

Impact-Mitigation Table

The Impact-Mitigation Table (IMT) below has been extracted from the MVLWB Land Use Permit Guidance Document. This IMT identifies all proposed activities, potential impacts, and possible mitigations that are relevant to the proposed project. All information provided is presented to reflect the size, scale, and nature of the proposed project – a small-scaled excavation of up to 25 m³ and Phase II Environmental Assessment.

To address carbon emissions, the following activities have been completed:

- Combined work with other project in Fort Simpson to limit mobilization – work planned to use same drill and staff, reducing the carbon impacts of mobilization by half.
- Selected closest soil receiving facility to reduce transportation impacts,
- coupling similar soils from site requiring off-site disposal at KBL in Yellowknife along with wash waters and GW Well purge and development waters in one shipment, reducing transportation carbon emissions

Worst case scenarios are used for the identified potential impacts. The table describes proposed mitigations, including environmental management systems, treatment systems, and monitoring programs etc.

| ABIOTIC COMPONENTS | | | |
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| Land | | | |
| Extent of land area to be disturbed (m ² or ha) | 200 m ² | | |
| Are sensitive land features present? If so, indicate the type(s): karsts, eskers, ice patches, mineral licks, hot and warm springs, glacial refugia, other | No – the works are to be completed at two separate residential lots in relation to heating oil releases. | | |
| Extent of sensitive land areas to be disturbed (m ² or ha) | 0 m ² | | |
| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
| <ul style="list-style-type: none"> • Soil contamination • Soil compaction | Clearing of timber, brush, or vegetation mat | x | Small scale removal of some branches from the trees in front of 9606 102nd Street. Tree not removed. Branches removed to local waste facility as per waste management plan. App. 10 m ² of sod removed during emergency excavation to be seeded once backfilled. |
| | Stripping of overburden | N/A | Overburden already removed from excavation footprint at 9606 102nd St. 9818 101st Street 5 m ³ excavation is on gravel driveway so no overburden removed |

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| | Bulk soil sampling | X | Soil sampling will be completed within the excavation on the side walls and base and therefore is part of the excavation impact |
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| <ul style="list-style-type: none"> • Destabilization/erosion • Change in soil structure • Inability to support vegetation • Other | Trenching, diamond drilling, geotechnical borehole drilling | X | Excavation directly adjacent to the foundation of 9606 102nd Street |
| | Cut and fill | N/A | N/A |
| | Oil and gas exploration well drilling | N/A | N/A |
| | Directional drilling (underground) | N/A | N/A |
| | On-site storage or disposal of wastes (domestic garbage, sewage, waste petroleum products, drilling waste and hydraulic flowback fluids, hazardous wastes, etc.) | X | Domestic garbage will be collected and placed in the garbage receptacles at the property or removed to landfill. Refer to waste management plan for detailed review of waste management |
| | Transfer, storage, and use of petroleum products and/or chemicals | X | Refer to Spill Contingency Plan. No fuel stored on-site. Equipment fueled from Tidy tanks in pick ups, if required using drip trays. |
| | Transfer, storage, and use of explosives | N/A | N/A |
| | Use of fertilizers, pesticides, herbicides | N/A | N/A |
| | Use of motorized and heavy equipment | X | Any grass sod compacted by access of equipment will be raked and reseeded to promote revegetation. |
| | Other | N/A | N/A |

Water

Groundwater

Is groundwater present? If so, indicate the type(s): shallow, deep, fresh, saline

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
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| <ul style="list-style-type: none"> • Water table alteration • Infiltration changes • Changes in water quality • Temperature changes • Other | Withdrawal of groundwater | X | Three groundwater wells will require development, purging and sampling the volume of groundwater removed will not affect the underlying aquifer. See waste management plan for disposal of such waters |
| | Trenching, diamond drilling, geotechnical borehole drilling | X | Trenching is only to 3 mbgs and is not near the groundwater table. Removal of soils to protect the groundwater table. |
| | Installation of groundwater monitoring wells | X | Three groundwater wells are to be installed at 9606 102nd St. Refer to spill contingency plan. All groundwater wells will be capped when not in use and lids locked within ground boxes |
| | Directional drilling (underground) | N/A | N/A |

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| | Oil and gas exploration well drilling | N/A | N/A |
| | Clearing of timber, brush, or vegetation mat | X | Removal of a few branches from tree in front of 9606 102nd st. will not affect groundwater or surface water. Areas potentially compacted from heavy equipment use will be raked and re-seeded so no change in surface water infiltration |
| | Stripping of overburden | X | Stripping of 10 m2 of overburden at the location of the fuel oil release for 9606 102nd st. will be re-seeded so infiltration will be same as prior to work. |
| | Transfer, storage, and use of petroleum products and/or chemicals | X | Refer to spill contingency plan for fueling of equipment from portable tidy tanks in pick up trucks. |
| | Other | N/A | N/A |
| Permafrost | | | |
| Is permafrost present? If so, indicate the type(s): continuous or discontinuous | Permafrost is not present | | |

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| Extent of permafrost area to be disturbed (m ² or ha) | N/A | | |
| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
| <ul style="list-style-type: none"> Loss or change in extent Changes in seasonal fluctuations Change in persistence | Clearing of timber, brush, or vegetation mat | N/A | N/A |
| | Stripping of overburden | N/A | N/A |
| | Construction of structures (buildings, water or waste management facilities, etc.) | N/A | N/A |
| | Construction (development or alteration: widening, straightening, detours), maintenance, and operation of lines, trails, or rights-of-way | N/A | N/A |
| | Trenching, diamond drilling, geotechnical borehole drilling | N/A | N/A |
| | Other | N/A | N/A |
| Surface Water | | | |
| Is surface water present? If so, indicate the type(s): lake, river, stream, wetland (bog, marsh, swamp, fen), seasonal, year-round | N/A. Work is not adjacent to surface water. | | |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
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| <ul style="list-style-type: none"> • Water flow or level changes (permanent, temporary, seasonal) • Drainage pattern changes • Temperature changes • Changes in water quality • Wetland impairment • Changes to aquatic habitat (see Biotic section below) • Other | Withdrawal of water from a watercourse | N/A | N/A |
| | Retaining, storing, or diverting water | N/A | N/A |
| | Construction and use of a watercourse crossing (bridge, ford) | N/A | N/A |
| | Watercourse alteration (ditch construction, channeling, training, installation of culvert) | N/A | N/A |
| | Construction of dams and impoundments | N/A | N/A |
| | Direct or indirect disposal of waste into water | N/A | N/A |
| | Clearing of timber, brush, or vegetation mat near a watercourse | N/A | N/A |
| | Stripping of overburden adjacent to a watercourse | N/A | N/A |
| | Excavation or stockpiling of earth or gravel adjacent to a watercourse | N/A | N/A |
| | Use of motorized or heavy equipment adjacent to, within, or through a watercourse | N/A | N/A |
| | Transfer, storage, and use of petroleum products and/or chemicals near a watercourse | N/A | N/A |
| | Use of fertilizers, pesticides, or herbicides | N/A | N/A |
| | Other | N/A | N/A |
| Air | | | |
| If applicable, indicate the type(s) of air pollutants: aerosols, particulate matter, noxious gases, volatile organic carbons, hazardous air pollutants, dust, other | Small amounts of dust related to excavation of up to 25 m3 of soil and mobilization of equipment on property. Dust to be minimized by the use of dust suppression water during excavation and back fill works and avoiding abrupt changes in direction by heavy equipment that damage top soil. | | |
| Indicate the estimated maximum dispersal distance | A few metres within the work zone for limited periods. To be suppressed with on-site water | | |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
|--|---|-----|---|
| <ul style="list-style-type: none"> Changes in air quality Harm to living things Increased greenhouse gases Other | Burning of fossil fuels | x | The diesel and gasoline burned to complete the project will not have an effect on the local air quality. No idling of vehicles will be allowed to minimize CO and CO2 emissions. |
| | Mobilization and operation of equipment for construction and operational activities | x | The diesel and gasoline burned to mobilize equipment for the project will not have an effect on the local air quality. |
| | Release of underground gases | N/A | N/A |
| | Increased road traffic | x | Moderate in extent and duration. Highest congestion will be when heavy equipment is mobilized by tractor and trailer to site. All such equipment shall be guided by a pilot truck when travelling in residential areas. |
| | Other | N/A | N/A |

BIOTIC COMPONENTS

Vegetation

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| If vegetation will be removed or compacted, indicate type(s): trees, shrubs, thickets, muskeg, Species at Risk plants, may-be-at-risk plant species, other | | | |
| Extent of vegetation to be removed or compacted (m ³ or ha) | A few minor branches of tree in front yard adjacent to groundwater well. May not be required if smaller drill can access this Groundwater well location without branch removal. | | |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
|---|--|-----|--|
| <ul style="list-style-type: none"> Direct loss of vegetation Loss of Species at Risk or may-be-at-risk plants Change in species composition Introduction of non-native (invasive) species Effects on plant health (dust, metals, toxins) Increased risk of fire | Clearing of timber, brush, or vegetation mat | x | Limited to a few branches cut from front yard tree. |
| | Stripping of overburden | x | Limited to sod from a private lawn |
| | Construction (development or alteration: widening, straightening, detours), maintenance, and operation of lines, trail, or rights-of-way | N/A | N/A |
| | Construction of structures (buildings, water or waste management facilities, etc.) | N/A | N/A |

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| <ul style="list-style-type: none"> • Compaction of vegetation • Other | Reclamation activities (levelling, contouring, placement of fines or woody debris, re-vegetation, fertilization) | x | Revegetation will be limited to planting grasses on the excavation limits and areas potentially disturbed by heavy equipment access. Use local seed mixture. |
| | Use of motorized and heavy equipment | x | Equipment is to be clean prior to mobilization to site to prevent potential introduction of invasive species. |
| | Burning of fossil fuels | x | Will not have an effect on Vegetation |
| | Increased road traffic | x | Minor increase for small period of time for traffic not to affect vegetation or bi |
| | Transfer, storage, and use of petroleum products and/or chemicals | x | Re-fueling of equipment is to be via a tidy tank in a truck, if required. All light duty to fuel at gas station. Refer to spill contingency plan for details regarding fuel transfer |
| | Excavation or stockpiling of earth and/or gravel | x | Stockpiling not occurring as soil transported off site and back fill directly placed |
| | Other | N/A | N/A |

Terrestrial Wildlife Habitat

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| If sensitive wildlife habitat is present, indicate type(s): Species at Risk (SAR), Canadian Important Bird Areas, migratory birds, keystone species, wildlife corridor | No all work on private property and limited to areas directly adjacent to the house. | | |
| Extent of sensitive wildlife habitat to be removed or disturbed (m ³ or ha) | N/A | | |
| If wildlife habitat will be removed or disturbed, indicate type(s): ungulates, furbearers, carnivores, small mammals, birds, insects, sensitive wildlife habitat (as noted above) | N/A | | |
| Extent of wildlife habitat to be removed or disturbed (m ³ or ha) | N/A | | |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
|--|--|----------|---|
| <ul style="list-style-type: none"> • Direct loss or removal of habitat, dens, or nests • Loss or removal of keystone species and/or SAR habitat • Fragmentation of wildlife | Clearing of timber, brush, or vegetation mat | x | Will examine tree prior to any removal of branches to make sure no nesting birds in |
| | Stripping of overburden | x | Stripping of residential lawn will not pose a risk to wildlife. |
| | Construction of structures (buildings, water or waste management facilities, etc.) | N/A | N/A |

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| <ul style="list-style-type: none"> corridor • Direct injury or mortality • Disturbances to key lifecycle stages: breeding, feeding, nesting, staging • Effects on population <ul style="list-style-type: none"> abundance • Change in species diversity • Effects on wildlife health (toxins, metals, etc.) • Changes to migratory movement patterns • Changes to predator-prey relationships • Human-wildlife conflicts • Other | Construction (development or alteration: widening, straightening, detours), maintenance and operation of lines, trails, or rights-of-way | N/A | N/A |
| | Increased traffic risk to wildlife | x | Traffic increase is very minimal and limited to existing roads and developed areas. Not anticipated to affect wildlife |
| | Increased human presence | x | Traffic human presence is very minimal and limited to existing roads and developed areas. Not anticipated to affect wildlife |
| | Noise (use of heavy equipment, blasting, crushing, drilling) | x | Noise is created in an existing urban area. And is short in duration. Not anticipated to affect local wildlife. |
| | Transfer, storage, and use of petroleum products and/or chemicals | x | Refer to spill contingency plan |
| | On-site storage or disposal of wastes (domestic garbage, sewage, waste petroleum products, drilling waste and hydraulic flowback fluids, hazardous wastes, etc.) | x | Refer to waste management plan. Garbage will not be left so as to cause an animal attractant. |
| | On-site disposal of domestic wastes (burning, burying) | N/A | N/A |
| | Other | N/A | N/A |
| Aquatic Habitat | | | |
| Indicate types of aquatic species: Species at Risk, fish, mammals (furbearers), amphibians, aquatic macroinvertebrates, insects, aquatic macrophytes | No aquatic habitats near work. Work within the property boundaries of the two residential lots. | | |
| Extent of aquatic habitat removed or disturbed for breeding, feeding, nesting, staging (m ³ or ha) | N/A | | |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
|---|--|-----|--|
| <ul style="list-style-type: none"> • Breeding disturbances • Change in species diversity • Effects on health (toxins, metals, sediment, etc.) • Changes to migratory movement patterns • Changes to predator-prey relationships • Effects on population abundance • Change in species diversity • Other | Clearing of timber, brush, or vegetation mat near a watercourse | x | Removal of branches is on residential property |
| | Stripping of overburden adjacent to a watercourse | x | Removal of sod on residential property |
| | Blasting near a watercourse | N/A | N/A |
| | Construction and use of a watercourse crossing (bridge, ford) | N/A | N/A |
| | Watercourse alteration (ditch construction, channeling, training, installation of culvert) | N/A | N/A |
| | Use of motorized or heavy equipment adjacent to, within, or through a watercourse | N/A | N/A |
| | Withdrawal of water from a watercourse | N/A | N/A |
| | Retaining, storing, or diverting water | N/A | N/A |
| | Construction of dams and impoundments | N/A | N/A |
| | Direct or indirect disposal of waste into water | N/A | N/A |
| | Other | N/A | N/A |

CULTURAL COMPONENTS

Wildlife Harvesting

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| Are harvesting areas present? If so, indicate type(s): Community Harvesting Areas, Special Harvesting Areas, Group Trapping Areas, etc. | No work is to be within the property boundaries of two residential lots |
| Extent of overlap of Project area with harvesting areas identified above (fish lakes, trapping or hunting areas) (m ³ or ha) | No overlap |

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
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| <ul style="list-style-type: none"> Loss or reduction in game species populations Effects on traditional land use, subsistence, and harvesting rights Other | Clearing of timber, brush, or vegetation mat | x | Will examine tree prior to any removal of branches to make sure no nesting birds in location |
| | Stripping of overburden | N/A | N/A |
| | Noise (use of heavy equipment, blasting, crushing, drilling) | x | Stripping of residential lawn will not pose a risk to wildlife. |
| | Oil and gas exploration well drilling | N/A | N/A |
| | Construction (development or alteration: widening, straightening, detours), maintenance and operation of lines, trails, or rights-of-way | N/A | N/A |
| | Increased traffic risk to wildlife | x | Traffic human presence is very minimal and limited to existing roads and developed areas. Not anticipated to affect wildlife |
| | Withdrawal of water from a watercourse | N/A | N/A |
| | Direct or indirect disposal of waste into water | N/A | N/A |
| Other | N/A | N/A | |
| Cultural Integrity and Heritage Resources | | | |
| If present, indicate types: places of significant cultural or spiritual value, heritage sites, important subsistence and harvesting areas (group trapping areas, camps and, log and timber harvesting areas, berry picking and medicine plant gathering areas), traditional trails, burial sites, sacred sites, archaeological or historic sites, artifacts and other objects of historical, cultural, or religious significance, historical or cultural records | No such areas. All work is to be within the limits of the property lines of two residential lots. | | |
| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | X | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
| <ul style="list-style-type: none"> Change to or loss of cultural integrity Change to or loss of traditional lifestyle Change to or loss of heritage resources Other | Clearing of timber, brush, or vegetation mat | x | Removal of branches from one tree is not expected to affect Cultural Integrity and Heritage Resources. |
| | Noise (use of heavy equipment, blasting, crushing, drilling) | x | Noise is not expected to affect Cultural Integrity and Heritage Resources. |
| | Construction of structures (buildings, water or waste management facilities, etc.) | N/A | N/A |
| | Construction (development or alteration: widening, straightening, detours), | N/A | N/A |

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| | maintenance and operation of lines, trails, or rights-of-way | | |
| | Increased human presence | x | Removal of branches from one tree is not expected to affect Cultural Integrity and Heritage Resources. |

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| | Withdrawal of water from a watercourse | N/A | N/A |
| | Retaining, storing, or diverting water | N/A | N/A |
| | Construction of dams and impoundments | N/A | N/A |
| | Direct or indirect deposit of waste into water | N/A | N/A |
| | Other | N/A | N/A |

Social and Economic Well-being

| Potential Impacts | Activity <i>Use an "x" to indicate which apply</i> | | Potential Project Impacts and Proposed Mitigations <i>Using the list at left, describe the potential impact(s) of each identified Project activity and the proposed measure(s) to reduce each of these impacts.</i> |
|--|--|-----|--|
| <ul style="list-style-type: none"> Increased human health hazard and risk Economic opportunities or losses (employment, training) Change in ecological, cultural, social, or economic values identified for protection in approved Land Use Plans Impairment of the recreational or traditional uses of the land or water Impairment of the aesthetic quality of the land or water Changes to the use of the area by other non-Indigenous people (e.g., trappers, outfitters, residents, hunters, forest harvesters, other authorized projects) Other | Noise (use of heavy equipment, blasting, crushing, drilling) | x | Limited noise not expected to affect social and economic wellbeing. Limit work to hours allowed by municipality |
| | Transfer, storage, and use of petroleum products and/or chemicals | x | Fueling equipment from a tidy tank not expected to affect social and economic wellbeing. Limit work to hours allowed by municipality |
| | On-site storage or disposal of wastes (domestic garbage, sewage, waste petroleum products, drilling waste and hydraulic flowback fluids, hazardous wastes, etc.) | x | Proper storage of domestic waste not expected to affect social and economic wellbeing. Limit work to hours allowed by municipality |
| | Construction (development or alteration: widening, straightening, detours), maintenance and operation of lines, trails, or rights-of-way | N/A | N/A |
| | Construction of structures (buildings, water or waste management facilities, etc.) | N/A | N/A |
| | Increased human access and presence | x | Limited and short term increased human access and presence is not expected to affect social and economic wellbeing. Limit work to hours allowed by municipality |
| | Operating in a remote location inaccessible or not easily accessible by emergency aid | N/A | N/A |
| | Withdrawal of water from a watercourse | N/A | N/A |
| | Retaining, storing, or diverting water | N/A | N/A |

| | | |
|--|-----|-----|
| Construction of dams and impoundments | N/A | N/A |
| Direct or indirect deposit of waste into water | N/A | N/A |
| Other | N/A | N/A |