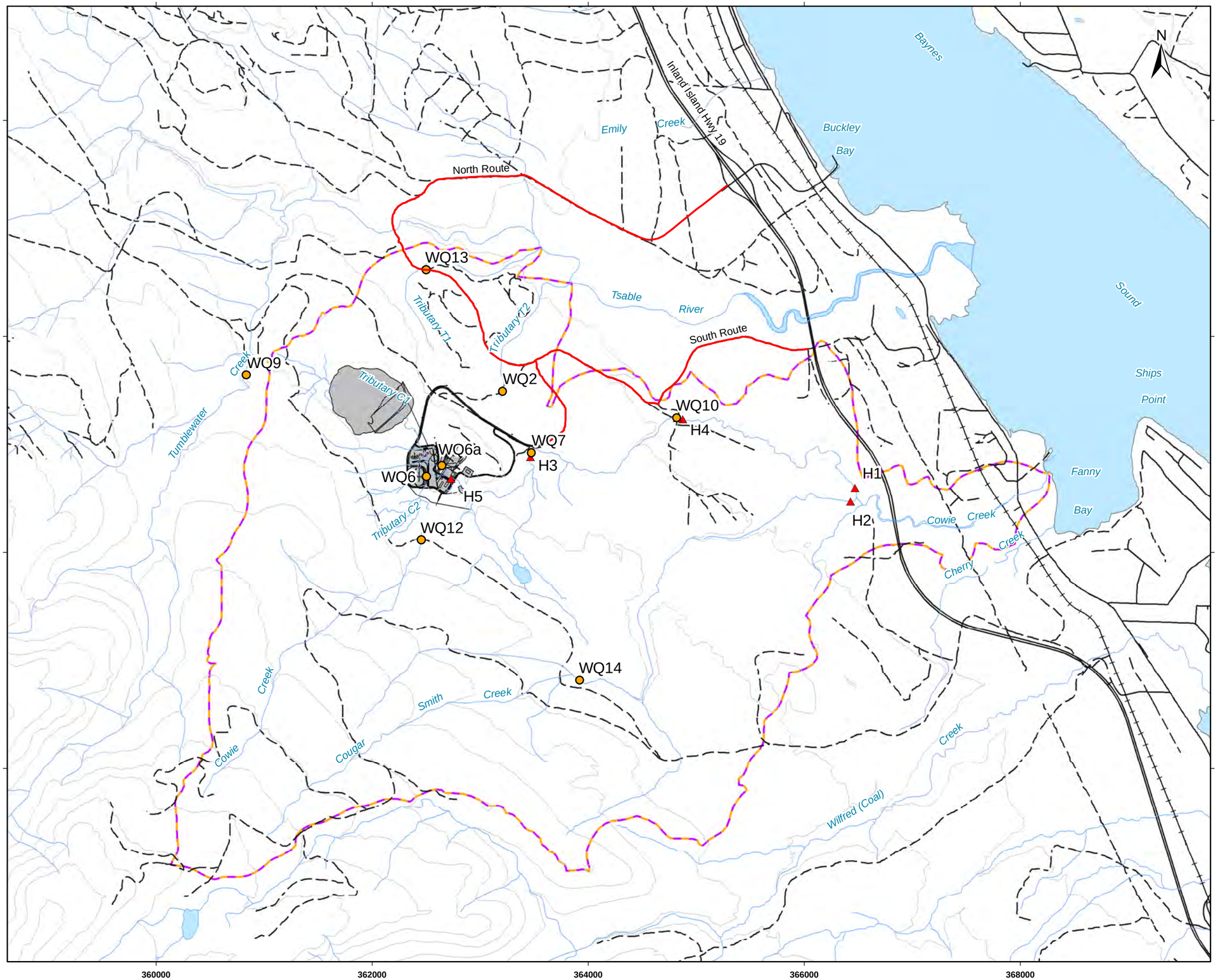
Water balance and flow, water navigability, water quality, and the health of wildlife and aquatic resources that are dependent on waters in the proposed Raven Project area could potentially be affected by mine construction and operation. A comprehensive water management plan will be implemented for the proposed Raven Project, to safely and efficiently manage the balance and quality of all underground and above-ground waters. The water management plant will ensure the reliability of water supply for all process and potable needs, will protect the operations from flooding, erosion, interference from groundwater, precipitation, and runoff, and will control, collect, and treat water that comes

into contact with project facilities in an environmentally sound manner. The primary issue will be to determine the overall site water balance for the site which will be a high priority during the Feasibility Study.

The LSA and RSA for hydrogeology include the Cowie and Cougar Smith Creek watersheds and portions of the Tsable River and Wilfred Coal Creek watersheds.

The zones of influence for the potential effects of the proposed Raven Project on freshwater and aquatic resources are shown in Figure 4.2-1. The LSA and RSA is the Cowie Creek watershed, and is common to hydrology, surface water and sediment quality, fisheries and aquatic resources, groundwater quality and hydrogeology studies. The rationale for the hydrology LSA and RSA is based on watershed boundaries; the proposed Raven Project is confined to Cowie Creek and some of its tributaries. The possible project influence on water quality and stream flows is therefore limited to the watershed in which it is located.

The zones of influence for the potential effects of the proposed Raven Project on ocean water and marine resources are shown in Figures 4.2-2 and 4.2-3. The Baynes Sound LSA is defined as the nearshore subtidal area of Fanny Bay into which Cowie Creek flows. The Baynes Sound RSA is defined as the nearshore subtidal area extending from just north of the Tsable River southward to the Qualicum National Wildlife Area. The Port Alberni LSA includes the proposed Port Alberni Port Facility footprint area plus a 200 m buffer. The Port Alberni RSA includes Alberni Inlet and Trevor Channel to the Cape Beale Pilotage Point.



Legend

- Water Quality Monitoring Station
- Hydrometric Station
- Proposed Access Road
- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Aquatic LSA and RSA
- Potential Location of Site Facilities

Scale: 1:35,000

0 0.5 1 2

Kilometers

Reference
Tributaries T1,T2, C1 are local names used for reference and are not gazetted names

Reference
LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds
LSA/RSA: Cowie, Cougar Smith Creek watersheds, and two first order tributaries to the Tsable River
Basedata: TRIM

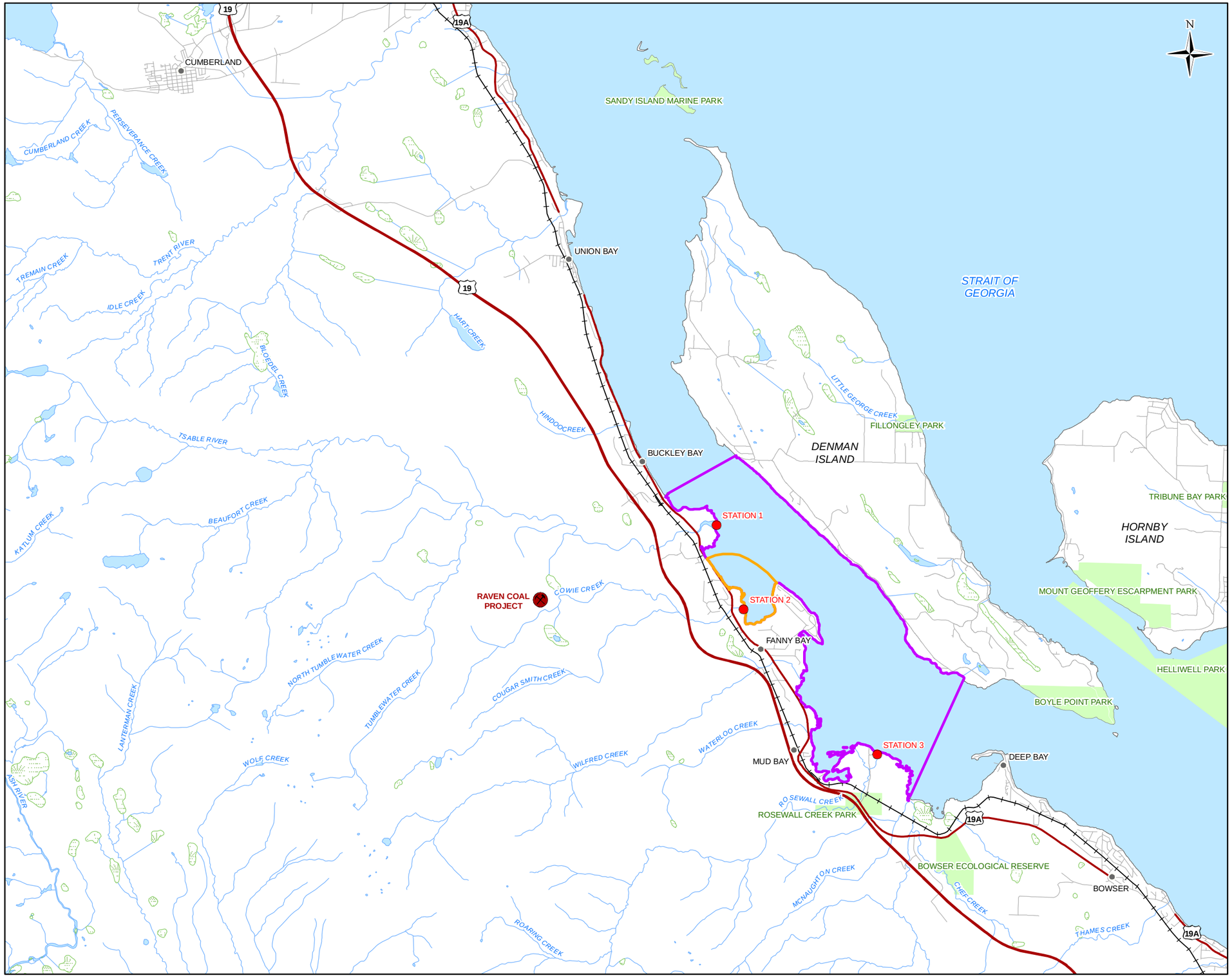
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Aquatic Spatial Boundaries

DATE:	ANALYST:	**Figure** 4.2-1
February 22, 2010	EO	
JOB No: VE51897	QA/QC: NF	PDF FILE: 10-50-009_aquatic_study_area.pdf
GIS FILE: 10-50-009		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ae-gis\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\10_fisheries-aquatics\Baseline\10-50-009_v2.mxd



Legend

- Populated Place
- Water Quality Study Area
- Raven Coal Project
- Road
- Highway
- Railway
- Stream
- River & Lake
- Swamp or Marsh
- Parks & Protected Area
- Marine LSA
- Marine RSA

Scale: 1:100,000

0 1 2 4

Kilometers

Reference

Basedata:
Road: Geobase 1:20,000
Water: Watershed Atlas 1:50,000

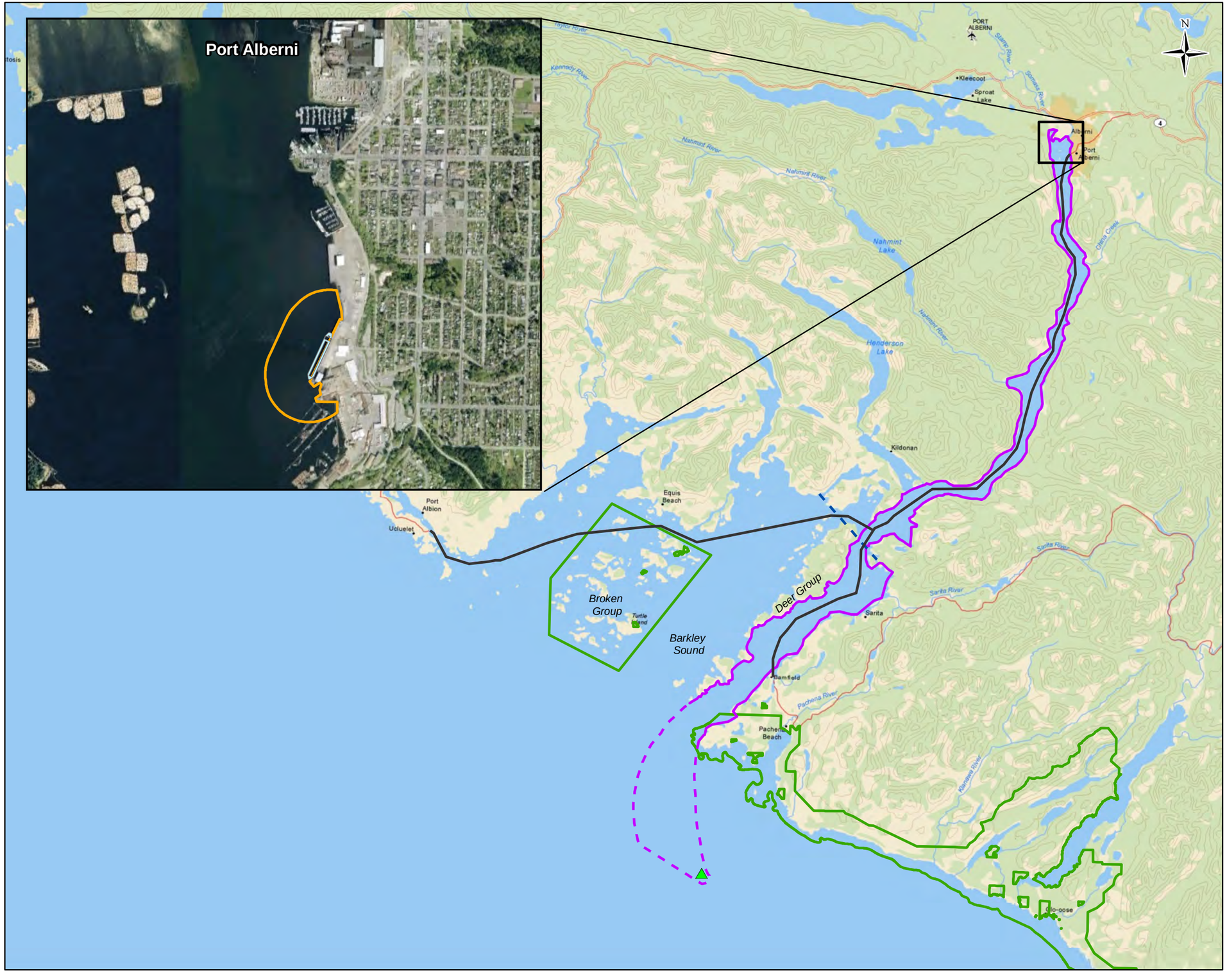
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Marine Spatial Boundaries, Baynes Sound, BC

DATE: July 19, 2010	ANALYST: EO	**Figure** 4.2-2
JOB No: VE51897	QA/QC: SB	PDF FILE: 20-50-001_marine_wq_study_area.pdf
GIS FILE: 20-50-001.mxd		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GISProjects\VE\VE51897_Raven_Coal\Mapping\20_Oceanography\20-50-001_v3.mxd



Legend

- Cape Beale Pilotage Point
- Ferry Route
- Port Alberni Port Authority Boundary
- Pacific Rim National Park Reserve of Canada
- Port Study Area
- Marine Study Area

0 2.5 5 10

Kilometers

Scale: 1:320,000

Reference

ESRI Community Base Map

CLIENT: Compliance Coal Corporation		
PROJECT: Raven Underground Coal Project		
Marine Spatial Boundaries, Port Alberni, Alberni Inlet – Trevor Channel, BC		
DATE: January 2011	ANALYST: MY	**Figure** 4.2-3
JOB No: VE51897	QA/QC: SB	PDF FILE: 18-50-020_port_alberni.pdf
GIS FILE: 18-50-020		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GISProjects\VE\VE51897_Raven_Coal\Mapping\18_Other\18-50-020_v3.mxd

Table 4.2-1 summarizes some of the potential impacts and the associated mitigation strategies.

Table 4.2-1: Potential Impacts to Water and Aquatic / Marine Resources, and Mitigation Strategies

Potential Issue	Mitigation / Management Strategy
Water balance Water quality degradation Increased nutrients in receiving waters Increased salinity in receiving water may cause a change in species occurrence and abundance	• Develop water management plan; • Recycle mine water to the extent practical; treat water non-compliant to discharge objectives; • Increases in salinity are not expected to be problematic, but water quality will be modelled as part of the EA and Feasibility Study; and • Institute mining practices to limit the generation of nitrogen and phosphorus; recycle mine water to the extent practical.
Fish / shellfish habitat	• Limit mine footprint to the extent practical consistent with safe and efficient operation; • Mass mine infrastructure into one watershed (Cowie); • Habitat compensation for unavoidable loss of fish habitat; and • Re-establish stream courses where possible on closure.
Abundance and diversity of fish / shellfish species Individual fish / shellfish health Health of piscivorous birds and mammals	• The mitigation strategies outlined above for water balance, water quality, and habitat will ensure that adverse health effects to fish / shellfish are minimized; and • All real or perceived potential health effects associated with altered water balances, water quality, or habitat will be investigated collaboratively by experienced fisheries biologists and toxicologists.

4.2.1 Underground Mine Water

Surface waters have the potential to enter the mine, as several pillar extraction panels in Seams 360 / 340 and 150 will be mined directly under Cowie Creek and Cougar Smith Creek, or in the proximity of the Tsable River. In areas where the panels are fully extracted, limited deformation and fractures of overlying strata will occur, resulting in minor but measureable subsidence of the ground surface. Based on the type of overburden at the proposed Raven Project, the safe cover depth required for the overlying water bodies has been calculated to be at least 47 times the extraction thickness (i.e., a minimum 150 m

cover depth is required, given the 3.2 m extraction thickness in the upper seam). The proposed Raven Project mine plan has sufficient overburden cover to prevent stream inflow into the underground mine.

Groundwater has the potential to enter any underground mine. The extent to which groundwater will enter the mine is currently unknown, as the hydrogeologic model for the proposed Raven Project area is still being developed. Based on experience at nearby mines (e.g., Quinsam), groundwater inflow is likely; based on sampling and analysis from baseline environmental studies, some of this water is likely to be saline. The up-dip extraction sequence will leave water behind where possible, thus minimizing the need for water treatment and discharge. Groundwater management options will be developed as part of the overall Feasibility Study. Typical options for management of excess water at a mine site include: (i) recycling within the wash plant; (ii) storage and surface release (with or without treatment depending on water quality objectives); (iii) storage and deep well injection; and (iv) ocean outfall. Alternatives (i) through (iii) will be evaluated; this project will not discharge any groundwater to the marine environment (i.e., no pipeline into Baynes Sound will be used).

4.2.2 Onsite Water

Surface runoff water (e.g., from the topsoil and till storage areas, the rejects dumps, the working yard area) will be managed with the use of a settling pond, a polishing pond, diversion ditches and catchment ditches.

Domestic water (e.g., washrooms, showers, underground dust suppression) will be obtained from a local well. After use, grey water will be discharged to a pond and enter the process water treatment stream.

All water quality will conform to Waste Management Effluent Permit objectives before being discharged to surface water bodies.

4.2.3 Acid Rock Drainage and Metal Leaching

ARD and ML to receiving water bodies is a concern around any mine site. To ensure that ARD is minimized and managed, ABA will be conducted on rock that is excavated during mining operations and disposed of on surface. ABA will also be conducted on till material. Based on ABA, waste rock and till will be managed accordingly.

4.2.4 Selenium Mobilization

Selenium mobilization from mined coal deposits is one particular example of ML that is currently a concern of BC MOE and will be addressed in the EA. Coal will be tested to determine the extent to which selenium is present and could leach. If required, water quality and aquatic biota in the vicinity of the proposed Raven Project will be monitored to determine the extent to which selenium is mobilizing in the environment and posing a potential risk to fish, wildlife, and humans.

4.2.5 Navigable Waters

Navigable waters that are potentially affected by the proposed Raven Project include Baynes Sound, the Alberni Inlet, the Tsable River, and the Cowie Creek watershed.

Baynes Sound is used by recreational and commercial vessels for shell fishing and the BC Ferries service between Buckley Bay and Denman Island.

Port Alberni is located at the head of the Alberni Inlet. If transportation of coal occurs from Port Alberni, then upgrades to the berthing and loading facilities may be required and there may be increased traffic in the Alberni Inlet.

The Tsable River is a 25 km fourth-order river that is frequently confined within a canyon. The river is crossed by Highways 19 and 19A, a powerline, and a clear span bridge as part of the Tsable Main resource road within the vicinity of the proposed Raven Project area. The first access route alternative is via the Buckley Bay main Forest Service Road. The second access route alternative is via the Fanny Bay overpass; this would require a bridge over Cougar Smith Creek and crossings over Cowie and a third smaller creek. The third access route alternative is via the Holiday Road "On Ramp" to Highway 19 for loaded Trucks (returning Trucks could use the existing Buckley Bay interchange); this route would not require any new bridges and have the least potential impact on existing watercourses.

The Cowie Creek[1] watershed is where most of the proposed Raven Project facilities are located. Cowie Creek (colloquially known as Cougar Creek) has one major named tributary (Cougar Smith Creek), and a number of first order tributaries. Cowie Creek lies immediately adjacent to the proposed Raven Project infrastructure. Cowie Creek is punctuated by approximately 12 log jams and multiple bedrock falls up 10 m in height between the headwaters and Baynes Sound. Depending on the final locations of the mine infrastructure, some portions of Cowie Creek may be diverted or crossed in various areas. Efforts will be made in the mine planning to avoid directly affecting the Cowie Creek system. If it becomes necessary to disturb the surface in the natural watercourse of Cowie Creek, the creek will need to be diverted to ensure water remains unaffected by mine construction and operation. Cowie Creek's first order tributaries have channel widths up to 2 m and have bridges, culverts and / or falls along their lengths. Table 4.2-2 summarizes the sections of Cowie and Cougar Smith Creeks.

[1] Note: Data based on Fisheries Information Summary System (FISS) and work conducted in Spring 2009 within the Cowie Creek watershed

Table 4.2-2: Summary of Navigable Waters

Watershed	Section or Tributary	Watershed Code	Stream Order (1:50000)	Stream Length (km)	Channel Width (m)	Existing Infrastructure and Potential Impediments to Navigation
Cowie Creek (Cougar Creek)	headwaters	920-524100	3	10.6	5	Multiple falls (~7m) within a canyon
	mid				8	Log jams and falls up to 10 m in height. Bridge crossing.
	lower				12	Falls (1.5 m) and powerline, rail and road crossings.
Cougar Smith Creek	headwaters	920-524100-19700	2	7.5	5	Culverts
	lower				8	Falls, ~5 m
Tsable River		920-527600	4	25.1	> 10	Cascades up to 22 m and bridge crossings

Note: km-kilometre; m-metre; ~ - approximately

The possible upgrade to the bridge on the Tsable River crossing is in a non-navigable reach. All other stream crossings are in non-navigable reaches of tributary streams. As road configuration involves only improvements over non-navigable waters, the *Navigable Waters Protection Act* will not be triggered.

4.2.6 Fish Habitat

The proposed Raven Project area contains tributaries to the Tsable River, Cowie and Cougar Smith Creeks and unnamed streams. Mine infrastructure will be built on fish-bearing stream habitat in Tributary C1, habitat known to be utilized by resident cutthroat trout. This activity is likely to result in a harmful alteration, disruption, or destruction (HADD) of fish habitat under the *Fisheries Act* and, if so, will require a Section 35(2) Fisheries Authorization from DFO prior to construction. This habitat will be quantified and compensation will be developed in consultation with DFO, BC MOE, local First Nations, and other stakeholders. The final compensation plan will ensure that DFO's "no-net-loss" guiding principle is met.

Subsidence-related impacts to fish habitat are possible as panels are extracted. Cowie Creek runs above four distinct subsidence basins (centered above four panels in the lower seam and three panels in the upper seam), while Cougar Smith Creek runs above one distinct subsidence basin (centered above one panel in the lower seam and one panel in the upper seam). Analyses were performed to predict immediate- and long-term subsidence-related movements on these creeks. The long-term estimate of subsidence that may occur

at the surface is 19% of the extraction thickness; the maximum subsidence movements that will occur close to Cowie Creek and Cougar Smith Creek are ~0.8 m and ~0.55 m, respectively. Streambeds running over panels would subside gradually as retreat mining progresses, increasing pool volumes and temporarily decreasing downstream flow rates. The highest magnitudes of tensile and compressive strains in either creek are less than the strain damage criterion for streams (5 millistrains; PAH 2010). Overall, these results indicate mining-induced subsidence impacts to fish habitat are likely insignificant (PAH 2010). Salmon habitat downstream of the junction of Cowie Creek and Cougar Smith Creek will be unaffected, as the junction is a sufficient distance away from planned mining activities.

4.2.7 Shellfish Resources

Baynes Sound contains important shelfish resources. The extent to which the proposed Raven Project could impact these resources will be determined.

4.3 Air, Noise, and Vibration Management

Air quality, noise levels, and vibration levels could potentially be affected by mine construction and operation. Comprehensive air, noise, and vibration management plans will be implemented for the proposed Raven Project, to safely and efficiently ensure that these components are not adversely affected.

The zones of influence for the potential effects of the proposed Raven Project on air quality are shown in Figure 4.3-1. The LSA is intended to cover the area that, by the operation of the proposed Raven Project at the designated site, may cause exceedance of air quality objectives. The LSA will be defined by a 3 km radius centred at the University of BC meteorological station located on the Raven property. A 3 km radius was chosen as the probable extent of pollutants dispersion to acceptable concentration levels based on professional judgement and experience. The LSA will accommodate emission sources from the proposed Raven Project, the transportation routes within the property border line, the topographical and constructed features which may affect the dispersion characteristics of air pollutants. The RSA is an estimate of the area of the Buckley Bay airshed which is characterized by baseline air quality pertaining to the proposed Raven Project. This is a conservative approach designed to ensure that humans and flora and fauna are protected from air contaminants. Climate data for the RSA has been collected for over a 30-year period by EC at the nearby YQQ meteorological station.

The zones of influence for the potential effects of the proposed Raven Project on noise levels are shown in Figure 4.3-2. The LSA consists of an approximate circular area within a 1.5 km distance from the proposed Raven Project's permanent noise sources. The exact shape of the LSA will depend on results of noise modelling and will be presented as noise contours. The RSA overlaps the proposed Raven Project footprint by 5 km in each direction. A distance of ~5 km is the maximum extent required for attenuating (to the background levels in the surrounding environment) unmitigated blasting noise, although

blasting is expected to be minimal during the construction phase of the proposed Raven Project. This is based on professional judgement and experience, and will be verified through modelling.

The study area for air quality and noise levels in the vicinity of the proposed Port Alberni Port Facility is defined as a 3 km buffer around the facility (Figure 4.3-3).

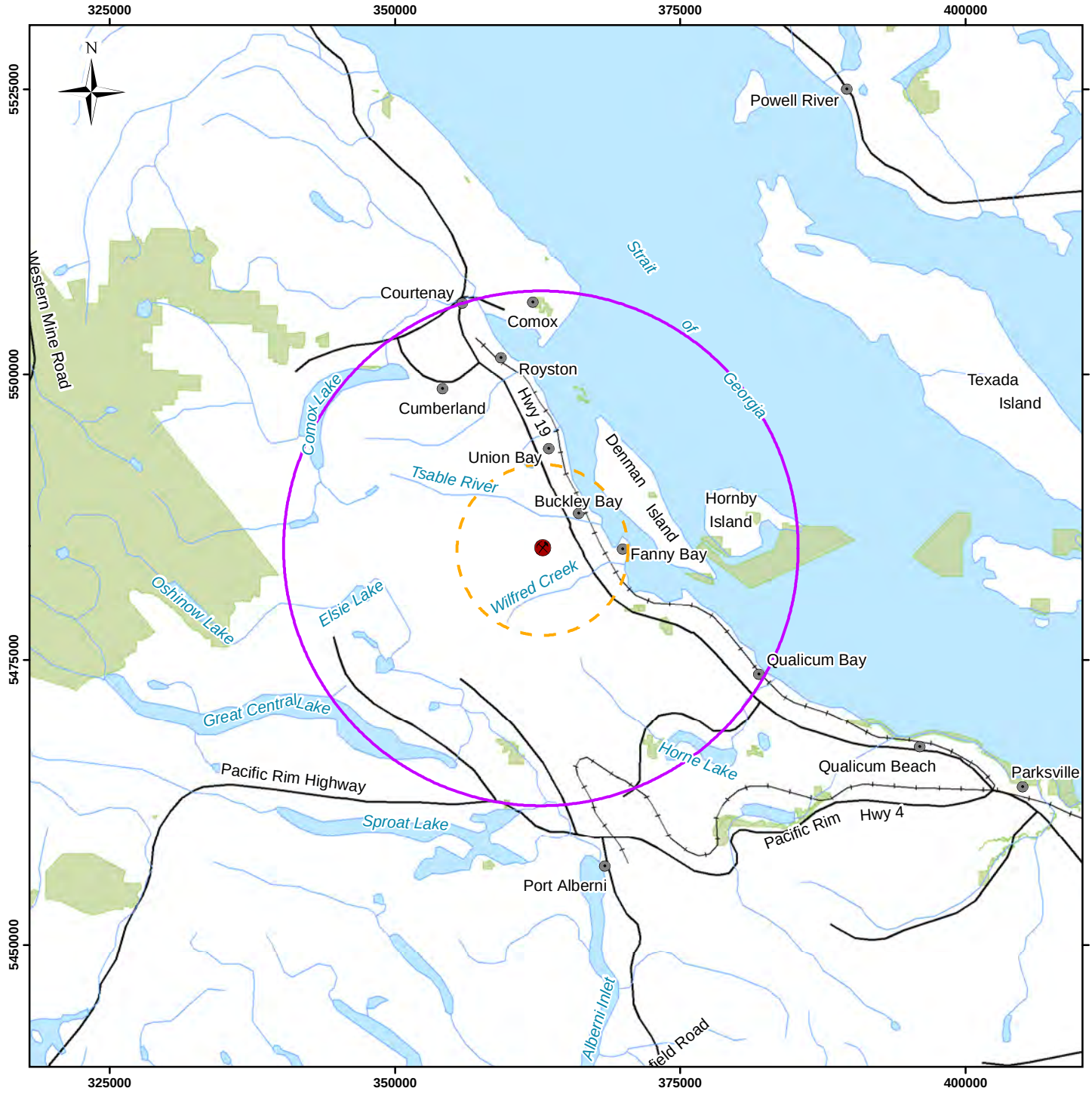
Tables 4.3-1 and 4.3-2 summarize some of the specific issues and the associated mitigation strategies.

Table 4.3-1: Potential Impacts to Air, and Mitigation Strategies

Potential Issue	Mitigation / Management Strategies
Dust generation from coal handling around the coal processing plant, rejectpiles and trucking / rail transport Greenhouse gases from mobile / stationary equipment and underground methane Other emissions	• Watering to reduce dust on rejectpiles; • Tarping trucks; • Using latex coating to cover coal transport train cars; • Using a dust suppressant on mine roads; • Enclose or semi-enclose crusher and conveyor systems where possible; • Strategic use of snow fencing to train wind away from potential sources of dust; • Progressive reclamation / revegetation of rejectpiles as available; • Limit greenhouse gases to the extent practical by use of renewable sources of energy; • Use of electrified instead of fuel-powered equipment where practical; • Limit unnecessary use of vehicles; and • Use low-sulphur fuel if available and cost competitive.

Table 4.3-2: Potential Impacts to Noise Levels, and Mitigation Strategies

Potential Issue	Mitigation / Management Strategies
Operational noise	• Monitor potential impacts and evaluate noise berms if required; and • Maintain equipment to factory specifications and ensure muffling equipment is operating properly.



Legend

- Raven Coal Project
- Populated Place
- Road
- Rail line
- Watercourse
- Waterbody
- Park or Protected Area
- Air Quality LSA
- Air Quality RSA

Reference

Base Data: 1:2,000,000 scale
from the Land and Resource Data Warehouse

Scale: 1:500,000

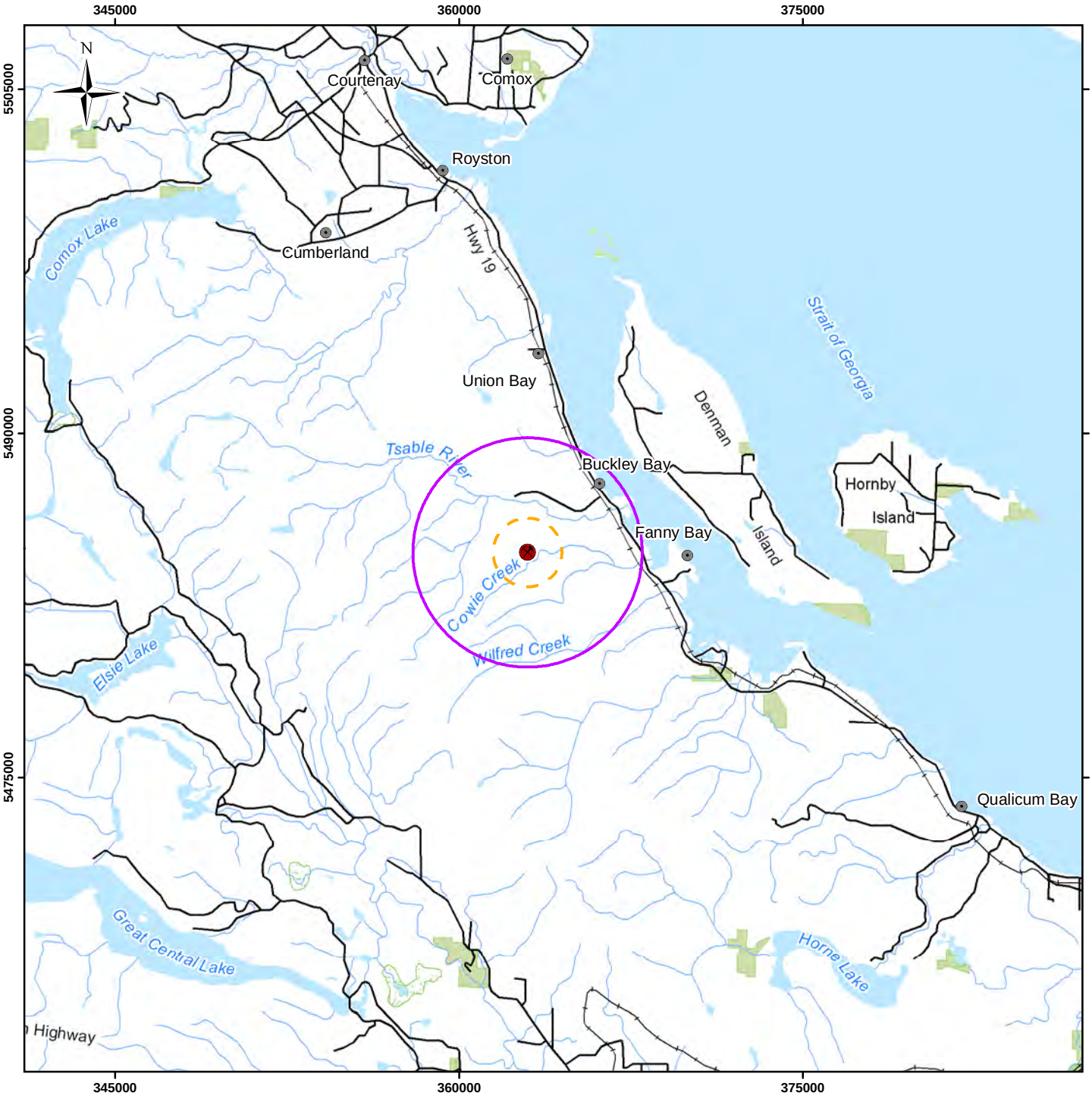
0 5 10 20
Kilometers

CLIENT:	Compliance Coal Corporation
PROJECT:	Raven Underground Coal Project

Air Quality Spatial Boundaries - Mine Site

DATE: February 22, 2010	ANALYST: EO	**Figure** 4.3-1
JOB No: VE51897	QA/QC: BO	PDF FILE: 04-50-001_AQ_study_area.pdf
GIS FILE: 04-50-001		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\04_air-quality\Baseline\4-50-001_v2.mxd



Legend

- Raven Coal Project
- Populated Place
- Road
- Railroad
- Watercourse
- Waterbody
- Swamp or Marsh
- Park or Protected Area
- Noise LSA
- Noise RSA

Reference

Base Data: 1:250,000 scale
from the NRCAN Geogratis NTDB

Scale: 1:250,000

0 2.5 5 10
Kilometers

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Noise Spatial Boundaries - Mine Site

DATE:	ANALYST:	Figure 4.3-2
February 22, 2010	MY	
JOB No: VE51897	QA/QC: BO	PDF FILE: 12-50-001_Noise_study_area.pdf
GIS FILE: 12-50-001		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\12_noise\Baseline\12-50-001_.mxd

364000 365000 366000 367000 368000 369000 370000 371000 372000

5458000 5457000 5456000 5455000 5454000 5453000 5452000 5451000

Legend

- Port Location
- Border of the Study Area at 3 km Zone

Key Map



Scale: 1:30,000

0 0.5 1 2

Kilometers

Note

Aerial Photo is georeference with four control points and location is approximate. AMEC assumes no liability direct or direct whatsoever for any such third party or unintended use.

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Air Quality and Noise Spatial Boundaries - Port Facilities

DATE: August 2010	ANALYST: MY	**Figure** 4.3-3
JOB No: VE51897	QA/QC: RP	PDF FILE: 12-50-003_study_area_port_alberni.pdf
GIS FILE: 12-50-003		
PROJECTION: UTM Zone 10	DATUM: NAD83	

Y:\GIS\Projects\VE\VE51897_Raven_CoalMapping\12_noise\Baseline\12-50-003_.mxd

4.3.1 Air Quality in the Mine

Air quality in the underground mine workings will be affected by coal bed methane gas, diesel particulate matter, and other vapours and particulates from vehicles and equipment. Adequately ventilating the mine will thus be critical for improving air quality and maintaining the health, safety, and well-being of workers. Methane is not of a sufficient quality to support degasification in advance of mining, but levels are high enough (maximum of 10.92 m^3/t) that it is expected to drive the dilution requirements. Estimated methane emissions are 127,500 m^3 per day. Air flow rates of 74 m^3 per second and 37 m^3 per second (measured at a point 90 m from the active face) will be provided in the super-sections and the standard section, respectively. These rates are adequate to dilute the methane to 0.8% by volume. Non-production support equipment is assumed to be diesel-powered but production section equipment will be electric-powered to the extent practical, to minimize ventilation requirements. The ventilation system will consist of two main mine fans (provide ventilation throughout the mine, from the portals to last open crosscuts), four auxiliary fans (in each mining section), ventilation curtains (in areas that are too low to provide fan and tubing clearance), and an air intake shaft in the southern extents of the mine. The up-dip extraction sequence while developing the mine has the potential to simplify ventilation management in respect of mined out areas.

4.3.2 Air Quality from Coal Handling and Transportation

Air quality above ground has the potential to be affected by dusts from the stockpiles (reject and clean coal), conveyors (at the processing plant and dockside), haul trucks, and shiploader. These areas will be covered and / or managedwith dust control systems or methods(e.g., a “zipper duct” opening for the tripper loader to the shiploader) to minimize fugitive dust (and noise) emissions. Selected points of potential dust creation, such as conveyor transfers and loaders, will be evaluated for dust creation potential and equipped with negative pressure dust control systems to gather fugitive dust if necessary If equipped, exhaust air will be passed through a baghouse type filter, and collected dust will be returned to the shipping stream via a rotary air lock at the bottom of the filter. A meteorological station may be established at the proposed Raven Project site in a location that can be secured and is representative of the local topography. Use will be made of local meteorological data from an on-going program by the University of BC where applicable. The university has a meteorological station on the proposed Raven Project site. Site data will be used to compare to Environment Canada (EC) long-term climatic data.

4.3.3 Noise and Vibration

Noise levels have the potential to be affected by the proposed Raven Project. Construction and operation of the proposed Raven Project will increase ambient noise levels in the immediate area of the mine. Increased truck traffic on the Island Highway during construction and operation (if the trucking option is used) will also affect noise levels to a limited extent. The construction period will be relatively brief and increased truck traffic during construction will be temporary. During operations, 2 – 3 trucks per hour on average

will travel the Island Highway transporting coal. Given the volume of traffic on the Island Highway, this increase will likely not result in a measurable increase in the noise levels from traffic on the Highway. With the mine operating underground, noise increase is expected to be minimal, however, an assessment of noise impacts will be completed for the EA required by *BC EAA* and potentially, the *CEA Act*.

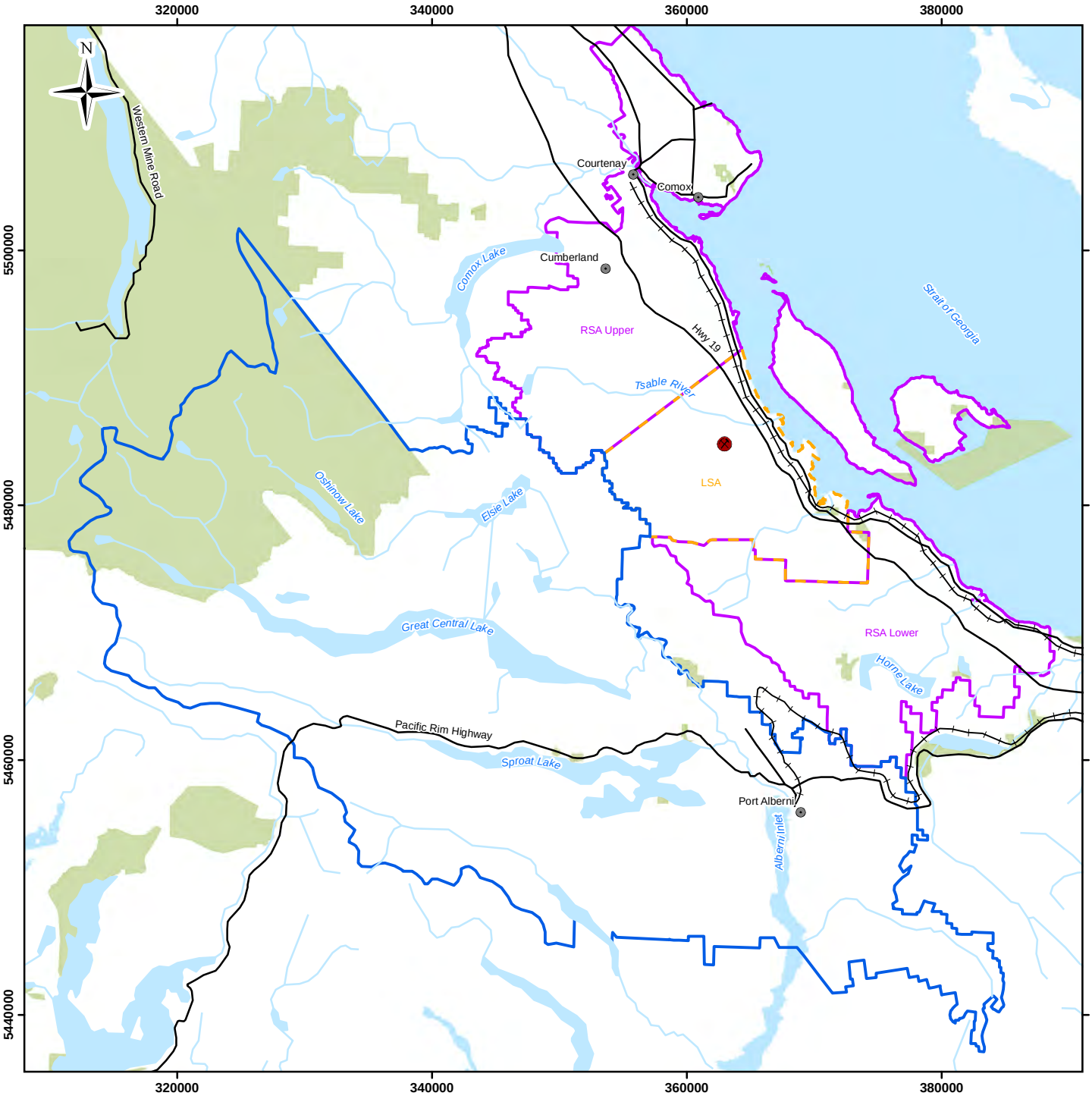
Vibration levels have the potential to be affected by the proposed Raven Project. Vibration from blasting has the potential to affect fish in streams such as Cowie Creek. Blasting will be very limited at the proposed Raven Project since it is not required for coal extraction. Some blasting may be required during initial roadway and portal construction which will occur at the surface. The potential effects on Cowie Creek will be estimated using standard procedures recommended by DFO. There are no nearby residences and thus vibration disturbance from blasting is expected to be minimal. However, effects will be evaluated. Where faults are encountered underground (i.e., discontinuities in coal seams), further blasting may be required. Since this blasting would only occur on average a few hundred m underground, and the volume of explosive detonated at any one time would be very small, vibration effects are expected to be dampened significantly at the surface, but again, will be evaluated in the EA.

4.4 Human Health and Well-Being

The zones of influence for the potential effects of the proposed Raven Project on the social and economic aspects of human health and well-being are shown in Figure 4.4-1. The proposed Raven Project is located in the newly created CVRD, and it is expected that project construction and operation could draw workers and involve businesses in the CVRD as well as the northern end of the Nanaimo Regional District. Construction and operation of the Port Facility will also provide employment and business opportunities. Consequently, the social and economic RSA generally consists of the urban and rural populations located within CVRD Area Regional District Electoral Area (RDEA) “A” (which includes Hornby Island); CVRD Area RDEA “B”; Nanaimo Regional District RDEA H; and Alberni-Clayoquot Regional District (ACRD) RDEAs D, E and F. As well as these areas, the RSA includes the City of Courtenay, the Town of Comox, the Village of Cumberland, and the City of Port Alberni. The RSA also includes the following reserves: Comox 1, Qualicum, Tsahaheh 1, Ahahswinis 1, Klehkoot 2, and Alberni 2.

The zones of influence for the potential effects of the proposed Raven Project on non-traditional land use (NTLU) are shown in Figure 4.4-2. The LSA and RSA for land use were selected following a review of the study areas for other related disciplines (e.g., air quality, vegetation and wildlife) as well as the economic and social environment. Where available, Land and Resource Management Plans (LRMPs), management zones and official community plans were also reviewed for the area. The LSA for the land use component was defined as the maximum area that captures potential direct disturbances from all of the alternatives being assessed. The NTLU and resource use LSA is defined by a 500 m buffer around the proposed Raven Project footprint to ensure potential direct unmitigated effects of

the proposed Raven Project on land use are addressed. The proposed Raven Project area and surrounding property are private land. The social and economic RSA will be used as the basis for the NTLU RSA as this area overlaps with representative biophysical and land use boundaries. The NTLU RSA falls within Wildlife Management Unit 1-6, which includes Denman Island, and this boundary will be used for the eastern and southern limits of NTLU RSA. The lower portion of this RSA also falls within the Regional Conservation Strategy Project Area (mainly within the southern portion of the Nanaimo Area Lowland Section) as described by the Comox Valley Land Trust. The RSA will include commercial aquaculture operations in Baynes Sound. The RSA considers land uses in the area as well as potential view points. The boundaries of the RSA are as follows: the Beaufort Mountain Range north to Comox Lake and south to the Pacific Rim Highway down to Parksville. Courtenay and Comox are included as the most northern communities. The study area for the proposed Port Facility is based on the city limits for the City of Port Alberni.



Legend

- Populated Place
- Raven Coal Project
- Rail
- Road
- Watercourse
- Waterbody
- Park or Protected Area
- Socio-Economic LSA
- Socio-Economic RSA
- Terminal RSA

Reference

Base Data: 1:1,000,000 scale
from the Atlas of Canada, NRCAN

Scale: 1:450,000

0 2.5 5 10

Kilometers

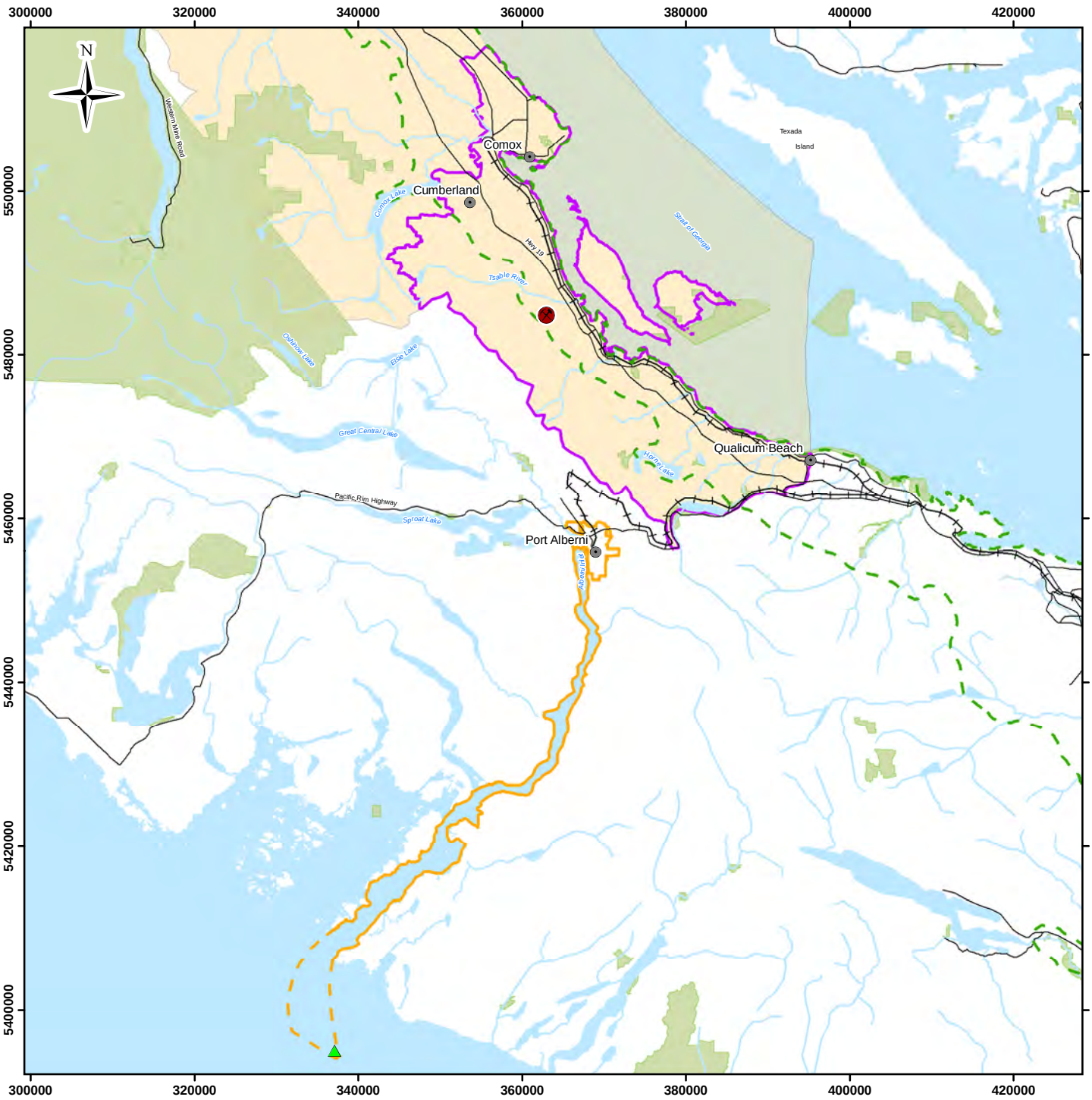
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Economic and Social Spatial Boundaries

DATE:	ANALYST:	**Figure** 4.4-1
November 17, 2010	MY	
JOB No: VE51897	QA/QC: JT	PDF FILE: 14-50-003_socio_study_area.pdf
GIS FILE: 14-50-003		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\14_socio-economics\Baseline\14-50-003_v2.mxd



Legend

- Cape Beale Pilotage Point
- Populated Place
- Raven Coal Project
- Rail
- Road
- Watercourse
- Waterbody
- Park or Protected Area
- Mine Site RSA
- Port Facility RSA
- Ecosection - Nanaimo Lowland
- Wildlife Management Unit 1-6

Reference

Base Data: 1:1,000,000 scale
from the Atlas of Canada, NRCAN

Scale: 1:700,000

0 2.5 5 10

Kilometers

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Non-traditional Land Use Spatial Boundaries

DATE:	ANALYST:	**Figure** 4.4-2
February 22, 2010	EO	
JOB No: VE51897	QA/QC: SB	PDF FILE: 17-50-002_NTLU_study_area.pdf
GIS FILE: 17-50-002		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GISProjects\VE\VE51897_Raven_Coal\Mapping\17_non-traditional-res\Baseline\17-50-002_v3.mxd

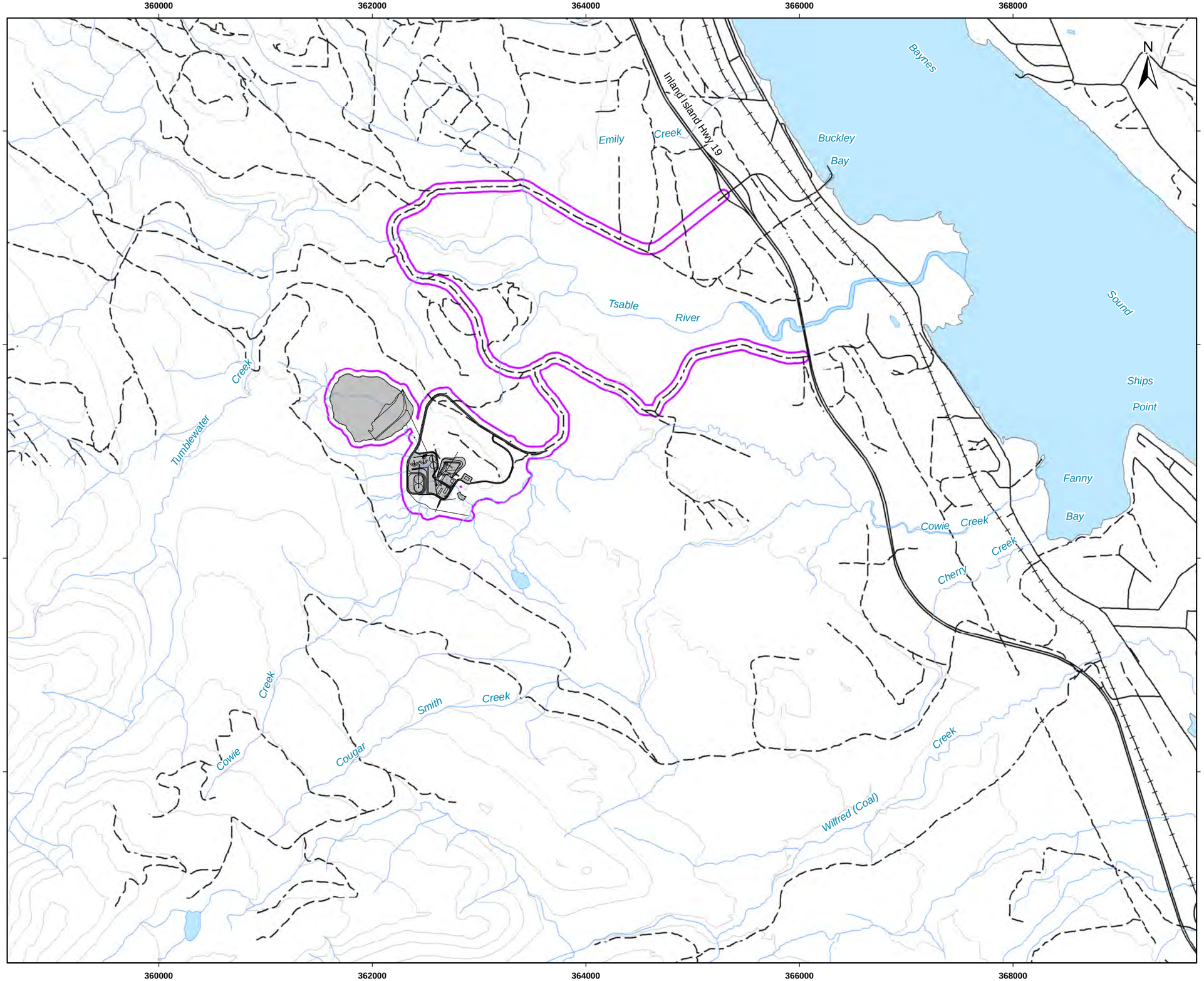
Table 4.4-1 summarizes some of the specific issues and possible mitigation strategies with respect to potential effects on human health and well-being.

Table 4.4-1: Potential Impacts to Human Health and Well-Being, and Mitigation Strategies

Potential Issue	Mitigation / Management Strategy
Air quality Water quality Soil quality Vegetation quality Wild Game quality Safety Noise	• All real or perceived potential health effects associated with air, water, land, food quality, or safety or noise, will be investigated collaboratively by experienced human health scientists and toxicologists; • The mitigation strategies outlined above for air-, water-, and land-related concerns will ensure that adverse health effects to human health are minimized; • Employee health, safety and well-being plans will be developed; and • Traffic safety planning will be included in the Feasibility Study.
Land uses Employment Economic stimulus	• Modify project design (employment planning, provision of services); • Employment and training strategies; • Procurement strategies to maximize local persons and businesses will be developed; • Ongoing public engagement and consultation during design, construction, operation and closure; • First Nations consultation and engagement; • Traditional Knowledge; • Archaeological and heritage assessments and management plans; and • Sustainability planning and liaison committees to leverage mine benefits and minimize potential impacts as well as address ongoing issues.
Demands on housing	• Review and work with local government official community plans to identify worker catchments and ameliorate potential effects during the design stage.
Demands on community services	• Review and work with local and provincial government agencies to identify and ameliorate potential effects during the design stage.
Transient workforce	• Workers and their families will live in nearby communities and be integral parts of these communities and thus issues associated with a transient workforce are not expected, except possibly during construction.

4.5 First Nations and Archaeology

The zones of influence for the potential effects of the proposed Raven Project on the archaeology and heritage resources are shown in Figure 4.5-1. First Nation Statement of Intent Boundaries are shown in Figure 4.5-2. The LSA and RSA will be developed in consultation with local First Nations and local historical societies. Culturally modified trees (CMT) were scoped into the methodology and two CMTs were identified and recorded outside the study area. The Reconnaissance Karst Potential Mapping tool available at the Geographic Data Discover Service was overlaid against the archaeological overview study area resulting in no karst potential present within the study area. The Archaeological Impact Assessment (AIA) LSA is set at 50 m beyond the proposed footprint of the mine and supporting facilities including associated transportation corridors. Information about the proposed Raven Project indicates no risk for the development to extend near the shoreline. Currently the closest south-easterly portion of the facility is 3.5 km west of the shoreline therefore no shoreline or tidal zones will be included in any archaeological assessments.



Legend

- Paved Road
- Gravel/Rough Road
- Railroad
- Elevation Contour (100 m)
- Watercourse
- Waterbody
- Archaeological Impact Assessment Study Area
- Potential Location of Site Facilities

Scale: 1:35,000

0 300 600 1200

Meters

Reference

LiDAR (5m) used to define Cowie and Cougar Smith Creek Watercourses
TRIM used in other watersheds
Basedata: TRIM

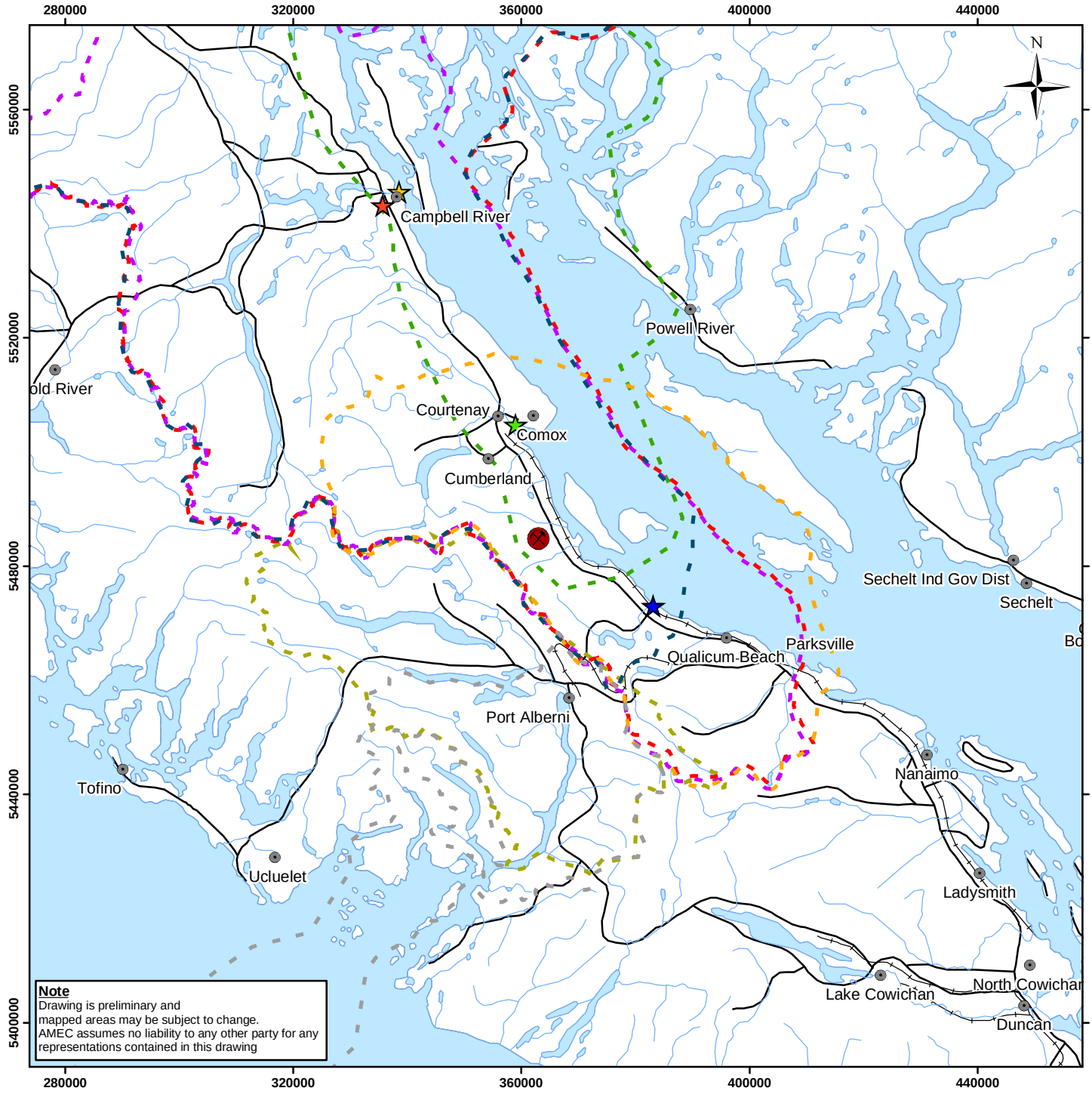
CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

Archaeology and Heritage Resources Spatial Boundaries

DATE: October 4, 2010	ANALYST: EO	**Figure** 4.5-1
JOB No: VE51897	QA/QC: BO	PDF FILE: 15-50-002_arch_study_area.pdf
GIS FILE: 15-50-002		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

Y:\GIS\Projects\VE\VE51897_Raven_CoalMapping\15_traditional-knowledge\Baseline\15-50-002_v8.mxd



Legend

- Raven Coal Project
- Populated Place
- Road
- Railway Line
- Watercourse
- Waterbody
- Campbell River First Nation
- Cape Mudge First Nation
- K'ómoks First Nation
- Qualicum First Nation
- Tseshaht First Nation Asserted Territory
- Qualicum Asserted Territory

Statement of Intent

- Comox (K'ómoks) First Nation
- Hamatla Treaty Society
- Hupacasath First Nation
- Xwemalhkwu Nation (formerly Homalco Indian Band)
- Laich-Kwil-Tach Treaty Society

Reference
Base Data: 1:1,000,000 scale
from the Land and Resource Data Warehouse
Aboriginal data from various sources including:
BC Treaty Commision, Federal National Framework Canada and other digitized sources

Scale: 1:1,000,000
0 5 10 20
Kilometers

CLIENT: Compliance Coal Corporation

PROJECT: Raven Underground Coal Project

First Nations Asserted Territories

DATE: April 11, 2011	ANALYST: EO	**Figure** 4.5-2
JOB No: VE51897	QA/QC: LR	PDF FILE: 15-50-009_FN_terr.pdf
GIS FILE: 15-50-009		
PROJECTION: UTM Zone 10	DATUM: NAD83	amec

\\Bby-fs1\bby-ee-gis\GIS\Projects\VE\VE51897_Raven_Coal\Mapping\15_traditional-knowledge\Baseline\15-50-009.mxd

4.6 Closure and Reclamation Activities

The entire above-ground area disturbed by the proposed Raven Project (~200 ha) will be reclaimed. Land use and productivity objectives would be consistent with the pre-mining levels determined by baseline observations and studies. Particular consideration would be given to the restoration of habitat for ungulates and plants of First Nations ethno botanical importance. Reforestation programs would be compatible with the silviculture programs being conducted as part of the regional timber harvesting activities. The preliminary reclamation goal will be to re-establish the site for recreational and wildlife values.

Reclamation of the coal reject stockpiles would involve stabilization (to control surface erosion) and revegetation (i.e., development of a self-sustaining tree cover). Fill will be placed on surfaces where necessary to provide tractability. Stockpiled overburden will be spread on the fill and the overburden revegetated. Once the settling and polishing ponds are no longer required, reclamation of the settling and polishing ponds proceed and will include draining the ponds and flattening the berms followed by revegetating.

5 CONSULTATION AND ENGAGEMENT

A critical part of developing any proposed new mining (or other) project is to respectfully engage and consult with any agency, organization, group, or individual with an interest in the project. CCC is committed to a level of consultation and engagement that not only meets but also exceeds that required by the provincial and federal EA processes. Some of the key aspects of the consultation and engagement activities for the proposed Raven Project are described below.

A website was developed as a central distribution point for information about the proposed Raven Project, including consultation and engagement activities. All public correspondence received via the website is answered by the Raven Project Management Team, and interests or concerns are logged. The web address for further information on the proposed Raven Project is http://www.theravenproject.ca.

A member of the We Wai Kai Nation with extensive knowledge of the proposed Raven Project area was established as a community liaison officer. Candy-Lea Chickite receives enquiries from the public, Aboriginal groups, and media outlets, with each telephone call tracked, and interests or concerns logged. The majority of calls to date have requested information about employment or contracting opportunities. Ms. Chickite can be reached via telephone at 250-830-7346, and via email at info@theravenproject.ca.

Two Open House events have been completed to date. They took place in Fanny Bay (October 2009; approximately 300 attendees) and in Port Alberni (July 2010; approximately 160 attendees). The Open House format provided an opportunity for CCC to present information about the proposed Raven Project, and for participants to review information boards and ask questions directly of technical and environmental consultants and project staff. All concerns raised were tracked.

Representatives from the proposed Raven Project have participated in two community events: Harbour Festival in Deep Bay (1 May 2010); and Island Railway Days in Parksville (10 July 2010). Participation at these events provided an opportunity for the proponent to present information about the proposed Raven Project and answer questions, and discuss issues.

The Raven Project Management Team have been proactive in dealing with local media outlets, including the provision of press releases, interviews, and the completion of a media site tour in October 2009. A file of media articles relating to the proposed Raven Project is maintained to track issues and concerns raised.

Four Project Updates have been advertised in community newspapers and / or distributed to stakeholders via email.

A series of site tours have also been organised with other interested parties, including the BC EAO, Vancouver Island University, the University of BC (UBC) Aboriginal Minerals Training Course, the Vancouver Island Branch of the BC Association of Professional Engineers and Geoscientists, and CoalWatch, a non-governmental organisation.

Proposed Raven Project team members made a presentation on the proposed Raven Project's social responsibility principles and activities to MBA students enrolled in a social responsibility class at Vancouver Island University.

CCC has established a Community Advisory Group as a forum for information exchange and issues resolution. Potential stakeholders, including Aboriginal groups, local governments and citizen groups, were identified and invited to participate. The group was initially established via an Opportunities and Concerns Workshop held in June 2009. A site tour was completed at this time to familiarise members with the proposed Raven Project area. The Community Advisory Group has subsequently met on two occasions (16 October 2009; 4 February 2010). Minutes of meetings are recorded to ensure that issues and concerns are identified. These minutes are reviewed and approved by the full Advisory Group.

Consultation with federal and provincial governments has been extensive and coordinated by the BC EAO. The BC EAO's advisory Working Group is comprised of representatives from federal, provincial, and local government agencies, and concerned Aboriginal groups. The BC EAO has coordinated the review of the Application Information Requirements / Environmental Impact Statement Guidelines (AIR / EIS Guidelines) document, and has also coordinated the development of a standalone tracking table document to track and consider all comments pertaining to the AIR / EIS Guidelines document.

Public participation is also an important component of the AIR / EIS Guidelines and EA processes. Federal funding to support the participation of the public in the EA review process has been made available through the Participant Funding Program. The proponent is committed to the public consultation process, and is engaged in an ongoing process to elicit feedback on the proposed Raven Project. Following Working Group review of Version 7.0 of the draft AIR / EIS Guidelines, a public review period of 40 days will be held, as required by the section 11 Order. The proponent is responsible for responding to all written comments received during this period, and for incorporating responses into the AIR / EIS Guidelines as appropriate. As for the Working Group review, comments will be recorded in a standalone tracking document. Notices of public comment opportunities will be posted on the Canadian Environmental Assessment Registry at http://www.ceaa-acee.gc.ca and on BC EAO's electronic Project Information Centre.

Once comments from the Working Group, Aboriginal groups and the public have been considered and addressed, BC EAO will formally issue an approved AIR / EIS Guidelines document to the proponent for the proposed Raven Project. Following approval of the AIR / EIS Guidelines, the proponent will complete the studies and analyses specified in the AIR / EIS Guidelines, and submit an Application / EIS to the BC EAO and the Agency for screening to ensure compliance with the AIR / EIS Guidelines. Provided the Application / EIS meets the information requirements of the approved AIR / EIS Guidelines document, the BC EAO will initiate the Application / EIS review phase. This phase will be completed within 180 days if the Application / EIS is accepted by the BC EAO. The Application / EIS will be

made available to the Aboriginal groups listed on the BC EAO's section 11 Order, the First Nations of the Maa-nulth Treaty Society, Métis Nation BC, government agencies, local governments, and the public. In the early stages of the Application / EIS review, the BC EAO will initiate a 50 day public comment period on the Application / EIS, as set out in the section 11 Order. Following the public comment period, the proponent will track and address the issues raised during the Application / EIS review. At the end of the review, the BC EAO will submit an assessment report, and recommendations to the provincial Minister of the Environment and the Minister of Forests, Mines and Lands for a provincial decision on the issuance of the EA Certificate. A legally binding table of commitments would be included in the EA Certificate, if issued, as a method of addressing issues raised. Commitments included in the EA Certificate are legally enforceable.

Following the proponent's submission and government review of the Application / EIS, the Agency will prepare a Comprehensive Study Report. The Comprehensive Study Report will be submitted to the federal Minister of the Environment and will be made available for public comment prior to the federal Minister of the Environment's decision under section 23 of the *CEA Act*. The federal Minister may request additional information or require that public concerns be further addressed before issuing the federal EA decision statement. The federal EA decision statement sets out the Minister's opinion as to whether the proposed Raven Project is or is not likely to cause significant adverse environmental effects, taking into account the implementation of any mitigation measures and follow-up programs that the Minister considers appropriate. Once the federal EA decision statement is issued, the proposed Raven Project will be referred back to the relevant federal responsible authorities (RA (e.g., DFO, PAPA)) for appropriate action, which may include issuing authorisations, or provision of federal land in order for the proposed Raven Project to proceed.

6 CONCLUDING REMARKS

CCC is committed to conducting a thorough EA that builds on the extensive work conducted to date and consulting with all stakeholders and First Nations to improve the design of the proposed Raven Project. The proposed Raven Project has a great potential to contribute social and economic benefits to First Nations, local communities and the province of BC, while minimizing potential environmental impacts. CCC looks forward to working with stakeholders and First Nations to achieve this objective.

7 REFERENCES

AGL (Associated Geosciences Limited). 2007. Preliminary Assessment of an Underground Mining Operation on Compliance Energy Corporation's Raven Coal Deposit, Tsable River, Vancouver Island BC. National Instrument 43-101 Compliant Resource Report. Prepared for Compliance Energy Corporation. Prepared by Peter Cain and Alan Craven. 2007CC10. 5 September 2007.

AGRA (AGRA Earth & Environmental). 1997. Baseline Information for Application for a Mine Permit (Tsable River Bulk Sample). Submitted to Tsable River Coal Corporation. NX20129. April 1997.

BC EAO (BC Environmental Assessment Office). 2006. Mine Proponents Guide to Terms of Reference (Working Draft): Appendix C. June 2006.

BC MNRO (BC Ministry of Natural Resource Operations). 2000. Vancouver Island Summary land Use Plan. February 2000.

BC MNRO (BC Ministry of Natural Resource Operations). 2002. Baynes Sound Coastal Plan for Shellfish Aquaculture. December 2002.

BC MNRO (BC Ministry of Natural Resource Operations). 2010. Hunting and Trapping Regulations Synopsis: Region 1, Vancouver Island.

BC MOE (BC Ministry of Environment). 1985. Technical Report 17 (Report Number 44): Soils of Southern Vancouver Island. August 1985.

BC MOE (BC Ministry of Environment). 2010a. Guide Outfitters in British Columbia: Region 1, Vancouver Island.

BC MOE (BC Ministry of Environment). 2010b. Water Stewardship: Ground Water Resources of British Columbia (Section 9.1.2, Nanaimo and Georgia Lowlands). Available online at http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/gwbc/index.html.

BC MOF (BC Ministry of Forests). 1991. Special Report Series 6: Ecosystems of British Columbia. ISSN 0843-6452.

BC MOFR (BC Ministry of Forests and Range). 2010. Wildfire Management Branch. Available online at http://bcwildfire.ca/.

BC MPSSG (BC Ministry of Public Safety and Solicitor General). 2010. Tsunami Preparedness. Available online at http://www.pep.bc.ca/hazard_preparedness/tsunami_preparedness.html.

CAC (Coal Association of Canada). 2010. Information on coal and the Canadian coal industry. Available online at http://coal.ca.

CVRD (Comox Valley Regional District). 2010. Information on the CVRD. Available online at http://www.comoxvalleyrd.ca.

Golder (Golder Associates Ltd.). 2001. Acid Rock Drainage (ARD) Review and Waste Rock Disposal Strategy (Proposed Tsable River Bulk Sample Project, Fanny Bay, BC). Prepared for Tsable River Coal Corporation. 10 May 2001.

MPMO (Government of Canada Major Projects Management Office). 2008. Guide to Preparing a Project Description for a Major Resource Project (Draft). Government of Canada. December 2008.

NRCan (Natural Resources Canada). 2010. Background on Earthquakes in Western Canada. Available online at http://earthquakescanada.nrcan.gc.ca/zones/westcan-eng.php.

ORCRC (O.R.Cullingham Resource Consultant Limited). 2007. Technical Report: Raven Coal Property, Comox Basin, Vancouver Island. National Instrument 43-101 Compliant Resource Report. Prepared for Compliance Energy Corporation. Prepared by O.R.Cullingham. 7 June 2007.

PAH (Pincock, Allen and Holt). 2010. Technical Report on the Raven Underground Coal Project, Comox Valley, British Columbia. Prepared for Compliance Energy Corporation and its wholly-owned Subsidiary, Compliance Coal Corporation, dba Comox Joint Venture. Prepared by Peter Christensen, A. Lorraine Livingston, Lynn A. Sessions. DE-00033. 14 October 2010.

WCA (World Coal Association). 2010. Information on coal and the global coal industry. Available online at http://www.worldcoal.org.