



Contact

P 867.873.5263
F 867.669.5555
kblenv.com

Address

#17 Cameron Road
P.O. Box 1895
Yellowknife, NT X1A 2P4

December 23, 2022

Gwich'in Land and Water Board
P.O. Box 2018, 105 Veterans Way
Inuvik, NT X0E 0T0

Attention: AlecSandra Macdonald, Regulatory Specialist

REFERENCE: Updated Closure Cost Estimate - RECLAIM
KBL Inuvik Soil Treatment Facility – Type B Water Licence G22L1-005

Dear Ms. Macdonald:

At the direction of the MVLWB, KBL is submitting an updated Security estimate based on current facility conditions, updated quotes, technology and annual costs.

A Summary of the Changes from the 2017 Security calculation is below:

RECLAIM TAB	Changes	Activity	Justification
Wells and Facilities	None	N/A	No wells and Facilities have been added to the site since the 2017 submission.
Building and Equipment	None	Other – Storage Tanks	The storage tanks on site remain. The cost for disposal at the adjacent Inuvik Landfill has not changed.
Chemicals	Yes	Contaminated soils - hydrocarbon	The facility dimensions have not changed. A third party quote was obtained for the application of chemicals, oversight by a third party. Soil then brought to the landfill for use as a daily cover.
	Yes	Transportation to disposal facility	Third party quoted costs for reagents to treat soils and water has been added. Based on the conditions, the consultant recommended water in the pond be used for the treatment campaign.
	None	Contam. soil investigation - technical	Costs for a technical investigation have not changed.
Water Management	Yes	Doze & spread	Third party quoted cost for returning the site to pre-construction conditions.

		excavated material	
	None	Puncture liner	Third party quoted costs for the removal and disposal of liner and ASTs.
Water Treatment	Yes.	Other - WTP operation	The amount of water was updated to include water from the pond at capacity.
	Yes	Analyses	Updated with 2022 laboratory rates.
	Yes	Reporting (annual Reporting, O&M, Spill Contingency, etc)	Updated with rates from a local contractor.

Third party quotes and standard contract rates were used for the development of the cost estimates. These quotes should remain confidential and will be provided to the GLWB and ENR as a separate file for confirmation.

Please contact Katie Oliver at 780.452.7779 or by email at koliver@kblenv.com if you have any questions or comments.

Sincerely,

KBL Environmental Ltd.



Katie Oliver
General Manager, Environmental Consulting

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
WELLS AND FACILITIES		\$0	\$0	\$0
BUILDINGS AND EQUIPMENT		\$500	\$500	\$0
CHEMICALS AND CONTAMINATED SOIL MANAGEME		\$157,000	\$126,200	\$30,800
SURFACE AND GROUNDWATER MANAGEMENT		\$151,785	-	\$151,785
INTERIM CARE AND MAINTENANCE		\$0	-	\$0
	SUBTOTAL: Capital Costs	\$309,285	\$126,700	\$182,585
	PERCENT OF SUBTOTAL		41%	59%

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		\$0	\$0	\$0
POST-CLOSURE MONITORING AND MAINTENANCE		\$0	\$0	\$0
ENGINEERING	5%	\$15,464	\$6,335	\$9,129
PROJECT MANAGEMENT	5%	\$15,464	\$6,335	\$9,129
HEALTH AND SAFETY PLANS/MONITORING & QA/QC		\$0	\$0	\$0
BONDING/INSURANCE		\$0	\$0	\$0
CONTINGENCY	20%	\$61,857	\$25,340	\$36,517
MARKET PRICE FACTOR ADJUSTMENT		\$0	\$0	\$0
	SUBTOTAL: Indirect Costs	\$92,785	\$38,010	\$54,775

TOTAL COSTS		\$402,070	\$164,710	\$237,360
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1 **Wells and Facilities**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost	Land Cost	Water Cost
OBJECTIVE: ABANDONMENT OF WELLS								
All wells- Drilled / Cased		m		#N/A	\$0.00	\$0	\$0	\$0
Sweet Well - Completed / Active / Inactive		m		#N/A	\$0.00	\$0	\$0	\$0
Sour Well (H2S>1%) - Completed / Active / Inactive		m		#N/A	\$0.00	\$0	\$0	\$0
Vent Flow / Gas Migration				#N/A	\$0.00	\$0	\$0	\$0
Additional Completion Zones				#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: ABANDONMENT OF PRODUCTION FACILITIES								
Oil / bitumen process or injection / disposal facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Gas processing facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Gas dehydration facility		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Compressor station		KW		#N/A	\$0.00	\$0	\$0	\$0
Battery sites		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Battery sites w/ separation, compression, injection and/or disposal equipment		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Satellite batteries		m3/day		#N/A	\$0.00	\$0	\$0	\$0
Other stations		ha		#N/A	\$0.00	\$0	\$0	\$0
Total						\$0	\$0	\$0
% of Total							#DIV/0!	#DIV/0!

1 Building / Equip Name:				Bldg / Equip #: 1				
ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site		each		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate, dispose on-site		each		#N/A	\$0.00	\$0	\$0	\$0
Other		each		#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: BUILDING DECONTAMINATION & HAZ. MATERIAL REMOVAL								
Decontaminate, oil, fuel and glycol systems		mandays		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate, general		mandays		#N/A	\$0.00	\$0	\$0	\$0
Mechanical		mandays		#N/A	\$0.00	\$0	\$0	\$0
Electrical		mandays		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate maintenance shop		each		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate power plant		each		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate bulk fuel storage		each		#N/A	\$0.00	\$0	\$0	\$0
Decontaminate offices/warehouse/accum		each		#N/A	\$0.00	\$0	\$0	\$0
Removal of asbestos siding on buildings		each		#N/A	\$0.00	\$0	\$0	\$0
Removal of friable asbestos on equipment		each		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: REMOVE BUILDINGS - ALL BUILDING AREAS SCALED TO ACCOUNT FOR HEIGHT								
Accommodation Complex		m2		#N/A	\$0.00	\$0	\$0	\$0
Process Facilities		m2		#N/A	\$0.00	\$0	\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0	\$0	\$0
Storage Facilities		m2		#N/A	\$0.00	\$0	\$0	\$0
Water and Wastewater Treatment Facilities		alloc		#N/A	\$500.00	\$0	\$0	\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0	\$0	\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0	\$0	\$0
AN Storage Facility		m2		#N/A	\$0.00	\$0	\$0	\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0	\$0	\$0
Storage Facility at Laydown/Airstrip		m2		#N/A	\$0.00	\$0	\$0	\$0
Fuel tanks		m2		#N/A	\$0.00	\$0	\$0	\$0
Fuel Tanks		m2		#N/A	\$0.00	\$0	\$0	\$0
Freshwater intake		m2		#N/A	\$0.00	\$0	\$0	\$0
Reclaim pumps		m2		#N/A	\$0.00	\$0	\$0	\$0
Outfall & Diffuser		m2		#N/A	\$0.00	\$0	\$0	\$0
Airstrip lighting, navigation, electrician		mandays		#N/A	\$0.00	\$0	\$0	\$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	\$0.00	\$0	\$0	\$0
Consolidate & dump boneyard debris		m3		#N/A	\$0.00	\$0	\$0	\$0
other - storage tanks	2 x 63,000 ASTs	alloc	1	#N/A	\$500.00	\$500	100%	\$500
OBJECTIVE: BREAK BASEMENT SLABS								
Accommodation Complex		m2		#N/A	\$0.00	\$0	\$0	\$0
Process Facilities		m2		#N/A	\$0.00	\$0	\$0	\$0
Offices, Repair, Lab, Warehouse		m2		#N/A	\$0.00	\$0	\$0	\$0
Storage Facilities		m2		#N/A	\$0.00	\$0	\$0	\$0
Water and Wastewater Treatment Facilities		m2		#N/A	\$0.00	\$0	\$0	\$0
U/G Heating Plant		m2		#N/A	\$0.00	\$0	\$0	\$0
Emulsion Plant		m2		#N/A	\$0.00	\$0	\$0	\$0
Warehouse, Shops and Other		m2		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0	\$0
Landfill disposal fee		tonne		#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: GRADE AND CONTOUR								
Accommodation Complex		ha		#N/A	\$0.00	\$0	\$0	\$0
Process Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
Offices, Repair, Lab, Warehouse		ha		#N/A	\$0.00	\$0	\$0	\$0
Storage Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
Water and Wastewater Treatment Facilities		ha		#N/A	\$0.00	\$0	\$0	\$0
U/G Heating Plant		ha		#N/A	\$0.00	\$0	\$0	\$0
Emulsion Plant		ha		#N/A	\$0.00	\$0	\$0	\$0
Warehouse, Shops and Other		ha		#N/A	\$0.00	\$0	\$0	\$0
Place rock cover		m3		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: LINED SUMPS								
Puncture liner and place soil cover		m3		#N/A	\$0.00	\$0	\$0	\$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts		each		#N/A	\$0.00	\$0	\$0	\$0
Remove bridges		each		#N/A	\$0.00	\$0	\$0	\$0
Scarify and install water breaks		ha		#N/A	\$0.00	\$0	\$0	\$0
Scarify airstrip		ha		#N/A	\$0.00	\$0	\$0	\$0
Scarify laydown areas		ha		#N/A	\$0.00	\$0	\$0	\$0
Vegetate		ha		#N/A	\$0.00	\$0	\$0	\$0
Other				#N/A	\$0.00	\$0	\$0	\$0
SPECIALIZED ITEMS								
Dispose of misc. debris and laydown area refuse				#N/A	\$0.00	\$0	\$0	\$0
Total						\$500	\$500	\$0
% of Total							100	0

1 Chemicals/Soil Area Name:

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	%		Water	
						Cost Land	Land Cost	Cost	Cost
HAZARDOUS MATERIALS AUDIT									
Phase 1 audit		each		#N/A	\$0.00	\$0		\$0	\$0
Phase 2 audit		each		#N/A	\$0.00	\$0		\$0	\$0
CONSOLIDATE HAZARDOUS MATERIALS FOR REMOVAL									
Waste oils		litre		#N/A	\$0.00	\$0		\$0	\$0
Fuel - Type 1, eg diesel dregs		litre		#N/A	\$0.00	\$0		\$0	\$0
Fuel - Type 1, eg gasoline dregs		litre		#N/A	\$0.00	\$0		\$0	\$0
Waste batteries		kg		#N/A	\$0.00	\$0		\$0	\$0
Assay & environmental lab reagents		kg		#N/A	\$0.00	\$0		\$0	\$0
Machine shop, paints, solvents etc		litre		#N/A	\$0.00	\$0		\$0	\$0
Contaminated soils - hydrocarbon	Cell: 75m * 36m - full capacity 6361 m3, aeration, then bring to landfill	m3	1	Other	\$140,000.00	\$140,000	80%	\$112,000	\$28,000
Metal contam. soil at conc. load-out		m3		#N/A	\$0.00	\$0		\$0	\$0
Glycol		litre		#N/A	\$0.00	\$0		\$0	\$0
Nuclear sources		each		#N/A	\$0.00	\$0		\$0	\$0
HAZARDOUS MATERIALS									
Transportation to disposal facility	assumed reagents application and oversight	allocati	1	#N/A	\$14,000.00	\$14,000	80%	\$11,200	\$2,800
Disposal fees		allow		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
CONTAMINATED SOILS									
Contam. soil investigation - technical		allocati	3	#N/A	\$1,000.00	\$3,000	100%	\$3,000	\$0
Contam. soil investigation - drilling & sampling		each		#N/A	\$0.00	\$0		\$0	\$0
CONTAMINATED SOIL REMOVAL									
Contaminated soils - hydrocarbon		m2		#N/A	\$0.00	\$0		\$0	\$0
Metal contam. soil at conc. load-out		m3		#N/A	\$0.00	\$0		\$0	\$0
Load, haul, dump or doze		m3		#N/A	\$0.00	\$0		\$0	\$0
Reagents/stabilizing agent		m2		#N/A	\$0.00	\$0		\$0	\$0
Contour reclaimed area		m3		#N/A	\$0.00	\$0		\$0	\$0
Type 2, heavy fuel and oil		m3		#N/A	\$0.00	\$0		\$0	\$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0		\$0	\$0
Upper and lower bedding layers		m3		#N/A	\$0.00	\$0		\$0	\$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	\$0.00	\$0		\$0	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0		\$0	\$0
Vegetate		m2		#N/A	\$0.00	\$0		\$0	\$0
Install infiltration/seepage instrumentation		allow		#N/A	\$0.00	\$0		\$0	\$0
Other				#N/A	\$0.00	\$0		\$0	\$0
OTHER									
				#N/A	\$0.00	\$0		\$0	\$0
Total						\$157,000		\$126,200	\$30,800
% of Total								80.382166	19.61783

1 Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
OBJECTIVE: STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS						
Place soil cover		m3		#N/A	\$0.00	\$0
Doze & spread excavated material	contour berms and pad area 3637, water area 540	Each	1	other	\$65,000.00	\$65,000
Vegetate spread material		ha		#N/A	\$0.00	\$0
Rip rap in channel base		each		#N/A	\$0.00	\$0
Puncture liner	restore natural drainage and dispose of liner	Each	1	other	\$57,500.00	\$57,500
OBJECTIVE: REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES						
Excavate ditches -soil		m3		#N/A	\$0.00	\$0
Excavate ditches -rock		m3		#N/A	\$0.00	\$0
Stabilize side slopes		m3		#N/A	\$0.00	\$0
Rip rap in channel base		m3		#N/A	\$0.00	\$0
OBJECTIVE: BREACH DITCHES						
Excavate breaches		m3		#N/A	\$0.00	\$0
Backfill/recontour		m3		#N/A	\$0.00	\$0
Install flow dissipation		m3		#N/A	\$0.00	\$0
Vegetate remainder of ditch		m2		#N/A	\$0.00	\$0
OBJECTIVE: FRESH WATER SUPPLY						
Breach embankment		m		#N/A	\$0.00	\$0
Remove pump		LS		#N/A	\$0.00	\$0
Remove pipeline		m		#N/A	\$0.00	\$0
OBJECTIVE: WATER CONTROL IN RECLAMATION QUARRY						
Install pumping system		LS		#N/A	\$0.00	\$0
Remove pumping system		LS		#N/A	\$500.00	\$0
OBJECTIVE: REMOVE WATER PIPELINES						
Remove pipes		m		#N/A	\$0.00	\$0
Concrete plug deep pipes		m3		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: GROUNDWATER COLLECTION SYSTEM						
Excavate/install sumps		m3		#N/A	\$0.00	\$0
Install pumping wells		m3		#N/A	\$0.00	\$0
Install pumps/pipelines/power supply		LS		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT CONTAMINATED WATER STORAGE POND						
Excavate pond		m3		#N/A	\$0.00	\$0
Doze & spread excavated material		m3		#N/A	\$0.00	\$0
Vegetate spread material		ha		#N/A	\$0.00	\$0
Bedding layer		m3		#N/A	\$0.00	\$0
Supply geomembrane		m2		#N/A	\$0.00	\$0
Install geomembrane		m2		#N/A	\$0.00	\$0
Erosion protection layer		m3		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)						
Construct access roads		km		#N/A	\$0.00	\$0
install HDPE piping system from collection pond		m		#N/A	\$0.00	\$0
Inter-cell flow structures		allow		#N/A	\$0.00	\$0
Install liners		m2		#N/A	\$0.00	\$0
Install growth media		m3		#N/A	\$0.00	\$0
Wetland vegetation		ha		#N/A	\$0.00	\$0
OBJECTIVE: CONSTRUCT WATER TREATMENT PLANT						
Build treatment plant		LS		#N/A	\$0.00	\$0
Build sludge containment facility		LS		#N/A	\$0.00	\$0
OBJECTIVE: WATER TREATMENT						
Water treatment - smapling and reporting	From Water Treatment Spreadsheet	alloc		#N/A	\$0.00	\$29,285
					Total	\$151,785

1 Post Closure Water Treatment - Identified as long term/post-closure in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
OBJECTIVE: ADDITION OF REAGENTS TO WTP						
H2O2		kg		#N/A	\$0.00	\$0
lime		kg		#N/A	\$0.00	\$0
ferric sulphate		kg		#N/A	\$0.00	\$0
ferrous sulphate		kg		#N/A	\$0.00	\$0
flocculents		kg		#N/A	\$0.00	\$0
Other - WTP operation	contingency treatment, 63,000 L in ASTs	m3	63	OTPh	\$2.00	\$126
OBJECTIVE: LABOUR AND SUPPLIES						
Annual fuel		litres		#N/A	\$0.00	\$0
Annual power		kW-h		#N/A	\$0.00	\$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	\$0.00	\$0
Equipment maintenance and parts		allow		#N/A	\$0.00	\$0
Misc. supplies, hoses, tools		allow		#N/A	\$0.00	\$0
Communications		allow		#N/A	\$0.00	\$0
Other				#N/A	\$0.00	\$0
OBJECTIVE: WTP WATER SAMPLING AND ANALYSES						
Sampling equipment		allow		#N/A	\$0.00	\$0
Analyses	water testing and reporting	allow	2	WSI	\$2,579.40	\$5,159
Shipping to laboratory		allow		#N/A	\$0.00	\$0
Reporting (annual Reporting, O&M, Spill Contingency, etc)		allow	2	other	\$12,000.00	\$24,000
Other - Misc sampling and shipping		allow		#N/A	\$0.00	\$0
OBJECTIVE: SITE ACCESS						
Road maintenance (incl. snow removal)		allow		#N/A	\$0.00	\$0
Winter road tariff		allow		#N/A	\$0.00	\$0
Truck rental		allow		#N/A	\$0.00	\$0
Air support		allow		#N/A	\$0.00	\$0
Annual water treatment costs						\$29,285
Number of years of water treatment		years	1			
Total water treatment costs						\$29,285