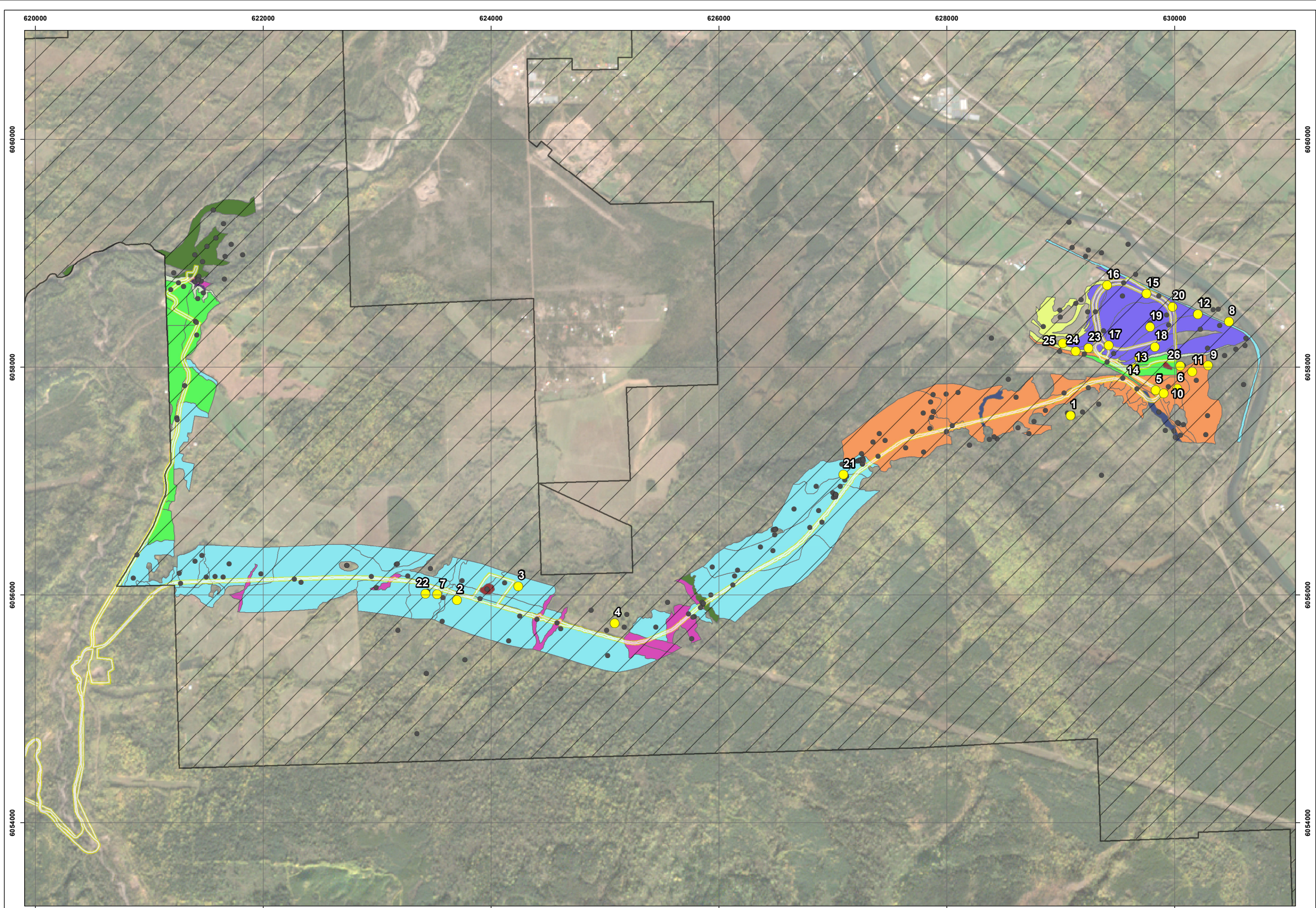




Tenas Project

ALR Preci
Project-Specific Soil Mapping Units

Legend

Detailed Soil Inspection Plots

Vegetation Ground Inspection and Shallow Soil Inspection Plots

ALR Boundary

Project Footprint

Soil Mapping Units

1.1 - Good to Fair

1.2 - Good

2 - Fair to Poor

3.1 - Fair to Poor

3.2 - Fair to Good

4.1 - Unsuitable

4.2 - Fair to Good

4.3 - Fair to Poor

5 - Poor

7 - Unsuitable

8.1 - Unsuitable

8.2 - Unsuitable

Refer to Table X for associated soil characteristics

Notes

1. All mapped features are approximate and should be used for discussion purposes only.

2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

3. Current Disturbance Data Extent is a 4km buffer around the greatest extent of the Wildlife RSAs and the Telkwa Herd Caribou Core/Matrix Habitat. This is the extent of the spatial data used in the current anthropogenic disturbance layer.

Sources

- Data: British Columbia Government Data Catalogue

N

1:35,000

05001,0001,5002,000

Meters

NAD 1983 UTM Zone 9N

Page Size: 11" x 17"

Production Date: Jun 15, 2020

Map 4

ALLEGIANCE COAL LIMITED

EDI ENVIRONMENTAL DESIGN INC.

Topsoil Stripping Conditions																											
Sample Site - Assessment Site		PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8	PL9	PL10	PL11	PL12	PL13	PL14	PL15	PL16	PL17	PL18	PL19	PL20	PL21	PL22	PL23	PL24	PL25	PL26
Land Use / Vegetation		Frst	Frst	Frst	Frst	Frst/Past	Frst	Frst	Frst	Frst	Frst	Frst	Frst	Frst	Frst/Past	Past	Past	Past	Frst/Past	Frst/Past	Frst	Frst	Frst	Frst/Past	Frst	Past	Frst
Topsoil Depth (cm)	Surface Organic	8	10	9	7	6	1	9	3	5	2	2	6	1.5	0.5	0.5	0	1	1	2	15	8	14	1	1	2	7
	A Horizon	0	0	5	5	11	8	8	7	5	12	0	0	4	0	13	3	6	0	0	15	12	0	0	18	20	9
Stripping Recommendation	Total Stripping Depth (cm)	8	10	14	12	17	9	17	10	10	14	2	6	5.5	0.5	13.5	3	7	1	2	30	20	14	1	19	22	16



3 AGRICULTURAL ASSESSMENT

3.1 POTENTIAL EFFECTS TO AGRICULTURAL PRODUCTION

The Project area located within the ALR mostly occurs on undeveloped forested land and two small areas of agricultural land, i.e., referring to cultivated cropland and hayland along the Bypass Road and hayland/pasture within a portion of the rail infrastructure. Soil resources are generally comprised of thin/shallow mineral topsoils with integrated coarse fragments (e.g., gravel) and skeletal soils are prevalent in some locations. Most of the Project area within the ALR is classified as Class 3 and Class 4 land (or a combination of both) that requires moderately intensive and/or special management practices to achieve sustained agricultural production; this classification also implies conditions that moderately-to-severely restrict the range of potential crops. The total ALR usage by the Project is 51.35 ha. However, less than 20 ha of this total area coincides with agricultural land use. Therefore, the potential impacts of the Project toward agricultural production, operations and infrastructure are both minimal and discrete.

EDI understands that planning of Project features within the ALR took into consideration current land use activities and landowner preferences³ to avoid and/or minimize detrimental effects to agricultural production. For example, causing the fragmentation of land parcels, the incidental removal or damage to agricultural fencing, and/or the disruption of farm access and movement of farm equipment. Where Project features intersect with and/or occur in proximity to agricultural land use (listed above) recommendations for soil conservation and land reclamation have been elucidated to mitigate potential Project effects. For example, such as the degradation of topsoil during soil salvage, handling and stockpiling, the alteration of drainage patterns and drainage infrastructure due to Project features, and/or the introduction of noxious, nuisance or otherwise undesirable weeds. These mitigation measures (listed in Section 4) are intended to achieve equivalent land capability and conserve the potential for agricultural land use activities (if/where applicable) at the end of the mining tenure.

3.2 SOIL REMOVAL AND FILL PLACEMENT

EDI understands that soil (i.e., topsoil) within the entire Project area will be stripped to recommended depths — i.e., to the extent possible, depending on the amount of integrated coarse fragment materials — and stockpiled in proximity to its origin. For portions of the Project area within the ALR, soil will be stored along the ditchline of the Bypass Road or within other designated stockpile areas. Based on estimates from the Project-specific Terrain and Soil baseline report, topsoil salvage for all earthworks is anticipated to be approximately 17000 m³. Salvaged soil will then be replaced and redistributed *in situ* during the Project's Decommissioning and Reclamation Phase. If recommendations for soil conservation are followed during all Project phases, there should be no significant loss of soil within portions of the Project located within the ALR insofar as to affect the re-instatement of an equivalent land capability at the time of reclamation.

³ TCL is the landowner of the Project area. That said, TCL's regional engagement strategy (e.g., pertaining to reclamation endpoints) included consultations with local residents, stakeholder and rights holder groups.



Gravel, rock, and other subgrade materials (i.e., fill) will be used to achieve the specified grade during construction of the Bypass Road and Rail Infrastructure. TCL anticipate a total fill placement area of approximately 10 ha and a maximum depth of fill material of 1.2 m — particularly for construction of the Rail Infrastructure. The volume of gravel fill and clean rock are anticipated to be approximately 7000 m³ and 11000 m³, respectively. Clean gravel materials will be sourced from the Project's nearby Gravel Quarry (located along the Bypass Road within Crown Land); these materials have been deemed acceptable for construction and originate from the same predominant parent materials and hold the same characteristics as the placement locations. Clean rock materials will be sourced from the Kulum Quarry (located offsite); these materials are used extensively throughout the region and have been approved by CN Rail for construction of the Rail Infrastructure.



4 MITIGATION MEASURES

4.1 RECOMMENDATIONS FOR SOIL CONSERVATION

Planning of the Tenas Project is supported by multiple Project-specific baseline inventories, effects assessments and management plans covering a variety of subject-matter areas. The Project's Reclamation and Closure Plan, Vegetation Management Plan, and Surface Erosion and Sediment Control Plan (available upon request) will primarily guide soil handling and soil conservation for the entire Project (i.e., both ALR and non-ALR designated areas). Based on the Assessment of Terrestrial Resources (Section 2) and Agricultural Assessment (Section 3), the following recommendations have been advanced to supplement this guidance. These recommendations and TCL commitments are intended to minimize Project effects within the ALR and conserve current and future agricultural land capability therein.

1. To the extent practical, it is beneficial to salvage topsoil prior to construction and minimize admixing (i.e., mixing of the subsoil/parent material with the topsoil) to maintain agricultural capability. Soil stripping/handling and stockpiling will be guided by the Project-specific Reclamation and Closure Plan using methods to the standard of the day. EDI understands that topsoils will be salvaged and stockpiled separately, excluding skeletal soils or thin/shallow topsoils overlying bedrock/parent material.
2. Due to their physical characteristics — i.e., being generally comprised of moderate-to-fine textured topsoils — the identified soil series and SMU's occurring along the Project area may be prone to erosion. EDI understands that most soil stripping/handling will occur during winter whereby frozen-ground conditions will limit/minimize the risk of erosion and sedimentation. Outside of these conditions, construction personnel should avoid or minimize soil stripping/handling and excessive traffic (if/where possible) during wet or very dry conditions to reduce topsoil degradation and rutting.
3. Surface water management should control for run-off, erosion, and/or sedimentation, and be guided by the Project-specific Surface Erosion and Sediment Control Plan. EDI understands that the exact location and extent of control measures will be field-fit during the construction of the Project and that these measures will be monitored/maintained while in place — especially in low-lying areas and/or areas near watercourses.
4. Exposed soil stockpiles should be stabilized as soon as practical, e.g., by seeding and facilitating development of a vegetation cover. Seed mixtures should be appropriate to the region and land use. Exposed soil stockpiles are prone to colonization by noxious and nuisance weed. Weed management will be guided by the Project-specific Vegetation Management Plan.

EDI understands that vegetation will be cleared and soil will be salvaged along or within the Bypass Road, Gravel Quarry and Rail Infrastructure. Vegetation along the Water Discharge Infrastructure will only require light clearing; soils will remain intact. Maps 3 and 4 (in this report) provide soil stripping guidance along portions of the Project area located with the ALR. Additional soil salvage recommendations and volume estimates are listed in the Project-specific Terrain and Soils Report (Ardea 2020b) and the Reclamation and Closure Plan (IEG 2020). EDI recommends that soil salvage and handling activities be monitored and documented by qualified personnel — especially in areas coinciding with and/or in proximity to agricultural land use.



4.2 RECLAMATION PLAN

As described in the Project Description (TCL 2018), the Project is delineated by defined phases and timelines: (1) Construction, (2) Operations, (3) Decommissioning and Reclamation and (4) Post-Closure. These phases correspond with specific design-build activities that consider (to varying extent) final reclamation and end-land use objectives for the entire Project (i.e., both ALR and non-ALR designated areas). Reflecting current and past land use activities within the Project area, the Project's general end land-use objective is to achieve multiple-use forest ecosystems, such as wildlife habitat, recreation, the potential for forest harvest (if/where appropriate), and traditional land uses (i.e., plant and animal harvest). To meet these objectives, the Project-specific Reclamation and Closure Plan (IEG 2020) specifies:

- End Land-Use, Land Capability Objectives and Reclamation Schedule
- Reclamation Approaches
 - Landform Design and Erosion Control
 - Revegetation Strategy and Progressive Reclamation/Sequencing
- Reclamation Research and Post-Closure Monitoring and Maintenance
 - Habitat Compensation Works
 - Trace Element Uptake in Soils and Vegetation
- Reclamation and Closure Prescriptions (i.e., For Specific Project Features/Infrastructure)

The Project-specific Reclamation and Closure Plan is the primary source for planning and guidance to meet the Project's reclamation requirements. The following recommendations have been identified as a supplement to conserve agricultural land capability for portions of the Project located within the ALR:

1. To reclaim disturbances on agricultural land, the proponent is required to meet ALC criteria by restoring soil, topography and vegetation to an equivalent land condition and capability that aligns with land-use.
2. The Project area is located on provincial Crown Land and Private Land. The end land-use objectives should be clearly communicated with all applicable administrative/regulatory agencies and landowners. Likewise, reclamation and aftercare should align with applicable land management initiatives (e.g., Bulkley Land and Resource Management Plan, Bulkley Valley Sustainable Resource Management Plan).
3. Reclaimed land should be recontoured consistently with the original topography and surface drainage patterns. The end landscape should have a suitable aesthetic and be free of remnant construction debris.
4. Replaced topsoils should preserve a minimum standard of quality/quantity compared with adjacent land:
 - Replaced topsoils should target >80 % of the average A horizon depth.
 - Replaced topsoils should have similar characteristics and texture.
 - Admixing should not exceed 30 % and/or result in a net change in soil properties.
 - Subsoils should be decompacted (if/where applicable) to facilitate aeration and root infiltration.
5. Vegetation composition should be consistent with or on a trajectory toward the given end land-use objective(s). Seed mixtures should be appropriate to the region and land use, and selected in consultation with the landowner (if on Private Land) or land management agency (if on Crown Land). Noxious weeds, as listed under the Weed Control Act/Regulation (BC Government 2011), should be monitored and managed until suitable development of the vegetation cover.



Rail Infrastructure

Located on Private Land, the Rail Infrastructure occurs on a combination of forested land and hayland/pasture. This area will be reclaimed back to forested land (via seeding and/or planting of native species) or reclaimed to pasture/hayland (via seeding of mixed forage species) to achieve capability for sustained perennial forage species and/or grazing and thereby enhance agricultural land use.

Bypass Road and Gravel Quarry

Located primarily on Crown Land and a lesser amount of Private Land, the Bypass Road mostly occurs on forested land and a small portion of hayland/pasture and cultivated cropland. This feature will primarily be reclaimed back to forested land (via seeding and/or planting of native species); land management should comply with the Environmental Protection and Management Regulation for reclamation on Crown Land and other applicable land management requirements. The small portion coinciding with agricultural land use will be reclaimed to cultivated cropland or the given land use and cover vegetation at the time of reclamation.

Also located on Crown Land, the Gravel Quarry will be decommissioned, backfilled, and reclaimed back to forested land (as described above).

Water Discharge Infrastructure

Located on Private Land, the Water Discharge Infrastructure (referring to an overland water pipeline) coincides along existing road corridors. Following decommissioning, land affected by the pipeline will likely require only light care and maintenance. No major earthworks or reclamation activities are anticipated for this feature.

TCL is committed to timely and effective reclamation of the Project area. Field assessment to evaluate reclamation performance will be addressed during the Project's Post-Closure phase. For Project features located within the ALR (listed above) reclamation performance should be assessed in comparison with the adjacent undisturbed land using measures of soil, topography and vegetation as indicators of equivalent land condition and capability.



5 CLOSURE

This Non-Farm Use Application has been compiled by EDI and submitted the ALC on behalf of TCL and the Tenas Project. Do not hesitate to contact Ryan Buck (250-301-7926, r.buck@edynamics.com) or Patrick Audet (403-797-0678, p.audet@edynamics.com) should you have any further questions or commentary pertaining to the contents of this report.

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Patrick Audet, PhD., R.P.Bio.....	Senior Oversight

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PA oversees EDI's baseline terrestrial site assessment and post-construction reclamation/closure portfolio for Oil and Gas projects in the PRRD. He also advises mine reclamation projects throughout North and Western Canada.



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Disclaimer:

Maps presented in this document are a geographical representation of known features. Although the data collected and presented herein has been obtained with the utmost attention to quality, this document is not an official land survey and should not be considered for spatial calculation. EDI Environmental Dynamics Inc. does not accept any liability for errors, omissions, or inaccuracies in the data

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APPENDIX A. FIELD DATA

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Appendix Table 1. Field Data Card — Plot ID #1.

SAMPLE #: 1		ARDEA # 7102								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	8-0												
Ccc	0-35	C	—										
Land Use				A Horizon (cm)						Pre-disturbance Soil Texture			
Forested				0						-			
Vegetation:		Populus tremuloides, Picea engelmannii x glauca, Lonicera involucrata, Rosa acicularis, Cornus stolonifera, Amelanchier alnifolia, Sympboricarpos albus, Thalictrum occidentale, Maianthemum stellatum, Lathyrus nevadensis, Arnica mollis, Cornus stolonifera, Aralia nudicaulis, Clintonia uniflora, Osmorbiza purpurea											

Appendix Table 2. Field Data Card — Plot ID #2.

SAMPLE #: 2		ARDEA# 08-3387								PROJECT: 18P0421PL		Slope Class: 3	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	10-0												
Bm	0-20	SL	—								40		PE/CO
C	20-28+	—	—										
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation:		Populus balsamifera, Populus tremuloides, Picea engelmannii × glauca, Lonicera involucrata, Rubus parviflorus, Clintonia uniflora, Lathyrus nevadensis, Arnica cordifolia											

Appendix Table 3. Field Data Card — Plot ID #3.

SAMPLE #: 3		ARDEA #08-3388								PROJECT: 18P0421PL		Slope Class: 3	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	9-0												
Ahe	0-5	SiCL	10YR3/2					M	GR			10	PE
Bt	5-25	SiCL	10YR5/2					M	SBK			15	PE/CO
C	25+	—	—									30	CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					5					Silty Clay Loam			
Vegetation:		Populus tremuloides, Picea engelmannii x glauca, Rosa acicularis, Lonicera involucrata, Rubus parviflorus, Symphoricarpos albus, Lathyrus nevadensis											



Appendix Table 4. Field Data Card — Plot ID #4.

SAMPLE #: 4		ARDEA # 08-3389								PROJECT: 18P0421PL		Slope Class: 4	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	7-0												
Ah	0-5	SiCL	10YR2/2									5	PE
Bm	5-10	SiCL	10YR3/4									11	PE/CO
Bt	10-24+	SiCL	10YR4/3									20	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					5					Silty Clay Loam			
Vegetation:		Populus tremuloides, Betula papyrifera, Symphoricarpos albus, Lonicera involucrata											

Appendix Table 5. Field Data Card — Plot ID #5.

SAMPLE #: 5		ARDEA # 09-778								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	6-0												
Ah	0-11	SiL	—					F	SBK				
Bm	11-25	SiL	—					F	SBK				
C	25+	SiL	—					F	SBK				
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Pasture					11					Silt Loam			
Vegetation:		Poa palustris, Vicia americana, Phleum pratense, Taraxacum officinale Noxious Weeds: Leucanthemum vulgare, Cirsium arvense											

Appendix Table 6. Field Data Card — Plot ID #6.

SAMPLE #: 6		ARDEA # 09-779								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1-0												
Ah	0-8	SiL	—					F	SBK				
Bm	8-20	SiL	—					M	SBK				
C	20-40+	SL	—					F	GR				
Land Use				A Horizon (cm)						Pre-disturbance Soil Texture			
Forested				8						Silt Loam			
Vegetation:		Populus tremuloides, Picea engelmannii × glauca, Rosa acicularis, Shepherardia canadensis, Amelanchier alnifolia, Symphoricarpos albus, Cornus canadensis, Petasites frigidus var. palmatus, Lathyrus nevadensis, Thalictrum venulosum, Galium boreale, Poa pratensis											



Appendix Table 7. Field Data Card — Plot ID #7.

SAMPLE #: 7		ARDEA # 12-8503								PROJECT: 18P0421PL		Slope Class: 8	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	9-0												
Ah	0-8	L	10YR2/2					F	GR			5	PE
Bm	8-24	L	10YR3/3					M	GR			10	PE
Bt	24-45	CL	10YR4/3					F	SBK			10	PE
C	45-50+	CL	10YR4/2					M	SBK			20	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					8					Loam			
Vegetation:		Populus tremuloides, Picea engelmannii × glauca, Rubus parviflorus, Lonicera involucrata, Cornus stolonifera, Gymnocarpium dryopteris, Aralia nudicaulis, Arnica cordifolia											

Appendix Table 8. Field Data Card — Plot ID #8.

SAMPLE #: 8		ARDEA # 12-8535								PROJECT: 18P0421PL		Slope Class: 4	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	3-0												
Ah	0-7	L	10YR3/1										
Bm	7-13	SL	10YR4/2										
C1	13-26	S	7.5YR4/2										
C2	26-32	LS	—										
C3	32-60+	S	—									1	CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					7					Loam			
Vegetation:		Populus tremuloides, Populus trichocarpa, Amelanchier alnifolia, Lonicera involucrata, Rubus idaea, Salix prolixa, Cornus stolonifera, Viburnum edule, Lathyrus nevadensis, Vicia americana, Symphyotrichum ciliolatum, Solidago canadensis, Aralia nudicaulis, Rubus pubescens											

Appendix Table 9. Field Data Card — Plot ID #9.

SAMPLE #: 9		ARDEA # 12-8536								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	5-0												
Ah	0-5	SiL	10YR5/2										
Bm	5-15	SiL	10YR5/3										
C1	15-35	SiL	7.5YR5/3										
C2	35-55+	S	5YR4/3										
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					5					Silt Loam			
Vegetation:		Populus tremuloides, Pinus contorta, Picea engelmannii x glauca, Rosa acicularis, Shepberdia canadensis, Cornus canadensis, Diphasiastrum complanatum, Lycopodium annotinum, Lathyrus nevadensis, Chimaphila umbellata, Aralia nudicaulis											



Appendix Table 10. Field Data Card — Plot ID #10.

SAMPLE #: 10		ARDEA # 12-8537								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	2-0												
Ah	0-12	SiL	10YR3/1										
Bm	12-18	SiL	10YR4/2										
C	18-42+	SiL	2.5Y5/2										
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					12					Silt Loam			
Vegetation:		Populus tremuloides, Fragaria virginiana, Melilotus alba, Taraxacum officinale, Phleum pratense, Dactylis glomerata, Poa interior, Lathyrus nevadensis, Ranunculus uncinatus, Elymus glaucus, Festuca altaica											

Appendix Table 11. Field Data Card — Plot ID #11.

SAMPLE #: 11		ARDEA # 12-8640								PROJECT: 18P0421PL		Slope Class: 2	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	2-0												
Bm	0-6	SiL	—					F	SBK				
Bm2	6-25	SiCL	—					F	SBK				
Cgj	25-45	SiCL	—					F	SBK				
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation:		Pinus contorta, Populus tremuloides, Rosa acicularis, Spiraea douglasii, Shepherdia canadensis, Petasites frigidus var. palmatus, Aralia nudicaulis, Galium boreale, Lathyrus nevadensis, Cornus canadensis											

Appendix Table 12. Field Data Card — Plot ID #12.

SAMPLE #: 12		ARDEA # 12-8642								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	6-0												
Bm	0-9	SL	—										
C1	9-17	SL	—					M	SBK				
C2	17-35+	S	—									50	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation:		Pinus contorta, Picea engelmannii × glauca, Populus tremuloides, Shepherdia canadensis, Galium boreale, Linnaea borealis, Arnica cordifolia, Elymus glauca											



Appendix Table 13. Field Data Card — Plot ID #13.

SAMPLE #: PL13		ARDEA # 12-8663								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1.5-0												
Ah	0-4	SL	5YR4/2										
Bm	4-13	SL	5YR4/3					M	SBK				
BC	13-28	SL	5YR5/2					C	SBK				
C	28-40+	S	5YR4/4					F	GF				
Land Use				A Horizon (cm)					Pre-disturbance Soil Texture				
Forested				4					Sandy Loam				
Vegetation:		Pinus contorta, Rosa acicularis, Hieracium umbellatum											

Appendix Table 14. Field Data Card — Plot ID #14.

SAMPLE #: 14		ARDEA # 12-8669								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	0.5-0												
Bm	0-7	S	5YR2.5/2						SGR			25	PE
BC	7-22	S	5YR3/2						SGR			45	PE
C	22-50+	S	5YR3/2						SGR			60	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation: <i>Pinus contorta</i> , <i>Salix scouleriana</i> , <i>Vaccinium caespitosum</i>													

Appendix Table 15. Field Data Card — Plot ID #15.

SAMPLE #: 15		ARDEA # 14-0501								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	0.5-0												
Ah	0-13	SiL	7.5YR3/2									35	PE/CO
BC	13-25	S	7.5YR4/2						SGR			45	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested/Range					13					Silt Loam			
Vegetation: <i>Populus tremuloides</i> , <i>Rosa acicularis</i> , <i>Hieracium umbellatum</i> , <i>Poa pratensis</i>													



Appendix Table 16. Field Data Card — Plot ID #16.

SAMPLE #: 16		ARDEA # 14-0502								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
Ah	0-3	SiL	5YR3/2										
Bm	3-9	SiL	5YR3/3					M	SBK				
C1	9-18	SiL	5YR4/3					M	SBK				
C2	18-30	S	5YR3/4						SGR			40	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Pasture					3					Silt Loam			
Vegetation: <i>Hieracium sp.</i> , <i>Taraxacum officinale</i> , <i>Achillea millefolium</i> , <i>Poa pratensis</i>													

Appendix Table 17. Field Data Card — Plot ID #17.

SAMPLE #: 17		ARDEA # 14-0503								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1-0												
Ah	0-6	SiCL	7.5YR3/2					VF	SBK				
C1	6-26	SiL	7.5YR4/2					C	SBK				
C2	26-35+	SiL	7.5YR4/2					C	SBK				
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Pasture					6					Silty Clay Loam			
Vegetation: <i>Hieracium sp.</i> , <i>Fragaria virginiana</i> , <i>Achillea millefolium</i> , <i>Pleum pratense</i> , <i>Poa pratensis</i> , <i>Taraxacum officinale</i>													

Appendix Table 18. Field Data Card — Plot ID #18.

SAMPLE #: 18		ARDEA # 14-0505								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1-0												
Bm	0-8	LS	10YR3/4						SGR				
BC	8-28	S	10YR4/3						SGR				
c	28-40+	S	10YR3/3						SGR			25	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation: <i>Pinus contorta</i> , <i>Shepberdia canadensis</i> , <i>Rosa acicularis</i> , <i>Amelanchier alnifolia</i>													



Appendix Table 19. Field Data Card — Plot ID #19.

SAMPLE #: 19		ARDEA # 14-0506								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	2-0												
Bm	0-9	SL	7.5YR3/4						SGR			15	PE
BC	9-22	SiL	7.5YR4/2					F	SBK			18	PE/CO
C	22-40+	S	10YR3/2						SGR			40	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation: <i>Pinus contorta</i> , <i>Rosa acicularis</i> , <i>Arctostaphylos uva-ursi</i> , <i>Galium boreale</i>													

Appendix Table 20. Field Data Card — Plot ID #20.

SAMPLE #: 20		ARDEA # 14-0507								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1.5-0												
Ah	0-1.5	S	10YR3/3										
C1	1.5-13	S	10YR4/3						SGR				
C2	13-32	S	10YR4/2						SGR				
C3	32-45+	S	—						SGR			25	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					1.5					Sand			
Vegetation: <i>Pinus contorta</i> , <i>Shepherdia canadensis</i> , <i>Rosa acicularis</i> , <i>Arctostaphylos uva-ursi</i> , <i>Vaccinium caespitosum</i>													

Appendix Table 21. Field Data Card — Plot ID #21,

SAMPLE #: 21		ARDEA # 14-3956								PROJECT: 18P0421PL		Slope Class: 5	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	8-0												
Bm	0-8	L	7.5YR3/2					M	SBK			7	PE/CO
Ae	8-12	SiC	10YR5/2					M	PL			7	PE/CO
Bt	12-30+	C	10YR5/3					M	ABK				
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					12					Silty Clay			
Vegetation:		Picea engelmannii × glauca, Populus tremuloides, Lonicera involucrata, Viburnum edule, Symphoricarpos albus, Rosa acicularis, Rubus parviflorus, Cornus canadensis, Lathyrus nevadensis, Eurybia conspicua											



Appendix Table 22. Field Data Card — Plot ID #22.

SAMPLE #: 22		ARDEA # IR213								PROJECT: 18P0421PL		Slope Class: 4	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	14-0												
Bm	0-20	SL	5YR3/4					F	GR			45	CO/PE
C	20+	SL	5YR4/3					F	GR			55	CO/PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation:		Populus tremuloides, Picea engelmannii x glauca, Populus balsamifera, Rubus parviflorus Lonicera involucrata, Lathyrus nevadensis, Rubus pubescens, Eurybia conspicua, Calamagrostis canadensis, Arnica cordifolia											

Appendix Table 23. Field Data Card — Plot ID #23.

SAMPLE #: 23		ARDEA # IR236								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1-0												
Bm	0-9	FS	10YR3/4										
BC	9-21	S	10YR4/2									15	PE
C	21-50	S	10YR3/2									45	PE/CO
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					0					-			
Vegetation:		Pinus contorta, Rosa acicularis, Hieracium triste											

Appendix Table 24. Field Data Card — Plot ID #24.

SAMPLE #: 24		ARDEA # IR238a								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	1-0												
Ah	0-18	Si	10YR2/2						MA				
Bg	18-40	SiC	10YR5/2					M	SBK				
Cg	40-50	S	—										
C	50+	S	—									20	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Forested					18					Silt			
Vegetation:		Stellaria sp.											



Appendix Table 25. Field Data Card — Plot ID #25.

SAMPLE #: 25		ARDEA # IR240								PROJECT: 18P0421PL		Slope Class: 1	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	2-0												
Ah	0-20	Si	10YR2/1										
Bm	20-24	SiC	10YR4/1					M	SBK				
C	24+	S	—						SGR			80	PE
Land Use					A Horizon (cm)					Pre-disturbance Soil Texture			
Pasture					20					Silt			
Vegetation: <i>Calamagrostis canadensis</i> , <i>Carex rossii</i> , <i>Mentha arvensis</i> , <i>Deschampsia cespitosa</i>													

Appendix Table 26. Field Data Card — Plot ID #26.

SAMPLE #: 26		ARDEA # VTF16								PROJECT: 18P0421PL		Slope Class: 3	
Profile	Depth (cm)	Texture	Colour	Mottling			Soil Structure			Consistence		Rocks	
				Abun.	Size	Contrast	Grade	Class	Kind	D-M-W	Cons	%	Kind
LFH	7-0												
A	0-9	SL	—					F	GR				
Bm1	9-24	S	—					M	GR				
Bm2	24-47+	SL	—					F	GR				
Land Use				A Horizon (cm)					Pre-disturbance Soil Texture				
Forested				9					Sandy Loam				
Vegetation:		Pinus contorta var. latifolia, Picea engelmannii × glauca, Shepherdia canadensis, Lathyrus sp., Pyrola asarifolia, Cornus canadensis											

Appendix Table 27. Sample Point Coordinates — Detailed Soil Inspections.

Plot ID	Ardea ID	Northing	Easting	Plot ID	Ardea ID	Northing	Easting
1	7102	6057577	629085	14	12-8669	6058084	629689
2	08-3387	6055952	623700	15	14-0501	6058642	629752
3	08-3388	6056076	624239	16	14-0502	6058717	629405
4	08-3389	6055751	625083	17	14-0503	6058189	629422
5	09-778	6057797	629833	18	14-0505	6058179	629828
6	09-779	6057812	630023	19	14-0506	6058352	629784
7	12-8503	6056005	623523	20	14-0507	6058532	629980
8	12-8535	6058397	630476	21	14-3956	6057054	627091
9	12-8536	6058014	630292	22	IR213	6056008	623423
10	12-8537	6057773	629903	23	IR236	6058169	629243
11	12-8640	6057963	630152	24	IR238a	6058143	629132
12	12-8642	6058466	630202	25	IR240	6058208	629019
13	12-8663	6057989	629653	26	VTF169	60580112	630049

All coordinates in NAD83/UTM Zone 9N.



Appendix Table 28. Sample Point Coordinates — Vegetation Ground Inspections and Shallow Soil Inspections.

Ardea ID	Northing	Easting	Ardea ID	Northing	Easting	Ardea ID	Northing	Easting
7102	6057576	629086	AD166	6057290	627637	BR02	6058973	621663
08-3387	6055951	623701	AD167	6057256	627795	BR03	6058774	621659
08-3388	6056075	624240	AD168	6057437	627997	BR04	6058754	621453
08-3389	6055750	625084	AD169	6057488	628046	BR07	6057558	621240
08-3391	6059080	621718	AD170	6057318	628197	BR18	6056757	626656
09-778	6057796	629834	AD171	6057367	628373	BR19	6056741	626873
09-779	6057813	630024	AD172	6057370	628440	BR20	6056955	626854
12-8503	6056004	623524	AD173	6057417	628719	BR21	6056956	627064
12-8535	6058396	630477	AD174	6057468	628626	BR22	6057150	627078
12-8536	6058013	630293	AD175	6057524	628764	BR23	6057148	627258
12-8537	6057772	629904	AD176	6057622	628864	BR24	6057356	627458
12-8640	6057962	630153	AD177	6057775	629027	BR25	6057560	627866
12-8642	6058465	630203	AD178	6057442	629993	BR26	6057762	627879
12-8663	6057988	629654	AD179	6057607	629862	BR37	6056347	621460
12-8669	6058083	629690	AD180	6059050	629098	BR38	6056158	621647
14-0501	6058641	629753	AD181	6058987	621818	BR40	6056150	620858
14-0502	6058716	629406	AD183	6059133	621585	INTWS05	6058711	621301
14-0503	6058188	629423	AD184	6059379	621560	IR004	6058169	630286
14-0504	6058125	629465	AD185	6059259	621648	IR005	6058333	630224
14-0505	6058178	629829	AD186	6058829	621213	IR007	6058462	629929
14-0506	6058351	629785	AR01TW	6056530	626487	IR008	6058372	629948
14-0507	6058531	629981	AR02TW	6057344	627352	IR149	6056157	621498
14-3956	6057053	627092	AR05TW	6055917	625858	IR150	6056191	621262
AD002	6057885	630189	AR06TW	6055757	624578	IR152	6058049	629408
AD004	6058156	630537	AR07TW	6055790	624402	IR153	6057905	629543
AD005	6058193	630617	AR09TW	6056870	627013	IR154	6058295	629284
AD006	6058256	630625	AR28LR	6058784	621419	IR155	6058484	629235
AD008	6058511	630381	AR32LR	6056167	623267	IR156	6058560	629131
AD009	6058506	630337	AR33LR	6056260	622731	IR157	6058973	629217
AD010	6058777	629807	AR41LR	6057390	628414	IR158	6059027	629242
AD011	6058016	630055	AR42LR	6057581	629089	IR159	6059004	629357
AD105	6058816	629657	AR43LR	6055966	623902	IR160	6059077	629591
AD163	6057764	627994	AR44LR	6056269	623166	IR161	6059273	629071
AD164	6057694	627857	AR46LR	6057178	627216	IR162	6058594	629178
AD165	6057600	627793	BR01	6058926	621467	IR163	6057187	627257
IR164	6057243	627250	IR170	6056168	626136	IR176	6055806	625772
IR165	6057043	627120	IR171	6056088	626121	IR178	6055832	625732
IR166	6056856	627003	IR172	6056002	625927	IR179	6056249	625941
IR167	6056593	626797	IR173	6055936	625850	IR201	6058604	621425
IR168	6056574	626486	IR174	6055928	625864	IR202	6058653	621473
IR169	6056423	626363	IR175	6055812	625782	IR203	6058751	621400



Appendix Table 28. Continued.

Ardea ID	Northing	Easting	Ardea ID	Northing	Easting	Ardea ID	Northing	Easting
IR204	6058682	621187	PC17TWB	6057839	621308	QA40	6056355	620892
IR205	6058284	621416	PC26TWA	6058254	628391	QA44	6058987	621397
IR211	6057537	621243	PC27TWA	6057892	628538	QA45	6058787	621428
IR213	6056007	623424	PC28TWA	6058018	630078	QA46	6057409	630273
IR215	6055976	623575	PC29TWA	6058390	629785	QA47	6057403	630051
IR217	6056052	623963	PC30TWA	6058628	629860	QA48	6057387	630006
IR220	6055720	625167	PC31TWA	6058470	630183	QA49	6057444	629916
IR221	6056274	623174	PC32TWA	6058366	630395	QA50	6058318	629374
IR222	6056165	622946	PC33LRB	6056113	622330	QA51	6058624	629542
IR223	6056140	622273	PC33TWA	6058103	630439	QA52	6058743	629553
IR236	6058168	629244	PC34LRB	6056064	622990	QA53	6057437	627698
IR237	6058117	629205	PC35LRB	6056033	623442	QA55	6057191	627252
IR238a	6058142	629133	PC36LRB	6056124	623744	VS04	6058395	621413
IR239	6058140	628990	PC37LRB	6055816	624252	VTF16	6058011	630050
IR240	6058207	629020	PC38LRB	6055703	624611	WF01W-1	6057567	629101
IR241	6058207	629020	PC39LRB	6055870	624875	WF01W-2	6057574	629098
IR242	6058359	628846	PC43TWB	6056187	621978	WF01W-3	6057585	629102
IR243	6058442	628995	PC44TWB	6056276	621701	WF01W-4	6057592	629104
IR244	6058501	628992	PC45TWB	6056298	621399	WF01W-5	6057580	629105
IR245	6057507	630037	PC46LRB	6055768	623571	WF02U	6057050	629357
IR246	6057515	630023	PC47LRB	6055431	623769	WF02W	6057677	629332
IR249	6057992	629650	PC48LRB	6055313	623431	WF03U	6057158	627259
IR250	6058072	629746	PC49LR	6055691	623182	WF03W-1	6057177	627222
IR257	6058486	629304	PC50LRB	6057778	628099	WF03W-2	6057183	627233
PC01LRB	6057612	627880	PC52LRB	6057738	628606	WF03W-3	6057183	627245
PC01TWB	6057500	630078	PC53LRB	6057598	629059	WF03W-4	6057198	627261
PC02LRB	6057417	627408	PC55LRB	6056230	623467	WF03W-5	6057184	627266
PC02TWB	6057848	630605	PC56LRB	6056110	624117	WF04U	6056883	627025
PC03LRB	6057009	627104	PC57LRB	6055598	624152	WF04W-1	6056884	627022
PC03TWB	6057577	630288	PC57TWB	6054784	623346	WF04W-2	6056871	627022
PC04LRB	6056640	626903	PC59TWB	6057467	627853	WF04W-3	6056862	627022
PC04TWB	6057813	629668	PC60TWB	6057221	627396	WF05W-1	6056883	627026
PC05TWB	6057821	629241	PC61TWB	6056899	626998	WF06U	6056581	626497
PC09LRB	6056573	626476	PC62TWB	6056391	626473	WF06W-1	6056574	626492
PC10LRB	6056219	626162	PC63TWB	6056102	621272	WF07U	6056259	622734
PC11LRB	6055888	625836	PC64TWB	6056162	621575	WF10U-1	6058795	621434
PC12LRB	6055718	625445	PC65LRB	6057830	629943	WF10U-2	6058765	621426
PC13LRB	6055692	625014	PC69TWB	6055469	625021	WF03W-3	6057183	627245
PC13TWB	6059063	621503	PC70TWB	6055830	625190	WF03W-4	6057198	627261
PC14TWB	6058742	621255	PC71TWB	6055938	625548	WF03W-5	6057184	627266
PC16TWB	6058406	621403	PC72TWB	6055617	625759	WF04U	6056883	627025

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APPENDIX B. TERMS AND DEFINITIONS

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Appendix Table 29. Field Data Terms and Definitions.

SURFACE EXPRESSION (Selected)		
LVL – Level	A flat or very gently sloping unidirectional surface. Slopes are generally <2%	
INC – Inclined	A sloping unidirectional surface with constant slope. Slopes are 2-70%	
HUM – Hummocky	A complex sequence of slopes extending from rounded depressions. Slopes are 9-70%	
ROL – Rolling	A regular sequence of moderate slopes (>5%) from rounded depressions. Slope length >1.6 km	
UND – Undulating	A regular sequence of gentle slopes (2-5%) extending from rounded convexities. Slope length is <1km	
TER – Terraced	A scarp face and the horizontal gently inclined surface above it	
STP – Steep	Erosional slopes. Slopes are >70%	
SURFACE DRAINAGE	SOIL TEXTURE	SLOPE POSITION
G - Good	Si – Silt	C – Crest
M - Moderate	SiL – Silt Loam	U – Upper
P - Poor	SiC – Silty Clay	M – Mid
	SiCL – Silty Clay Loam	L – Lower
	CL – Clay Loam	D – Depression
	S – Sand	F – Flat
	SC – Sandy Clay	
	SL – Sandy Loam	
	SCL – Sandy Clay Loam	
	C – Clay	
	HC – Heavy Clay	
	L – Loam	
	LS – Loamy Sand	
SLOPE CLASS CATEGORIES		
Slope Class	Percent Slopes	Terminology
1	0 - 0.5	level
2	> 0.5 - 2	nearly level
3	> 2 - 5	very gentle slopes
4	> 5 - 10	gentle slopes
5	>10 - 15	moderate slopes
6	> 15 - 30	strong slopes
7	> 30 - 45	very strong slopes
8	> 45 - 70	extreme slopes
9	> 70 - 100	steep slopes
10	> 100	very steep slopes
SOIL CONSISTENCY CATEGORIES		
Dry (D)	Moist (M)	Wet (W)
L - Loose	L - Loose	N - None sticky
SO - Soft	VFR - Very Friable	SLS - Slightly Sticky
SLH - Slightly Hard	FR - Friable	S - Sticky
H - Hard	F - Firm	VS - Very Sticky
VH - Very Hard	VF -Very Firm	
EH - Extremely Hard	EF - Extremely Firm	
R - Rigid		



Appendix Table 29. Continued.

SOIL MOTTLING CATEGORIES		
Abundance	Size (mm)	Contrast
Few < 2%	Fine: < 5	Faint
Common 2 – 20%	Medium 5 – 15	Distinct
Many > 20%	Coarse: >15	Prominent
SOIL STRUCTURE CATEGORIES		
Grade	Class (mm)	Kind
Structureless (N)	Fine < 2	Platy (PL)
Moderate (M)	Medium 2 – 5	Granular (GR)
Weak (W)	Coarse > 5	
Strong (S)	Fine < 10	Angular Blocky (ABK)
	Medium 10 -20	Subangular Blocky (SBK)
	Coarse 20 – 50	
	Very Coarse >50	
	Fine < 20	Prismatic (PR)
	Medium 20 -50	Columnar (COL)
	Coarse 50 – 100	Massive (MA)
	Very Coarse > 100	
SURFACE STONINESS CLASS CATEGORIES (>25 cm diameter)		
Class	Description	% Coverage
S0	Non-Stony	0.01
S1	Slightly Stony	0.01 – 0.1
S2	Moderately Stony	0.1 - 3
S3	Very Stony	3 - 15
S4	Exceedingly Stony	15 - 50
S5	Excessively Stony	50 %
SPECIFIC CLASTIC TEXTURES		
Particle/Coarse Fragment	Definition	
BL – Blocks	Angular particles greater than 256 mm in size.	
BO – Boulders	Rounded particles greater than 256 mm in size.	
CO – Cobbles	Rounded particles between 64 and 256 mm in size.	
PE – Pebbles	Rounded particles between 2 and 64 mm in size.	
S – Sand	Particles between .0625 and 2 mm in size.	
Si – Silt	Particles between 2µm and .0625 mm in size.	
C – Clay	Particles less than 2µm in size.	



APPENDIX C. PHOTOGRAPHS

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Photo 1. Forested Land at Plot ID #22. (Ardea: IR213).



Photo 2. Forested Land at Plot ID #3 (Ardea: 08-3388).



Photo 3. Forested Land at Plot ID #10 (Ardea: 12-8537).



Photo 4. Forested Land at Plot ID #19 (Ardea: 14-0506).



Photo 5. Forested Land at Plot ID #21 (Ardea: 14-3953).



Photo 6. Pasture at Plot ID #25 (Ardea: IR240).



Photo 7. Soil Profile at Plot ID #22 (Ardea: IR213).



Photo 8. Soil Profile at Plot ID #3 (Ardea: 08-3388).



Photo 9. Soil Profile at Plot ID #25 (Ardea: IR240).

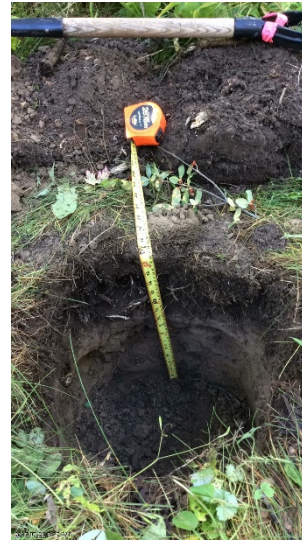


Photo 10. Soil Profile at Plot ID #10 (Ardea: 12-8537).



Photo 11. Soil Profile at Plot ID #19 (Ardea: 14-0506).



Photo 12. Soil Profile at Plot ID #21 (Ardea: 14-3953).



Telkwa Coal Non-Farm Use Application

Land Use of Adjacent Parcels:

Please see Table 3 below, which outlines the primary land use and specific activities of each adjacent parcel of land.

Table 3: Land Use of Adjacent Parcels

Parcel #	Land Use/ Size (ha)	North		East		South		West	
Parcel 1	Land Use	Agriculture (Pasture, Crop)		Agriculture (Pasture, Crop)		Agriculture (Pasture, Crop)		Agriculture (Pasture)	
	Size (ha)	62.11		129.34		259.58		20.52	
Parcel 2	Land Use	Agriculture (Pasture)		Agriculture (Pasture)	Crown Land	Agriculture (Pasture)		Agriculture (Pasture, Crop)	Agriculture (Pasture, Crop)
	Size (ha)	64.80		64.41	64.40	259.58		64.20	62.11
Parcel 3	Land Use	Crown Land	Agricultural, Limited residential (one house)	Agriculture, Farm		Forested private land (TCL)		Crown Land	
	Size (ha)	108.74	62.11	64.19		259.49		108.74	
Parcel 4	Land Use	Crown Land		Crown Land		Crown Land		Agriculture (Pasture, Crop)	
	Size (ha)	64.40		64.95		258.70		128.98	
Parcel 5	Land Use	Agriculture (Pasture, Crop)		Crown Land		Crown Land	Crown Land	Agriculture (Pasture, Crop)	Agriculture (Pasture, Crop)
	Size (ha)	14.11		38.71		60.92	6.48	129.14	30.88



Telkwa Coal Non-Farm Use Application

Other Parcels of Interest

All other parcels of interest are Crown land that are used for grazing purposes.

- RAN076242 A (already included in Online Application)
 - Client Name: Colleen Helps
 - Crown Land
 - Size: 517.79 hectares
 - Active
 - Total Authorized Grazable Forage, Private Land Grazable forage, non-use forage: N/A
 - Max Number of Cattle, Sheep, Horses, other livestock: N/A
- RAN075745 A
 - Client Name: W Diamond Ranch
 - Crown Land
 - Size: 6,549.55 hectares
 - Active
 - Total Authorized Grazable Forage, Private Land Grazable forage, non-use forage: N/A
 - Max Number of Cattle, Sheep, Horses, other livestock: N/A
- RAN077588 A
 - Client Name: Brian McConnell
 - Crown Land
 - Size 152,955.95 hectares
 - Active
 - Total Authorized Grazable Forage (62), Private Land Grazable forage (12), non-use forage (0)
 - Max Number of Cattle (N/A), Sheep (N/A), Horses (10), Other livestock (N/A)

TITLE SEARCH PRINT

File Reference: 0228388.0003

Declared Value \$\$90,000.00

2018-07-25, 10:04:18

Requestor: Sheila Teng

****CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN******Land Title District**

Land Title Office

PRINCE RUPERT

PRINCE RUPERT

Title Number

From Title Number

TG15376

K2189

Application Received

1993-10-14

Application Entered

1993-10-14

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

WENDY KATHLEEN MACDONALD, SECRETARY
DONALD GEORGE MACDONALD, MANAGER
P.O. BOX 164
TELKWA, BC
V0J 2X0
AS JOINT TENANTS

Taxation Authority

Omineca Assessment District

Description of Land

Parcel Identifier:

013-581-180

Legal Description:

LOT A (SEE DF18988) DISTRICT LOT 1143 RANGE 5 COAST DISTRICT PLAN 1056
EXCEPT PLAN 9828

Legal Notations

FOR PROVISOS AND CONDITIONS IN CROWN GRANT SEE K2189

THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND
COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 7828

Charges, Liens and Interests

Nature:

STATUTORY RIGHT OF WAY

Registration Number:

TK6478

Registration Date and Time:

1996-05-08 13:33

Registered Owner:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

TITLE SEARCH PRINT

File Reference: 0228388.0003

Declared Value \$\$90,000.00

2018-07-25, 10:04:18

Requestor: Sheila Teng

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	TK6479
Registration Date and Time:	1996-05-08 13:33
Registered Owner:	BC TEL INCORPORATION NO. A-1801

Nature:	MORTGAGE
Registration Number:	BV39388
Registration Date and Time:	2003-02-03 14:54
Registered Owner:	ROYAL BANK OF CANADA

Duplicate Indefeasible Title	NONE OUTSTANDING
-------------------------------------	------------------

Transfers	NONE
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Pending Applications	NONE
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TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 38037

2018-09-19, 08:51:30

Requestor: Sheila Teng

****CURRENT AND CANCELLED INFORMATION SHOWN******Land Title District**

Land Title Office

PRINCE RUPERT

PRINCE RUPERT

Title Number

From Title Number

BB1725341

TC22577

CROWN GRANT 203/1372

Application Received

2010-12-09

Application Entered

2011-02-02

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

BRUCE EDWARD KERR, FARMER
MARIE JOESPHINE KERR, FARMER
POST OFFICE BOX 33
TELKWA, BC
VOJ 2X0
AS JOINT TENANTS**Taxation Authority**

Omineca Assessment District

Description of Land

Parcel Identifier:

028-406-869

Legal Description:

BLOCK A DISTRICT LOT 223 RANGE 5 COAST DISTRICT

Legal Notations

SUBJECT TO PROVISOS, SEE CROWN GRANT BB1725341

THIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND
COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 7828**Charges, Liens and Interests**

Nature:

RIGHT OF WAY

Registration Number:

G9649

Registration Date and Time:

1978-08-17 15:11

Registered Owner:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Remarks:

INTER ALIA

PART IN PLAN PRP7025

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 38037

2018-09-19, 08:51:30

Requestor: Sheila Teng

Nature:	UNDERSURFACE AND OTHER EXC & RES
Registration Number:	BB1725342
Registration Date and Time:	2010-12-09 11:15
Registered Owner:	THE CROWN IN RIGHT OF BRITISH COLUMBIA
Remarks:	SEE BB1725341

Nature:	COVENANT
Registration Number:	BB1741790A
Registration Date and Time:	2011-02-01 12:13
Registered Owner:	THE CROWN IN RIGHT OF BRITISH COLUMBIA
Remarks:	INTER ALIA RESTRICTS DEALINGS

Duplicate Indefeasible Title	NONE OUTSTANDING
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Transfers	NONE
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Pending Applications	NONE
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Corrections

BB1738805 2011-02-02 11:58:00 CHARGE REMARKS ADDED G9649

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 59500

2018-09-19, 08:51:31

Requestor: Sheila Teng

****CURRENT AND CANCELLED INFORMATION SHOWN******Land Title District**

Land Title Office

PRINCE RUPERT

PRINCE RUPERT

Title Number

From Title Number

BV136615

J16783

Application Received

2003-04-22

Application Entered

2003-05-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

DANIEL BRUCE KERR, BUSINESSMAN
BOX 629
HOUSTON, BC
V0J 1Z0**Taxation Authority**

Omineca Assessment District

Description of Land

Parcel Identifier:

010-652-787

Legal Description:

BLOCK B DISTRICT LOT 222 RANGE 5 COAST DISTRICT

Legal NotationsTHIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND
COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 7828

FOR PROVISOS AND CONDITIONS IN CROWN GRANT SEE 92857-I

Charges, Liens and Interests

Nature:

RIGHT OF WAY

Registration Number:

B3980

Registration Date and Time:

1973-05-07 13:57

Registered Owner:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Remarks:

PART ON PLAN 7010

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 59500

2018-09-19, 08:51:31

Requestor: Sheila Teng

Nature: MORTGAGE
Registration Number: E4500
Registration Date and Time: 1976-05-10 11:34
Registered Owner: BANK OF MONTREAL
Remarks: INTER ALIA
Cancelled By: BX378287
Cancelled Date: 2005-10-03

Nature: CERTIFICATE OF PENDING LITIGATION
Registration Number: BV271749
Registration Date and Time: 2003-07-17 11:08
Registered Owner: MARGARET KATHLEEN KERR
Remarks: INTER ALIA
Cancelled By: BX241384
Cancelled Date: 2005-06-08

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

Corrections NONE

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 27500

2018-09-19, 08:51:30

Requestor: Sheila Teng

****CURRENT AND CANCELLED INFORMATION SHOWN******Land Title District**

Land Title Office

PRINCE RUPERT

PRINCE RUPERT

Title Number

From Title Number

BV136614

G14457

Application Received

2003-04-22

Application Entered

2003-05-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

DOUGLAS MURDOCK KERR, BUSINESSMAN
BOX 4174
SMITHERS, BC
V0J 2N0**Taxation Authority**

Omineca Assessment District

Description of Land

Parcel Identifier:

010-652-043

Legal Description:

DISTRICT LOT 222 RANGE 5 COAST DISTRICT EXCEPT BLOCKS A AND B

Legal NotationsTHIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND
COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 7828

FOR PROVISOS AND CONDITIONS IN CROWN GRANT SEE G14457

Charges, Liens and Interests

Nature:

RIGHT OF WAY

Registration Number:

G9649

Registration Date and Time:

1978-08-17 15:11

Registered Owner:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Remarks:

INTER ALIA

PART ON PLAN 7025

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 27500

2018-09-19, 08:51:30

Requestor: Sheila Teng

Nature:	CERTIFICATE OF PENDING LITIGATION
Registration Number:	BV271749
Registration Date and Time:	2003-07-17 11:08
Registered Owner:	MARGARET KATHLEEN KERR
Remarks:	INTER ALIA
Cancelled By:	BX241384
Cancelled Date:	2005-06-08

Nature:	EASEMENT
Registration Number:	CA4276913
Registration Date and Time:	2015-03-11 16:18
Remarks:	APPURTENANT TO DISTRICT LOT 248 RANGE 5 COAST DISTRICT

Duplicate Indefeasible Title	NONE OUTSTANDING
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Transfers	NONE
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Pending Applications	NONE
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Corrections	NONE
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TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 19000

2018-09-19, 09:01:42

Requestor: Sheila Teng

****CURRENT AND CANCELLED INFORMATION SHOWN******Land Title District**

Land Title Office

PRINCE RUPERT

PRINCE RUPERT

Title Number

From Title Number

PM29440

TC5287

Application Received

1998-07-13

Application Entered

1998-07-14

Registered Owner in Fee Simple

Registered Owner/Mailing Address:

COLLEEN GAIL HELPS, RANCHER
PO BOX 95
TELKWA, BC
V0J 2X0**Taxation Authority**

Omineca Assessment District

Description of Land

Parcel Identifier:

013-496-751

Legal Description:

THE SOUTHWEST 1/4 OF DISTRICT LOT 402 RANGE 5 COAST DISTRICT

Legal NotationsTHIS CERTIFICATE OF TITLE MAY BE AFFECTED BY THE AGRICULTURAL LAND
COMMISSION ACT, SEE AGRICULTURAL LAND RESERVE PLAN NO. 7828 DEPOSITED
19/02/1975 PER R.E. HOOPER

FOR PROVISOS AND CONDITIONS IN CROWN GRANT SEE 63127I

Charges, Liens and Interests

Nature:

RIGHT OF WAY

Registration Number:

B1959

Registration Date and Time:

1973-03-02 14:34

Registered Owner:

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Remarks:

PART IN PLAN 7010

TITLE SEARCH PRINT

File Reference: Telkwa Coal

Declared Value \$ 19000

2018-09-19, 09:01:42

Requestor: Sheila Teng

Nature:	MORTGAGE
Registration Number:	PP14052
Registration Date and Time:	2000-05-02 10:17
Registered Owner:	BULKLEY VALLEY CREDIT UNION
Remarks:	INTER ALIA

Duplicate Indefeasible Title	NONE OUTSTANDING
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Transfers	NONE
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Pending Applications	NONE
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Corrections	NONE
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