Appendix G9: Alternatives Evaluation – Fuel Source for Mining Equipment

Alternative Method Design Assumptions		
Diesel Truck Delivery and Tank Storage	**Liquefied Natural gas (LNG) Truck Delivery and Tank Storage**	**LNG Plant**
• *Diesel would be attained from relatively local sources.* • *Tanks would be designed and operated based on regulatory requirements for safety and to control environmental effects.*	• *LNG would be obtained from Union Gas's Hagar LNG Plant in Hagar, Ontario.* • *Tanks would be designed and operated based on regulatory requirements for safety and to control environmental effects.*	• *Union Gas would be responsible for constructing a new pipeline, to supply the Project.* • *The LNG Plant would have a limited footprint that can be accommodated in the existing Project development area (PDA) without additional landscape level effects.* • *Refuelling practices would adhere to regulatory requirements for safety and to control environmental effects.*

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Natural Environment				
Atmospheric Environment	Climate change as measured by change in greenhouse gases (GHGs)	**Construction:** Minor increase in GHG emissions expected from the equipment used to install the storage tank. **Operation:** Increase in GHG emissions expected from trucks used to deliver diesel from Thunder Bay (approximately 275 kilometres (km)). **Closure:** Minor increase in GHG emissions expected from the equipment used to decommission the storage tank.	**Construction:** Minor increase in GHG emissions expected from the equipment used to install the storage tank. **Operation:** Increase in GHG emissions expected from trucks used to deliver LNG from Hagar (approximately 900 km). **Closure:** Minor increase in GHG emissions expected from the equipment used to decommission the storage tank.	**Construction:** Minor increase in GHG emissions expected from the equipment used to construct the LNG plant. **Operation** Increase in localized GHG emissions expected from LNG plant operation. **Closure:** Minor increase in GHG emissions expected from the equipment used to decommission the LNG plant.
	Change in ambient air quality parameters	**Construction:** Minor increase in ambient air quality parameters expected from the equipment used to install the tank. **Operation:** Increase in ambient air quality parameters expected from trucks used to deliver diesel from Thunder Bay (approximately 275 km). **Closure:** Minor increase in ambient air quality parameters expected from the equipment used to decommission the storage tank.	**Construction:** Minor increase in ambient air quality parameters expected from the equipment used to install the tank. **Construction:** Increase in ambient air quality parameters expected from trucks used to deliver LNG from Hagar (approximately 900 km). **Closure:** Minor increase in ambient air quality parameters expected from the equipment used to decommission the storage tank.	**Construction:** Minor increase in ambient air quality parameters expected from the equipment used to construct the LNG plant. **Operation:** Increase in localized ambient air quality parameters from LNG plant operation. **Closure:** Minor increase in ambient air quality parameters expected from the equipment used to decommission the LNG plant.
Overall Atmospheric Environment Ranking *Key differentiating factor – the potential for effects is different between identified alternatives.*		***Disadvantage*** Change in the atmospheric environment expected because although the tank installation, storage or decommissioning will not result in substantial emissions, trucking fuel approximately 275 km will result in higher atmospheric environment emissions.	***Major Disadvantage*** Change in the atmospheric environment expected because although the tank installation, storage or decommissioning will not result in substantial emissions, the long-distance trucking (approximately 900 km) will result in substantially higher atmospheric environment emissions.	***Advantage*** Change in the atmospheric environment expected from emissions from the construction, operation, and decommissioning of a LNG plant, but overall lower air quality effects compared to trucking fuel long distances.
Acoustic Environment	Change in noise or vibration levels	**Construction:** Minor change in noise and vibration levels expected from the equipment used to install the storage tank. **Operation:** Minor, occasional change in noise and vibration levels expected from the trucks delivering the diesel. **Closure:** Minor change in noise and vibration levels expected from the equipment used to decommission the storage tank.	**Construction:** Minor change in noise and vibration levels expected from the equipment used to install the storage tank. **Operation:** Minor, occasional change in noise and vibration levels expected from the trucks delivering the LNG. **Closure:** Minor change in noise and vibration levels expected from the equipment used to decommission the storage tank.	**Construction:** Minor change in noise and vibration levels expected from the equipment used to construct the LNG plant. **Operation:** Minor change in noise and vibration levels from the operation of the LNG plant. **Closure:** Minor change in noise and vibration levels expected from the equipment used to decommission the LNG plant.
Overall Acoustic Environment Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** Minor change in acoustic environment expected; however potential effects are similar across all alternatives.	***Neutral*** Minor change in acoustic environment expected; however potential effects are similar across all alternatives.	***Neutral*** Minor change in acoustic environment expected; however potential effects are similar across all alternatives.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Groundwater	Change in groundwater quantity or flow	**Construction:** No change in groundwater quantity and flow as the storage tank will be constructed above ground and will not require water taking or affect drainage in the area. **Operation:** No change in groundwater quantity and flow because diesel truck delivery and tank storage will not require water taking. **Closure:** No change in groundwater quantity and flow because the decommissioning of the above ground storage tank will not require water taking.	**Construction:** No change in groundwater quantity and flow as the storage tank will be constructed above ground and will not require water taking. **Operation:** No change in groundwater quantity and flow because LNG truck delivery and tank storage will not require water taking. **Closure:** No change in groundwater quantity and flow because the decommissioning of the above ground storage tank will not require water taking.	**Construction:** No change in groundwater quantity and flow because the construction of the LNG plant will not require water taking. **Operation:** No change in groundwater quantity and flow because the operation of the LNG plant will not require water taking. **Closure:** No change in groundwater quantity and flow because the decommissioning of the LNG plant will not require water taking.
	Change in groundwater quality	**Construction:** No change in groundwater quality because the storage tank will be constructed above ground and will not release parameters of potential concern to the groundwater. **Operation:** Potential for change in groundwater quality due to minor spills associated with refuelling activities. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in groundwater quality because the decommissioning of the storage tank will not release parameters of potential concern to the groundwater.	**Construction:** No change in groundwater quality because the storage tank will be constructed above ground and will not release parameters of potential concern to the groundwater. **Operation:** Potential for change in groundwater quality due to minor spills associated with refuelling activities. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in groundwater quality because the decommissioning of the storage tank will not release parameters of potential concern to the groundwater.	**Construction:** No change in groundwater quality because the construction of the LNG plant will not release parameters of potential concern to the groundwater. **Operation:** Potential for change in groundwater quality due to minor spills associated with refuelling activities. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in groundwater quality because the decommissioning of the LNG plant will not release parameters of potential concern to the groundwater.
Overall Groundwater Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** Potential for limited effects on groundwater from minor spills are comparable across alternatives.	***Neutral*** Potential for limited effects on groundwater from minor spills are comparable across alternatives.	***Neutral*** Potential for limited effects on groundwater from minor spills are comparable across alternatives.
Surface Water	Change in surface water quantity or flow	**Construction:** No change in surface water quantity and flow as the construction of the storage tank will not require water taking or affect drainage in the area. **Operation:** No change in surface water quantity and flow because diesel truck delivery and tank storage will not require water taking or affect drainage in the area. **Closure:** No change in surface water quantity and flow because the decommissioning of the above ground storage tank will not require water taking or affect drainage in the area.	**Construction:** No change in surface water quantity and flow as the construction of the storage tank will not require water taking or affect drainage in the area. **Operation:** No change in surface water quantity and flow because diesel truck delivery and tank storage will not require water taking or affect drainage in the area. **Closure:** No change in surface water quantity and flow because the decommissioning of the above ground storage tank will not require water taking or affect drainage in the area.	**Construction:** No change in surface water anticipated as the construction of the LNG plant would not require water taking or affect drainage in the area. **Operation:** No change in surface water anticipated as the operation of the LNG plant would not require water taking or affect drainage in the area. **Closure:** No change in surface water anticipated as the decommissioning of the LNG plant would not require water taking or affect drainage in the area.
	Change in surface water quality	**Construction:** No change in surface water quality because the construction of the storage tank will not release parameters of potential concern. **Operation:** No change in surface water quality because the trucking of diesel and operation of the storage tank will not release parameters of potential concern. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in surface water quality because the decommissioning of the storage tank will not release parameters of potential concern.	**Construction:** No change in surface water quality because the construction of the storage tank will not release parameters of concern. **Operation:** No change in surface water quality because the trucking of LNG and operation of the storage tank will not release parameters of concern. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in surface water quality because the decommissioning of the storage tank will not release parameters of concern.	**Construction:** No change in surface water quality because the construction of the LNG plant will not release parameters of potential concern. **Operation:** No change in surface water quality because the operation of the LNG plant will not release parameters of potential concern. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on water quality. **Closure:** No change in surface water quality because the decommissioning of the LNG plant will not release parameters of potential concern.
Overall Surface Water Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No change in surface water anticipated because the construction, operation and decommissioning of the storage tank and trucking of diesel will not interact with surface water features.	***Neutral*** No change in surface water anticipated because the construction, operation and decommissioning of the storage tank and trucking of LNG will not interact with surface water features.	***Neutral*** No change in surface water anticipated because the construction, operation and decommissioning of the LNG plant will not interact with surface water features.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Fish and Fish Habitat	Change in fish habitat Change in fish	**Construction:** No change in fish habitat, fish health, or fish mortality expected because the installation of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. **Operation:** No change in fish habitat, fish health, or fish mortality expected because the delivery of diesel and operation of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on fish and fish habitat. **Closure:** No change in fish habitat, fish health, or fish mortality expected because the decommissioning of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.	**Construction:** No change in fish habitat, fish health, or fish mortality expected because the installation of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. **Operation:** No change in fish habitat fish health, or fish mortality expected because the delivery of LNG and operation of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on fish and fish habitat. **Closure:** No change in fish habitat, fish health, or fish mortality expected because the decommissioning of the storage tank would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.	**Construction:** No change in fish habitat, fish health, or fish mortality expected because the construction of the LNG plant would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. **Operation:** No change in fish habitat, fish health, or fish mortality expected because the operation of the LNG plant would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish. An appropriate spills management plan will be put in place to mitigate potential effects of accidental spills on fish and fish habitat. **Closure:** No change in fish habitat, fish health, or fish mortality expected because the decommissioning of the LNG plant would not affect water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.
Overall Fish and Fish Habitat Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No change to fish and fish habitat anticipated because the delivery of diesel and the storage tank will not result in any changes to water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.	***Neutral*** No change to fish and fish habitat anticipated because the delivery of LNG and the storage tank will not result in any changes to water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.	***Neutral*** No change to fish and fish habitat anticipated because the LNG plant will not result in any changes to water quality, sediment composition, riparian vegetation, or in-stream cover or cause direct mortality to fish.
Vegetation Communities	Change in abundance of vegetation species of interest Change in abundance and condition of upland vegetation communities Change in wetland function or connectivity	**Construction/Closure:** No change in vegetation or wetland function and connectivity anticipated because facilities and equipment will be located within the PDA. **Operation:** Truck delivery will use established roads with no anticipated effect on vegetation.	**Construction/Closure:** No change in vegetation or wetland function and connectivity anticipated because facilities and equipment will be located within the PDA. **Operation:** Truck delivery will use established roads with no anticipated effect on vegetation.	**Construction/Operation/Closure:** No change in vegetation or wetland function and connectivity anticipated because facilities and equipment will be located within the PDA.
Overall Vegetation Communities Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No effect on vegetation or wetland function and connectivity anticipated since facilities and equipment will be located within the PDA.	***Neutral*** No effect on vegetation or wetland function and connectivity anticipated since facilities and equipment will be located within the PDA.	***Neutral*** No effect on vegetation or wetland function and connectivity anticipated since facilities and equipment will be located within the PDA.
Wildlife and Wildlife Habitat	Change in movement, health or mortality risk of wildlife Change in wildlife habitat	**Construction/Closure:** No effect on wildlife or wildlife habitat anticipated because facilities and equipment will be located within the PDA. **Operation:** Potential for wildlife mortality from occasional increased truck traffic, but the increase in mortality risk should be limited.	**Construction/Closure:** No effect on wildlife or wildlife habitat anticipated because facilities and equipment will be located within the PDA. **Operation:** Potential for wildlife mortality from occasional increased truck traffic, but the increase in mortality risk should be limited.	**Construction/Operation/Closure:** No effect on wildlife or wildlife habitat anticipated because facilities and equipment will be located within the PDA.
Overall Wildlife and Wildlife Habitat Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** Facilities and equipment will be located within the PDA, and the potential increase in mortality risk should be limited.	***Neutral*** Facilities and equipment will be located within the PDA, and the potential increase in mortality risk should be limited.	***Neutral*** Facilities and equipment will be located within the PDA.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Social Environment				
Community Services and Infrastructure	Change in capacity of housing and accommodation Change in capacity of health and emergency services and infrastructure Change in the capacity of recreation and entertainment services and infrastructure	**Construction/Operation/Closure:** Any infrastructure required will be located within the PDA, and will not result in any additional effects on community services and infrastructure because there will be no increase in population.	**Construction/Operation/Closure:** Any infrastructure required will be located within the PDA, and will not result in any additional effects on community services and infrastructure because there will be no increase in population.	**Construction/Operation/Closure:** Any infrastructure required will be located within the PDA, and will not result in any additional effects on community services and infrastructure because there will be no increase in population.
	Change in the capacity provincial and municipal services and infrastructure	**Construction:** No change in the capacity of provincial and municipal services and infrastructure because the installation of the storage tank will not use provincial and municipal traffic, water or sewer infrastructure. **Operation:** No change in the capacity of transportation infrastructure as the existing highway is currently functioning under capacity, as noted in the Traffic Impact Study (Appendix F9 of the Final EIS/EA). The delivery of diesel and operation of the storage tank will not rely on water, sewer or power services and infrastructure. Diesel could be sourced relatively locally, providing the potential to improve community services and infrastructure through local contract sourcing. **Closure:** No change in the capacity of provincial and municipal services and infrastructure because the removal of the storage tank will be located within the PDA and will not result in any additional use of provincial and municipal services and infrastructure.	**Construction:** No change in the capacity of provincial and municipal services and infrastructure because the installation of the storage tank will not use provincial and municipal traffic, water or sewer infrastructure. **Operation:** No change in the capacity of transportation infrastructure as the existing highway is currently functioning under capacity, as noted in the Traffic Impact Study. The delivery of liquefied natural gas (LNG and operation of the storage tank will not rely on water, sewer or power services and infrastructure. Sourcing LNG for the Project will also provide an opportunity to enhance LNG availability for local residents and Aboriginal communities in the region. **Closure:** No change in the capacity of provincial and municipal services and infrastructure because the removal of the storage tank will be located within the PDA and will not result in any additional use of provincial and municipal services and infrastructure.	**Construction:** No change in the capacity of provincial and municipal services and infrastructure because the construction of the LNG plant will not use provincial and municipal traffic, water or sewer infrastructure. **Operation:** No change in the capacity of provincial and municipal services and infrastructure because the LNG plant will be located within the PDA and will not result in any additional use of provincial and municipal services and infrastructure. Developing a local LNG plant will also provide the opportunity to enhance LNG availability for local residents and Aboriginal communities in the region. **Closure:** No change in the capacity of provincial and municipal services and infrastructure because the removal of the LNG plant will be located within the PDA and will not result in any additional use of provincial and municipal services and infrastructure.
Overall Community Services and Infrastructure Ranking *Key differentiating factor – the potential for effects is different between identified alternatives.*		***Disadvantage*** Potential opportunity to enhance CSI through local contract sourcing of diesel fuel, but no opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.	***Advantage*** Sourcing LNG for the Project will provide an opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.	***Advantage*** Developing a local LNG plant will provide an opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Operational Health and Safety	Health and safety of mine workers	**Construction/Operation/Closure:** No effect on the health and safety of mine workers expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers. Infrastructure will be operated in accordance with Health and Safety Standards.	**Construction/Operation/Closure:** No effect on the health and safety of mine workers expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers. Infrastructure will be operated in accordance with Health and Safety Standards.	**Construction/Operation/Closure:** No effect on the health and safety of mine workers expected because the Project will be designed in consideration of avoiding the potential for operational failures that could lead to injury of workers. Infrastructure will be operated in accordance with Health and Safety Standards.
	Health and safety of local residents	**Construction:** The occasional delivery of fuel will have a limited effect on overall traffic. The storage tank will be operated within the PDA where access from local residents is restricted. **Operation:** The occasional delivery of fuel will have a limited effect on overall traffic. The storage tank will be operated within the PDA where access from local residents is restricted. **Closure:** No effect on the health and safety of local residents expected because trucking will no longer be required and the storage tank will be removed within the PDA where access is restricted.	**Construction:** The occasional delivery of fuel will have a limited effect on overall traffic. The storage tank will be operated within the PDA where access from local residents is restricted. **Operation:** The occasional delivery of fuel will have a limited effect on overall traffic. The storage tank will be operated within the PDA where access from local residents is restricted. **Closure:** No effect on the health and safety of local residents expected because trucking will no longer be required and the storage tank will be removed within the PDA where access is restricted.	**Construction/Operation/Closure:** No effect on the health and safety of local residents expected because the LNG plant will be constructed and operated within the PDA where access is restricted.
Overall Operational Health and Safety Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** The storage tank will be operated within the PDA in consideration of avoiding the potential for operational failures that could lead to injury of workers and the delivery of fuel will not result in a substantial increase in traffic.	***Neutral*** The storage tank will be operated within the PDA in consideration of avoiding the potential for operational failures that could lead to injury of workers and the delivery of fuel will not result in a substantial increase in traffic.	***Neutral*** The LNG plant will be operated within the PDA in consideration of avoiding the potential for operational failures that could lead to injury of workers.
Economic Environment				
Cost	Capital cost, Operational/maintenance cost, Rehabilitation/ closure cost	**Construction:** Lower capital costs for the installation of a storage tank than the construction of the LNG plant. **Operation:** Ongoing delivery fees for fuel delivery. **Closure:** Similar closure cost to decommission infrastructure across all alternatives.	**Construction:** Lower capital costs for the installation of a storage tank than the construction of the LNG plant. **Operation:** Ongoing delivery fees for fuel delivery. **Closure:** Similar closure cost to decommission infrastructure.	**Construction:** Highest capital cost for the construction of the LNG plant compared to installation of a storage tank. **Operation:** Lowest delivery cost with hook up to natural gas pipeline. **Closure:** Similar closure cost to decommission infrastructure.
Overall Cost Ranking *Key differentiating factor – the potential for effects is different between identified alternatives.*		***Advantage*** The storage tank will have a lower capital cost but higher operating costs than the LNG plant.	***Advantage*** The storage tank will have a lower capital cost but higher operating costs than the LNG plant.	***Disadvantage*** Higher capital cost may affect feasibility of implementation.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Labour and Economy	Change in labour	**Construction:** No change in labour expected because the installation of the storage tank would involve a temporary short-term job. **Operation:** Change in labour expected as a third party would be hired to haul fuel. **Closure:** No change in labour expected because the removal of the storage tank would involve temporary short-term jobs.	**Construction:** No change in labour expected because the installation of the storage tank would involve a temporary short-term job. **Operation:** Change in labour expected as a third party would be hired to haul fuel. **Closure:** No change in labour expected because the installation of the storage tank would involve temporary short-term jobs.	**Construction:** No change in labour expected because the construction of the LNG plant would involve a temporary short-term job. **Operation:** Change in labour expected because LNG plant operators would need to be hired. **Closure:** No change in labour expected because the decommissioning and removal of the LNG plant would involve temporary short-term jobs.
	Change in economy	**Construction:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required. **Operation:** Minor change in economy expected from the increased income to business owners from haulage fees and to the company selected to supply diesel for the Project. **Closure:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required.	**Construction:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required. **Operation:** Minor change in economy expected from the increased income to business owners from haulage fees and to Union Gas's Hagar LNG Plant in Hagar, Ontario for the supply. Enhanced availability of LNG in the region will lower LNG costs for local residents and Aboriginal communities. **Closure:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required.	**Construction:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required. **Operation:** Minor change in economy expected from the increased income to Union Gas for supplying LNG. Enhanced availability of LNG in the region will lower LNG costs for local residents and Aboriginal communities. **Closure:** No change in economy expected because the potential income to local businesses would be minimal and no municipal taxes would be required.
Overall Labour and Economy Ranking *Key differentiating factor – the potential for effects is different between identified alternatives.*		***Disadvantage*** Minor change in economy expected from the increased income to business owners from haulage fees and to the company selected to supply diesel for the Project. No opportunity to lower LNG costs for local residents and Aboriginal communities.	***Advantage*** Minor change in economy expected from the increased income to business owners from haulage fees and to Union Gas for the LNG supply. Opportunity to lower LNG costs for local residents and Aboriginal communities.	***Advantage*** Minor change in economy expected from the increased income to Union Gas for the LNG supply. Opportunity to lower LNG costs for local residents and Aboriginal communities.
Technical Feasibility	Ability to implement /commonly used technology in similar applications	**Construction/Operation/Closure:** A licensed third party would be used to truck diesel to the PDA. Fuel storage tanks are commonly used in several industries.	**Construction/Operation/Closure:** A licensed third party would be used to truck diesel to the PDA. Fuel storage tanks are commonly used in several industries.	**Construction:** Requires the construction of a new pipeline to service the Project by Union Gas which is common infrastructure. **Operation:** LNG plants are commonly used to generate energy. **Closure:** LNG plants are commonly decommissioned.
	Effectiveness/reliability	**Construction/Operation/Closure:** Diesel is a reliable and effective source of fuel; however, storm events could affect the delivery of fuel.	**Construction/Operation/Closure:** LNG is a reliable and effective source of fuel; however, storm events could affect the delivery of fuel.	**Construction/Operation/Closure:** The LNG plant provides the most reliable supply through a direct connection to the existing pipeline, reducing reliance on fuel delivery.
Overall Technical Feasibility Ranking *Key differentiating factor – the potential for effects is different between identified alternatives.*		***Disadvantage*** Diesel is commonly used and typically reliable, however a third party would be required to implement and storm events could affect delivery.	***Disadvantage*** LNG is commonly used and typically reliable, however a third party would be required to implement and storm events could affect delivery.	***Advantage*** LNG is commonly used and typically reliable, however a third party would be required to initially implement. The LNG plant provides the highest reliability due to a direct connection to the existing pipeline.

Alternative Method				
Valued Component (VC)/Criteria	**Indicators**	**Diesel Truck Delivery and Tank Storage**	**LNG Truck Delivery and Tank Storage**	**LNG Plant**
Cultural Environment				
Heritage Resources	Change in archaeological sites Change in architectural or historical resources	**Construction/Operation/Closure:** No change in archaeological sites or architectural or historical resources expected because the storage tank would be located within the PDA, and will not result in any additional removal, disruption or displacement of archaeological sites or architectural or historical resources. Fuel delivery would be along established roads and access roads.	**Construction/Operation/Closure:** No change in archaeological sites or architectural or historical resources expected because the storage tank would be located within the PDA, and will not result in any additional removal, disruption or displacement of archaeological sites or architectural or historical resources. Fuel delivery would be along established roads and access roads.	**Construction/Operation/Closure:** No change in archaeological sites or architectural or historical resources expected because the LNG plant would be located within the PDA, and will not result in any additional removal, disruption or displacement of archaeological sites or architectural or historical resources
Overall Heritage Resources Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No effect on heritage resources anticipated because the storage tank will be located within the PDA and delivery of fuel will be along established routes.	***Neutral*** No effect on heritage resources anticipated because the storage tank will be located within the PDA and delivery of fuel will be along established routes.	***Neutral*** No effect on heritage resources anticipated because the LNG plant will be located within the PDA.
Traditional Land and Resource Use	Change in Aboriginal communities' cultural practices Change in Aboriginal communities' traditional land uses (including hunting, fishing, trapping and harvesting)	**Construction/Operation/Closure:** No change in Aboriginal communities' cultural practices or traditional land uses expected because the storage tank would be located within the PDA and haulage would be along established routes and will not have additional effects on the use of cultural or spiritual sites or traditional land use areas.	**Construction/Operation/Closure:** No change in Aboriginal communities' cultural practices or traditional land uses expected because the storage tank would be located within the PDA and haulage would be along established routes and will not have additional effects on the use of cultural or spiritual sites or traditional land use areas.	**Construction/Operation/Closure:** No change in Aboriginal communities' cultural practices or traditional land uses expected because the LNG plant would be located within the PDA and will not have additional effects on the use of cultural or spiritual sites or traditional land use areas.
Overall Traditional Land and Resource Use Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No effect on traditional land and resource use anticipated because the storage tank will be located within the PDA and will not result in any additional effects on traditional land and resource use.	***Neutral*** No effect on traditional land and resource use anticipated because the storage tank will be located within the PDA and will not result in any additional effects on traditional land and resource use.	***Neutral*** No effect on traditional land and resource use anticipated because the LNG plant will be located within the PDA and will not result in any additional effects on traditional land and resource use.
Built Environment				
Land and Resource Use	Change in recreational land and resource use Change in navigation Change in commercially-based land and resource use	**Construction/Operation/Closure:** No change in recreational or commercially-based land and resource use or navigation because the storage tank will be located within the PDA and will not result in any additional access restrictions or removal of land and resource use areas.	**Construction/Operation/Closure:** No change in recreational or commercially-based land and resource use or navigation because the storage tank will be located within the PDA and will not result in any additional access restrictions or removal of land and resource use areas.	**Construction/Operation/Closure:** No change in recreational or commercially-based land and resource use or navigation because the LNG will be located within the PDA and will not result in any additional access restrictions or removal of land and resource use areas.
Overall Land and Resource Use Ranking *Not a key differentiating factor – the potential for effects is comparable across all identified alternatives.*		***Neutral*** No effect on land and resource use anticipated because the storage tank will be located within the PDA.	***Neutral*** No effect on land and resource use anticipated because the storage tank will be located within the PDA.	***Neutral*** No effect on land and resource use anticipated because the LNG plant will be located within the PDA.

OVERALL ALTERNATIVE RANKING BASED ON KEY DIFFERENTIATING FACTORS

Key Differentiating Factors	Diesel Truck Delivery and Tank Storage	LNG Truck Delivery and Tank Storage	LNG Plant
Atmospheric Environment	**Disadvantage -** Change in the atmospheric environment expected because although the tank installation, storage or decommissioning will not result in substantial emissions, trucking fuel approximately 275 km will result in higher atmospheric environment emissions.	**Major Disadvantage -** Change in the atmospheric environment expected because although the tank installation, storage or decommissioning will not result in substantial emissions, the long-distance trucking (approximately 900 km) will result in substantially higher atmospheric environment emissions.	**Advantage -** Change in the atmospheric environment expected from emissions from the construction, operation, and decommissioning of a LNG plant, but overall lower air quality effects compared to trucking fuel long distances.
Community Services and Infrastructure	**Disadvantage -** Potential opportunity to enhance CSI through local contract sourcing of diesel fuel, but no opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.	**Advantage -** Sourcing LNG for the Project will provide an opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.	**Advantage -** Developing a local LNG plant will provide an opportunity to enhance LNG availability for local residents and Aboriginal communities in the region.
Cost	**Advantage -** The storage tank will have a lower capital cost but higher operating costs than the LNG plant.	**Advantage -** The storage tank will have a lower capital cost but higher operating costs than the LNG plant.	**Disadvantage -** Higher capital cost may affect feasibility of implementation.
Labour and Economy	**Disadvantage -** Minor change in economy expected from the increased income to business owners from haulage fees and to the company selected to supply diesel for the Project. No opportunity to lower LNG costs for local residents and Aboriginal communities.	**Advantage -** Minor change in economy expected from the increased income to business owners from haulage fees and to Union Gas for the LNG supply. Opportunity to lower LNG costs for local residents and Aboriginal communities.	**Advantage -** Minor change in economy expected from the increased income to Union Gas for the LNG supply. Opportunity to lower LNG costs for local residents and Aboriginal communities.
Technical Feasibility	**Disadvantage -** Diesel is commonly used and typically reliable, however a third party would be required to implement and storm events could affect delivery.	**Disadvantage** - LNG is commonly used and typically reliable, however a third party would be required to implement and storm events could affect delivery.	**Advantage -** LNG is commonly used and typically reliable, however a third party would be required to initially implement. The LNG plant provides the highest reliability due to a direct connection to the existing pipeline.
OVERALL	**PREFERRED - Long-term (ongoing diesel delivery will be required even if the combination diesel/LNG fuel supply is implemented)**	**PREFERRED - Short-term (required to supply LNG during the establishment of the LNG Plant)**	**PREFERRED - Long-term (presents the most economical option over the long-term, despite potential implementation challenges)**