Appendix A
Benefit-Cost Analysis Memorandum

Greenfield Louisiana Project

2022 PIDP Grant Application

Prepared for Port of South Louisiana by AECOM

Table of Contents

Attachment A - BCA Excel Workbook (locked and unlocked)

Executive Summary

A benefit-cost analysis (BCA) was conducted by AECOM for Greenfield Louisiana (i.e., the Project) to support the grant application of the Port of South Louisiana (POSL) for the U.S. Department of Transportation (USDOT) Maritime Administration 2022 Port Infrastructure and Development Program (PIDP).

Located in a Qualified Opportunity Zone in a rural area on the West Bank of the Mississippi River in St. John the Baptist Parish, Louisiana, the Project is a Community Investment Plan which includes a newbuild grain export elevator being developed by POSL and its private sector partner, Greenfield Louisiana LLC. The Project will include:

- A barge dock for unloading grain from barges
- A ship dock capable of loading high capacity Post-Panamax and Neopanamax bulk carriers with grain
- A trestle over the Mississippi River levee for accessing the dock
- A grain elevator

The principal benefit of the Project in the BCA is lowering the cost and increasing the efficiency of transporting grain from U.S. farmers to foreign markets. Additionally, the newbuild grain elevator will reduce grain dust emissions through best-in-class design and construction technology.

The methodology used for the BCA follows the guidelines of the Notice of Funding Opportunity (NOFO) for the PIDP, and the 2022 USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Estimates of the expected benefits for each of the long-term outcomes specified in the NOFO are presented for the full completion of the Project (alternative case) net of the baseline (base case). All costs and benefits are discounted using a 7 percent discount rate, as required by the BCA guidance, and all values are in 2020 dollars and discounted to 2020. To compute the final BCA score, total benefits of the Project, less operating costs, are compared to the total capital costs of the Project, including costs assumed to be paid by state, local, the private partner, and the Federal government.

The main components of the project have a lifecycle of 50 years; therefore, the analysis incorporated the associated residual value of those components.

As the POSL will have a long-term lease agreement with Greenfield Louisiana, the private sector will perform maintenance on the asset at no cost to the port. The revenue generated by the Project is more than sufficient to cover all O&M costs. The Project is assumed to be maintained at the highest quality, based upon leases with other POSL tenants where the tenants bear all maintenance responsibilities for the facilities, including what is expected from Greenfield Louisiana.

The benefit-cost ratio (BCR) is **1.73** following the implementation of the Project. A 20-year analysis period was used to calculate the BCR, with 2 years for project construction starting in 2023 and project benefits beginning in 2025.

Table 1 presents the **Impact Matrix** as specified in the NOFO. The impact matrix describes the baseline, the Project, and the estimated project impacts.

Table 1: Impact Matrix

Project Matrix

Current Status/Baseline & Problem to be Addressed	Change to Baseline or Alternative	Types of Impacts
Grain elevators on the lower Mississippi River are at least 40 years old and were built without the latest technology for quickly loading large bulk carriers.	The Project will enable loading of multiple holds quickly on large Post-Panamax and Neopanamax bulk carriers.	Reduced grain transportation costs from reducing the time needed to fully load bulk carriers by up to 40%.
Most grain elevators on the lower Mississippi River do not have sufficient dock depth to service the larger bulk carriers that can transit the River after completion of the Mississippi River Deepening Project.	The Project will be designed to allow efficient loading of larger Post-Panamax and Neopanamax bulk carriers.	Lower transportation costs to major markets in Asia by shipping grain in larger bulk carriers.
Grain elevators on the lower Mississippi River are at least 40 years old and were built without the latest technology for reducing grain dust emissions.	The Project will result in 80% less grain dust emissions compared to the existing 11 grain export elevators.	Reduced PM2.5 emissions.
Existing grain elevators on the lower Mississippi River are located in metropolitan Baton Rouge or metropolitan New Orleans or on the east bank of the Mississippi River.	The Project will be located on the west bank of the Mississippi River, in a rural area without traffic congestion.	Reduced truck traffic while transporting grain from central and south-central Louisiana; reduced transportation costs for Louisiana farmers; reduced accidents and reduced emissions from trucks.

1. Introduction

The Board of Commissioners of POSL requests funding from the USDOT under the 2022 PIDP Discretionary Grants program to be used for the construction of a new barge unloading and a ship loading dock. The docks will be used solely for the benefit of a newbuild grain elevator being constructed in St. John the Baptist Parish, Louisiana. Over the life of the asset, the Project will provide significant improvements in transportation efficiency and reliability of the U.S. agriculture supply chain. Additionally, the Project will reduce emissions from grain dust and from trucks and improve safety outcomes. The Project is expected to be operational in 2025, which is the first year of benefits recognized in the BCA. The Project is expected to export over 11 million metric tons of grain per year.

Figure 1. Project Site

Note: Coordinates are latitude 30.027589 N, longitude -90.656577 W

2. Benefit Analysis Framework

The benefit analysis was conducted using the 2022 Benefit-Cost Analysis Guidance for Discretionary Grant Programs as a guide for preferred methods and monetized values. The parameters of the benefits analysis follow the protocols set by the Office of Management and Budget (OMB) Circular A-94, as well as the recommended benefit quantification methods by the USDOT. Generally, standard factors and values accepted by federal agencies were used for the benefits calculation except in cases where more Project-specific values or prices were available. In all such cases, modifications are noted and references are provided for data sources.

3. Analysis Assumptions

A list of assumptions for the Project is provided in the BCA workbook (see Input tab in the file App A BCA.xls) as well as Table 2 below.

Table 2: Analysis Assumptions

Input	Value	Source
Benefit Discount Rate	7%	USDOT, 2022 Benefit-Cost Analysis Guidance
CO2 Benefit Discount Rate	3%	USDOT, 2022 Benefit-Cost Analysis Guidance
Discount Year	2020	USDOT, 2022 Benefit-Cost Analysis Guidance
Dollar Year	2020	USDOT, 2022 Benefit-Cost Analysis Guidance
Analysis Period (years)	20	Reflects USDOT comments on previous submittal
Construction Start Year	2023	Greenfield Project Information
Substantial Completion (opening year)	2025	Greenfield Project Information
Construction Duration (years)	2	Assumes 2023 and 2024

Years in Operation During Analysis Period (years)	18	20 year Analysis Period less 2 year Construction Period
Project Useful Life (years)	50	FY2018 DESC1805 Upgrade Fuel Wharf Yokose, NAVSUP Fleet Logistics Center, Yokose, Japan, Design Analysis Submittal, AECOM, March 2, 2018 (s see Section 4: Construction Costs for detail)
Capital Spending Distribution (annual percentage of total costs)	50%	Assumes even distribution of Capital costs across 2-year construction timeframe
Annual O&M Cost Compared with Construction Cost	5%	Greenfield
Project Acreage	300	https://www.lobservateur.com/2021/12/15/greenfield-says-grain-terminal-presents-economic-opportunity-for-west-bank-local-doctor-addresses-health-safety-concerns/?msclkid=5fb86b74d14311eca50671034e6160e5
St John the Baptist Parish Average cost per acre	$136,705	Zillow.com (see Section 4: Construction Costs for detail)
Conversion Rate for kg per metric ton	1,000	N/A - Standard unit conversion factor
Bushels/metric ton - Corn	39.3680	https://grains.org/markets-tools-data/tools/converting-grain-units/
Bushels/metric ton - Soybeans	36.7437	https://grains.org/markets-tools-data/tools/converting-grain-units/
Bushels/metric ton - average	38.0559	Average of Corn and Soybean volumes
Total annual grain exports	11,089,000	Greenfield
Truck annual inbound grain	1,000,000	Greenfield
No Build Vessel Loading Rate (bushels/hour)	70,000	Greenfield and Table 14-11 USDA RTI Report
Project Vessel Loading Rate (bushels/hour)	100,000	
No Build Vessel Loading Rate (metric tons/hour)	1,839	70k bushels per hour / 38.0559 bushels per metric ton
Project Vessel Loading Rate (metric tons/hour)	2,628	100k bushels per hour / 38.0559 bushels per metric ton
In Port Vessel Operating Cost per Hour ($2004)	$399	http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.225.486&rep=rep1&type=pdf
In Port Vessel Operating Cost per Hour ($2020)	$537	
Maximum truck load (metric tons)	25.0	http://fess.su/news/dimensions-and-sizes-of-trucks?msclkid=778b462fd15c11ec98e63fba4d6bf056
Vehicle Operating Cost per mile (2020$), commercial truck	$0.94	USDOT, 2022 Benefit-Cost Analysis Guidance, Table A-5
Value of Time - Truck Driver (2020$)	$32.00	USDOT, 2022 Benefit-Cost Analysis Guidance, Table A-3
Truck Operator Hours Saved per Local Trip	1.0	Estimates based on geographic location of proposed vs existing grain elevators facility relative to local grain production
Truck Miles Saved per Local Trip	40.0	
Vessel Savings per Metric Ton POSL -China (2020$)	$4.82	USDA, Update on United States–South America Ocean Grain Freight Spreads (See Section 6: Benefits for detail)
Elevator Savings per Metric Ton (efficiency)	$2.00	Greenfield
Baseline grain elevator PM emissions (lb. per ton loaded/unloaded)	0.00055	USEPA, Emission Factor documentation for AP-42
Project PM2.5 emission reduction	80%	POSL/Greenfield

4. Construction Costs

Benefits of the ship dock and the barge dock are dependent upon use of the entire grain elevator, which will be the sole user of the dock. Therefore, full capital costs for the Project include costs for the grain elevator and the docks, shown in Table 3 and

Table 4, respectively. In addition, land purchase costs are estimated at $37.5 million (in 2020$).

Table 3: Grain Elevator Construction Costs (2020$)

Quantity	Description	Cost ($2020)
1	Test Pile Program	$1,097,347
1	Greenfield Utility Expenses During Construction	$1,964,596
1	Temporary Construction Access, Storage, and Maintenance Expenses	$7,876,658
1	QA/QC	$717,306
1	Construction Management	$12,792,716
1	Design	$18,275,309
1	Foundation Pile Package	$25,630,388
1	Site Civil Package	$8,772,148
1	Concrete Foundation Package	$18,353,741
1	Slipform Package	$41,119,445
1	Structural/Mechanical Package	$91,682,381
1	Building Package	$7,279,949
1	Sprinkler and Fire Protection Package	$411,194
1	Rail Package	$8,454,158
1	Electrical Package - Interstates	$36,031,599
1	Automation Package - Interstates	$4,784,476
1	Owner Furnished Equipment - Taken from VAA Spreadsheet	$87,278,881
1	Insurance	$1,462,025
1	Contractor Bonds (Electrical and Control Bonds Listed in Breakdown)	$2,349,413
	Total	$376,333,731

Source: Greenfield Louisiana, June 2021

Table 4: Docks Construction Costs (2019$)

Quantity	Description	Units	Unit Price (2023)	Total (2020$)
1	Mobilization/Demobilization	LS	$264,183	$241,401
1	Ship Dock	LS	$12,163,881	$11,143,691
1	Barge Dock	LS	$5,211,924	$4,774,798
1	CBU Dock	LS	$5,676,147	$5,200,086
6	Breasting Dolphins	EA	$772,690	$4,247,305
5	Mooring Dolphins	EA	$512,249	$2,346,432
4	Barge Haul Platforms	EA	$844,260	$3,093,806
1	Approach way	LS	$15,343,326	$14,056,475
5	Pipe Bridges	EA	$136,460	$625,075
1	Levee Abutment	LS	$79,741	$73,053
1	Protection Piles	LS	$5,034,065	$4,611,856
1	Barge Fender System	LS	$7,714,595	$7,067,569
1	Barge Divider Piles	LS	$1,103,835	$1,011,256
2	Conveyor Supports (Piles & Jackets Only)	EA	$1,211,909	$2,220,531
	Total			**$60,713,334**

Source: POSL, June 2021

To estimate the project year in which expenses would occur, grain elevator and docks costs are distributed evenly across each year of project construction (50% in 2023 and 50% in 2024).

All land purchase costs are assumed to occur in year 1 (2023). Land costs are estimated based on an expected Project footprint of 300 acres[1] and an average cost of $136,705 (2022$) per acre[2].

Capital costs (including the 2020 equivalent value of land costs) are discounted at 7 percent for each year of spending, resulting in a total present value equivalent of $376 million (2020$).

5. Operation and Maintenance Costs

The Project requires annual and periodic operating and maintenance (O&M) costs to keep the docks and the grain elevator in good condition. The Project O&M cost is estimated to be 2 percent of total construction cost annually, which is approximately $8.7 million (2020$) per year, starting in 2025. The total O&M cost over the analysis period (discounted at 7 percent) is $67 million (2022).

[1] L'Observateur, December 2021, Greenfield says grain terminal presents economic opportunity for West Bank ; Local doctor addresses health & safety concerns - L'Observateur | L'Observateur (lobservateur.com)
[2] Zillow average listed price for lot/land (no improvements) within the St. John the Baptist Parish.

The POSL will have a long-term lease agreement with Greenfield Louisiana LLC. The private sector operator will maintain the docks and the grain elevator at no cost to POSL. The revenue generated by the asset is more than sufficient to cover all O&M costs.

6. Benefits

Benefits of the project spanning a variety of transportation, environmental, and economic categories have been categorized according to the following PIDP evaluation criteria:

- Achieving Safety, Efficiency, or Reliability Improvements
- Supporting Economic Vitality at the Regional or National Level
- Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment
- Addressing Climate Change and Environmental Justice Impacts
- Advancing Equity and Opportunity for All

In addition to these benefits, the residual value of the Project investment expected to remain at the end of the 20-year analysis period is included in the numerator of the benefit cost calculation. The methodology used to estimate the residual value and benefits of the Project is described in the following pages.

Residual Value

Calculations of residual value for the docks and the grain elevator assume a design life of 50 years. Many of the current functioning grain elevators along the lower Mississippi River are over 50 years old. The first 18 years of the asset's life, between the first year of operations in 2025 and the final year of analysis in 2042 (inclusive) contribute towards depreciation of the asset. The value remaining at the end of the analysis period is equivalent to the 32 years of life remaining, or 64 percent the original cost discounted at 7 percent. Since land value does not depreciate, full value of the land acquisition needed for the Project was included in the residual analysis. The total remaining value of the Project at the end of the analysis period, discounted at 7 percent is $45 million (2020$).

Achieving Safety, Efficiency, and Reliability Improvements

Local Truck Transportation Efficiencies

The Project will be in a rural area of St. John Parish on the West Bank of the Mississippi River with an excellent mainline rail connection to the Union Pacific (UP) Railroad, as well as excellent highway connections. Fewer sites in the region have UP connections versus Canadian National (CN) Railway. The new facility will provide farmers who service to the UP and not the CN an ability to better access the export market.

Louisiana currently produces about 2 million tons of soybeans and 2 million tons of corn annually and these grains are generally shipped by truck as rail and barge are not efficient for distances less than 300 miles. The truck transportation benefits are based upon the Project facilitating the export of

approximately 1 million tons of grain annually[3]. The geographic location of the proposed facility would reduce the average truck trip by approximately 40 miles, or 1 hour, compared to existing export facilities.

Table 5 shows the annual transportation cost savings from inbound tonnage shipped by truck from central Louisiana farmers. This includes both a mileage-based savings for operation of the vehicle as well as a value of time savings for the truck operators. The total benefit of these local truck efficiencies over the analysis period, discounted to 7%, is $21.3 million (2020$)

Table 5: Inbound Grain Transportation Cost Savings

Value	Description
1,000,000	Truck annual inbound grain (MT)
25	Maximum Truck Load (MT) per Trip
40,000	Number of Impacted Trips
Value of operational savings (excludes labor)	
40	Round Trip Truck Miles Saved per Trip
$0.94	2020 Truck operating cost per mile (excludes driver value of time)
$1,504,000	***Annual Truck Operational Savings (2020$)***
Value of time savings	
1	Truck operator time saved per eliminated trip (hours)
$32.00	2020 Truck operator value of time
$1,280,000	***Annual Truck Operator Value of Savings (2020$)***

Source: Greenfield and USDOT, 2022 Benefit-Cost Analysis Guidance, Tables A-3 and A-5

Congestion Reduction (Trucks)

The Project will reduce truck transportation for grain grown in Louisiana and shipped by truck by an estimated 40 miles round trip as the Project is located closer to Louisiana production than other exporting grain elevators. By reducing the travel associated with truck trips, benefits would accrue not only for the direct operators of these trucks (quantified above) but also for general motorists as a result of the reduction of truck traffic on shared facilities. The travel time savings benefits for motorists were not quantified for inclusion in the BCA.

Reduced Roadway Fatalities and Crashes (Trucks)

There are safety benefits and safety costs avoided expected from the Project. The reduction in truck transportation will decrease the total VMT on Louisiana roadways resulting in fewer transportation-related accidents, serious injuries, and fatalities. The potential safety benefits associated with reduced truck travel were not quantified for the BCA.

[3] Equivalent to 25% of the current 4 million tons produced within Louisiana.

Lighting during Night Hours

Lighting will be provided for workers on the dock as well as on the ship loading arms and associated conveyor bridges such that the operation of loading the ship can continue through the night. Potential safety benefits associated with increased lighting were not quantified for the BCA.

Fewer Demurrage Charges for Delayed Loading

The USDA, Study of Rural Transportation Issues gives the typical fees associated with demurrage charges are approximately $200 per day per vessel[4]. These charges are incurred when barges are delayed more than 3 days due to grain elevator loading or unloading wait time. The Project would improve grain elevator loading speeds relative to existing facilities thereby reducing the instances of barge delays. This would reduce total demurrage fees paid as well as support reliability of the system. These benefits are not quantified in the BCA calculations.

Supporting Economic Vitality at the Regional or National Level

The export grain elevators adjacent to the lower Mississippi River export most of the grain exported from the U.S. The Greenfield elevator will be the first grain new grain elevator built in the region in 40 years. During this time the worldwide demand for grain has increased and is forecast to continue increasing. The Greenfield elevator will use the latest technology to efficiently load larger bulk carriers and lower the cost of shipping grain from the U.S. to overseas markets. The Project is expected to increase the worldwide market share for U.S. grain exports and is not expected to negatively impact other U.S. export grain elevators.

The Project will reduce the cost of exporting grain from the central United States to foreign markets generating greater demand for US grain market. The lower Mississippi River is the largest port for grain exports in the United States with the POSL handling over 50 percent of U.S. grain exports each year.[5] The Project will reduce shipping costs by allowing the use of larger bulk carriers, by reducing the lay time in the Mississippi River, and by more efficiently storing and transferring grain from trucks, railcars, and barges to the elevator and from the elevator to bulk carriers (over 40 percent faster vessel load times compared to an average elevator).

The last grain elevator built on the lower Mississippi River was completed in 1979. Grain exports from the U.S., primarily soybeans and corn, have increased during the past 40 years. However, during this timeframe grain exports from Brazil and Argentina have greatly increased and these nations have made large investments in transportation including port facilities and channel deepening.[6] To maintain a competitive position for U.S. agriculture, the Army Corps of Engineers has started deepening the lower Mississippi River from 45 feet to 50 feet in September 2020. This will allow larger, more efficient bulk

[4] Page 424 of USDA 'Study of Rural Transportation Issues'
[5] POSL website Facts-at-a Glance, and POSL Cargo Statistics and U.S.D.A. Grain export statistics
[6] U.S.D.A. Economic Research Service, "A Deeper Look into the U.S.D.A. Crop Baseline Projections to 2028, With a Focus on Trade," November 2019.

carriers to load U.S. grain for export. The docks design and construction by Greenfield Louisiana LLC and POSL specifically takes this deepening into account. The new docks will serve to efficiently load the larger bulk carriers that will transport grain to countries around the world. Additionally, the Project will be on a less congested section of the Mississippi River, which will facilitate more efficient barge transportation.

The U.S. Department of Agriculture (U.S.D.A.) conducts annual research on the transportation costs of grain from the U.S. Gulf Coast to Asia and from grain ports in Brazil and Argentina to Asia.[7] Although U.S. production and exports of grains, primarily soybeans and corn, have increased, the overall worldwide market share of the U.S. has declined because of the rapidly increasing grain exports from Brazil. Supporting the economic competitiveness benefits of investing in and constructing a newbuild grain export elevator in the POSL, the two quotes below are from the author of a 2019 U.S.D.A. commissioned study.[8]

> *'The U.S. is in direct competition with Brazil for agricultural export business, particularly for corn and soybeans—two of our largest exports, therefore, infrastructure investments can have a tremendous impact upon a farmer's profitability,' said Ken Eriksen, senior vice president of Agribusiness Intelligence's consulting business and lead author of the study.*
>
> *'Multinational corporations, including Chinese companies, are making significant investments in the Brazilian grain and soybean transportation and handling systems,' Erickson said. 'If not addressed, U.S. infrastructure problems will make U.S. grain and soybeans less competitive in global markets.'*

Two major Project benefits associated with Supporting Economic Vitality at the Regional or National Level would serve to increase the competitiveness of the US grain export market, as described below.

Support for Larger Export Vessels

Project improvements would support Post-Panamax or Neopanamax bulk carrier with 68,000 metric ton capacity rather than the 58,000 metric ton capacity Panamax bulk carrier used currently. Although shipping costs for these larger vessels are slightly higher, they are able to transport more grain per trip resulting in a significant savings per ton of exported materials, as shown in Table 6.

[7] U.S.D.A. Grain Transportation Report (2019)

[8] *U.S.D.A.'s Agricultural Marketing Service (2020) "Importance of Inland Waterways to U.S. Agriculture"*

Table 6: Export Vessel Costs per Metric Ton

Vessel Type	Panamax	Post-Panamax
Cargo Mean Quantity (Metric Tons)	58,000	68,000
Total Vessel Cost (2019)	2,604,308	2,729,583
Freight rate per Metric Ton:	$ 44.90	$ 40.14
Savings associated with larger vessels per Metric Ton		*$ 4.76*
2020 Value of savings		*$ 4.82*

Source: USDA, Update on United States–South America Ocean Grain Freight Spreads (Summary)

Geenfield estimates an additional $2.00 per ton savings as a result of other Project efficiencies, for a total savings of $6.82 per ton. Given the Project's annual export capacity of 11,089,000 MT, this results in an annual transportation cost savings of $75.7 million (2020$). Discounted at 7 percent, the total export benefit for the analysis period would be $580.6 million (2020$).

Faster Vessel Loading Speed

Table 7 shows the hours saved loading Post-Panamax or Neopanamax bulk carriers for the Project, compared to the average loading rate of existing lower Mississippi River grain elevators. The U.S.D.A. estimates 15 days of lay time for a bulk carrier loading and unloading during a round trip from the U.S. Gulf to China.[9]

Table 7: Neopanamax / Post-Panamax Bulk Carrier Loading Time Savings

Scenario	No Build Vessel (lower Mississippi River average)	Project Vessel
Loading Rate (Bushels/hour)	70,000	100,000
Loading Rate (Metric Tons/hour)	1,839	2,628
Annual hours for 11,089,000 MT Exports	6,030	4,220
Hours Saved Annually		1,810
In Port Cost per Hour (2020$)		$536.85
Annual Benefit (2020$)		$970,942

Source: U.S.D.A. Economic Research Service, "A Deeper Look into the U.S.D.A. Crop Baseline Projections to 2028, With a Focus on Trade," November 2019.

The conversion between bushels and Metric Tons is based upon and average corn and soybean volumes of 38.056 bushels per metric ton[10]. Over the analysis period, the faster loading times save a total of $7.5 million (2020$), present value discounted at 7%.

[9] U.S.D.A. Agricultural Marketing Service (2020)
[10] https://grains.org/markets-tools-data/tools/converting-grain-units/

Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment

The BCA calculations do not quantify any benefits associated with leveraging non-federal revenue. However, as described in Section 5: Operating and Maintenance Costs. All O&M costs associated with the Project would be supported through private investment. A robust maintenance program, not reliant on Federal budget support could reasonably extend the life of the Project beyond the 50 years assumed for this analysis, leading to increased benefits and residual value over the life of the project.

Addressing Climate Change and Environmental Justice Impacts

Emissions Reduction (Dust)

The Project will use the latest technology to reduce grain dust for the health and safety of workers and the neighboring community.

Based upon current design and the air permit application under preparation, the Project will reduce grain dust emissions ($PM_{2.5}$) by up to 80 percent from average existing grain elevator emissions. These benefits are quantified based upon scientific research of $PM_{2.5}$ emissions from operating grain elevators.

The tons of reduced emissions were monetized using the recommended value of emissions by year published in the USDOT's 2022 Benefit-Cost Analysis Guidance for discretionary Grant Programs, Table A-6. In total, the Project results in dust emissions cost of $64.4 million discounted at 7 percent

Emissions Reduction (Trucks)

The Project facilitates the movement of grain via rail and barge, which directly reduces the available alternative of truck transportation. In addition the location of the Project would reduce local truck travel by approximately 40 miles per trip, further reducing VMT for travel associated with inbound grains. Keeping trucks off the road has clear environmental benefits in the form of reduced congestion and climate-change causing emissions. These benefits were not quantified for the BCA.

Emissions Reduction (Export Vessels & Barges)

The Project accommodates larger capacity vessels for overseas grain export, allowing for a reduction in energy and emissions needed per unit of material shipped. In addition, improved elevator speeds could decrease the amount of idling and in-port time for both oversea vessels and river barges, further reducing energy and emissions associated with shipping similar levels of grain. These benefits were not quantified in the BCA.

Advancing Racial Equity and Reducing Barriers to Opportunity

Training

Greenfield Louisiana will invest in secondary and post-secondary education and training in neighboring communities and the region. These educational opportunities will be critical to the area in terms of its sustainable development. Additionally, Greenfield will host job fairs and in-house training programs on the St. John the Baptist West Bank to train job candidates and employees.

Within the census area, nearly 27 percent people live below the poverty line, and the median household income of $34,224 is only two-thirds of the amount of the rest of the state. Prior to the COVID-19

pandemic, the regions unemployment rate was over 5 percent, compared to ~3.9 percent nationally, with St. John Parish at ~5.5 percent and neighboring St. James Parish near 6 percent. Following the pandemic, the unemployment rate in the region reached over 17 percent in early 2021. Most of the jobs at this facility will be sourced locally, thus providing employment for underserved and minority populations. 58.4 percent of the population of St. John the Baptist Parish is African American, and minority groups make up a total of about two-thirds of the population. African Americans make up 48.8 percent of nearby St. James Parish. The training benefits are qualitative.

7. BCA Results

The Project provides benefits for a wide variety of parties, including but not limited to U.S. farmers, the food and agriculture supply chain, and the general public. It will also provide a source of non-federal revenue for the Port of South Louisiana. The Project benefits cover the key benefit categories: safety, state of good repair, economic competitiveness, and environmental sustainability.

Table 8 summarizes long term outcomes of the Project. Taken in total, the Project provides $652 million in benefits—from lowering transportation costs and emissions reductions—over the analysis period, (2023 – 2042) using a 7 percent discount rate. The net benefits of the Project are $276 million (2020$). The BCA results in a BCA ratio of **1.72** when discounted at a rate of 7 percent.

Table 8- Costs & Benefits Delivered by Long-Term Outcomes (2023- 2042; in thousands of 2020$)

BCA Summary	7% Discounted Project Totals
Project Cost Summary	
Docks Cost	$47,939
Grain Elevator Cost	$297,152
Land Purchase	$30,591
Total Project Capital Costs Present Value	**$375,681**
Operations and Maintenance Cost	$67,078
Project Benefits Summary	
Residual Value	
Residual Value (Docks)	$7,425
Residual Value (Grain Elevator)	$29,078
Residual Value (Property)	$8,459
Sub-Total: Residual Value	*$44,962*
Achieving Safety, Efficiency, or Reliability Improvements	
Inbound Grain Transportation Cost Savings	$21,364

Congestion Reduction (Trucks)	Qualitative
Reduced Roadway Fatalities and Crashes (Trucks)	Qualitative
Lighting during Night Hours	Qualitative
Fewer Demurage Charges for Delayed Loading	Qualitative
Sub-Total: Achieving Safety, Efficiency, or Reliability Improvements	*$21,364*
Supporting Economic Vitality at the Regional or National Level	
Export Savings Associated with Ability to use Larger Vessels	$580,663
Faster Vessel Loading Speeds	$7,451
Sub-Total Supporting Economic Vitality at the Regional or National Level	*$588,114*
Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment	
Private Sector Maintenance Responsibilities	Qualitative
Sub-Total: Leveraging Federal Funding to Attract Non-Federal Sources of Infrastructure Investment	*Not Quantified*
Environmental Sustainability	
Emissions Reduction (Dust)	$64,433
Emissions Reduction (Trucks)	Qualitative
Emission Reductions (Ship Exports)	Qualitative
Sub-Total: Environmental Sustainability	*$64,433*
Advancing Equity and Opportunity for All	
Training	Qualitative
Sub-Total: Advancing Equity and Opportunity for All	*Not Quantified*

Total Benefits Present Value	**$651,795**
Net Benefits Present Value	**$276,113**
Benefit-Cost Ratio	**1.73**

8. References

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