



MARYLAND PORT ADMINISTRATION  
MPA-MA Project [013-2004-02]



## BARGE TRANSLOAD FACILITY – SOYBEAN SITE LOCATION ANALYSIS



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## EXECUTIVE SUMMARY

Due to the closing of the Archer Daniels Midland (ADM) Corporation grain elevator at the Port of Baltimore in December 2002, the cost of shipping soybeans to processing facilities increased for Maryland farmers. This was particularly true for southern Maryland farmers. As a result of this negative impact on the cost of marketing soybeans, the Maryland General Assembly established the Maryland Task Force on the Marketing of Grain and Other Agricultural Products. The Task Force was established to investigate alternatives for getting soybeans to market more cost effectively than was then the case. The Task Force commissioned Martin Associates (Martin) to complete an economic analysis of the feasibility of reestablishing an export grain facility at the Port of Baltimore. Martin concluded that, due to market changes and the size of competing soybean markets and producers, it would not be cost effective to build a new grain elevator and grain-loading facility at the Port of Baltimore. The report identified local barge transload facilities as a feasible alternative with the potential for substantial cost savings in the transportation of the soybeans produced in southern Maryland. The Martin concept was for the transload facilities to be part of a multi-terminal grain transshipment system along the Chesapeake Bay. Building on the work done by Martin, and continuing to seek effective ways to assist southern Maryland soybean farmers, the Task Force recommended and requested that the Maryland Port Authority (MPA) evaluate potential barge transload sites, and develop recommendations to meet the soybean transporting needs of southern Maryland farmers and, more generally, of all Maryland soybean farmers.

Williams Associates-Engineers (WAE), in association with Martin, was directed by the MPA to use its transportation planning and engineering expertise to complete this evaluation and assessment. The following objectives were established for this study:

- Identify potential sites in areas previously identified by the Task Force
- Establish criteria for determining the operational feasibility of the sites
- Investigate sites and evaluate factors associated with establishing a barge transload facility at each site
- Estimate acquisition, development and operating costs
- Make recommendations on the appropriate locations for a new barge transload site

WAE evaluated more than twelve possible locations for a barge transload facility that would meet the needs of Maryland farmers, especially southern Maryland farmers. After careful vetting and site visits, WAE established a final list of four sites for detailed evaluations. This group of sites was then thoroughly investigated. During the investigations, WAE identified the following criteria as appropriate to an efficient modern truck-to-barge transshipment operation.

These criteria are based on discussions with soybean industry professionals as well as from observing the operation of Perdue, Inc.'s barge transload facility at Seaford, Delaware.

- Water depth of at least 12' MLW (mean low water);
- Acceptable zoning and allowable use environmentally;
- Parcel size of at least 3 acres to accommodate on-site vehicle flow;
- Sufficient bulkhead length to accommodate 1,500-ton barges (approximately 200 ft per barge);
- Close proximity to soybean production and to network trucking access (within a few miles).

Using an evaluation matrix with more than 15 comparison elements, WAE compared and ranked the four most promising sites:

- Breton Bay in St. Mary's County, MD
- Dann Marine Towing in Chesapeake City, MD
- North Locust Point in Baltimore, MD
- School of Seamanship in St. Mary's County, MD

The evaluation resulted in the following findings:

- The most Maryland grain that WAE anticipates being shipped by any of the final four candidate sites is 2.1 million bushels through a facility at the North Locust Point site. This is followed by 1.5 million bushels through the Dann Marine Towing site, and finally by 1.3 million bushels at Breton Bay and the School of Seamanship sites.
- To maximize the benefits of a barge transload facility, the proximity of the facility to the geographic network centroid of the farms served should be at a minimum. As the facility is moved from this central access location, the greater the negative impact on the potential benefit of reduced truck transportation costs for the southern Maryland soybean farmer. While this is an important factor, WAE found other factors to be important also.
- Maryland's superior roadway network ensures that there are efficient alternative access routes between most sites and the farmers to be served by them.
- Each of the four final sites needs a considerable amount of infrastructure. The associated capital cost affects the break-even point of transloaded soybeans required to ensure economic feasibility of the transload facility at each of these sites.
- Placing a new barge transload facility in Baltimore on the wharf adjacent to the former ADM facility would be advantageous for farmers in northern and western Maryland as it would make new shipment options available. It would also support southern Maryland

farmers. The potential transloaded soybean volume at a centrally located site in the state is much greater and includes the possibility of drawing soybeans from southern Pennsylvania. However, as northern and western Maryland farmers are served by a rail transload facility in Keymar, Maryland (northeast of Frederick), this element was somewhat discounted in determining rankings of the final four sites.

- The WAE study ranked the sites in the following order:
  1. North Locust Point,
  2. School of Seamanship,
  3. Breton Bay, and
  4. Dann Marine Towing.

WAE recommends that the first two sites be considered for barge transload facilities for the movement of soybeans. It should be noted that the Dan Marine Towing site has excellent operations potential and substantial unit transportation cost savings for the farmers it serves, but it has little utility for southern Maryland farmers.

## 1. INTRODUCTION

The collapse and eventual closing of the Archer Daniels Midland (ADM) grain elevator in Baltimore resulted in increased transportation costs for Maryland soybean farmers in accessing soybean markets. The loss of the grain elevator moved the collection and transload point of southern Maryland soybeans from the Port of Baltimore, Maryland, to the Port of Norfolk, Virginia, resulting in increased transportation costs (due to additional fuel, maintenance, and personnel costs). The Maryland Port Administration (MPA), through its contract with Martin Associates (Martin), tasked Williams Associates-Engineers (*WAE*) with assessing potential barge transload sites. The Maryland Task Force on the Marketing of Grain and Other Agricultural Products (Task Force) had identified general locations of sites that may provide farmers with competitive alternatives for transporting their soybean crops to market.

To determine the requirements of a new Maryland barge transload facility, WAE investigated Maryland's soybean production areas by county; collected information on harvest and trucking operations; and reviewed existing barge transload operations, including barge specifications and availability, as well as the layout of barge transload sites. In addressing farmers' needs, WAE estimated the primary draw areas for soybean in Maryland in terms of counties likely to be served by transload facilities at given locations. The report details the following:

- *Soybean Production and Transport Demand* – Includes data from the Task Force, United States Department of Agriculture (USDA), Maryland Department of Agriculture, and the Maryland Port Administration. WAE estimated soybean production and associated demand for transportation. This section includes regional soybean supply levels, harvesting and available transportation infrastructure.
- *Functional Requirements* – WAE determined the size and operational parameters appropriate for the transload sites. Considerations included barge docking needs, truck type and operations, on-site storage, grain inspection, operation and maintenance, and utility requirements.
- *Potential Sites* – Sites considered include those originally identified by the Task Force, as well as other sites identified by us as having the appropriate roadway and waterway transportation infrastructure to accommodate the desired end-use. Part of WAE's focus was on sites that provide flexibility for farmers in the southern parts of Maryland who have significantly increased transportation costs since the closure of ADM's Baltimore grain elevator. No focus was placed on serving areas of Maryland that already have existing transload operations, (e.g., Keymar in Carroll County).

- *Site Evaluation* – WAE’s site evaluation analysis is presented with the use of a comprehensive evaluation matrix that captures various elements WAE identified as important to the successful operation of a barge transload facility, and recognizes the intent of this study. WAE identified and considered land purchase or lease costs, on-site access improvement costs; and infrastructure costs including: wharf, storage, hopper, grain elevator, dump site, truck scale and inspection station/office building. WAE also estimated transportation cost savings for each site.
- *Recommendations* – From the site evaluation analysis in this section, WAE ranks the four (4) qualifying sites and the report discusses WAE’s recommendations with respect to a barge transload facility for soybean.



## 2. SOYBEAN PRODUCTION AND TRANSPORT DEMAND

The volume of soybeans to be processed at a transload facility is dependent on the areas served by the facility, the availability of soybeans, the regional accessibility of the facility and the return to the producer. WAE used historical soybean production data and transportation network data to evaluate demands and options for serving the demand for the movement of soybeans to market. The production data are presented below in the following sections:

- Target Counties,
- Regional Soybean Demand
- Soybean Harvest and Transport Options
- Soybean Transport Demand

The historical data used in the following was obtained from the USDA.

### A. Target Counties

The research on soybean production focused on those areas of Maryland not served by a nearby soybean transshipping facility. Though there are underserved areas in Pennsylvania, WAE focused its study on Maryland farmers and their needs. WAE identified the following Maryland counties to be within the area to be served by the proposed barge transload service (the target counties):

- |                   |              |
|-------------------|--------------|
| ▪ Anne Arundel    | ▪ St. Mary's |
| ▪ Calvert         | ▪ Baltimore  |
| ▪ Charles         | ▪ Cecil      |
| ▪ Prince George's | ▪ Harford    |

In addition, in its evaluation, WAE included volume data for the following counties in South Central Pennsylvania: Chester, Lancaster, and York. These counties are west of Philadelphia and north of Baltimore. Soybean farmers in these three Pennsylvania counties typically use truck to rail transload facilities at Keymar near Frederick, Maryland; at Boston Street, in Baltimore, Maryland; and near Gettysburg, Pennsylvania, to get their grain to market.<sup>1</sup>

### B. Regional Soybean Demand

Historical data on soybean production for the Maryland and Pennsylvania counties were obtained from the U.S. Department of Agriculture for the previous four years (see Table A-1 in the Appendix). From 2000 to 2001, the Target Counties' soybean volume fell from 3,241,200 to 3,051,000 bushels, an average of 6% (though Charles and St. Mary's Counties increased

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<sup>1</sup> From Mr. Brad Powers, Consultant to Perdue, a major purchaser of soybeans in the region.

production). In 2002, a severe drought reduced the Target Counties' soybean volumes from 3,051,000 to 1,906,000 bushels, a decline of 38%. In 2003, soybean production increased to 2,667,100 bushels, an increase of 40%. Due to this volatility and unpredictability, the USDA does not offer mid- or long-term county-specific forecasts. Therefore, WAE used the USDA-reported mean soybean volume produced from 2000 through 2003 to estimate planning soybean demand. These volumes are presented in *Table 2-1* below.

Table 2-1  
**ANNUAL AVERAGE SOYBEAN PRODUCTION**  
 (2000 to 2003)

REGION	COUNTY	SOYBEAN PRODUCTION (Bushels)
SOUTHERN MARYLAND	Anne Arundel	166,925
	Calvert	110,400
	Charles	327,375
	Prince George's	140,300
	St Mary's	506,150
	<i>Subtotal</i>	<i>1,251,150</i>
NORTHERN MARYLAND	Baltimore	440,700
	Cecil	626,575
	Harford	397,900
	<i>Subtotal</i>	<i>1,465,175</i>
PENNSYLVANIA	Chester	796,075
	Lancaster	1,200,175
	York	1,484,625
	<i>Subtotal</i>	<i>3,480,875</i>

As will be seen in Section 4, WAE evaluated sites in three areas:

- Northern Maryland – North of Baltimore County
- Central Maryland – Northern Anne Arundel County or within Beltway (I-695)
- Southern Maryland – South of US-50

Transload sites in each of these areas are likely to be used by soybean producers from the target counties in various combinations, and the analysis reflects this in the transshipment demand estimate. Projected soybean demands for these areas are shown in *Table 2-2*.

TABLE 2-2  
**SOYBEAN PRODUCTION BY TARGET COUNTY (TC) FOR EACH  
 POTENTIAL BARGE TRANSLOAD SITE**

September 20, 2004  
 Williams Associates-Engineers

Originating County	AVERAGE SOYBEAN VOLUME FOR PROCESSING AT POTENTIAL BARGE TRANSLOAD SITES (BUSHEL) <sup>1</sup>		
	Northern MD Site <sup>2</sup>	Central MD Site <sup>3</sup>	Southern MD Site <sup>4</sup>
<b>Northern MD Counties</b>			
Baltimore	440,700	440,700	
Cecil	626,575		
Harford	397,900	397,900	
Subtotal:	1,465,175	838,600	0
<b>Southern MD Counties</b>			
Anne Arundel		166,925	166,925
Calvert		110,400	110,400
Charles		327,375	327,375
Prince George's		140,300	140,300
St. Mary's		506,150	506,150
Subtotal:	0	1,251,150	1,251,150
TC TOTAL:	1,465,175	2,089,750	1,251,150
<b>PA Counties</b>			
Chester	796,075	796,075	
Lancaster	1,200,175	1,200,175	
York	1,484,625	1,484,625	
TOTAL:	3,480,875	3,480,875	0
<b>TOTAL PROJECTED SOYBEAN TRANSLOAD DEMAND (FROM TC)</b>			
Maryland Only:	1,465,000	2,090,000	1,251,000
Maryland and Pennsylvania:	4,946,000	5,571,000	1,251,000

Source: Developed by Williams Associates-Engineers from  
 United States Department of Agriculture from *SoybeanHistoricCountyEst-USDA.XLS*

<sup>1</sup> Average of soybean production from 2000 through 2003

<sup>2</sup> North of Baltimore County

<sup>3</sup> Within Baltimore Beltway (MD-695) or northern Anne Arundel County

<sup>4</sup> South of US-50

### **C. Soybean Harvest and Transport Options**

Soybeans are planted in the summer with harvesting starting in late October and continuing through December<sup>2</sup>. Some of the soybean may be sold upon harvesting and, if necessary, some may be stored for later transport and sale. The decision to store soybean by the farmer is dependent on several factors, including the availability of storage and transportation, and on the current and anticipated price available to the farmer for soybeans. The soybean harvest is sold from October through March into early April.

To transport the soybeans, the farmer may have several options including:

- Ownership of trucks
  - Hired truck
  - Local grain storage
  - Transload facility
- Transport Destination
  - Local grain elevator
  - Crushing plant
  - At farm
- Selling Location
  - Truck operator
  - Transload facility
  - Self-owned
- Local grain elevator
  - Local grain elevator
  - Crushing plant

Therefore, the farmer may own trucks or may lease trucks to haul the harvest. The harvest may be hauled to a transload facility or to a local county grain elevator. The grain elevator operators purchase and consolidate soybeans from many farms. The soybean is then transported to its sale destination: a transload facility or a crushing plant. Another option may be to sell the harvest to a truck operator who then transports the soybeans to a transload facility and resells them. It is noted that, in southern Maryland, trucks with a capacity of 300 to 400 bushels are typically used; and in central Maryland and the Eastern Shore, the typical truck has a capacity of 800 to 850 bushels.

While the frequency and volume of truck traffic accessing a typical transload facility will vary, during the peak harvest period of approximately two weeks there may be 80 to 100 trucks daily at existing transload facilities in the region.

### **D. Soybean Transport Demand**

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<sup>2</sup> From Mr. Brad Powers, Consultant to Perdue; and from USDA-provided spreadsheet.

<sup>4</sup> Pennsylvania counties considered are Chester, Lancaster and York.

As previously discussed, the potential volume of soybeans expected to be handled at a facility depends on the location of the site relative to the soybean production areas of the counties it will serve. For example, a centrally located barge transload facility, close to or in Baltimore City, would receive soybeans from north-central Maryland counties and from Pennsylvania counties directly north of the Maryland-Pennsylvania border. Such a facility would also serve southern Maryland counties because of its central location. As such, the total potential volume was estimated at approximately 6.2 million bushels of soybeans.

A *southern* Maryland barge transload facility would have a more limited draw area, namely the southern Maryland counties, handling approximately 1.3 million bushels of soybean annually. Such a facility may best serve the southern Maryland farmers. Conversely, a *northern* Maryland barge transload facility would serve north and north-central Maryland counties and the Pennsylvania counties previously identified, but not the southern Maryland counties. WAE projects that a northern barge transload facility would receive approximately 5.0 million bushels of soybeans annually. A breakdown by county for each of these areas is contained in Appendix A-1.

### 3. SITE REQUIREMENTS

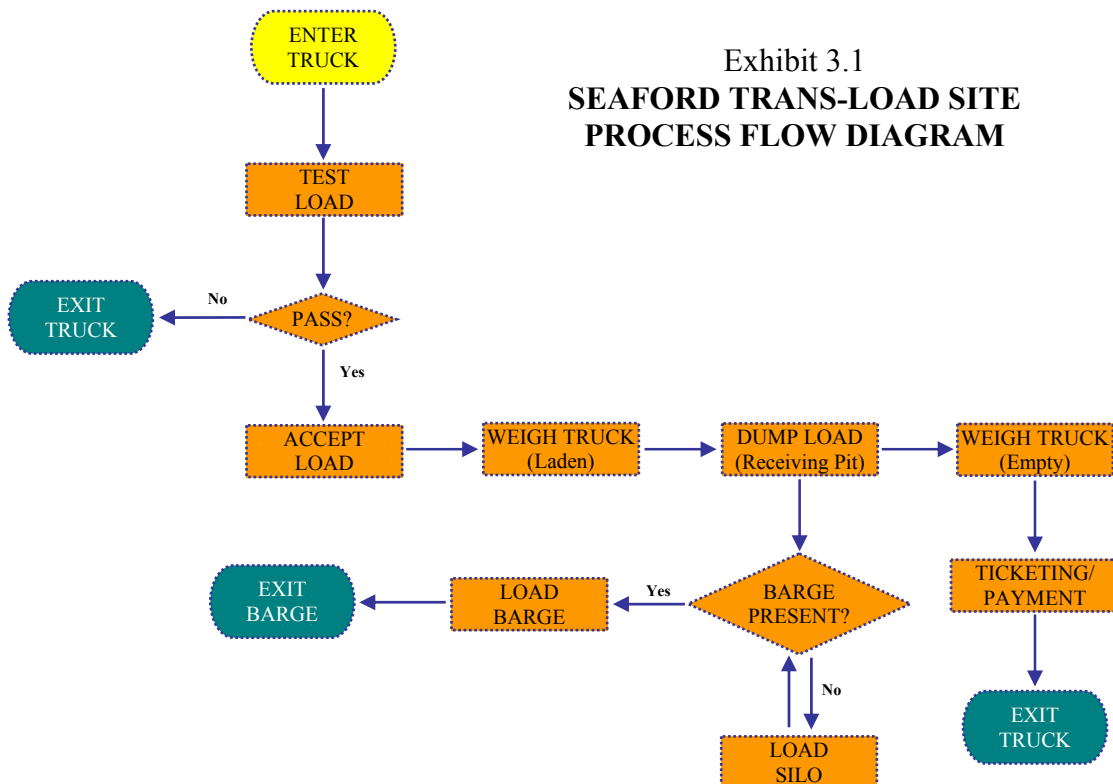
WAE developed functional requirements through observation and analysis, combined these with a functional evaluation, to establish space and configuration requirements. These requirements are presented along with a barge transload facility concept. This development includes:

- Transload Process – Site Visit to Seaford, Delaware
- Property and Facility Requirements
- Conceptual Barge Transload Facility

In the following sections, WAE uses these requirements to identify sites that would meet the anticipated needs for the facility.

#### A. Transload Process – Site Visit to Seaford, Delaware

WAE observed the layout and operations at a Perdue grain and soybean barge transload facility in Seaford, Delaware. The site covers approximately 3 acres and has a silo storage capacity of approximately 1 million bushels. Operating staff reported that this facility required one to three people to operate. The Seaford transload facility can operate 24 hours per day during peak activity periods. Using on-site observations, discussions with facility managers, and literature reviews, WAE developed a flow diagram of the transload process. The diagram (Exhibit 3.1) illustrates the process from the time trucks enter the facility to the time a barge is loaded.



## B. Property and Facility Requirements

WAE developed two sets of functional requirements – property requirements and facility requirements – to evaluate potential barge transload sites. The following property requirements criteria were identified:

- **Water Depth** – 1,500-ton barges require a minimum of 12-ft. MLW when fully loaded. The potential barge transload site must have this minimum water depth available at or within a reasonable distance from the wharf (to minimize dredging or to provide pier access).
- **Acceptable Zoning** – Property must be zoned Marine Commercial (MC) for use as a barge transload site. Potential barge transload sites that are not zoned MC will not necessarily be removed from consideration. However, there should not be any major hindrance to zoning change (e.g., such as the site being identified as an environmentally sensitive area).
- **Sufficient Property Size** – The three- acre minimum size requirement includes the area necessary for infrastructure and truck traffic flow through the site. More space would be required for staging trucks during peak harvest season, which lasts for approximately two weeks.
- **Accessible by Trucks and Barges** – The property must be accessible by primary and/or secondary roads without impeding the traffic in already densely populated areas or towns. Also, the site must provide sufficient space to accommodate docking one barge and having another moored at the same time.

The property requirements and the facilities requirements are listed in *Table 3.1*. The property requirements are minimum criteria that must be satisfied for a site to be further considered for a barge transload facility. Sites that fail to satisfy any one property requirement were removed from further consideration.

The Facilities Requirements are the elements that research and observation indicate are necessary for the operation of a barge transload facility. For the facilities requirements, the elements identified do not have to exist currently. However, there must be the opportunity to satisfy any deficiencies in order to accommodate a transload facility. WAE’s assessment included the costs of improvements to sites to meet the Facilities Requirements.



Table 3-1  
**BARGE TRANSLOAD FACILITY  
 PROPERTY AND FACILITY REQUIREMENTS CRITERIA**

PROPERTY REQUIREMENTS	FACILITY REQUIREMENTS
<ul style="list-style-type: none"> <li>▪ Transload acceptable use by current zoning laws.</li> <li>▪ Transload acceptable use by Army Corps of Engineers for river channel encroachment and environmental sensitivity of areas.</li> <li>▪ 12-foot minimum mean low water depth (sufficient water depth for fully loaded and empty barges, 1,500-ton or 4,000-ton).</li> <li>▪ 3 acres minimum (sufficient for processing 80 to 100 trucks daily plus required equipment and buildings).</li> <li>▪ Proximity to interstate or primary-access roads and local access for trucks.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Inspection station/office area</li> <li>▪ Sampling probe</li> <li>▪ Truck scale(s)</li> <li>▪ Receiving pit (hopper)</li> <li>▪ Soybean conveyor system (on-site transport)</li> <li>▪ Two (2) storage towers (site minimum)</li> <li>▪ Bulkhead</li> <li>▪ Two (2) mooring dolphins</li> </ul>

**C. Conceptual Barge Transload Facility**

Using the functional requirements WAE developed, a conceptual barge transload facility layout was created. The conceptual layout is similar to the transload facility WAE observed at Seaford, Delaware. This conceptual layout is shown in *Exhibit 3.2*. WAE has included photos from the Seaford facility to illustrate some of the components of the facility.

The conceptual facility includes an office and inspection station, testing probe, truck scale, hopper, two grain silos, overhead conveyor system, winch and bulkhead. The vehicle flow at the facility accommodates a one-way system for accessing the scales, inspection station, and off-load area.

To size appropriately the elements of the conceptual layout, WAE estimated the required capacities for the following facility parameters:

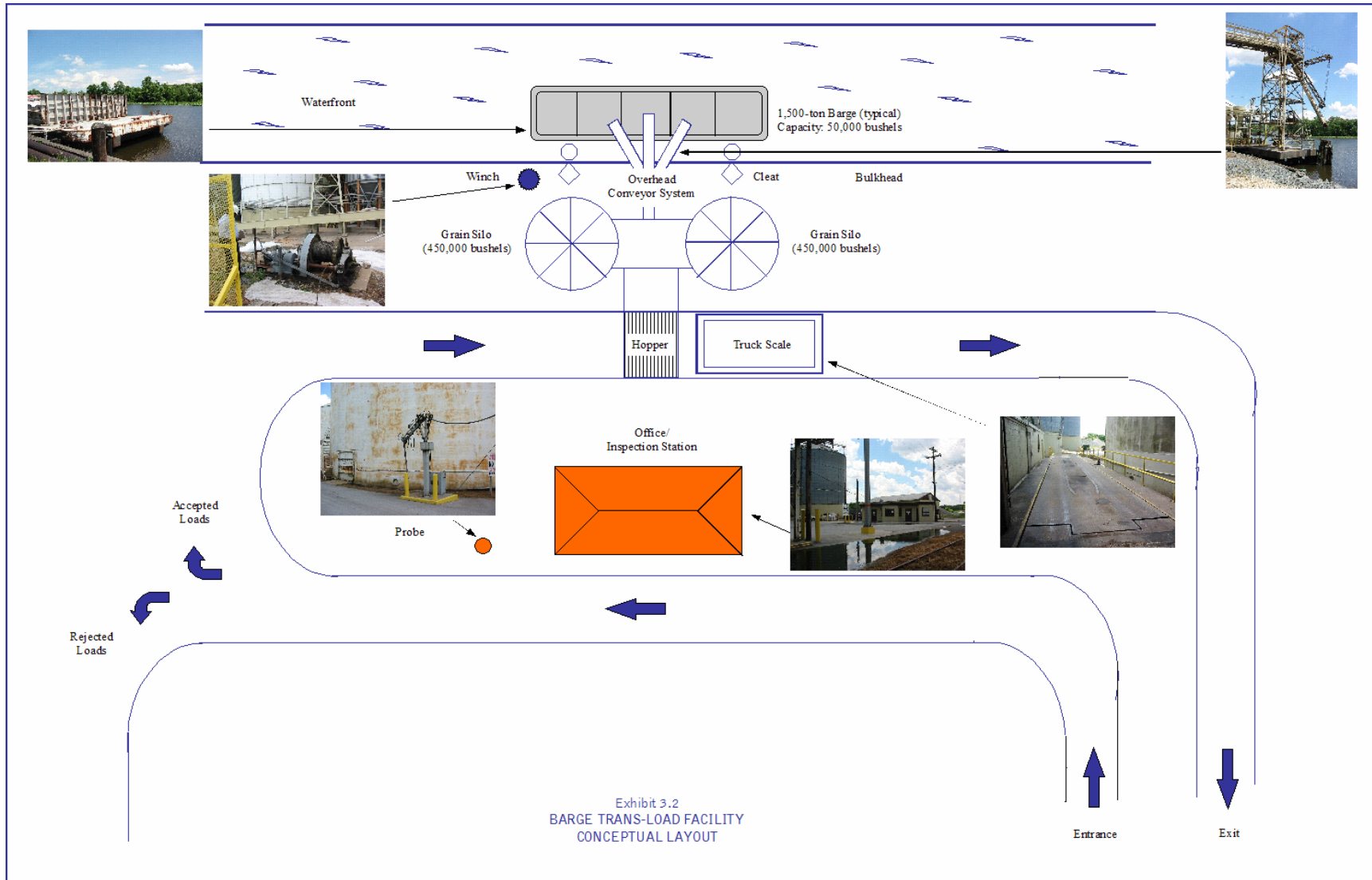
- Storage of soybeans
- Queuing and parking of trucks
- Bulkhead to accommodate barges

The conceptual layout includes the assumption that silos will be provided for moisture-content-based storage. As a result, the conceptual layout includes a minimum of two (2) silos. However,

WAE notes that it is not a requirement that soybeans be separated by moisture content. The requirement for moisture-content-based storage is a result of a price penalty for high moisture content soybean. By mixing dryer soybeans with higher moisture content soybean an acceptable moisture content can be achieved for the soybeans. As this mixing process can also be done at an end destination, such as the crushing plant, capital costs for a new transload facility can be reduced to include only a single silo. However, this may have some negative effect on the price paid to the transload facility operator for the soybeans and consequently reduce the amount the farmer is paid as well.

To estimate the storage capacity needed for a barge transload facility, WAE used barge availability on the Chesapeake Bay. Based on current operations at the Seaford site and discussions with barge operators, WAE estimates that one to two barges would be available each week. During peak harvest periods, the site must have sufficient storage capacity to accommodate a continuous truck-flow through the facility, without a barge on-site. A standard 1,500-ton barge, as is commonly used for inland waterway grain shipment, holds 50,000 bushels (or about 60 tractor-trailer loads) of soybeans, and during peak season WAE assumes 50% of the annual harvest is delivered to the transload site. WAE uses the simplifying assumptions that the peak period starts two weeks into the harvesting period (i.e., the peak harvest is from mid-November to the end of November) and that barge transload soybean demand is uniformly distributed around the peak period for a total of 11 weeks (in addition to the two peak weeks). WAE estimates, therefore, that the facility must store up to 760,000 bushels. This reflects an operation with one (1) barge serving the facility through the end of the peak period then, with a reduced system demand in the off peak period and the resulting availability of additional barges, two (2) barges per week serving the facility until all soybean is transported.

To ensure sufficient surge capacity (the uneven arrival of soybeans during the peak period), the conceptual layout includes two silos with a capacity of 450,000 bushels each.



#### 4. POTENTIAL SITES

Once WAE identified the site requirements for the site-selection process, WAE proceeded to identify sites that would serve the Maryland soybean production regions. In doing so, WAE took into account that two (2) rail transload sites were already in operation in Keymar (Carroll County) and at a Boston Street facility in Baltimore City.

*Exhibit 4.1* shows the general location of sites that were identified as having potential for a new barge transload facility. It also shows the location of the two existing Maryland truck-to-rail transload facilities, Keymar and Boston Street. Each of the potential sites was assessed with respect to the four (4) basic property requirements criteria shown in *Table 4.1*. This process constituted the initial vetting of sites that reduced the list to four (4) qualifying sites. Sites that did not meet one or more of the property requirements criteria were removed from further consideration. There were also several sites identified after the evaluation was well underway. These sites have been listed but have not been comprehensively evaluated (see *Appendix A2* for a synopsis).

As a result of the preliminary site investigation, the results of which are summarized in *Table 4.1*, four (4) sites were identified for more detailed analyses. Also, as word of the study spread, other sites were suggested by interested individuals. Resources were not available to investigate thoroughly every possible transload site. However, WAE confirmed that a representative number of sites were evaluated and that the evaluated sites have the potential of meeting the barge transload needs of the southern Maryland soybean farmer.

Exhibit 4.1  
**SOYBEAN TRANSLOAD SITES**

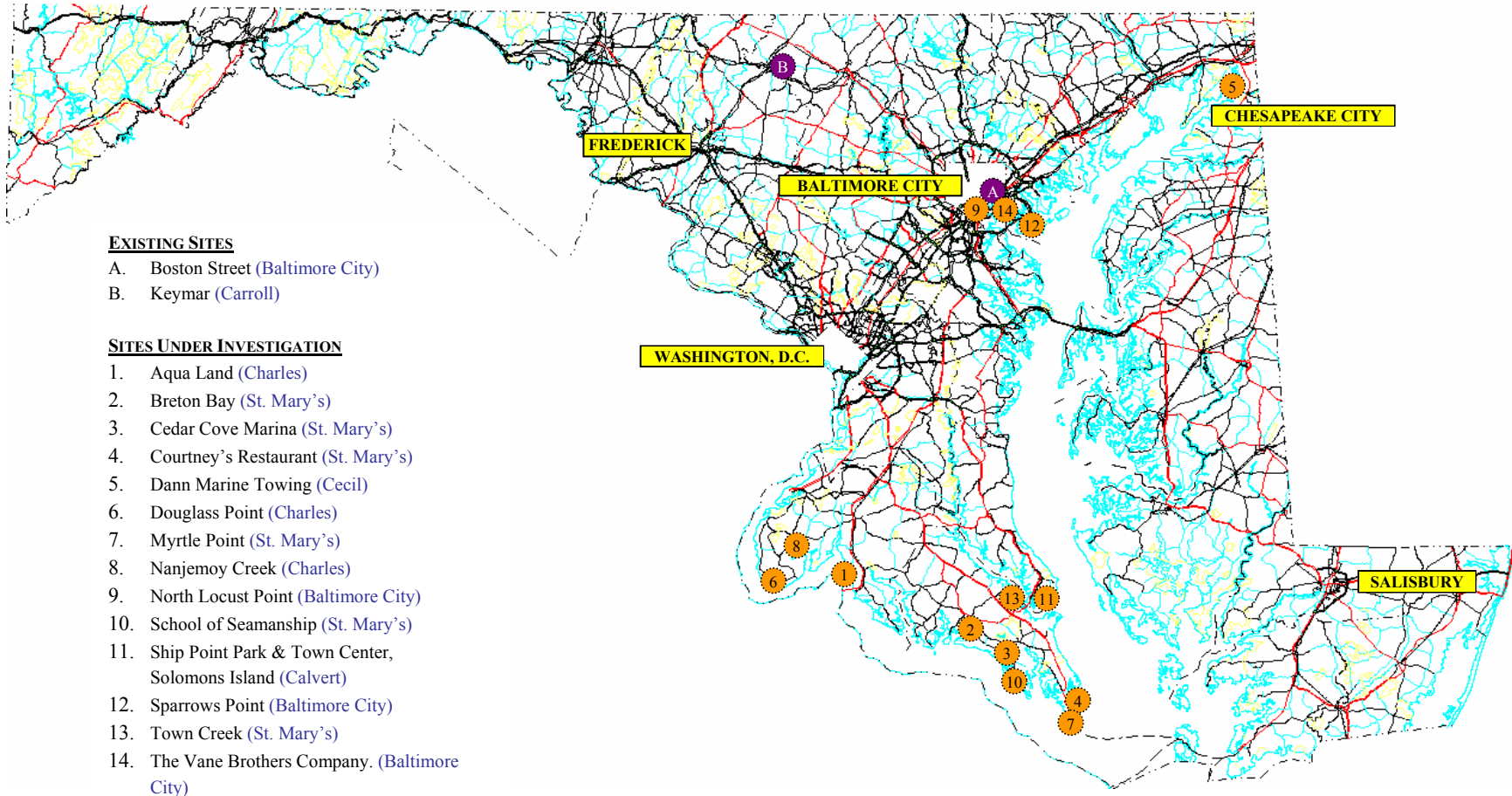


Table 4.1  
**PROPERTY REQUIREMENTS**  
 (Sites Listed Alphabetically)

SITES INVESTIGATED <sup>1</sup>	PROPERTY REQUIREMENTS <sup>2</sup>			
	WATER DEPTH (≥ 12-ft. MLW)	ACCEPTABLE ZONING?	PROPERTY SIZE (≥ 3 Acres)	ACCESSIBLE? (Trucks & Barges)
1. AQUA LAND <sup>3</sup>	88' @ 500' out	Yes	30	Yes
2. BRETON BAY	11'-12' @ 200' out	Yes	10.5	Yes
3. CEDAR COVE MARINA	5'	Yes	> 3	Yes
4. COURTNEY'S RESTAURANT	5'-10' @ 150' out	Yes	3.5	No
5. DANN MARINE TOWING	> 12'	Yes	100	Yes
6. DOUGLASS POINT	--	No (ES) <sup>4</sup>	--	--
7. MYRTLE POINT <sup>3</sup>	> 12'	--	> 3	--
8. NANJEMOY CREEK	--	No (ES) <sup>4</sup>	--	--
9. NORTH LOCUST POINT	> 12'	Yes	2-3 Acres; common area	Yes
10. SCHOOL OF SEAMANSHIP	9'-12' at wharf	Yes	> 3	Yes
11. SHIP POINT PARK	> 12'	--	--	No
TOWN CENTER MARINA	--	Yes	--	No
12. SPARROWS POINT <sup>3</sup>	> 12'	Yes	3-4	--
13. TOWN CREEK MARINA	14' @ 250' out	Yes	1.5	No
14. THE VANE BROTHER'S COMPANY <sup>3</sup>	> 12'	Yes	--	Yes

1 Sites investigated are listed alphabetically and correspond to the sites identified on *Exhibit 4.1*.

2 Property requirements are discussed in *Section 3*.

3 These sites were identified too late in the process for in-depth evaluation.

4 ES – environmentally sensitive site

**Note:** Shaded cells correspond to property requirements that were not satisfied for the various sites investigated. Sites having shaded entries were not investigated further and were subsequently removed from consideration for the barge transload facility.

## 5. SITE EVALUATION

Following a review of the potential sites, WAE identified four (4) sites that appear qualified to serve as barge transload facilities. These sites were then evaluated using a variety of parameters included in a comprehensive evaluation matrix. Included in the evaluation matrix is a cost analysis that estimates capital costs, operating and maintenance costs, and transportation savings associated with each potential transload facility. These elements are reviewed in the following sections:

- Site Descriptions
- Evaluation Matrix
- Cost Analysis

This section concludes with a ranking of the four qualifying sites.

### A. Site Descriptions

The following brief synopses describe the qualifying sites. Information on the other sites included in the preliminary investigation is included in the Appendix A-2.

#### BRETON BAY

This 10.5-acre site is located close to Leonardtown on the Potomac River. This property meets all the requirements, and is accessed by MD-243, MD-5, and MD-244 and is listed for sale for \$1.7 million. Adjacent to the property is an existing barge operation (Maryland Rock). The site, zoned Marine Commercial, has a house, guest house and two piers, one of which is a commercial floating pier for mooring pleasure boats, approximately 260' long. The water depth at the end of the floating pier is stated by the owners to be 14' MLW. The land is fairly level with a slope to the water. WAE observed an existing barge operation in the area. However, some zoning or environmental concerns exist. The Breton Bay area is currently the focus of considerable high-end residential development and is among the top 25% of Maryland waterfront sites for water quality. Hence, it is cited by the Department of Natural Resources (DNR) as being "considered a priority protection watershed." While noted for high water quality, the area was also identified as having elevated bacteria thus restricting shellfish activity and making it a "priority restoration" site as well as a protection site.

#### STRENGTH

1. Very accessible for barge and truck traffic.
2. Location would reduce transportation costs for southern Maryland farmers.

#### WEAKNESS

1. Significant purchase price (estimated at \$1.7 million) greatly increases capital costs.
2. Additional barge and truck traffic in this area may raise environmental concerns

Exhibit 5.1  
**BRETON BAY SITE PHOTOS**



Photo 5.2a  
Existing Adjacent Barge  
Operation



Photo 5.1b  
Waterfront w/ Wooden Pier



Photo 5.1c  
Existing Structure



Photo 5.1d  
Property Driveway



Photo 5.1e  
Driveway from Main Road



Photo 5.1f  
Secondary Roadway to/from MD-244



DANN MARINE TOWING

This is a privately owned marina along the Chesapeake & Delaware Canal in Chesapeake City, Maryland, operating tugboats out of this site. The marina is situated on 100 acres that is zoned marine-commercial adjacent to 500 acres of farmland also owned by Dann Marine Towing. Currently, access to the site is provided via a two-lane road from MD-213 through a residential neighborhood. Alternate access could be provided from Elk Forest Road through the farmland to the marina. The site has several buildings situated on it: an office, a maintenance building, and one vacant building. There is approximately 500' of well-maintained bulkhead (enough to dock at least two 1,500-ton barges) and sufficient water depth as a 12,000-ton barge was observed moored on the day of WAE's visit. According to the owners, the canal could not be used as a staging area for additional barges due to Army Corps of Engineers restrictions. The owners of Dann Marine are interested in being owner operators of a barge transload operation and have experience in coordinating backhaul possibilities for the barges and tugs used. Cecil County is very interested in developing this site as a barge transload facility.

STRENGTH

1. The owners of Dann Marine are experienced in tug and barge operations, and are interested in being owner/operators of the barge transload site. Their expertise would noticeably reduce the time to get such a site up and running.

WEAKNESS

1. Location in Cecil County would increase transportation costs for southern Maryland farmers.
2. Installing a mile-long access road on the property would significantly increase capital costs.

Exhibit 5.2  
**DANN MARINE TOWING SITE PHOTOS**



Photo 5.2a  
Access Driveway



Photo 5.2b  
Inlet Waterfront (w/Barge)



Photo 5.2c  
Bulkhead – View to Canal



Photo 5.2d  
Bulkhead – View from Canal



Photo 5.2e  
Canal Bulkhead–View to Bay



Photo 5.2f  
Canal – View to Delaware  
River

NORTH LOCUST POINT

This two to three acre site along the northwest branch of the Patapsco River in Baltimore, Maryland is within the Maryland Port Administration's North Locust Point Marine Terminal. Zoned- marine commercial, the site is located between Piers 7 and 8 which are adjacent to the former ADM grain elevator. Locust Point has some of the site requirements for a barge transload site already in place, including an existing, marginal wharf, a maintenance building, and a truck- staging area that is shared with other tenants at the terminal. Access to the site is provided via I-95 and the water depth at the wharf is approximately 20 feet. There is sufficient room at the wharf to dock a 1,500- ton barge with room in the harbor to stage another. This property would be leased by the owner to the operator.

STRENGTH

1. Centrally located to reduce transportation costs to southern Maryland farmers as well as to other farmers in the state.
2. Well-suited for barge traffic as this site is in the marine terminal.

WEAKNESS

1. The common truck-staging area may not be available when needed causing truck traffic to back up on access roads.
2. The single gate access to the property would need to be expanded during the harvest season to accommodate 60 to 80 trucks per day.

Exhibit 5.3  
**NORTH LOCUST POINT SITE PHOTOS**



Photo 5.3a  
Pier 7 Access Driveway



Photo 5.3b  
Existing Waterfront Building



Photo 5.3c  
Waterfront Access Road



Photo 5.3d  
Bulkhead – View to Pier 7



Photo 5.3e  
Bulkhead – View to Pier 8

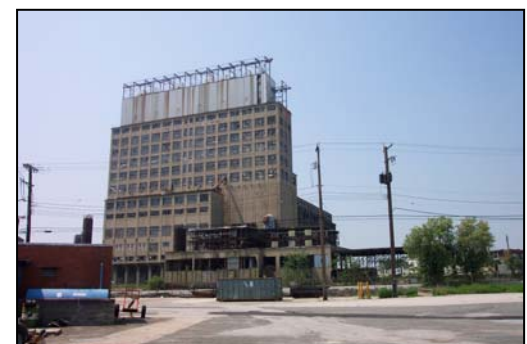


Photo 5.3f  
Egress Driveway – ADM  
Elevator.

SEAFARERS HARRY LUNDEBERG SCHOOL OF SEAMANSHIP (SHLSS)

Owned by the Seafarers International Union (a part of the AFL-CIO), this school occupies a 60 - acre site located on Piney Point in southern St. Mary's County and is accessed by MD-249. The acreage required for a barge transload site is available for lease to an operator. Zoned agricultural, a feature of the property is the operational farm that shares the site with the school. Because of the farm, much of the infrastructure required for a barge transload site is already in place including: an office/inspection building, truck scale, grain elevator, 2 storage silos and a hopper dump and 500 bushel/hour continuous grain dryer. Most of these would require some repair or refurbishment. Approximately ¼ mile from these facilities is 300' of waterfront with a wharf that would also require some repair and possibly the addition of truss pilings. The water depth is 9'-12' MLW at the wharf. While the water is not adjacent to the storage facilities, the owner of the property is amenable to allowing the soybeans to be conveyed over pasture to a barge. Significant improvements to the on-site access road are needed, including widening to allow for two way truck traffic and shoring up of existing cattle crossings. An existing convalescent center is adjacent to the barge-loading operation. Its proximity should be addressed as part of detailed preparation for use of this site.

STRENGTH

1. Much of the infrastructure is in place, reducing capital costs.
2. Well-located to reduce transportation costs for southern Maryland farmers.

WEAKNESS

1. Significant on-site access improvements to a mile-long road would greatly increase capital costs.
2. Creating a barge transload facility from two non-contiguous parcels necessitates an extremely long grain conveyor system that would also significantly increase capital costs.

Exhibit 5.4  
**SCHOOL OF SEAMANSHIP SITE PHOTOS**



Photo 5.4a  
Waterfront with View of Inlet



Photo 5.4b  
Wooden Bulkhead



Photo 5.4c  
View to Silos 1/4-mile away



Photo 5.4d  
Scale and Scale House



Photo 5.4e  
Scale - On Approach to Pit



Photo 5.4f  
Egress Driveway/Silos

## **B. Evaluation Matrix**

The evaluation matrix used to rank the qualifying sites for the barge transload facility, utilizes several evaluation factors. The selection of these factors is based on the preliminary property requirements outlined earlier, as well as on the cost to acquire and operate the site. The matrix, Table 5.1, includes overall costs and benefits derived from the use of one proposed facility versus another. The matrix lists the qualifying sites, the evaluation factors used for their assessment, and ranks the sites. The site layout section identifies the size, configuration, and required facility improvements. The truck access section identifies existing roadway network access and the distance to it, as well as required on-site access road changes. The barge access section addresses in-place wharf and moorage as well as existing water depth.

In the operations balance section, benefits to southern Maryland farmers are addressed, and the projected volume of soybeans that may be transloaded at each site is noted. The categories in the other/miscellaneous section include adjacent land uses, local support, state support, and potential issues or show stoppers that could prevent a site from becoming a new barge transload facility.

The cost section gives the capital costs to develop a site and the estimated operation and maintenance costs. Estimated cost savings to be realized by farmers who would use a given site are included.

Key assumptions for the matrix are included in Appendix A3.

**EVALUATION MATRIX**  
September 20, 2004  
Williams Associates-Engineers

		DESCRIPTION: (Ownership):	POTENTIAL SITES			
			1	2	3	4
			North Locust Point (MPA)	Dann Marine Towing (Dann Brothers)	Breton Bay	School of Seamanship
<b>EVALUATION FACTORS</b>	SITE LAYOUT	Size (Acres)	2.5 acres + approximately 1 acre common truck area	Over 3 acres (Up to 600 acres available)	10.5 acres	Over 3 acres (part of 60-acre property)
		Configuration/Operation	Rectangular; allows one-way flow of trucks through unloading process per concept sketch	Rectangular; allows one-way flow of trucks through unloading process per concept sketch	Square; allows one-way flow of trucks through unloading process	Two (2) parcels about 1/4-mile apart; allows one-way flow of trucks through unloading process
		Facility Improvements Needed (including equipment and structures)	Add: truck scale, inspection station, 2 grain silos, hopper, grain elevator and conveyor system (~100 feet)	Add: truck scale, inspection station, 2 grain silos, hopper, grain elevator and conveyor system (~1500 feet)	Add: truck scale, 2 grain silos, hopper, grain elevator and conveyor system (~1000 feet)	Improve scales (add inspection station), renovate hopper & grain elevator, add conveyor system (~1500 feet); improve bulkhead
	TRUCK ACCESS	Network Access	I-95	MD-213	MD-244	MD-249
		Distance from Network	1.5 miles	1.1 miles	0.8 miles	0.2 miles
		On-site Access Changes Required	<b>No major changes required.</b> May relocate access road to improve on-site circulation. May reserve sections of common truck areas for high-activity periods	<b>New access road required</b> (approximately 1.0 mile of 2-lane truck access road). Access through farmland; (on-site road would allow on road staging of trucks).	<b>Re-grade and pave on-site road</b> (approximately 0.125 mile of 2-lane access road). Existing grade appears too severe for truck operations	<b>Pave and widen access and on-site road</b> (approximately 0.75 mile) and <b>improve two cattle crossings.</b> On-site road would allow on-road staging of trucks
	BARGE ACCESS	Moorage Minimum (1,500 ton-barge); or other as noted	Yes	No (Except in C&D Canal with permission of Army Corps of Engineers)	Yes	Requires buoy or other anchor point
		Bulkhead (equivalent 1,500-ton barges shown in brackets)	400' (1 barge)	500' (2 barges)	None	300' (1 barge)
		Depth at Bulkhead (or at given distance to deep water: ≥ 12' MLW required)	20'	20'	14' (250 linear feet out)	12'
	OPERATIONS BALANCE	May benefit Southern MD Farmers.	Yes	No	Yes	Yes
		Average Harvest Volume for 2000-2003 (bushels)	2.1 million <sup>1</sup> [5.6 million] <sup>2</sup>	1.5 million <sup>3</sup> [4.9 million] <sup>2</sup>	1.3 million <sup>4</sup>	1.3 million <sup>4</sup>
	OTHER/ MISC.	Adjacent Uses	Industrial/maritime	Agricultural, residential	Commercial: Maryland Rock, Residential	Residential
		Local Support	Neutral	Strong from Cecil County and Dann Brothers (identified and promoted site)	Strong - zoned commercial, county development manager identified and promoted site	Strong - Zoned agricultural, county development manager identified and promoted site
		State Support	Strong from MPA (MPA-owned facility previously used for grain trans-shipment)	Neutral	Neutral	Neutral
		Potential Show Stoppers	None	Environmental permitting	Environmental permitting Purchase of property	Environmental permitting Maintaining competitive Staffing costs
	COSTS (Annual with Maryland Soybean only)	Purchase/Lease Cost (Annual)	\$110,000 <sup>5</sup>	\$0	\$1.7M Principal \$142,000/YR	\$110,000 <sup>5</sup>
		Facility Improvements (equipment; structures, etc.)	\$2.5M principal \$160,000/yr.	\$2.5M principal \$160,000/yr.	\$2.5M principal \$160,000/yr.	\$2M principal \$130,000/yr.
		Waterside Improvements <sup>6</sup>	\$1M	\$0	\$1.5M	\$1.5M
		Access Improvements	\$0	\$760,000 (one mile, 2-lane road)	\$190,000 (1/8 mile, 2-lane road <sup>7</sup> )	\$570,000 (3/4 mile, 2-lane road)
		Total Capital Cost (TCC) (per bushel) <sup>8</sup>	\$0.16	\$0.14	\$0.29	\$0.29
		Operation & Maintenance (O&M) (per bushel) <sup>8,9</sup>	\$0.06	\$0.08	\$0.10	\$0.10
		Sum of TCC and O&M	\$0.22	\$0.22	\$0.39	\$0.38
		Transportation Saving (TS) (per bushel) <sup>10</sup>	\$0.49	\$0.51	\$0.31	\$0.34
		Estimated Net Benefit (per bushel) <sup>11</sup>	\$0.27	\$0.29	(\$0.08)	(\$0.04)
	<b>Total Development Cost</b>	<b>\$3.5M</b>	<b>\$3.3M</b>	<b>\$5.9M</b>	<b>\$4.1M</b>	
	<b>RANKING<sup>12</sup></b>		<b>1</b>	<b>4</b>	<b>3</b>	<b>2</b>

<sup>1</sup> Maryland counties included: Baltimore, Harford, Anne Arundel, Calvert, Charles, Prince George's and St. Mary's.

<sup>2</sup> With 3 Pennsylvania counties (Chester, Lancaster and York) included.

<sup>3</sup> Maryland counties included: Baltimore, Cecil, and Harford.

<sup>4</sup> Maryland counties included: Anne Arundel, Calvert, Charles, Prince George's and St. Mary's.

<sup>5</sup> Assumed lease requirement of MPA and Seaman's School. Assumed to include dockage, wharfage, and lease fees.

<sup>6</sup> Mooring Dolphins. \$500,000/each

<sup>7</sup> Includes grading.

<sup>8</sup> Assuming a 5%, 30-year bond, the total cost was amortized into annual payments. Annual payments were then divided by the projected volume.

<sup>9</sup> Annual operations and maintenance cost estimated to be \$120,000 for each site. Six month operation assumed with two people at \$30,000 each and \$60,000 in Electrical/Water/Maintenance/Other.

<sup>10</sup> Savings compared to transporting soybean directly to Chesapeake, Virginia.

<sup>11</sup> Estimated net benefit combines TCC and O&M costs with transportation savings.

<sup>12</sup> Ranking reflect proximity and benefits for southern Maryland farmers, as well as estimated net benefits per bushel of soybean transported.



### C. Cost Analysis

As this is a planning evaluation, the study included cost differentials between qualifying sites. In making a final selection, a comprehensive analysis of whether the state, a public-private partnership, or a private enterprise should construct and operate a grain transload facility should be conducted. The ideal location for such a facility will be finalized using an evaluation process that considers various factors including:

- Economic Feasibility – will the investment and operating expenses return sufficient revenues and non-monetary benefits to justify all the dollar and social costs?
- Technical Feasibility – can the sea and land infrastructure safely accommodate the facility and the transportation of grain to it?
- Political Factors - is there sufficient institutional support for the project?
- Environmental Factors – are there non-quantifiable environmental costs that cannot be justified?
- Financial Feasibility – even if the project is worthwhile economically, are there sufficient financial resources, (i.e., funds) to build and operate it?

Several sites are available where both environmental and political factors appear to support locating a new soybean barge transload facility. WAE's basic methodology estimated the costs of shipping the soybean production of the appropriate combination of target counties to each of the four qualifying sites and then compare these costs to determine which site produces the overall lowest transportation costs.

The typical distance from the centroid of the primary agriculture areas of each of the target counties to each alternative transload site was measured. Perdue Farms, Inc. provided the cost to truck a bushel of soybeans for distances from 1 mile to 250 miles. These costs are not wholly linear. In other words, it does not necessarily cost 10 times as much to ship soybeans 100 miles versus 10 miles. The Perdue costs are based on average contract prices the company actually pays independent carriers to haul soybeans. Therefore the costs were computed by multiplying the quantity of soybeans produced in each county by the cost per bushel to ship it the computed distance to each of the alternative sites. Cost calculations are reported in Appendix A4.

#### Summary

The analysis indicates that the North Locust Point site results in the lowest overall transportation costs; with the Dann Marine site second. Of the sites investigated, Maryland farmers would receive the greatest reduction in soybean transportation costs by locating a soybean barge transload facility at North Locust Point. The Dann Marine site does not provide any benefits for southern Maryland farmers.

## 6. RECOMMENDATIONS

The analysis of the options available to Maryland farmers for transporting their soybeans to market made clear that the two most economically feasible options are the site at North Locust Point and the Dann Marine site. However, as WAE noted in Section 2, WAE focused its study on Maryland farmers and their needs. WAE also noted that farmers north of the Baltimore area have available a new transload facility at Keymar that does not appear to provide any benefit to southern Maryland farmers. Similarly, the Dann Marine site does not offer any benefit to the southern Maryland farmer. WAE therefore considered the other three sites superior in meeting the needs of the southern Maryland farmer. Using these criteria, WAE notes that the site at North Locust Point remains competitive as it can be expected to attract southern Maryland farmers, just as the ADM facility did when it was in place. The analysis of planted acreage and soybean yield indicates that southern Maryland farmers have retrenched and reduced acres planted, and they are producing less soybean per planted acre than they were prior to the 2002 draught (unlike other subsets of soybean producers in the area). Given this, WAE found that locating a facility in the general area of the southern counties may be advantageous in stimulating additional soybean production. This assumes that the transportation cost savings and the political support that such an investment would represent sufficiently shifts the cost equation to result in increased soybean planting and production in the Target Counties.

Therefore, even though WAE finds that the North Locust Point site is the best site given current circumstances, WAE recommends that one of the two southern Maryland sites also be considered for a barge transload facility. A location in the south counties may have a stimulative effect on increasing the acreage of soybean planted in the Target Counties, and result in increased economic feasibility for southern Maryland sites. WAE notes however that these benefits are also likely to result from a return to using North Locust Point as a transload point for soybeans. In concluding, WAE makes the following observations:

- North Locust Point would best serve Maryland farmers, including the southern Maryland farmers. The most Maryland soybeans that WAE anticipated being shipped by any of the final four candidate sites is 2.1 million bushels through a facility at the North Locust Point site. This is followed by 1.5 million bushels through the Dann Marine site, and finally by 1.3 million bushels at Breton Bay and the School of Seamanship sites. The North Locust Point site has the additional benefit of providing a shorter truck haul for Baltimore County soybean farmers, while the sites further south do not have this flexibility. North Locust Point also has direct rail service providing the flexibility for rail transload operations in the future.
- As the cost analysis shows, the greatest economic benefit for a facility that serves southern Maryland farmers is with the North Locust Point site.

- To maximize the benefits of a barge transload facility, the proximity of the facility to the geographic network centroid of the farms served should be at a minimum. As the location is moved from this central access location, the smaller the potential reduction of truck transportation cost for the southern Maryland soybean farmer. As a barge transload facility must be served by water, it is likely to be located at some distance from the centroid of where farming is occurring. In this case, the two southern Maryland sites are on the southern periphery and the North Locust Point site is on the northern periphery of the southern Maryland farmers' farming areas. Thus, while the effect is not the same between the southern Maryland sites and the North Locust Point sites, they are sufficiently similar that the relative distances from the centroid of the southern Maryland soybean farming area to these two areas are not likely to affect a choice between them. Therefore, while distance from the farming centroid is an important factor, WAE found that other factors were more important in ranking the sites.
- The southern Maryland sites are an opportunity for peak period operation that may supplement a facility at North Locust Point, if the demand for a North Locust Point facility results in excessive peak period stresses. Structuring such an operation to be economically feasible may be difficult, but it is possible that increasing demand will make this a viable alternative to be pursued in the future.
- The southern Maryland soybean farming area is served by a roadway network that includes MD-2, MD-4, MD-5, MD-235, and MD-301. This extensive network serves both north-south traffic and east-west traffic throughout the area. The multiplicity of arterial type roads such as these ensures that there are efficient alternative access routes between most sites and the farmers to be served by them.
- WAE notes that each of the four final sites needs a considerable amount of infrastructure. The analysis has necessarily been preliminary in nature. WAE recommends that a detailed financial feasibility analysis be completed for the top two sites as part of the process of implementation. This is necessary as the associated capital costs affect the breakeven point of transloaded soybeans required to ensure economic feasibility of the transload facility at each of these sites.
- Placing a new barge transload facility in Baltimore at the North Locust Point site would be advantageous for farmers in northern and western Maryland as it would make new shipment options available and would support southern Maryland farmers. The potential transloaded soybean volume at a centrally located site in the state is even greater and includes the possibility of drawing soybeans from southern PA. A primary focus for the study included maximizing the benefits to southern Maryland farmers within the larger constraints of

developing a feasible facility. Additional soybean volume from Pennsylvania would make a transload facility more economically feasible with all else being equal. However, as northern and western Maryland farmers are already served by a rail transload facility in Keymar, MD (northeast of Frederick), this element was discounted by not including Pennsylvania soybean volumes in determining rankings of the final four sites in the rankings. This does not mean that a particular site would not attract Pennsylvania soybeans; it means that this demand is not considered as part of the determination of whether the facility will meet the needs of the southern Maryland soybean farmer.

- WAE's study ranked the sites in the following order:
  1. North Locust Point
  2. School of Seamanship
  3. Breton Bay, and
  4. Dann Marine Towing

WAE recommends that the first two sites be considered for barge transload facilities for the movement of soybeans. WAE notes that the Dann Marine Towing site has excellent operations potential and substantial unit transportation cost savings for the farmers it serves, but it has little utility for southern Maryland farmers.

## APPENDIX

- A1. Historical Soybean Production Data
- A2. Information on Other Sites
- A3. Key Assumptions of the Evaluation Matrix
- A4. Cost Analysis Example and Tables

## A1. Historical Soybean Production Data

TABLE A-1  
**HISTORICAL SOYBEAN PRODUCTION DATA BY  
 TARGET COUNTIES (TC) 2000-2003**  
 September 20, 2004  
 Williams Associates-Engineers

County	SOY BEAN PRODUCTION (BUSHELS TO NEAREST THOUSAND)				
	YEAR				Annual Average
	2000	2001	2002	2003	
<b>Northern MD Counties</b>					
Baltimore	546,000	411,000	368,900	436,900	440,700
Cecil	802,000	584,000	446,300	674,000	626,575
Harford	394,000	374,000	344,600	479,000	397,900
Subtotal:	1,742,000	1,369,000	1,159,800	1,589,900	1,465,175
<b>Southern MD Counties</b>					
Anne Arundel	223,000	213,000	109,000	122,700	166,925
Calvert	167,000	136,000	43,200	95,400	110,400
Charles	389,000	446,000	187,500	287,000	327,375
Prince George's	100,200	218,000	177,000	66,000	140,300
St. Mary's	620,000	669,000	229,500	506,100	506,150
Subtotal:	1,499,200	1,682,000	746,200	1,077,200	1,251,150
TC TOTAL:	3,241,200	3,051,000	1,906,000	2,667,100	2,716,325
<b>PA Counties</b>					
Chester	1,143,900	968,600	441,600	630,200	796,075
Lancaster	1,474,400	1,257,500	836,000	1,232,800	1,200,175
York	1,712,100	1,370,800	1,150,200	1,705,400	1,484,625
PA TOTAL:	4,330,400	3,596,900	2,427,800	3,568,400	3,480,875

County	SOYBEAN ACREAGE HARVESTED				
	YEAR				Annual Average
	2000	2001	2002	2003	
<b>Northern MD Counties</b>					
Baltimore	13,400	11,900	11,900	10,300	11,875
Cecil	19,800	17,700	17,500	17,100	18,025
Harford	9,600	10,400	10,900	11,700	10,650
Subtotal:	42,800	40,000	40,300	39,100	40,550
<b>Southern MD Counties</b>					
Anne Arundel	5,500	5,400	5,200	3,800	4,975
Calvert	2,900	3,400	2,700	2,500	2,875
Charles	9,200	11,900	12,500	10,100	10,925
Prince George's	5,100	4,900	4,000	3,900	4,475
St. Mary's	15,500	17,600	15,300	15,400	15,950
Subtotal:	38,200	43,200	39,700	35,700	39,200
TC TOTAL:	81,000	83,200	80,000	74,800	79,750
<b>PA Counties</b>					
Chester	22,900	22,500	14,200	13,700	18,325
Lancaster	32,800	32,500	27,800	26,800	29,975
York	40,800	42,300	42,600	41,500	41,800
PA TOTAL:	96,500	97,300	84,600	82,000	90,100

Source: Data - United States Department of Agriculture from SoybeanHistoricCountyEst-USDA.XLS

TABLE A-1 (Cont.)  
**HISTORICAL SOYBEAN PRODUCTION DATA BY  
 TARGET COUNTIES (TC) 2000-2003**

Page 2 of 2  
 September 20, 2004  
 Williams Associates-Engineers

County	SOYBEAN YIELD (BUSHELS PER ACRE)				
	YEAR				Annual Average
	2000	2001	2002	2003	
<b>TARGET COUNTIES</b>					
Northern MD Counties					
Baltimore	40.7	34.5	31.0	42.4	37.1
Cecil	40.5	33.0	25.5	39.4	34.8
Harford	41.0	36.0	31.6	40.9	37.4
Northern Average:	40.7	34.2	28.8	40.7	36.1
Southern MD Counties					
Anne Arundel	40.5	39.4	21.0	32.3	33.6
Calvert	57.6	40.0	16.0	38.2	38.4
Charles	42.3	37.5	15.0	28.4	30.0
Prince George's	19.6	44.5	44.3	16.9	31.4
St. Mary's	40.0	38.0	15.0	32.9	31.7
Southern Average:	39.2	38.9	18.8	30.2	31.9
TC AVERAGE:	40.0	36.7	23.8	35.7	34.1
PA Counties					
Chester	50.0	43.0	31.1	46.0	43.4
Lancaster	45.0	38.7	30.1	46.0	40.0
York	42.0	32.4	27.0	41.1	35.5
PA AVERAGE:	44.9	37.0	28.7	43.5	38.6

Source: Developed by Williams Associates-Engineers from  
 United States Department of Agriculture from *SoybeanHistoricCountyEst-USDA.XLS*

## A2. Information on Other Sites

***Cedar Cove Marina, St. Mary's County*** – This full-service marina on 15.93 acres of land is located on the headwaters of Herring Creek in St. Mary's County and is zoned commercial. The site is accessed by local roads MD-244 and MD-249 and is relatively close to the energy off-loading facilities at Piney Point. Pictures observed from the Marina's Web page indicate reasonably extensive open space and a large dock area with 66 slips on three docks and 536' bulkhead frontage. Some buildings of possible interest on the property are: 2,640 square-foot marina office, ship store and equipped mechanic shop, houseboat with 3 offices and storage, a 25-ton marine travellift, a 528-square-foot garage, and a fuel dock with 1,500 gallon above-ground storage capacity. The property is half-cleared with unlimited dry storage. The MLW depth is 5' with much of Herring Creek being equally shallow; therefore this site was eliminated from consideration.

***Douglass Point, Charles County*** – This area, located off MD-224 on the Potomac River, has commercial sites owned by PEPCO and an existing gravel mining site. The entire area is subject to relatively intensive environmental preservation efforts and, therefore, was eliminated from consideration.

***Nanjemoy Creek, Charles County*** – *There were no specific parcels identified on this body of water, so all the land along the creek was evaluated in general.* The nearest roads to Nanjemoy Creek are MD-425 and MD-6. The creek is adjacent to Blossom Point proving grounds, a 1,600-acre Army weapons testing site at the mouth of Nanjemoy Creek. This military site is also used by the Naval Research Laboratory for its satellite control network. According to their web site, a 2,000-foot radius buffer zone is maintained to prevent interference with sensitive satellite antenna radio receivers. This area is also the subject of strong environmental protection efforts. For these reasons, this site was eliminated from consideration.

***Solomons Island, Calvert County*** – Both Town Center Marina and Ship Point Business Park are on the Chesapeake Bay at the mouth of the Patuxent River. Road access to Solomons Island is via MD-2/MD-4. The approach to Town Center Marina is through the town of Solomons, a highly developed recreational area full of buildings and homes with limited room to maneuver or stage truck traffic. The approach to Ship Point Business Park, across the harbor from Solomons, is also through a developed residential area. Anticipated truck traffic of 80-100 trucks/day during the peak season is likely to cause gridlock in both the town and the residential area. Because of this, both of these sites were eliminated from consideration.



Town Center Marina – This site offers a full service boatyard with a 50-ton lift, ships’ store, fuel, 104 resident slips plus transient berths and dry stack storage. The water depth at the dock is less than 12 feet.

Ship Point Business Park – Ship Point Park is a research facility located on 9 to 10 acres directly across from the town of Solomons at the mouth of the harbor. The existing concrete dock there is in good shape. Relatively near the Cove Point energy off-loading facility, the area has recently acquired the headquarters facility for Chesapeake Plastics Manufacturing; hence commercial use of the site may be possible. The water depth in Solomons Harbor is 14 feet.

***Town Creek Marina*** – This marina is an irregularly shaped site with approximately 1.5 acres of useable land located on the Patuxent River just west of the Solomons Island Bridge in St. Mary’s County. The marina is not currently in operation and the existing structures, building and piers have fallen into disrepair. The owner plans to replace the existing unsound dock with one that will extend into 14.8’ of water, at least 200 feet out from the shore. The approach to the site is through a small residential area on a two-lane road with no shoulders. Additionally, the road cuts through the site separating the facility from the piers. As there is not sufficient acreage on this site, it was eliminated from consideration.

***Other Potential Sites*** – As previously noted, as word of the study spread, additional potential soybean transload sites were suggested. Though resources did not permit these sites to be thoroughly investigated, they should be considered before a final decision on a barge transload site is made. The following four (4) additional sites – Aqua Land, Myrtle Point, Sparrow’s Point and the Vane Brothers Company – were identified.

Aqua Land, Charles County – This marina is on a 30-acre parcel adjacent to the Governor Harry Nice Memorial Bridge, which connects Maryland and Virginia across the Potomac River. It has approximately 1,200’ of waterfront. The site is located on the north side of the bridge and is accessed by MD-301 and the access road for the bridge toll facility administration building. According to published navigation charts, there is 88’ MLW within 500’ of the shoreline. A brief site visit indicated that there are several existing buildings and piers, but no wharf or paving. The property meets the minimum criteria for water depth, property size, and is more centrally located in southern Maryland than some other sites.

Myrtle Point, St. Mary’s County – This 192- acre site with at least 1 mile of waterfront was identified by St. Mary’s Department of Economic and Community Development. It was recently purchased by the county with Program Open Space funds and was slated for

development as a county park. The site is located along the Patuxent River west of the Solomon's Island Bridge and is reported to have the deepest water in St. Mary's County. Access to the site is provided via MD-4 and Patuxent Boulevard, which has portions unpaved. According to the current tax maps, it appears to pass through a low-density residential area. Currently, the site is totally undeveloped with no useable infrastructure in place possibly making this site the most costly to develop.

Sparrows Point, Baltimore City – This 3-acre site is currently owned by International Steel Group (ISG) and houses two transload operations – one barge and one rail. There is a 250' to 300' concrete wharf in good condition with 14' MLW. Access to the site is somewhat difficult as the road is winding but it is available for truck staging. In addition, the rail line goes to the barge transload site but, as the rail bed is deteriorated, repairs would be needed before use of rail. There is a 60,000 square foot warehouse with a loading dock in good condition on the property. ISG was previously interested in leasing this space and may still be.

The Vane Brothers Company, Baltimore City – This site is located on the Patapsco River next to Seagirt Marine Terminal on Baltimore Harbor just east of the northern entrance to the Fort McHenry tunnel. This was the site of an export grain elevator. Much of the required infrastructure remains in place, including a truck scale, 2.5 million bushels of silo storage, a deep-water wharf, rail siding, and excellent truck access. However, its location on the north side of the Patapsco River significantly increases the transportation costs for southern Maryland farmers.

### **A3. Key Assumptions for the Evaluation Matrix**

- The purchase cost listed for Breton Bay is the actual listed price. This cost was then amortized into annual payments assuming a 5% interest rate with a 30- year bond.
- The estimated costs under North Locust Point and School of Seamanship are for lease and/or dockage and wharfage fees. These fees came from the Maryland Port Administration and are being used as an estimate of costs at the School of Seamanship.
- The facility improvements numbers come from the estimates in the Martin Report with concurrence from Ben Vanderwende and Michael Phillips of Perdue. The infrastructure costs at the School of Seamanship are lower since that site already has a significant amount of the infrastructure in place. These costs were then amortized into annual payments assuming a 5% interest rate with a 30-year bond.
- Waterside improvements include additions or repairs to create the necessary wharf. A wharf of 300 feet minimum length capable of supporting the docking of 1,500-ton barges is assumed. Ben Vanderwende provided an estimate of \$1,500 per linear foot to install such a wharf. The cost to repair or rebuild such a wharf was considered the same for estimating purposes. The cost of adding mooring dolphins as necessary are included here. Each site would need two mooring dolphins except for Dann Marine Towing. Dan Marine's wharf has adequate length to accommodate two barges. Curtis Lipsi of TEC-ICON estimated that installation of each dolphin would cost \$500,000, and would accommodate one 1500-ton barge.
- Access improvements refers to the costs of improvements necessary to make on-site access roads acceptable. James Saklas of the Federal Highway Administration provided an estimate of \$380,000 per mile per lane for a road to accommodate heavy laden truck traffic.
- Total development cost (TDC) is the sum of the above costs on an amortized, annual basis. This figure is then divided by the potential volume of soybeans for that site to obtain a TDC per bushel.
- The estimated operation and maintenance (O&M) costs assume \$120,000 per year for each site. This annual cost was obtained from the Martin report. This cost is then divided by the potential volume of soybeans for that site to get the O&M cost per bushel.
- Transportation savings (TS) were calculated using the following methodology. Using the increased transportation costs incurred by various Maryland counties due to the closing of

the ADM grain facility (as calculated in the Martin report), a weighted average increased cost for each area is determined, for southern Maryland alone and southern Maryland combined with north central Maryland. By placing a barge transload site in Baltimore, the farmers would recoup this cost minus the cost of using the barge transload facility estimated to be \$0.35/bushel by Martin. This gives the potential savings (PS). The transportation savings could be higher or lower depending on whether the new barge transload site is closer to or farther from the relevant counties than the Baltimore site. The TS is obtained by combining the PS with estimated cost savings of the candidate site.

#### A4. Cost Analysis Example and Tables

To highlight the comparative advantage of one site to the other, WAE computed the savings of shipping the soybean to one site versus other sites.

Table A4.1 presents the results. The rows contain the data for each Maryland county with sub-totals for two regions in Maryland, and for each state, Maryland and Pennsylvania<sup>4</sup>. Next to the column with the county name is the annual average (2000 through 2003) production of soybeans. The next set of four columns presents the transportation cost of shipping the annual average (2000 through 2003) soybeans to the indicated proposed transload site. For example, the cost to Baltimore County farmers to ship their soybeans to Breton Bay is approximately \$117,500.

The next four groupings, of four columns each, present the relative advantage of one site to the others. In the first group, the dollars shown indicate the savings of shipping the grain to the North Locust Point site relative to the other three sites (Dann Marine, Breton Bay, and Seafarer's School of Seamanship).

For example, farmers in Cecil County are closer to Dann Marine in Cecil County than they are to North Locust Point in Baltimore, and therefore there would be a negative "savings" (i.e., increased costs) of approximately \$65,300 for them to ship to North Locust Point versus shipping to Dann Marine. However, Cecil County is much farther from Breton Bay in St Mary's County than it is from Baltimore. Consequently there are savings of \$90,100 for Cecil County farmers to ship to Baltimore versus south to St. Mary's County.

The remaining three groupings of columns present the relative advantage of shipping to the indicated sites versus shipping to Dann Marine, Breton Bay and Seafarer's School of Seamanship, respectively.