

**EXECUTIVE SUMMARY**

Project Name: **Echo Hill**, a proposed coal mine in northeastern British Columbia (Figure ES-1)

Proponent: Hillsborough Resources Limited,  
Suite 950, 1090 West Georgia Street,  
Vancouver, British Columbia, V6E 3V7  
Telephone: (604) 684-9288  
Facsimile: (604) 684-3178  
Internet: [www.hillsboroughresources.com](http://www.hillsboroughresources.com)

Principal Contact: Gary Gould, Vice President  
Email: [gbg@hillsboroughresources.com](mailto:gbg@hillsboroughresources.com)  
Phone: (604) 684-9288 or (250) 286-3224  
Facsimile: (604) 684-3178

The Echo Hill Project ("Project") is located about 44 highway kilometres north of Tumbler Ridge, British Columbia near Highway 52 (the Heritage Highway) between Tumbler Ridge and Dawson Creek (Figure ES-2). The Project site is located within National Topographic System (NTS) map 93P/37, at approximately latitude 55° 22' 01" N and longitude 120° 48' 10" W and at about 1000 to 1100 metres elevation above mean sea level.

The proponent for the Project is Hillsborough Resources Limited ("Hillsborough"). Hillsborough is a wholly-owned subsidiary of the Vitol group of companies, a private energy trading company.

Exploration of the deposit dates from 1978 when the property was staked and drilled by Gulf Canada Resources. Gulf Canada subsequently let the claims lapse and the property was re-staked by Hillsborough which carried out further exploration and drilling continuing up to the present time.

A project at this location was submitted into the BC environmental assessment process by AES Wapiti Energy Corporation (a joint venture between Hillsborough and AES Power Corporation) in 2006. At that time the project was presented as a 700,000 tonne per year surface coal mine with a thermal electric power plant. A terms-of-reference (now Application Information Requirements [AIR]) was submitted and Section 11 order was received from the British Columbia Environmental Assessment Office ("BCEAO"), but the project was cancelled in 2007 following passage of legislation in British Columbia requiring net zero greenhouse gas emissions from power facilities. In June 2012 Hillsborough requested that that application be withdrawn from the British Columbia environmental assessment process pending submission of this Project Description.

The Echo Hill Project will produce between 1.0 and 1.5 million tonnes of product coal per annum via the combination of contour mining and highwall auger mining; as such, it is expected that an environmental impact assessment could be required. Physical works related to the Project (Figure ES-6) are proposed to consist of:

- *Contour and highwall auger mine: coal will be sequentially exposed (and the area will be progressively reclaimed) along approximately 42km of subcrop (325 hectare surface area) and to a depth of 15 to 20 metres. Highwall augering will extract additional reserves up to 220 metres in from the exposed coal face. Mining is proposed at a rate of 2,700 to 4,000 tonnes per day (1.0 to 1.5 million tonnes per annum), with a mine life of approximately 10 to 14 years. The opportunity to extend the mine life exists through exploration on Coal Licences held adjacent the Project region.*
- *An office, mine dry and maintenance facilities: associated facilities and infrastructure needed for the life of the project are expected to include a maintenance shop, warehouse and administration complex, generator, fuel storage, and storage and laydown areas. These facilities will be supported by related water and power infrastructure.*
- *Mine access and haul roads: access to the site facilities noted above will be by existing roads. Access to the mine working areas will be by temporary haul roads.*
- *A coal handling and storage site: coal will be stockpiled, crushed and screened onsite to provide a thermal coal product for sale.*
- *Water management structures: where possible water diversions will direct runoff water away from the mine workings and mine impacted water will be directed to water management structures for treatment prior to being released to the environment.*
- *Use of existing highway roads to a train load-out: product coal from the mine will be hauled to an existing train loading facility on existing roads and highway.*

Primary construction phase activities will include:

- *Completion of engineering studies and environmental approvals processes*
- *Procurement and movement of construction materials and mining equipment to identified laydown areas*
- *Establishment of site drainage and water management structures*
- *Construction of associated buildings, facilities and access roads*
- *Initiation of contour mine development: timber clearing, cover soil salvage and overburden removal*

Operations phase activities are anticipated to include:

- *Overburden removal to expose the coal seam and coal mining from the contour mine and highwall augering*
- *Coal stockpiling, crushing, screening and hauling to the train loadout facility*
- *Progressive mine reclamation*
- *Ongoing environmental management*

Decommissioning phase activities will include reclamation of the remaining mine disturbances and closure and removal of mine infrastructure. Ongoing environmental monitoring and site management will occur as needed after decommissioning activities are complete.

A preliminary schedule for the Project has the construction phase commencing in the second quarter of 2015 (after completion of the Federal and Provincial EA processes). The operation and production phases are planned to start in the end of the second quarter of 2015 and continue for the 10 to 14 year mine life. Closure and decommissioning is anticipated to begin in 2025 at the earliest.

Several aspects of the Project are anticipated to require completion of the British Columbia provincial EA process coordinated by the British Columbia Environmental Assessment Office (“BCEAO”). Part 3 of the *Reviewable Projects Regulation* under the *BC Environmental Assessment Act* identifies new coal mining facilities with a production capacity  $\geq 250,000$  tonnes/year (clean coal or raw coal) as requiring an environmental assessment certificate. The project proposes a production level of 1.0 to 1.5 million tonnes of raw coal per year and is therefore expected to be subject to a BC environmental assessment.

The project may require completion of a Federal Environmental Assessment (“EA”), pursuant to the Canadian Environmental Assessment Act, 2012 (“CEAA”). Under the CEAA (paragraph 84(3)) the *Regulations Designating Physical Activities* identifies “*the construction, operation, decommissioning and abandonment of a coal mine with a coal production capacity of 3,000 tonne per day or more*” as a type of project that may be subject to a federal environmental assessment. The proposed Project will produce between 2,700 and 4,000 tonne per day and have an estimated annual groundwater extraction rate of 30,000 to 50,000 m<sup>3</sup>. If the CEAA determines that a Federal EA is required, the Project Description will be used to develop Environmental Impact Statement Guidelines, which defines the scope of the Federal EA. The proposed Project is not within a region that has been the subject of federal regional environmental studies.

It is fully expected that the same body of information will be used to inform both the Provincial and Federal EA processes. Where possible, consultation activities pursuant to both processes will be coordinated and used to inform both EA processes.

#### *Local Communities Proximate to the Project (Figure ES-3)*

##### *Aboriginal Groups*

Although the proposed Project footprint does not overlap with any Indian Reserves, there are five Aboriginal groups in the Project region which are expected to have an interest in the Project going forward. The proposed Project site falls within the Treaty 8 Region. Initial consultation efforts have commenced with the four identified First Nations, including discussion on draft Protocol Agreements.

- Halfway River First Nation – community located 160km northwest of the Project

- Saulteau First Nations – community located 80km northwest of the Project
- West Moberly First Nations – community located 80km northwest of the Project
- McLeod Lake Indian Band – community located 150km southwest of the Project

#### *Municipalities*

There are a number of local municipalities which are expected to have an interest in the Project, including:

- Tumbler Ridge – located 35km south of the Project
- Dawson Creek – located 55km north of the Project
- Kelly Lake – located 50km east of the Project
- Chetwynd – located 60km northwest of the Project

Permanent residences associated with agricultural activity are located 25 kilometres north of the Project area.

#### *Mineral Title and Land*

The Project property includes a total of 31 Coal Licences - 30 are currently held by Hillsborough (owner number 137113) and one is under application by Hillsborough. Together, the 31 Coal Licences cover a total of 22,512 hectares (Figure ES-2).

#### *Project Rationale*

The Project will involve the development and operation of a thermal coal mine. Demand for thermal coal is growing to support industrialization and power generation in countries such as China, Korea, Japan and India. Meanwhile new technologies are providing more cost-effective solutions for cleaner emissions from coal-fired power plants, which could expand markets for this coal. The expected market for the Project coal will be export markets in Asia, shipped through the Ridley Terminal in Prince Rupert, B.C.

#### *Resource Estimate*

The measured plus indicated reserves total 80,108,000 tonnes with an additional inferred resource of 35,246,000 tonnes.

### *Capital Cost and Taxation*

The Pre-Feasibility Study completed in 2012 estimated the initial capital cost for the Project at CAN \$35 million. The Project will contribute to the BC and Federal Government by way of corporate taxes, provincial net proceeds and net revenue taxes, mineral taxes, sales taxes, income taxes and employment taxes.

### *Mining Method*

The proposed mining method for the Project is a combination of contour mining and highwall auger mining. The contour mining involves mining to either an economic cut-off based on the thicknesses of the coal seam and overlying overburden and mining costs or to a minimum bench width of 30m (to allow sufficient room for the highwall-augering equipment). The coal reserve for the contour mining portion of the plan is 6.4 million tonnes. The mining reserves for the highwall-auger portion of the plan is a function of the depth that the auger will operate to and the spacing of the auger holes to provide a stable roof. The coal reserve for the highwall-auger portion of the plan is 6.6 million tonnes.

The contour mining operation has a total footprint of about 325 hectares over the planned 10 to 14 year life of the mining operation. The surface disturbance from the contour mining will be temporary, with reclamation advancing with the mining as it progresses along the contour. The active mining area will have a footprint of about 20 hectares at any one time. An additional temporary disturbance of 80 ha for surface facilities and temporary site roads will be required.

Explosives are not expected to be required either for removal of overburden or coal mining.

The proposed plan is to produce a raw coal product, with the only beneficiation being crushing and screening to remove oversize parting and dilution from mining. This eliminates the production of tailings (typically associated with wet processing) and the need for a tailings management plan. Parting and coal rejects from the crushing and screening operation will be backfilled in mine out contour benches as part of the reclamation.

### *Reclamation and Closure*

The proposed mining method lends itself to progressive reclamation due to the progression of the contour bench development and associated backfilling following the highwall-augering coal removal. Once backfilled and recontoured the completed benches will be planted. Progressive reclamation will minimize the active mining footprint, limiting the area exposed to possible erosion and impact on water quality.

The projected end land use is forage and shelter for wildlife and commercial forestry with potential for recreation and traditional and cultural use. End land use objectives will be discussed through consultation as the Project moves through the environmental certificate application process.

### *Access*

The existing Provincial Highway 52 and the Moore Forest Service Road (FSR) will serve as the access to and from the mine for personnel, supplies and coal product transport. These roads will be used for all phases of the project (construction, operation, decommissioning and abandonment) and are permanent structures.

### *Water Management*

Water management structures for the mining operations, coal handling and storage site and shop, warehouse and office site will be engineered containment structures designed to collect and treat runoff affected by the disturbance areas. Combined, these structures will cover an area of about 1 hectare and will be reclaimed following mining activity. A water balance (natural inputs, mine use and outputs) and water management plan will be developed for the Environmental Assessment application based on the project design. With the contour mining located at the height of land and well above and away from the major drainages (Salt Creek and Jackpine Creek), it is expected that there will be minimal groundwater and surface water to manage. To the extent practical, surface water not impacted by mining activity will be diverted around active workings through ditches, culverts and pipes. Mining impacted waters will be routed to engineered sediment ponds prior to discharge into the natural drainage system. Minimal, if any, groundwater is expected to seep onto the contour bench from the highwall or coal seam.

### *Water Supply*

Water demands for the mine (potable water, dust suppression, equipment cleaning and fire protection) will be met with well(s) drilled near the site facilities area. The estimated annual groundwater extraction rate is 30,000 to 50,000 m<sup>3</sup>. Bottled potable water will be supplied if well water is not suitable or adequate.

*Fuel and Liquid Storage and Handling*

Requirements for fuel and lubricant storage and handling will include diesel for generators and mine equipment, oil, lubricants, antifreeze and coolants for mine equipment. All storage and dispensing locations will be designed and constructed with secondary containment and in accordance with applicable regulations.

*Waste Generation*

Anticipated management plans for the gaseous, liquid, solid, or hazardous wastes that will be generated by the proposed Project are tabulated below.

Waste Type	Management Plan
Dust generated by mining activity and vehicle movement	<ul style="list-style-type: none"> <li>• Watering unsurfaced roads and coal stockpiles.</li> <li>• Covers on highway coal trucks</li> </ul>
Exhaust (GHG) from diesel fuel consumption	<ul style="list-style-type: none"> <li>• Diesel equipment will meet required emission standards (currently Canadian Tier 4 standard)</li> </ul>
Mine site water	<ul style="list-style-type: none"> <li>• Water in contact with mine workings will be collected and directed to a settling pond</li> </ul>
Domestic sewage	<ul style="list-style-type: none"> <li>• Treated on site with a rotating biological reactor</li> </ul>
Mine solid waste (topsoil and overburden)	<ul style="list-style-type: none"> <li>• Through the progressive reclamation plan will be placed back into the mined out areas.</li> </ul>
Domestic solid waste	<ul style="list-style-type: none"> <li>• Evaluate potential for reuse or recycling</li> <li>• Incinerate if suitable</li> <li>• Landfill bulk inert waste</li> </ul>
Hazardous wastes (waste petroleum products, glycol, batteries)	<ul style="list-style-type: none"> <li>• Store in appropriate temporary storage areas and remove from site for recycling or disposal as per regulations</li> </ul>

*Power*

Power will be supplied by diesel generators as there is no power transmission line within reasonable distance to the Project site. Alternate, economically viable means of power supply will be investigated.

### *Offsite Facilities*

Offsite facilities will include shared use of a coal storage and train load-out facility with another coal producer in the area. Discussions are underway towards reaching such an agreement.

### *Staff Accommodations*

Staff needed for construction and operations are expected to live in Tumbler Ridge or Dawson Creek.

### *Project Alternatives*

Potential Project alternatives at this early planning stage include:

- mining method: contour, open pit and dragline mining with contour mining being the base case
- highwall mining: auger and surface highwall mining with auger mining being the base case
- coal processing: non-washed and washed or partially washed thermal coal with non-washed product being the base case
- offsite rail load out: Peace River Coal Trend mine load out and Teck Coal Bullmoose load out with either being the base case at the time of writing of this document

Assessment of alternatives will involve discussion with First Nations, provincial and federal regulators and interested third parties.

### *Geology*

The region is underlain by Upper Cretaceous rock formations hosting what is referred to as the Wapiti Coal Seam. All of the overburden mined to expose the coal seam on the contour benches is non-marine in origin and generally sandstone. An erosion-resistant sandstone forms the floor of the contour bench. The Wapiti Coal Seam consists of an upper ply and lower ply of coal separated by a parting of variable thickness.

### *Coal Quality*

The Wapiti Coal Seam is classified as a sub-bituminous A to high volatile C bituminous coal (beyond the oxidation limit). The coal sampling and quality analysis work done in conjunction with the exploration drilling indicates this coal to be suitable for thermal power generation. Coal sampling was also done for washability. The results of these tests indicate that the coal has difficult washability characteristics and significant yield losses could be expected from a wet process coal preparation plant. For this reason the coal is being considered for use as a raw, run of mine product. Production of a raw, run of mine product eliminates the production of fine tailings and coarse rejects.

### *Geochemistry*

The geochemistry and potential for acid rock drainage (ARD) and metal leaching (ML) has been characterized for the strata found at the Project coal deposit. Static testing, laboratory kinetic tests and field leaching studies were conducted on samples collected from the exploration drill holes. Samples were collected from the overlying rock formation, the coal seam and the rock that lies immediately below the coal seam (although little to no mining of this rock is anticipated). Generally, the relative position to the coal seam appears to be the most important factor regarding the acid generating potential of the strata.

The strata overlying the coal seam, which represents most of the material to be mined, are predominately non-PAG. In contrast, 90% and 100% of the samples from the footwall rock and coal seam respectively were found to be PAG. Due to its greater stratigraphic thickness, the majority of the waste rock (>98%) from mining activity is expected to be derived from the non-PAG overburden.

### *Terrain, Soils and Surficial Geology*

The Project leases occur on two headlands (Figures ES-4 and ES-5) which are characterized by slightly undulating topography composed primarily of variable thickness cordilleran till capping the local carbonaceous sandstones and shales. A discontinuous thin veneer of eolian material commonly overlies the local till on these headlands. U-shaped valleys with steep slopes separate the headlands; valley bottoms are level to very gently sloping with evidence of preserved post-glacial lacustrine deposits and widespread accumulation of organic material. Jackpine East and Jackpine West Creeks drain from the upland headlands into the valley bottoms where they form shallow misfit floodplains.

### *Climate*

The climate of the Project site area is continental subhumid, characterized by dry summers and cold winters and fairly low annual precipitation. Throughout the area, the mean annual temperature is 3°C, varying from -10.7°C in January to 15.5°C in July. Monthly average precipitation varies throughout the year with the wettest month being July while the driest month is February. The annual precipitation totals about 44.7 cm and snowfall is 169.6 cm. Monthly average wind speeds stay relatively constant around 8.2 km/h blowing from the southwest.

An automated UT30 Weather Station supplied by Campbell Scientific (Canada) Corp. was established in late August 2010 at the Project site; siting, construction and operation of the station follow relevant guidelines and regulations.

### *Air Quality*

The Project area has no long-term publically available air quality monitoring data other than for the city of Fort St. John and Taylor which are not representative of undeveloped areas. Spot data collected over a short time period provides an order of magnitude estimate of background concentrations of criteria air contaminants (CACs), as defined by Environment

Canada and BC Ministry of Environment. Of interest for the Project are particulate matter (TSP, PM<sub>10</sub>, PM<sub>2.5</sub>), nitrogen gases (NO<sub>x</sub>), sulphur gases (SO<sub>x</sub>), and carbon monoxide.

Site investigation involved direct, real-time continuous measurement of particulate matter concentrations in two 36-hour sessions in August 2011 using DustTrak Aerosol Monitor 8533 DRX. The monitoring site was by the Project weather station located within the boundaries of the Project. Baseline sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and carbon monoxide (CO) concentrations for the proposed mine site are expected to be similar to those from a relatively uncontaminated and remote undisturbed location in northern Canada. Regional averages of gaseous CACs were assumed to apply to the Project site.

Concentrations of particulates measured were all very low:

- PM<sub>2.5</sub>: 2 µg/m<sup>3</sup>
- PM<sub>10</sub>: 4 µg/m<sup>3</sup>
- TSP: 5 µg/m<sup>3</sup>

No nearby background published data for NO<sub>x</sub> or SO<sub>x</sub> was available. Environment Canada's range for CO in unpolluted air is 29 to 115 µg/m<sup>3</sup>.

#### *Noise*

Baseline noise surveys were conducted in the Project area in August 2011. Daytime sound pressure level averaged 28 dBA and night time 26.6 dBA.

#### *Vegetation*

Vegetation surveys were conducted on the Project site during June through to August 2011. Activities included terrestrial ecosystem mapping (TEM) field vegetation typing, rare plant and invasive plant surveys and plant tissue collections for background metals levels. Rare plant surveys confirmed the presence of one provincially Blue-Listed Species, western Jacob's ladder. No invasive plant species were recorded. TEM and plant metals results will be discussed in the baseline report prepared for the environmental certificate application (EIA).

#### *Wildlife*

Wildlife surveys included: amphibians and reptiles, raptors, terrestrial birds, mammals including bats, furbearers, and ungulates.

The amphibian and reptile surveys focused on the western toad, however, any amphibian and reptiles identified were recorded. Amphibians located were well away from any areas that will be directly disturbed by mining. Mining activities will be on hillsides and to a limited extent on the plateau above Jackpine Creek.

Raptor information for the 2011 field season was collected through call playback surveys and incidental observations. Objectives were to assess the presence and distribution of raptor species in the project footprint and buffer. No nests of any raptors were confirmed in

the project footprint and buffer. Raptors recorded included Barred Owl, Red-tailed Hawk, Cooper's Hawk, Sharp-shinned Hawk and American Kestrel.

Thirty-seven point counts were established through the LSA during the 2011 field season and a diversity of terrestrial bird species recorded. A total of 302 detections of 47 species were made. One hundred thirty five detections of 27 species were recorded during the July surveys. Four species of conservation concern were recorded during the 2011 season. These included Olive-side Flycatcher, Black-throated Green Warbler, and Barn Swallow.

Bird feathers were collected to assess metals accumulation; many metals were undetectable due to low sample sizes. Selenium was below detectable levels in all specimens.

Acoustic bat surveys utilized an Anabat™ detector to record bat calls within the area surrounding the bat detector. During the July surveys, five detections occurred on each of the two nights.

The purposes of the ungulate overview assessment were to identify important wildlife values in the proposed mine site RSA along the branches of the LSA and around Muskeg Creek. Specifically, the overview was conducted to identify any winter wildlife use of the study area by ungulate species (i.e., deer and moose), furbearers and to identify any critical wintering habitats that may be impacted by the Project. The study confirmed five species using the area that consist of Moose, Black-tailed Deer, Lynx, Snowshoe Hare and Wolf. The most frequently encountered ungulate species was moose.

### *Hydrology*

The Project site is located just east of the drainage divide between the Murray River on the west and the Kiskatinaw River on the east (Figure ES-4). Both rivers drain to the Arctic. Six continuously recording water level stations were established at various times commencing mid-July 2010 on Jackpine and Salt creeks and the West Kiskatinaw River. One atmospheric pressure recorder was established near one of the stations. Spot discharges were obtained from monthly discharge measurements obtained by wading a cross section of streams at the hydrology stations. This will allow establishment of a relationship between continuous water levels recorded by the dataloggers and stream flows. These hydrology data will be used to assist in interpreting water quality and aquatic habitat data and for predicting possible effects of mining on both quality and quantity of water in potentially affected water bodies.

### *Hydrogeology*

Nine monitoring wells were installed by CH2M Hill in 2006. In 2010 and 2011 Hillsborough installed 20 additional wells. Three of the CH2M Hill wells were reactivated and the ground water monitoring network now consists of 23 wells. Monitoring includes levels and quality.

Groundwater levels mimic topographic relief. Hydraulic conductivity was found to decrease with depth, i.e., groundwater moved more slowly the deeper the readings were taken. Groundwater flow is dominated by downward vertical gradients through the block.

Recharge generally occurs on the upper surface of the blocks with discharge occurring either as springs along the edges or at the base of the blocks where artesian conditions were observed. Ultimately groundwater from the three resource blocks will report to Jackpine Creek, Muskeg Creek or Salt Creek, contributing to the base flow component of these streams.

Groundwater sampled from wells screened in the coal seam and overlying rock formation on both the Heritage and Centre blocks (recharge zones) are dominantly Calcium – Bicarbonate type water. Groundwater sampled from wells screened in the underlying rock formations and associated with artesian flow are dominantly Calcium – Sulfate type water. Groundwater from the lower Chungo lying below the coal seam is intermediary between Calcium-Bicarbonate type water and Calcium – Sulfate type water. Cadmium, cobalt, iron, manganese, sulphate, and zinc were measured to be above BC water quality guidelines for the protection of aquatic life. Selenium slightly exceeded the 2 µg/L aquatic life guideline in two wells.

#### *Surface Water Quality*

Surface water runoff from the Project area reports primarily to Jackpine Creek. Muskeg Lake is located 2 km west of the southern tip of the Heritage Block, and also receives runoff from the southern end of the Heritage Block. Surface water quality monitoring was carried out in 2005 and 2006 in support of the proposed Wapiti Power Development by AESWapiti Energy. Monitoring was initiated in support of the Project in July 2010 and is ongoing. The locations provide baseline information for Jackpine Creek from its headwaters just downstream of the Centre Block to its mouth at the Kiskatinaw River, Salt Creek upstream and downstream of the Project area, Muskeg Creek, the West Kiskatinaw River, as well as the Teepee Creek reference stream. Samples were collected monthly, as well as weekly during spring freshet seasons of 2011 and 2012.

Water quality in Jackpine Creek is highly influenced by spring freshet and storm events. During winter low flow periods, Jackpine Creek is characterized by a high level of total dissolved solids (TDS) and related parameters such as conductivity and hardness. All dissolved metals in Jackpine Creek, Muskeg Creek, and West Kiskatinaw River were below WQGs, which apply to total metals. Many total metal levels were above their WQG during turbid flow conditions (As, Cd, Cr, Cu, Fe, Hg, and Zn). This is related to metals associated with suspended sediments, which are elevated during high flow periods. During clear flow periods all metals are below their WQGs.

#### *Sediment Quality*

Depositional zones, where fine grain sediments accumulate, are created by the numerous beaver dams on Jackpine, Salt, and Teepee Creek. The location of these change as dams get washed away during floods, as occurred in 2011, and rebuilt. Jackpine Creek, below the Project area, is a low gradient stream with muddy stream bed and relatively little gravel and cobble size material. The West Kiskatinaw River bed is primarily composed of gravel/cobble/boulder sized material, with few depositional zones. Salt Creek stream bed is similar to the West Kiskatinaw, with primarily rock substrate. Sediment quality samples were

collected in August 2010 and August 2011 at the same locations as water quality samples. Fine grained sediments were collected from depositional zones. Metals were analyzed on the <63 µm fraction.

### *Fish and Fish Habitat*

Fish, fish habitat, tissue metal burdens and lower trophic work have been conducted for a variety of purposes since the 1970s. Rationale for studies has been associated with forestry, oil and gas and since 2005 for the Project. A multi-season, multi-year collection of aquatic data has been compiled to characterize baseline conditions. Fish habitat for sport fish and other species in Jackpine Creek progressively declines upstream.

Lake chub and suckers were the only fish captured upstream of Muskeg Creek; the stream is low gradient (<1%) and high in fine sediment and organics. The upper reaches of Jackpine Creek (Figure ES-4) where it branches into two tributaries were found to be non-fish-bearing. Highest species diversity over multiple years of sampling is in the lower reaches of Jackpine Creek (beyond the Project footprint), and includes Arctic grayling and rainbow trout.

Salt Creek, situated west and south of the Project footprint, contains a 20 m high waterfall which constitutes a fish barrier 5 km upstream of the Murray River. Fish present in the lower reaches are potentially a combination of resident and migratory fish from the Murray River. Below the barrier (approximately 8km from the project site) to fish passage in Salt Creek bull trout, burbot, mountain whitefish, slimy sculpin, white sucker, brook trout, lake chub, longnose sucker and rainbow trout have been captured. Upstream of the barrier only white sucker have been captured across all years of sampling.

Lower trophic communities, benthic macro invertebrates (BMI) and periphyton, were sampled in 2006 and 2011. Sampling was limited by substrate variances and suitability sampling methods were modified accordingly.

Selenium in fish tissue sampled in 2006 exceeded the BC interim guideline for total selenium in tissue of 1µg/g wwt at Salt Creek reach 1 and Jackpine Creek reach 5. Slimy sculpin and lake chub were sampled at these sites respectively with the maximum recorded concentration of 1.36 µg/g wwt. White sucker sampled in Salt Creek in reach 4 and 7 did not have total selenium concentrations above 0.6 µg/g wwt. No other exceedances were observed in algae or BMI although BMI tissue from Salt Creek reach 5 did have a selenium concentration of 0.92 µg/g wwt. Selenium concentrations from fish sampled in 2011 indicated similar patterns to the 2006 results.

### *Socio-Economics*

The Project site is situated in northeast British Columbia close to the Municipal District of Tumbler Ridge. This area is sparsely populated.

The socio-economic regional study area (SRSA) selected for this assessment consists of those urban and rural communities that are most likely to provide the manpower, goods and

services needed to construct and operate the mine and/or that will be directly or indirectly affected by mine construction or operation.

The boundary of the SRSA was also chosen to reflect the statistical reporting units used by Statistics Canada and the Government of British Columbia. The Statistics Canada reporting units in this region include only three communities and two RDEAs:

- Urban communities (City of Dawson Creek, District Municipality of Tumbler Ridge, District Municipality of Chetwynd);
- RDEAs (Peace River D, Peace River E).

There are two Aboriginal groups with interests in the SRSA (Saulteau First Nations, East Moberly Lake 169 reserve; and West Moberly First Nations, West Moberly Lake 168A reserve).

In 2006, the population of the SRSA was 25,187 people, which is an increase of 2.5% from 2001. About 64% of the regional population lived in the communities of Dawson Creek, Tumbler Ridge and Chetwynd, while 23% lived in rural areas and the balance in smaller communities. Dawson Creek is the largest community in the region, with a population of 10,995 in 2006. Next in size is Chetwynd (2,633 residents in 2006), followed by Tumbler Ridge (2,454 residents in 2006). The rural areas include Peace River, which had a combined population of 8,780 in 2006. In 2006 approximately 22% of the SRSA population was Aboriginal, with 325 living on reserves and 2,874 living off reserves. The reserves in the region include East Moberly Lake 169 and West Moberly Lake 168A.

In 2006, just over one-third of the regions workforce was employed in primary industries which include the agriculture and resource-based, manufacturing and construction industries. In recent years, the regional economy has been evolving through the development of more value-added processing of resources and the expansion of tourism and eco-tourism. The resource-based industry employs 18.6% of those working in the region. This includes extensive agriculture, forestry and mining as well as oil and gas exploration and development.

Approximately 75.6% of the homes in the SRSA were privately owned. In Dawson Creek, 34.2% of housing was rented. In Tumbler Ridge 81.3% of housing was owner occupied and 18.7% was rented. About 61.5% of the Aboriginal off-reserve population owned their homes. Housing has been an issue in the SRSA, especially in Tumbler Ridge.

In Dawson Creek, potable water is currently being drawn from the Kiskatinaw River, but the new proposed reclaimed water plant will treat effluent currently being released into the Dawson Creek and be reclaimed for industrial purposes, which may reduce the amount drawn from the Kiskatinaw. In Tumbler Ridge, potable water is drawn primarily from wells.

Dawson Creek is fully equipped with medical facilities, including a number of health centres and a hospital that serves Dawson Creek and the surrounding area. Tumbler Ridge has a health centre equipped with an emergency department and the facilities needed to stabilize patients before transfer to a hospital.

In the SRSA, the communities of Dawson Creek and Tumbler Ridge are governed by an elected council comprised of a mayor and six members. In the Peace River Regional District, there is a common board chairperson and each district has a director. In the Aboriginal community of West Moberly Lake 168A, a chief and four council members govern the community.

#### *Land Use*

The footprint of the proposed Project contains no water lots and does not overlap with any private or federal Crown land. The nearest Federal land area is Jasper National Park, approximately 300km to the southeast.

The area surrounding the Project study area is a combination of provincial Crown lands and private lands that are managed by a variety of land use policies, plans and regulations. They include the Dawson Creek Land and Resource Management Plan (LRMP), the Peace River Regional District Rural Official Community Plan and the *Agricultural Land Commission Act* relating to the Agricultural Land Reserve (ALR).

There are no parks or protected areas proximate to the Project area. The exact extent of recreational activity is not known in the areas within and adjacent to the Project Area because recreationists are not required to register their activities, but it is evident that recreational opportunities and areas are plentiful for summer, winter and water-related activities. Recreational areas in the LSA include the Paradise Valley trail that generally runs in a north-south direction primarily in the western half of the LSA, Muskeg Lake (privately

owned), Muskeg Creek, Murray River and Muskeg Lake Trail. In the RSA recreational areas include Murray River Canyon Overlook, Teepee Falls, Bearhole Lake Trail and Wasp Lake Trail. There are no designated trails that cross the Project deposit.

One guide-outfitter's territory (British Columbia *Wildlife Act* Management Unit) covers the Project deposit, but the territory is 533,672 ha and the projected mining area is a very small percentage of this territory. Forest harvesting has been actively carried out in the general area, including the portions of the planned mining footprint and thus industrial disturbance pre-dates the Project. Hunting for large mammals (moose, deer, bears, carnivores) and birds is allowed in the general area of the project under BC hunting regulations. The extent of hunting in the Project area is not known.

There are no natural gas or oil wells directly on the Heritage or Centre Blocks. However a natural gas pipeline constructed by Encana Corporation crosses the northern part of the Heritage Block.

There are four operating coal mines in the northeast BC region and several projects that have active extensive exploration (\$1 to \$3 million based on Ministry of Energy and Mines [MEM] statistics). Teck has two closed mines, one of which has potential to reopen (Quintette).

There are no Federal lands within the proximity of the Project and the Project will not change the environment on Federal lands outside of British Columbia.

#### *Archaeology*

An archaeological overview assessment (AOA) was completed in 2006 (CH2M Hill 2006). Nearly all of the commercially valuable timber has been logged from the immediate Project area and there are consequently few undisturbed areas. The AOA identified two sites well away from the proposed mine footprint: a culturally modified tree 4.9 km southeast, and surface lithics 5.4 km southeast.

An archaeological impact assessment (AIA) of the proposed surface disturbance area for contour mining was conducted in 2011 and no artefacts were found. Upon finalizing the precise location for additional infrastructure, a further assessment will be undertaken.

#### *Effects Assessment*

Comprehensive environmental, social and economic effects assessments will be conducted as part of the Application process. This Project Description document provides an overview of potential effects that could result from Project development.

#### Particulate Matter

It is anticipated that the Project will generate a small amount of particulate matter from surface operations. Generation of suspended particulate matter is not expected to be significant from transport of coal by truck since transport will be largely on paved roads and coal trucks will be covered or coal sprayed with a tackifier. Air quality modelling will be

conducted to predict levels of air contaminants and to identify where mitigation will be required. Gaseous pollutants will be generated by fixed and mobile internal combustion engines both on the mine property and in transporting the coal to rail loadout south or west of Tumbler Ridge. The main sources on the mine site will be diesel powered generators (assuming alternate sources such as wind power are not available or are not cost competitive).

#### Noise

During construction, there will be heightened activity at the mine site and access road corridors from heavy machinery and vehicle movements, diesel generators, erection of plant building, and process equipment installation. During operations noise generation will be reduced; the principal sources will be earth moving equipment during construction and reclamation of contour benches, limited noise from the highwall-auger miner (whose moving parts will be mostly underground and therefore muffled), and raw and finished coal haul trucks.

An inventory of noise sources by type and location will be made and noise levels modelled to predict impacts on human and wildlife receptors. Mitigation will be in the form of best management practices and engineered sound reduction devices such as mufflers, baffles, etc. to the extent practical.

#### ARD/ML

Disturbance of geologic materials during mine activities will result in increased exposure of rock surfaces, which increases the ML/ARD potential post mining relative to the present undisturbed condition. Possible sources of ML/ARD include runoff and seepage from the contour bench floor, waste rock and coarse reject. Mitigation of acid rock drainage will be undertaken during operations to prevent acidic waters from emanating from the major mine facilities. The primary mitigation method is the overall design of the mine that limits the volume of waste rock produced and progressive reclamation that limits the extent of exposed highwall surfaces at any one point in time.

#### Terrain, Soils and Surficial Geology

Till and overburden will be removed in creating the contour benches for operation of the highwall-auger miner. Soils will be stockpiled for reclamation purposes and redistributed once a bench segment is reclaimed. Soil rehandling will be minimized to mitigate soil degradation from that source.

Soil contamination is a potential at industrial sites including mines. A diesel fuel spill is seen as the mostly likely cause of soil contamination. Storage of fuel and fuelling of vehicles will be localized to reduce the areas where soil contamination could occur. The fuel farm will be bermed and any tanks outside the fuel farm will be double walled with leak detection.

#### Vegetation

Construction and operation of the mine will require removal of vegetation. However, the proposed mine site is an area of active logging and thus much disturbance has occurred and will continue to occur in the area. The mining method (previously described) will minimize disturbance and vegetation removal and shorten the length of time before reclamation and revegetation of bench areas can commence.

### Wildlife

Changes to wildlife (including migratory birds) habitat and its associated use by wildlife may result from the removal of habitat during construction and the reclamation of habitat during post-closure. Direct effects occur in areas where habitat is lost, and indirectly in areas immediately adjacent, where wildlife use patterns may change in response to a habitat edge, and greater proximity to disturbance. Reclamation will restore habitat as much as possible.

Specific changes to migratory bird habitat could include the direct loss of nesting areas resulting from site logging and clearing or indirect physical and biological changes to habitat (noise, surface water flow or level changes, and air, water, sediment and soil quality) resulting from the proposed project. Mitigations and windows for clearing and construction activities will follow the protection of migratory birds as per the *Migratory Birds Convention Act 1994*. Potential effects associated with altered habitat will be investigated and addressed in the environmental impact assessment.

The project is off the migratory path of caribou so disruption of movement is not expected to be a concern.

### Hydrology

Neither Jackpine Creek nor Salt Creek will require diversion as a result of mining. Runoff from contact areas will need to be treated, at least by removal of suspended sediment, before discharge. A certain amount of this water will be lost due to evaporation or be used as a water source for mining and/or processing operations. Groundwater that could otherwise recharge in Jackpine Creek could be intersected by mine workings and require treatment prior to discharge to the creek. As part of the effects assessment and for water management purposes a detailed water balance will be developed as part of mine design engineering. The water balance model outputs will be used to predict effects on water quantity through the various phases of mining and suggest possible design changes to minimize identified potential impacts. This information will identify the amount of water required and suggest possible practical sources, be they ground or surface water.

### Surface Water Quality

Water that is in contact with mine components, including the contour bench floor, waste rock, and coarse reject, has the potential to carry elevated levels of contaminants to receiving environment streams. Mine contact water may potentially affect receiving water quality due to ML/ARD. Water quality may also be affected by increased sediment loads from roads and cleared areas leading to elevated total suspended sediment (TSS) levels.

Settling ponds will be constructed to reduce TSS levels in water prior to discharging to the receiving environment. A water quality monitoring program during construction and operation will be implemented in order to identify changes to water quality due to mining activities. A selenium monitoring program will be implemented that includes monitoring selenium levels in tissues of biota in contact with water in the LSA. The monitoring program will allow additional mitigation measures, such as water management or treatment, to be triggered if necessary.

### Hydrogeology

Potential effects on groundwater in the project area may be produced by both contour mine operations and coal coring. Groundwater quality may also be affected by the influence of ML/ARD on waters seeping through the mine area. Mining operations will likely result in increased drainage from the perched aquifer in the sandstone overlying the coal seam. Mitigation through design is planned by limiting subsidence over the augered coal, thus limiting the potential for enhanced seepage.

### Fisheries and Aquatics

Potential effects on fisheries and aquatics would be limited to changes in water quality caused by contact with mined materials and mine impacted water and flow reductions caused by use of water for mining activities and loss of ground water recharge.

The effect of water quality changes will be mitigated by water management plans that intercept and routes clean water around active areas and collects contact water to control

sediment release. The effect of flow reduction will be mitigated by not having a wet process for coal beneficiation.

The potential for and estimated magnitude of these possible changes will be the objective of hydrology, hydrogeology, water quality and aquatic effects assessments.

### Land Use

The Project site has been actively logged. During mining certain areas will remain open which will affect tree rotation times on forest tenure managed licenses that overlap the proposed facilities.

One pipeline crosses the northern part of the Heritage Block and there are no gas wells on either the Heritage or Centre blocks. A number of oil and gas and/or forestry access roads cross the Project deposit. Consultation has occurred or is planned with other land users in the Project area.

There will be no land use conflicts with other mines since Hillsborough, by way of its extensive mineral claims and a mining lease once the mine is approved and permitted, will essentially preclude others mining in the immediate area.

The footprint of the proposed mine has limited recreational potential. There are no organized trails nor are there fish-bearing water bodies. Given the large size of the trapping and guiding territories that encompass the Project deposit and previous forestry and natural gas activities at the site, no issues are expected.

### Visual Aesthetics

No facilities should be visible from the Heritage Highway (Highway 52). The area east of Highway 52 parallel to the Project deposit is classified as a scenic area and thus any changes in the viewscape from the highway may result in concerns and need to be addressed.

### Archaeology

No artefacts were found on the contour mine area; an additional survey will be carried out on the other proposed surface facilities areas once selected.

### Social, Health and Community Issues

There are a number of positive economic benefits, as well as some social impacts associated with the proposed Project. Overall, the Project is but one of several proposed and operating industrial activities in the Peace region and therefore in the context of regional development will not be the dominant factor in any issues that may arise as a result, except on a local scale. The Project will provide employment, training and business opportunities, pay royalties and taxes to government. However, there will be an influx of people to the area and housing is relatively short in Tumbler Ridge. The cumulative effect of the Project in

combination with other mining and oil and gas projects may pose challenges for municipal health and public safety services.

*Sustainability*

The underlying sustainability goal and Hillsborough corporate policy is to leave a legacy of trained people in the employment catchment area of the mine who will be able to shift to other mining or heavy industrial professions and trades once the Echo Hill Mine closes at the end of its 10 to 12 year mine life.

*Cumulative Effects*

A cumulative effects assessment will be carried out to include other past, present and reasonably foreseeable future projects that could reasonably be expected to interact temporarily or spatially with the proposed Echo Hill Project. The assessment will follow guidelines provided by both the federal and provincial environmental assessment agencies.

*Aboriginal Group Engagement and Public Consultation*

During the preparation of this Project Description document, the following Aboriginal groups were consulted with:

- *McLeod Lake Indian Band*
- *West Moberly First Nations*
- *Halfway River First Nation*
- *Saulteau First Nations*

Discussions with the First Nations to date have indicated the existence of environmental values of interest that are important considerations for the Project. Historical issues include archaeology, traditional use, and aboriginal rights and title related to environmental resources and quality (including water, land, vegetation and wildlife). Socio-economic considerations include topics such as employment and business opportunities. A summary of the potential effects on Aboriginal peoples of any changes to the environment resulting from the proposed Project are presented below.

Possible Impact	Potential Effect on Aboriginal Rights	Possible Mitigation
Changes to the environment: Potential impact to downstream aquatic habitat and water quality from sediment and effluent discharge and from the use of water resources for Project operation.	Could affect FN treaty rights to traditional food harvesting practices, including fishing and plant food harvesting.	Project design (including producing a non-washed product) will insure that a very limited amount of water will be used for operations. The Proponent is committed to developing a water management and monitoring plan for the Project prior to construction and

		operation,
Changes to the environment: Potential impacts to vegetation and wildlife that support subsistence hunting and traditional use caused by physical disturbances (logging, overburden and coal removal, road construction) on the Project footprint.	Could affect FN treaty rights to traditional food harvesting practices, including hunting, trapping and plant food harvesting. Could also result in the loss of structures or sites of historical, archaeological, paleontological, architectural or spiritual significance.	Impacts to wildlife and habitat on the Project footprint are reversible, with the significance of the impact mitigated by: <ul style="list-style-type: none"> <li>• Highwall auger mining minimizes the overall disturbance footprint</li> <li>• Progressive reclamation will minimize the area of productive habitat lost at any given time during the life of the Project</li> </ul> The Proponent is committed to developing a wildlife management and monitoring plan for the Project prior to construction and operation. No artifacts have been discovered in the archaeology impact assessment work done to-date.
Changes to the environment: Continued development in the area (coal mining, oil and gas activity and timber harvesting) having a cumulative impact on water, habitat, wildlife and terrain.	Could affect FN treaty rights to traditional food harvesting practices, including fishing, hunting, trapping, plant food harvesting and non-subsistence harvesting.	The Project design will minimize impacts and the progressive plan will insure the site is returned to productive habitat after decommissioning.
Social impacts: Training, employment and contracting opportunities during construction and operations		During the EA phase discussions will be held with Aboriginal groups to develop strategies for training and employment and contracting opportunities.
Traditional use: Loss of access to the Project area for hunting	Could affect FN treaty rights to traditional food harvesting practices, including hunting and trapping.	Through site visits and discussion on the final mine plan efforts will be made to minimize effects on access for traditional uses

Additional engagement, including TK/TLU studies, with Aboriginal groups will take place throughout the pre-application and application phases of the environmental assessment.

Hillsborough has initiated meetings with the Ministry of Environment and Fisheries and Oceans Canada, Prince George offices and with both BCEAO and CEAA offices to introduce the project and scope of baseline studies. A summary of consultations to date with public, regional government and municipal government stakeholders is tabulated below.

Stakeholder	Nature of Consultation	Results of Consultation
British Columbia Ministry of Environment	Meetings at the ministry office in Prince George and at the Project site	Recommendations relating to the baseline studies for the EIA: location of hydrometric stations, scope of aquatic studies
District of Tumbler Ridge	Meeting with the Mayor and administration to provide a Project overview	Points of interest noted as possible Project effects included truck traffic (in the vicinity of the community) associated with the coal haul to the train loadout, workforce size and sourcing and housing.
City of Dawson Creek	Meeting with the Mayor and administration to provide a Project overview	Points of interest noted as possible Project effects include impacts to water quality and quantity in the Kiskatinaw River (the cities drinking water source), workforce size and sourcing and housing.
Peace River Regional District	Meeting with District administration to provide a Project overview	Points of interest noted as possible Project effects included the possibility of having a campsite to house workers (there are no plans for a campsite).
Encana Corporation – holder of overlapping oil and gas tenures	Meeting to provide a Project overview and discuss possible development conflicts	Communications regarding development activities will be maintained, including mining activity in the vicinity of a pipeline and sharing baseline information.
West Fraser Mills Limited – holder of timber harvesting rights over portions of the Project area	Meeting to provide a Project overview and discuss possible development conflicts	Communications regarding development activities will be maintained.
Private woodlot owner - holder of timber harvesting rights over portions of the Project area	Meeting to provide a Project overview and discuss possible development conflicts	Communications regarding development activities will be maintained.

The general public and stakeholders will be consulted as the Project moves forward through the assessment process.

### *Reclamation Security*

Section 10 of the provincial *Mines Act* stipulates that the Chief Inspector of Mines may, as a condition of issuing a permit, require that the mine owner provide monetary security for mine reclamation and to provide for protection of, and mitigation of damage to, watercourses and cultural heritage resources affected by the mine. Security will remain in effect until such time as the Chief Inspector of Mines determines that all reclamation obligations have been met and the Company can be indemnified.

### *Permits*

A *Mines Act* permit will be required to commence construction. Any effluent discharge or point emissions will require *Environmental Management Act* permits. Under the one project one process guidelines, all major permit applications will be reviewed together and coordinated through the Prince George office of Ministry of Forests, Lands and Natural Resource Operations, although responsible ministries will issue permits and licenses.

Potential Federal permits, licences and authorizations required for the proposed project include:

- *Canadian Environmental Assessment Act* – CEA Act Approval
- *Radio Communications Act* – Radio Licence

There are no Federal lands that will be used for the purpose of carrying out the Project and no federal authorities will be providing financial support.

### *Summary*

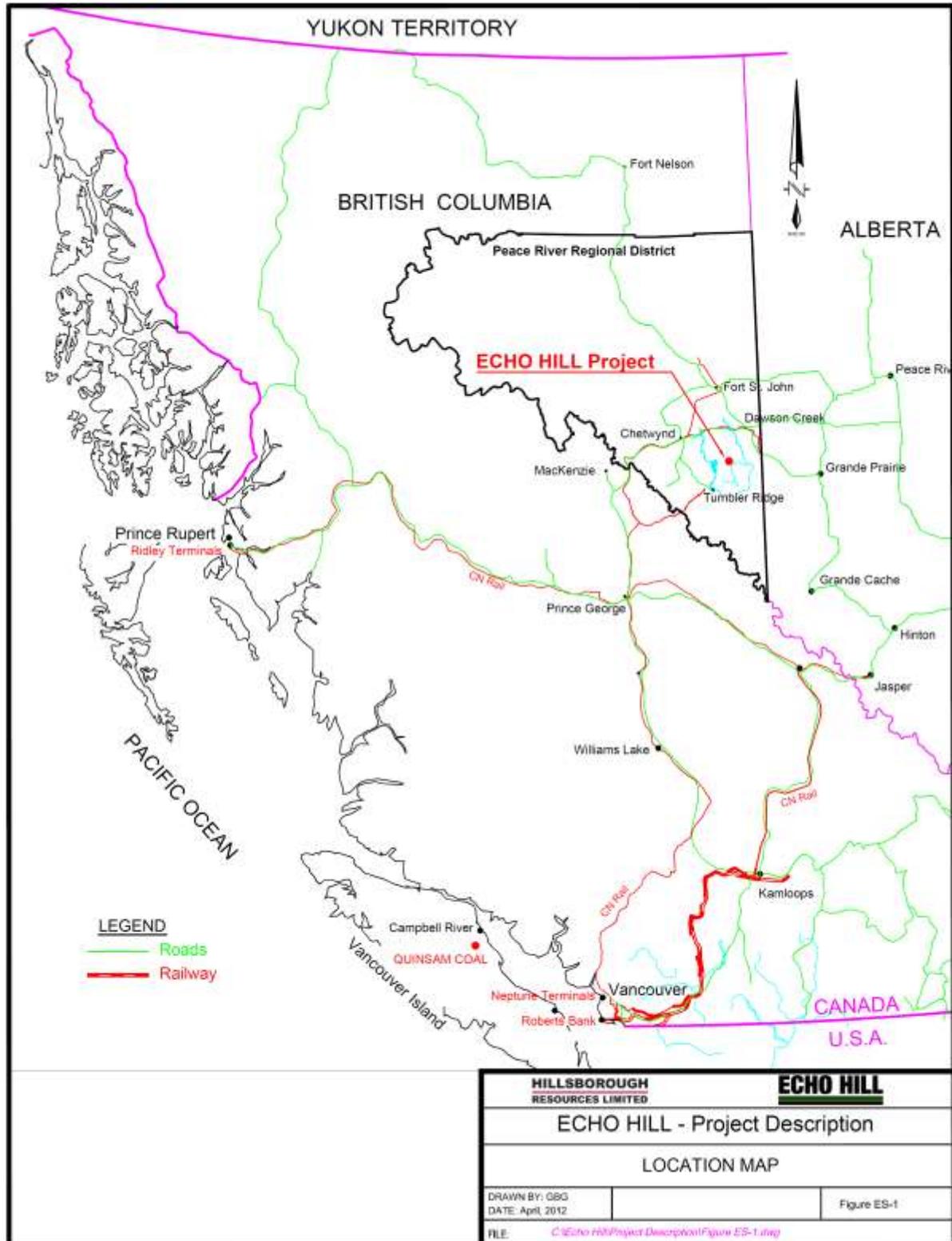
The Project will provide jobs and business opportunities to Aboriginal groups as well as other British Columbians and Canadians, and will provide royalties to the provincial government. The initial capital cost of the Project is estimated at CAN \$35 million and the Project is anticipated to create 80 full time jobs during operations. The coal deposit can be mined in an environmentally responsible manner and, with proper closure (which is planned) will not leave a negative environmental legacy. The Project is unique in several key aspects and will result in a comparatively low environmental impact.

A mining method and mine plan has been developed that minimizes the disturbance footprint and allows for progressive reclamation. The mining method is referred to as contour mining with highwall augering. The contour mining takes advantage of the natural slope of the hillside and flat orientation of the coal seam to develop a bench along the contour of the hill (at the elevation of the coal subcrop) from which about 50% of the coal is released. The highwall-augering then recovers the balance of the mineable reserve by extracting coal from beyond the contour bench highwall without any further disturbance to the overlying ground surface. Once the highwall-auger mining is complete along a section

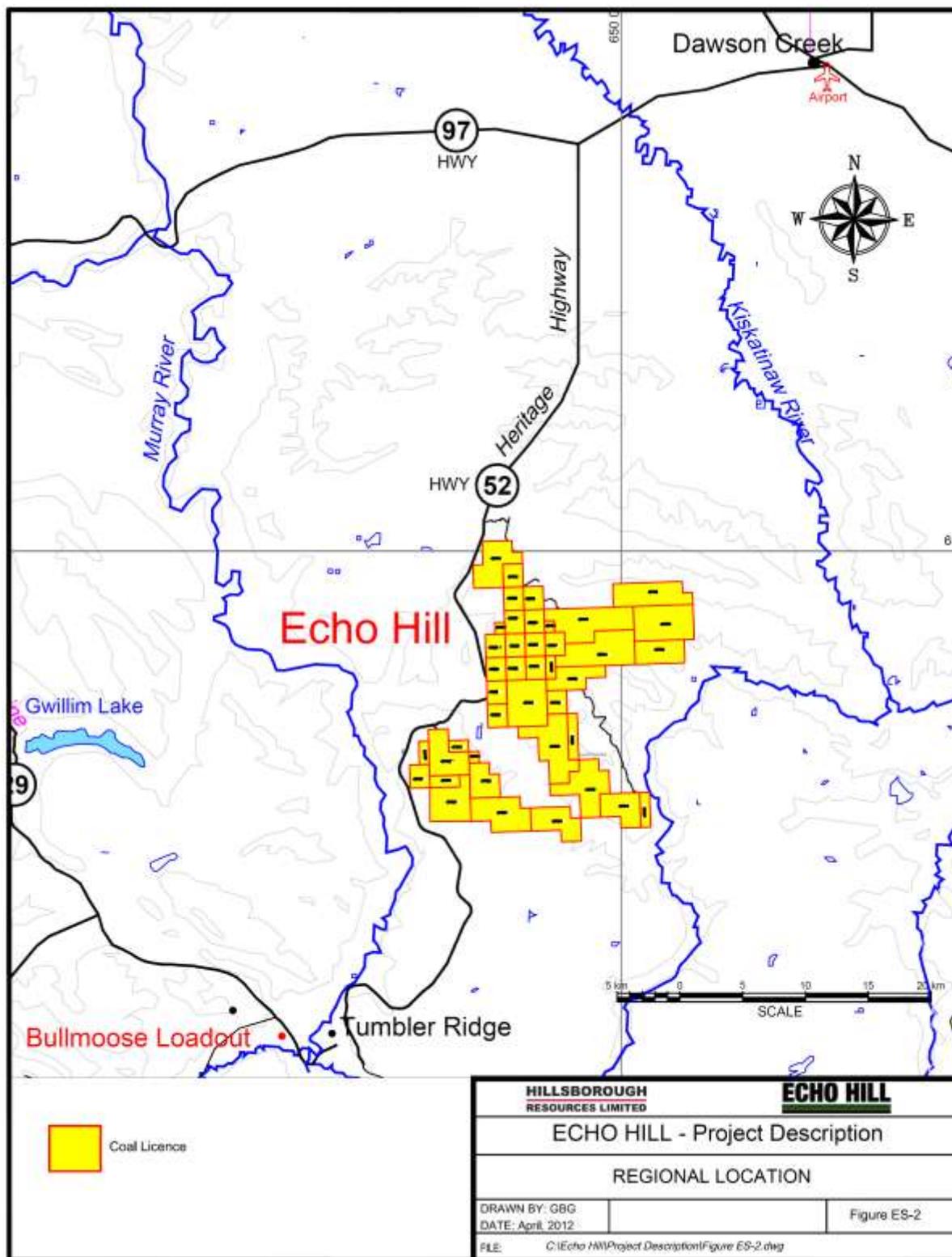
of highwall, the area is immediately backfilled to the approximate original ground surface, cover soil replaced and re-vegetation started.

1. There is no requirement for permanent overburden dumps for the mining method and plan described above.
2. No in-stream works or stream diversion will be required.
3. The mine will produce a non-washed coal product. By not having a wet-process coal preparation plant, water and electrical power requirements are reduced and the need for a tailings pond and coarse coal rejects dump is eliminated.
4. The mining area is outside of present day maps delineating core-caribou habitat.

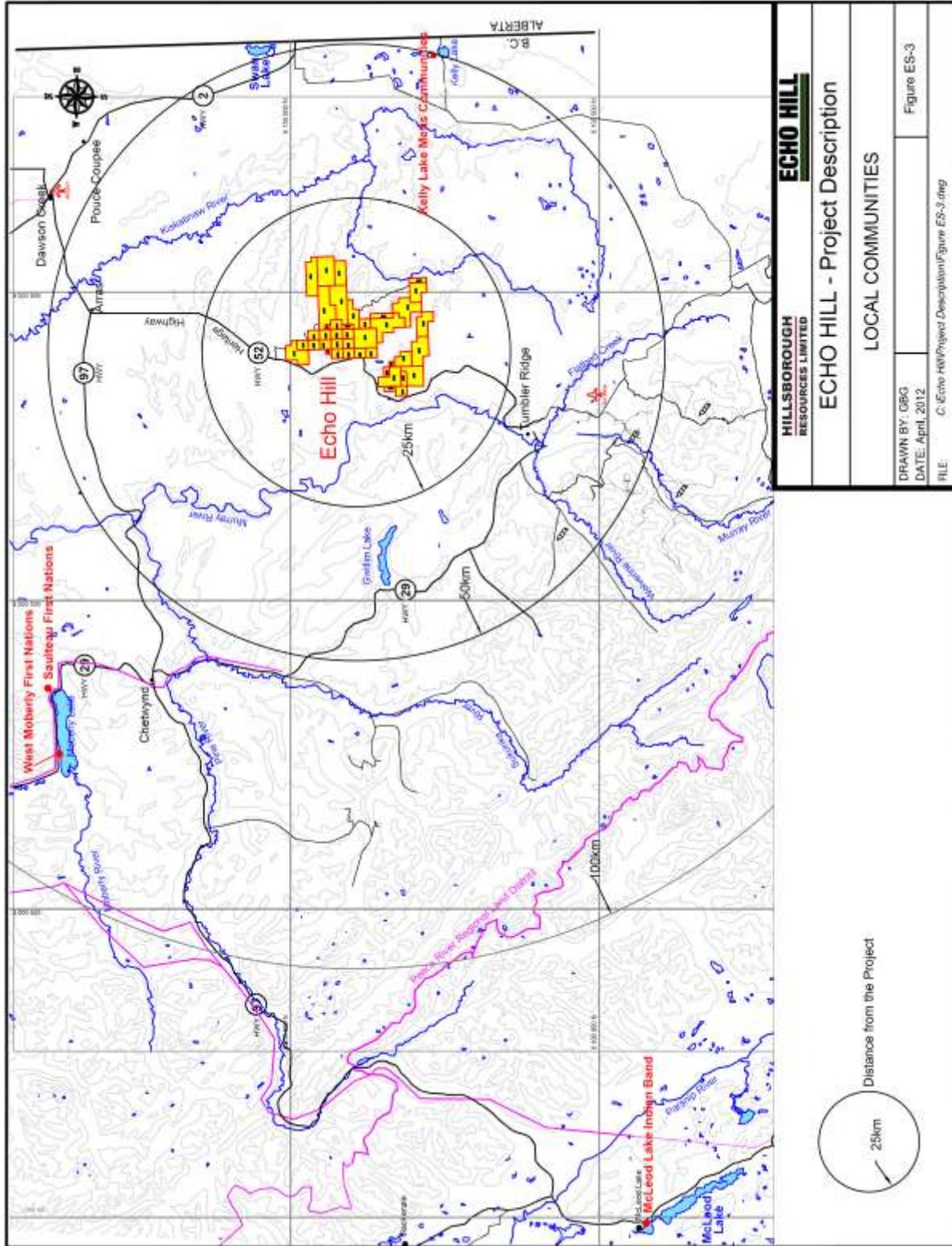
The Project will contribute to the sustainability of the region by facilitating acquisition of job skills that can be used outside of mining or at other mining projects in the future. Project planning will focus on minimizing environmental impacts and returning the project area to pre-mining land form and use.



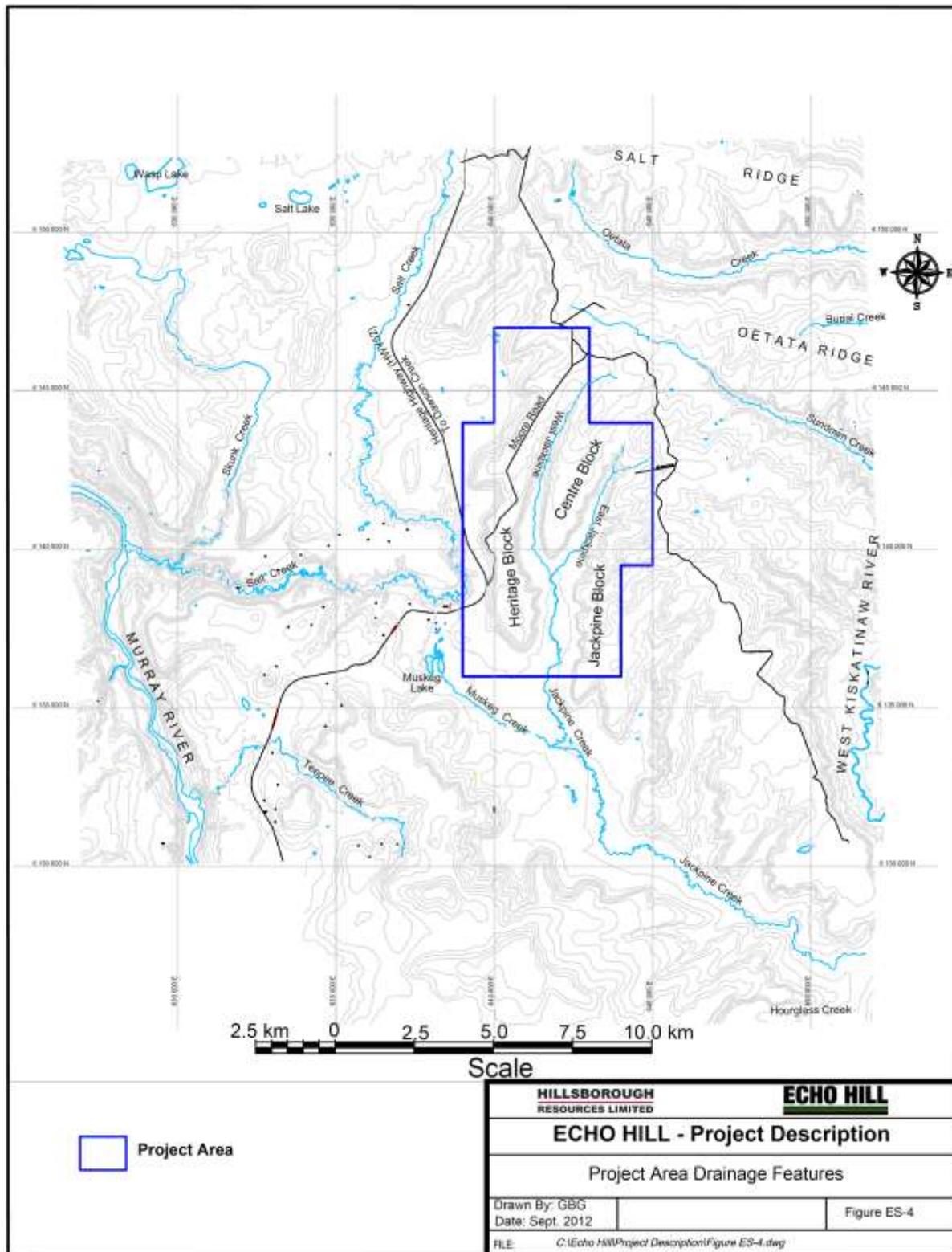
**Figure ES-1: ECHO HILL Location Map**



**Figure ES-2: ECHO HILL Regional Location**



**Figure ES-3: ECHO HILL Local Communities**



**Figure ES-4: ECHO HILL Drainage Features**

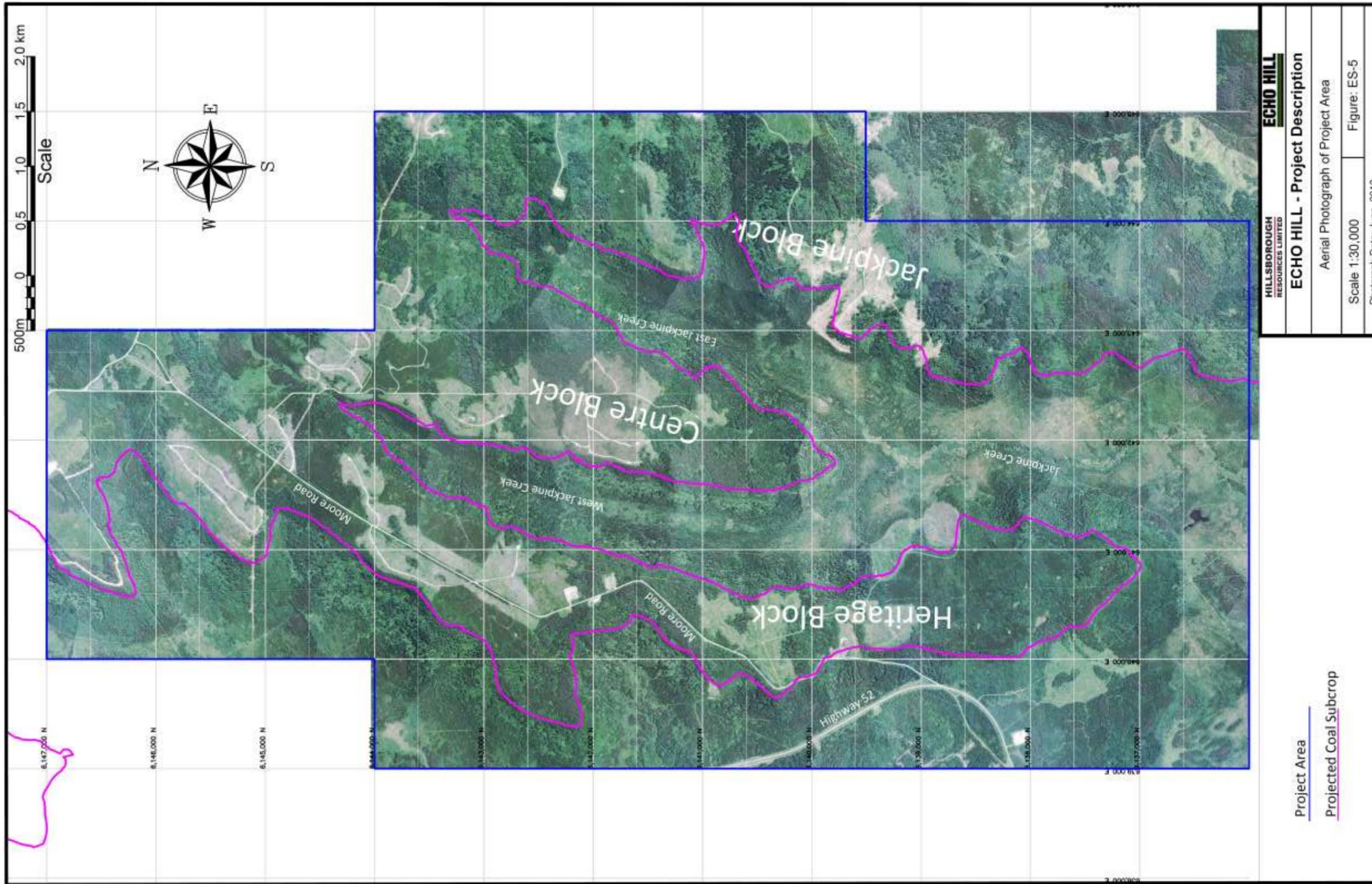
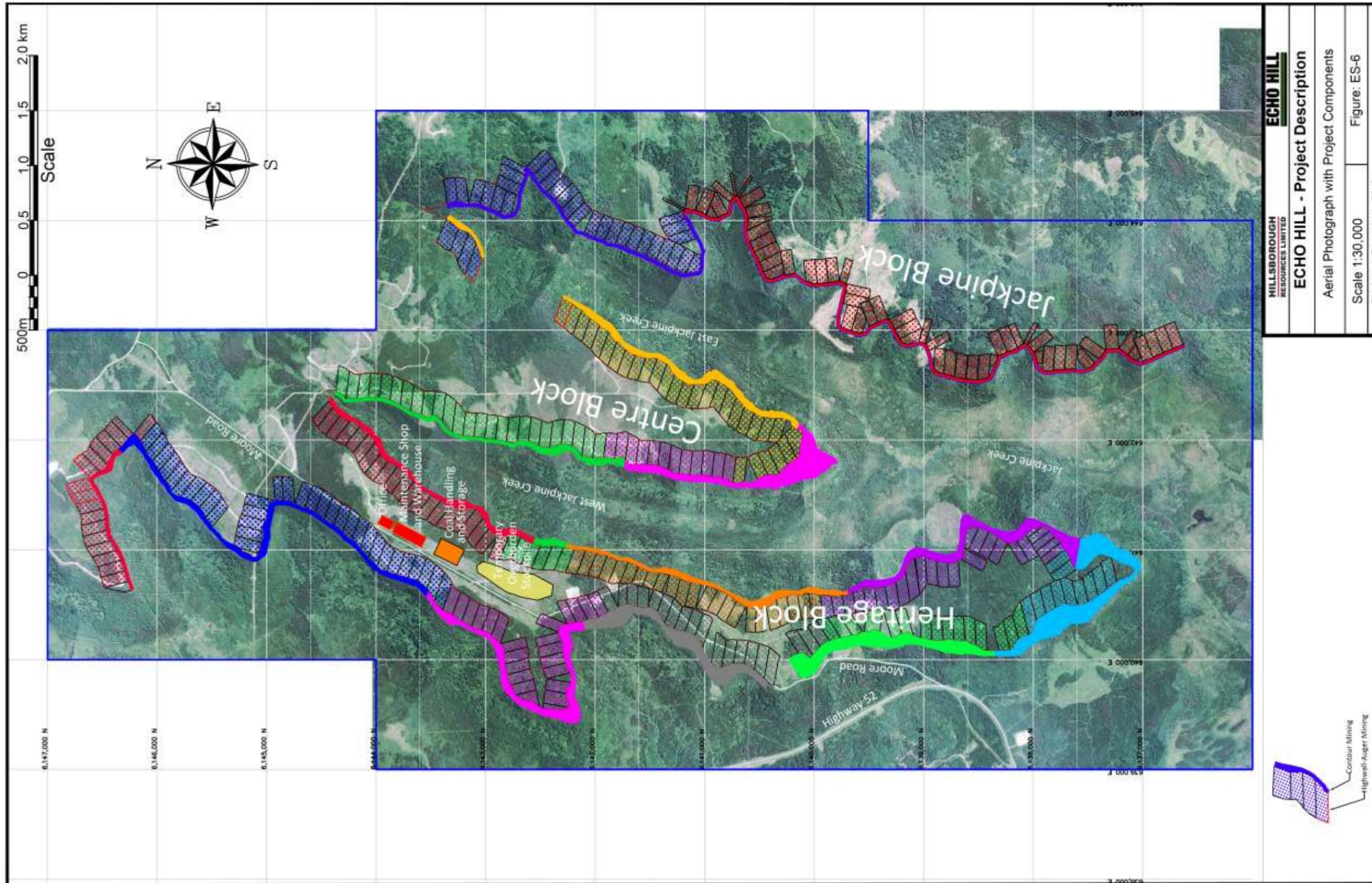


Figure ES-5: ECHO HILL – Aerial Photograph of Project Area



<b>HILLSBOROUGH RESOURCES LIMITED</b>	
<b>ECHO HILL - Project Description</b>	
Aerial Photograph with Project Components	
Scale 1:30,000	Figure: ES-6
Photograph Date: June, 2012	

**Figure ES-6: ECHO HILL – Aerial Photograph with Project Components**