

Appendix C

Net Effects and Comparative Evaluation of Alternatives

Table 1: Net Effects Analysis and Comparative Evaluation of the Alternative Solutions - Sarnia Expanded Dock Facility Class EA

Category/ Criteria	Indicator(s)		Alternative No. 1 – Do Nothing	Alternative No. 2 – Expand Dock Facility	Alternative No. 3 – Construct New Dock Facility
Technical					
Ability of the alternative to accommodate the shipment of oversized loads.	Accommodation of oversized shipment loads	Potential Effects	Does not accommodate oversized shipment loads	Will accommodate oversized shipment loads	Will accommodate oversized shipment loads
		Impact Management Measures	No impact management measures available	No impact management measures required	No impact management measures required
		Net Effects	Potential effects remain unchanged.	Potential effects remain unchanged.	Potential effects remain unchanged.
	Criterion Ranking		Less Preferred because this alternative cannot accommodate oversized shipment loads	Tied for More Preferred because oversized shipment loads would be accommodated	Tied for More Preferred because oversized shipment loads would be accommodated
Length of time for constructing the alternative	Duration of construction	Potential Effects	No construction required	Construction period would be shorter as the existing dock would only need to be expanded	Construction period would be longer as the existing dock would need to be decommissioned and re-constructed.
		Impact Management Measures	No impact management measures available	No impact management measures available	No impact management measures available
		Net Effects	Potential effects remain unchanged	Potential effects remain unchanged	Potential effects remain unchanged
	Criterion Ranking		More Preferred because there is no construction required	Moderately Preferred because the duration of the construction would be less than Alternative No. 3	Less Preferred because this the duration of construction would be the longest
Technical Category Ranking			Tied for Moderately Preferred because although this alternative requires no construction it will not be able to accommodate the oversized shipment loads.	More Preferred because this alternative can accommodate the oversized shipment loads and the duration of construction is less than Alternative No. 3.	Tied for Moderately Preferred because although this alternative allows for the oversized shipment loads it has the longest construction duration.
Natural Environment					
Effect on aquatic habitat	Permanent effects on aquatic species and habitat quality	Potential Effects	No potential permanent effects on aquatic species or habitat quality	There is potential for fish mortality during the construction works. There are no permanent effects on aquatic habitat quality as the expanded dock facility will be located within the existing maintenance dredging area.	There is potential for fish mortality during the construction works. There are no permanent effects on aquatic habitat quality as the expanded dock facility will be located within the existing maintenance dredging area.

Category/ Criteria	Indicator(s)		Alternative No. 1 – Do Nothing	Alternative No. 2 – Expand Dock Facility	Alternative No. 3 – Construct New Dock Facility
		Impact Management Measures	No impact management measures required	The death of fish will be prevented by planning in water work to respect timing windows to protect fish. In water works will be limited to between July 16 and March 14 of any given year	The death of fish will be prevented by planning in water work to respect timing windows to protect fish. In water works will be limited to between July 16 and March 14 of any given year
		Net Effects	Potential effects remain unchanged	The potential for permanent loss of fish during construction will be reduced by respecting the timing windows for in water works.	The potential for permanent loss of fish during construction will be reduced by respecting the timing windows for in water works.
	Criterion Ranking		Tied for More Preferred because there will be no permanent effects on aquatic species and habitat quality.	Tied for More Preferred because there will be no permanent effects on aquatic species and habitat quality.	Tied for More Preferred because there will be no permanent effects on aquatic species and habitat quality.
	Temporary effects on aquatic species and habitat quality (e.g., temporary disturbance during construction, sedimentation, etc.)	Potential Effects	No temporary effects on aquatic species and habitat quality	<p>There will be some minor temporary effects on aquatic species. Previous records of four SAR species have been identified in the vicinity of the Project area, including:</p> <ul style="list-style-type: none"> • Silver lamprey (Special Concern) • Spotted sucker (Special Concern) • Northern madtom (Endangered) • Channel darter (Endangered) <p>Temporary disturbance during construction to these species is likely occur.</p> <p>Additionally placing of fill or permanent structures below the high water mark cannot be avoided for this proposed project.</p>	<p>There will be temporary effects on aquatic species as a result of demolishing the existing dock and re-establishing a whole new dock. Previous records of four SAR species have been identified in the vicinity of the Project area, including:</p> <ul style="list-style-type: none"> • Silver lamprey (Special Concern) • Spotted sucker (Special Concern) • Northern madtom (Endangered) • Channel darter (Endangered) <p>Temporary disturbance to these species as a result decommissioning and re-constructing is likely to occur.</p> <p>Additionally placing of fill or permanent structures below the high water mark cannot be avoided for this proposed project.</p>
		Impact Management Measures	No impact management measures required	<p>To improve the habitat quality and to encourage opportunities for the establishment of habitat a living shoreline is proposed along the southern end of the Project site.</p> <p>In water work will be undertaken in specific timing windows to protect aquatic species. In water works will be limited to between July 16 and March 14 of any given year</p>	<p>To improve the habitat quality and to encourage opportunities for the establishment of habitat a living shoreline is proposed along the southern end of the Project site.</p> <p>In water work will be undertaken in specific timing windows to protect aquatic species. In water works will be limited to between July 16 and March 14 of any given year</p>
		Net Effects	Potential effects remain unchanged	The temporary effects on aquatic species and habitat quality will be offset by the installation of	The temporary effects on aquatic species and habitat quality will be offset by the installation of

Category/ Criteria	Indicator(s)		Alternative No. 1 – Do Nothing	Alternative No. 2 – Expand Dock Facility	Alternative No. 3 – Construct New Dock Facility
				<p>the living shoreline which will provide opportunities for habitat establishment post construction works.</p> <p>Additionally undertaking work during appropriate timing windows and limiting in water works will reduce the temporary effects.</p>	<p>the living shoreline which will provide opportunities for habitat establishment post construction works.</p> <p>Additionally undertaking work during appropriate timing windows and limiting in water works will reduce the temporary effects. However the temporary effects will still be felt by the ecosystem for a longer period of time.</p>
	Criterion Ranking		More Preferred because this alternative has no permanent or temporary impacts on aquatic species or habitat quality.	Moderately Preferred because although this alternative has temporary impacts on aquatic species and habitat quality the impacts are over a lesser duration than Alternative 3.	Less Preferred because this alternative has temporary impacts on aquatic species and habitat quality for the longest duration.
Effect on terrestrial habitat	Permanent effects on terrestrial habitat and species vegetation (e.g., riparian vegetation)	Potential Effects	No permanent effects on terrestrial species or habitat quality	Minor, permanent impacts are anticipated during construction with the removal of riparian vegetation and a small patch of willow shrubs along the bank.	Minor, permanent impacts are anticipated during construction with the removal of riparian vegetation and a small patch of willow shrubs along the bank.
Impact Management Measures		No impact management measures proposed	Upon completion of construction activities riparian vegetation will be incorporated along the shoreline in an effort to improve the quality of riparian vegetation. The efforts will be concentrated at the south end of the Site where the shoreline is already eroding.	Upon completion of construction activities riparian vegetation will be incorporated along the shoreline in an effort to improve the quality of riparian vegetation. The efforts will be concentrated at the south end of the Site where the shoreline is already eroding.	
Net Effects		Potential effects remain unchanged	The permanent loss of minor riparian vegetation and willow shrubs will be replaced with new riparian vegetation to improve the quality of the existing vegetation and to stabilize the shoreline.	The permanent loss of minor riparian vegetation and willow shrubs would be replaced with new riparian vegetation to improve the quality of the existing vegetation and to stabilize the shoreline.	
	Criterion Ranking		Less Preferred because although under this scenario no impacts are anticipated the existing shoreline is already experiencing erosion and no mitigation measures are proposed under this alternative.	Tied with More Preferred because although there is some permanent loss of riparian vegetation and willow shrubs these will be replaced to improve the riparian vegetation and the shoreline will be stabilized.	Tied with More Preferred because although there is some permanent loss of riparian vegetation and willow shrubs these will be replaced to improve the riparian vegetation and the shoreline will be stabilized.
	Temporary effects on terrestrial habitat quality and species (e.g., temporary disturbance during construction, etc.)	Potential Effects	No temporary effects on aquatic species and habitat quality	The construction period will have some temporary effects on terrestrial habitat quality due to the disturbance from vehicle movements, the removal of riparian vegetation and the placement of fill or permanent structures below the high water mark.	The construction period will have some temporary effects on terrestrial habitat quality due to the disturbance from vehicle movements, the removal of riparian vegetation and the placement of fill or permanent structures below the high water mark.

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					This temporary disturbance will be experienced over a longer period of time to allow for the decommissioning of the existing dock.
		Impact Management Measures	No impact management measures proposed	There are limited impact management measures available during construction as placement of fill or permanent structures below the high water mark are unavoidable. The works will be planned and staged to limit the impacts to the terrestrial environment. Upon completion of the works the eroding shoreline will be stabilized and riparian vegetation planted.	There are limited impact management measures available during decommission of the existing dock and construction of the new dock. Placement of fill or permanent structures below the high water mark are unavoidable. The proposed works will be planned and staged to limit the impacts to the terrestrial environment. Upon completion of the works the eroding shoreline will be stabilized and riparian vegetation planted.
		Net Effects	Potential effects remain unchanged	The temporary impacts will be mitigated through the stabilisation of the eroding shoreline and rehabilitation of areas disturbed during construction.	The temporary impacts will be mitigated through the stabilisation of the eroding shoreline and rehabilitation of areas disturbed during construction.
	Criterion Ranking		Less Preferred because although under this scenario no impacts are anticipated the existing shoreline is already experiencing erosion and no mitigation measures are proposed under this alternative.	More Preferred because although there is some temporary impacts to the terrestrial environment existing erosion will be mitigated and areas disturbed will be rehabilitated and the impacts will be felt for a shorter duration that Alternative No. 3.	Moderately Preferred because there is some temporary impacts to the terrestrial environment, upon completion of the works the existing erosion will be mitigated. However the temporary impacts will be felt for a longer duration of time than Alternative No. 2.
Natural Environment Category Ranking			Less Preferred because although this alternative has no potential impacts to the aquatic environment and the terrestrial environment it does not propose to mitigate the eroding shoreline and does not promote habitat establishment in the aquatic environment along the shoreline.	More Preferred because despite the potential temporary and permanent impacts the overall mitigation measures proposed provide an improved outcome of the aquatic environment and terrestrial environment post construction works.	Moderately Preferred This alternative has the same overall outcome of Alternative No. 2 in terms of providing an improvement to the existing aquatic and terrestrial environment. However the impacts will be felt over a longer duration of time and the demolition of the existing dock has higher effects on the aquatic environment than Alternative No. 2.
Built Environment					
Effects on the existing dock facility, shoreline and access road	Type and duration of effects	Potential Effects	No temporary effects on the built environment	During the construction period there will be temporary disruption/ inconveniences to adjacent properties as a result of equipment and structures being brought to site via Exmouth Street. Other	During the demolition of the existing dock facility and the construction period for the new dock facility there will be temporary disruption/ inconveniences to adjacent properties as a result of equipment and structures being removed and

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				docks may be temporarily impacted as well during times.	brought to site via Exmouth Street. Other docks may be temporarily impacted as well during times. The temporary effects will be longer in duration than Alternative No. 2.
		Impact Management Measures	No impact management measures proposed	The construction activities will be scheduled to limit disruption to adjacent properties. Adjacent businesses will be notified on the construction scheduling prior to commencement.	The construction activities will be scheduled to limit disruption to adjacent properties. Adjacent businesses will be notified on the construction scheduling prior to commencement.
		Net Effects	No potential effects	The potential effects will be managed through the implementation of the impact management measures.	The potential effects will be managed through the implementation of the impact management measures.
	Criterion Ranking		More Preferred because there are no effects to the built environment	Moderately Preferred because there will be some temporary disturbance to adjacent properties during construction of the expanded dock, however the disruption should be limited with the implementation of the impact management measures.	Less Preferred because the temporary impacts to adjacent properties owners will be over a longer duration than Alternative No. 2.
Built Environment Category Ranking			More Preferred because there are no effects to the built environment	Moderately Preferred because there will be some temporary disturbance to adjacent properties during construction of the expanded dock, however the disruption should be limited with the implementation of the impact management measures.	Less Preferred because the temporary impacts to adjacent properties owners will be over a longer duration than Alternative No. 2.
Social Environment					
Effects on area users (e.g., business employees, boaters, etc.)	Type and duration of effects	Potential Effects	No temporary effects on the built environment	The Sarnia Dock Facility is within the industrial area of the Sarnia Port. As such, there are no residences in the area that would be potentially affected by construction.	The Sarnia Dock Facility is within the industrial area of the Sarnia Port. As such, there are no residences in the area that would be potentially affected by construction.
		Impact Management Measures	No impact management measures proposed	No impact management measure proposed	No impact management measure proposed
		Net Effects	No potential effects	No potential effects	No potential effects

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	Criterion Ranking		Tied with More Preferred because there are no effects to the social environment.	Tied with More Preferred because there are no effects to the social environment.	Tied with More Preferred because there are no effects to the social environment.
Social Environment Category Ranking			Tied with More Preferred because there are no effects to the social environment.	Tied with More Preferred because there are no effects to the social environment.	Tied with More Preferred because there are no effects to the social environment.
Economic Environment					
Ability of the alternative to reduce shipping costs for local fabricators and industry	Effect on shipping costs for local fabricators and industry	Potential Effects	Does not reduce shipping costs for local fabricators and industry	Will reduce the shipping costs for local fabricators and industry	Will reduce the shipping costs for local fabricators and industry
		Impact Management Measures	No impact management measure available	No impact management measure available	No impact management measure available
		Net Effects	Net effects remain unchanged – the shipping costs for local fabricators and industry will not be reduced	Net effects remain unchanged – the shipping costs for local fabricators and industry will be reduced	Net effects remain unchanged – the shipping costs for local fabricators and industry will be reduced
	Criterion Ranking		Less preferred because this alternative does not reduce the shipping costs for local fabricators and industry	Tied for More Preferred because this alternative does reduce the shipping costs for local fabricators and industry	Tied for More Preferred because this alternative does reduce the shipping costs for local fabricators and industry
Ability of the alternative to facilitate increased revenue generation for local fabricators and industry	Effect on revenue generation for local fabricators and industry	Potential Effects	Does not generate any new revenue	The proposed dock facility expansion has the opportunity to improve the economic environment revenue of Sarnia-Lambton fabricators by an estimated \$9.5 million.	The proposed dock facility expansion has the opportunity to improve the economic environment revenue of Sarnia-Lambton fabricators by an estimated \$9.5 million.
		Impact Management Measures	No impact management measure available	No impact management measure available	No impact management measure available
		Net Effects	Potential effects remain unchanged	Potential effects remain unchanged	Potential effects remain unchanged
	Criterion Ranking		Less Preferred because this alternative does not provide opportunity for revenue generation for local fabricators and industry	Tied for More Preferred because this alternative provides opportunity for revenue generation for local fabricators and industry	Tied for More Preferred because this alternative provides opportunity for revenue generation for local fabricators and industry
Ability of the alternative to facilitate new job creation	Effect on new job creation	Potential Effects	Does not facilitate new job creation	Has the potential to create an estimated 2613 new jobs	Has the potential to create an estimated 2613 new jobs

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		Impact Management Measures	No impact management measure available	No impact management measure available	No impact management measure available
		Net Effects	Potential effects remain unchanged	Potential effects remain unchanged	Potential effects remain unchanged
	Criterion Ranking		Less Preferred because this alternative does not provide opportunity for new job creation	Tied for More Preferred because this alternative provides opportunity for an estimated 2613 new jobs	Tied for More Preferred because this alternative provides opportunity for an estimated 2613 new jobs
Economic Environment Category Ranking			Less Preferred because this alternative does not provide opportunity for revenue generation for local fabricators and industry, does not reduce the shipping costs and does not provide any opportunities for new job creation.	Tied for More Preferred because this alternative provides opportunity for revenue generation for local fabricators and industry, reduces the shipping costs for local fabricators and industry and provides the opportunity for an estimated 2613 new jobs.	Tied for More Preferred because this alternative provides opportunity for revenue generation for local fabricators and industry, reduces the shipping costs for local fabricators and industry and provides the opportunity for an estimated 2613 new jobs.
Cultural Environment					
Effects on cultural heritage resources	Loss of and/or disturbance to cultural heritage resources	Potential Effects	No loss of or disturbance to cultural heritage resources	No loss of or disturbance to cultural heritage resources	No loss of or disturbance to cultural heritage resources
		Impact Management Measures	No impact management measures required	No impact management measures required	No impact management measures required
		Net Effects	Net effects remain unchanged	Net effects remain unchanged	Net effects remain unchanged
	Criterion Ranking		Tied for More Preferred because this alternative has no potential effects on cultural heritage resources	Tied for More Preferred because this alternative has no potential effects on cultural heritage resources	Tied for More Preferred because this alternative has no potential effects on cultural heritage resources
Cultural Environment Category Ranking			Tied for More Preferred because this alternative has no potential effects on cultural heritage resources	Tied for More Preferred because this alternative has no potential effects on cultural heritage resources	Tied for More Preferred because this alternative has no potential effects on cultural heritage resources
Financial					
Capital Costs	Estimated cost	Potential Effects	There are no capital costs associated with Alternative No. 1	The estimated capital costs for constructing Alternative No. 2 is approximately \$6.0 million.	The estimated capital costs for constructing Alternative No. 3 is approximately \$9.0 million.
		Impact Management Measures	No impact management measures required	No impact management measures available.	No impact management measures available.

Category/ Criteria	Indicator(s)		Alternative No. 1 – Do Nothing	Alternative No. 2 – Expand Dock Facility	Alternative No. 3 – Construct New Dock Facility
		Net Effects	Net effects remain unchanged	Net effects remain unchanged	Net effects remain unchanged
	Criterion Ranking		More Preferred because Alternative No. 1 has no capital costs.	Moderately Preferred because Alternative No. 2 has lower capital costs than Alternative No. 3.	Less Preferred because Alternative No. 3 has the highest capital costs.
Financial Category Ranking			More Preferred because Alternative No. 1 has no capital costs.	Moderately Preferred because Alternative No. 2 has lower capital costs than Alternative No. 3.	Less Preferred because Alternative No. 3 has the highest capital costs.
Overall Recommendation and Rationale			<p>Alternative No. 2: Expand Existing Dock Facility was selected as the Recommended Solution because it is the only Alternative to rank either More Preferred or Moderately Preferred in every evaluation category. Expanding the Existing Dock Facility would accommodate the shipment of oversized loads in order to support the OLC unlike the ‘Do Nothing’ alternative and has a shorter construction timeline than constructing a new dock facility.</p> <p>Alternative No. 2 has limited effects to the Natural Environment due to the continuous disturbance of Sarnia Port’s Winter Basin (including maintenance dredging activities). Alternative No. 2 is able to maintain the existing dock facility unlike Alternative No. 3, which requires its demolition.</p> <p>The economic benefits of the project, including the generation of an estimated \$9.5 million in revenues and the creation of approximately 2613 new jobs will be realized with Alternative No. 2 because it is able to accommodate the shipment of oversized loads unlike the Do Nothing alternative. Finally, expanding the existing dock facility will have lower capital costs compared to constructing a new dock facility.</p>		