ESS Group: Water Crossing

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Easting</th>
<th>Northing</th>
<th>UTM Zone</th>
<th>Channel Width</th>
<th>Wet Width</th>
<th>Fish Habitat Class</th>
<th>Habitat Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S20</td>
<td>N3-Aqua-136</td>
<td>Unnamed tributary of Saskatchewan River</td>
<td>363524</td>
<td>5967184</td>
<td>14N</td>
<td>9m</td>
<td>9m</td>
<td>Moderate</td>
<td>Important</td>
</tr>
<tr>
<td>N3-S20</td>
<td>N3-Aqua-137</td>
<td>Unnamed tributary of Saskatchewan River</td>
<td>363449</td>
<td>5964181</td>
<td>14N</td>
<td>N/A</td>
<td>N/A</td>
<td>Moderate</td>
<td>Important</td>
</tr>
</tbody>
</table>

Potential Effects:
Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbances and impacted fish movement; Raising of floodplain.

Specific Mitigation:
- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Identify and flag buffer areas prior to start of work
- Riparian Buffers shall be a minimum of 20m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory veg will be maintained along with trees that do not violate MR Veg Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.
- No in-stream works or fording from April 1 - July 15.

ESS Group: Groundwater

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S20</td>
<td>N3-Aqua-203</td>
<td>Aquifers Vulnerable to contamination</td>
<td>Site: 202 to 214</td>
<td>E-363617</td>
<td>N-5971038</td>
<td>14N</td>
<td>8676 m</td>
</tr>
</tbody>
</table>

Potential Effects:
Potential groundwater contamination from a contingency event (e.g., spill)

Specific Mitigation:
- Marshalling yards will be located on upland sites where possible.
- An Emergency Preparedness and Spill Response Plan will be developed and an emergency response spill kit will be kept on-site at all times in case of fluid leaks or spills from machinery.
- Qualified driller with appropriate experience will be contracted to work in areas affected by artesian conditions.
- Emergency response plans for sealing/grouting and pumping will be implemented as required.

ESS Group: Groundwater

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S20</td>
<td>N3-Aqua-202</td>
<td>Freshwater artesian areas</td>
<td>Site: 201 to 212</td>
<td>E-363617</td>
<td>N-5971038</td>
<td>14N</td>
<td>5350 m</td>
</tr>
</tbody>
</table>

Potential Effects:
Wetting the surficial environment near potential discharge from tower foundation drill hole (ground saturation); Also, potential level drop in the aquifer.

Specific Mitigation:
- Qualified driller with appropriate experience will be contracted to work in areas affected by artesian conditions.
- Emergency response plans for sealing/grouting and pumping will be implemented as required.
- Follow up inspections of installed foundations will be undertaken to monitor for excess moisture.

ESS Group: Terrain

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S20</td>
<td>N3-Soils-401</td>
<td>Enduring Features (Unique Terrain/Soil Features)</td>
<td>Site: 202 to 213</td>
<td>E-363617</td>
<td>N-5971038</td>
<td>14N</td>
<td>9676m</td>
</tr>
</tbody>
</table>

Potential Effects:
Impairment or loss of approximately 67 ha (0.10 %) of single occurrence PAE enduring feature from right-of-way establishment.

Specific Mitigation:
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Avoid development of new borrow areas, access routes and other activities within enduring features
- Maintain 10m setback around feature outside of ROW
- Minimize movement of vehicles, machinery and equipment during construction
- Prevent off-ROW activities and equipment use within terrain feature, during construction

MAP NUMBER: 155
ESS Group: Permafrost

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ-520</td>
<td>N3-Soils-127</td>
<td>Permafrost</td>
<td>Site: 217 to 218</td>
<td>E-363509</td>
<td>E-363482</td>
<td>14N</td>
<td>1041 m</td>
</tr>
<tr>
<td>NJ-520</td>
<td>N3-Soils-128</td>
<td>Permafrost</td>
<td>Site: 219 to 220</td>
<td>E-363466 N-5965132</td>
<td>E-363455 N-5964705</td>
<td>14N</td>
<td>427 m</td>
</tr>
<tr>
<td>NJ-520</td>
<td>N3-Soils-128</td>
<td>Permafrost</td>
<td>Site: 221 to 222</td>
<td>E-363452 N-5964903</td>
<td>E-363451 N-5964524</td>
<td>14N</td>
<td>57 m</td>
</tr>
<tr>
<td>NJ-520</td>
<td>N3-Soils-128</td>
<td>Permafrost</td>
<td>Site: 223 to 224</td>
<td>E-363447 N-5964405</td>
<td>E-363442 N-5964191</td>
<td>14N</td>
<td>214 m</td>
</tr>
<tr>
<td>NJ-520</td>
<td>N3-Soils-129</td>
<td>Permafrost</td>
<td>Site: 225 to 226</td>
<td>E-363434 N-5963979</td>
<td>E-363426 N-5963547</td>
<td>14N</td>
<td>326 m</td>
</tr>
</tbody>
</table>

Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

• Carry out construction activities on frozen ground to minimize surface damage and rutting.
• Use existing trails, roads or cut lines whenever possible as access routes
• Maintain shrub and herbaceous vegetation to the extent possible
• Remove trees by low-disturbance methods
• Confinve vehicle traffic to established trails to the extent possible
• Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

MAP NUMBER: 155
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ESS Group: Archaeological

Potential Effects:

Potential disturbance to Heritage Resources

Specific Mitigation:

- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Identify and flag prior to start of work
- Conduct site investigation with Archaeologist post clearing and prior to construction
- Minimize surface disturbance around the site to the extent possible
- Inspect excavated materials or surface disturbance for heritage resources and report any finds to Environmental Inspector
- Implement additional mitigation from site investigation

ESS Group: Water Crossing

Potential Effects:

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbances and impeded fish movement; Rutting of culverts

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Identify and flag buffer areas prior to start of work
- Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory veg will be maintained along with trees that do not violate MH Veg Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.
- No instream works or flooding from April 1 - July 15

ESS Group: Groundwater

Potential Effects:

Potential groundwater contamination from a contingency event (e.g., spill)

Specific Mitigation:

- Marshaling yards will be located on upland sites where possible.
- An Emergency Preparedness and Spill Response Plan will be developed and an emergency response spill kit will be kept on-site at all times in case of fluid leaks or spills from machinery.
- Qualified driller with appropriate experience will be contracted to work in areas affected by artesian conditions.
- Emergency response plans for sealing/grouting and pumping will be implemented as required.
**ESS Group: Permafrost**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-G20</td>
<td>N3-Soils-129</td>
<td>Permafrost</td>
<td>Site: 227 to 228</td>
<td>E-363424</td>
<td>N-5962217</td>
<td>14N</td>
<td>839 m</td>
</tr>
<tr>
<td>N3-G21</td>
<td>N3-Soils-130</td>
<td>Permafrost</td>
<td>Site: 235 to 236</td>
<td>E-363115</td>
<td>N-5962161</td>
<td>14N</td>
<td>120 m</td>
</tr>
<tr>
<td>N3-G21</td>
<td>N3-Soils-130</td>
<td>Permafrost</td>
<td>Site: 239 to 240</td>
<td>E-362895</td>
<td>N-5962105</td>
<td>14N</td>
<td>389 m</td>
</tr>
<tr>
<td>N3-G21</td>
<td>N3-Soils-130</td>
<td>Permafrost</td>
<td>Site: 242 to 243</td>
<td>E-362508</td>
<td>N-5961999</td>
<td>14N</td>
<td>454 m</td>
</tr>
<tr>
<td>N3-G21</td>
<td>N3-Soils-131</td>
<td>Permafrost</td>
<td>Site: 243 to 244</td>
<td>E-360848</td>
<td>N-5961829</td>
<td>14N</td>
<td>152 m</td>
</tr>
<tr>
<td>N3-G21</td>
<td>N3-Soils-131</td>
<td>Permafrost</td>
<td>Site: 245 to 246</td>
<td>E-360650</td>
<td>N-5960929</td>
<td>14N</td>
<td>41 m</td>
</tr>
</tbody>
</table>

**Potential Effects:**

Potential loss or damage to permafrost, soil, vegetation, or wildlife may occur.

**Specific Mitigation:**

- Carry out construction activities on frozen or dry ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes.
- Maintain shrub and herbaceous vegetation to the extent possible.
- Remove trees by low-disturbance methods.
- Confinement of vehicle traffic to established trails to the extent possible.
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan.

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**ESS Group: Terrain**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-G21</td>
<td>N3-Soils-401</td>
<td>Pathway Features (Unique Terrain/Soil Features)</td>
<td>Site: 230 to 231</td>
<td>E-363395</td>
<td>N-5962364</td>
<td>14N</td>
<td>431 m</td>
</tr>
<tr>
<td>N3-G20</td>
<td>N3-Soils-401</td>
<td>Pathway Features (Unique Terrain/Soil Features)</td>
<td>Site: 237 to 238</td>
<td>E-363014</td>
<td>N-5962164</td>
<td>14N</td>
<td>2381 m</td>
</tr>
</tbody>
</table>

**Potential Effects:**

Impairment or loss of approximately 67 ha (0.18%) of single occurrence PAT enduring feature from right-of-way establishment.

**Specific Mitigation:**

- Carry out construction activities on frozen or dry ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes.
- Avoid development of new borrow areas, access routes and other activities within existing features.
- Maintain 100m setback around feature outside of ROW.
- Minimize movement of vehicles, machinery and equipment during construction.
- Prevent off-ROW activities and equipment use within terrain feature, during construction.

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**ESS Group: Cultural**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-G21</td>
<td>N3-H1rt-200</td>
<td>Gathering Area</td>
<td>Site: 232 to 234</td>
<td>E-363228</td>
<td>N-5962276</td>
<td>14N</td>
<td>9382 m</td>
</tr>
</tbody>
</table>

**Potential Effects:**

Potential Loss of Heritage Resources.

**Specific Mitigation:**

- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion.
- Identify and flag prior to start of work.
- Burn clearing debris during winter months only and ensure that all fires are extinguished prior to spring break-up.
- Conduct site investigation with Archeologist post clearing and prior to construction.
- Inspect excavated materials or surface disturbance for heritage resources and report any finds to Environmental Inspector.
- Implement additional mitigation from site investigation.
- Confinement of vehicle traffic to established trails to the extent possible.

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**MAP NUMBER:** 156
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**ESS Group: Groundwater**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S61</td>
<td>N3-S6</td>
<td>Vulnerable Fm Contamination</td>
<td>E 362571 N 3995068</td>
<td>14N</td>
<td>995</td>
<td>441 m</td>
<td></td>
</tr>
</tbody>
</table>

**Potential Effects:**
Potential groundwater contamination from a contingency event (e.g., spill)

**Specific Mitigation:**
- Marshalling yards will be located on upland sites where possible.
- An Emergency Preparedness and Spill Response Plan will be developed and an emergency response spill kit will be kept on-site at all times in case of fluid leaks or spills from machinery.
- Qualified driller with appropriate experience will be contracted to work in areas affected by artesian conditions.
- Emergency response plans for sealing/grouting and pumping will be implemented as required.

**ESS Group: Permafrost**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S21</td>
<td>N3-S2</td>
<td>Permafrost</td>
<td>E 359478 N 3960111</td>
<td>14N</td>
<td>195</td>
<td>9 m</td>
<td></td>
</tr>
<tr>
<td>N3-S21</td>
<td>N3-S2</td>
<td>Permafrost</td>
<td>E 3559238 N 3909083</td>
<td>14N</td>
<td>231</td>
<td>9 m</td>
<td></td>
</tr>
<tr>
<td>N3-S21</td>
<td>N3-S2</td>
<td>Permafrost</td>
<td>E 357058 N 3910010</td>
<td>14N</td>
<td>141</td>
<td>9 m</td>
<td></td>
</tr>
</tbody>
</table>

**Potential Effects:**
Melting or loss of permafrost due to disturbance of the active layer

**Specific Mitigation:**
- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

**ESS Group: Cultural**

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
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<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S21</td>
<td>N3-Hirt-200</td>
<td>Gathering Area</td>
<td>E 363228 N 3996276</td>
<td>14N</td>
<td>9382</td>
<td>9 m</td>
<td></td>
</tr>
</tbody>
</table>

**Potential Effects:**
Potential Loss of Heritage Resources

**Specific Mitigation:**
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Identify and flag prior to start of work
- Burn clearing debris during winter months only and ensure that all fires are extinguished prior to spring break-up
- Conduct site investigation with Archeologist post clearing and prior to construction
- Inspect excavated materials or surface disturbance for heritage resources and report any finds to Environmental Inspector
- Implement additional mitigation from site investigation
- Confine vehicle traffic to established trails to the extent possible

**MAP NUMBER:** 157
### ESS Group: Groundwater

**Potential Effects:**
Potential groundwater contamination from a contingency event (e.g., spill)

**Specific Mitigation:**
- Hardhulling ponds will be located on upland sites where possible.
- An Emergency Preparedness and Spill Response Plan will be developed and an emergency response spill kit will be kept on-site at all times in case of fluid leaks or spills from machinery.
- Qualified driller with appropriate experience will be contracted to work in areas affected by artesian conditions.
- Emergency response plans for sealing/grouting and pumping will be implemented as required.

### ESS Group: Permafrost

**Potential Effects:**
Melting or loss of permafrost due to disturbance of the active layer

**Specific Mitigation:**
- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicular traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

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<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
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<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S21</td>
<td>N3-Hort-200</td>
<td>Gathering Area</td>
<td>Site: 233 to 234</td>
<td>E-363228</td>
<td>N-59622276</td>
<td>14N</td>
<td>9382m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sec-Seg ID</th>
<th>ESS ID</th>
<th>ESS Name</th>
<th>Location</th>
<th>Start</th>
<th>Stop</th>
<th>UTM Zone</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N3-S21</td>
<td>N3-Solts-131</td>
<td>Permafrost</td>
<td>Site: 253 to 254</td>
<td>E-357068</td>
<td>N-59554529</td>
<td>14N</td>
<td>1418m</td>
</tr>
<tr>
<td>N3-S21</td>
<td>N3-Solts-131</td>
<td>Permafrost</td>
<td>Site: 255 to 256</td>
<td>E-358531</td>
<td>N-59582318</td>
<td>14N</td>
<td>416m</td>
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</table>