Line Creek Operations Phase II Project Description

Submitted To:

BC Environmental Assessment Office
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PO Box 9426 Stn Prov Govt
Victoria, BC, V8W 9V1

Pursuant To:

BC *Environmental Assessment Act*

Submitted By:

Teck Coal Limited – Line Creek Operations

August 2009

Teck

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TABLES

FIGURES

APPENDICES

ACRONYMS

AIA	Archaeological Impact Assessment
AOA	Archaeological Overview Assessment
BC	British Columbia
BCEAA	*British Columbia Environmental Assessment Act*
BCEAO	BC Environmental Assessment Office
BRN	Burnt Ridge North
BRS	Burnt Ridge South
CDC	Conservation Data Centre
CEA	Canadian Environmental Assessment
CEAA	*Canadian Environmental Assessment Act*
CLI	Canada Land Inventory
CP	Canadian Pacific
DFO	Fisheries and Oceans Canada (Note: formerly Department of Fisheries and Oceans Canada)
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EMS	Environmental Management System
ESSF	Engelmann Spruce-Subalpine Fir
ESSFdk	Engelmann Spruce-Subalpine Fir dry cool
ESSFdkp	Engelmann Spruce-Subalpine Fir dry parkland
ESSFdkw	Engelmann Spruce-Subalpine Fir dry woodland
HADD	Harmful alteration, disruption or destruction
HCA	*Heritage Conservation Act*
HSR	Horseshoe Ridge
HSRC	Health Safety and Reclamation Code
KNC	Ktunaxa Nation Council
LCO	Line Creek Operations
LOM	Life of mine plan
MEMPR	Ministry of Energy Mines and Petroleum Resources
MM	Mount Michael
Mmtcc	million metric tonnes clean coal
MOE	Ministry of Environment
MPMO	Major Projects Management Office
MSAN	Mine Services Area North
MSAWX	Mine Services Area West Extension
MSdk	Montane Spruce dry cool
NLC	North Line

NLX	North Line Extension
PM_{10}	Particulate matter less than 10 µm (micrometres) in diameter
RDEK	Regional District of East Kootenay
SARA	*Species at Risk Act*
Teck Coal	Teck Coal Limited
the Project	the LCO Phase II Project
TSP	Total Suspended Particulate

1 PROPONENT INFORMATION

Teck Coal Limited (Teck Coal), a division of Teck, is the leading North American producer of steel making and thermal-grade coal. The company operates six open-pit mines in western Canada: Cardinal River, Coal Mountain, Fording River, Greenhills, Elkview and Line Creek. Five of these mines are in the Elk Valley of south-eastern British Columbia (BC); Cardinal River is in west-central Alberta. Together they account for annual production capacity in excess of 25 million tonnes of high-grade metallurgical coal.

The extension of the Line Creek Operations (LCO) is the subject of this Project Description, which has been prepared in accordance with the guidance documents administered by the BC Environmental Assessment Office (EAO) and the Major Projects Management Office (MPMO). The Project is referred to as the LCO Phase II Project (the Project).

1.1 Key Proponent Contacts

The Proponent of the Project is:

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Website: www.teck.com

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For the purposes of the environmental assessment (EA) for the Project, the principal contact person is:

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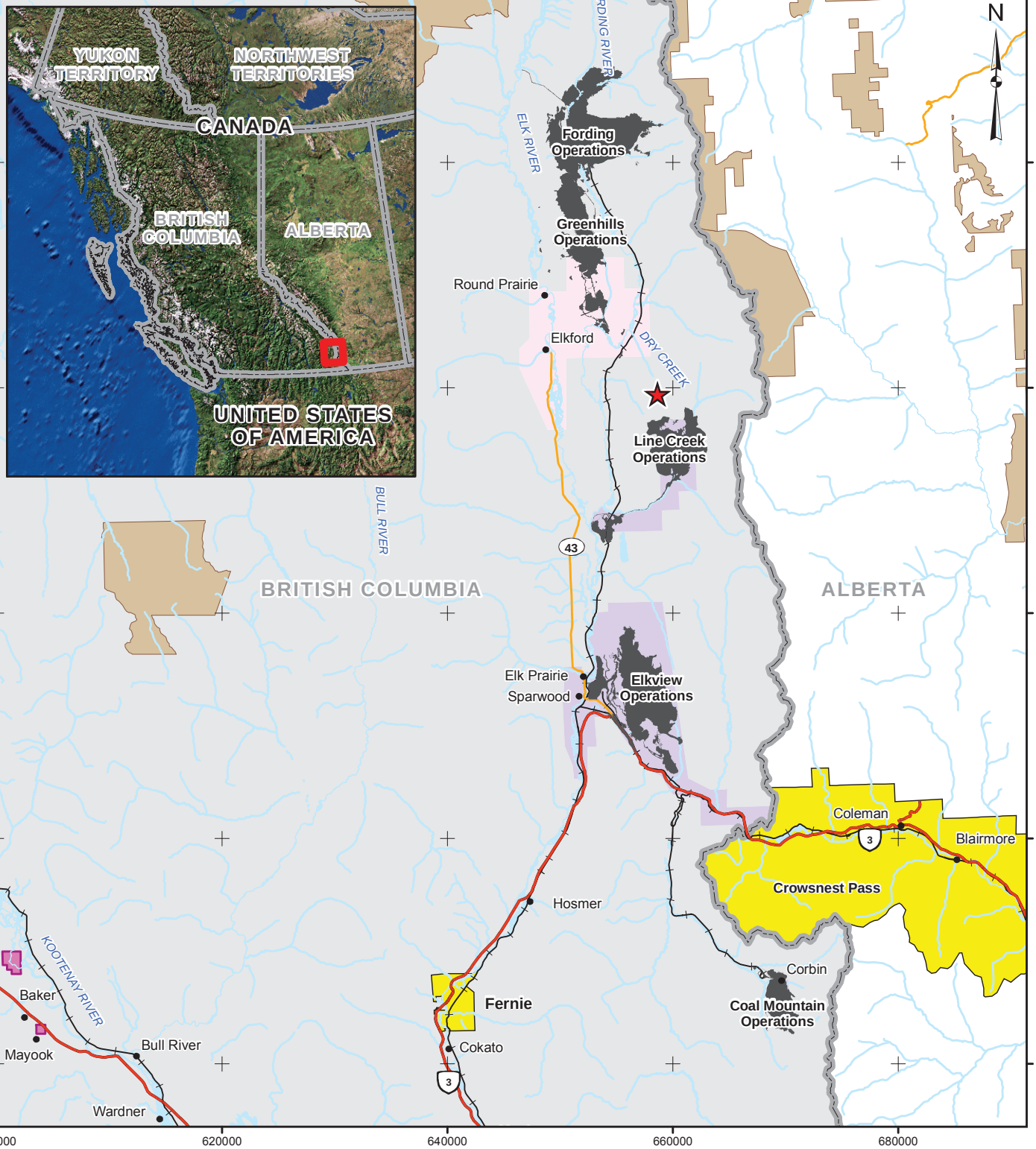
2 PROJECT INFORMATION

2.1 Location

The Project is located within the East Kootenay region in the southeastern portion of BC (Figure 1), immediately north of the existing LCO open pit mine (Figure 2). The centre of the Project footprint is located at approximately 114° 47' 7.35" W and 49° 59' 2.96" N. The Project area is located in the Dry Creek and Grace Creek drainage basins, both tributaries to the Fording River (Figure 2). This area forms part of the Front Ranges of the Canadian Rockies, with elevations reaching over 2,550 metres (m) above sea level. The Project footprint will encompass portions of two peaks, referred to as Burnt Ridge North and Mount Michael. The Project area is located on fee simple land owned by Teck Coal and on Crown land on coal licences held by Teck Coal. Regional context for the Project is presented on Figure 3.

Access to the Project area for the purposes of baseline data collection is north via Highway 43 (Elk Valley Highway) from Sparwood then east on Fording Road to Ewin Creek Road. Access to the Project area for the purposes of construction and operation of the mine will be via the existing LCO, which is accessed from Highway 43 and Line Creek Mine Road, and then along proposed new haul roads as described in Section 2.4.



LEGEND

- COMMUNITY
- PROJECT LOCATION
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- CITY/TOWN
- COAL MINING OPERATION
- EAST KOOTENAY REGIONAL DISTRICT
- FIRST NATIONS RESERVE
- PROVINCIAL PARK

MUNICIPAL DISTRICT

- ELKFORD MUNICIPAL DISTRICT
- SPARWOOD MUNICIPAL DISTRICT

REFERENCE

Provincial boundaries, cities, First Nations Reserves and transportation data obtained from ESRI and DMTI. Protected areas obtained from Geogratis. Hydrography data obtained from IHS Energy. Imagery obtained from WorldSat International.
Projection: UTM Zone 11 Datum: NAD 83

PROJECT
LINE CREEK OPERATIONS
PHASE II

TITLE
PROJECT LOCATION

Teck

PROJECT No. 09-1349-0005			SCALE AS SHOWN	REV. 0
DESIGN	SL	09 Jun. 2009	FIGURE: 1	
GIS	CW	27 Jul. 2009		
CHECK	MO	09 Jun. 2009		
REVIEW	SL	09 Jun. 2009		

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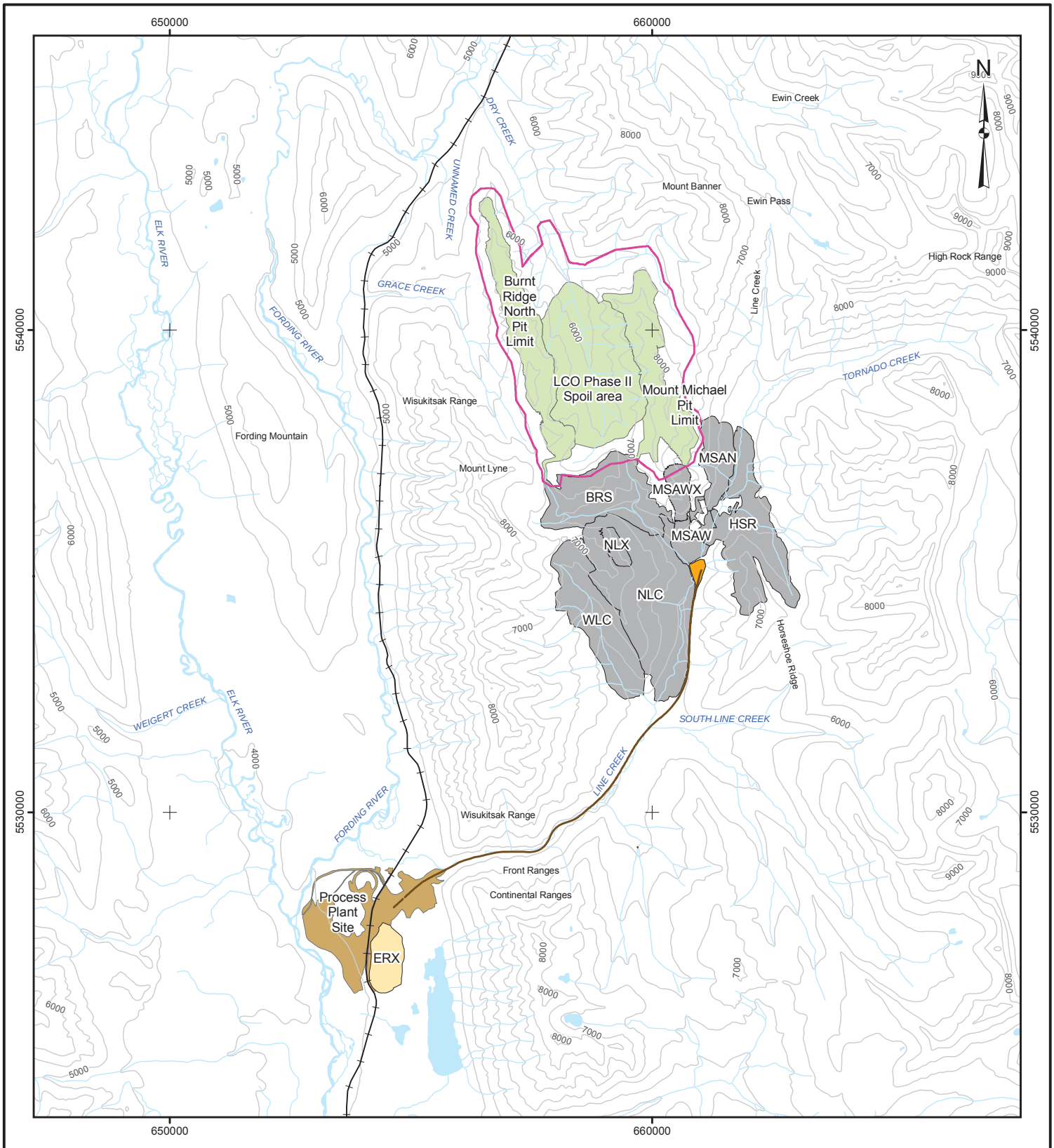

LEGEND

- CANADIAN PACIFIC RAILWAY
- CONTOUR (500 FOOT INTERVAL)
- EXISTING CABLE BELT
- WATERCOURSE
- EXISTING LINE CREEK OPERATIONS DEVELOPMENT AREA
- EXISTING PROCESS PLANT SITE
- EXISTING TRUCK DUMP
- LINE CREEK OPERATIONS PHASE II PROJECT MINING FOOTPRINT
- OPERATIONAL BOUNDARY FOR LINE CREEK PHASE II PROJECT
- PERMITTED COAL REFUSE AREA
- WATERBODY

BRS	BURNT RIDGE SOUTH
ERX	EAST REFUSE EXPANSION
HSR	HORSESHOE RIDGE
MSAN	MINE SERVICES AREA NORTH
MSAW	MINE SERVICES AREA WEST
MSAWX	MINE SERVICES AREA WEST EXTENSION
NLC	NORTH LINE CREEK
NLX	NORTH LINE CREEK EXPANSION
WLC	WEST LINE CREEK

REFERENCE

1: 50,000 scale hydrography and elevation data obtained from GeoGratis.
Projection: UTM Zone 11 Datum: NAD 83

3,500 0 3,500

SCALE 1:110,000 METRES

PROJECT

LINE CREEK OPERATIONS
PHASE II

TITLE

PROJECT FOOTPRINT AND EXISTING LINE CREEK OPERATIONS

Teck

PROJECT No. 09-1349-0005			SCALE AS SHOWN	REV. 0
DESIGN	SL	25 May 2009	FIGURE: 2	
GIS	CW	31 Jul. 2009		
CHECK	MO	31 Jul. 2009		
REVIEW	SL	31 Jul. 2009		

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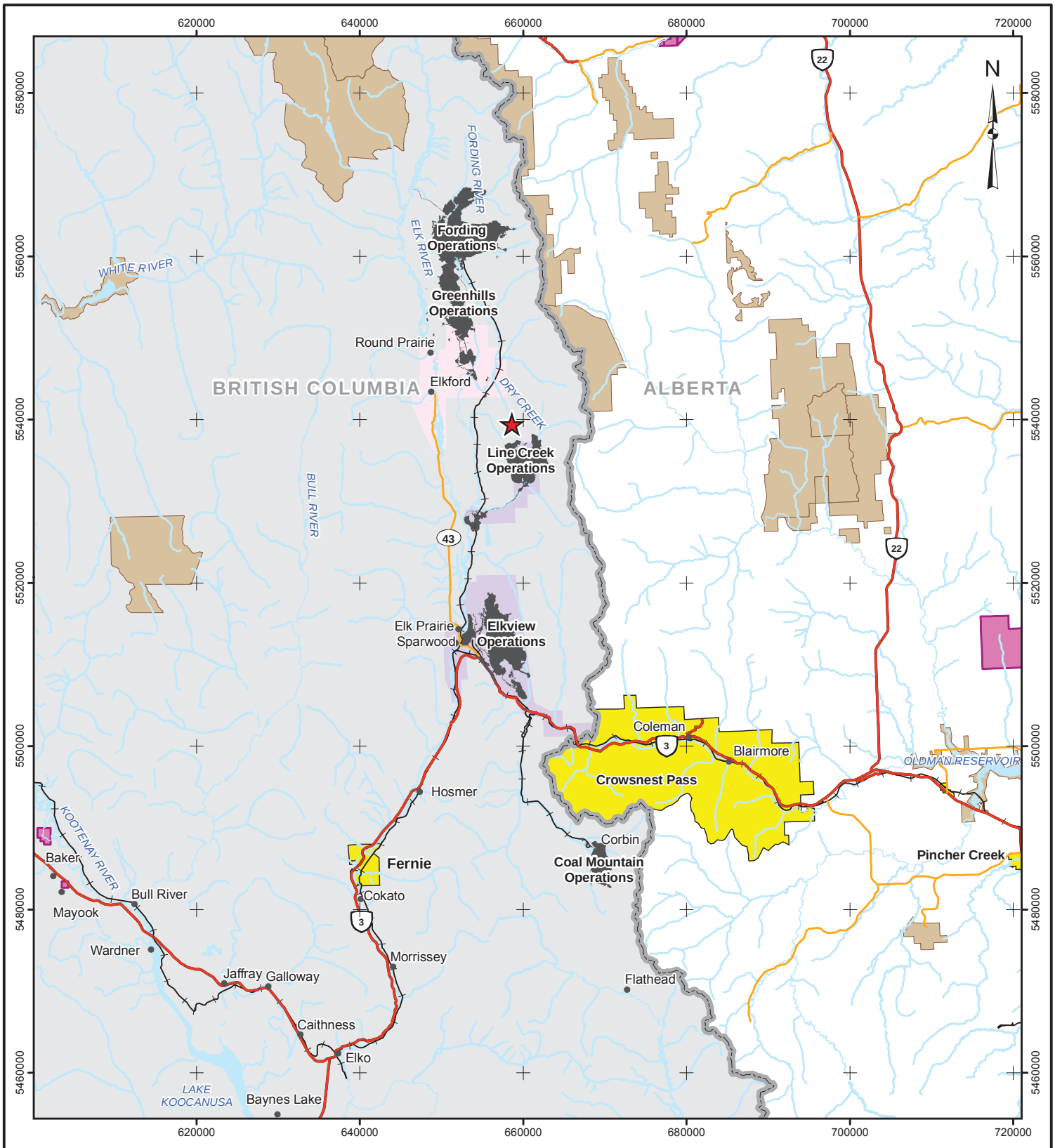

LEGEND

- COMMUNITY
- PROJECT LOCATION
- PRIMARY HIGHWAY
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- FIRST NATIONS RESERVE
- PROVINCIAL PARK

MUNICIPAL DISTRICT

- ELKFORD MUNICIPAL DISTRICT
- SPARWOOD MUNICIPAL DISTRICT

15 0 15

SCALE 1:650,000 KILOMETRES

REFERENCE

Provincial boundaries, cities, First Nations Reserves and transportation data obtained from ESRI and DMTI.
Protected areas obtained from Geogratis. Hydrography data obtained from IHS Energy.
Projection: UTM Zone 11 Datum: NAD 83

PROJECT

LINE CREEK OPERATIONS
PHASE II

TITLE

REGIONAL CONTEXT

Teck

PROJECT No. 09-1349-0005			SCALE AS SHOWN	REV. 0
DESIGN	SL	25 May 2009	FIGURE: 3	
GIS	CW	27 Jul. 2009		
CHECK	MO	09 Jun. 2009		
REVIEW	SL	09 Jun. 2009		

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2.2 Project History and Overview

Mining of metallurgical coal in the region began in the late 1890's at the Coal Creek Mine near Fernie, BC. Development continued throughout the 1900's and today the remaining Teck Coal operations at Elkview, Coal Mountain, Greenhills, Line Creek and Fording River are all that remain of the original developments. These operations have survived the historic market cycles and numerous ownership changes that have occurred over the years.

The existing Line Creek mine has been in production for the past 26 years and has produced approximately 78 million metric tonnes of primarily metallurgical coal for sale to various customers around the world. The mining operations and associated infrastructure at Line Creek have occurred primarily within the Line Creek valley.

Operations at Line Creek began in 1982 after the successful application to the Ministry of Energy and Mines for the initial development of the Line Ridge under the current C-129 permit. The environmental assessment for this project was completed by BC Research in the late 70's. In 1984 an application to amend the existing Ministry of Mines approval was made for an expansion to the original mine. This expansion resulted in an increase in processing capacity to 3.0 MMtcc annually as well as expanded the operating areas and increased the minable reserve and life expectancy of the operation beyond the previous permit. Subsequently there have been several modifications to the existing permit as new operating areas and supporting infrastructure have been required.

Today, the LCO support about 370 employees and contributes significantly to the local economies of Sparwood, Elkford, Crowsnest Pass and Fernie through employment, purchases in those communities and through a formal mine-property tax sharing pool which contributes $9 million annually to the three Elk Valley Communities and the Regional District of East Kootenay Area A. Reserves in the current Line Creek operational areas will sustain production requirements to the year 2014. In order to sustain production into the future, development of new reserves within the areas adjacent to the existing LCO are required.

Evaluation of the reserves in the proposed LCO Phase II Project area has been ongoing for several years and the Project is considered a "brownfields" opportunity as the area has been previously disturbed by oil and gas exploration, timber harvesting and mining exploration. The Project area is located immediately adjacent to the Burnt Ridge South (BRS) and Mine Services Area North (MSAN) pits in the northern portion of the existing LCO area. As an extension of the current operations, the Project will mine the same coal deposits being extracted by existing mining operations and will use existing mine facilities to process and load the coal. Figures 2 and 3 illustrate the location of the proposed development in relation to current operations and the surrounding area.

The Project includes the development of two new operating areas referred to as Burnt Ridge North (BRN) and Mount Michael (MM). These areas are estimated to provide an aggregate total of approximately 52 million metric tonnes of clean coal (Mmtcc) and will extend overall mine life by approximately 20 years. The proposed development will generate about 600 million m^3 of waste rock. Waste rock will be placed in both existing operational spoil areas (including the Mine Services Area West Extension [MSAWX] and BRS pits) and new spoil areas within the upper reaches of the Dry Creek valley. The conceptual plan for development of the Project will result in a mining footprint approximately 6 km long by 3 km wide and totalling an area of approximately 1,100 hectares. Within this new disturbance area there will be:

- transportation and electrical transmission infrastructure for coal and waste hauls, pit access and power line right of ways;
- waste spoils both in current operating areas and in the Dry Creek valley;
- surface water management systems including outfalls and other drainage structures; and
- coal stockpile and sorting areas.

An operational boundary totalling an area of approximately 1,800 ha is also established around the mining footprint (Figure 2). This area is established to allow for construction of downstream water management features, including any required settling pond(s), and incidental rock accumulation associated with normal waste rock dumping and mining activities.

The Project will also use existing infrastructure in place at LCO including waste and coal haul roads, mine access roads, coal processing facilities, Canadian Pacific (CP) rail line and load out loop, explosive storage and delivery systems and office facility. The Project will not require additional plant capacity beyond its' current design and approved operating conditions, and will not result in an increase to the operational productive capacity of LCO (refer to Section 2.4.3).

2.3 Deposit Geology and Resource Characterization

2.3.1 Regional Stratigraphy

The general stratigraphic sequence of the Project area, beginning with the oldest sediments is: Rundle Group, Rocky Mountain Group, Spray River Formation, Fernie Formation, the Kootenay Group and the Blairmore Group [Samuelson 1996].

The Kootenay Group strata, which contain all of the coal seams, consist of the Morrissey Formation, the Mist Mountain Formation and the Elk Formation [Gibson 1979a]. While the entire Kootenay Group has some coal seams within it, technically all the economic seams occur in the Mist Mountain Formation. The Moose Mountain Member of the Morrissey Formation and the Elk Formation lie respectively under and over the main coal-bearing Mist Mountain formation.

The Moose Mountain Member is a resistant, generally cliff-forming unit comprised of massive, medium to coarse-grained, medium-gray weathering sandstone. There are commonly two coal horizons within this sandstone, but their small thickness (rarely over one metre) and the overlying massive sandstone make them unattractive for economic consideration. The distinctive nature and prominence of this unit makes it an easily traceable marker horizon throughout the Elk Valley Coalfield of southeastern BC.

The Mist Mountain Formation is the main coal-bearing unit of the Kootenay Group. It overlies the Moose Mountain Member with an abrupt but conformable contact. It is comprised of a generally recessive, interbedded sequence of brownish tinted sandstones, gray to brown siltstones, gray and black shales, gray mudstones and coal seams. In the Elk Coalfield this formation ranges in thickness between 400 and 660 m. The coal seams attain a maximum individual thickness of over 10 m and a lateral extent of several km.

The Elk Formation lies conformably but abruptly over the Mist Mountain Formation. It consists of an interbedded sequence of cliff forming sandstones, shales and siltstones and thin (less than 1 m), sporadic coal seams. The exact base of the Elk Formation is somewhat arbitrary as it is defined as being “the base of the first major sandstone or conglomerate above the uppermost major coal seam in the Mist Mountain formation” [Gibson 1979a]. Therefore the stratigraphic position of the Mist Mountain-Elk formational contact may vary slightly between Project areas.

The following descriptions of BRN and MM are based on Gibson 1979, Samuelson 1996, Price 1966, Wheeler 1968 and White 1982.

2.3.2 Burnt Ridge North Structure

Burnt Ridge North lies on the west limb of the Alexander Creek Syncline. The strike of the bedding is roughly north-northwest with the dips on the west side of the ridge ranging between 30 and 50 degrees to the east. The dips steepen to the east so that on the east side of the ridge the dips range from 45 degrees to vertical. It appears that initially the beds steepen with depth before flattening to the east into the axis of the Alexander Creek Syncline.

While the major structure of the area is the Alexander Creek syncline, mapping in the area indicates that a myriad of secondary structures have been superimposed on the west limb of the syncline. Folded and faulted areas have been mapped along the east side of Burnt Ridge. These areas are characterized by drag folds in anticline/syncline pairs, minor faulting, crushed and sheared zones and overturned bedding.

There are seven major coal seams occurring in the section ranging from thickness of 1 to 22 m representing a total reserve volume of 31 Mmtcc.