FINAL REPORT

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

Speous IR#8,
Lower Nicola Indian Band
Merritt, British Columbia

Prepared for

Lower Nicola Indian Band
181 Nawishaskin Lane
Merritt, B.C. V1K 0A7

Submitted by

Columbia Environmental Consulting Ltd.
RR#2, Site 55, Compartment 10
Penticton, B.C. V2A 6J7

Project No: 10-0374
April, 2011

COLUMBIA
ENVIRONMENTAL

COLUMBIA
ENVIRONMENTAL

RR#2, Site 55, Compartment 10
Penticton, BC. V2A 6J7

April 30, 2011

Lower Nicola Indian Band
181 Nawishaskin Lane
Merritt, B.C. V1K 0A7

Attention: John Keating and Sharon Parsons, LNIB Lands and Leasing Office

Subject: Final Phase I Environmental Site Assessment (ESA) of the Speous Indian Reserve # 8, Lower Nicola Indian Band, Merritt, BC.

We trust that this final report meets your present needs. Two hard copies of the final report and a CD-ROM including the source files and an Adobe pdf version will be provided upon receipt of your review. Please do not hesitate to call if you have any questions or comments, or if you require anything further.

Yours truly,

Columbia Environmental Consulting Ltd.

Per: Dwight Shanner, R.P.Bio
Project Manager

EXECUTIVE SUMMARY

Columbia Environmental Consulting Ltd. (Columbia) was contracted by the Lower Nicola Indian Band (LNIB) on behalf of Indian and Northern Affairs Canada (INAC) to conduct a Phase I Environmental Site Assessment (ESA) of the Speous Indian Reserve #8, herein referred to as the "Site".

The first step in site characterization is to conduct a Phase I ESA. During this phase, information is gathered about site layout and previous activities and/or operations that may have caused contamination at the Site. The Phase I ESA consisted of the following:

- records review;
- interviews with regulatory officials and personnel knowledgeable about the Site;
- site reconnaissance; and
- information evaluation and preparation of the report provided herein.

The Phase I ESA was conducted as per the requirements of the CSA document *Z768-01 Phase I Environmental Site Assessment, April 2003*. The Phase 1 ESA focused on preliminary areas of interest identified through historical document review, and interviews. In general, all residential structures were excluded unless information was gathered to suggest contamination or external visual observations indicated potential contamination. Specific residential structures listed for inspection at the request of the First Nation or INAC require the permission from the First Nation and the Certificate of Possession holder.

The Speous IR#8 is comprised of approximately 280 acres on one reserve. The reserve is rectangular in shape, it occupies portions of the northern valley of Nicola River. The site is located 8 km west of Lower Nicola and less than a kilometer north of the Nicola River. A burnt house and one residence with an AST is currently located onsite.

Based on historical review results and interviews the burnt house is not retained as an Area of Potential Environmental Concern (APEC). The AST is retained as an on-site APEC with details summarized in the table below.

Table A. Areas of Potential Environmental Concern (APECs)

APEC	Description of Contamination or Risk	COPC
APEC #1 Speous IR#8 AST 643957E 5554858N	The active 1270L AST of unknown contents is elevated on a metal frame and appears in decent condition. Some rust was observed on the tank and some weeping was observed at the connections hose and bung. The tank is unlabelled and contains no secondary containment. A 0.8m diameter soil stain was observed below the tank and appears surficial.	• Metals • PAH • PHC

PAH = Polycyclic Aromatic Hydrocarbons
PHC = Petroleum Hydrocarbons including F1, F2, F3 and F4 fractions, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

A Phase 2 ESA is recommended to determine the presence or absence of contaminated media at APEC 1.

TABLE OF CONTENTS

FIGURES

TABLES (in report)

APPENDICES

1.0 INTRODUCTION

Columbia Environmental Consulting Ltd. (Columbia) was commissioned by the Lower Nicola Indian Band (LNIB) on behalf of Indian and Northern Affairs Canada (INAC) to conduct a Phase I Environmental Site Assessment (ESA) of the Speous Indian Reserve #8, herein referred to as the "Site".

The Site is located, approximately 8 km west of the town of Lower Nicola B.C, on 1:50,000 NTS mapsheet 092I02. The Site's geographic position relative to the surrounding features is shown on Figure 1 included in Appendix A.

The Phase I ESA follows procedures outlined in the Canadian Standards Association (CSA) document *Z768-01 Phase I Environmental Site Assessment, April 2003*. This report will be used in making decisions concerning whether further investigation and or remediation is necessary. John Keating and Sharon Parsons (LNIB Lands and Leasing Office) provided written authorization for the project.

1.1 OBJECTIVE

The objective of this Phase I ESA is to identify and document any actual or potential human health or environmental risks associated with the Site and provide recommendations for further assessment and/or risk management. The "Areas of Potential Environmental Concern" (APECs), with their associated "Contaminants of Potential Concern" (COPC), and the person or agencies that may be responsible for causing the contamination define these risks.

1.2 SITE BACKGROUND

The Speous IR#8 is comprised of approximately 280 acres on one reserve. The reserve is rectangular in shape, it occupies portions of the northern valley of Nicola River. The site is located 8 km west of Lower Nicola and less than a kilometer north of the Nicola River. One residence with an AST is currently located onsite.

2.0 SCOPE OF WORK

The first step in site characterization is to conduct a Phase I ESA. During this phase, information is gathered about site layout and previous activities and/or operations which may have caused contamination at the Site.

The Phase I ESA consisted of the following:

- records review;
- interviews with regulatory officials and personnel knowledgeable about the site;
- site reconnaissance; and
- information evaluation and preparation of the report provided herein.

The Phase I ESA was conducted as per the requirements of the CSA document *Z768-01 Phase I Environmental Site Assessment, April 2003*.

The Phase 1 ESA focused on preliminary areas of interest identified prior to the site visit, through historical document review, and interviews. A list of these areas is included in Section 5.1.1. In general, all residential structures were excluded unless information was gathered to suggest contamination or external visual observations indicated potential contamination. Specific residential structures listed for inspection at the request of the First Nation or INAC require the permission from the First Nation and the Certificate of Possession holder.

3.0 METHODOLOGY

3.1 RECORDS REVIEW

Records included a search for previous environmental reports, historical aerial photographs, city directories, fire insurance maps, federal and provincial agency review, Lower Nicola Indian Band records, and regional district records. The applicable search distance for the records review included properties immediately adjacent to the Site, and other properties (as identified by aerial photographs, and other sources) where the potential for environmental contamination to impact the Site was apparent (i.e. petroleum product storage in the immediate area). A reference of personal communications is included at the end of this report in Section 11.0

3.2 INTERVIEWS

Interviews with persons knowledgeable about the Site were carried out to obtain or confirm information on the environmental characteristics of the property and historical use. Information provided by interviewees is detailed in Section 5, and included throughout the report. Dwight Shanner and Carmen Marshall from Columbia Environmental conducted the interviews on September 14, 2010.

3.3 SITE VISIT

The site visit was conducted by Summer Zawacky, B.Sc., and Carmen Marshall, B.Sc. from Columbia Environmental and Harold Joe from LNIB on September 30th 2010. A site inventory was completed and the subject property was examined for evidence of actual or potential environmental contamination. All areas of the reserve and structures were accessible during the site visit, and GPS coordinates were taken at each point of interest using a hand held Garmin GPS Map 60Cx as UTMs in the NAD 83 datum. Physical limitations were not observed during the site visit, and all locations were accessible to Columbia personnel. Selected photographs are included in Appendix F.

4.0 HISTORICAL RECORDS REVIEW

4.1 RECORDS REVIEW

An outline of the history of land use on the subject property and adjacent properties was compiled though the review of the variety of information sources. These typically include historical records and a review of files retained by regulatory agencies, however, the following standard sources of information were not available:

- Fire insurance drawings;
- City/Business directories; and
- Historical Title search.

For the historical uses of the property, aerial photographs dating back to 1948, interviews, web searches, archives, and previous reports supplied by INAC and the provided important information. A list of sources and references for the records review is provided in Section 11. The BC online Site Registry search results are found in Appendix B. Correspondence can be found in Appendix C and examples of historical aerial photographs can be found in Appendix D. A list of Species at Risk potentially in the Site area can be found in Appendix E. Previous Reports can be found in Appendix G.

4.1.1 REVIEW OF AERIAL PHOTOGRAPHS

Aerial photographs dated 1948, 1951, 1960, 1972, and 1991 from the University of British Columbia's Geographic Information Centre (UBC GIC) were reviewed for information about land use at the subject property and adjacent lands. Copies of representative aerial photographs are included in Appendix D. Site details from the aerial photograph interpretation is briefly described below in the following table:

Table B. Air Photo Review Summary

Aerial photo Year	Description
1948	***Subject Property:*** The only visible development on Speous IR#8 is a dirt road, which is now known as Sunshine Valley Road.
	Adjacent Lands: Adjacent lands show no development in the south, east and west. One kilometer north if Speous IR#8 is the Nicola River and Highway 8. Nicola river is in its natural state.
1951	***Subject Property:*** Cleared vegetation is visible in the east portion of the reserve.
	Adjacent Lands: The railway running parallel to Highway 8 is visible and crosses the Nicola river north of the reserve. The adjacent lands west of the reserve appear to have been cleared of vegetation. Other adjacent land remains unchanged.
1960	***Subject Property:*** No changes were observed.
	Adjacent Lands: An increase in agricultural and residential land use north of Highway 8. Remaining lands appear to have no changes.
1972	***Subject Property:*** No changes were observed. Photos were small in scale.
	Adjacent Lands: No changes were observed. Photos were small in scale.
1991	***Subject Property:*** No changes were visible.
	Adjacent Lands: No changes were visible.

4.1.2 CITY DIRECTORIES

The Merritt Public Library was contacted in regards to any business directories. They did not have records of City/Business directories for the reserve.

4.1.3 MERRITT AND LOWER NICOLA FIRE DEPARTMENT

The Merritt Fire Department and Lower Nicola Fire Department were contacted regarding any historical information. Fire records were obtained from Fire Chief Lindsay Tighe of LNFD, and are attached in the Appendix C. The records pertain to all reserve lands within the Lower Nicola city limits including Mameet IR #1. In 2005 to 2010 a total of 141 fire responses occurred within Speous IR#8 and Mameet IR#1. Of the total fires; thirty five (35) were grass/ debris fires, six (6) structural, three (3) natural gas leaks one (1) car and thirteen (13) wood chip piles. The remaining were medical type calls. The details such as fire location were not available due to time constraints of the Fire Department. Interviews indicated the location of a house fire and a Site visit confirmed the details.

4.1.4 HISTORICAL TITLE SEARCH

A historical title search was not considered relevant for this project, as the subject property has remained in the authority of the federal government since its inception as a reserve.

4.2 AGENCY REVIEW

Columbia contacted federal, provincial, regional, and municipal agencies to identify actual or potential environmental contamination issues on or near the subject site. The following sections of the report present the findings of the regulatory review conducted for the subject property.

4.2.1 LOWER NICOLA INDIAN BAND

LNIB maintains a file with the original surveys of the lot boundaries and utilities serviced to each lot. Records of surveys were requested through the housing department, however no reply has been received at this time.

4.2.2 FEDERAL GOVERNMENT

The INAC Environmental Management System database, IEMS (formerly ESSIMS), had no records or reports for the reserve.

The Treasury Board of Canada Contaminated Sites Action Plan site registry did not have any registered sites within its database for the reserve.

4.2.3 MINISTRY OF TOURISM

The Ministry of Tourism's Archeology Branch was contacted regarding any records they may have pertaining to the Site. There were no records recorded for the Site but a high potential for unrecorded archeology materials are within the area. The response and map from the Ministry is included in Appendix C.

4.2.4 BC MINISTRY OF ENVIRONMENT – SITE REGISTRY

The contaminated sites provisions under the *Environmental Management Act* (Formerly the *Waste Management Act*) and *Contaminated Sites Regulations*, effective April 1997, require the Province to provide public information about site investigations and cleanups. The Site Registry has been established to meet this requirement. The Site Registry documents milestones in the site assessment process and provides public access to this information. It contains information regarding which sites have been investigated and/or remediated since MoE began recording this activity. The Site Registry is not a registry of only contaminated sites; it also includes sites for which a Site Profile has been submitted.

The online version of the Site Registry database searches for records of sites within a 1.0 kilometer radius of the subject property. The Site Registry has been collecting data only since

its inception in April 1997, and not all sites of known or potential contamination within the search area may have been captured. Therefore, the searches cannot be considered a definitive method of identifying all sites of potential contamination within the search area. The Site Registry search results are presented in Appendix B and are summarized below:

Subject Property
According to the BC Online search there were no records in the Site Registry for the subject property.

Adjacent Properties
According to the BC Online search there were no records in the Site Registry for the adjacent properties when a 1.0 km radius search was completed using the center of the reserve as the search center.

4.2.5 TOWN OF MERRITT

Sean O'Flaherty of the City of Merritt was contacted requesting any information regarding environmental or contamination issues or building permits for the lands of LNIB. The City has no records regarding the subject property and adjacent lands, and do not maintain any such records for facilities operating on Reserve Lands.

4.2.6 MERRITT MUSEUM & ARCHIVES

The Museum of Merritt was contacted via phone. The Museum did a search for lands within LNIB, no records were found pertaining to Speous IR#8.

4.2.7 THOMPSON NICOLA REGIONAL DISTRICT

Peter Hughs of the environmental department with the Thompson Nicola Regional District (TNRD) was contacted requesting any information regarding environmental issues on or near LNIB. Mr Hughs stated that the district has no records regarding the subject property and do not maintain any such records for facilities operating on reserve lands.

4.2.8 TERASEN (FORMERLY BC GAS)

Toni Melliere of Terasen Gas was contacted regarding service connections to the subject property including any current or historical issues that are likely to have resulted in environmental impacts on the Reserve. Terasen has no record of environmental issues that may have occurred on the subject property or adjacent properties. Terasen does not keep records pertained to the service initiation and decommission as the companies standard policy.

4.2.9 FORTIS BC (FORMERLY BC HYDRO)

Louise Ouelett of Transmission Distribution and Environment at Fortis BC was contacted regarding the presence of service connections to the subject property including any current or

historical issues that are likely to have resulted in environmental impacts on the reserve. Fortis has no record of environmental issues or transformer locations (possibly containing PCBs) that may have occurred on the subject property or adjacent properties.

4.3 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

In 1999, Klohn-Crippen Consultants Ltd (Kolhn-Crippen) completed a Phase I and II ESA for Mammet IR#1, Joeyaska IR# 2, Pipseul IR#3, Zoht IR#4 and Speous IR#8 on behalf of First Nations Emergency Services Society of BC (FNESS). The report focused on the assessment, removal and replacement of fuel storage tanks. Speous IR#8 was found to have no environmental concerns. The report identified that the reserve had one resident and heating was supplied by a wood burning stove.

4.4 INTERVIEWS

Interviewees included: Marvin Shuter, Willie Basil, Francis Shuter, Delia Shuter, Ira Sterling, Maggie Shuter Harold Joe. Interviews with LNIB members identified the following concerns:

Table C. Summary of Information Obtained from Interviewees

Issue	Location	Description
Speous IR#8	8 km west of Lower Nicola on Sunshine Valley Road	Burnt house- Gloria Sams former residence Across the road a new cabin was built

5.0 SITE DESCRIPTION

5.1 GENERAL PROPERTY DESCRIPTION

The Lower Nicola Indian Band is comprised of ten reserves that total 17,500 acres. Nine reserves are located within the Merritt area and the most northern parcel (Hihium IR #6) is located approximately 65 km north of the city of Kamloops B.C. Speous IR #8 is rectangular in shape and is 280 acres in size, located approximately 15km east of Merritt. Coordinates for the reserve are zone 10 642649E, 5554609N on topographic NTS map sheet 092I02. The majority of land use on the reserve is undeveloped wild lands, with one residence and some agricultural land use on the eastern portion of the Site. A confluence between Spius and Waterfall Creek is located east of the site where Waterfall Creek eventually flows through central portion of the Site.

5.1.1 SITE DETAILS

Based on the information identified in the interviews and historical review, the only development noted onsite is the former burnt residence and new current residence. The

current land use is categorized as wild lands with the exception of residential land use at the eastern section of the reserve.

The table on the following pages summarizes the major features of the former and current land uses of each area, and any other relevant information that pertains to this study.

Table D. Site Area Summary

Area ID (UTM Zone 10)	Potential Environmental Concerns	Structures Present	Historical Land Use	Current land Use
Current Residence 643957E 5554858N	• AST with weeping nozzle and hose	• One Storey house	Wild lands & Residential	Residential
Former Burnt Residence 644084E 5554675N	• Former residence has no remaining materials of concern on the Site.	• Grave Marker and Wooden Chicken Coop	Wild lands & Residential	Agricultural

5.1.2 STRUCTURES INVENTORY

One AST at the current residence and a grave marker and wooden chicken coop were noted in the areas visited during the Phase I ESA. As the focus of this investigation was on previous sites, ASTs, waste materials and potential contamination sources, residences and municipal structures were not within the scope of work and are not included in the structures inventory. A summary of the structures observed at the various sites is detailed in the table below.

Table E. Summary of Structures On-Site

Area ID	Structure Name	Description/Contents
Speous IR# 8	AST	• Approximately 1300L AST elevated on metal frame stand is un-marked but in decent condition. A 0.8m diameter stain was noted below the AST.
	Burnt House Chicken Coop	• A wooden chicken coop is abandoned next to the former burnt residence. The chicken coop is empty
	Burnt House Grave Marker	• A wooden beam fence serves as a grave marker surrounding the former burnt house footprint.

5.2 TOPOGRAPHY

The Site is situated in a relatively flat valley bottom gently sloped to the northeast at an elevation of approximately 640 meters above sea level. Relief on the property is less than 35 m. A shallow marshland is located near the central portion of the reserve. Waterfall Creek is an intermittent stream located within the center of the reserve and flows to the west.

5.3 GEOLOGY

The Site is located within the Spences Bridge Group, above the Spius Creek Formation in Overlap Terrane within the intermontane belt. The Spius Creek Formation consists generally of andesitic volcanic rocks including amygdaloidal andesite with lesser amounts of dense andesite, mafic volcanic breccias, and epiclastic rocks. The volcanic rocks dominating the Site are covered with a surficial "Till Blanket" of varying thickness primarily made up of unconsolidated compositions of silt, sand, gravel and cobbles. Surface soils on the reserve consist of a grey luvisol, typical of a forest-grassland transition zone (Ministry of Energy, Mines, & Resources, 2010).

5.4 SURFACE DRAINAGE

Surface drainage at the Site is anticipated to be primarily infiltration into the underlying soils. Waterfall Creek flows east through the Site towards Spius Creek which eventually flows to Nicola River. To the west the land slopes towards Nicola River in a shallow valley trunning east to west through the Site.

5.5 CLIMATE DATA

The tables below provide climate values and monthly precipitation values as collected at Merritt B.C. Metrological Station, based on data from 1971 to 2000[1]. The average annual precipitation is 322.2 mm.

Table F. Climate Values for 1971-2000

Meteorological Station Elevation:	609.0m
Daily Mean Temperature:	7.4ºC
Annual Rainfall:	238.9mm
Annual Precipitation:	322.2mm
Highest Monthly Average Precipitation:	Dec, 39.6mm
Lowest Monthly Average Precipitation:	April, 14.5mm

[1] www.climate.weatheroffice.ec.gc.ca

Table G. Precipitation Values for 1971-2000

Month	Average Precipitation (mm)	Month	Average Precipitation (mm)	Month	Average Precipitation (mm)
January	37.2	May	26.8	September	23.6
February	23.6	June	34.1	October	23.5
March	16.6	July	25.8	November	34.7
April	14.5	August	22.1	December	36.9

5.6 UTILITIES

The residential property on the Site is serviced by underground water and overhead electrical power. The residence likely has a septic tank. Water and power lines were located adjacent to the roadways in most locations.

5.7 ADJACENT PROPERTIES

The adjacent land to the south and north are undeveloped wild lands. The eastern and western portions of the Site are bounded by Agricultural and Residential land uses including pastures and cropland. The town of Lower Nicola consists of industrial, residential, and agricultural usage and is located 8km northeast of the Site.

5.8 VALUED ECOSYSTEM COMPONENTS (VECs)

The Site is located on the floodplain of Nicola River, in Bunchgrass and Interior Douglas Fir (IDF) biogeoclimatic zones. Representative trees in this ecosystem include Douglas fir, trembling aspen, lodgepole pine, ponderosa pine, hybrid spruce, Rocky Mountain juniper. Shrubs for the area include species such as snowberry, common juniper, Saskatoon, Kinnikinnik, red osier dogwood, black gooseberry, prickly rose and false box. Herbs common to the area include bluebunch wheatgrass, pinegrass, wheatflower, bunchberry, yarrow, sedges (spp) and spike rushes to name a few (Ministry of Forests 1991).

A list of species from the BC Conservation Data Center (CDC) search, indicating species found within the area has been included in Appendix E. Characteristic wildlife in the region (CDC) include, but is not limited to, moose, mule deer, black bear, cougar, elk, grizzly, eagle, big horn sheep, badger, coyote, wolf, marmot, raven, spruce grouse, and various waterfowl.

A number of potential species on the Site are considered Species at Risk by COSEWIC[2] and receive special protection for critical habitats. Provincially, red listed (being considered for

[2] COSEWIC means the Committee on the Status of Endangered Wildlife in Canada

designation as threatened or endangered) or blue listed (considered vulnerable) species, by the BC Ministry of the Environment, means that they require special management attention. The semi-pristine natural lands within the area of the Site are favorable Species at Risk Act (SARA) listed species habitat. A biological inventory would be required to further investigate the potential presence of Species at Risk.

5.9 WATER WELLS

The BC MoE water well database[3] was searched in a 0.5 km radius from the Site. Ten (10) wells were located within the 0.5km radius. Of the ten, one well was found on the Site to the 450m southwest and down gradient of the current residence with the title Shooter & Jackson and usage unknown. The nine wells located offsite had the usage of (private/domestic) or unknown with various titles. Well details for the on-reserve well are summarized in the table below.

Table H. Water Well Search Results

Well Tag Number	Well Depth (m)	Drill Date	Direction to Site	Distance from Site	Owner	Major Geology Encountered (m)
58490	53.3	October 1988	SW of Current Residence	450m	Shooter & Jackson Jr	0-50.3 Hardpan 50.3-53.3 Conglomerate

5.10 HISTORICAL LAND USE

Speous IR#8 has historically been utilized for residential/agricultural and wild lands. Hunting, fishing, and gathering were and are traditional uses of the Reserve lands. A former residence burnt on the eastern edge of the reserve south of Sunshine Valley Road. A new house is situated north of the previous house on the north side of Sunshine Valley Road.

5.11 REGULATORY HISTORY

One previous report was found regarding the Site, details on this report are specified in Section 4.3.

6.0 FINDINGS

6.1 FUEL / CHEMICAL HANDLING AND STORAGE

No evidence of current or former underground storage tanks (USTs) were identified during this assessment. One ASTs is present on the Site with details provided in the table below. An AST field checklist is included in Appendix H.

[3] Ministry of Environment. 2010. Water Resource Atlas Web Mapping Application http://www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html

Table I. Summary of ASTs

#	Location (Site ID)	Capacity	Contents	Active	Condition
1	**AST-Speous IR#8**	1 x 1270L	Unknown	Yes	One active AST west of the house. AST appears in fair condition. Some rust on the tank and weeping at the bung and hose. No secondary containment. 0.8m diameter soil staining below.

6.2 SOLID WASTE MATERIALS

Currently the solid waste generated on the Site is disposed of at the local landfill by the resident. There was no solid waste of a significant amount observed at the former or current residence.

6.3 SPILLS AND STAIN AREAS

Minor stains associated with the use and handling of petroleum hydrocarbons were noted below the AST located at the current residence on Sunshine Valley road. This "spotty" soil stain was 0.8m in diameter, and appeared surficial.

6.4 WASTEWATER DISCHARGE

Wastewater produced at the Site is limited to domestic effluent discharged via local septic systems. No concerns with regard to wastewater discharge were noted at the Site during this investigation.

6.5 AIR DISCHARGES

No concerns with regard to air quality discharge were presented during the interview process or site visit.

6.6 POLYCHLORINATED BIPHENYLS (PCB)

There were no records of PCB containing transformers or capacitors on the Site. No environmental concerns regarding PCBs were determined during this investigation.

6.7 ASBESTOS

The use of friable asbestos as a building material was banned in the U.S. in the mid 1970s. The manufacture of building materials containing asbestos was generally phased out in North America by the mid 1980s. The current residence is fairly new, therefore the possibility of asbestos within this Site is not likely.

6.8 HEAVY METALS

No concerns with respect to metals impacts were identified at this Site.

6.9 OZONE DEPLETING SUBSTANCES (ODS)

No evidence to suggest environmental contamination by ODS were identified.

6.10 NOISE

No environmental issues concerning noise were noted during this investigation.

7.0 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on historical review results and interviews, the burnt residence was an area of concern, but as indicated during the site visit, there is no debris or hazardous materials remaining at the Site. The burnt house is not retained as an Area of Potential Environmental Concern (APEC).

During the site visit, one AST was noted at the current residence. The AST appears in acceptable condition, however there is no secondary containment and limited spotty soil staining was noted below. The AST is retained as an APEC with details summarized in the table below.

Table J. Areas of Potential Environmental Concern (APECs)

APEC	Description of Contamination or Risk	COPC
APEC #1 Speous IR#8 AST 643957E 5554858N	The active 1270L AST of unknown contents is elevated on a metal frame and appears in decent condition. Some rust was observed on the tank and some weeping was observed at the connections hose and bung. The tank is unlabelled and contains no secondary containment. A 0.8m diameter soil stain was observed below the tank and appears surficial.	• Metals • PAH • PHC

PAH = Polycyclic Aromatic Hydrocarbons
PHC = Petroleum Hydrocarbons including F1, F2, F3 and F4 fractions, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

8.0 RECOMMENDATIONS

A Phase 2 ESA is recommended to determine the presence or absence of contaminated media at APEC 1 identified by this assessment. No other concerns were identified on this reserve at this time.

9.0 REPORT USE AND LIMITATIONS

This Phase I ESA report has been prepared for the exclusive use of Indian and Northern Affairs Canada (INAC), and it is intended to provide INAC with an understanding of the potential for environmental contamination by hazardous materials at the property assessed. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user. The findings and recommendations in this report are based upon data and information obtained during site visits by Columbia and INAC personnel to the Site identified herein and the condition of the Site on the dates of such visits, supplemented by information and data obtained by Columbia described herein.

The findings and recommendations contained in this report are based on the expertise and experience of Columbia in conducting similar site assessments. In assessing the Site, Columbia has also relied upon representations and information furnished by individuals noted in the report with respect to existing operations and property conditions and the historical uses of the properties to the extent that the information obtained has not been contradicted by data obtained from other sources. Accordingly, Columbia accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of misstatements, omissions, misrepresentations or fraudulent information provided by others.

It should be recognized that this study was not intended to be a definitive investigation of contamination at the Site. Given that the limited scope of services for this assessment as stated in the Terms of Reference for the Phase I ESA, it is possible that currently unrecognized contamination may exist at the Site and, if present, that the levels of contamination may vary across the Site. Opinions and recommendations presented herein apply to site conditions existing at the time of our assessment and those reasonably foreseeable. Should environmentally significant changes to the Site or additional information become available, Columbia should be provided the opportunity to review this information/data and amend our opinions, as appropriate. Fungi, mycotoxins, bioaerosols and other indoor air quality issues were not included in the scope of work.

Columbia's objective is to perform our work with care, exercising the customary thoroughness and competence of earth science, environmental, and engineering consulting professionals, in accordance with the standard for professional services at the time and location those services are rendered. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liability on a particular site. Therefore, Columbia cannot act as insurers and cannot "certify" or "underwrite" that a Site is free of environmental contamination, and no expressed or implied representation or warranty is included or intended in our reports, except that our work was performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

10.0 PROFESSIONAL STATEMENT

The information compiled for this document has been prepared in accordance with the requirements of the INAC Scope of Work.

Columbia certifies that the persons signing this document have demonstrable experience in the assessment of commercial and industrial sites. The work has been performed by Columbia staff under the guidance and supervision of the signatories below.

Report prepared by:

COLUMBIA ENVIRONMENTAL CONSULTING LTD.

_____	_____
Summer Zawacky, B.Sc.	Carmen Marshall, B.Sc.
Field Supervisor	Field Assessor
_____	_____
Dave Diplock, P.Eng.	Dwight Shanner, R.P.Bio.
Report Review	Project Manager

11.0 REFERENCES

Aerial Photographs dated 1948, 1951, 1960, 1972 and 1991 from the University of British Columbia's Geographic Information Center (UBC GIC)

BC Online Site Registry Search 1. 1km radius from the center of the reserve.

Canadian Standards Association. 2001. Z768-01 Phase I Environmental Site Assessment

CCME. 2001 Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil. Winnipeg, Manitoba.

CCME. 2004. Canadian Environmental Quality Guideline. Winnipeg, Manitoba.

Conservation Data Center (CDC). 2011. BC Species and Ecosystems Explorer. BC Ministry of Environment, Victoria, BC. http://srmapps.gov.bc.ca/apps/eswp/ Accessed January 2011.

Environment Canada. 2010. National Climate Archive. www.climate.weatheroffice.ec.ga.ca Accessed January 2011.

Klohn-Crippen. 1999. UST Removal and Replacement Program. First Nations Emergency Services.

Lower Nicola Indian Band. 2011. Community Profile. http://www.lnib.net/communityprofile.htm. Accessed January 2011.

Meidinger, D. and Pojar, J. 1991. Ecosystems of British Columbia. British Columbia Ministry of Forests. 330 pp. http://www.for.gov.bc.ca/hfd/pubs/Docs/Srs/SRseries.htm

Ministry of Environment, 1986. Soil Landscapes of British Columbia. Resource Analysis Branch, Victoria, BC

Ministry of Energy, Mines and Resources. iMap web mapping application & surficial geology mapping application. http://www.empr.gov.bc.ca/Mining/Geoscience/MapPlace/MainMaps/Pages/default.aspx. Accessed December 2010.

Ministry of Tourism. Archeology Branch. Province of British Columbia. http://www.tti.gov.bc.ca/archaeology/requesting_archaeological_site_information/process.htm. Accessed on January 2011.

NTS 1:50000 Map Sheet 092I02.

Valentine, K.W.G. & A.B. Dawson. 2008. The Soils Landscapes of BC. Ministry of Sustainable Resource Management, Victoria, B.C. http://srmwww.gov.bc.ca/soils/landscape/ part3.html Accessed August 2010.

WRBC. 2008. BC Water Resource Atlas. http://www.env.gov.bc.ca/wsd/data_searches/wrbc/index.html. Accessed January 2011.

Personal Communications

Lindsay Tighe. Fire Chief. Lower Nicola Fire Department. Lower Nicola B.C. Requesting Fire Records for reserve lands.

Louise Ouelett. Environmental and Transmission and Distribution Department. Fortis BC. Vancouver B.C.Regarding records and locations of transformers and service dates.

Peter Hughs. Director of Environmental Services. Thompson Nicola Regional District. Regarding Environmental Records.

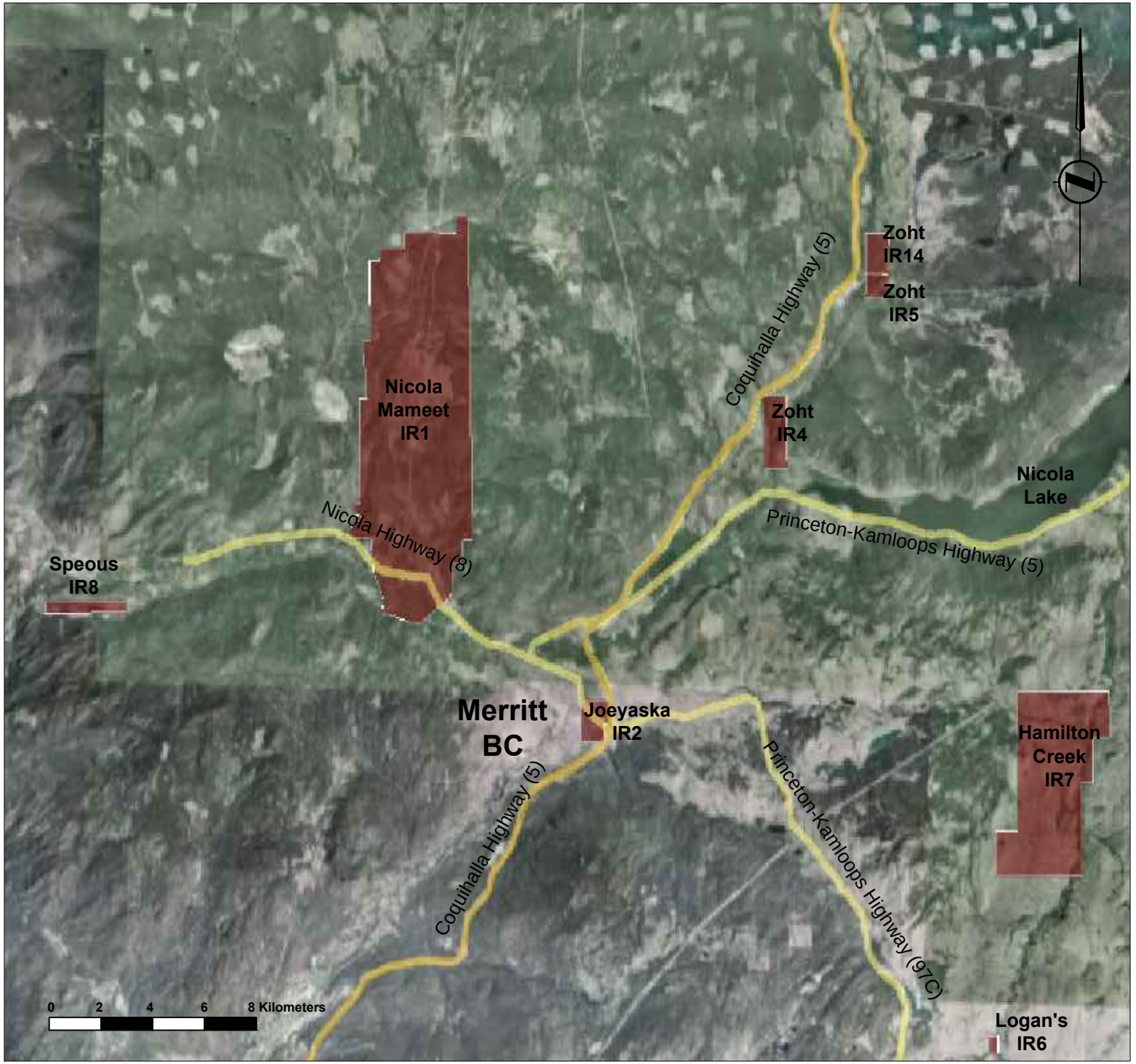
Sean O'Flaherty. Development Services Officer. City of Merritt. Merritt B.C. Regarding building permits on reserve or environmental issues.

Toni Melliere. Environmental Division. Terasen Gas. Vancouver B.C. Requesting Environmental records and service dates for LNIB.

Vonna Hall. Public and Capital Works Clerk. LNIB. Merritt BC. Provided utility service information.

APPENDIX A

FIGURES



LEGEND

RESERVE FOOTPRINT

NOTES:

Airphoto taken from Google Earth, December 2010

No.	Revision/Issue	Date

COLUMBIA ENVIRONMENTAL

Figure 1
Site Location

LNIB / INAC
Phase I
Environmental Site Assessment
Speous IR #8

Project	Sheet
10-0374	
Date: January, 2011	
Drawn By: SZ / Checked By: DS/DD	

LEGEND

- AST
- FENCE
- GRAVEL ROAD
- RESERVE BOUNDARY
- SURFACE / GROUNDWATER FLOW DIRECTION

NOTES:

All elevations in metres (m)

Locations of site features were taken from:
1. Aerial photographs
2. GPS data points, and
3. Visual observations / adjustments of GPS waypoints and site features

No.	Revision/Issue	Date

COLUMBIA ENVIRONMENTAL

Figure 2
Site Plan

LNIB / INAC
Phase I
Environmental Site Assessment
Speous IR #8

Project	10-0374	Sheet
Date	January, 2011	
Drawn By: SZ	Checked By: DS/DD	

APPENDIX B

BC ONLINE SITE REGISTRY RESULTS

Site Registry **Nil Search**

For: [PA95213] [COLUMBIA ENVIRONMENTAL CONSULTING LTD] Jan 04, 2011

As Of: JAN 02, 2011 Check for Prints 04:27:41 PM

Main Menu | Return | | | Print | Help ?

Folio:

Area Nil Search

As of JAN 02, 2011, no records from Site Registry
fall within 0.5 kilometers of coordinates
Latitude 50 degrees, 07 minutes, 38.1 seconds, and
Longitude 120 degrees, 59 minutes, 25.2 seconds.

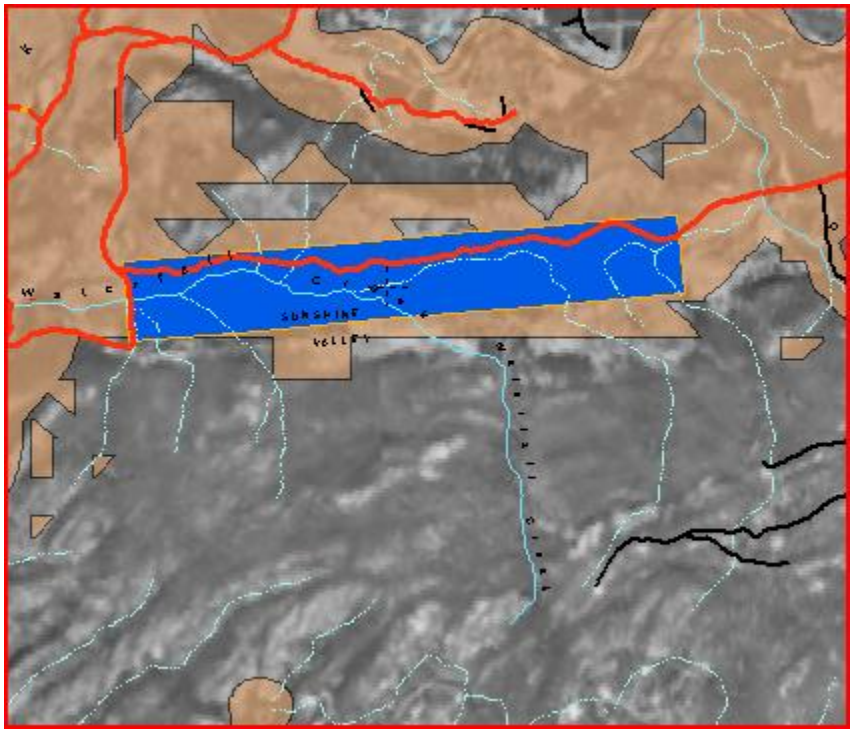
You have been charged for this information.

Sites may be revealed by searching with alternate search methods. For example, a site not revealed in an Area search may be revealed by searching with another piece of information such as PID, PIN, Address or Crown Lands File Number.

APPENDIX C

CORRESPONDENCE

Speous IR #8 (Center 642599.11 5554638.10) no archaeological sites but high potential for previously unrecorded archaeological materials.



Hi Carmen here is the info you requested last Friday I hope this helps with your assessment. The information is from 2005-2010.

2005	88 total calls 18 on the reserve land and 8 of those were grass and debris fires
2006	97 total calls 26 on the reserve land and 2 were structural 2 natural gas leaks and 8 grass/debris fires
2007	66 total calls 14 on the reserve land and 4 were structural and 2 grass/debris fires
2008	97 total calls 31 on the reserve land and 1 car fire 8grass/debris and 1 natural gas leak
2009	145 total calls 21 on the reserve land 2grass/debris and 7 chip piles (industrial type)
2010	130 total calls 31 on the reserve land 2 natural gas leaks 6 chip piles (industrial type) and 7 grass/debris

The remaining on the reserve would be medical type calls.

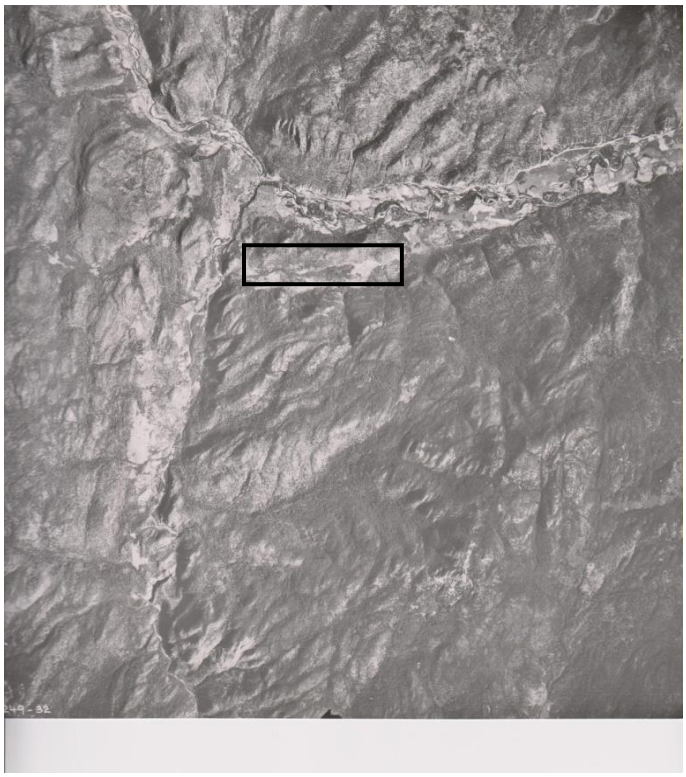
Thanks, Lindsay Tighe

Fire Chief L.N.I.B

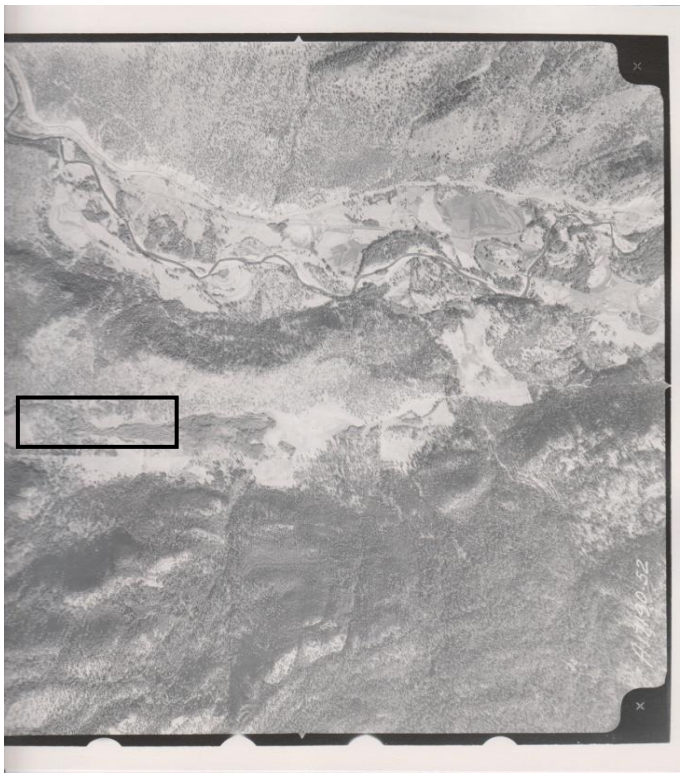
APPENDIX D

AERIAL PHOTOGRAPHS

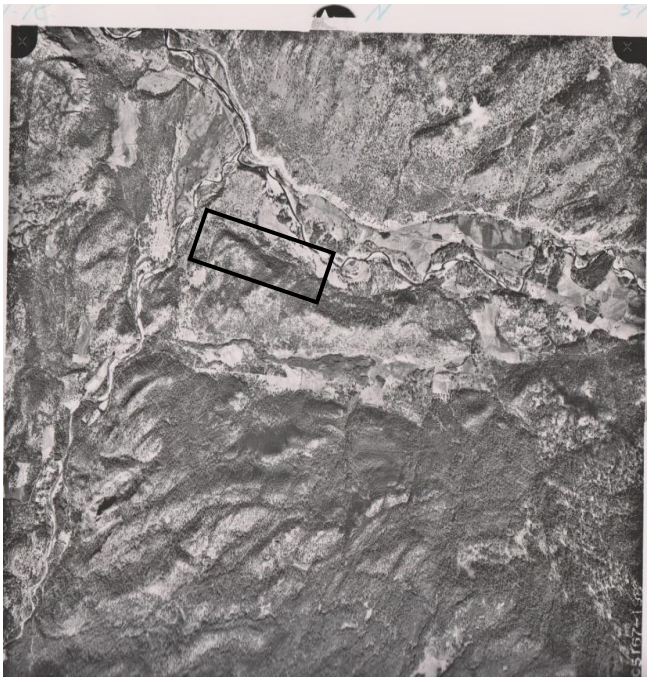
Photograph 1. 1948 Aerial Photograph BC 623_82



Photograph 2. 1951 Aerial Photograph A13249-32



Photograph 3. 1960 Aerial Photograph A17190-52



Photograph 4. 1965 Aerial Photograph BC 5167-198

Photograph 5. 1972 Aerial Photograph RSA30518-19

Photograph 6. 1991 Aerial Photograph 30 BCC91051-123

APPENDIX E

POTENTIAL SPECIES AT RISK

Table B: BC CDC Search Results for Species within the Bunchgrass Ecosystem (CDC, 2010)[1]

Scientific Name	English Name	COSEWIC*	BC List**
Amphibians			
Spea intermontana	Great Basin Spadefoot	T (Apr 2007)	Blue
Chrysemys picta pop. 2	Western Painted Turtle - Intermountain - Rocky Mountain Population	SC (Apr 2006)	Blue
Fish			
Acrocheilus alutaceus	Chiselmouth	NAR (May 2003)	Blue
Catostomus platyrhynchus	Mountain Sucker	NAR (May 1991)	Blue
Salvelinus confluentus	Bull Trout		Blue
Reptiles			
Coluber constrictor	Racer	SC (Nov 2004)	Blue
Pituophis catenifer deserticola	Gopher Snake, *deserticola* subspecies	T (May 2002)	Blue
Crotalus oreganus	Western Rattlesnake	T (May 2004)	Blue
Birds			
Ardea herodias herodias	Great Blue Heron, *herodias* subspecies		Blue
Buteo swainsoni	Swainson's Hawk		Red
Falco mexicanus	Prairie Falcon	NAR (May 1996)	Red
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	SC (Apr 2007)	Red
Grus canadensis	Sandhill Crane	NAR (May 1979)	Yellow
Numenius americanus	Long-billed Curlew	SC (Nov 2002)	Blue
Asio flammeus	Short-eared Owl	SC (Mar 2008)	Blue
Athene cunicularia	Burrowing Owl	E (Apr 2006)	Red
Megascops kennicottii macfarlanei	Western Screech-Owl, *macfarlanei* subspecies	E (May 2002)	Red
Otus flammeolus	Flammulated Owl	SC (Apr 2010)	Blue
Melanerpes lewis	Lewis's Woodpecker	T (Apr 2010)	Red
Sphyrapicus thyroideus thyroideus	Williamson's Sapsucker, *thyroideus* subspecies	E (May 2005)	Red

Scientific Name	English Name	COSEWIC*	BC List**
Contopus cooperi	Olive-sided Flycatcher	T (Nov 2007)	Blue
Eremophila alpestris merrilli	Horned Lark, *merrilli* subspecies		Blue
Hirundo rustica	Barn Swallow		Blue
Catherpes mexicanus	Canyon Wren	NAR (May 1992)	Blue
Oreoscoptes montanus	Sage Thrasher	E (Nov 2000)	Red
Chondestes grammacus	Lark Sparrow		Red
Spizella breweri breweri	Brewer's Sparrow, *breweri* subspecies		Red
Dolichonyx oryzivorus	Bobolink	T (Apr 2010)	Blue
Euphagus carolinus	Rusty Blackbird	SC (Apr 2006)	Blue
Mammals			
Perognathus parvus	Great Basin Pocket Mouse		Red
Corynorhinus townsendii	Townsend's Big-eared Bat		Blue
Euderma maculatum	Spotted Bat	SC (May 2004)	Blue
Myotis ciliolabrum	Western Small-footed Myotis		Blue
Myotis thysanodes	Fringed Myotis	DD (May 2004)	Blue
Gulo gulo luscus	Wolverine, *luscus* subspecies	SC (May 2003)	Blue
Martes pennanti	Fisher		Blue
Taxidea taxus	American Badger	E (May 2000)	Red
Ursus arctos	Grizzly Bear	SC (May 2002)	Blue
Ovis canadensis	Bighorn Sheep		Blue
Invertebrates			
Stylurus olivaceus	Olive Clubtail		Red
Hesperia nevada	Nevada Skipper		Blue
Pholisora catullus	Common Sootywing		Blue
Satyrium californica	California Hairstreak		Blue
Danaus plexippus	Monarch	SC (Apr 2010)	Blue
Promenetus umbilicatellus	Umbilicate Sprite		Blue
Vallonia cyclophorella	Silky Vallonia		Blue
Hemphillia camelus	Pale Jumping-slug		Blue
Vascular Plants			
Azolla mexicana	Mexican mosquito fern	T (Nov 2008)	Red

Scientific Name	English Name	COSEWIC*	BC List**
Dryopteris cristata	crested wood fern		Blue
Ophioglossum pusillum	northern adder's-tongue		Blue
Agoseris lackschewitzii	pink agoseris		Blue
Arabis lignifera	woody-branched rockcress		Blue
Arabis sparsiflora	sickle-pod rockcress		Red
Astragalus lentiginosus	freckled milk-vetch		Blue
Atriplex argentea ssp. *argentea*	silvery orache		Red
Atriplex truncata	wedgescale orache		Red
Castilleja cusickii	Cusick's paintbrush		Red
Centaurium exaltatum	western centaury		Red
Chamaerhodos erecta ssp. *nuttallii*	American chamaerhodos		Blue
Chamaesyce serpyllifolia ssp. *serpyllifolia*	thyme-leaved spurge		Blue
Chenopodium atrovirens	dark lamb's-quarters		Red
Crepis atribarba ssp. *atribarba*	slender hawksbeard		Red
Crepis modocensis ssp. *modocensis*	low hawksbeard		Red
Crepis modocensis ssp. *rostrata*	western low hawksbeard		Red
Epilobium halleanum	Hall's willowherb		Blue
Gaura coccinea	scarlet gaura		Red
Gayophytum humile	dwarf groundsmoke		Blue
Hackelia diffusa	spreading stickseed		Blue
Hedeoma hispida	mock-pennyroyal		Red
Hutchinsia procumbens	hutchinsia		Blue
Hypericum scouleri ssp. *nortoniae*	western St. John's-wort		Blue
Iva axillaris	poverty-weed		Red

Scientific Name	English Name	COSEWIC*	BC List**
Leptosiphon septentrionalis	northern linanthus		Blue
Lupinus argenteus var. *laxiflorus*	silvery lupine		Red
Lupinus bingenensis var. *subsaccatus*	Suksdorf's lupine		Red
Mimulus breviflorus	short-flowered monkey-flower		Red
Myriophyllum ussuriense	Ussurian water-milfoil		Blue
Navarretia intertexta	needle-leaved navarretia		Red
Polygonum polygaloides ssp. *kelloggii*	Kellogg's knotweed		Blue
Pyrola elliptica	white wintergreen		Blue
Salix boothii	Booth's willow		Blue
Salix tweedyi	Tweedy's willow		Blue
Sidalcea oregana var. *procera*	Oregon checker-mallow		Red
Sphaeralcea coccinea	scarlet globe-mallow		Red
Allium geyeri var. *tenerum*	Geyer's onion		Blue
Carex hystericina	porcupine sedge		Blue
Carex sychnocephala	many-headed sedge		Blue
Cyperus squarrosus	awned cyperus		Blue
Epipactis gigantea	giant helleborine	SC (May 1998)	Blue
Hesperostipa spartea	porcupinegrass		Red
Juncus confusus	Colorado rush		Red
Melica spectabilis	purple oniongrass		Blue
Olsynium douglasii var. *inflatum*	satinflower		Red
Poa fendleriana ssp. *fendleriana*	mutton grass		Red
Sphenopholis obtusata	prairie wedgegrass		Red
Sporobolus compositus var. *compositus*	rough dropseed		Blue

Scientific Name	English Name	COSEWIC*	BC List**
Stuckenia vaginata	sheathing pondweed		Blue
Non Vascular Plants			
Bryoerythrophyllum columbianum	Columbian carpet moss	SC (May 2004)	Blue
Microbryum vlassovii	nugget moss	E (Nov 2006)	Red
Pterygoneurum kozlovii	alkaline wing-nerved moss	T (Nov 2004)	Red

* SC=Special Concern; T=Threatened; E=Endangered; XT=extirpated

** Blue= of special concern, Red= extirpated, endangered or threatened in British Columbia

APPENDIX F

PHOTOGRAPHIC DOCUMENTATION

Photo 1. Overview of Speous IR #8 facing northwest. Note the only residence on the reserve and open field occasionally used as a pasture.

Photo 2. Overview of former house location facing southwest.

Photo 3. Overview of Speous IR #8 former burnt residence facing northeast. Note the eastern reserve boundary noted by the fence and the wooden grave marker denoting the former residence location.

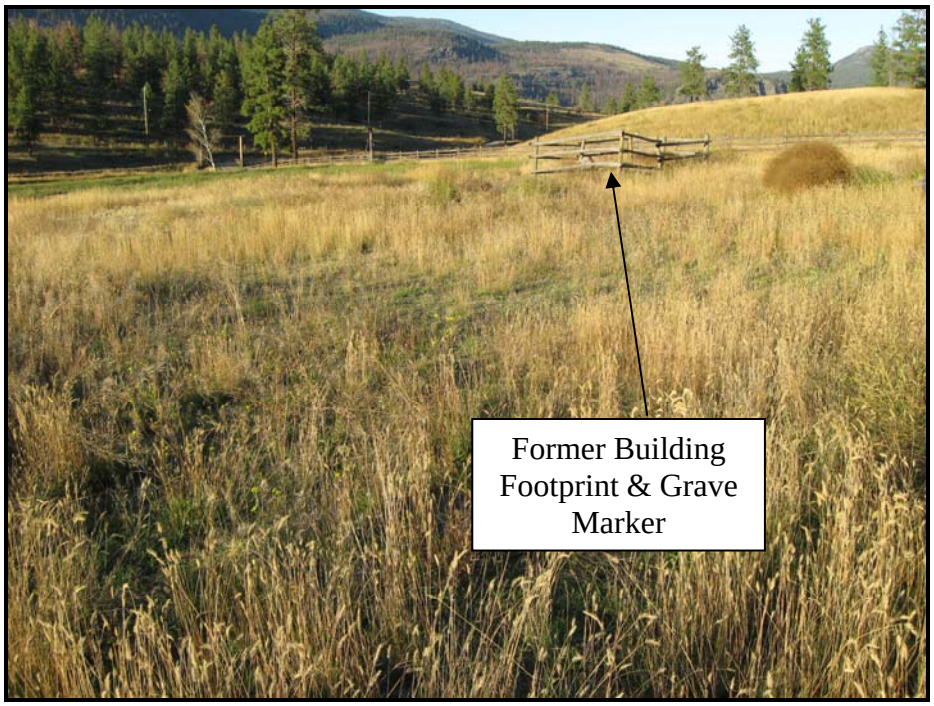


Photo 4. View of 1270L AST facing east at the current residence on Speous IR#8.

APPENDIX G

PREVIOUS REPORTS

APPENDIX H

AST LOGS

CHECKLIST FOR ROUTINE INSPECTIONS OF ABOVEGROUND STORAGE TANKS

Location: Speous IR 8 AST **Date: 09/29/2010**

Tank Size: 1270L **Distance from Buildings or other tanks: > 5m**

Stain Area: 0.8 meter diameter stain below **Tank ID #:**

Question					Comments/Observations
Tanks, pipes and dispensing stations are appropriately labeled, with labels in good condition.				N	No labels
Tank support structure and vents are free of rust, weeps, wet spots, or excessive dents on the tank's surface.				Y	Some rust
Tank is free of drips or signs of leakage around valves, piping and gauges.				N	Weeping Hose and bung
Tank gauges are in good repair, with no evidence of cracking, sticking or freezing.				Y	
Tank fill pipe is free of blockage and in good condition.				Y	
Tank vents are in good repair and free of obstructions (e.g.: ice or snow)				Y	
Automatic shutoff devices, overfill alarms, float valves and similar spill prevention equipment operating are in good repair				N	No alarms
Tank and pipe coating is in good condition.				Y	Green coating of paint
Corrosion protection and grounding systems are functioning properly and in good repair.				N	Not in place
Vehicular impact protection measures are in good repair.				N	Tanks is located on a bank
Secondary containment dikes, bunkers and berms are in good repair and free of cracks.				N	No secondary containment
Drainage valves and pumps are locked in the closed/off position.				Y	
Secondary containment dikes, bunkers and berms are free from debris accumulated water or snow and cracks and corrosion.				N	No secondary containment
Precautionary signs (e.g.: emergency response requirements, "No Smoking" signs) are present and in good repair.				N	No signs, in private residence
Spill prevention measures (i.e.: spill kits) are available and in close proximity?				N	Not in use
Inventory control records are maintained in accordance with established procedures.				N	Not in use
Additional Notes:					

Inspection Completed By: Summer Zawacky and Carmen Marshall