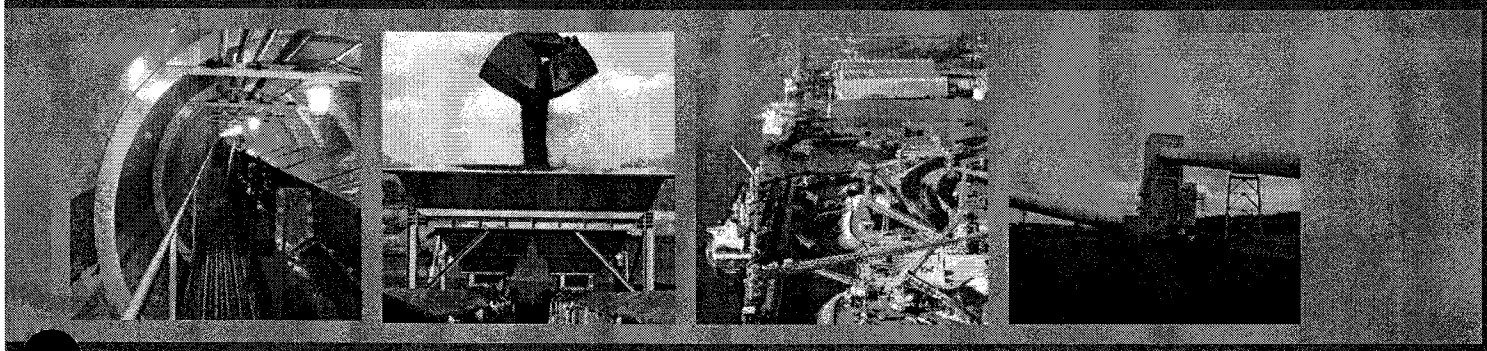
DMJM HARRIS | AECOM

Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras

Final Report - Public Version



April 2008

Submitted to:
Empresa Nacional Portuaria
U.S. Trade and Development Agency

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This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government. The opinions, findings, conclusions, or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report.

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April 2008

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Note: The task numbers used in the terms of reference (Annex I) have been maintained in this report.

[1] Appendix C contains confidential and security information to be handled on a need to know basis and is not included in the public version of the report.

[2] Appendix D contains confidential and security information to be considered sensitive and is not included in the public version of the report.

1 COLLECTION OF DATA AND REVIEW OF CARGO FORECASTS

1.0 Introduction

The Port of Cortés is the premier Caribbean port for the Central American region, handling the majority of trade from Honduras, and substantial cargo volumes from Nicaragua, Guatemala and El Salvador bound for the eastern US and European markets. In recent years, the Port of Cortés has seen substantial growth in cargo volumes.

Although the Port of Cortés is controlled by the Empresa Nacional Portuaria of Honduras (ENP), operations are a mix of port personnel and private stevedores. ENP recently entered into a contract with an American-owned firm for implementation and operation of an aggregate export facility, but the Port lacks the infrastructure and space for an import or unloading facility. The export berth operations are operating at 65% of capacity, which is generally the range resulting in delays in ship operations. Therefore, there is insufficient capacity remaining for other operations, such as imports of dry bulk cargo. Dry bulk imports have been growing rapidly.

ENP currently controls the import of the dry bulk commodities at the Port. The dry bulk cargo is unloaded by private stevedoring companies, using ships' gear, portable hoppers and numerous trucks hired by the importer. The private stevedoring companies use their own equipment, including buckets and hoppers, and ships' gear. Hauling the cargo away by truck creates serious congestion and numerous delays, with significant costs for vessel laytime. However, open or closed storage for dry bulk commodities is not available, so that direct unloading to trucks is unavoidable.

The construction of a dry bulk unloading terminal is a top priority for ENP. The feasibility study is needed to establish realistic performance criteria for the terminal operation, with contractual arrangements that are in the best interest of Honduras.

Empresa Nacional Portuaria of Honduras (ENP) has requested preparation of guidelines and criteria to establish working relationships with private groups interested in developing the Dry Bulk Unloading Terminal Project in the Port of Cortés (the "Project"). Currently, ENP envisions developing and contracting out construction of the terminal itself, and then contracting for lease and or operations to a private terminal operator or operators. Implementation of this Project would expand and modernize dry bulk unloading infrastructure, lessen congestion and improve the overall efficiency of port operations.

The development of this terminal would fulfill the following objectives:

1. Provide facilities dedicated to bulks without interference with other port users, such as container traffic and cruise ships;
2. Improve bulk unloading rates, which would permit a reduction in ship time in port and the freight rates, as well as costs for cargo handling;
3. Permit receiving and efficient service to Panamax vessels and larger handymax ships, with the potential for economies of scale in ocean shipping;
4. Provide multi-functional equipment and unloading systems capable of handling various types of bulk cargo without contamination;
5. Provide silos and other intermediate storage facilities, with controls for health and safety, eliminating the need for lines of trucks and large truck fleets during peak hours and resulting waiting during the ship time in port;
6. Provide facilities for loading and unloading trucks, including inventory control, dust control and waiting areas, reducing traffic congestion in the city;
7. Improve the control of environmental problems and noxious dust emissions associated with present obsolete methods of cargo handling; and
8. Reduce the total handling cost for dry bulks in the port, reducing the cost of imports and raw materials for Honduran industry.

The U.S. Trade and Development Agency provided a grant to fund the costs of the Feasibility Study for the Port of Cortés Dry Bulk Unloading Terminal Project in Honduras. Empresa Nacional Portuaria selected DMJM Harris to carry out the study to examine technical, financial, environmental and other critical aspects of the proposed Project.

DMJM Harris provided engineering, planning and economic services required to meet the objectives of the study. Working with DMJM Harris were subcontractors and team members, including Saybe y Asociados S. de R.L., Técnica de Ingeniería, S.A., Michael L. Sclar Associates, Inc. and DMJM H&N.

The project was kicked off with a site visit the week of March 5, 2007. Four DMJM Harris staff members participated in the site visit and kickoff meeting, to include the Project Director, Project Manager, Principal Economist and Principal Bulk Handling Engineering, in addition to Technical Director, Manager, Structural Engineer and Environmental Specialist from Saybe and TECNISA.

1.1 Results of Site Visit

During the visit, the team visited alternative sites proposed for the bulk terminal inside the port precinct between Wharf 2 and the Cabotage Wharf, as well as the existing Wharves, Nos. 3 and 4.

In addition to the meetings with Empresa Nacional Portuaria, meetings were conducted in the Port of Cortés, San Pedro Sula and Tegucigalpa with shipping agents, port users, importers and exporters, and other government and private entities, including:

Honduran Association of Shipping Companies and Agents (AHCORENA - Asociación Hondureña de Compañías y Representantes Navieros);

Shipping agents:
Terminales de Cortés;
Navieras Ysaguirre S.A. (NAVYSA);
Marítima y Transportes Honduras S.A. de C.V. (MATRA).

Importers, exporters and representatives:
Chamber of Commerce of Cortes (Cámara de Comercio de Cortés);
Industria Molinera Sula S.A. (IMSA), grain importer;
Grupo Alcon (Alimentos Concentrados), grain importer;
Búfalo Industrial S.A. (BUFINSA), grain importer;
Compañía Azucarera Hondureña S.A. (CAHSA), sugar exporter;
Fertilizantes del Norte S.A. (FENORSA), fertilizer importer;
Fertilizantes Centroamericanos S.A. (FERTICA), fertilizer importer;
Beneficio de Productos Agrículos S.A. (Beproagro), rice importer;
Agregados del Caribe S.A. (Agrecasa), aggregates exporter (proposed);
Lloyd Provost, rock exporter (proposed).

Government of Honduras:
Ministry of the Presidency (Ministro de la Presidencia);
Secretariate of Public Works, Transportation and Housing (Secretaría de Obras Públicas, Transporte y Vivienda) (SOPTRAVI);
Presidential Commission for Modernization of the State (Comisión Presidencial para la Modernización del Estado) (CPME).

Additional contacts:

World Bank; and
U.S. Commercial Service.

Interviews were also requested with cement companies Cementos del Norte S.A. (CENOSA) and Industria Cementera Hondureña S.A. (INCEHSA) but it was not possible to obtain meetings on either site visit.

1.2 Demand Analysis and Guidelines for Facilities Planning and Development

1.2.1 Review of Existing Facilities and Site Conditions

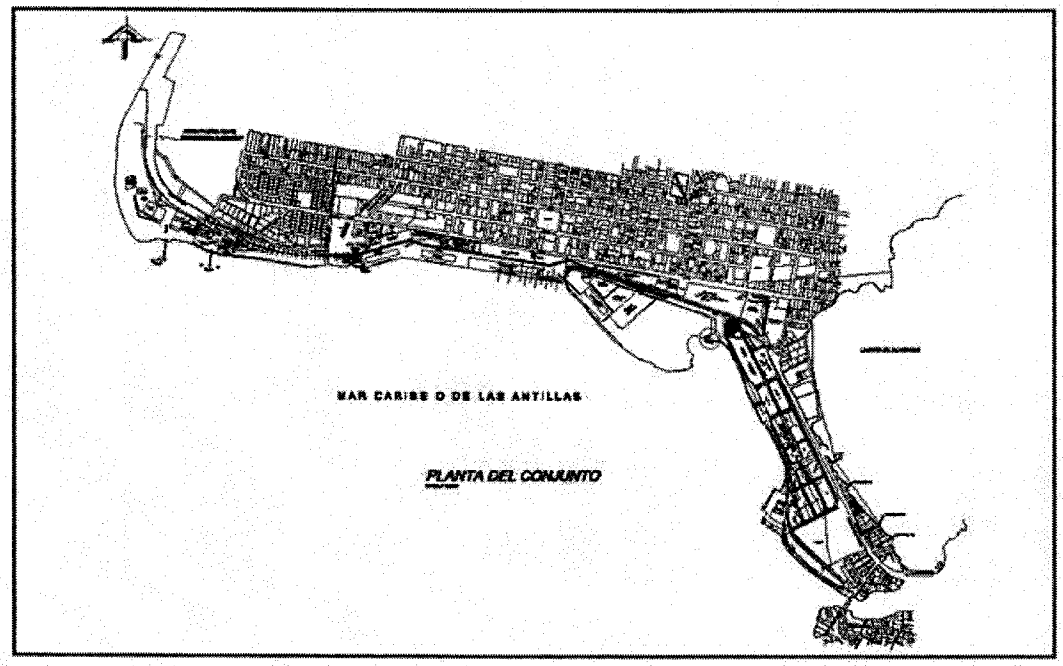


Fig. 1.2.1-1 Complete Plan – Port of Cortés

Puerto Cortés is situated on a peninsula connected to the mainland by bridges in the easterly area of the port. The city and port are separated from the mainland by the Alvarado Lagoon. The port is situated on a strip of land between the city and the Caribbean sea. The locations of the existing facilities of the Port of Cortés are shown in Dwg. 1-1. Referring to the drawing, the Port includes Piers 1 and 2 and Wharves 3 to 5, in addition to a Cabotage Wharf. Pier 1 serves a Texaco refinery. Pier 2 serves a molasses wharf. Wharves 3 to 5 serve dry bulks and general cargo. Most of the dry bulk cargo is handled at Wharves 3 and 4, while most of the container cargo is handled at Wharf 5. Domestic barge cargo is handled at the Cabotage Wharf. The Quilimaco creek runs to the sea west of Wharf 3. The mouth of the Alvarado Lagoon is situated to the east of the Cabotage Wharf.

The site visit covered several alternative sites for the proposed dry bulk terminal:

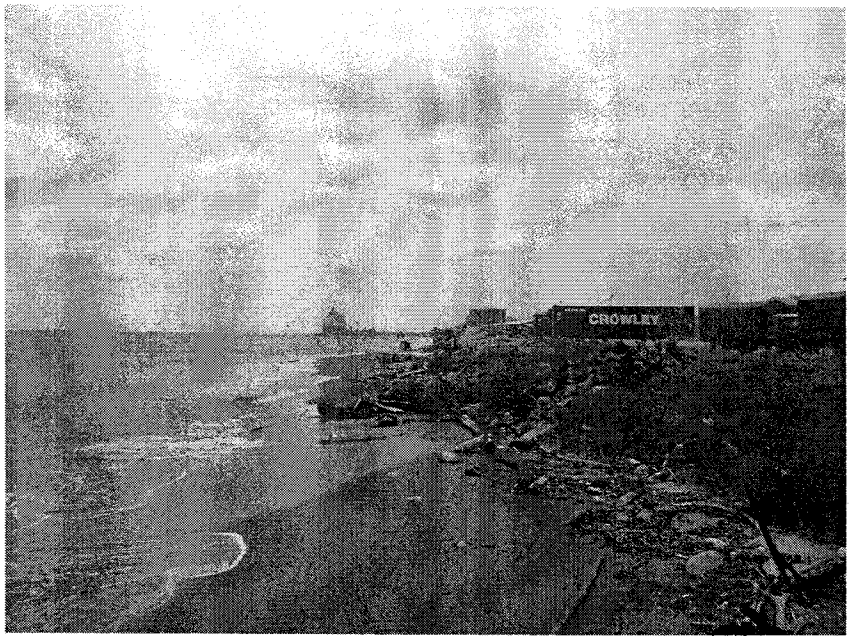


Fig. 1.2.1-2 Truck parking area west of Quilimaco creek

Fig. 1.2.1-3 Truck parking area west of Quilimaco creek

One alternative site for a dry bulk terminal is situated in an area west of Quilimaco creek, between Wharf 3 and the molasses pier. Subsequent to the site visit, it was learned that it has been reported that this site was leased to Agregados del Caribe S.A. (Agrecasa) for a 10-year period by Empresa Nacional Portuaria, to handle export aggregates, through a contract dated December 12, 2005, which was later approved by the National Congress of Honduras. The aggregates were reported to originate in a quarry located in Sapadril, Cortés, and to move to the port by either truck or conveyor.

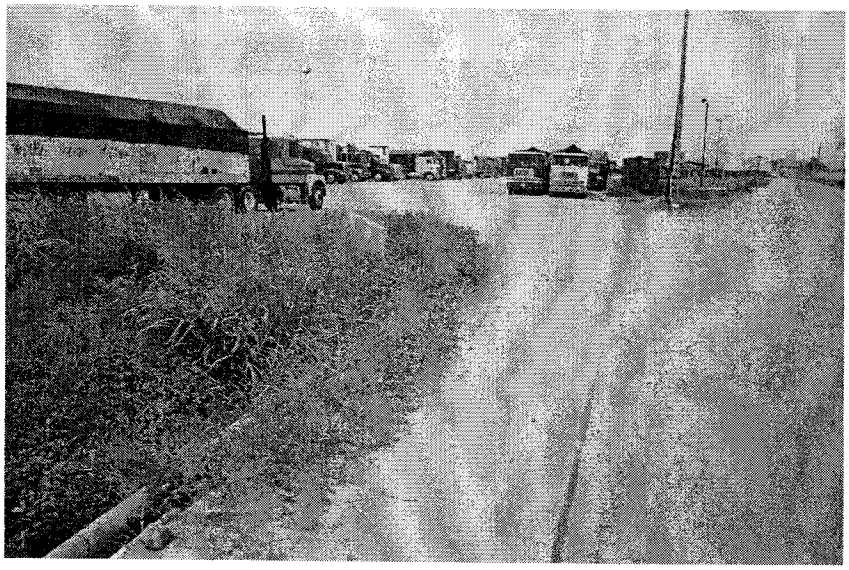


Fig. 1.2.1-4 Truck parking area west of Quilimaco creek

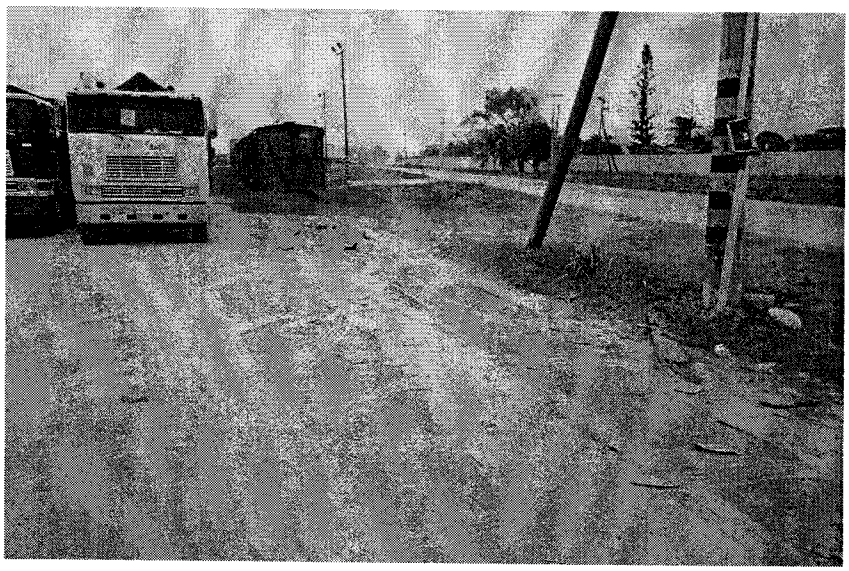


Fig. 1.2.1-5 Truck parking area between the Quilimaco creek and the molasses wharf, and rail line not in service.

The current use of the land behind the Wharf 2 area is for a truck parking area. There is an internal port road serving the area. A rail line serving the site connected to the line between Puerto Cortés, Choloma, San Pedro Sula, Villa Nueva and Potrerillos, Cortés, but is not currently in service. The narrow strip of land is separated from the local community by a concrete wall.

Fig. 1.2.1-6 Truck parking area west of Quilimaco creek

Fig. 1.2.1-7 Area in front of truck parking, looking east across the mouth of the Quilimaco creek towards Wharf No. 3

The Wharf 2 area is separated from Wharf 3 by the Quilimaco creek, which drains a small lagoon of the same name. There are currently no wharf structures in the Wharf 2 area.

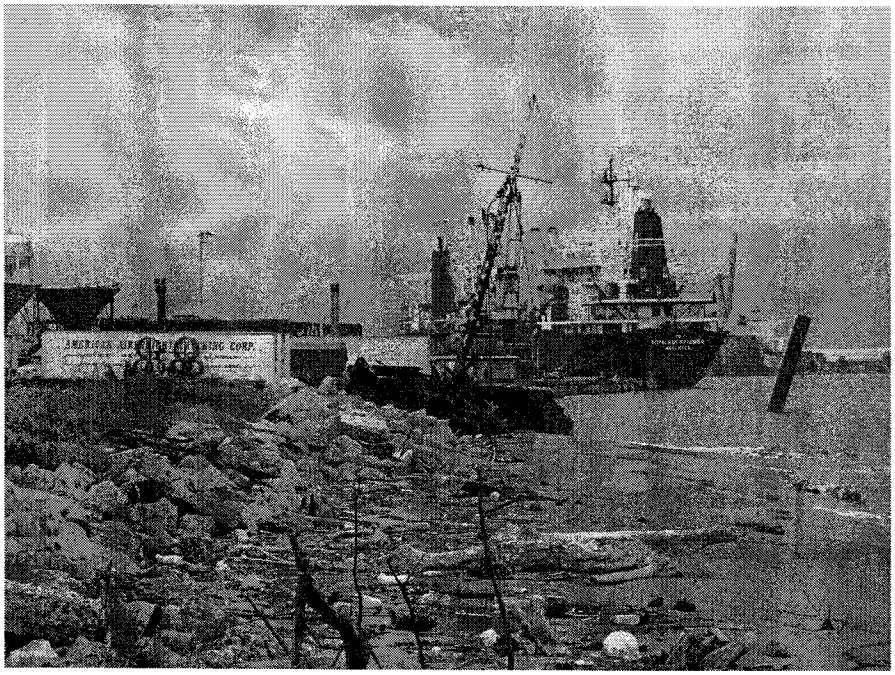


Fig. 1.2.1-8 Area in front of mouth of Quilimaco creek, showing beached vessel.

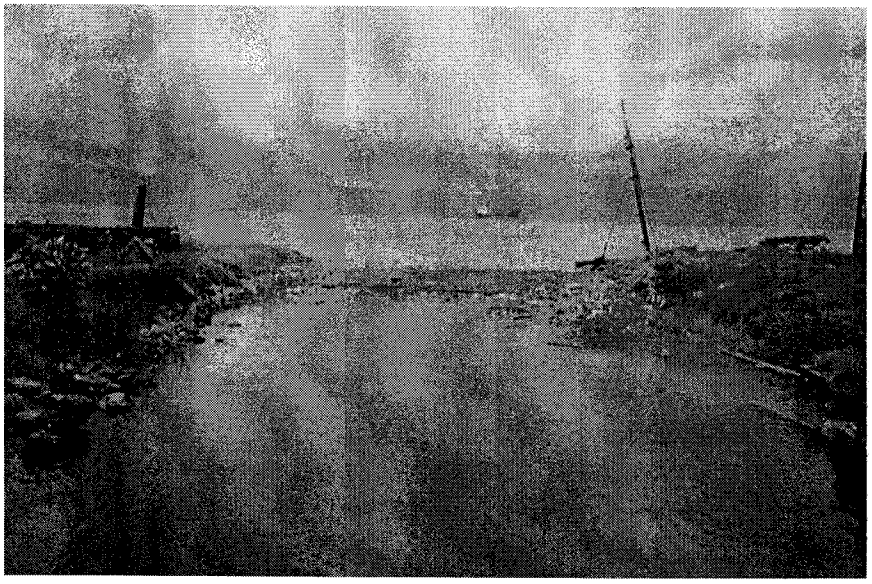


Fig. 1.2.1-9 Mouth of Quilimaco creek, looking seaward

The Quilimaco creek flows into the Caribbean sea between Wharf 3 and the area proposed for Wharf 2. The creek is a potential source for silt and sediment, and under-scouring of marine structures.

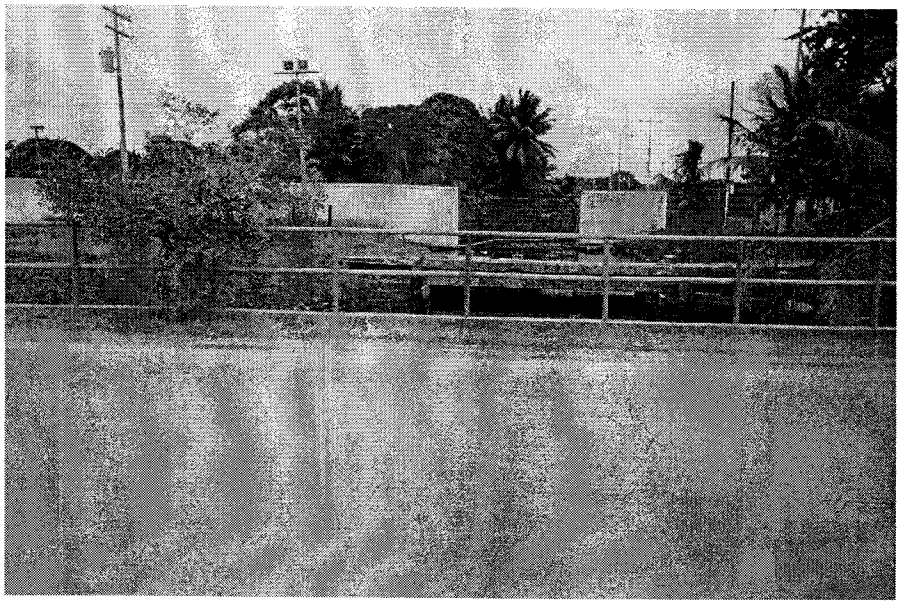


Fig. 1.2.1-10 Mouth of Quilimaco creek, looking towards landside

Fig. 1.2.1-11 Vicinity of mouth of Quilimaco creek, showing remains of pier and beached vessel

At the mouth of the Quilimaco creek, there are pilings or remains of an old pier reported to have been built by the Tela banana company, whose successors are the Chiquita group. This pier, reported to have been built directly in front of the mouth of the Quilimaco creek, collapsed for reasons not defined.

Fig. 1.2.1-12 Wharf 3 and railroad tracks in front of mouth of Quilimaco creek

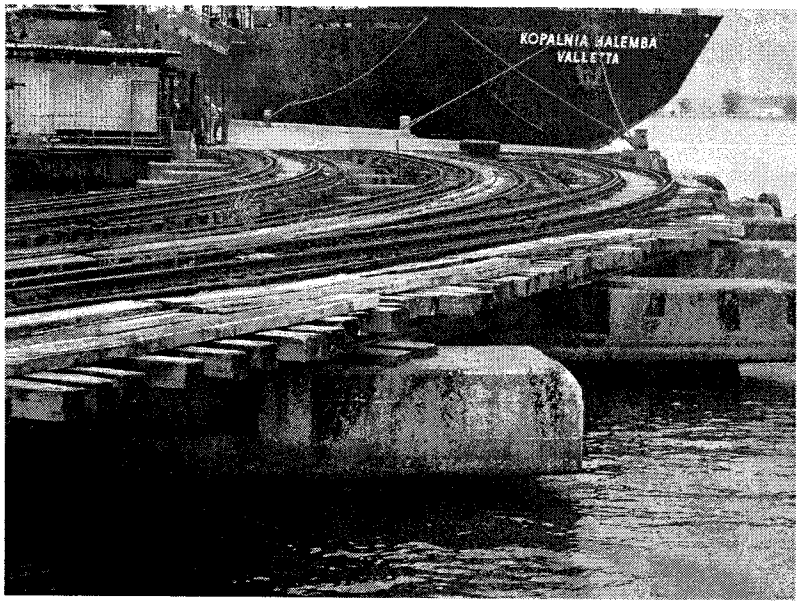


Fig. 1.2.1-13 Railroad tracks at Wharf 3, considered as the site for Wharf 3A extension

Wharf 3, one of two wharves currently used mainly for dry bulks, is situated east of the Quilimaco creek. The railroad tracks running to the Wharf are supported by piles reported to be some 60 m long. The tracks are not in service.

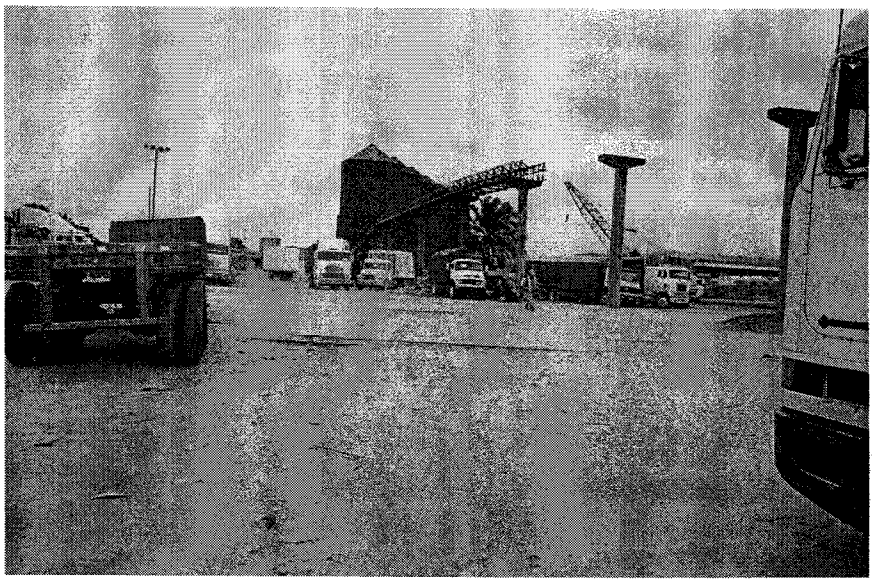


Fig. 1.2.1-14 Hoppers and uncompleted conveyor built by cement company near Berth 3

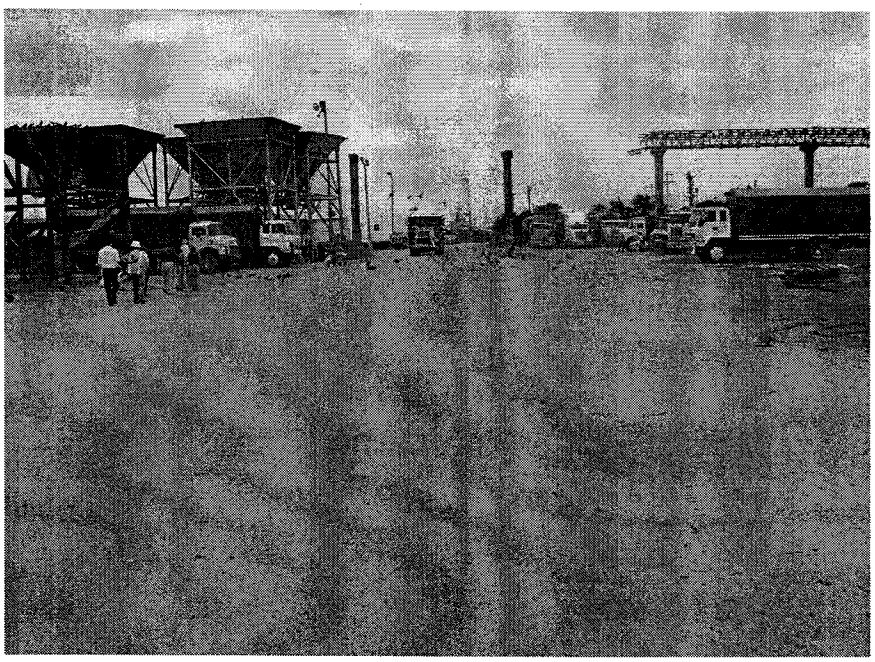


Fig. 1.2.1-15 Port road across Quilimaco creek showing mobile hoppers and unfinished conveyor supports

A cement company, Cementos del Norte, S.A., built several small silos and initiated construction of a conveyor system in the area behind Wharf 3. However, the facility, reported to have been intended to export cement, was never finished or placed in service.

Fig. 1.2.1-16 Hoppers built by cement company near Berth 3

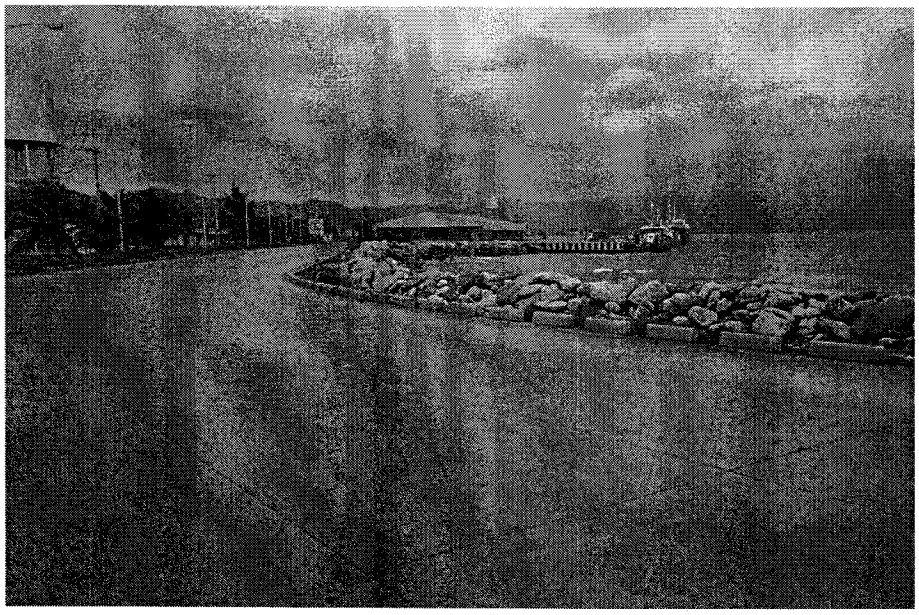


Fig. 1.2.1-17 Port road, looking eastward across site of Wharf 6 towards Cabotage Wharf

In the eastern area of the port, a new road connects the main area of the port to a new gate near the Cabotage Wharf. The Port plans to build Wharf 6, a marginal wharf to serve containers, on fill in the area. The area to the east of the proposed Wharf 6, in the vicinity of the Cabotage Wharf, was also considered as an alternative for new dry bulk facilities.

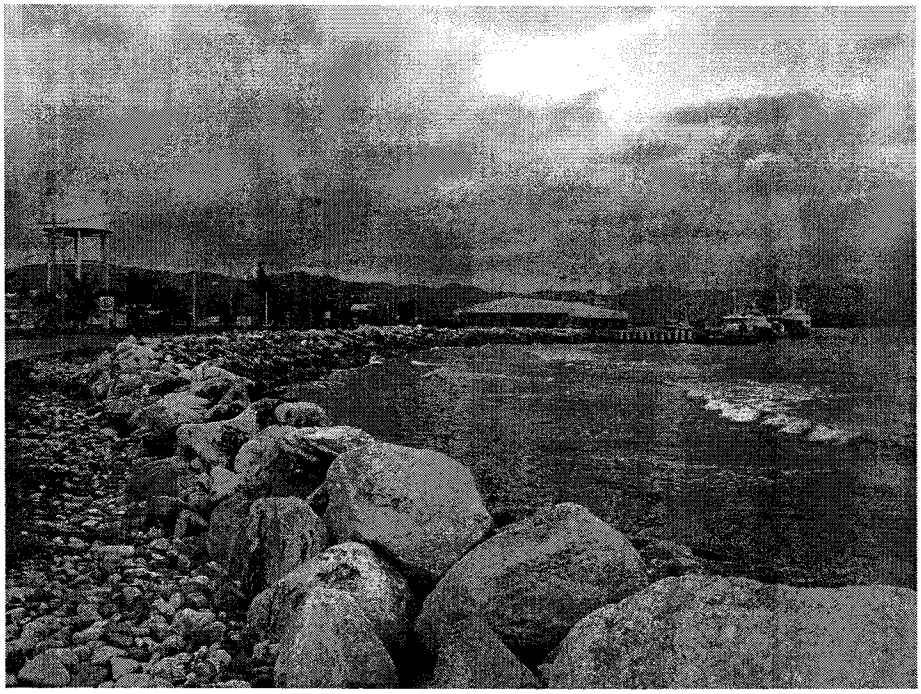


Fig. 1.2.1-18 Site of Container Wharf 6 with the cabotage wharf

1.2.2 Review of Previous Studies

The following previous studies were reviewed:

- Asociación de Consultores en Ingeniería, S. de R.L., *Estudio geotécnico del subsuelo del muelle no. 2 para granel sólido en Puerto Cortés* (Geotechnical study for subsoil of Wharf No. 2 for Dry Bulk in the Port of Cortes (prepared for Empresa Nacional Portuaria, noviembre 1999
- Geoconsult, S.A. de C.V., TECNISA, *Informe geológico geotécnico, análisis e interpretación de los resultados de campo y sus laboratorios, Estudio y diseño muelle #6 de Puerto Cortés* (Geological Geotechnical Report, Analysis and Interpretation of the Field and Lab Results), prepared for Empresa Nacional Portuaria, 22 de mayo 2000
- DMJM Harris with TECNISA, Saybe y Asociados and Michael L. Sclar Associates, Technical Assistance for the Port of Cortés Modernization Project, prepared for Empresa Nacional Portuaria and U.S. Trade and Development Agency, May 2007.

Geotechnical conditions in the area of Wharf No. 2

The geotechnical study of Wharf No. 2 states the following conclusion:
"The zone where it is planned to locate Wharf No. 2 can be considered as the one which has the subsoil of lowest quality of the entire port area. The zone is located almost in front of the exit to the mouth of the Quilimaco Canal, which drains water from a small lagoon. All of the sediments dragged by the marine current have been deposited in all of the influence area of the mouth, making difficult the stratigraphic conditions with soils whose mechanical properties are significantly low. The conditions imply a high risk for foundation of structures on it, since the possibility of obtaining a behavior acceptable over the long term is minimal and the presence of considerable settlements during the useful life of the structure can be guaranteed."

- Bedrock was not reached in 50 m of borings.

Geotechnical Conditions in the Area of Wharf No. 6

The geotechnical conditions in the Wharf No. 6 area provide some indication of the types of conditions that might be found in the eastern area of the Port. Although soil borings were not available east of Wharf No. 6, Empresa Nacional Portuaria indicated that they plan to contract such borings.

The report on the Wharf 6 boring program indicates that the site is found in an area affected by sediments from the mouth of the Alvarado Lagoon.

The stratigraphy includes:

9.50 to 10.0 m	Sea level
9.50/10.0 to 16.0/26.0 m	Fine silty sand
16.0/26.0 to 30.0 m	Coral fragments in a silt-sand network
30.0 to 55.0	Alternating sequence of continental clay-silt-sandy sediments
55.0 to 60.0	Sandy gravel strata
60.0 to 70.0	Old sequence of clays and silts

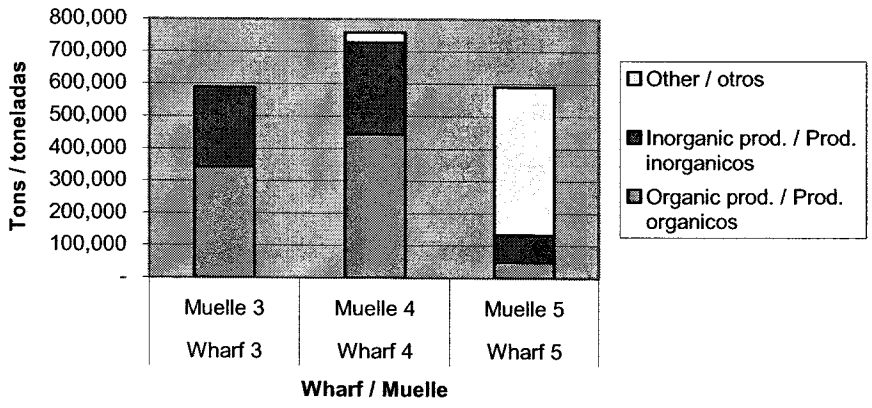
Bedrock was not reached in 70 m of borings.

Additional studies requested by DMJM Harris include the 1995 master plan of the Port of Cortes prepared by the Japan International Cooperation Agency (JICA), and the study and design of Wharf 6, the new container wharf which is next to the sites for Wharves / Piers 7A and 7B discussed in this study, as well as related meteorological and oceanographic data ("met-ocean" data). As these studies were not received, this analysis is based on data which was available.

1.2.3 Review and Evaluation of Operational Procedures

Bulk cargoes are unloaded mainly at Wharves 3 and 4, and sometimes Wharf 5. Unloading of dry bulk cargo is carried out primarily by two stevedoring companies, Terminales de Cortés and NAVYSA. The unloading operation of dry bulks is mainly carried out utilizing ships' gear. The ship cranes are used with clamshell buckets and portable hoppers provided by stevedores. As shown in Figure 1.2.3-2, dry bulks are discharged into the portable hoppers. Referring to Figures 1.2.3-3 and 1.2.3-4, the cargo is discharged to trucks contracted by the importers, which will transport products or materials to their final destinations. Discharge to truck, rather than storage, is referred to a "direct" discharge.

Fig. 1.2.3-1 Distribution of Import Cargo by Wharf / Distribucion de Carga de Importacion por Muelle, 2006



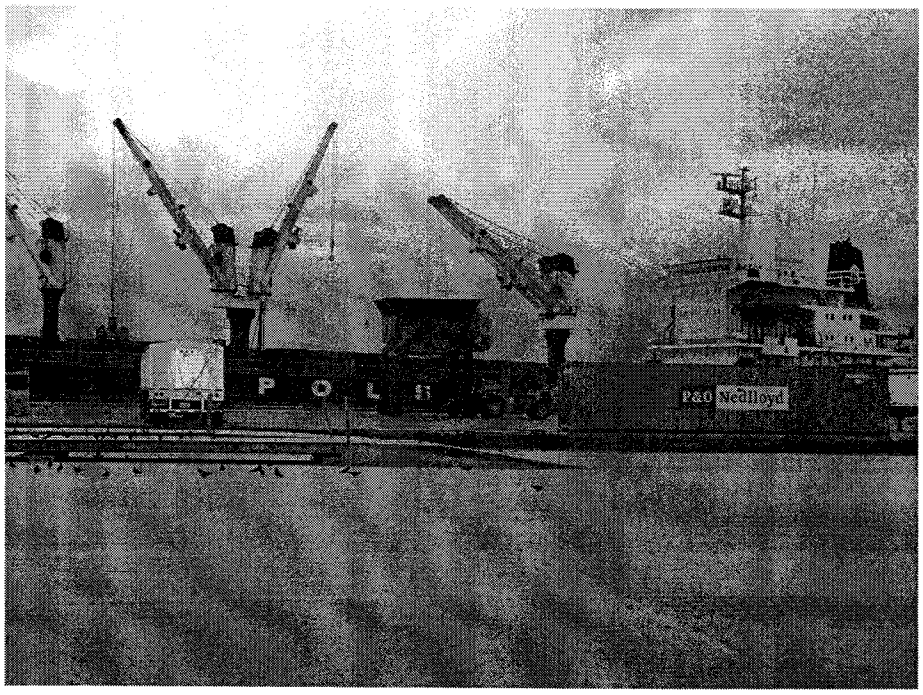


Fig. 1.2.3-2 Ship unloading with ships' gear to mobile hopper

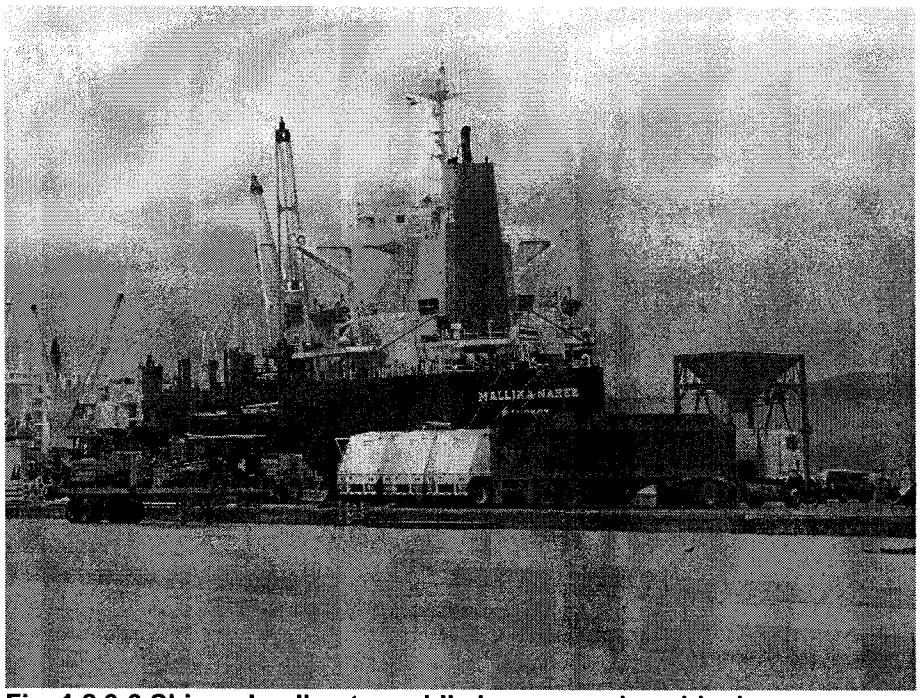


Fig. 1.2.3-3 Ship unloading to mobile hoppers using ships' gear

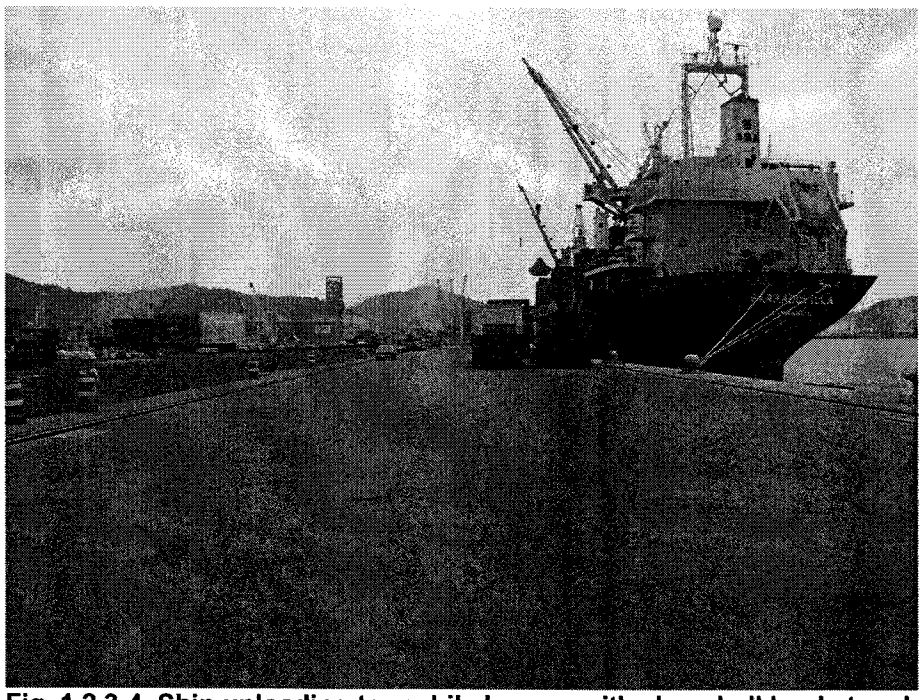


Fig. 1.2.3-4 Ship unloading to mobile hopper with clamshell bucket and ships' gear, trucks standing by

Table 1.2.3-1
Port of Cortes Ship Traffic, Tráfico de Naves, 2006

Type of Ship / Tipo de Barco	Qty. Cant.	GRT TRB	NRT TRN	Port hours Horas puerto	Berth hours Horas atraq	Import Tons / toneladas	Export Tons / toneladas
Conventional cargo ship / Cargieroo convencional	95	538,569	294,934	4,476	3,382	150,164	42,143
Dry bulker / Granelero sólido	125	1,372,364	733,556	18,356	12,740	1,317,181	81,901
Petroleum tanker / Tanquero petrolero	93	1,747,924	809,896	4,725	2,232	1,219,152	28,596
Molasses tanker / Tanquero con melaza	6	51,446	25,648	276	246	-	48,788
Oil tanker / Tanquero con aceite	6	40,298	20,562	186	165	2,900	18,673
Chemical products tanker / Tanques productos químico	31	284,411	154,109	568	474	76,654	3,033
Refrigerated banana ship / Bananeros refrigerados	7	65,653	31,345	350	304	-	18,755
LO-LO Banana ship / Bananero sistema LO-LO	229	3,569,236	208,370	2,322	1,935	298,855	394,906
Wood carrier / Maderero	19	87,873	32,482	1,534	893	1,778	26,920
Container ship / Portacontenedores	682	6,135,753	820,767	13,122	9,388	1,069,458	1,110,510
RO-RO	447	7,391,487	516,516	6,161	4,009	739,202	640,512
Passenger ship / Buques de pasajeros	18	531,833	253,071	274	259	-	-
Ship in ballast / Buques en lastre	38	64,720	24,782	757	400	-	-
Gas carrier / Gaseros	40	316,208	107,722	1,719	1,386	106,770	-
General total / Total general	1,836	22,197,775	4,033,760	54,826	37,813	4,982,114	2,414,735

GRT: Gross registered tonnage / TRB: Toneladas registro bruto
NRT: Net registered tonnage / TRN: Toneladas registro neto

Percent of total / Porcentaje del total	Qty. Cant.	GRT TRB	NRT TRN	Port hours Horas puerto	Berth hours Horas atraq	Import Tons / toneladas	Export Tons / toneladas
Dry bulker / Granelero sólido	7%	6%	18%	33%	34%	26%	3%
LO-LO Banana ship / Bananero sistema LO-LO	12%	16%	5%	4%	5%	6%	16%
Container ship / Portacontenedores	37%	28%	20%	24%	25%	21%	46%
RO-RO	24%	33%	13%	11%	11%	15%	27%
Other	19%	17%	43%	27%	26%	31%	8%
Total	100%	100%	100%	100%	100%	100%	100%

Table 1.2.3-1 shows the ship traffic at the Port of Cortés in 2006 by type of ship. Referring to the table, dry bulk ships had a GRT of 1,372,364 tons and handled 1,317,181 tons of import cargo and 81,901 tons of export cargo. The dry bulk ships accounted for 7% of the ships and 6% of the GRT, but 33% of the port hours and 34% of the berth hours.

Table / Cuadro 1.2.3-2
Port of Cortes Vessel Traffic and Cargo / Puerto Cortés Tráfico de Naves y Carga, 2006
Annual Summary / Resumen Annual

Tipo de carga	Qty. Cant.	Port hours Horas pto	Berth hours Horas atraq	Delay hours Horas demora	Work hours Horas trabajo	Import Importación Tons/toneladas	Export Exportación Tons/toneladas	Total Tons/Tonelaladas
Breakbulk cargo / Carga fraccionada	82	3,236	2,410	96	2,314	113,439	21,512	134,951
Liquid bulk / Granel liquido	173	7,006	11,339	139	11,200	399,487	98,173	497,660
Dry bulk / Granel sólido	129	18,969	12,774	1,950	10,823	326,680	82,817	409,497
Mixed bulk / Granel mixto	0							-
Homogeneous cargo / Carga homogénea	70	3,638	2,526	240	2,285	40,283	66,735	107,018
Containers / Contenedores	910	16,324	38,284	746	4,205	366,083	504,882	870,965
Ro - Ro	416	8,115	3,645	256	3,389	736,139	640,614	1,376,753
Total	1,780	57,288	70,978	3,427	34,216	1,982,111	1,414,733	3,396,844

Table / Cuadro

Percent of total / Porcentaje del total	Qty. Cant.	Port hours Horas pto	Berth hours Horas atraq	Delay hours Horas demora	Work hours Horas trabajo	Import Importación	Export Exportación	Total
Dry bulk / Granel sólido	7%	33%	18%	57%	32%	16%	6%	12%
Containers / Contenedores	51%	28%	54%	22%	12%	18%	36%	26%
Ro - Ro	23%	14%	5%	7%	10%	37%	45%	41%
Other / Otros	18%	24%	23%	14%	46%	28%	13%	22%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: Empresa Nacional Portuaria statistics

Table 1.2.3-2 summarizes the ships calling at the Port of Cortés by type of cargo during 2006. Referring

to the table, ships carrying dry bulk represent 7% of the total vessel traffic, and 12% of total import and export cargo, but account for 33% of port hours, 18% of berth hours and 57% of delay hours. By comparison, the ships with container cargo represented 54% of the port hours, but also handled 51% of the cargo. Thus, the dry bulk ships represent a disproportionate share of the port and delay hours.

All bulk imports are handled with clamshell buckets. This equipment is owed by the stevedoring companies. Experience has shown that this is the most economic technology for the operations in Puerto Cortes. The existing clamshells are of modest size.

The dry bulk cargoes handled in Puerto Cortes are diverse, including 16 organic products and 10 inorganic products, plus fertilizer and coal.

The dry bulk cargo is not homogeneous. For example, the imports include 3 classifications of wheat, 4 of corn, and 2 of rice.

Many of the importers are of small scale. A problem that frequently arises is that the importers do not have the capacity to receive the entire shipment.

In terms of priority in the use of berths, the bulk traffic is placed at the end of the line by the ENP. Perishable and container cargo is given higher priority. If a ship carrying cargo with a higher priority arrives at the port, it is frequent that the bulk carrier is ordered away from the berth and to the harbor.

Another problem is that, when other branches of the government approve import permits for bulk cargoes, it can lead to 3 vessels arriving at the port at the same time.

Productivity of bulk operations can reach 6,000 tons, using 4 gangs, but the normal productivity is 2,400 tons a day. Some ships are better than others due to their configuration and equipment. The "Century Queen" is an example of a very good vessel. Puerto Quetzal using 14 cubic yard clamshells is able to attain up to 14,000 tons a day.

According to ENP, there was an attempt to regulate a minimum productivity or the ENP could send the ship to the anchorage. This rate was 4,800 tons per day. This regulation is not observed.

Terminales de Cortes has some pneumatic equipment. It was brought to the Port but is not used, as it produces higher operating cost and may discharge at a faster rate than the trucking from the port can sustain.

Table 1.2.3-NN1, which summarizes dry bulk vessels statistics for the Port of Cortés, shows how throughput increased substantially each year: 9% in 2005 over 2004 and another 7% in 2006 over 2005. Delay hours had improved in 2005 but turned for worse to 22 hours average per vessel in 2006.

In 2006 about half of the annual tonnage was handled at Berths No. 3 and No. 4 respectively, negligible amounts were unloaded at berth No.5. Berth No.3 had an unloading rate of 3,111 tons per day and the occupancy of bulk unloading activities was 57% of a full year. Berth No.4 had an unloading rate of only 2,318 tons per day and the occupancy of bulk unloading activities was 75% of a full year, leaving not much time for container operations.

It was noted that the longest Length Over All (LOA) of 640ft or 195 m corresponds to an average 48,000 DWT Handymax vessel.

The main observation regarding these statistics is that the handling rates shown for bulk cargo averaged only 100 to 130 tons per hour. This means that a 12,000 ton load would take in the range of 100 hours to unload or around 4 days on average. This is far in excess of a normal target rate of 2 days or 48 hours, which is achieved in other ports for much larger vessels.

Some issues not fully explained regarding the statistics from ENP were:
- Why the Net Berth hours are shown as the same as Gross Berth Hours and whether these hours counted from berthing to de-berthing.
-Looking at the overall berth hours 102.9 h/V and the delay hours 22.0 h/V per vessel for example in 2006 these do not add up to the port hours of 149.5 h/V.

However, based on examination of these port statistics, the unloading rates are well under requirements for an efficient operation, and inevitably lead to excess charges for ships and cargo handling.

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August 2, 2007

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Table No. 1.2.3-NN1: SUMMARY OF PREVIOUS BULK UNLOADING OPERATIONS K.Kroeter

BULK UNLOADING	YEAR 2004		YEAR 2005		YEAR 2006	
Berths No. 3+4+5	100%		100%	Incr. 05/04	100%	Incr. 06/05
Total Annual Tons	1,140,962 tons	= Base	1,245,344 tons	9.1%	1,333,509 tons	7.1%
No. of Vessels	105 –		117 –		121 –	
AverageCargo	10,866 t/V		10,644 t/V		11,021 t/V	
Berth Hours	9,755.9 hours	92.9 h/V	10,985.1 hours	93.9 h/V	12,448.9 hours	102.9 h/V
Delay Hours	1,764.9 hours	16.8 h/V	1,374.9 hours	11.8 h/V	2,663.1 hours	22.0 h/V
Port Hours	14,630.5 hours	139.3 h/V	15,627.5 hours	133.6 h/V	18,092.0 hours	149.5 h/V
Avg.Berth Rate	117.0 t/h		113.4 t/h		107.1 t/h	
Daily Berth Rate	2806.8 t/day		2720.8 t/day		2570.9 t/day	
MIN Vessel Size	974 GRT	258 ft LOA	1,267 GRT	230 ft LOA	1,865 GRT	268 ft LOA
MAX Vessel Size	26,216 GRT	619 ft LOA	26,044 GRT	640 ft LOA	25,719 GRT	623 ft LOA
MIN Cargo tons	2 tons		3 tons		10 tons	
MAX Cargo tons	38,538 tons		38,668 tons		33,063 tons	
T/Y Organic	824,185 tons	72%	891,192 tons	72%	930,885 tons	70%
No. of Vessels	72 –	11,447 t/V	78 –	11,426 t/V	80 –	11,636 t/V
T/Y Non-Organic	316,777 tons	28%	354,151 tons	28%	402,624 tons	30%
No. of Vessels	33 –	9,599 t/V	39 –	9,081 t/V	41 –	9,820 t/V
Berth No. 3	45% of total annual tons		47% of total annual tons		48% of total annual tons	
No.3 Annual Tons	515,569 tons		579,315 tons		644,960 tons	
No. of Vessels	42 –		45 –		48 –	
AverageCargo	12,275 t/V		12,874 t/V		13,437 t/V	
Berth Hours Cb	3,963.0 hours	94.4 h/V	4,518.5 hours	100.4 h/V	4,975.3 hours	103.7 h/V
Occupancy	45.2% of 24h x 365d		51.6% of 24h x 365d		56.8% of 24h x 365d	
Delay Hours Cw	701.0 hours	16.7 h/V	610.1 hours	13.6 h/V	1,049.5 hours	21.9 h/V
Delay factor Cw/Cb	0.18 –		0.14 –		0.21 –	
Avg.Berth Rate	130.1 t/h		128.2 t/h		129.6 t/h	
Daily Berth Rate	3122.3 t / 24h day		3077.0 t / 24h day		3111.2 t / 24h day	
Berth No. 4	41% of total annual tons		53% of total annual tons		48% of total annual tons	
No.4 Annual Tons	467,618 tons		662,751 tons		634,937 tons	
No. of Vessels	42 –		71 –		67 –	
AverageCargo	11,134 t/V		9,335 t/V		9,477 t/V	
Berth Hours	4,304.6 hours	102.5 h/V	6,426.8 hours	90.5 h/V	6,573.3 hours	98.1 h/V
Occupancy	49.1% of 24h x 365d		73.4% of 24h x 365d		75.0% of 24h x 365d	
Delay Hours	810.0 hours	19.3 h/V	764.8 hours	10.8 h/V	1,325.8 hours	19.8 h/V
Delay factor Cw/Cb	0.19 –		0.12 –		0.20 –	
Avg.Berth Rate	108.6 t/h		103.1 t/h		96.6 t/h	
Daily Berth Rate	2607.2 t/day		2475.0 t/day		2318.3 t/day	
Berth No. 5	14% of total annual tons		0.3% of total annual tons		4% of total annual tons	
No.5 Annual Tons	157,776 tons		3,278 tons		53,612 tons	
No. of Vessels	21 –		1 –		6 –	
AverageCargo	7,513 t/V		3,278 t/V		8,935 t/V	
Berth Hours	1,488.3 hours	70.9 h/V	39.8 hours	39.8 h/V	892.5 hours	148.8 h/V
Occupancy	17.0% of 24h x 365d		0.5% of 24h x 365d		10.2% of 24h x 365d	
Delay Hours	253.8 hours	12.1 h/V	0.0 hours	0.0 h/V	287.8 hours	48.0 h/V
Delay factor Cw/Cb	0.17 –		0.00 –		0.32 –	
Avg.Berth Rate	106.0 t/h		82.5 t/h		60.1 t/h	
Daily Berth Rate	2544.3 t/day		1979.0 t/day		1441.7 t/day	

NOTES: Container vessels take priority over bulk vessels at all three berths
Maximum Vessel 26,000 GRT, LOA 640 ft = 195 m corresponds to 48,000 DWT Handymax

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Table No. 1.2.3-NN2: SUMMARY OF PREVIOUS BULK UNLOADING OPERATIONS

K.Kroeter

ANALYSIS OF PRODUCTS

BULK UNLOADING	YEAR 2004				YEAR 2005				YEAR 2006			
Berths No. 3+4+5	tons	vessels	average		tons	vessels	average		tons	vessels	average	
Total Annual Tons and Vessels	1,140,962 t	105 V	10,866 t/V		1,245,344 t	117 V	10,644 t/V		1,333,509 t	121 V	11,021 t/V	
Non-Organic:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Fertilizer, Urea	158,757 t	18 V	8,820 t/V	20,000 t	163,494 t	18 V	9,083 t/V	21,000 t	216,642 t	21 V	10,316 t/V	20,000 t
Coal, Green Coke	121,763 t	4 V	30,441 t/V	39,000 t	129,186 t	5 V	25,837 t/V	39,000 t	124,604 t	4 V	31,151 t/V	33,000 t
Concentrates	30,500 t	9 V	3,389 t/V	10,000 t	16,500 t	8 V	2,063 t/V	3,000 t	40,053 t	11 V	3,641 t/V	10,000 t
Salt, Sodium Chloride/Sulphate	-	-	- t/V	-	37,531 t	6 V	6,255 t/V	16,000 t	15,022 t	3 V	5,007 t/V	10,000 t
Asphalt, General Cargo, Iron	5,757 t	2 V	2,879 t/V	4,000 t	7,441 t	2 V	3,721 t/V	4,200 t	6,303 t	2 V	3,152 t/V	4,200 t
Total Non-Organic	316,777 t	33 V	9,599 t/V		354,152 t	39 V	9,081 t/V		402,624 t	41 V	9,820 t/V	
Organic:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Multiple Shipmt. Cargo [up to 4]	543,952 t	40 V	13,599 t/V	25,800 t [2]	718,125 t	55 V	13,057 t/V	28,000 t [2]	725,389 t	53 V	13,687 t/V	24,800 t [2]
Single Shipment Cargo	270,621 t	30 V	9,021 t/V	22,200 t	160,374 t	22 V	7,290 t/V	24,000 t	182,735 t	23 V	7,945 t/V	23,100 t
Sugar, raw/granular	9,612 t	2 V	4,806 t/V	10,000 t	12,693 t	1 V	12,693 t/V	13,000 t	22,760 t	4 V	5,690 t/V	9,000 t
Total Organic	824,185 t	72 V	11,447 t/V		891,192 t	78 V	11,426 t/V		930,885 t	80 V	11,636 t/V	
Organic Bulk Products that arrived in a Single Shipment:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Wheat	73,536 t	6 V	12,256 t/V	22,199 t	17,544 t	4 V	4,386 t/V	12,532 t	27,400 t	5 V	5,480 t/V	10,059 t
Wheat Bran	0 t	0 V	- t/V	- t	15,390 t	3 V	5,130 t/V	6,400 t	29,690 t	6 V	4,948 t/V	7,000 t
Rice	7 t	1 V	7 t/V	7 t	34,962 t	4 V	8,741 t/V	15,268 t	47,727 t	4 V	11,932 t/V	17,304 t
Corn	67,154 t	6 V	11,192 t/V	13,185 t	69,791 t	5 V	13,958 t/V	24,000 t	42,836 t	3 V	14,279 t/V	23,100 t
Corn Flour	0 t	0 V	- t/V	- t	12 t	1 V	12 t/V	12 t	10,238 t	1 V	10,238 t/V	10,238 t
Soy Beans	47,408 t	4 V	11,852	16,310 t	10,249 t	2 V	5,125	6,249 t	21,544 t	3 V	7,181 t/V	9,859 t
Soy Flour	39,674 t	3 V	13,225 t/V	19,074 t	0 t	0 V	- t/V	- t	0 t	0 V	- t/V	- t
Malt	9,483 t	3 V	3,161 t/V	4,094 t	5,925 t	2 V	2,963 t/V	2,965 t	3,300 t	1 V	3,300 t/V	3,300 t
Bran	33,359 t	7 V	4,766 t/V	6,325 t	6,500 t	1 V	6,500 t/V	6,500 t	0 t	0 V	- t/V	- t
Total Single Products Cargo	270,621 t	30 V	9,021 t/V	22,200 t	160,374 t	22 V	7,290 t/V	24,000 t	182,735 t	23 V	7,945 t/V	23,100 t

Table 1.2.3-NN2 disaggregates the vessel statistics from ENP for organic products (food grains for human and animal consumption) and inorganic products (fertilizers, salt, etc.). Referring to the table, most products were handled in shipments of 5,000 to 10,000 tons, while there were some larger shipments from 20,000 to 33,000 tons, including multiple shipments.

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Table No. 1.2.3-NN3: ANALYSIS OF 2006 DELAYS OF 121 VESSELS K.Kroeter

DEMORAS DE LOS BARCOS DESDE LA HORA DE ARRIBO AL PUERTO A LA HORA DE ATRAQUE
Ships delays from arrival to the Port to the Berthing time

Code	hours	% of berth hours	% of port hours	Delay Reason	Spanish Original
1	2	0.0%	0.0%	Waiting for Officials	ESPERANDO VISITA OFICIAL
2	0	0.0%	0.0%	Missing/revision of Documents	POR FALTA O REVISION DE DOCUMENTOS
3	0	0.0%	0.0%	Berthing maneuverings	MANIOBRAS DE ATRAQUE
4	2,569	20.6%	14.2%	No berth available	SIN ATRACADERO DISPONIBLE
5	0	0.0%	0.0%	No transportation at port	SIN FLETE EN PUERTO
6	0	0.0%	0.0%	Strong swells or hurricanes	FUERTES MAREAS O HURACANES
7	0	0.0%	0.0%	To avoid payment of overtime	POR NO PAGAR SOBRETIEMPO
8	0	0.0%	0.0%	Due to ENP pending debts	POR DEUDAS PENDIENTES E.N.P.
9	0	0.0%	0.0%	Arrival w/o prior notice	ARRIBO SIN AVISO
10	2,624	21.1%	14.5%	Waiting for instructions	ESPERANDO ORDENES

DEMORAS DE LOS BARCOS ANTES DE PRINCIPAR SUS OPERACIONES UNA VEZ ATRACADOS
Ship delays before beginning of operations

101	0	0.0%	0.0%	Waiting for Officials	ESPERANANDO VISITA OFICIAL
102	0	0.0%	0.0%	Waiting for Stevedores	ESPERRANDO TRABAJADORES A BORDO
103	0	0.0%	0.0%	Waiting for ENP personnel	ESPERANDO TRABAJADORES E.N.P.
104	0	0.0%	0.0%	Waiting for cargo	ESPERANDO CARGA
105	0	0.0%	0.0%	Due to rain	POR LLUVIA
106	0	0.0%	0.0%	Other causes by ENP	OTRAS CAUSAS E.N.P.
107	0	0.0%	0.0%	Other causes Shipowner	OTRAS CAUSAS NAVIEROS

DEMORAS DE LOS BARCOS DURANTE SUS OPERACIONES
Delays during operations

201	1,088	8.7%	6.0%	Rain or bad weather	LLUVIA O MAL TIEMPO
202	1,452	11.7%	8.0%	Moving to other berth	CAMBIO DE ATRACADERO
203	0	0.0%	0.0%	Waiting for cargo	ESPERANDO CARGA
204	34	0.3%	0.2%	Waiting for transport	ESPERANDO TRANSPORTE
205	0	0.0%	0.0%	Troubles during operations	POR FALLAS EN OPERACIONES
206	88	0.7%	0.5%	Other causes by ENP	OTRAS CAUSAS E.N.P.
207	2	0.0%	0.0%	Meal breaks	DESCANSO POR COMIDA
208	0	0.0%	0.0%	Other causes Shipowner	OTRAS CAUSAS NAVIEROS

DEMORAS DE LOS BARCOS UNA VEZ FINALIZADAS LAS OPERACIONES
Ship delays after the completion of its operations

301	0	0.0%	0.0%	Waiting for Pilot	ESPERANDO PILOTO
302	9	0.1%	0.1%	Other causes by ENP	OTRAS CAUSAS E.N.P.
303	0	0.0%	0.0%	Ship problem	FALLAS DEL BARCO
304	547	4.4%	3.0%	Other causes Shipowner	OTRAS CAUSAS NAVIEROS
305	0	0.0%	0.0%	By Order of Port Authority*	ORDENES DE AUTORIDADES DE PUERTO
306	12	0.1%	0.1%	Strong swell or hurricane	FUERTES MAREAS O HURACANES
307	0	0.0%	0.0%	Waiting for documents from Agent	ESPERANDO DOCUMENTOS AGENCIA
	2,663	21.4%	14.7%	hours delays during operations	12,449 Berth hours
	8,426	67.7%	46.6%	hours total delays	18,092 Port Hours

Notes: * Is an authority different from ENP. May be a Port Captain

Table 1.2.3-NN3 summarizes the statistics from ENP regarding the causes of delay to the dry bulk vessels in 2006. According to the statistics, ships were delayed a total of 8,426 hours. Of this time, 2,569 hours were reported as being delays awaiting a berth and 2,663 hours were reported as being

delays during operations. It should be noted that ENP's statistics do not record the delays or slow operations when awaiting trucks or due to slow cargo handling. It also appears unlikely that these statistics include delays when a ship is required to leave a berth after berthing, due to another ship having priority.

OPERATIONAL YIELDS 2006 BULK MATERIAL — **RENDIMIENTOS OPERACIONALES 2006** GRANELERO — DEMORA EN OPERACIÓN / DELAYS DURING OPERATION

Type	Berthing	No. of Vessel	Vessel Name	Voyage No.	Product Class	Consignees	Arrival Date	Berth date	Agency Code	Berth# Used	IMPORT	EXPORT	Total kg	Ship delays from port arrival to berthing time										Ship delay beforebeginning of operations							Ships delays during operations								Ship delays after completion of operations							Total delays	Total delays during operations	Qantity of Vessels
TIPO	ATRAQUE	No. DE NAVE	NOMBRE DEL BUQUE	NO DE VIAJE	CLASE DE PRODUCTO	CONSIGNATARIOS	FECHA DE ARRIBO	FECHA ATRAQUE	CODIGO DE AGENCIA	MUELLE UTILIZADO	IMPOR	EXPOR	TOTAL KILOS	DEMORA DE LOS BARCOS DESDE LA HORA DE ARRIBO AL PUERTO A LA HORA DE ATRAQUE										DEMORA ANTES DE COMENZAR SUS OPERACIONES UNA VEZ ATRACADO							DEMORAS DE LOS BARCOS DURANTE SUS OPERACIONES								DEMORAS DE LOS BARCOS UNA VEZ FINALIZADOS LAS OPERCIONES							TOTAL DEMORAS	TOTAL DEMORAS EN OPERACIÓN	CANTIDAD DE BUQUES
														1	2	3	4	5	6	7	8	9	10	101	102	103	104	105	106	107	201	202	203	204	205	206	207	208	301	302	303	304	305	306	307			
GS	17	3756	KOPALNIA BORYNIA	1	ARROZ Y TRIGO A GRANEL		01-04-06	01-05-06	1-185	3	10,211,295.00		10,211,295										21.42								6.17											2.33				29.92	6.17	1
GS	21	3746	KOPALNIA RYDULTOWY	11	TRIGO,MAIZ Y HARINA DE SOYA A GRANEL		01-05-06	01-06-06	1-185	4-C	10,384,788.00		10,384,788										19.75								1.83	17.83										2.92				42.33	19.66	1
GS	36	5246	ONEGO BAY	1	CONCENTRADO DE PLOMO		01-08-06	01-09-06	1-142	4-E		1,000,000.00	1,000,000										13.75								0.50											4.92				19.17	0.50	1
GS	62	1693	BCZA CHISTINA REM. MISS ANN	2	TRIGO A GRANEL		01-14-06	01-14-06	1-018	3	8,300,186.00		8,300,186										1.33								11.00											4.25				16.58	11.00	1
GS	64	3608	KANK NAREE	1	TRIGO A GRANEL		01-14-06	01-16-06	1-018	4-E	1,050,412.00		1,050,412				37.58																									2.83				40.41		1
GS	66	1103	BOONTRIKA NAREE	1	FERTILIZANTE A GRANEL		01-15-06	01-15-06	1-018	3	16,849,962.00		16,849,962				14.50														19.50													11.50		45.50	19.50	1
GS	73	2028	DESERT VOYAGER	23	SALVADO DE TRIGO		01-16-06	01-20-06	1-129	3	5,000,000.00		5,000,000										96.67								4.00											5.42				106.09	4.00	1
GS	95	3746	KOPALNIA RYDULTOWY	2	TRIGO,MAIZ Y HARINA DE SOYA A GRANEL		01-20-06	01-22-06	1-185	3	9,994,964.00		9,994,964										33.08								22.08	28.92		2.00												86.08	53.00	1
GS	102	7708	WISLA	1	HARINA DE SOYA Y MAIZ A GRANEL		01-22-06	01-24-06	1-185	4-E	11,329,729.00		11,329,729										41.00								20.00	29.25										1.50				91.75	49.25	1
GS	145	1580	CENTURY ELKHORN	43	FERTILIZANTE A GRANEL		02-01-06	02-01-06	1-018	4-C	11,257,407.00		11,257,407										4.75																							4.75		1
GS	169	3746	KOPALNIA RYDULTOWY	3	MAIZ Y TRIGO A GRANEL		02-06-06	02-06-06	1-185	3	10,767,740.00		10,767,740										21.00								37.00									1.00		1.50				60.50	37.00	1
GS	192	2124	BCZA DORIS GUENTHER REM. SHAR	1	TRIGO A GRANEL		02-11-06	02-11-06	1-185	3	2,270,000.00		2,270,000										5.50								13.25											2.75				21.50	13.25	1
GS	225	1918	CYNTHIA HARMONY	32	MAIZ Y HARINA DE SOYA A GRANEL		02-17-06	02-17-06	1-185	3	21,999,937.00		21,999,937										6.17								12.83											2.42				21.42	12.83	1
GS	248	3746	KOPALNIA RYDULTOWY	4	MAIZ ,TRIGO Y HARINA DE SOYA A GRANEL		02-20-06	02-21-06	1-185	4-O	10,993,396.00		10,993,396										17.92								1.00											3.58				22.50	1.00	1
GS	253	708	ASTA	1	CONCENTRADO DE PLOMO		02-21-06	02-22-06	1-142	4-O		1,000,000.00	1,000,000										0.25																			3.83				4.08		1
GS	268	7347	UBC SACRAMENTO	1	MAIZ ,TRIGO Y HARINA DE SOYA A GRANEL		02-25-06	02-25-06	1-185	3	23,002,168.00		23,002,168																																			1
GS	316	3746	KOPALNIA RYDULTOWY	5	TRIGO Y ARROZ A GRANEL		03-06-06	03-07-06	1-185	3	9,653,959.00		9,653,959										19.42								1.00	6.50										2.17				29.09	7.50	1
GS	344	2357	EUGENIE C	345	SALVADO DE TRIGO		03-11-06	03-15-06	1-129	4-O	3,000,000.00		3,000,000										89.00																			3.08				92.08		1
GS	345	7347	UBC SACRAMENTO	6004	GREEN DELAYED PETROLERO COKE	INCEHSA	03-12-06	03-12-06	1-229	3	30,755,850.00		30,755,850										0.25									25.50										2.08				27.83	25.50	1
GS	382	3746	KOPALNIA RYDULTOWY	6	MAIZ Y HARINA DE SOYA A GRANEL		03-18-06	03-19-06	1-185	4-O	10,392,417.00		10,392,417				16.67															9.42								1.00		2.00				29.09	9.42	1
GS	383	1518	CASTOR	1	FERTILIZANTE A GRANEL		03-19-06	03-19-06	1-018	3	8,424,833.00		8,424,833										0.17																			2.67				2.84		1
GS	383-1	1518	CASTOR	1	CONCENTRADO DE PLOMO		03-21-06	03-25-06	1-142	4-O		3,000,000.00	3,000,000										94.66								11.17											2.08				107.91	11.17	
GS	384	5143	OASSYS	1	CARGAR AZUCAR A GRANEL		03-19-06	03-20-06	1-018	4-E	2,700,000.00		2,700,000										34.08																			1.75				35.83		1
GS	393	7338	UBC BREMEN	6005	MAIZ ,TRIGO Y ARROZ A GRANEL		03-20-06	03-21-06	1-185	3	17,099,832.00		17,099,832										19.67								3.00											3.25				25.92	3.00	1
GS	401	2112	DS REGENT	1	FERTILIZANTE A GRANEL		03-23-06	03-23-06	1-018	4-O	3,540,000.00		3,540,000										6.00																			2.17				8.17		1
GS	416	556	ANTILLES III	82	MAIZ Y ARROZ A GRANEL		03-25-06	03-28-06	1-185	3	8,401,524.00		8,401,524	#####									17.75								15.67	37.08					1.50					1.42				75.67	54.25	1
GS	433	722	BCZA ATC 1800 REM.FALCON	8	TRIGO		03-28-06	03-28-06	1-185	4-O	10,059,049.00		10,059,049										2.83								7.00									1.00		2.83				13.66	7.00	1
GS	434	7341	UBC BATRON ROUGE	6004	MAIZ Y ARROZ A GRANEL		03-27-06	03-28-06	1-185	4-C	16,849,528.00		16,849,528										16.83								13.00					9.67						2.42				41.92	22.67	1
GS	436	6464	SIBONEY BELLE	11	ARROZ A GRANEL		03-28-06	03-31-06	1-018	4	12,798,330.00		12,798,330										75.92									28.25										2.17				106.34	28.25	1
GS	454	3744	KOPALNIA RYDULTOWY	7	ARROZ, HARINA DE SOYA Y TRIGO A GRANEL		03-31-06	04-03-06	1-185	3	9,360,147.00		9,360,147				75.92															34.25										2.67				112.84	34.25	1
GS	504	1034	BERDYANSK	1	SAL INDUSTRIAL A GRANEL		04-10-06	04-11-06	1-018	4-E	10,000,000.00		10,000,000										11.00								4.67					12.00				1.83		77.42				106.92	16.67	1
GS	517	556	ANTILLES III	83	FERTILIZANTE A GRANEL		04-13-06	04-15-06	1-018	3	4,243,649.00		4,243,649										44.50																			2.17				46.67		1
GS	520	6004	ROSELLA	1	MAIZ Y SOYA A GRANEL		04-13-06	04-16-06	1-185	4-O	23,043,414.00		23,043,414				57.50														2.17											1.33				61.00	2.17	1
GS	525	5257	ORLA	1	TRIGO Y HARINA DE SOYA A GRANEL		04-14-06	04-17-06	1-185	3	15,081,356.00		15,081,356										67.17								2.25					0.75						2.67				72.84	3.00	1
GS	538	3746	KOPALNIA RYDULTOWY	8	HARINA DE MAIZ A GRANEL		04-16-06	04-17-06	1-185	4-E	10,238,393.00		10,238,393										24.50								2.08					29.58						3.42				59.58	31.66	1
GS	540	551	ANTILLES I	105	AZUCAR A GRANEL		04-17-06	04-17-06	1-018	5-O		7,800,000.00	7,800,000										17.83																			2.17				20.00		1
GS	593	558	ANTILLES V	47	MAIZ Y HARINA DE SOYA A GRANEL		04-26-06	04-27-06	1-185	4-O	10,482.20		10,482										15.00																			1.42				16.42		1
GS	599	5596	POLYDEFKIS	6	FERTILIZANTE A GRANEL		04-29-06	04-29-06	1-185	3	11,499,742.00	3,000,000.00	14,499,742										0.08																			36.33				36.41		1
GS	607	3746	KOPALNIA RYDULTOWY	9	TRIGO Y HARINA DE SOYA A GRANEL		04-30-06	05-02-06	1-185	4-O	10,150,803.00		10,150,803										41.92																			1.75				43.67		1
GS	618	5586	POLYDEFKIS	5	CARGAR CONCENTRADO DE ZINC		05-04-06	05-06-06	1-142	3		3,000,000.00	3,000,000				65.00																									6.58				71.58		1
GS	637	5439	PAZ COLOMBIA	9	FERTILIZANTE A GRANEL		05-06-06	05-06-06	1-018	4-E	7,256,428.00		7,256,428										6.83																			3.33				10.16		1
GS	678	652	AZTECA		CARGAR CONCENTRADO DE ZINC		05-15-06	05-15-06	1-142	3		3,000,000.00	3,000,000										1.75																			3.33				5.08		1
GS	681	3746	KOPALNIA RYDULTOWY	10	TRIGO,MAIZ Y HARINA DE SOYA A GRANEL		05-16-06	05-16-06	1-185	4-E	10,643,345.00		10,643,345										15.17								4.83											3.00				23.00	4.83	1
GS	690	904	BALSA 55	49	FERTILIZANTE A GRANEL		05-17-06	05-17-06	1-018	3-O	4,300,000.00		4,300,000										3.58								3.58											2.92				10.08	3.58	1
GS	715	556	ANTILLES 111	85	MAIZ Y TRIGO A GRANEL		05-24-06	05-24-06	1-185	4-O	11,355,910.00		11,355,910										14.50								6.25											37.82				58.57	6.25	1
GS	715-1	6492	SIDER SWAN		CARGAR AGUA Y COMBUSTIBLE(LASTRE)		05-27-06	06-02-06	1-229	5-O	0.00		-																																			1
GS	725	7766	YANNIS	1	MALTA A GRANEL		05-25-06	05-29-06	1-018	4-O	3,300,000.00		3,300,000										101.00								0.92											4.42				106.34	0.92	1
GS	733	2607	GALILEO	35	SALVADO DE TRIGO A GRANEL		05-27-06	05-30-06	1-129	4-E	4,610,000.00		4,610,000										76.17								0.75											2.83				79.75	0.75	1
GS	736	1571	CENTURY QUEEN	24	FERTILIZANTE A GRANEL		05-27-06	05-27-06	1-018	4-O	10,832,751.00		10,832,751										0.17								1.17											2.67				4.01	1.17	1
GS	761	4944	NEW NIKKI	1	AZUCAR A GRANEL		05-31-06	06-01-06	1-185	3		8,540,000.00	8,540,000				33.67														10.00											7.08				50.75	10.00	1
GS	762	3746	KOPALNIA RYDULTOWY	11	TRIGO Y HARINA DE SOYA A GRANEL		05-31-06	06-05-06	1-185	4-C	10,740,324.00		10,740,324										115.00								15.75											2.50				133.25	15.75	1
GS	780	553	ANTILLES 11	29	FERTILIZANTE A GRANEL		06-04-06	06-04-06	1-018	4-O	3,797,500.00		3,797,500										5.67																			2.33				8.00		1
GS	796	3756	KOPALNIA BORYNIA	2	MAIZ ,TRIGO Y ARROZ A GRANEL		06-07-06	06-07-06	1-185	3	10,731,743.00		10,731,743										9.17								38.67	12.42										4.17				64.43	51.09	1
GS	798	4942	NEW BLESSING	6	SULFATO DE SODIO (SODA ASH)		06-07-06	06-09-06	1-185	3	5,003,990.00		5,003,990										40.67								7.83	12.83										2.92				64.25	20.66	1
GS	836	1787	COMET	6068	MAIZ A GRANEL		06-14-06	06-15-06	1-185	3-E	9,349,932.00		9,349,932										17.67								0.83											4.00				22.50	0.83	1
GS	839	6799	SUCHADA NAREE	1	FERTILIZANTE A GRANEL		06-15-06	06-15-06	1-018	4-O	18,000,000.00		18,000,000										0.58								0.83	1.75										5.25				8.41	2.58	1
GS	847	3746	KOPALNIA RYDULTOWY	12	HARINA,TRIGO,ARROZ Y MAIZ A GRANEL		06-17-06	06-17-06	1-185	4-C	9,493,976.00		9,493,976										15.92								3.75											2.42				22.09	3.75	1
GS	859	3756	KOPALNIA BORYNIA	3	MAIZ,HARINA,TRIGO Y HARINA DE SOYA		06-19-06	06-19-06	1-185	4-E	10,834,074.00		10,834,074										8.75								15.50											3.17				27.42	15.50	1
GS	860	2102	DION	1	MAIZ A GRANEL		06-19-06	06-20-06	1-185	3	23,099,973.00		23,099,973										22.25								47.33	48.75										1.33				119.66	96.08	1
GS	870	1787	COMET	1	CARGAR CONCENTRADO DE ZINC		06-22-06	06-23-06	1-142	4-O		3,000,000.00	3,000,000				29.92														38.25	32.33										2.25				102.75	70.58	1
GS	920	3078	HONOR	1	SAL A GRANEL		07-02-06	07-04-06	1-018	4	18,452.00		18,452										35.33								15.67											13.17				64.17	15.67	1
GS	923	3756	KOPALNIA BORYNIA	4	MAIZ,HARINA,TRIGO Y HARINA DE SOYA		07-03-06	07-04-06	1-185	4-E	9,626,283.00		9,626,283										38.00								4.00											2.25				44.25	4.00	1
GS	927	3746	KOPALNIA RYDULTOWY	13	HARINA,TRIGO,ARROZ Y MAIZ A GRANEL		07-03-06	07-09-06	1-185	3	9,851,243.00		9,851,243										22.92								10.83	31.83										3.33				68.91	42.66	1
GS	947	1693	BCZA CHISTINA REM. MISS ANN	1	TRIGO A GRANEL		07-07-06	07-10-06	1-018	3-O	5,720,000.00		5,720,000										74.42								3.67											11.75				89.84	3.67	1

GS	968	537	ANNETTA	2318	GREEN DELAYED PETROLERO COKE	INCEHSA	07-12-06	07-15-06	1-229	3	33,062,578.00		33,062,578									1.50							0.42										3.00			4.92	0.42	1
GS	973	1751	CLIPPPER BEAUFORT	1	GRANO SECO, HARINA DE SOYA, ARROZ A GRANE		07-12-06	07-25-06	1-185	4-E	19,208,563.00		19,208,563		21.75														27.08	97.92							2.00		2.33			151.08	125.00	1
GS	982	7214	TRADE WIND	318	SALVADO DE TRIGO A GRANEL		07-14-06	07-22-06	1-129	4-O	6,000,000.00		6,000,000									166.30							15.17	30.00									3.50			154.97	45.17	1
GS	990	7343	UBC SAVANNAH	6002	CARBON BITUMINOSO	CENOSA	07-15-06	07-22-06	1-129	3-O	30,528,836.00		30,528,836									0.83								10.25		31.67							3.33			46.08	41.92	1
GS	1003	3756	KOPALNIA BORYNIA	5	TRIGO,MAIZ Y HARINA DE SOYA A GRANEL		07-18-06	07-25-06	1-185	4-E	10,774,753.00		10,774,753		50.42														4.17	8.83									2.58			56.00	13.00	1
GS	1006	2552	FU KANG SHAN	66	CONCENTRADO DE PLOMO A GRANEL		07-19-06	07-25-06	1-142	4-O		1,000,000.00	1,000,000		87.08														2.83										0.25			90.16	2.83	1
GS	1023	5804	BCZA SUGAR EXPRESS	1	SOYA A GRANEL		07-22-06	07-30-06	1-018	4-O	9,815,412.00	43,500.00	9,858,912									70.33							4.17										7.00			81.50	4.17	1
GS	1030	5438	PAZ COLOMBIA	1	FOSFATO MONOCALCIO A GRANEL		07-23-06	07-30-06	1-018	4-E	7,395,774.00		7,395,774		55.00														3.92	58.92							0.50		2.67			120.01	63.84	1
GS	1072	1571	CENTURY QUEEN	27	FERTILIZANTE A GRANEL		08-01-06	08-04-06	1-018	4-O	12,200,000.00		12,200,000									0.33							1.92										2.75			5.00	1.92	1
GS	1083	3756	KOPALNIA BORYNIA	6	MAIZ,HARINA,TRIGO Y HARINA DE SOYA		08-03-06	08-04-06	1-185	3	10,096,218.00		10,096,218		21.42														2.00										3.08			26.50	2.00	1
GS	1103	7603	WINSOME WISDOM	1	MAIZ A GRANEL		08-06-06	08-07-06	1-185	4-O	10,386,365.00		10,386,365									17.17							39.00								1.00		1.58			58.75	38.00	1
GS	1104	7732	XENIA	7	CONCENTRADO DE ZINC A GRANEL		08-06-06	08-08-06	1-142	5-O		10,000,000.00	10,000,000									43.08							16.33	46.00									5.00			110.41	62.33	1
GS	1108	1847	CORNELIA	25	MAIZ Y HARINA DE SOYA A GRANEL		08-07-06	08-07-06	1-185	3	20,999,467.00		20,999,467									42.83							8.50	44.00									3.08			98.41	52.50	1
GS	1113	806	AUGUSTE OLDENDORFF	61749	MAIZ TRIGO Y ARROZ A GRANEL		08-08-06	08-08-06	1-185	4-E	15,713,136.00		15,713,136									9.92							31.58	13.83									2.75			58.08	45.41	1
GS	1134	1144	BASS BULKER	1	FERTILIZANTE A GRANEL		08-10-06	08-14-06	1-018	3	15,170,890.00		15,170,890		35.00														5.33										2.00			42.33	5.33	1
GS	1147	421	AMY C	1	FERTILIZANTE A GRANEL		08-15-06	08-16-06	1-185	4-E	12,800,000.00		12,800,000									25.67							8.50	22.00									3.17			58.34	30.50	1
GS	1148	3756	KOPALNIA BORYNIA	7	TRIGO,MAIZ Y ARROZ A GRANEL		08-16-06	08-16-06	1-185	4-E	10,109,571.00		10,109,571									9.00							4.83	22.08									2.92			38.83	26.91	1
GS	1162	6899	SVILAS	1	FERTILIZANTE A GRANEL		08-19-06	08-19-06	1-018	4-E	8,693,518.00		8,693,518		19.58														3.42										6.75			29.75	3.42	1
GS	1166	2478	FEDERAL FUJI	418	MAIZ Y ARROZ A GRANEL		08-19-06	08-23-06	1-185	4-O	20,835,751.00		20,835,751		98.42																											98.42		1
GS	1176	6227	SEA HARMONY	9	LAMINA,VIGA,VEHICULOS Y MALTA A GRANEL		08-20-06	08-20-06	1-185	3	4,148,428.00		4,148,428		5.33														3.58										5.75			14.66	3.58	1
GS	1182	806	AUGUSTE OLDENDORFF	61749	TRIGO Y HARINA DE SOYA A GRANEL		08-23-06	08-23-06	1-185	3-E	15,802,631.00		15,802,631		38.17														12.67	7.75									1.33			59.92	20.42	1
GS	1194	3657	LAUREL	1	FERTILIZANTE A GRANEL		08-25-06	08-29-06	1-018	4-E	13,073,000.00		13,073,000																															1
GS	1216	3756	KOPALNIA BORYNIA	8	TRIGO Y ARROZ A GRANEL		08-28-06	08-30-06	1-185	4-O	10,336,387.00		10,336,387		44.75														12.00	81.08									2.83			140.66	93.08	1
GS	1219	4343	MASURIEN	417	FERTILIZANTE A GRANEL		08-28-06	08-29-06	1-229	5-E	2,417,521.00		2,417,521		19.82														18.00										2.33			40.25	18.00	1
GS	1261	3817	GRETKE OLDEN DORFF	618995	FERTILIZANTE A GRANEL		09-06-06	09-07-06	1-185	3-O	19,083,242.00		19,083,242									28.67							13.33			0.17							3.00			43.17	13.50	1
GS	1319	7622	WARTA	1	TRIGO Y HARINA DE SOYA A GRANEL		09-20-06	09-20-06	1-185	4-O	12,118,089.00		12,118,089									7.00							2.33										2.33			11.66	2.33	1
GS	1324	5568	PILICA	1	HARINA DE GALLETA Y MAIZ AMARILLO A GRANEL		09-21-06	09-22-06	1-185	4-E	15,080,736.00		15,080,736									24.08							3.00	2.92									2.08			32.08	5.92	1
GS	1327	7214	TRADEWIND		SALVADO DE TRIGO A GRANEL		09-21-06	09-25-06	1-129	4-E	7,000,000.00		7,000,000									96.00							5.50										2.42			103.92	5.50	1
GS	1338	7348	UBC BALBOA	1	HARINA DE SOYA Y MAIZ AMARILLO A GRANEL		09-23-06	09-24-06	1-185	3	21,654,994.00		21,654,994		20.67														16.67	26.25									6.50			70.09	42.92	1
GS	1344	811	AUDRE	1	CONCENTRADO DE PLOMO A GRANEL		09-24-06	09-28-06	1-142	4-O		3,000,000.00	3,000,000		90.42														5.58										4.67			100.67	5.58	1
GS	1377	1597	CENTURY SEYMOUR	1	FERTILIZANTE A GRANEL		09-30-06	09-30-06	1-018	4-E	9,800,000.00		9,800,000									1.42							5.75	22.08									3.08			32.33	27.83	1
GS	1384	7622	WARTA	2	HARINA DE SOYA Y MAIZ AMARILLO A GRANEL		10-01-06	10-03-06	1-185	4-O	12,361,235.00		12,361,235		49.33														4.42										2.33			56.08	4.42	1
GS	1408	5568	PILICA	2	TRIGO ,ARROZ Y HARINA DE SOYA A GRANEL		10-05-06	10-06-06	1-185	3	15,212,419.00		15,212,419									8.92							28.50	38.67									4.33			76.42	65.17	1
GS	1443	4211	MARK C	1	MAIZ ,TRIGO Y ARROZ A GRANEL		10-13-06	10-14-06	1-185	3	17,112,170.00		17,112,170									20.67								10.25									13.58			50.50	10.25	1
GS	1446	7622	WARTA	1	TRIGO Y MAIZ A GRANEL		10-13-06	10-14-06	1-185	4-O	12,483,317.00		12,483,317									27.83							0.50	43.38									3.00			74.71	43.88	1
GS	1478	3741	KOPALNIA HALEMBA		MAIZ ,TRIGO Y HARINA DE SOYA A GRANEL		10-19-06	10-20-06	1-185	5-O	10,335,707.00		10,335,707									24.58							3.58	23.50							1.00		1.92			54.58	27.08	1
GS	1483	6169	SANKO ETERNAL	1	ARROZ Y MAIZ A GRANEL		10-20-06	10-24-06	1-185	4-O	21,999,891.00		21,999,891		103.50															30.58									2.92			137.00	30.58	1
GS	1520	811	AUDRE		CARGA CONCENTRADO		10-27-06	10-27-06	1-142	3		2,000,000.00	2,000,000									7.33																	6.08			13.41		1
GS	1573	3741	KOPALNIA HALEMBA	2	TRIGO Y HARINA DE SOYA A GRANEL		11-07-06	11-07-06	1-185	3-O	10,098,338.00		10,098,338									13.58																	3.00			16.58		1
GS	1593	2859	GULFWIND	266	SALVADO DE TRIGO A GRANEL		11-11-06	11-15-06	1-129	3	4,080,000.00		4,080,000									91.25																	2.75			94.00		1
GS	1597	1693	BCZA CRISTINA REM. MISS ANN	1	SOYA A GRANEL		11-12-06	11-18-06	1-018	4-O	6,500,000.00		6,500,000									146.00							29.08	56.83									6.25			238.16	85.91	1
GS	1621	4847	MORAKOT NAREE	1	TRIGO,MAIZ Y HARINA DE SOYA A GRANEL		11-17-06	11-17-06	1-185	3	15,139,454.00		15,139,454									12.92							85.00	25.08									3.08			126.08	110.08	1
GS	1627	7342	UBC STAVANGER	6012	CARBON A GRANEL		11-18-06	11-19-06	1-129	3	30,256,290.00		30,256,290									33.50																	1.58			35.08		1
GS	1632	3741	KOPALNIA HALEMBA	3	ARROZ, HARINA DE SOYA Y TRIGO A GRANEL		11-19-06	11-24-06	1-185	3	9,193,541.00		9,193,541									127.33							18.75	23.08									3.25			171.41	41.83	1
GS	1650	5253	AORIENT SUNRISE	13	MAIZ Y HARINA DE SOYA A GRANEL		11-23-06	11-28-06	1-185	3	24,725,138.00		24,725,138		130.00														16.58										2.03			148.61	16.58	1
GS	1671	7622	WARTA	4	MAIZ,HARINA DE SOYA Y ARROZ A GRANEL		11-26-06	11-29-06	1-185	4-O	11,216,927.00		11,216,927									69.17							15.75	1.58									2.42			88.92	17.33	1
GS	1685	5226	OLMECA	1	CONTENEDORES,TRASFERENCIA Y CONCENTRAD		11-30-06	12-01-06	1-142	5-O		10,053,000.00	10,053,000									26.92							54.08	90.82									1.60			172.42	144.90	1
GS	1727	5248	ONEGO RUNNER	1	SOYA A GRANEL		12-08-06	12-12-06	1-018	4-O	5,184,995.00		5,184,995		66.82														2.17										20.80			88.59	2.17	1
GS	1729	4291	BCZA MARIE FOOD REM. JANIS GUZZ	1	MAIZ Y HARINA DE SOYA A GRANEL		12-09-06	12-11-06	1-185	4	23,996,213.00		23,996,213		61.08														21.50										9.92			92.50	21.50	1
GS	1741	3741	KOPALNIA HALEMBA	4	TRIGO Y ARROZ A GRANEL		12-11-06	12-12-06	1-185	3	24,464,790.00		24,464,790		28.17														20.00	55.50									2.58			106.22	75.50	1
GS	1744	241	ALERCE N	1	ARROZ EN GRANZA A GRANEL		12-12-06	12-18-06	1-018	4-E	17,303,655.00		17,303,655		155.92														29.83	15.67					36.00				1.83			238.25	81.50	1
GS	1748	3746	KOPALNIA RYDULTOWY	14	TRIGO Y MAIZ A GRANEL		12-13-06	12-19-06	1-185	4-O	10,865,772.00		10,865,772		144.00														2.17	59.33									3.08			209.58	61.48	1
GS	1768	7622	WARTA	5	MAIZ,HARINA DE SOYA Y ARROZ A GRANEL		12-16-06	12-21-06	1-185	4-E	11,450,013.00		11,450,013		125.58														7.50	65.92									2.25			200.85	73.42	1
GS	1770	3656	LISANNE	8	CARGAR MADERA		12-17-06	12-18-06	1-229	5-E		2,155,210.00	2,155,210									22.50							0.58										8.08			29.16	0.58	1
GS	1779	3438	PATAGONIA	1	FERTILIZANTE A GRANEL		12-18-06	12-26-06	1-018	5-O	13,005,508.00		13,005,508		192.25														7.83	27.58									2.33			230.00	35.51	1
GS	1781	553	ANTILLES II	1	CARGAR AZUCAR MORENA A GRANEL		12-19-06	12-26-06	1-018	4-O		3,720,000.00	3,720,000		202.00														1	16.60									5.33			224.93	17.60	1
GS	1800	1159	BITLIS	1	ARROZ A GRANEL		12-23-06	12-29-06	1-018	3	13,617,000.00		13,617,000		149.08														16.83	17.83									2.70			186.44	34.66	1
GS	1807	3859	LANGENES	1	ARROZ A GRANEL		12-23-06	01-02-07	1-018	4-O	4,008,088.00		4,008,088		224.25														3.25										1.58			229.08	3.25	1
											128197038	85311710	1,333,569	2.25	0	0	2568.67	0	0	0	0	2624.32	0	0	0	0	0	0	1088.06	1451.71	0	33.64	0	88	1.5	0	0	9.33	0	548.76	0	11.5	0	8425.84	2863.11	121

DEMORAS DE LOS BARCOS DESDE LA HORA DE ARRIBO AL PUERTO A LA HORA DE ATRAQUE

Ships delays from arrival to the Port to the Berthing time

1	2	ESPERANDO VISITA OFICIAL	Waiting for Officials
2	0	POR FALTA O REVISION DE DOCUMENTOS	Missing/revision of Documents
3	0	MANIOBRAS DE ATRAQUE	Berthing maneuverings
4	2,589	SIN ATRACADERO DISPONIBLE	No berth available
5	0	SIN FLETE EN PUERTO	No transportation at port
6	0	FUERTES MAREAS O HURACANES	Strong swells or hurricanes
7	0	POR NO PAGAR SOBRETIEMPO	To avoid payment of overtime
8	0	POR DEUDAS PENDIENTES E.N.P.	Due to ENP pending debts
9	0	ARRIBO SIN AVISO	Arrival w/o prior notice
10	2,624	ESPERANDO ORDENES	Waiting for instructions

DEMORAS DE LOS BARCOS ANTES DE PRINCIPIAR SUS OPERACIONES UNA VEZ ATRACADOS

Ship delays before beginning of operations

101	0	ESPERANIANDO VISITA OFICIAL	Waiting for Officials
102	0	ESPERRANDO TRABAJADORES A BORDO	Waiting for Stevedores
103	0	ESPERANDO TRABAJADORES E.N.P.	Waiting for ENP personnel
104	0	ESPERANDO CARGA	Waiting for cargo
105	0	POR LLUVIA	Due to rain
106	0	OTRAS CAUSAS E N.P.	Other causes by ENP
107	0	OTRAS CAUSAS NAVIEROS	Other causes Shipowner

DEMORAS DE LOS BARCOS DURANTE SUS OPERACIONES

DELAYS DURING OPERATIONS

201	1,088	LLUVIA O MAL TIEMPO	Rain or bad weather
202	1,452	CAMBIO DE ATRACADERO	Moving to other berth
203	0	ESPERANDO CARGA	Waiting for cargo
204	34	ESPERANDO TRANSPORTE	Waiting for transport
205	0	POR FALLAS EN OPERACIONES	Troubles during operations
206	88	OTRAS CAUSAS E N.P.	Other causes by ENP
207	2	DESCANSO POR COMIDA	Meal breaks
208	0	OTRAS CAUSAS NAVIEROS	Other causes Shipowner

DEMORAS DE LOS BARCOS UNA VEZ FINALIZADAS LAS OPERACIONES

Ship delays after the completion of its operations

301	0	ESPERANDO PILOTO	Waiting for Pilot
302	0	OTRAS CAUSAS E.N.P.	Other causes by ENP
303	0	FALLAS DEL BARCO	Ship problem
304	547	OTRAS CAUSAS NAVIEROS	Other causes Shipowner
305	0	ORDENES DE AUTORIDADES DE PUERTO	By Order of Port Authority*
306	12	FUERTES MAREAS O HURACANES	Strong swell or hurricane
307	0	ESPERANDO DOCUMENTOS AGENCIA	Waiting for documents from Agent

2,663 hours delays during operations

8,426 hours total delays

Notes * is an authority different from ENP. May be a Port Captain

OPERATIONAL YIELDS 2004
RENDIMIENTOS OPERACIONALES 2004

Non-organic in yellow | Multiple organic in green | Data used

Type	Berthing	No.of Vessel	Vessel Name	Voyage No.	Product Class	Arrival Date	Berth date	Agency Code	Berth# Used	TOTAL KILOS	tons/hour gross	tons/hour net	Delay hours	ENP	Client	Others	Gross operat. hours	% delay of total hours	Net operat. hours	Berth hours Gross	Berth hours NET	Port hours	Total waiting h at port	% NET hours at port	LOA in feet	GRT tons
											Data used									Data used		Data used			Data used	
TIPO	ATRAQUE	No. DE NAVE	NOMBRE DEL BUQUE	NO DE VIAJE	CLASE DE PRODUCTO	FECHA DE ARRIBO	FECHA ATRAQUE	CODIGO DE AGENCIA	MUELLE UTILIZADO	TOTAL KILOS	POR TONELADA REN BTO	POR TONELADA REN NTO	TOTAL DEMORAS	ENP	CLIENTE	OTRAS	TIEMPO BRUTO OPERADO	% DEMORAS T. BRUTAS	TIEMPO NETO OPERADO	HRS MUELLES (BRUTAS)	HRS. MUELLES (NETAS)	HORAS PUERTO	TOTAL DEMORAS EN EL PUERTO	% T. NETO HRS PUERTO	ESLORA EN PIES	TRB TONELADAS
GS	15	5436	BETTY WOOD/ PAT CANTRELL	1	TRIGO A GRANEL	03-01-04	06-01-04	1-018	3-4O	22199038	93308.55	110857	37.66	0.83			237.91	16%	200.25	257.17	257.17	328.33	0.83	61%	550	974
GS	27	2607	GALILEO	6	SALVADO EN PELLETS	06-01-04	08-01-04	1-129	4-E	4100000	58705.61	84536	21.34	8.92	2.92	43.92	69.84	31%	48.50	73.59	66.67	118.83	53.76	41%	556	17357
GS	36	229	ALAMO	1	MAIZ Y SOYA A GRANEL	07-01-04	12-01-04	1-185	3	18611657	175996.78	249252	31.08				105.75	29%	74.67	113.67	98.17	225.50	-	33%	528	15274
GS	45	4993	NIDA	6	MAIZ Y TRIGO A GRANEL	31-12-03	31-12-03	1-185	4-O	11419000	139256.10	164113	12.42		5.08	41.75	82.00	15%	69.58	88.84	88.84	131.66	46.83	53%	471	9815
GS	53	5531	PERLA	1	HARINA Y ARROZ A GRANEL	10-01-04	15-01-04	1-018	4-O	13196371	88715.10	99468	16.08	120.25	8.50	14.75	148.75	11%	132.67	154.00	152.67	279.00	143.50	48%	477	10320
GS	71	7622	WARTA	70	HARINA DE SOYA	14-01-04	17-01-04	1-185	3	11000000	113017.57	169675	32.5				97.33	33%	64.83	100.75	72.75	160.75	-	40%	471	9815
GS	77	4209	MARATHON	1	SARGAR AZUCAR	16-01-04	16-01-04	1-018	5-EN	2182	56.06	57	0.5				38.92	1%	38.42	42.66	42.16	49.75	-	77%	258	1655
GS	138	1098	BENEDETTA DAMATO	11	CARBON MINERAL	28-01-04	29-01-04	1-129	3	28514110	472635.67	472636	0				60.33	0%	60.33	65.17	65.17	79.17	-	76%	560	17951
GS	145	6083	SALOMA	1	CONCENTRADO DE ZINC	30-01-04	03-02-04	1-142	3	3000000	70307.01	70307	0				42.67	0%	42.67	47.17	47.17	165.50	-	26%	445	9529
GS	180	7622	WARTA	2	MAIZ,SOYA Y ARROZ A GRANEL	01-02-04	02-02-04	1-185	3	10730385	159157.30	192473	11.67				67.42	17%	55.75	71.58	71.58	112.42	-	50%	471	9815
GS	255	7622	WARTA	3	MAIZ Y SOYA A GRANEL	20-02-04	21-02-04	1-185	4-E	11715788	197202.29	263335	14.92				59.41	25%	44.49	61.83	46.91	79.00	-	56%	471	9815
GS	258	5526	PERLA II	1	TRIGO Y ARROZ A GRANEL	20-02-04	24-02-04	1-018	3	14103484	106105.06	125823	20.83				132.92	16%	112.09	162.09	147.84	248.66	-	45%	476	10274
GS	277	7338	UBC BREMMEN	4004	MAIZ, SOYA ,TRIGO Y SALVADO	23-02-04	24-02-04	1-185	4-E	18991323	198342.80	260762	22.92				95.75	24%	72.83	102.50	86.08	120.75	-	60%	506	14708
GS	310	5531	PERLA	47	TRIGO Y SOYA A GRANEL	02-03-04	06-03-04	1-018	3	14797279	87299.58	126570	52.59				169.50	31%	116.91	175.83	126.66	274.08	-	43%	477	10320
GS	318	7622	WARTA	4	MAIZ Y SOYA A GRANEL	04-03-04	06-04-04	1-185	4-C	9682900	168632.88	193968	7.5				57.42	13%	49.92	59.33	51.83	110.08	-	45%	471	9815
GS	332	3748	KOPALNIA RYDULTOWY	175	UREA NITRATO	07-03-04	09-03-04	1-185	4-E	10383094	162235.84	182160	7				64.00	11%	57.00	75.92	75.92	127.75	-	45%	471	8897
GS	349	1893	BARCAZA CHRISTINA	27	TRIGO A GRANEL	09-03-04	10-03-04	1-018	4-E	8500000	70247.93	74184	6.42				121.00	5%	114.58	141.92	141.92	196.58	-	58%	330	4247
GS	382	7622	WARTA	5	MAIZ Y SOYA A GRANEL	16-03-04	16-03-04	1-185	4-E	11229645	181621.30	181621	0				61.83	0%	61.83	66.50	66.50	77.25	-	80%	471	9815
GS	407	2174	EDDA	1	MALTA A GRANEL	20-03-04	20-03-04	1-018	4-O	2761754	64226.84	73647	5.5				43.00	13%	37.50	45.41	45.41	55.83	-	67%	323	2729
GS	416	3746	KOPALNIA RYDULTOWY	2	MAIZ A GRANEL	21-03-04	23-03-04	1-185	3	11044014	142503.41	168611	12				77.50	15%	65.50	84.25	84.25	128.42	-	51%	471	8897
GS	430	1597	CENTURY SEYMOUR	36	FERTILIZANTE A GRANEL	24-03-04	26-03-04	1-018	5-O	8250000	257169.58	257170	0				32.08	0%	32.08	35.25	35.25	69.83	-	46%	450	9978
GS	433	5759	RAYS	1	MAIZ Y SOYA A GRANEL	25-03-04	27-03-04	1-185	4-O	21823722	114818.26	137076	30.58				188.33	16%	157.75	191.25	167.75	228.33	-	69%	594	18649
GS	455	5288	OSSA	8	SALVADO [Bran]	29-03-04	01-04-04	1-129	3	5200000	68421.05	77996	9.33				76.00	12%	66.67	80.91	71.58	148.50	-	45%	557	17356
GS	457	7622	WARTA	6	MAIZ Y SOYA A GRANEL	29-03-04	02-04-04	1-185	5-O	11277335	164632.63	164633	0				68.50	0%	68.50	73.83	73.83	94.50	-	72%	471	9815
GS	460	1101	BBC PACIFIC	1	CONCENTRADO DE ZINC	30-03-04	01-04-04	1-142	4-E	1000000	61538.46	61538	0				16.25	0%	16.25	21.08	21.08	64.50	-	25%	354	6170
GS	469	2426	FALCON	19	CARBON MINERAL	31-03-04	04-04-04	1-229	4-O	31575870	685240.23	686978	0.25				46.08	1%	45.83	49.25	49.00	154.00	-	30%	597	25929
GS	477	1893	BARCAZA CHRISTINA	28	MAIZ A GRANEL	02-04-04	12-04-04	1-018	4-E	5866357	24893.31	27958	25.91				235.66	11%	209.75	272.33	272.33	512.00	-	41%	330	4247
GS	483	3748	KOPALNIA RYDULTOWY	3	MAIZ Y SOYA A GRANEL	03-04-04	06-04-04	1-185	4	10594757	270550.49	270550	0				39.16	0%	39.16	42.33	42.33	113.75	-	34%	471	8897
GS	499	416	AN JI JIANG	4	ASFALTO	05-04-04	07-04-04	1-129	3	3901670	201845.32	201845	0				19.33	0%	19.33	24.67	24.67	57.92	-	33%	348	3951
GS	501	7213	TOLTECA	1	CARGAR CONCENTRADO DE ZINC Y	06-04-04	11-04-04	1-142	4-O	3000000	56338.03	61656	4.75				53.25	9%	48.50	59.16	59.16	174.33	-	28%	508	13231
GS	507	2684	GOLD FRIDAY	1	FERTILIZANTE A GRANEL	06-04-04	09-04-04	1-018	3	14698281	103992.37	139320	35.84				141.34	25%	105.50	153.92	131.25	240.92	-	44%	587	18895
GS	512	898	BALSA 63	3	FERTILIZANTE A GRANEL	08-04-04	13-04-04	1-018	5-O	6301269	101095.28	171884	25.67				62.33	41%	36.66	65.09	47.84	192.50	-	19%	346	4355
GS	524	7622	WARTA	7	TRIGO, MAIZ Y SOYA A GRANEL	11-04-04	16-04-04	1-185	3	12110674	169380.06	193771	9				71.50	13%	62.50	75.91	75.91	197.50	-	32%	471	9815
GS	589	3756	KOPALNIA BORYNIA	1	MAIZ Y SOYA A GRANEL	23-04-04	23-04-04	1-185	3	10821030	229016.51	229017	0				47.25	0%	47.25	51.84	51.84	64.17	-	74%	472	8893
GS	604	7622	WARTA	8	SOYA A GRANEL	28-04-04	28-04-04	1-185	4-E	9098240	119713.68	123651	2.42				76.00	3%	73.58	82.00	82.00	89.50	-	82%	471	9815
GS	644	1052	BZA HUDSON Y REMOL MISS CHLOE	3	TRIGO A GRANEL	07-05-04	08-05-04	1-018	4	6000000	69565.22	81633	12.75				86.25	15%	73.50	98.75	98.75	142.00	-	52%	272	4114
GS	652	7214	TRADEWIND	1	SALVADO A GRANEL	09-05-04	09-05-04	1-129	3	5225398	73000.81	73001	0				71.58	0%	71.58	75.25	75.25	81.09	-	88%	557	17356
GS	660	7622	WARTA	9	MAIZ, TRIGO,ARROZ Y HARINA A GR	11-05-04	11-05-04	1-185	4-O	12474548	162175.61	165775	1.67				76.92	2%	75.25	79.92	79.92	87.92	-	86%	471	9815
GS	691	6283	SEA BAISEN	1	HARINA DE SOYA	18-05-04	18-05-04	1-185	4-O	9600000	87074.83	98290	12.58				110.25	11%	97.67	112.75	111.67	119.00	-	82%	564	17172
GS	695	5018	NIKOLAOS G	1	CARGAR CONCENTRADO	19-05-04	21-05-04	1-142	5-O	3000000	47125.35	65217	17.68				63.86	28%	46.00	68.00	61.67	111.58	-	41%	432	7188
GS	705	902	BALSA 58	8	FERTILIZANTE A GRANEL	19-05-04	21-05-04	1-018	3	6330809	119449.23	151927	11.33				53.00	21%	41.67	55.50	55.17	83.50	-	50%	325	4355
GS	720	7622	WARTA	10	TRIGO,ARROZ ,MAIZ	23-05-04	24-05-04	1-185	4-O	11343012	198408.47	198408	0				57.17	0%	57.17	65.83	65.83	86.25	-	66%	471	9815
GS	731	1597	CENTURY SEYMOUR	39	FERTILIZANTE A GRANEL	26-05-04	27-05-04	1-018	3	8200081	312384.04	312384	0				26.25	0%	26.25	30.17	30.17	40.08	-	65%	450	9978
GS	733	5408	PAKRAC	1	MAIZ,TRIGO Y SOYA A GRANEL	27-05-04	27-05-04	1-185	4-O	25761320	96365.24	112089	37.5				267.33	14%	229.83	271.50	235.50	279.75	-	82%	616	22372
GS	739	4386	MAY	6	MALTA	28-05-04	28-05-04	1-229	5-O	4094377	51559.97	67220	18.5				79.41	23%	60.91	90.50	72.00	114.00	-	53%	272	3775
GS	746	5152	OCEANO DREAM	1	FERTILIZANTE A GRANEL	29-05-04	30-05-04	1-018	3	6089421	173191.72	173192	0				35.16	0%	35.16	38.58	38.58	68.25	-	52%	331	4380
GS	755	8652	SOTIRIA	1	ARROZ Y TRIGO A GRANEL	31-05-04	01-06-04	1-018	3	18779239	101372.41	128186	38.75				185.25	21%	146.50	189.50	154.25	221.42	-	66%	539	13677
GS	756	3611	KASTOR P	1	SOYA Y ARROZ A GRANEL	31-05-04	04-06-04	1-185	4-E	18698201	111133.44	177369	62.83				168.25	37%	105.42	172.91	112.08	270.75	-	39%	528	14312
GS	761	4993	NIDA	7	MAIZ A GRANEL	01-06-04	08-06-04	1-185	4-C	11879979	179320.44	554621	44.83				66.25	68%	21.42	68.59	48.76	233.87	-	9%	471	9815
GS	794	5422	PATHFINDER	1	FERTILIZANTE A GRANEL	08-06-04	11-06-04	1-018	3	13612128	116922.59	170856	36.75				116.42	32%	79.67	123.25	98.50	194.50	-	41%	590	18430
GS	840	931	BALSA -57	1	FERTILIZANTE A GRANEL	17-06-04	22-06-04	1-018	5-O	6301924	182241.87	547993	23.08				34.58	67%	11.50	37.59	37.59	105.00	-	11%	346	4355
GS	852	4993	NIDA	1	MAIZ,TRIGO Y SOYA	19-06-04	20-06-04	1-185	4-E	10897577	162698.99	186045	8.17				65.87	12%	57.50	67.83	67.83	88.67	-	65%	471	9815
GS	859	5502	PERSENK	1	SOYA A GRANEL	21-06-04	22-06-04	1-185	3	11000000	155477.03	155477	0				70.75	0%	70.75	77.42	77.42	119.67	-	64%	466	10220
GS	902	4993	NIDA	9	MAIZ Y TRIGO A GRANEL	01-07-04	01-07-04	1-185	3	12813815	169360.49	199189	11.33				75.66	15%	64.33	78.00	78.00	84.67	-	76%	471	9815
GS	929	6292	SEA HOPE	1	SOYA A GRANEL	07-07-04	08-07-04	1-185	4-O	16310000	77452.75	132146	87.15				210.58	41%	123.43	217.33	178.28	239.42	-	52%	559	16021

GS	949	1223	BUSSARA NAREE	1	MAIZ ,ARROZ Y SOYA A GRANEL	10-07-04	13-07-04	1-185	5-O	16850826	137456.77	214633	44.08				122.59	36%	76.51	125.42	99.17	193.42	-	41%	475	11474	1
GS	959	4993	NIDA	10	GRANOS [Grains]	13-07-04	17-07-04	1-185	3	12416895	208407.10	241527	8.17				59.58	14%	51.41	66.75	65.33	159.33	-	32%	471	9815	1
GS	981	3967	LITA	1	CONCENTRADO DE ZINC	17-07-04	21-07-04	1-142	3	3000000	42504.96	44425	3.06				70.58	4%	67.53	74.50	74.50	167.67	-	43%	486	11121	1
GS	986	6543	SIR JACOB	1	FERTILIZANTE A GRANEL	18-07-04	20-07-04	1-018	5-O	6012586	128391.97	148790	6.42				46.63	14%	40.41	51.00	51.00	94.34	-	48%	372	6000	1
GS	1010	1081	BOGDAN	10	SOYA A GRANEL	23-07-04	23-07-04	1-185	5-O	11000000	171206.23	171675	0.25				64.25	0%	64.00	68.59	68.34	60.16	-	80%	466	10220	1
GS	1013	1734	CLIPPER FALCON	1	MAIZ Y TRIGO A GRANEL	24-07-04	25-07-04	1-185	3	15765263	146204.79	168248	13				107.83	12%	94.83	112.41	112.41	149.50	-	63%	490	11542	1
GS	1030	1223	BUSSARA NAREE	2	ARROZ, TRIGO, MAIZ, SOYA A GRAN	27-07-04	27-07-04	1-185	5-O	15621800	140005.38	140005	0				111.58	0%	111.58	116.00	116.00	126.00	-	67%	475	11474	1
GS	1038	4993	NIDA	11	ARROZ Y MAIZ A GRANEL	28-07-04	30-07-04	1-185	4-O	8559950	135335.18	135335	0				63.25	0%	63.25	66.34	66.34	90.92	-	70%	471	9815	1
GS	1054	6012	ROSINA TOPIC	0	CARBON MINERAL	02-08-04	02-08-04	1-129	3	36537680	456499.17	456499	0				54.42	0%	84.42	88.63	88.63	90.08	-	94%	510	26216	1
GS	1055	3784	KRITIKA NAREE	38	MERCADERIA GENERAL ,HIERRO	03-08-04	03-08-04	1-185	5-O	1655572	94335.13	94335	0				19.67	0%	19.67	23.58	23.58	24.67	-	80%	584	20232	1
GS	1062	7216	TOP PROGRESS	1	FERTILIZANTE A GRANEL	04-08-04	05-08-04	1-018	4-O	19422419	138070.80	174192	29.17				140.67	21%	111.50	144.42	130.75	169.83	-	66%	558	18036	1
GS	1095	2607	GALILEO	13	SALVADO A GRANEL	10-08-04	10-08-04	1-129	5-O	5052770	65902.63	86982	18.58				76.67	24%	58.09	82.50	82.50	172.42	-	34%	556	17537	1
GS	1107	3756	KOPALNIA BORYNIA	1	MAIZ Y HARINA A GRANEL	13-08-04	13-08-04	1-185	4-O	10076991	159320.02	198249	12.42				63.25	20%	50.83	67.33	67.33	78.75	-	65%	472	8893	1
GS	1124	1726	CLIPPER BREEZE	1	HARINA DE SOYA A GRANEL	17-08-04	18-08-04	1-185	3	19074000	218613.81	266439	20.58				87.17	24%	66.59	104.25	104.25	120.84	-	56%	507	14762	1
GS	1126	1223	BUSSARA NAREE	3	MAIZ Y TRIGO A GRANEL	17-08-04	17-08-04	1-018	5-O	17389897	100566.14	138477	47.34				172.92	27%	125.58	170.00	138.08	177.63	-	71%	475	11474	1
GS	1153	1723	CLIPPER RANGER	1	FERTILIZANTE A GRANEL	23-08-04	23-08-04	1-018	5-O	4360310	69854.37	70328	0.42				62.42	1%	62.00	65.33	65.33	76.50	-	81%	508	12900	1
GS	1159	3756	KOPALNIA BORYNIA	3	MAIZ Y ARROZ A GRANEL	24-08-04	24-08-04	1-185	3	10469670	370607.79	5033495	26.17				25.25	93%	2.08	83.50	58.50	90.53	-	2%	472	8893	1
GS	1159-1	3756	KOPALNIA BORYNIA	3	CONCENTRADO DE ZINC	28-08-04	01-09-04	1-142	4-C	10000000	192012.29	192012	0				52.08	0%	52.08	54.84	54.84	156.34	-	33%	472	8893	1
GS	1162	5501	PERELIK	1	FERTILIZANTE A GRANEL	28-08-04	28-08-04	1-018	3	10026000	292184.07	298304	1.92				35.53	5%	33.51	39.42	39.42	40.83	-	82%	466	10220	1
GS	1191	2907	HANDY ISLANDER	95	CARBON MINERAL	30-08-04	30-08-04	1-229	3	23134970	463440.91	463441	0				49.92	0%	49.92	58.25	58.25	59.83	-	83%	549	15833	1
GS	1223	4993	NIDA	12	MAIZ,TRIGO Y ARROZ A GRANEL	08-09-04	07-09-04	1-185	4-E	12135747	186445.64	210727	7.5				65.09	12%	57.59	67.92	67.92	91.42	-	63%	471	9815	1
GS	1224	5456	PAWITRA NAREE	1	AZUCAR A GRANEL	06-09-04	06-09-04	1-018	3	9610000	162881.36	172624	3.33				59.00	6%	55.67	65.83	65.83	67.58	-	82%	499	12312	1
GS	1228	149	AGENA	1	MALTA A GRANEL	07-09-04	07-09-04	1-018	4-O	2827357	61343.85	64873	2.33				42.83	5%	40.50	45.25	45.25	55.50	-	73%	283	2528	1
GS	1229	2029	DESERT EXPLORER	17	SALVADO A GRANEL	07-09-04	10-09-04	1-129	3	6325000	69500.50	108584	12.42				70.67	18%	58.26	74.00	74.00	151.33	-	38%	619	25076	1
GS	1262	5501	PERELIK	1	MAIZ A GRANEL	17-09-04	17-09-04	1-185	3	12886295	236078.81	236079	0				54.50	0%	54.50	61.59	61.59	71.42	-	76%	466	10220	1
GS	1266	933	SALSA 53	103	FERTILIZANTE A GRANEL	17-09-04	17-09-04	1-018	5-O	8299007	164879.92	164880	0				38.25	0%	38.26	41.67	41.67	42.67	-	90%	346	4358	1
GS	1277	4993	NIDA	10	TRIGO A GRANEL	20-09-04	20-09-04	1-018	3	11319746	108927.50	109805	0.83				103.92	1%	103.09	107.50	107.50	126.08	-	82%	471	9815	1
GS	1282	653	ANTILLES 11	1	FERTILIZANTE A GRANEL	20-09-04	20-09-04	1-018	5-O	6880090	271511.06	271511	0				25.34	0%	25.34	28.91	28.91	32.00	-	79%	378	7266	1
GS	1317	5501	PERELIK	2	ARROZ, TRIGO Y MAIZ A GRANEL	29-09-04	30-09-04	1-185	3-O	12053286	133687.73	204328	31.17				90.16	35%	56.99	94.42	86.75	119.42	-	49%	466	10220	1
GS	1382	5501	PERELIK	3	MAIZ Y TRIGO A GRANEL	15-10-04	15-10-04	1-185	3	12366123	142286.54	144785	1.5				86.91	2%	85.41	90.50	90.50	99.83	-	86%	466	10220	1
GS	1397	4792	NALINEE NAREE	1	ARROZ, MAIZ Y SOYA	17-10-04	18-10-04	1-185	4-C	18129012	78453.40	94713	39.67				231.08	17%	191.41	238.17	210.17	257.00	-	74%	525	14792	1
GS	1403	3118	HSH SENTOSA	1	ARROZ A GRANEL	19-10-04	19-10-04	1-018	5-O	6600	90.51	93	2.25				72.92	3%	70.67	75.42	75.42	93.25	-	76%	518	14118	1
GS	1433	7622	WARTA	11	MAIZ, SOYA Y ARROZ A GRANEL	25-10-04	27-10-04	1-185	4-O	10614610	89695.88	151270	46.17				118.34	41%	70.17	123.17	87.75	176.83	-	40%	471	9815	1
GS	1446	5177	OCEAN VENUS	103	CONCENTRADO DE ZINC	28-10-04	28-10-04	1-142	4-O	2000000	61862.05	89246	9.92				32.33	31%	22.41	37.75	37.75	44.08	-	51%	331	4360	1
GS	1459	4193	MANISAMUT NAREE	1	FERTILIZANTE A GRANEL	30-10-04	31-10-04	1-018	4-O	10598655	178115.87	178116	0				61.75	0%	61.75	66.00	66.00	97.92	-	63%	501	12898	1
GS	1463	5501	PERELIK	4	TRIGO A GRANEL	31-10-04	01-11-04	1-185	3	13100358	68409.18	96504	55.75				191.50	29%	135.75	195.09	195.09	220.42	-	62%	466	10220	1
GS	1504	7622	WARTA	12	MAIZ,TRIGO Y HARINA A GRANEL	10-11-04	11-11-04	1-185	3	11771951	155734.24	234221	25.33				75.59	34%	50.26	78.75	78.75	119.00	-	42%	471	9815	1
GS	1540	2607	GALILEO	15	SALVADO A GRANEL	18-11-04	18-11-04	1-129	4-O	3455600	65405.50	66035	2.17				54.50	4%	52.33	58.41	58.41	195.58	-	27%	556	17537	1
GS	1549	5501	PERELIK	5	MAIZ A GRANEL	18-11-04	19-11-04	1-185	3	13185031	141774.53	171792	15.25				93.00	17%	76.75	96.33	83.50	111.58	-	69%	466	10220	1
GS	1553	4993	NIDA	13	TRIGO,MAIZ Y HARINA DE SOYA A G	19-11-04	22-11-04	1-185	5-O	12627983	143630.38	151524	4.58				87.92	5%	83.34	92.75	92.75	164.50	-	51%	471	9815	1
GS	1581	1597	CENTURY SEYMOUR	47	FERTILIZANTE A GRANEL	25-11-04	25-11-04	1-018	5-O	11353300	166129.65	196276	11.06				68.34	16%	57.26	75.08	67.25	76.25	-	75%	450	9978	1
GS	1592	7622	WARTA	13	MAIZ,TRIGO Y ARROZ A GRANEL	27-11-04	27-11-04	1-185	3	10763819	119824.32	130471	7.33				89.83	8%	82.50	93.75	93.75	136.75	-	60%	471	9815	1
GS	1602	1673	CHRISTINA C	344	SALVADO A GRANEL	29-11-04	03-12-04	1-129	3	4000000	50207.10	121603	46.63				79.67	59%	32.84	84.08	61.58	190.58	-	17%	557	17356	1
GS	1612	933	SALSA 53	18	FERTILIZANTE A GRANEL	01-12-04	01-12-04	1-018	5-E	3236089	57566.03	141773	33.41				56.25	59%	22.84	59.08	27.75	76.50	-	30%	346	4358	1
GS	1623	4624	MONIQUE	1	CONCENTRADO DE ZINC	03-12-04	09-12-04	1-142	3	3000000	20930.72	45059	76.75				143.33	54%	66.58	151.67	90.09	302.50	-	22%	517	11867	1
GS	1644	5262	OVERSEAS MARILYN	123	TRIGO Y SOYA A GRANEL	07-12-04	12-12-04	1-185	4-O	16247669	60214.46	110221	122.42				269.83	45%	147.41	276.84	197.42	386.33	-	38%	567	15531	1
GS	1670	7622	WARTA	14	MAIZ A GRANEL	13-12-04	16-12-04	1-185	4-E	12312623	197254.45	217923	5.92				62.42	9%	56.50	66.00	66.00	139.92	-	40%	471	9815	1
GS	1678	4993	NIDA	14	SOYA,TRIGO,ARROZ Y HARINA A GF	15-12-04	16-12-04	1-185	4-O	11384646	77843.73	158848	74.58				148.25	51%	71.67	150.58	84.33	182.00	-	39%	471	9815	1
GS	1680	3756	KOPALNIA BORYNIA	4	HARINA DE SOYA Y MAIZ A GRANEL	15-12-04	21-12-05	1-185	4-E	9648825	142061.62	167311	10.25				67.92	15%	57.67	72.67	62.42	211.67	-	27%	472	8893	1
GS	1714	7614	ZAPOTECA	431	CONCENTRADO DE ZINC	22-12-04	23-12-04	1-142	4-O	2500000	111957.01	111957	0				22.33	0%	22.33	29.25	29.25	53.08	-	42%	508	13237	1
																						14,630.5					
										1140962068	15288322.82	22903057.85	1764.87	126	16.5	100.42	9107.93	17.15869997	7343.06	9755.86	8820.61	14630.53	244.92	57.42666423	49505.10602	1158250	105
			*******ULTIMA LINEA********		*******ULTIMA LINEA********					1140962.07							86.74		69.93	92.91	84.01	139.34			471	11031	

OPERATIONAL YIELDS 2005
RENDIMIENTOS OPERACIONALES 2005

Non-organic in yellow | Multiple organic in green | Data used

Type	Berthing	No.of Vessel	Vessel Name	Voyage No.	Product Class	Arrival Date	Berth date	Agency Code	Berth# Used	TOTAL KILOS	tons/hour gross	tons/hour net	Delay hours	ENP	Client	Others	Gross operat. hours	% delay of total hours	Net operat. hours	Berth hours Gross	Berth hours NET	Port hours	Total waiting h at port	% NET hours at port	LOA in feet	GRT tons
TIPO	ATRAQUE	No. DE NAVE	NOMBRE DEL BUQUE	NO DE VIAJE	CLASE DE PRODUCTO	FECHA DE ARRIBO	FECHA ATRAQUE	CODIGO DE AGENCIA	MUELLE UTILIZADO	TOTAL KILOS	POR TONELADA REN BTO	POR TONELADA REN NTO	TOTAL DEMORAS	ENP	CLIENTE	OTRAS	TIEMPO BRUTO OPERADO	% DEMORAS T. BRUTAS	TIEMPO NETO OPERADO	HRS. MUELLES (BRUTAS)	HRS. MUELLES (NETAS)	HORAS PUERTO	TOTAL DEMORAS EN EL PUERTO	% T. NETO HRS PUERTO	ESLORA EN PIES	TRB TONELADAS
GS	19	7622	WARTA	15	MAIZ Y TRIGO A GRANEL	04-01-05	04-01-05	1-185	4-E	12292102	254758.59	254759	0				48.25	0%	48.25	51.17	51.17	60.75	-	79%	471	9,815
GS	29	2114	DORSET	12	PETROLEO EN COKE	06-01-05	06-01-05	1-229	3	22268575	336535.82	336536	0				66.17	0%	66.17	70.92	70.92	202.75	-	33%	539	14,156
GS	31	1727	CLIPPER REUNION	1	MAIZ,ARROZ Y HARINA DE SOYA A G	06-01-05	07-01-05	1-185	4-O	13627506	87823.07	87823	0				155.17	0%	155.17	160.92	160.92	179.92	-	86%	509	12,578
GS	33	4993	NIDA	15	MAIZ,ARROZ Y HARINA DE SOYA A G	06-01-05	07-01-05	1-185	4-E	11095687	102029.31	102029	0				108.75	0%	108.75	111.92	111.92	133.75	-	81%	471	9,815
GS	48	553	ANTILLES II	7	SAL INDUSTRIAL A GRANEL	10-01-05	11-01-05	1-018	4-E	11700000	198574.34	198574	0				58.92	0%	58.92	64.41	64.41	102.92	-	57%	378	7,265
GS	62	7339	UBC SYDNEY	4018	UREA	13-01-05	14-01-05	1-018	3	20762500	180684.88	180685	0				114.91	0%	114.91	120.75	120.75	146.67	-	78%	563	19,746
GS	80	6262	SCM ALEXANDER	1	ARROZ A GRANEL	16-01-05	17-01-05	1-018	4-E	7334791	42387.84	42388	0				173.00	0%	173.00	182.00	182.00	319.67	-	54%	414	7,662
GS	86	3756	KOPALNIA BORYNIA	1	MAIZ Y TRIGO A GRANEL	17-01-05	19-01-05	1-185	4-O	10740323	143357.22	143357	0				74.92	0%	74.92	89.75	89.75	133.58	-	56%	472	8,893
GS	103	7622	WARTA	16	MAIZ,ARROZ Y HARINA DE SOYA A G	19-01-05	21-01-05	1-185	4-E	12180728	101650.07	101650	0				119.83	0%	119.83	123.41	123.41	178.08	-	67%	471	9,815
GS	164	6233	BCZA PORTSMOUTH/ REM.EILEEN MCAL	1	SOYA A GRANEL	01-02-05	02-02-05	1-185	4-O	6249170	115725.37	115725	0				54.00	0%	54.00	66.84	66.84	84.25	-	64%	402	7,438
GS	173	3331	IVAN PAPANIN	1	MALTA A GRANEL	03-02-05	03-02-05	1-129	3	2959958	63888.58	63889	0				46.33	0%	46.33	49.75	49.75	59.50	-	78%	546	14,184
GS	188	7622	WARTA	2	TRIGO Y MAIZ A GRANEL	06-02-05	08-02-05	1-185	4-O	12422088	143194.10	143194	0				86.75	0%	86.75	95.58	95.58	143.25	-	61%	471	9,815
GS	194	5161	OCEAN FORTUNE	0	CARBON CUCUTA	06-02-05	08-02-05	1-018	3	29870420	247722.84	247723	0				120.58	0%	120.58	124.50	124.50	156.84	-	77%	590	18,579
GS	195	1108	BCZA CECO, REM. FLORIANA	1	SAL INDUSTRIAL A GRANEL	06-02-05	08-02-05	1-185	4-E	2306510	68687.02	68687	0				33.58	0%	33.58	39.83	39.83	72.58	-	46%	230	1,267
GS	247	3741	KOPALNIA HALEMBA	4	TRIGO Y MAIZ A GRANEL	16-02-05	17-02-05	1-185	3	10883058	302980.40	302980	0				35.92	0%	35.92	42.17	42.17	63.17	-	57%	471	8,898
GS	262	1673	CHRISTINA C	346	SALVADO DE TRIGO A GRANEL	19-02-05	22-02-05	1-129	4-O	4950000	109392.27	109392	0				45.25	0%	45.25	49.09	49.09	126.83	-	36%	557	17,356
GS	275	156	AGILE	1	CONCENTRADO	21-02-05	21-02-05	1-142	4-E	2000000	38895.37	38895	0				51.42	0%	51.42	57.42	57.42	58.75	-	88%	420	7,918
GS	283	7622	WARTA	3	MAIZ A GRANEL	23-02-05	24-02-05	1-185	4-E	12665437	226492.08	226492	0				55.92	0%	55.92	60.25	60.25	82.42	-	68%	471	9,815
GS	290	7708	WISLA	1	MAIZ A GRANEL	24-02-05	24-02-05	1-185	3	12535435	293845.17	293845	0				42.66	0%	42.66	47.84	47.84	59.92	-	71%	471	9,815
GS	307	7653	WESTERN NAVIGATOR	1	CONCENTRADO	26-02-05	28-02-05	1-142	3	1000000	78431.37	78431	0				12.75	0%	12.75	22.17	22.17	59.00	-	22%	305	3,186
GS	319	7732	XENIA	1	FERTILIZANTE A GRANEL	28-02-05	28-02-05	1-018	4-O	5000000	72025.35	72025	0				69.42	0%	69.42	74.83	74.83	85.92	-	81%	468	7,406
GS	349	7708	WISLA	2	MAIZ Y TRIGO A GRANEL	06-03-05	07-03-05	1-185	4-O	12681431	171556.16	173315	0.75				73.92	1%	73.17	79.41	79.41	115.83	-	63%	471	9,815
GS	359	556	ANTILLES III	61	MAIZ Y SOYA A GRANEL	08-03-05	10-03-05	1-185	4-E	8399696	122180.31	162317	17				68.75	25%	51.75	70.59	70.59	117.58	-	44%	378	7,265
GS	360	7622	WARTA	4	HARINA DE SOYA Y ARROZ A GRAN	08-03-05	11-03-05	1-185	4-O	10812293	165073.18	265920	24.84				65.50	38%	40.66	72.75	72.75	133.42	-	30%	471	9,815
GS	398	2116	DS FREEWAY	1	FERTILIZANTE A GRANEL	11-03-05	14-03-05	1-018	3	16129000	332009.06	332009	0				48.58	0%	48.58	52.42	52.42	116.92	-	42%	594	18,597
GS	430	3949	LAURETTA	9084	SAL INDUSTRIAL A GRANEL	20-03-05	20-03-05	1-018	4-O	5000000	64383.21	95402	25.25				77.66	33%	52.41	72.50	72.50	87.00	-	60%	560	17,951
GS	438	1223	BUSSARA NAREE	1	MAIZ Y ARROZ A GRANEL	21-03-05	23-03-05	1-185	3	15468000	118661.99	133230	14.25				130.50	11%	116.25	133.67	133.67	191.83	-	61%	475	11,474
GS	445	4993	NIDA	1	HARINA DE SOYA Y ARROZ A GRAN	22-03-05	24-03-05	1-185	4-E	11198513	65858.84	124752	80				169.75	47%	89.75	172.42	172.42	225.33	-	40%	471	9,815
GS	447	7622	WARTA	5	MAIZ Y TRIGO A GRANEL	22-03-05	29-03-05	1-185	4-O	12940955	167520.45	214183	16.83				77.25	22%	60.42	83.08	83.08	259.42	-	23%	471	9,815
GS	454	3759	KOM	5	MAIZ Y TRIGO A GRANEL	23-03-05	31-03-05	1-185	3	13226265	137415.74	159989	13.58				96.25	14%	82.67	101.17	101.17	295.67	-	28%	466	10,220
GS	526	3242	IONIAN WIND	256	SALVADO A GRANEL	05-04-05	09-04-05	1-129	3	6500000	110169.49	110169	0				59.00	0%	59.00	61.92	61.92	149.25	-	40%	607	23,646
GS	527	4198	MAJESTIC PESCADORES	1	MAIZ Y SOYA A GRANEL	05-04-05	06-04-05	1-185	3	10010738	226641.11	226641	0				44.17	0%	44.17	46.83	46.83	61.75	-	72%	387	6,683
GS	548	7622	WARTA	6	MAIZ A GRANEL	09-04-05	11-04-05	1-185	4-C	12907281	227080.95	227081	0				56.84	0%	56.84	59.84	59.84	96.25	-	59%	471	9,815
GS	550	4993	NIDA	2	HARINA DE SOYA,MAIZ Y ARROZ A G	10-04-05	12-04-05	1-185	3	10067976	129076.62	138718	5.42				78.00	7%	72.58	83.17	83.17	133.17	-	55%	471	9,815
GS	568	5542	PENSILVANIA	1	FERTILIZANTE A GRANEL	14-04-05	14-04-05	1-018	4-C	2794000	131482.35	166808	4.5				21.25	21%	16.75	27.58	27.58	40.00	-	42%	389	4,819
GS	592	5373	PACODA	1	FERTILIZANTE A GRANEL	19-04-05	19-04-05	1-018	4-E	16910092	247765.92	247767	0				68.25	0%	68.25	73.41	73.41	78.25	-	87%	494	14,436
GS	606	7341	UBC BATON ROUGE	5007	MAIZ, TRIGO Y SOYA A GRANEL	22-04-05	23-04-05	1-185	3	19028960	252876.81	253720	0.25				75.25	0%	75.00	78.66	78.66	99.17	-	76%	508	14,708
GS	610	7622	WARTA	705	MAIZ Y TRIGO A GRANEL	23-04-05	24-04-05	1-185	4-E	12835648	186284.06	225637	11.83				67.83	17%	56.00	70.17	70.17	105.92	-	53%	471	9,815
GS	612	5439	PAZ COLOMBIA	9	FERTILIZANTE A GRANEL	23-04-05	23-04-05	1-018	4-O	2900000	104204.10	104204	0				27.83	0%	27.83	31.75	31.75	32.92	-	85%	389	4,803
GS	616	156	AGILE	2	ARROZ A GRANEL	24-04-05	26-04-05	1-018	4-E	8800	116.68	117	0				75.42	0%	75.42	78.33	78.33	123.67	-	61%	420	7,918
GS	631	4299	MARINER	1	FERTILIZANTE A GRANEL	27-04-05	27-04-05	1-018	3	7997380	48445.36	80791	66.08				165.08	40%	99.00	170.83	170.83	171.92	-	58%	549	15,768
GS	632	5023	NOA	1	CARBON MINERAL	26-04-05	27-04-05	1-129	3	38347837	232537.97	334215	50.17				164.91	30%	114.74	169.84	169.84	195.83	-	59%	610	26,044
GS	651	1597	CENTURY SEYMOUR	54	ARROZ,TRIGO Y HARINA A GRANEL	30-04-05	04-05-05	1-185	4-E	13898202	241015.87	241016	0				58.08	0%	58.08	62.17	62.17	129.92	-	45%	450	9,978
GS	662	6984	TATJANA	1	FERTILIZANTE A GRANEL	02-05-05	04-05-05	1-018	4-O	7532362	119713.32	119713	0				62.92	0%	62.92	67.59	67.59	117.42	-	54%	425	6,382
GS	675	7622	WARTA	8	MAIZ Y TRIGO A GRANEL	06-05-05	06-05-05	1-185	3	12017412	158645.70	171874	5.83				75.75	8%	69.92	80.00	80.00	85.92	-	81%	471	9,815
GS	695	4198	MAJESTIC PESCADORES	2	CARGAR CONCENTRADO DE ZINC	09-05-05	10-05-05	1-142	4-O	3000000	54624.91	67919	10.75				54.92	20%	44.17	62.66	62.66	90.58	-	49%	387	6,683
GS	700	4993	NIDA	3	SOYA Y MAIZ A GRANEL	10-05-05	12-05-05	1-185	4-E	11819844	179088.55	202325	7.58				66.00	11%	58.42	73.08	73.08	114.75	-	51%	471	9,815
GS	742	7622	WARTA	9	TRIGO A GRANEL	20-05-05	20-05-05	1-185	4-O	12532143	131571.06	238707	42.75				95.25	45%	52.50	99.00	99.00	110.50	-	48%	471	9,815
GS	746	1573	CHADA NAREE	1	MAIZ Y SOYA A GRANEL	20-05-05	20-05-05	1-185	3	16436870	178506.41	183652	2.58				92.08	3%	89.50	95.00	95.00	110.17	-	81%	479	10,964
GS	783	2799	GREAT HARMONY	1	MAIZ, TRIGO Y ARROZ A GRANEL	23-05-05	24-05-05	1-185	3	20760242	171927.47	190025	11.5				120.75	10%	109.25	135.83	135.83	165.08	-	66%	526	15,983
GS	786	7341	UBC BATON ROUGE	5009	MAIZ,ARROZ Y SOYA A GRANEL	21-05-05	24-05-05	1-185	4-E	19350944	191985.76	210616	8.92				100.84	9%	91.92	105.50	105.50	180.50	-	51%	506	14,706
GS	774	6984	TATJANA	67	FERTILIZANTE A GRANEL	26-05-05	27-05-05	1-018	4-O	8210563	125505.40	156154	12.84				65.42	20%	52.58	68.92	68.92	106.33	-	49%	425	6,382
GS	777	2156	EASTERN NAVIGATOR	1	CARGAR CONCENTRADO DE ZINC	26-05-05	26-05-05	1-142	4-O	1000000	62500.00	62500	0				16.00	0%	16.00	19.25	19.25	20.50	-	78%	305	3,186
GS	790	553	ANTILLES II	14	FERTILIZANTE A GRANEL	30-05-05	30-05-05	1-018	4-E	11600	228.57	266	7.18				50.75	14%	43.58	54.25	54.25	60.25	-	72%	378	7,265
GS	809	7622	WARTA	10	MAIZ,HARINA Y TRIGO A GRANEL	01-06-05	02-06-05	1-185	4-E	12180253	74192.93	74193	0				164.17	0%	164.17	167.42	167.42	184.92	-	89%	471	9,815

GS	812	5252	ONEGO PRIDE	1	FERTILIZANTE A GRANEL	02-06-05	02-06-05	1-185	3	6599788	75065.61	134006	38.67				87.92	44%	49.25	94.83	94.83	96.50	-	51%	372	5,941
GS	851	5281	ONEGO SPIRIT	1	SAL A GRANEL	11-06-05	12-06-05	1-018	3	15999000	81007.59	81008	0				197.50	0%	197.50	203.50	203.50	211.50	-	93%	471	10,490
GS	854	4993	NIDA	4	SOYA Y MAIZ A GRANEL	12-06-05	13-06-05	1-185	4-O	11740081	200411.25	200411	0				58.58	0%	58.58	62.42	62.42	91.33	-	84%	471	9,815
GS	860	5568	PILICA	10	MAIZ,ARROZ Y SOYA A GRANEL	13-06-05	16-06-05	1-185	4-O	14737731	108966.59	108967	0				135.25	0%	135.25	140.67	140.67	218.08	-	62%	490	11,848
GS	863	3242	IONIAN WIND	258	SALVADO DE TRIGO A GRANEL	13-06-05	16-06-05	1-129	3	6400000	70391.55	70392	0				90.92	0%	90.92	94.00	94.00	174.66	-	52%	607	23,646
GS	896	6602	SMOLYAN	1	CARGAR CONCENTRADO DE ZINC	21-06-05	22-06-05	1-142	4-E	2500000	54549.42	54549	0				45.83	0%	45.83	51.41	51.41	67.92	-	67%	401	7,366
GS	910	4993	NIDA	5	ARROZ Y SOYA A GRANEL	25-06-05	26-06-05	1-185	4-O	10362733	133989.31	138151	2.33				77.34	3%	75.01	79.37	79.37	108.50	-	69%	471	9,815
GS	918	1743	CLIPPER BONTEUS	1	MAIZ,ARROZ Y SOYA A GRANEL	26-06-05	27-06-05	1-185	3	22488066	289867.59	284984	4.42				83.33	5%	78.91	90.08	90.08	117.50	-	87%	507	14,762
GS	930	5568	PILICA	2	TRIGO, MAIZ Y ARROZ A GRANEL	29-06-05	30-06-05	1-185	4-O	15845986	239473.87	252164	3.33				66.17	6%	62.84	118.00	118.00	131.75	-	48%	490	11,848
GS	933	6814	SUOMIGRACHT	508	MALTA A GRANEL	30-06-05	30-06-05	1-129	4-E	2964825	68673.27	70019	0.83				43.17	2%	42.34	45.33	45.33	54.50	-	78%	608	18,321
GS	952	2214	EMERALD	664	CARBON	03-07-05	03-07-05	1-229	3	38668228	410706.01	451152	8.42				94.13	9%	85.71	99.16	99.16	101.50	-	84%	609	26,028
GS	982	7342	UBC STAVANGER	5009	CARBON MINERAL	09-07-05	09-07-05	1-229	3	30824.75	515.90	516	0				59.75	0%	59.75	64.75	64.75	65.75	-	91%	563	19,748
GS	984	4993	NIDA	6	MAIZ AMARILLO	10-07-05	14-07-05	1-185	3	12204.368	179.03	238	16.92				68.17	25%	51.25	72.73	72.73	171.00	-	30%	471	9,815
GS	989	7622	WARTA	11	ARROZ Y SOYA A GRANEL	11-07-05	11-07-05	1-185	4-E	11658271	159402.61	229374	22.33				73.20	31%	50.87	102.67	102.67	106.92	-	48%	471	9,815
GS	999	811	AUDRE	1	FERTILIZANTE A GRANEL	13-07-05	14-07-05	1-018	4-E	2400000	88332.72	88333	0				27.17	0%	27.17	30.92	30.92	103.00	-	26%	337	3,893
GS	1044	7708	WISLA	3	MAIZ Y TRIGO A GRANEL	24-07-05	24-07-05	1-185	4-O	12386.38	175.69	191	5.67				70.50	8%	64.83	72.84	72.84	85.42	-	76%	471	9,815
GS	1048	6452	SEA LINK	1	FERTILIZANTE A GRANEL	24-07-05	25-07-05	1-018	3	9000000	61821.68	75630	26.58				145.58	18%	119.00	149.67	149.67	162.67	-	73%	640	18,173
GS	1059	2329	EVER REGAL	1	ARROZ Y MAIZ A GRANEL	27-07-05	27-07-05	1-185	4-O	20207167	129882.81	179619	43.08				158.58	28%	112.50	158.50	158.50	171.42	-	66%	507	14,762
GS	1065	3746	KOPALNIA RYDULTOWY	1	ARROZ,SOYA Y TRIGO A GRANEL	29-07-05	31-07-05	1-185	4-O	6726362	95179.68	110868	10				70.67	14%	60.67	73.50	73.50	128.25	-	47%	471	8,897
GS	1074	1721	CLIPPER EAGLE	1	HARINA,SOYA Y MAIZ A GRANEL	01-08-05	01-08-05	1-185	4-E	14531852	96988.93	136667	43.5				149.83	29%	106.33	155.17	155.17	175.08	-	61%	490	11,807
GS	1084	1572	CENTURY HOPE	1	FERTILIZANTE A GRANEL	02-08-05	03-08-05	1-018	4-O	11000000	201539.03	283298	15.75				54.58	29%	38.83	57.42	57.42	86.67	-	45%	450	8,978
GS	1104	7708	WISLA	4	TRIGO Y SOYA A GRANEL	07-08-05	08-08-05	1-185	3	11617549	175396.25	184640	4.08				67.00	8%	62.92	70.00	70.00	86.50	-	73%	471	9,815
GS	1109	3448	JIMAKOS T	1	CARGAR CONCENTRADO DE ZINC	08-08-05	08-08-05	1-142	4-O	3000000	32317.14	36439	10.5				92.83	11%	82.33	99.17	99.17	103.00	-	80%	481	10,669
GS	1120	3746	KOPALNIA RYDULTOWY	2	MAIZ,ARROZ Y SOYA A GRANEL	12-08-05	12-08-05	1-185	3	10041912	154681.33	200477	14.83				64.92	23%	50.09	68.58	68.58	78.67	-	64%	471	8,897
GS	1156	5693	POPOCATEPETL II	1	CLORURO DE SODIO A GRANEL	20-08-05	21-08-05	1-018	3	2517940	73174.86	73175	0				34.41	0%	34.41	39.59	39.59	61.00	-	56%	389	9,357
GS	1168	3746	KOPALNIA RYDULTOWY	3	ARROZ,TRIGO Y HARINA A GRANEL	23-08-05	23-08-05	1-185	4-O	10364093	213692.84	224915	2.42				48.50	5%	46.08	53.00	53.00	60.50	-	76%	471	8,897
GS	1189	3242	IONIAN WIND	260	SALVADO DE TRIGO A GRANEL	27-08-05	30-08-05	1-129	3	4040000	88635.37	99975	5.17				48.58	11%	40.41	48.83	48.83	126.67	-	32%	607	23,646
GS	1214	7052	TETEVEN	20	SAL A GRANEL	03-09-05	04-09-05	1-018	4-O	7710	108.21	134	13.5				71.25	19%	57.75	75.41	75.41	85.50	-	68%	401	7,098
GS	1259	5531	PERLA	65	AZUCAR A GRANEL	13-09-05	13-09-05	1-018	4-O	12963000	85802.22	121536	44.42				151.08	29%	106.66	157.08	157.08	160.75	-	66%	477	10,320
GS	1260	5252	ONEGO PRIDE	2	FERTILIZANTE A GRANEL	13-09-05	13-09-05	1-185	3	6599925	48202.78	86647	60.75				136.92	44%	76.17	139.83	139.83	141.67	-	54%	372	5,941
GS	1270	3746	KOPALNIA RYDULTOWY	4	ARROZ Y MAIZ A GRANEL	18-09-05	19-09-05	1-185	4-E	10191873	255820.11	279843	3.42				39.84	9%	36.42	45.58	45.58	137.50	-	26%	471	8,897
GS	1301	5244	ONEGO BLUES	1	CARGAR CONCENTRADO DE ZINC	22-09-05	22-09-05	1-142	4-O	1000000	103412.62	103413	0				9.67	0%	9.67	19.16	19.16	20.17	-	48%	305	3,186
GS	1314	2759	GOMAIN NAREE	1	ARROZ Y MAIZ A GRANEL	25-09-05	26-09-05	1-185	4-O	18823383	109279.44	120470	16				172.25	9%	156.25	177.42	177.42	199.50	-	78%	525	14,286
GS	1319	1571	CENTURY QUEEN	14	TRIGO, MAIZ Y ARROZ A GRANEL	26-09-05	27-09-05	1-185	3	15270245	142712.57	149708	5				107.00	5%	102.00	119.75	119.75	138.58	-	74%	450	9,978
GS	1348	3746	KOPALNIA RYDULTOWY	5	TRIGO Y SOYA A GRANEL	03-10-05	05-10-05	1-185	4-O	10633539	142546.57	182321	16.58				76.00	22%	59.42	79.75	79.75	121.25	-	49%	471	8,897
GS	1350	7278	TROY	1	MAIZ Y SOYA A GRANEL	03-10-05	05-10-05	1-185	4-E	9650000	58841.46	58841	0				164.00	0%	164.00	169.25	169.25	204.08	-	80%	501	12,798
GS	1373	6543	SIR JACOB	1	FERTILIZANTE A GRANEL	08-10-05	11-10-05	1-018	4-E	9465918	150476.10	175369	8.92				62.84	14%	53.92	66.16	66.16	138.67	-	39%	372	6,000
GS	1383	7346	UBC TAMPICO	1	MAIZ,ARROZ Y SOYA A GRANEL	11-10-05	12-10-05	1-185	3	27934977	232481.50	284818	22.08				120.16	16%	98.08	123.17	123.17	162.67	-	60%	599	24,140
GS	1404	1898	CIKAT	1	MAIZ A GRANEL	16-10-05	16-10-05	1-185	4-O	7663308	112017.90	139266	13.42				68.59	20%	55.17	120.34	120.34	131.00	-	42%	393	5,669
GS	1414	3746	KOPALNIA RYDULTOWY	6	MAIZ,ARROZ,TRIGO Y SOYA A GRAN	18-10-05	19-10-05	1-185	4-E	10401860	117641.48	145298	16.83				88.42	19%	71.59	99.75	99.75	139.25	-	51%	471	8,897
GS	1420	6804	BCZA SUGAR EXPRESS	1	TRIGO A GRANEL	19-10-05	21-10-05	1-185	3	9220	99.41	104	4.25				92.75	5%	88.50	101.00	101.00	154.75	-	57%	346	6,552
GS	1445	3202	INZHENER PLAVINSKIY	1	SOYA A GRANEL	26-10-05	27-10-05	1-018	3	3999837	120585.98	120586	0				33.17	0%	33.17	37.00	37.00	66.67	-	50%	432	6,395
GS	1454	1682	CHOLLADA NAREE	1	TRIGO Y HARINA DE SOYA A GRANE	29-10-05	29-10-05	1-185	4-O	14554468	77793.64	148500	89.08				187.09	48%	98.01	192.17	192.17	210.67	-	47%	475	11,474
GS	1462	7107	TONG CHENG	1	CARGAR CONCENTRADO DE ZINC	31-10-05	03-11-05	1-142	3	3000000	31139.71	33393	6.5				96.34	7%	89.84	101.16	101.16	173.50	-	52%	485	11,959
GS	1478	3746	KOPALNIA RYDULTOWY	7	MAIZ, TRIGO Y ARROZ A GRANEL	02-11-05	06-11-05	1-185	4-O	10337050	116921.73	156646	22.42				88.41	25%	65.99	90.67	90.67	183.67	-	36%	471	8,897
GS	1494	558	ANTILLES V	39	FERTILIZANTE A GRANEL	07-11-05	07-11-05	1-018	4-E	11500091	205652.56	205653	0				55.92	0%	55.92	61.91	61.91	76.08	-	74%	378	7,265
GS	1518	1918	CYNTHIA HARMONY	28	SOYA Y MAIZ A GRANEL	12-11-05	13-11-05	1-185	3	21593582	118049.32	187493	67.75				182.92	37%	115.17	189.33	189.33	211.33	-	54%	494	14,431
GS	1532	354	BCZA ATC 350 REM. CALUSA COAST	1	TRIGO A GRANEL	16-11-05	21-11-05	1-185	3-E	3000	80.00	80	0				37.50	0%	37.50	52.00	52.00	168.92	-	22%	349	5,320
GS	1544	3746	KOPALNIA RYDULTOWY	8	TRIGO Y HARINA DE SOYA A GRANE	18-11-05	21-11-05	1-185	4-O	10685000	134382.72	144805	5.83				81.00	7%	75.17	84.17	84.17	187.08	-	45%	471	8,897
GS	1561	5257	ORLA	1	MAIZ Y HARINA DE SOYA A GRANEL	22-11-05	25-11-05	1-185	4-O	15155.62	126.74	129	2				119.58	2%	117.58	122.75	122.75	200.67	-	59%	491	11,848
GS	1564	5044	NOBLESSE	1	ARROZ Y MAIZ A GRANEL	23-11-05	25-11-05	1-185	4-O	13769246	75139.13	79785	10.67				183.25	6%	172.58	188.00	188.00	233.33	-	74%	521	12,765
GS	1605	4291	BCZA MARIE FLOOD REM. JANIS GUZZLE	1	MAIZ A GRANEL	02-12-05	02-12-05	1-018	3	23999882	109090.37	115846	12.83				220.00	6%	207.17	231.84	231.84	239.91	-	86%	545	19,271
GS	1616	3746	KOPALNIA RYDULTOWY	9	MAIZ,HARINA Y ARROZ A GRANEL	04-12-05	06-12-05	1-185	3	9417027	154605.60	176316	7.5				60.91	12%	53.41	64.25	64.25	115.83	-	46%	471	8,897
GS	1645	373	AMALIA	1	FERTILIZANTE A GRANEL	10-12-05	12-12-05	1-185	4-O	18690460	170564.52	189597	11				108.58	10%	98.58	118.33	118.33	159.08	-	62%	581	20,352
GS	1655	5257	ORLA	1	MAIZ Y HARINA DE SOYA A GRANEL	12-12-05	13-12-05	1-185	4-E	15346602	130698.36	159032	20.92				117.42	18%	96.50	123.33	123.33	146.33	-	66%	491	11,848
GS	1672	419	AN DA JIANG	516	ASFALTO	16-12-05	16-12-05	1-129	3-O	4163100	150566.88	159567	0				26.09	0%	26.09	31.42	31.42	32.25	-	81%	348	3,951
GS	1673	6266	SEAGATE	1	ARROZ A GRANEL	16-12-05	18-12-05	1-018	3	12350576	49750.56	77511	88.91				248.25	36%	159.34	254.17	254.17	301.17	-	53%	558	17,590
GS	1683	1693	BCZA CHRISTINA REM. MISS ANN	1	TRIGO A GRANEL	18-12-05	19-12-05	1-018	4-C	5000000	46010.86	52910	14.17				108.67	13%	94.50	148.34	148.34	198.83	-	46%	330	4,247
GS	1687	3746	KOPALNIA RYDULTOWY	10	ARROZ,TRIGO Y HARINA A GRANEL	19-12-05	19-12-05	1-185	4-E	10184759	98641.73	130024	24.92				103.25	24%	78.33	107.75	107.75	126.58	-	62%	471	8,897
GS	1700	7339	UBC SYDNEY	1505	MALTA,HIERRO Y VEHICULOS	21-12-05	26-12-05	1-185	5-O	3277677	86073.45	86073	0				38.08	0%	38.08	39.75	39.75	156.75	-	24%	563	19,746

GS	1701	7716	WORADA NAREE	1	ARROZ A GRANEL	21-12-05	28-12-05	1-185	3	15267949	90880.65	93285	4.33				168.00	3%	163.67	170.92	170.92	326.50	-	50%	528	15.269
GS	1718	1918	CYNTHIA HARMONY	29	MAIZ Y SOYA A GRANEL	25-12-05	30-12-05	1-185	3	21999950	211030.70	350150	41.42				104.25	40%	62.83	119.50	119.50	232.33	-	27%	494	14.431
																						15,627.5				TC
										1245343863	15169393.9	17190317.4	1374.91	0	0	0	10248.28	12.5672936	8873.37	10985.05	10985.05	15627.54	0	68.781787	54948.219	1303737

OPERATIONAL YIELDS 2006
RENDIMIENTOS OPERACIONALES 2006

Non-organic in yellow | Multiple organic in green | Data used | Data used | Data used | Data used | Data used

Type	Berthing	No.of Vessel	Vessel Name	Voyage No.	Product Class	Arrival Date	Berth date	Agen-cy Code	Berth# Used	TOTAL KILOS	tons/hour gross	tons/hour net	Delay hours	ENP	Client	Others	Gross operat. hours	% delay of total hours	Net operat. hours	Berth hours Gross	Berth hours NET	Port hours	Total waiting h at port	% NET hours at port	LOA in feet	GRT tons
TIPO	ATRAQUE	No. DE NAVE	NOMBRE DEL BUQUE	NO DEL VIAJE	CLASE DE PRODUCTO	FECHA DE ARRIBO	FECHA ATRAQUE	CODIGO DE AGENCIA	MUELLE UTILIZADO	TOTAL KILOS	POR TONELADA		TOTAL DEMORAS	ENP	CLIENTE	OTRAS	TIEMPO BRUTO OPERADO	% DEMORAS T. BRUTAS	TIEMPO NETO OPERADO	HRS. MUELLES (BRUTAS)	HRS. MUELLES (NETAS)	HORAS PUERTO	TOTAL DEMORAS EN EL PUERTO	% T. NETO HRS. PUERTO	ESLORA EN PIES	TRS TONELADAS
											REN BTO	REN NTO														
GS	17	3756	KOPALNIA BORYNIA	1	ARROZ Y TRIGO A GRANEL	01-04-06	01-05-06	1-185	3	10211295	116700.51	125554	6.17				87.50	7%	81.33	93.00	93.00	115.00	-	71%	472	8,893
GS	21	3746	KOPALNIA RYDULTOWY	11	TRIGO,MAIZ Y HARINA DE SOY	01-05-06	01-06-06	1-185	4-C	10384788	152717.47	214828	19.66				68.00	29%	48.34	72.41	72.41	92.92	-	52%	471	8,897
GS	36	5246	ONEGO BAY	1	CONCENTRADO DE PLOMO	01-08-06	01-09-06	1-142	4-E	1000000	71428.57	74074	0.5				14.00	4%	13.50	20.75	20.75	35.00	-	39%	305	3,186
GS	62	1693	BCZA CHISTINA REM. MISS ANN	2	TRIGO A GRANEL	01-14-06	01-14-06	1-018	3	8300186	63037.79	68784	11				131.67	8%	120.67	166.75	166.75	168.75	-	72%	330	4,247
GS	64	3608	KANK NAREE	1	TRIGO A GRANEL	01-14-06	01-16-06	1-018	4-E	1050412	51465.56	51466	0				20.41	0%	20.41	24.00	24.00	62.42	-	33%	573	19,340
GS	65	1103	BOONTRIKA NAREE	1	FERTILIZANTE A GRANEL	01-15-06	01-15-06	1-018	3	16849962	177692.34	224009	19.5				94.72	21%	75.22	109.00	109.00	124.50	-	60%	579	17,066
GS	73	2026	DESERT VOYAGER	23	SALVADO DE TRIGO	01-16-05	01-20-06	1-129	3	5000000	124501.99	136274	4				40.16	10%	36.16	46.84	46.84	144.50	-	25%	623	24,666
GS	95	3746	KOPALNIA RYDULTOWY	2	TRIGO,MAIZ Y HARINA DE SOY	01-20-06	01-22-06	1-185	3	9994964	95874.95	195024	53				104.25	51%	51.25	107.50	107.50	141.16	-	36%	471	8,897
GS	102	7708	WISLA	1	HARINA DE SOYA Y MAIZ A GR	01-22-06	01-24-06	1-185	4-E	11329729	102689.47	185490	49.25				110.33	45%	61.08	113.33	113.33	155.00	-	39%	471	9,815
GS	145	1580	CENTURY ELKHORN	43	FERTILIZANTE A GRANEL	02-01-06	02-01-06	1-018	4-C	11257407	248343.41	248343	0				45.33	0%	45.33	48.84	48.84	54.50	-	83%	450	9,978
GS	169	3746	KOPALNIA RYDULTOWY	3	MAIZ Y TRIGO A GRANEL	02-05-06	02-06-06	1-185	3	10767740	125454.27	220515	37				85.83	43%	48.83	89.83	89.83	111.50	-	44%	471	8,897
GS	192	2124	BCZA DORIS GUENTHER REM. SH	1	TRIGO A GRANEL	02-11-06	02-11-06	1-185	3	2270000	33336.23	41393	13.25				68.09	19%	54.84	76.75	76.75	83.42	-	66%	548	11,556
GS	225	1918	CYNTHIA HARMONY	32	MAIZ Y HARINA DE SOYA A GR	02-17-06	02-17-06	1-185	3	21999937	222987.40	256320	12.83				98.66	13%	85.83	102.09	102.09	109.00	-	79%	494	14,431
GS	248	3746	KOPALNIA RYDULTOWY	4	MAIZ ,TRIGO Y HARINA DE SOY	02-20-06	02-21-06	1-185	4-O	10993396	171557.37	174277	1				64.08	2%	63.08	69.25	69.25	87.83	-	72%	471	8,897
GS	253	708	ASTA	1	CONCENTRADO DE PLOMO	02-21-06	02-22-06	1-142	4-O	1000000	106157.11	106157	0				9.42	0%	9.42	15.42	15.42	40.75	-	23%	337	3,891
GS	268	7347	UBC SACRAMENTO	1	MAIZ ,TRIGO Y HARINA DE SOY	02-25-06	02-25-06	1-185	3	23002168	233122.21	233122	0				98.67	0%	98.67	100.92	100.92	108.50	-	91%	563	19,746
GS	316	3746	KOPALNIA RYDULTOWY	5	TRIGO Y ARROZ A GRANEL	03-06-06	03-07-06	1-185	3	9653959	174479.65	201839	7.5				55.33	14%	47.83	62.42	62.42	82.50	-	58%	471	8,897
GS	344	2357	EUGENIE C	345	SALVADO DE TRIGO	03-11-06	03-15-06	1-129	4-O	3000000	75471.70	75472	0				39.75	0%	39.75	43.67	43.67	133.33	-	30%	557	17,356
GS	345	7347	UBC SACRAMENTO	6004	GREEN DELAYED PETROLERO	03-12-06	03-12-06	1-229	3	30755850	414220.20	630889	25.5				74.25	34%	48.75	77.67	77.67	78.75	-	62%	563	19,746
GS	382	3746	KOPALNIA RYDULTOWY	6	MAIZ Y HARINA DE SOYA A GR	03-18-06	03-19-06	1-185	4-O	10392417	138399.46	158252	9.42				75.09	13%	65.67	79.17	79.17	96.42	-	68%	471	8,897
GS	383	1518	CASTOR	1	FERTILIZANTE A GRANEL	03-19-06	03-19-06	1-018	3	8424833	182830.58	182831	0				46.08	0%	46.08	51.34	51.34	51.93	-	89%	423	8,351
GS	383-1	1518	CASTOR	1	CONCENTRADO DE PLOMO	03-21-06	03-25-06	1-142	4-O	3000000	61538.46	79630	11.17				48.75	23%	37.58	57.50	57.50	152.99	-	25%	423	8,351
GS	384	5143	OASSYS	1	CARGAR AZUCAR A GRANEL	03-19-06	03-20-06	1-018	4-E	2700000	60456.78	60457	0				44.66	0%	44.66	48.00	48.00	82.58	-	54%	269	2,029
GS	393	7338	UBC BREMEN	6005	MAIZ ,TRIGO Y ARROZ A GRAN	03-20-06	03-21-06	1-185	3	17099832	196730.69	203763	3				86.92	3%	83.92	91.92	91.92	112.25	-	75%	506	14,706
GS	401	2112	DS REGENT	1	FERTILIZANTE A GRANEL	03-23-06	03-23-06	1-018	4-O	3540000	102668.21	102668	0				34.48	0%	34.48	38.00	38.00	44.92	-	77%	509	12,578
GS	418	556	ANTILLES III	82	MAIZ Y ARROZ A GRANEL	03-25-06	03-26-06	1-185	3	8401524	52183.38	78703	54.25				161.00	34%	106.75	165.50	165.50	194.75	-	55%	378	7,265
GS	433	722	BCZA ATC 1800 REM.FALCON	8	TRIGO	03-28-06	03-28-06	1-185	4-O	10069049	103787.13	111867	7				96.92	7%	89.92	106.25	106.25	110.33	-	82%	411	9,815
GS	434	7341	UBC BATRON ROUGE	6004	MAIZ Y ARROZ A GRANEL	03-27-06	03-28-06	1-185	4-C	16849528	104713.99	121886	22.67				160.91	14%	138.24	169.00	169.00	186.83	-	74%	506	14,706
GS	436	6464	SIBONEY BELLE	11	ARROZ A GRANEL	03-28-06	03-31-06	1-018	4	12798330	69273.78	81778	28.25				184.75	15%	156.50	188.00	188.00	265.00	-	59%	477	10,511
GS	454	3744	KOPALNIA RYDULTOWY	7	ARROZ, HARINA DE SOYA Y TR	03-31-06	04-03-06	1-185	3	9360147	80117.67	113346	34.25				116.83	29%	82.58	120.42	120.42	197.17	-	42%	471	8,897
GS	504	1034	BERDYANSK	1	SAL INDUSTRIAL A GRANEL	04-10-06	04-11-06	1-018	4-E	10000000	104263.54	126183	16.67				95.92	17%	79.25	101.16	101.16	189.00	-	42%	585	16,585
GS	517	556	ANTILLES III	83	FERTILIZANTE A GRANEL	04-13-06	04-15-06	1-018	3	4243649	115725.36	115725	0				36.67	0%	36.67	40.00	40.00	85.33	-	43%	378	7,265
GS	520	6004	ROSELLA	1	MAIZ Y SOYA A GRANEL	04-13-06	04-16-06	1-185	4-O	23043414	258914.76	265385	2.17				89.00	2%	86.83	90.83	90.83	149.58	-	58%	560	17,951
GS	525	5257	ORLA	1	TRIGO Y HARINA DE SOYA A G	04-14-06	04-17-06	1-185	3	15081358	116458.35	119220	3				129.50	2%	126.50	138.83	138.83	207.17	-	61%	491	11,848
GS	538	3746	KOPALNIA RYDULTOWY	8	HARINA DE MAIZ A GRANEL	04-16-06	04-17-06	1-185	4-E	10238393	94441.41	133399	31.66				108.41	29%	76.75	114.75	114.75	140.25	-	55%	471	8,897
GS	540	551	ANTILLES I	105	AZUCAR A GRANEL	04-17-06	04-17-06	1-018	5-O	7800000	191036.00	191036	0				40.83	0%	40.83	44.92	44.92	63.50	-	64%	378	7,265
GS	593	556	ANTILLES V	47	MAIZ Y HARINA DE SOYA A GR	04-26-06	04-27-06	1-185	4-O	10482.2	189.45	189	0				55.33	0%	55.33	58.00	58.00	74.17	-	75%	378	7,265
GS	599	5596	POLYDEFKIS	6	FERTILIZANTE A GRANEL	04-29-06	04-29-06	1-185	3	14499742	185679.88	185680	0				78.09	0%	78.09	83.67	83.67	117.58	-	66%	423	8,351
GS	607	3746	KOPALNIA RYDULTOWY	9	TRIGO Y HARINA DE SOYA A G	04-30-06	05-02-06	1-185	4-O	10150803	137024.88	137025	0				74.08	0%	74.08	80.58	80.58	123.08	-	60%	471	8,897
GS	618	5586	POLYDEFKIS	5	CARGAR CONCENTRADO DE Z	05-04-06	05-06-06	1-142	3	3000000	135869.57	135870	0				22.08	0%	22.08	31.50	31.50	49.42	-	45%	423	8,351
GS	637	5439	PAZ COLOMBIA	9	FERTILIZANTE A GRANEL	05-06-06	05-06-06	1-018	4-E	7256428	149617.07	149617	0				48.50	0%	48.50	52.92	52.92	60.67	-	80%	389	4,893
GS	678	852	AZTECA	0	CARGAR CONCENTRADO DE Z	05-15-06	05-15-06	1-142	3	3000000	66298.34	66298	0				45.25	0%	45.25	50.25	50.25	53.17	-	85%	508	13,327
GS	681	3746	KOPALNIA RYDULTOWY	10	TRIGO,MAIZ Y HARINA DE SOY	05-16-06	05-16-06	1-185	4-E	10643345	178609.58	194363	4.83				59.59	8%	54.76	63.50	63.50	79.67	-	69%	471	8,897
GS	690	904	BALSA 55	49	FERTILIZANTE A GRANEL	05-17-06	05-17-06	1-018	3-O	4300000	128052.41	143333	3.58				33.58	11%	30.00	38.00	38.00	42.42	-	71%	346	4,358
GS	715	556	ANTILLES 111	85	MAIZ Y TRIGO A GRANEL	05-24-06	05-24-06	1-185	4-O	11355910	180481.72	200387	6.25				62.92	10%	56.67	68.58	68.58	93.00	-	61%	378	7,265
GS	715-1	6492	SIDER SWAN	0	CARGAR AGUA Y COMBUSTIBL	05-27-06	06-02-06	1-229	5-O	0			0				0.00	0%	0.00	7.84	7.84	113.75	-	0%	378	7,265
GS	725	7766	YANNIS	1	MALTA A GRANEL	05-25-06	05-29-06	1-018	4-O	3300000	78159.70	77812	0.92				43.33	2%	42.41	65.50	65.50	167.75	-	25%	806	16,502
GS	733	2607	GALILEO	35	SALVADO DE TRIGO A GRANEL	05-27-06	05-30-06	1-129	4-E	4610000	148326.90	151995	0.75				31.08	2%	30.33	39.42	39.42	116.83	-	26%	556	17,537
GS	738	1571	CENTURY QUEEN	24	FERTILIZANTE A GRANEL	05-27-06	05-27-06	1-018	4-O	10832751	258906.96	266357	1.17				41.84	3%	40.67	45.08	45.08	46.00	-	88%	450	9,978
GS	761	4944	NEW NIKKI	1	AZUCAR A GRANEL	05-31-06	06-01-06	1-185	3	8540000	115140.89	133084	10				74.17	13%	64.17	83.41	83.41	118.33	-	54%	549	15,757
GS	762	3746	KOPALNIA RYDULTOWY	11	TRIGO Y HARINA DE SOYA A G	05-31-06	06-05-06	1-185	4-C	10740324	133835.81	166517	15.75				80.25	20%	64.50	85.75	85.75	201.42	-	32%	471	8,897
GS	780	563	ANTILLES 11	29	FERTILIZANTE A GRANEL	06-04-06	06-04-06	1-018	4-O	3797500	145553.85	145554	0				26.09	0%	26.09	29.42	29.42	83.83	-	31%	378	7,265
GS	796	3756	KOPALNIA BORYNIA	2	MAIZ ,TRIGO Y ARROZ A GRAN	06-07-06	06-07-06	1-185	3	10731743	111496.63	237638	51.09				96.25	53%	45.16	101.83	101.83	112.00	-	40%	472	8,893
GS	798	4942	NEW BLESSING	6	SULFATO DE SODIO (SODA AS	06-07-06	06-09-06	1-185	3	5003990	46548.74	57623	20.66				107.50	19%	86.84	113.67	113.67	155.25	-	56%	576	21,059
GS	836	1787	COMET	6068	MAIZ A GRANEL	06-14-06	06-15-06	1-185	3-E	9349932	138702.45	140432	0.83				67.41	1%	66.58	74.75	74.75	93.50	-	71%	372	5,997

GS	839	6799	SUCHADA NAREE	1	FERTILIZANTE A GRANEL	06-15-06	06-15-06	1-018	4-O	18000000	296687.00	309864	2.58				60.67	4%	58.09	67.08	67.08	68.50	-	85%	494	14,431
GS	847	3746	KOPALNIA RYDULTOWY	12	HARINA,TRIGO,ARROZ Y MAIZ,	06-17-06	06-17-06	1-185	4-C	9493976	166560.98	178291	3.75				57.00	7%	53.25	61.33	61.33	78.00	-	68%	471	8,897
GS	859	3756	KOPALNIA BORYNIA	3	MAIZ,HARINA,TRIGO Y HARINA	06-19-06	06-19-06	1-185	4-E	10834074	205385.29	290848	15.5				52.75	29%	37.25	81.58	81.58	91.33	-	41%	472	8,893
GS	860	2102	DION	1	MAIZ A GRANEL	06-19-06	06-20-06	1-185	3	23099973	134302.17	304267	96.08				172.00	56%	75.92	174.16	174.16	197.75	-	38%	558	17,428
GS	870	1787	COMET	1	CARGAR CONCENTRADO DE Z	06-22-06	06-23-06	1-142	4-O	3000000	38834.95	449775	70.58				77.25	91%	6.67	166.66	166.66	197.50	-	3%	372	5,997
GS	920	3078	HONOR	1	SAL A GRANEL	07-02-06	07-04-06	1-018	4	18452	137.35	155	15.67				134.34	12%	118.67	121.42	121.42	181.92	-	65%	549	15,847
GS	923	3756	KOPALNIA BORYNIA	4	MAIZ,HARINA,TRIGO Y HARINA	07-03-06	07-04-06	1-185	4-E	9626283	80052.25	82807	4				120.25	3%	116.25	123.75	123.75	138.58	-	84%	472	8,893
GS	927	3746	KOPALNIA RYDULTOWY	13	HARINA,TRIGO,ARROZ Y MAIZ,	07-03-06	07-09-06	1-185	3	9851243	62090.27	84925	42.66				158.66	27%	116.00	163.50	163.50	182.92	-	71%	471	8,897
GS	947	1693	BCZA CHISTINA REM. MISS ANN	1	TRIGO A GRANEL	07-07-06	07-10-06	1-018	3-O	5720000	73806.45	0	3.67				77.50	5%	73.83	97.91	97.91	173.33	-	43%	330	4,247
GS	968	537	ANNETTA	2318	GREEN DELAYED PETROLERO	07-12-06	07-15-06	1-229	3	33062578	497181.62	500342	0.42				66.50	1%	66.08	71.08	71.08	73.50	-	90%	596	24,954
GS	973	1751	CLIPPPER BEAUFORT	1	GRANO SECO, HARINA DE SOY	07-12-06	07-25-06	1-185	4-E	19208583	68802.01	123926	125				280.00	45%	155.00	285.58	285.58	308.25	-	50%	507	14,762
GS	982	7214	TRADE WIND	319	SALVADO DE TRIGO A GRANEL	07-14-06	07-22-06	1-129	4-O	8000000	78094.49	189514	45.17				78.83	59%	31.66	90.16	90.16	197.83	-	16%	557	17,356
GS	990	7343	UBC SAVANNAH	6002	CARBON BITUMINOSO	07-15-06	07-22-06	1-129	3-O	30528836	186344.60	250421	41.92				163.83	26%	121.91	169.00	169.00	170.67	-	71%	561	19,743
GS	1003	3756	KOPALNIA BORYNIA	5	MAIZ,HARINA,TRIGO Y HARINA	07-18-06	07-25-06	1-185	4-E	10774753	118196.06	137855	13				91.16	14%	78.16	97.32	97.32	148.73	-	53%	472	8,893
GS	1006	2552	FU KANG SHAN	66	CONCENTRADO DE PLOMO A C	07-19-06	07-25-06	1-142	4-O	1000000	17415.53	18318	2.83				57.42	5%	54.59	62.09	62.09	149.92	-	36%	532	17,000
GS	1023	6804	BZA SUGAR EXPRESS	1	SOYA A GRANEL	07-22-06	07-30-06	1-018	4-O	9858912	92641.53	96420	4.17				106.42	4%	102.25	121.50	121.50	192.83	-	53%	346	6,552
GS	1030	5439	PAZ COLOMBIA	1	FOSFATO MONOCALCIO A GRA	07-23-06	07-30-06	1-018	4-E	7395774	76640.15	226447	63.84				96.50	66%	32.66	100.58	100.58	157.25	-	21%	389	4,803
GS	1072	1571	CENTURY QUEEN	27	FERTILIZANTE A GRANEL	08-01-06	08-04-06	1-018	4-O	12200000	201919.89	208547	1.92				60.42	3%	58.50	64.42	64.42	65.67	-	89%	450	9,978
GS	1083	3756	KOPALNIA BORYNIA	6	MAIZ,HARINA,TRIGO Y HARINA	08-03-06	08-04-06	1-185	3	10096218	250278.09	263334	2				40.34	5%	38.34	46.00	46.00	68.25	-	56%	472	8,893
GS	1103	7693	WINSOME WISDOM	1	MAIZ A GRANEL	08-06-06	08-07-06	1-185	4-O	10386385	83815.08	122308	39				123.92	31%	84.92	128.41	128.41	146.50	-	58%	387	6,664
GS	1104	7732	XENIA	7	CONCENTRADO DE ZINC A GR	08-06-06	08-08-06	1-142	5-O	10000000	100583.38	269614	82.33				99.42	63%	37.09	116.25	116.25	160.58	-	23%	468	7,406
GS	1108	1847	CORNELIA	25	MAIZ Y HARINA DE SOYA A GR	08-07-06	08-07-06	1-185	3	20999467	163419.98	276309	52.5				128.50	41%	76.00	133.58	133.58	177.33	-	43%	576	16,807
GS	1113	806	AUGUSTE OLDENDORFF	61749	MAIZ ,TRIGO Y ARROZ A GRAN	08-08-06	08-08-06	1-185	4-E	15713136	110198.02	161891	45.41				142.59	32%	97.16	158.42	158.42	167.92	-	58%	486	11,194
GS	1134	1144	BASS BULKER	1	FERTILIZANTE A GRANEL	08-13-06	08-14-06	1-018	3	15170890	170308.35	181145	5.33				89.08	6%	83.75	92.08	92.08	127.58	-	66%	579	17,075
GS	1147	421	AMY C	1	FERTILIZANTE A GRANEL	08-15-06	08-16-06	1-185	4-E	12800000	81705.60	101458	30.5				156.66	19%	126.16	163.16	163.16	190.00	-	66%	448	9,177
GS	1149	3756	KOPALNIA BORYNIA	7	TRIGO,MAIZ Y ARROZ A GRANE	08-16-06	08-16-06	1-185	4-E	10109571	122659.20	182122	26.91				82.42	33%	55.51	94.25	94.25	104.17	-	53%	472	8,893
GS	1162	6889	SVILAS	1	FERTILIZANTE A GRANEL	08-19-06	08-19-06	1-018	4-E	8693518	117878.21	123610	3.42				73.75	5%	70.33	81.00	81.00	101.75	-	69%	405	6,996
GS	1166	2478	FEDERAL FUJI	418	MAIZ Y ARROZ A GRANEL	08-19-06	08-23-06	1-185	4-O	20835751	133348.81	133349	0				156.25	0%	156.25	159.33	159.33	257.08	-	61%	600	17,814
GS	1176	6227	SEA HARMONY	9	LAMINA VIGA,VEHICULOS Y MA	08-20-06	08-20-06	1-185	3	4148428	82836.02	89214	3.58				50.08	7%	46.50	60.17	60.17	86.50	-	54%	555	16,960
GS	1182	806	AUGUSTE OLDENDORFF	61749	TRIGO Y HARINA DE SOYA A G	08-23-06	08-23-06	1-185	3-E	15802631	123612.57	147111	20.42				127.84	16%	107.42	130.00	130.00	169.00	-	64%	486	11,194
GS	1194	3857	LAUREL	1	FERTILIZANTE A GRANEL	08-25-06	08-29-06	1-018	4-E	13073000	73480.97	73481	0				177.91	0%	177.91	181.66	181.66	273.25	-	65%	549	15,786
GS	1216	3756	KOPALNIA BORYNIA	8	TRIGO Y ARROZ A GRANEL	08-28-06	08-30-06	1-185	4-O	10336387	70473.76	192879	93.08				146.67	63%	53.59	150.83	150.83	196.83	-	27%	472	8,893
GS	1219	4343	MASUREN	417	FERTILIZANTE A GRANEL	08-28-06	08-29-06	1-229	5-E	2417521	27550.10	34660	18				87.75	21%	69.75	240.67	240.67	261.58	-	27%	622	25,719
GS	1261	2817	GRETKE OLDEN DORFF	618995	FERTILIZANTE A GRANEL	09-06-06	09-07-06	1-185	3-O	19083242	225171.00	267835	13.5				84.75	16%	71.25	89.34	89.34	117.17	-	61%	517	13,712
GS	1319	7622	WARTA	1	TRIGO Y HARINA DE SOYA A G	09-20-06	09-20-06	1-185	4-O	12118089	190067.67	197299	2.33				63.75	4%	61.42	67.25	67.25	75.33	-	82%	471	9,815
GS	1324	5568	PILICA	1	HARINA DE GALLETA Y MAIZ A	09-21-06	09-22-06	1-185	4-E	15080736	130476.77	137523	5.92				115.58	5%	109.66	119.75	119.75	145.16	-	76%	490	11,848
GS	1327	7214	TRADEWIND	0	SALVADO DE TRIGO A GRANEL	09-21-06	09-25-06	1-129	4-E	7000000	45802.53	47512	5.5				152.83	4%	147.33	63.33	63.33	160.17	-	92%	557	17,356
GS	1338	7348	UBC BALBOA	1	HARINA DE SOYA Y MAIZ AMAR	09-23-06	09-24-06	1-185	3	21654994	138000.22	189956	42.92				156.92	27%	114.00	140.59	140.59	162.00	-	70%	506	14,861
GS	1344	811	AUDRE	1	CONCENTRADO DE PLOMO A C	09-24-06	09-28-06	1-142	4-O	3000000	147565.17	203390	5.58				20.33	27%	14.75	26.33	26.33	117.50	-	13%	337	3,893
GS	1377	1597	CENTURY SEYMOUR	1	FERTILIZANTE A GRANEL	09-30-06	09-30-06	1-018	4-E	9800000	148665.05	257285	27.83				65.92	42%	38.09	70.16	70.16	72.08	-	53%	450	9,978
GS	1384	7622	WARTA	2	HARINA DE SOYA Y MAIZ AMAR	10-01-06	10-03-06	1-185	4-O	12361235	224749.73	244390	4.42				55.00	8%	50.58	58.42	58.42	108.67	-	47%	471	9,815
GS	1408	5568	PILICA	2	TRIGO ,ARROZ Y HARINA DE S	10-06-06	10-06-06	1-185	3	15212419	89748.78	145811	65.17				169.50	38%	104.33	187.83	187.83	195.67	-	53%	490	11,848
GS	1443	4211	MARK C	1	MAIZ ,TRIGO Y ARROZ A GRAN	10-13-06	10-14-06	1-185	3	17112170	127702.78	136280	10.25				134.00	8%	123.75	138.83	138.83	175.50	-	71%	525	14,357
GS	1445	7622	WARTA	1	TRIGO Y MAIZ A GRANEL	10-13-06	10-14-06	1-185	4-O	12483317	95176.25	143026	43.88				131.16	33%	87.28	134.84	134.84	163.50	-	53%	471	9,815
GS	1478	3741	KOPALNIA HALEMBA	0	MAIZ ,TRIGO Y HARINA DE SOY	10-19-06	10-20-06	1-185	5-O	10335707	110047.99	154634	27.08				93.92	29%	66.84	98.00	98.00	123.25	-	54%	471	8,897
GS	1483	6169	SANKO ETERNAL	1	ARROZ Y MAIZ A GRANEL	10-20-06	10-24-06	1-185	4-O	21999891	155852.26	198627	30.58				141.34	22%	110.76	145.08	145.08	249.58	-	44%	555	18,108
GS	1520	811	AUDRE	0	CARGA CONCENTRADO	10-27-06	10-27-06	1-142	3	2000000	177777.78	177778	0				11.25	0%	11.25	19.08	19.08	27.25	-	41%	337	3,893
GS	1573	3741	KOPALNIA HALEMBA	2	TRIGO Y HARINA DE SOYA A G	11-07-06	11-07-06	1-185	3-O	10098339	218768.18	218768	0				46.16	0%	46.16	49.75	49.75	64.33	-	72%	471	8,897
GS	1593	2859	GULFWIND	266	SALVADO DE TRIGO A GRANEL	11-11-06	11-15-06	1-129	3	4080000	183370.79	183371	0				22.25	0%	22.25	27.00	27.00	119.25	-	19%	607	23,646
GS	1597	1693	BCZA CRISTINA REM. MISS ANN	1	SOYA A GRANEL	11-12-06	11-18-06	1-018	4-O	6500000	26904.12	41510	85.91				242.50	35%	156.59	252.00	252.00	399.92	-	39%	330	4,247
GS	1621	4847	MORAKOT NAREE	1	TRIGO,MAIZ Y HARINA DE SOY	11-17-06	11-17-06	1-185	3	15139454	55848.66	94034	110.08				271.08	41%	161.00	280.58	280.58	294.42	-	55%	482	10,943
GS	1627	7342	UBC STAVANGER	6012	CARBON A GRANEL	11-18-06	11-19-06	1-129	3	30256290	484721.08	484721	0				62.42	0%	62.42	65.58	65.58	75.91	-	82%	563	19,748
GS	1632	3741	KOPALNIA HALEMBA	3	ARROZ, HARINA DE SOYA Y TR	11-19-06	11-24-06	1-185	3	9193041	70808.30	104466	41.83				129.83	32%	88.00	132.92	132.92	261.08	-	34%	471	8,897
GS	1650	5253	AORIENT SUNRISE	13	MAIZ Y HARINA DE SOYA A GR	11-23-06	11-28-06	1-185	3	24725138	237741.71	282832	16.58				104.00	16%	87.42	106.58	106.58	238.03	-	37%	558	17,431
GS	1671	7622	WARTA	4	MAIZ,HARINA DE SOYA Y ARRO	11-26-06	11-29-06	1-185	4-O	11218927	111889.55	135274	17.33				100.25	17%	82.92	103.62	103.62	173.83	-	48%	471	8,815
GS	1685	5226	OLMECA	1	CONTENEDORES,TRASFEREN	11-30-06	12-01-06	1-142	5-O	10053000	37119.23	79830	144.9				270.83	54%	125.93	274.13	274.13	301.27	-	42%	605	17,778
GS	1727	5248	ONEGO RUNNER	1	SOYA A GRANEL	12-09-06	12-12-06	1-018	4-O	5184995	55704.72	57034	2.17				93.08	2%	90.91	99.25	99.25	183.33	-	50%	372	5,943
GS	1729	4291	BCZA MARIE FOOD REM. JANIS GU	1	MAIZ Y HARINA DE SOYA A GR	12-09-06	12-11-06	1-185	4	23996213	131789.39	149435	21.5				182.08	12%	160.58	203.25	203.25	265.50	-	60%	532	19,271
GS	1741	3741	KOPALNIA HALEMBA	4	TRIGO Y ARROZ A GRANEL	12-11-06	12-12-06	1-185	3	24484790	158174.11	309018	75.5				154.67	49%	79.17	157.80	157.80	187.39	-	42%	471	8,897
GS	1744	241	ALERCE N	1	ARROZ EN GRANZA A GRANEL	12-12-06	12-18-06	1-018	4-E	17303655	78503.11	124558	81.5				220.42	37%	138.92	223.58	223.58	380.33	-	37%	501	12,874

GS	1748	3746	KOPALNIA RYDULTOWY	14	TRIGO Y MAIZ A GRANEL	12-13-06	12-19-06	1-185	4-O	10865772	96110.81	220580	61.49				110.75	56%	49.26	116.20	116.20	262.25	-	19%	471	6,897	1
GS	1768	7622	WARTA	5	MAIZ,HARINA DE SOYA Y ARRO	12-16-06	12-21-06	1-185	4-E	11450013	68526.02	121718	73.02				167.09	44%	94.07	170.42	170.42	296.67	-	32%	471	9,815	1
GS	1770	3956	LISANNE	6	CARGAR MADERA (TIMBER)	12-17-06	12-18-06	1-229	5-E	2155210	62469.86	63538	0.58				34.50	2%	33.92	36.00	36.00	64.25	-	53%	268	1,865	1
GS	1779	3438	PATAGONIA	1	FERTILIZANTE A GRANEL	12-18-06	12-26-06	1-018	5-O	13005508	113664.64	164814	35.51				114.42	31%	78.91	118.50	118.50	311.50	-	25%	578	17,075	1
GS	1781	553	ANTILLES II	1	CARGAR AZUCAR MORENA A G	12-19-06	12-28-06	1-018	4-O	3720000	76970.83	121054	17.6				48.33	36%	30.73	78.00	78.00	280.84	-	11%	378	7,265	1
GS	1800	1159	BITLIS	1	ARROZ A GRANEL	12-23-06	12-29-06	1-018	3	13617000	68310.42	82688	34.68				199.34	17%	164.68	204.08	204.08	353.87	-	47%	505	11,973	1
GS	1807	3859	LANGENES	1	ARROZ A GRANEL	12-23-06	01-02-07	1-018	4-O	4008088	78977.10	84381	3.25				50.75	6%	47.50	56.17	56.17	281.25	-	17%	312	4,043	1
																						18,092					TOT:
										1333508748	15683405.97	19733907.28	2663.11	0	0	0	11528.19	21.79728705	8865.08	12448.87	12448.87	18092.02	0	84.85889977	57769.781	1389431	122

BULK MATERIAL HANDLING CONSULTING
PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS

August 2, 2007

DMJM HARRIS - USTDA STUDY

Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras

K.Kroeter

Table No. 1.2.3-NN4: ANALYSIS OF STATEMENTS OF FACTS

		Total [hours]	Vessel at Port: Vessel Port [hours]	Vessel at Port: Rain at Port [hours]	Vessel at Berth: Vessel Berth [hours]	Vessel at Berth: Open Hatch [hours]	Vessel at Berth: Dis-charge [hours]	Vessel at Berth: Meal [hours]	Vessel at Berth: Grab Maint. [hours]	Vessel at Berth: Rain at Berth [hours]	Vessel at Berth: No Trucks [hours]	Vessel at Berth: Pay-loader [hours]
Vessel 1: Onego Explorer Voy 02												
Arrived 10/8/06 5:36												
Completed 10/11/06 11:55			2.05	0.00	1.35	0.95	63.82	0.50	0.78	7.78	0.00	1.08
	Total Port [h]:	78.32	3.26 days		1.8%	1.2%	83.7%	0.7%	1.0%	10.2%	0.0%	1.4%
	Total Berth [h]:	76.27	3.18 days		of Berth hours							
Bulk Fertilizer 4,400 tons	Berth Rate:	58 tons/hour	=		1,385 tons/day			No Congestion, no rain at port				
Vessel 2: Onego Runner Voy 15												
Arrived 12/9/06 7:30												
Completed 12/16/06 2:20			12.17	54.67	5.00	0.57	49.68	14.00	0.25	6.42	19.50	0.58
	Total Port [h]:	162.83	6.78 days		5.2%	0.6%	51.8%	14.6%	0.3%	6.7%	20.3%	0.6%
	Total Berth [h]:	96.00	4.00 days		of Berth hours							
Soy Bean Meal 5,185 tons	Berth Rate:	54 tons/hour	=		1,296 tons/day			Rain:	34% of Port hours			
			Congestion [h]:		11.15 h	=	0.46 days		7% of Port hours			
Vessel 3: Patagonia Voy 01-06												
Arrived 12/18/06 17:36												
Completed 12/31/06 15:40			202.95	17.25	4.65	3.07	58.17	0.50	1.67	7.93	10.93	2.95
Xmas Holyday Port closed 21 hours	Total Port [h]:	310.07	12.92 days		5.2%	3.4%	64.7%	0.6%	1.9%	8.8%	12.2%	3.3%
	Total Berth [h]:	89.87	3.74 days		of Berth hours							
Bulk Fertilizer 13,006 tons	Berth Rate:	145 tons/hour	=		3,473 tons/day			Rain:	6% of Port hours			
			Congestion [h]:		178.30 h	=	7.43 days		58% of Port hours			
Vessel 4: Macondo Voy 01												
Arrived 2/6/07 10:00												
Completed 2/9/07 16:35			6.58	0.50	3.42	0.92	37.83	4.50	0.42	19.75	4.00	0.67
	Total Port [h]:	78.58	3.27 days		4.8%	1.3%	52.9%	6.3%	0.6%	27.6%	5.6%	0.9%
	Total Berth [h]:	71.50	2.98 days		of Berth hours							
Bulk Fertilizer 7,297 tons	Berth Rate:	102 tons/hour	=		2,449 tons/day			Rain:	1% of Port hours			
			Congestion [h]:		4.40 h	=	0.18 days		6% of Port hours			

Conclusion: Congestion affected vessels between 0% and 58% of its hours at Port
Rain affected vessels and discharge operations up to 34% of hours at Port and 5% to 28% of hours at Berth
Waiting for trucks affected discharge operations between 0% and 20% of hours at berth
Meals affected discharge operations between 0% and 15% of hours at berth
Vessel Berth hours are identified as: vessel berthing or shifting or free pratique or draft [survey]

Table 1.2.3-NN4 shows the results of analyzing 4 selected Statements of Facts for ships unloading at the Port of Cortés during 2006. This information, which is recorded by the ship agents, includes details on delays when awaiting trucks, when a ship is moved of berth, and other details not available from the ENP statistics. Although limited conclusions can be drawn due to the small sample size, it should be noted that there appeared to be delays due to congestion or awaiting berth, due to weather and waiting for trucks for soy bean meal and fertilizer, the two products handled on the ships included in this limited sample.

Many of the importers for commodities, such as wheat, corn and soy are located along the road between Puerto Cortes and San Pedro Sula, and between San Pedro Sula and Villanueva / Potrerillos along the road to Tegucigalpa. Importers of some commodities, such as rice, are located as far away as Tegucigalpa or even Danlí. Large fleets of trucks are mobilized to accommodate the round trip travel times. No dry bulk storage is available at the port. Six small metallic silos were built by cement company CENOSA, but not completed. A conveyor system built for cement is incomplete.

There are a number of problems with the present operation:

- There is insufficient berthing available for the ships, as indicated by the high berth occupancies, resulting in the dry bulk carriers being forced to wait for a berth or even sent back to anchorage after having commenced unloading due to the greater priority accorded the other types of vessel, such as containerships, tankers and cruise vessels. If Wharf 6, the proposed berthing for container ships is developed, it is expected to relieve some of the pressure on berthing space at Wharf 5 which would otherwise exist. However, it could not be ascertained whether Wharf 5 would continue to be required mainly for non-bulk cargoes.
- There is no storage available at the Port, resulting in the need to have "direct" discharge into trucks. With each truck handling in the range of 30 tons, compared to a shipload of 10 to 12,000 tons, 400 truckloads have to be moved for each ship.
- This operation requires large numbers of trucks to maintain unloading rates, due to the distances between the Port and the importers plants and due to the time to unload the trucks at the receiving locations. The operation depends vitally in the availability of truck fleets, unloading times and driving time with local traffic and weather conditions. Although truck delays are not directly reported by Empresa Nacional Portuaria, selected Statements of Facts obtained for the study report delays due to "waiting for truck." This results in costly delays to the ships, as well as necessitating large numbers of trucks at peak times and congestion in the port and city outside the gate.
- When the buckets are opened to drop dry bulk cargo into the hoppers, there is spillage of bulk material onto the wharves deck and the emission of dust from the products. There are no enclosures to contain dust or dust collection to prevent its escape to the atmosphere. Spillage of grains and other foodstuffs, which must then be recovered, can lead to contamination and attract vermin. The exact disposition of the spilled food grains and inorganic products was not determined.
- The operation depends on the performance of ships' gear, which can vary with different ships and is often substandard.

1.2.4 Summary of Guidelines and Criteria for Terminal Development

The following guidelines were developed based on the results of the interviews of port users and the site visit:

- The users emphasized the importance of separating organics products for human and animal consumption (food products) from inorganic products which can be hazardous or could contaminate the foodstuffs.
- The different organic products should also be separated from each other, as should the inorganic products.
- It is necessary to provide storage to speed up the unloading of ships, without waiting for the arrival of lines of trucks, but at the same time it is necessary to control the time in storage of inventories in order to have storage free for the arrival of the next ship.
- Additional wharves dedicated to bulks are needed to avoid waiting for bulk carriers.
- Modern unloading equipment can speed up the operations, which at present depend in many cases on ships' gear.

1.2.5 Review of Dry Bulk Cargo Demand

Introduction

Michael L. Sclar Associates, Inc., in support of DMJM+HARRIS, Inc., has conducted an analysis of the dry bulk market for the Port of Cortes Dry Bulk Unloading Terminal Project. Based on that analysis the following dry bulk forecast was prepared.

In July 2005, Michael L. Sclar Associates, Inc., in conjunction with DMJM+HARRIS, developed a forecast of total cargo volumes for Puerto Cortes. The previous forecast for the dry bulk commodities was based on Puerto Cortes reported trade by commodity, which included some non bulk shipments. The previous forecast was also based on Global Insight trade forecasts which did not include the impact of CAFTA-DR. CAFTA-DR was passed and implemented after the forecast. Modest growth rates were forecast for the dry bulk commodities handled by Puerto Cortes.

The following data sources were utilized to review the demand and forecasts for dry bulk cargo:

Empresa Nacional Portuaria statistics, 2001 – March 2007
Journal of Commerce Port Import Export Retrieval System (PIERS), 2006
United Nations, Comtrade Commodity Trade data
Forecasts prepared by Michael L. Sclar for the Technical Assistance for the Port of Cortés Modernization Project, including Global Insight

The current Puerto Cortes dry bulk forecast is dominated by three specific factors, which have evolved since the previous forecast.

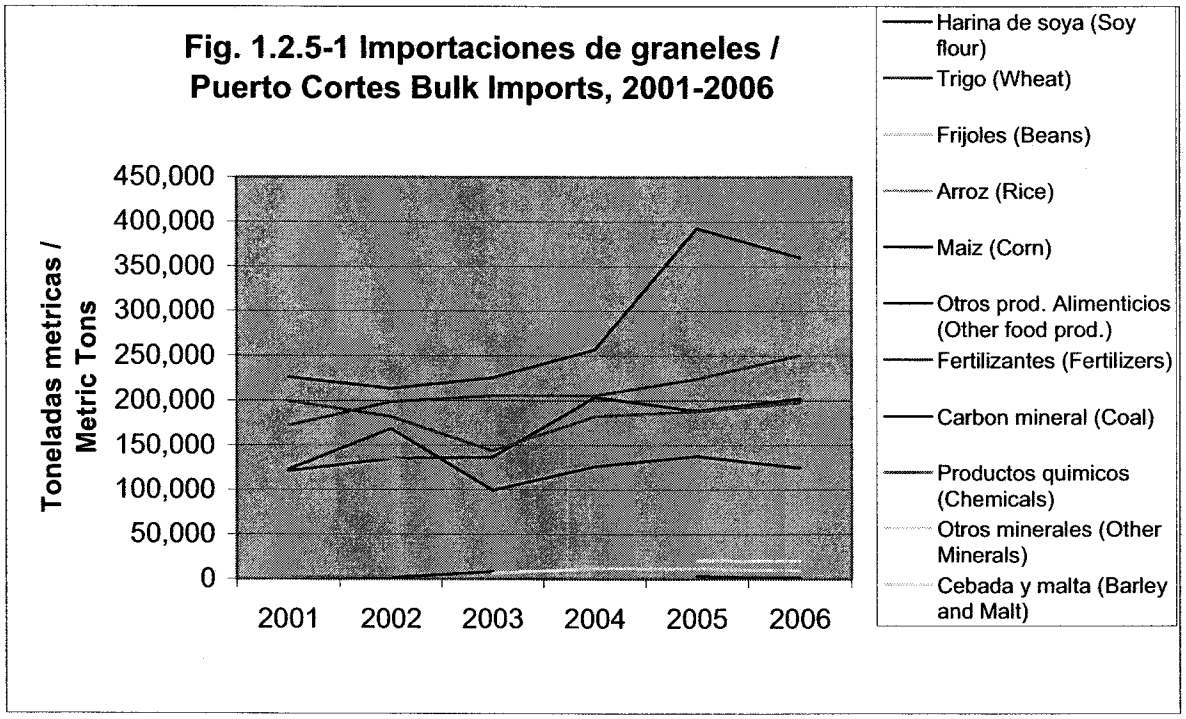
Historically, Puerto Cortes dry bulk cargos maintained moderate growth, and the previous forecast projected continued moderate growth after 2004. However, the previous forecast preceded the implementation of CAFTA-DR. (The forecast was prepared in July 2005 and CAFTA-DR was signed by the US on August 2, 2005 and by Honduras on April 1, 2006. Increases in dry bulk cargo through the Puerto Cortes in 2005 and 2006 occurred, in part, related to crop losses from drought conditions during the 2004-2005 harvest and subsequently the implementation of CAFTA-DR. In particular, grain shipments from the United States have increased significantly. The recent levels of dry bulk trade are projected to continue at the adjusted post CAFTA-DR levels and to increase moderately from 2006 levels. Despite cyclical slowdowns in 2007 year to date and the potential impact of price increases for corn due to ethanol demand in the US, Puerto Cortes dry bulk is projected to increase at slightly higher growth rates than the previous forecast due to the continued demand for grain and other bulk commodities and the ongoing beneficial effects of CAFTA-DR.

In addition to the adjustments resulting from CAFTA-DR, two additional factors will potentially impact the future levels of dry bulk cargo through the Port of Cortes.

First, two new projects were identified during interviews conducted by DMJM+HARRIS. They include a coal fired power plant that would increases coal imports by 200,000 tons per year and an aggregate mine operation that could significantly increase aggregate exports by between 2 and 4 million tons per year and would dramatically increase the dry bulk tons through Puerto Cortes.

Second, the potential shift of dry bulk cargos from Central America Pacific Coast ports to Puerto Cortes (primarily grain from the US Gulf Coast to El Salvador and Guatemala) could increase Puerto Cortes tonnage by an additional 1 million tons over the forecast period.

Historical Data



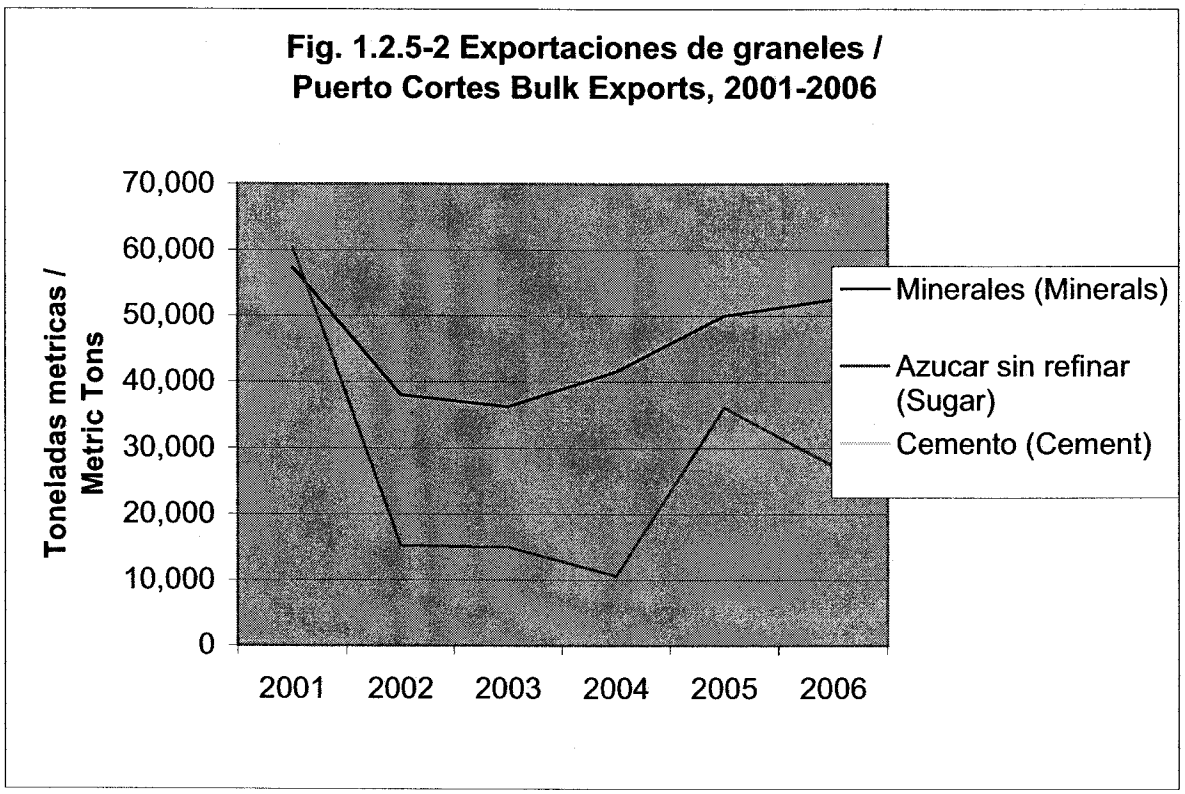


Table 1.2.5-1
Historical Dry Bulk Imports and Exports
(Metric Tons)

Imports	2001	2002	2003	2004	2005	2006	avg01to04	avg0506	Difference	CAGR04to06	CAGR05to06
Harina de soya (Soy flour)	121,043	135,058	136,642	203,997	188,481	202,319	149,185	195,400	46,215	-0.41%	7.3%
Trigo (Wheat)	199,379	182,139	143,658	182,616	188,093	198,095	176,948	193,094	16,146	4.15%	5.3%
Frijoles (Beans)			5,118				5,118		-5,118		
Arroz (Rice)	140,174	135,382	114,764	129,660	163,219	137,250	129,995	150,235	20,240	2.89%	-15.9%
Maiz (Corn)	226,198	213,352	225,484	256,894	392,668	359,823	230,482	376,246	145,764	18.35%	-8.4%
Otros prod. Alimenticios (Other food prod.)	2,256	1,361	8,291		2,950	1,478	3,969	2,214	-1,755		
Fertilizantes (Fertilizers)	172,342	198,767	205,491	205,720	224,253	250,409	195,580	237,331	41,751	10.33%	11.7%
Carbon mineral (Coal)	123,107	168,774	99,406	126,268	137,711	124,604	129,389	131,158	1,769	-0.66%	-9.5%
Productos quimicos (Chemicals)	1,954	3,000			2,183		2,477	2,183	-294		
Otros minerales (Other Minerals)			1,988		20,823	20,350	1,988	20,587	18,599		-2.3%
Cebada y malta (Barley and Malt)			6,360	11,988	11,525	9,377	9,174	10,451	1,277	-11.56%	-18.6%
Subtotal	986,453	1,037,833	947,202	1,117,143	1,331,906	1,303,705	1,022,158	1,317,806	295,648	8.03%	-2.1%
Exports	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**					
Minerales (Minerals)	57,337	38,000	36,233	41,540	50,000	52,500	43,278	51,250	7,973	12.42%	5.0%
Azucar sin refinar (Sugar)	60,438	15,200	15,000	10,610	36,096	27,310	25,312	31,703	6,391	60.44%	-24.3%
Cemento (Cement)						4,020	0	4,020	4,020		
Sub Total	117,775	53,200	51,233	52,150	86,096	83,830	68,590	84,963	16,374	26.79%	-2.6%
Total	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,090,747	1,402,769	312,021	8.93%	-2.1%

Table 1.2.5-1 includes a summary of historical dry bulk cargo movements through the Puerto Cortes.

The average tons per year of dry bulk cargo in Puerto Cortes between 2001 and 2004 was 1.091 million tons compared with 1.403 million tons per year for 2005 and 2006.

The primary factor contributing to the higher tonnages in 2005 and 2006 seems to be the implementation of CAFTA-DR. The largest increase between the two periods is for corn (from the USA), which increased by 145,764 tons. The next two largest increases are for soy/feed (shifted to the USA), which increased by 46,215 tons, and fertilizer, which increased by 41,751 tons.

Moderate increases in wheat and rice took place between 2004 and 2006. Imported and exported minerals and exported sugar also increased moderately. In the first quarter of 2007, corn has slowed year to date while wheat and soy have increased. Rice has decreased in the first quarter due to delays in CAFTA-DR import certificates and is expected to recover. Without rice, dry bulk imports increased by 4.8% in first quarter 2007 versus 2006 and including rice total dry bulk cargo increased by 3.6% in 2007.

Major Commodities

The following tables and figures detail the historical trends for the major dry bulk commodities handled in Puerto Cortes. The tables show dry bulk imports reported by Puerto Cortes by commodity and the tons for that commodity reported to the UN by Honduras and Honduras' trade partners, and finally the non containerized tons reported by the Journal of Commerce (JoC) for the commodity trade between the US and Honduras.

Fig. 1.2.5-3 Importaciones de Maiz / Corn Imports reported by Puerto Cortes, 2001-2006

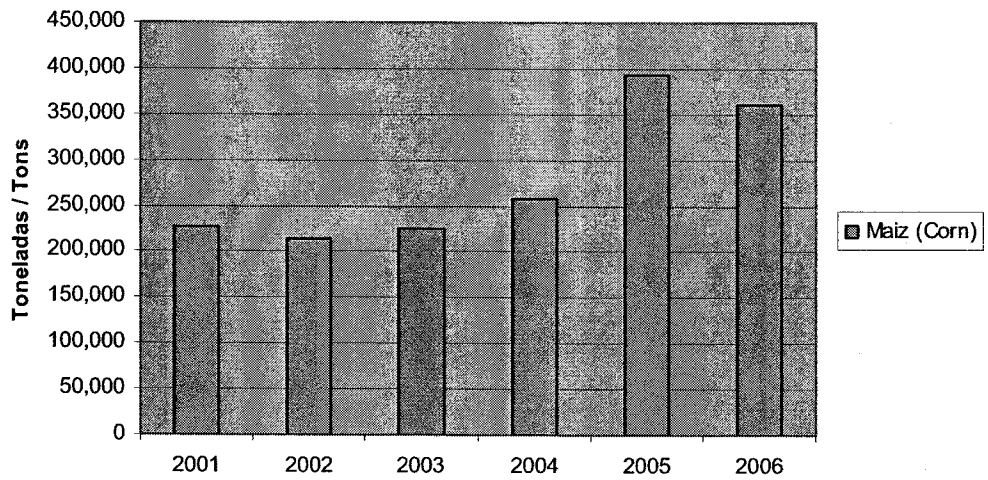


Table 1.2.5-2
Corn Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Maiz (Corn)	226,198	213,352	225,484	256,894	392,668	359,823

Reported by Honduras			**2003**	**2004**	**2005**	
World			224,922	256,561	389,406	
USA			223,507	255,779	382,616	
Argentina					5,003	

Reported by Honduras Trade Partners	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
USA	224,454	214,138	247,374	235,581	373,127	374,424
Argentina					5,047	
Brazil	25,050					
Nicaragua	6,643		1,046			
Guatemala	1,283					

JoC USA NonContainer	**2006**
Harm4 1005	350,107

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-2 Corn Imports shows the significant increase in corn imports, entirely from the United States, that took place in 2005 and was maintained in 2006. (Due to timing differences, Puerto Cortes shows a decrease in corn in 2006 from 2005 levels while the US reported steady levels of exported corn from the United States to Honduras.) According to importers contacted for this study, corn imports into Honduras are of various classifications, principally white corn, yellow corn, high oil content corn, and yellow corn with special treatment for storage in silos.

Fig. 1.2.5-4 Importaciones de Harina de soya / Soy flour Imports reported by Puerto Cortes, 2001-2006

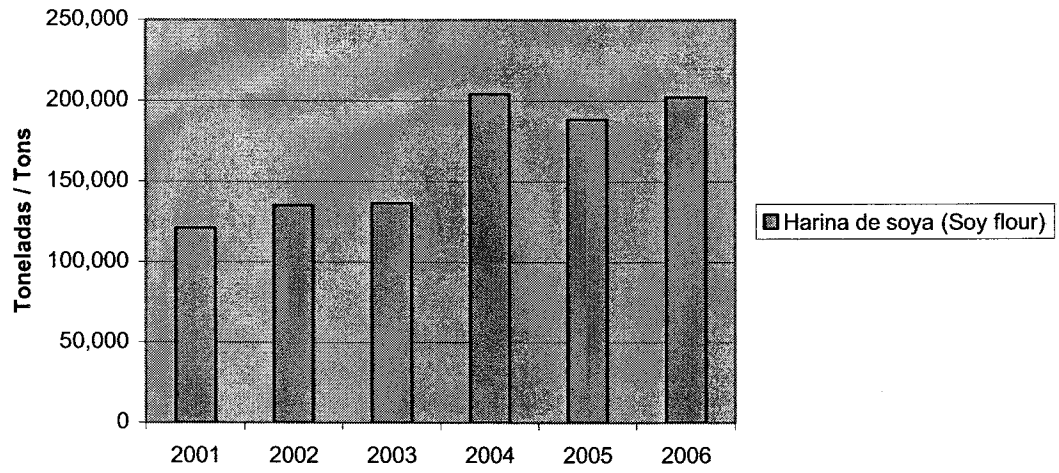


Table 1.2.5-3
Soy/Feed Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Harina de soya (Soy flour)	121,043	135,058	136,642	203,997	188,481	202,319

Reported by Honduras			**2003**	**2004**	**2005**	
World			202,557	262,585	251,219	
USA			140,505	131,152	177,077	
Argentina				57,845	4,800	
Nigeria			21,285	33,359	21,890	
Nicaragua			6,239	9,429	12,800	
El Salvador			11,593	6,883	8,814	
Guatemala			10,596	6,090	6,275	

Reported by Honduras Trade Partners	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
USA				107,419	150,503	184,528
Argentina		79,679		67,627		

JoC USA Bulk	**2006**
Harm4 1208	145,391

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-3-Soy/Feed shows soy imports, which are also primarily from the United States. World imports of soy reported by Honduras to the UN are higher than the reported dry bulk cargo levels due to the portion of soy/feed not handled in bulk. Soy imports increased in 2004, with a sizable volume from Argentina. In 2005 and 2006, the higher levels were maintained, but the Argentina trade shifted to the United States.

Fig. 1.2.5-5 Importaciones de Fertilizantes / Fertilizers Imports reported by Puerto Cortes, 2001-2006

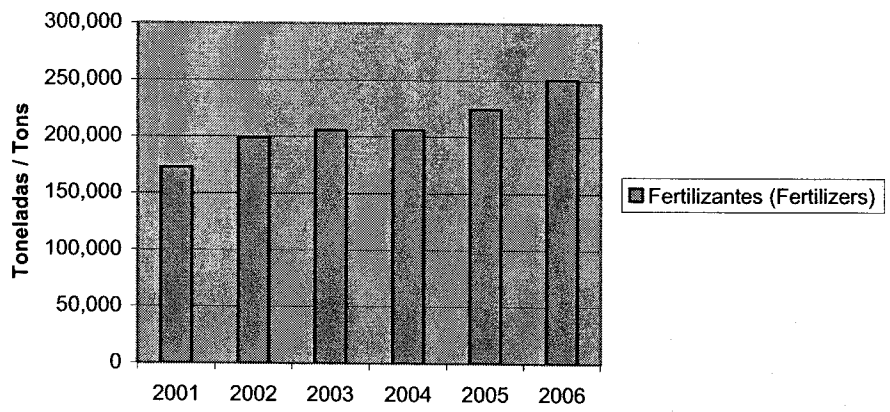


Table 1.2.5-4
Fertilizer Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Fertilizantes (Fertilizers)	172,342	198,767	205,491	205,720	224,253	250,409

Reported by Honduras			**2003**	**2004**	**2005**
World			231,746	240,390	257,151
USA			90,762	61,936	62,970
Russian Fed			30,935	68,630	61,714
Canada			31,882	26,620	29,008
Chile			3,763	4,660	12,522
Spain					16,324
Areas NES					18,690
El Salvador					15,200
Germany					13,553
Belgium			10,379	17,004	
Ukraine			27,293	18,698	
Estonia				10,383	

Reported by Honduras Trade Partners	**2001**	**2002**	**2003**	**2004**	**2005**
Russian Fed	175,075	240,155	183,349	280,070	31,052
Spain			138	219	16,310
Canada	12,800	15,600	46,649	17,250	38,729
Chile	2,050			2,000	6,100
Guatemala		4,031	2,674	7,891	9,650
Belgium		11,744	9,973	13,724	
Sweden			196	1,837	504
Ukraine	38,200		25,824	26,300	
Venezuela		4,000		6,089	
Trinidad&Tobago			6,093		

JoC USA NonContainer	**2006**
Harm4 3105	45,293
Harm4 3102	28,491
Harm4 2815	16,440
Total	90,224

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-4-Fertilizer shows imports of fertilizer. Fertilizer is imported from a range of global sources including the United States, Eastern Europe, Canada etc. (Note: the United States does not report the weight of exported fertilizer for confidentiality reasons so the data reported by trade partners does not show USA tonnages.)

Fig. 1.2.5-6 Importaciones de Trigo / Wheat Imports reported by Puerto Cortes, 2001-2006

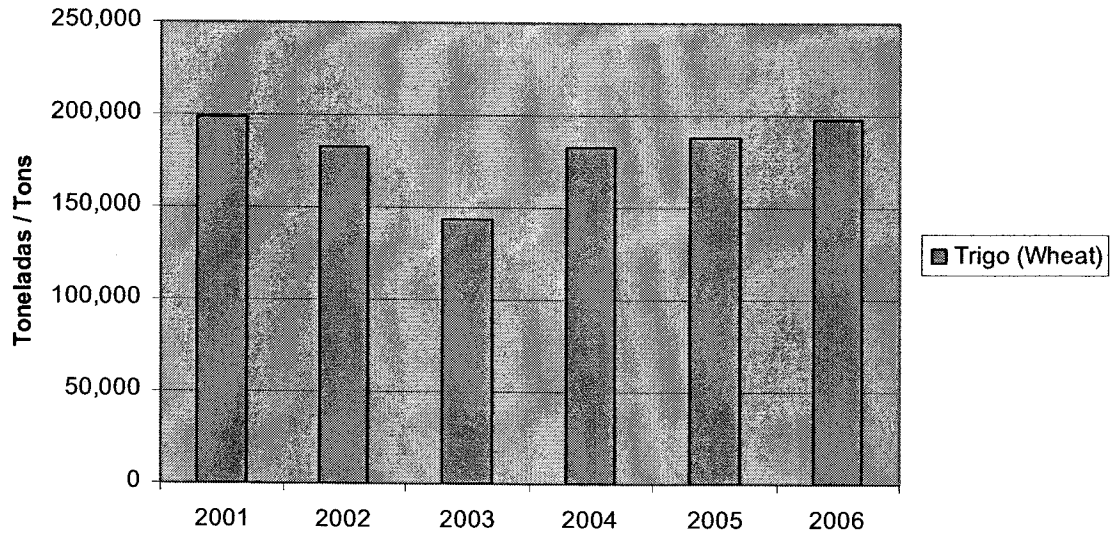


Table 1.2.5-5
Wheat Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Trigo (Wheat)	199,379	182,139	143,658	182,616	188,093	198,095
Reported by Honduras			**2003**	**2004**	**2005**	
World			147,638	208,619	185,672	
USA			147,630	208,618	185,672	
Reported by Honduras Trade Partners	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
USA	171,699	204,144	170,230	171,406	183,162	196,176
Guatemala	5,689	2,571				
JoC USA Non Container						**2006**
Harm4 1001						209,581
Source: Puerto Cortes, UN Comtrade, and JoC PIERS						

Table 1.2.5-5-Wheat shows imports of wheat are also primarily from the United States and they have increased moderately between 2004 and 2006. According to importers contacted for this study, there are four kinds of wheat imported to Honduras. In approximately in 80% of the shipments of wheat, there is product for all three of the main wheat importers – Molino Harinero Sula, Bufalo Industrial (also imports corn and soy flour in bulk) and IMSA. Wheat imports consist of the following classifications - Dark Northern Spring (DNS), Soft Red Winter (SRW), Hard Red Winter (HRW) and Hard Amber Durum (HAD). Most often two types of wheat are brought in a shipment, and sometimes three. In addition to wheat for human consumption, there is some wheat feed grain imported for animal consumption.

Fig. 1.2.5-7 Importaciones de Arroz / Rice Imports reported by Puerto Cortes, 2001-2006

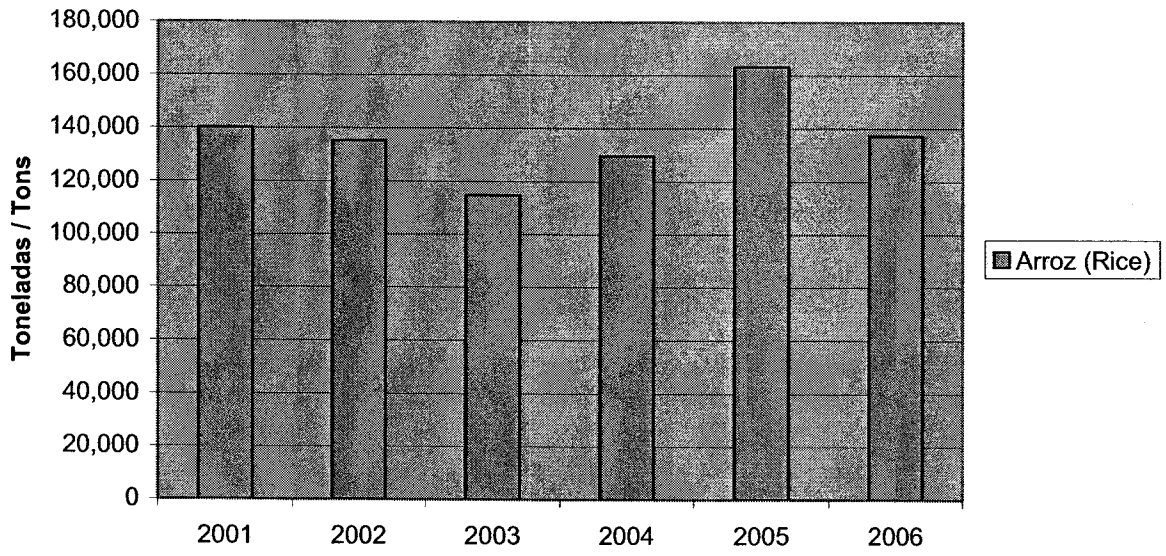


Table 1.2.5-6
Rice Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Arroz (Rice)	140,174	135,382	114,764	129,660	163,219	137,250
Reported by Honduras			**2003**	**2004**	**2005**	
World			130,948	146,321	171,310	
USA			128,579	143,573	171,100	
Pakistan				1,800		
Andorra			1,250			
Reported by Honduras Trade Partners	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
USA	135,573	145,442	123,309	142,300	161,109	160,201
Pakistan			2,720	2,720		

JoC USA NonContainer	**2006**
Harm4 1006	128,693

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-6-Rice shows rice imports are also primarily from the United States and increased between 2004 and 2006. According to importers contacted for this study, for the rice trade, CAFTA-DR is fundamental in that there is a quota for rice imports from the US for 17 years. The annual totals provide

for a 3% annual growth, starting with 91,800 tons in year 1 (2006) to 120,600 tons in year 17. In year 18, the imports are unlimited. This quota permits imports without duty. Outside the quota, the duty is 45%. Rice in imported in two forms – paddy rice ("arroz en granza") and processed rice.

The quotas are based on calendar year, which tends to cause imports in December, which is a very difficult month in operational terms, due to congestion in the port with other cargoes and high charter rates.

The government of Honduras distributes the quota to the rice importers, based upon the percentage of the local rice crop purchased by each firm. A formula is based upon 3 years of data.

There are some 22 companies importing rice into Honduras. The largest 6 or 7 firms control 60% to 70% of the volume. Two of the firms, BEPROAGRO and Honduras Rice distribute nationally; the other firms have a regional focus. Cargill is another importer. Most of the firms are small and tend to purchase rice shipments together. This has generated conflicts during the process of unloading the ship and distributing the cargo to each firm.

Fig. 1.2.5-8 Importaciones de Carbon mineral / Coal imports reported by Puerto Cortes, 2001-2006

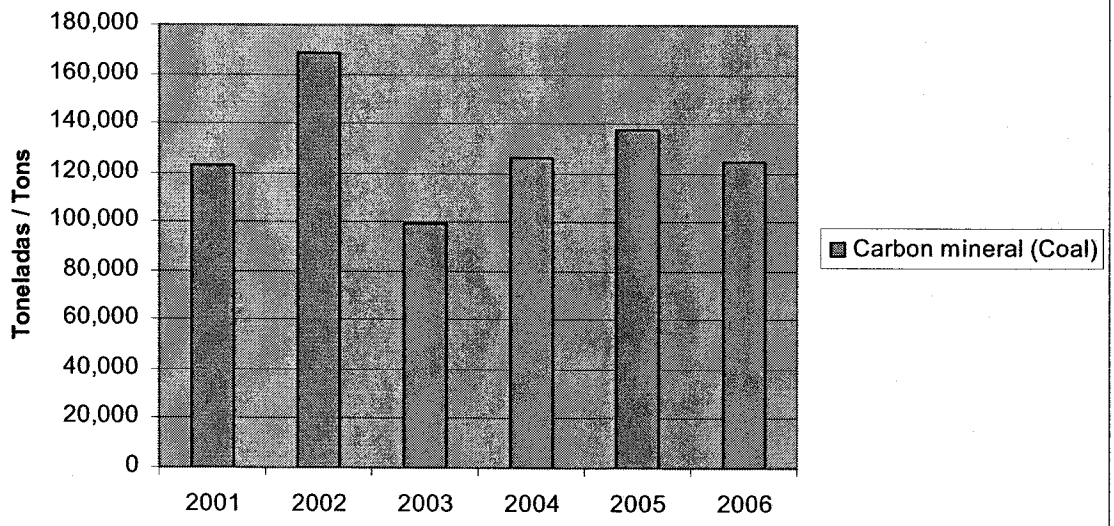


Table 1.2.5-7
Coal/Cement Imports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Carbon mineral (Coal)	123,107	168,774	99,406	126,268	137,711	124,604

JoC USA Non Container	**2006**
Harm4 2701	30,520

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-7-Coal for the cement industry imports - Coal for cement imports are not consistently reported in the trade sources utilized.

Fig. 1.2.5-9 Importaciones de Azucar sin refinar / Raw sugar exports reported by Puerto Cortes, 2001-2006

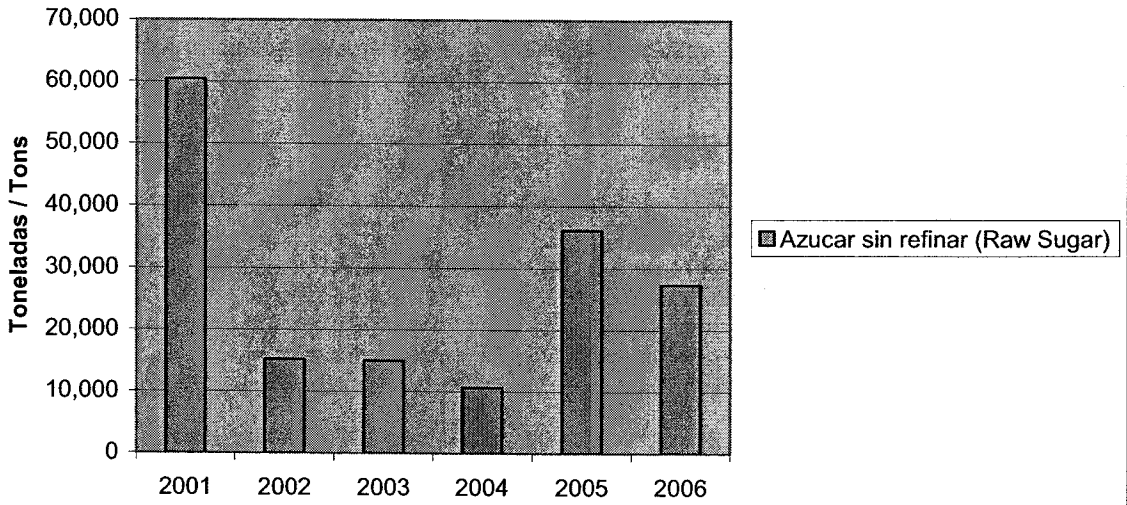


Table 1.2.5-8
Sugar Exports
(Metric Tons)

Reported by Puerto Cortes	2001	2002	2003	2004	2005	2006
Azucar sin refinar (Raw Sugar)	60,438	15,200	15,000	10,610	36,096	27,310

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-8-Sugar exports - Sugar exports are not consistently reported in the trade sources utilized. According to sugar exporters contacted for this study, most of the production is destined to the local market. The major export market for Honduras is the United States, where importers always request

brown sugar in bulk. The exports to the US are regulated by the sugar quota assigned to Honduras. The current quota is for 10,817 tones and the CAFTA allocation is for an additional 8,700 tons. These amounts are distributed to the different sugar producers in Honduras in accordance with their production. These include Azucarera Chumbawa and Yojoa.

Sugar is handled in bulk, transported in specialized containers; in bags loaded on pallets; and in bags loaded into containers, all at the request of the client. Export sugar is usually brown unrefined sugar.

On occasion, white refined sugar is requested. Refined sugar is always transported in bags. This happened in 2006, and the company does not know if this will be repeated in subsequent years. Refined sugar exports are modest and sporadic.

Fig. 1.2.5-10 Importaciones de Minerales / Minerals exports reported by Puerto Cortes, 2001-2006

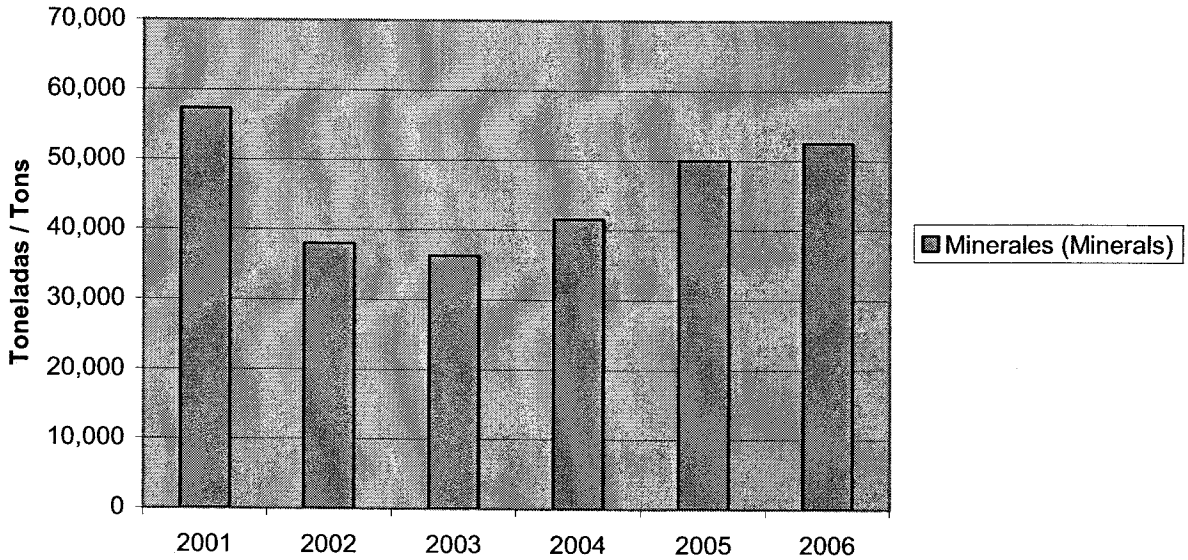


Table 1.2.5-9
Mineral Exports
(Metric Tons)

Reported by Puerto Cortes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Minerales (Minerals)	57,337	38,000	36,233	41,540	50,000	52,500

Source: Puerto Cortes, UN Comtrade, and JoC PIERS

Table 1.2.5-9-Mineral exports - Mineral exports are not consistently reported in the trade sources utilized.

1.2.6 Analysis of Trade Practices in Honduras and other Central American Countries

Neighboring Markets

The following trade practices and issues were addressed in the study:

- CAFTA-DR / TLC CA DR
- Import and export approval and inspections by the Ministry of Finance (Ministerio de Hacienda), Honduran Customs (Aduanas), and environmental and agricultural agencies SEPA, SENASA and OIRSA

The following two tables address the reported dry bulk trades for Honduras' neighboring countries.

Table 1.2.6-1 shows the reported tonnage by commodity and neighboring country. The data in the table includes only the trades which exceeded 50,000 tons in 2005. Other movements of these commodities from trade partners that shipped less than 50,000 tons are not shown. The major dry bulk cargoes (above 50,000 tons) moving to Guatemala, El Salvador and Nicaragua are grains from the United States. The only major commodity to Belize is fertilizer from Eastern Europe.

Table 1.2.6-1
Neighboring Countries 2005 Major Dry Bulk Trades
(Metric Tons)

Direction	Reporter	Partner	Commodity (SITC3)	Commodity	Reported by Trade Partner	
BELIZE EXPORTS						
Export	Russian Federation	Belize	562	Fertilizer	104,986	
		Belize Total			104,986	
EL SALVADOR EXPORTS						
Export	Belgium	El Salvador	562	Fertilizer	125,573	El Salvador USA Grain
Export	USA	El Salvador	041	Wheat	204,662	929,405
Export	USA	El Salvador	042	Rice	93,798	
Export	USA	El Salvador	044	Corn	486,507	
Export	USA	El Salvador	081	Soy/Feed	144,438	
		El Salvador Total			1,054,978	
GUATEMALA EXPORTS						
Export	Colombia	Guatemala	321	Coal	364,574	
Export	Russian Federation	Guatemala	562	Fertilizer	79,232	
Export	Rep. of Korea	Guatemala	661	Cement	123,810	
Export	Canada	Guatemala	041	Wheat	146,283	Guatemala USA Grain
Export	USA	Guatemala	041	Wheat	339,285	1,352,047
Export	USA	Guatemala	042	Rice	79,788	
Export	USA	Guatemala	044	Corn	659,836	
Export	USA	Guatemala	081	Soy/Feed	273,138	
Export	USA	Guatemala	562	Fertilizer	189,365	(Reported by Guatemala)
Export	Canada	Guatemala	562	Fertilizer	61,125	(Reported by Guatemala)
		Guatemala Total			2,316,436	
NICARAGUA EXPORTS						
Export	USA	Nicaragua	041	Wheat	115,772	Nicaragua USA Grain
Export	USA	Nicaragua	042	Rice	182,417	410,234
Export	USA	Nicaragua	044	Corn	112,045	
		Nicaragua Total			410,234	
EL SALVADOR IMPORTS						
Import	Canada	El Salvador	0611	Sugar	73,642	
Import	Russian Federation	El Salvador	0611	Sugar	64,798	
Import	USA	El Salvador	0611	Sugar	145,447	
		El Salvador Total			283,887	
GUATEMALA IMPORTS						
Import	Canada	Guatemala	0611	Sugar	130,374	
Import	China	Guatemala	0611	Sugar	264,789	
Import	Rep. of Korea	Guatemala	0611	Sugar	326,473	
Import	USA	Guatemala	0611	Sugar	217,050	
Import	Venezuala	Guatemala	0611	Sugar	63,610	
		Guatemala Total			1,002,296	
NICARAGUA IMPORTS						
Import	Canada	Nicaragua	0611	Sugar	59,127	
Import	Russian Federation	Nicaragua	0611	Sugar	57,493	
Import	USA	Nicaragua	0611	Sugar	87,730	
Import	China	Nicaragua	0611	Sugar	53,346	
		Nicaragua Total			257,696	
		Grand Total			5,430,513	

Includes Only Reported Trades Greater Than 50 thousand tons.
Excludes Intra Central America Trade

The 2005 USA grain shipments to El Salvador are 929,405, to Guatemala are 1,352,047 tons and to Nicaragua are 410,234 tons. The USA grain shipped to these three countries totaled 2,691,686 tons in 2005. This compares with 932,461 tons of grain imported through Puerto Cortes in 2005. Sugar exports from the neighboring countries include 1,002,296 tons from Guatemala, 283,887 tons from Nicaragua and 257,696 tons from El Salvador. 59% of the Guatemala sugar exports are shipped to China and the Republic of Korea.

1.2.7 Identification of Ports competing for Cargo and Impact on Demand for the Port of Cortés

Table 1.2.7-1 shows the mileages between Puerto Cortes and the capital city of each neighboring country and compares that distance with the distance from the primary port of the neighboring country. In addition, the table shows the ocean distances between New Orleans and the major ports in Guatemala, El Salvador and Nicaragua and compares those distances with the distance between New Orleans and La Ceiba, Honduras and Puerto Barrios, Guatemala. Puerto Cortes is not reported by this source, but is between La Ceiba and Puerto Barrios and the average distance is used for Puerto Cortes in this analysis.

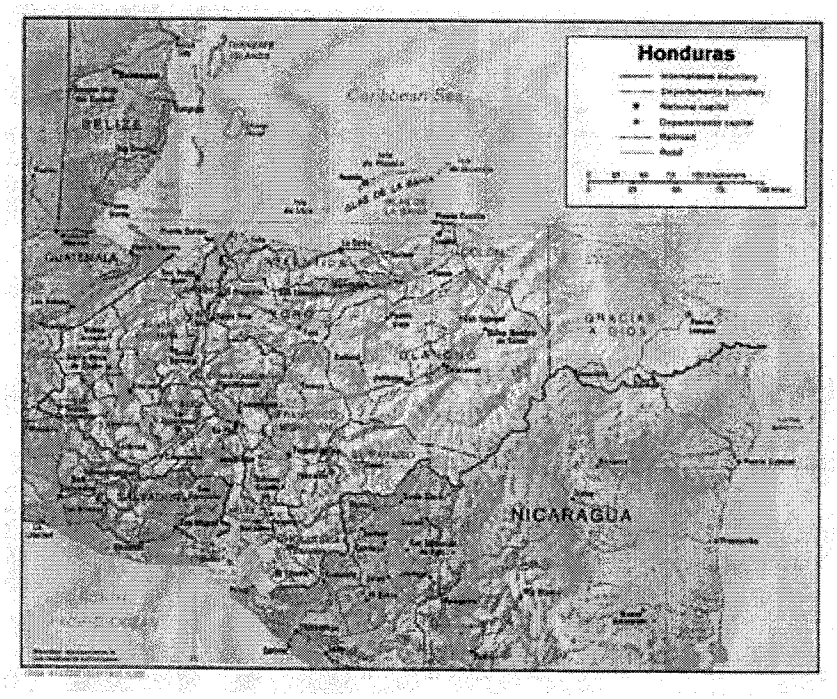


Table 1.2.7-1
Neighboring Country Road and Sailing Distances

A. Road distances

Neighbor port	Neighbor city	Distance to neighbor city km	Distance to Port of Cortes km	Difference km
Puerto Quetzal, Guatemala	Guatemala City, Guatemala	99	485	386
Acajutla, El Salvador	San Salvador, El Salvador	82	365	283
Corinto, Nicaragua	Managua, Nicaragua	150	623	473
Belize City, Belize	Belize City, Belize	0	555	555

B. Sailing distances

Origin port	nm	Neighbor Port	Difference nm
New Orleans	912	La Ceiba, Honduras	
New Orleans	936	Puerto Cortes, Honduras	
New Orleans	960	Puerto Barrios, Guatemala*	
New Orleans	2,326	Acajutla, El Salvador	1,390
New Orleans	2,385	San Jose, Guatemala	1,449
New Orleans	2,177	Corinto, Nicaragua	1,241
New Orleans	871	Belize City, Belize	

Source: Road Distances from Maps.live.com, Microsoft Corporation.
Source: Sea Distances from World Port Distances, Distances.com
Note Puerto Cortes distance estimated from La Ceiba and Puerto Barrios

The road distances between the neighboring country ports and the capital of the neighboring country are 176 to 294 miles closer than the distances from Puerto Cortes. These road distances represent a challenge to the routing of cargo through Puerto Cortes to those cities. However, the ocean distances between New Orleans and the neighboring country ports are between 2,177 and 2,385 nautical miles compared with (an estimated) 936 nautical miles for Puerto Cortes. The ocean differences are between 873 and 1424 miles further than the truck differences (adjusted for nautical miles). In addition, the neighboring port distances include a Panama Canal transit and tolls. Nevertheless, current cargo volumes

routed through Pacific Coast ports access high cargo handling rates, larger vessels and adequate road systems.

These routing differences for the major grain shipments from the United States to neighboring countries present an opportunity for Puerto Cortes, assuming competitive operations and services available at Puerto Cortes and suitable road systems. Research did not identify trade practices or regulations restricting access to these markets. However, improvements in vessel drafts and sizes, handling rates and road systems are required to penetrate this market.

1.2.8 Identification and Forecasts of Type and Quantity of Cargo, its Origins and Destinations

Recent Trade Update

Fig. 1.2.8-1 Importaciones de graneles solidos enero - marzo 2007 y 2006 / Puerto Cortes dry bulk imports, YTD Jan-Mar 2007 and 2006

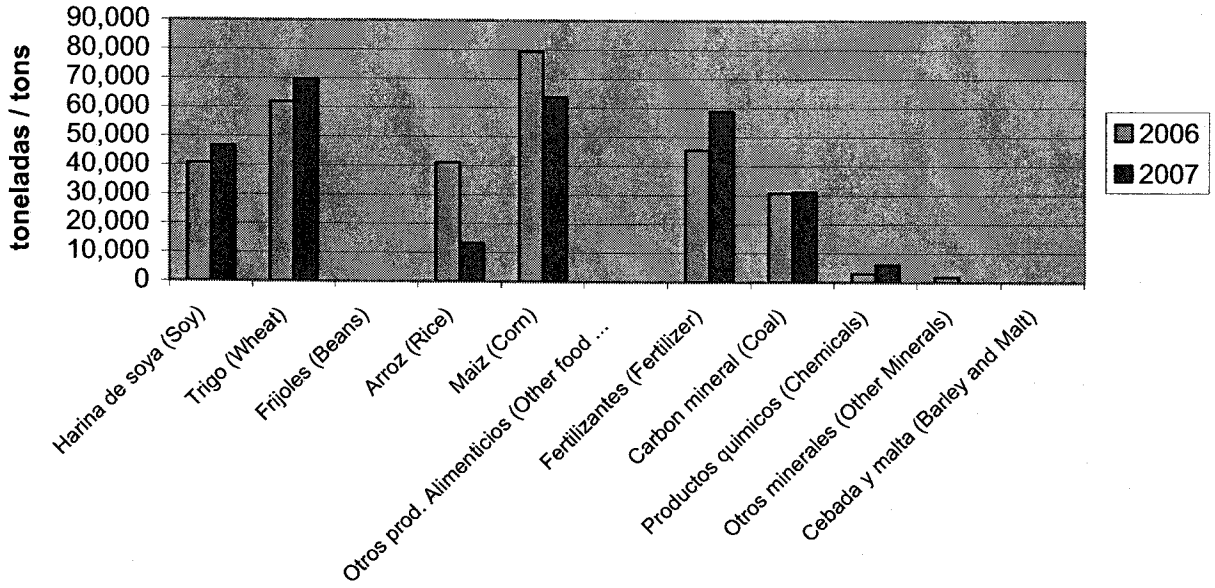


Fig. 1.2.8-2 Exportaciones de graneles solidos enero - marzo 2007 y 2006 / Puerto Cortes dry bulk exports, YTD Jan-Mar 2007 and 2006

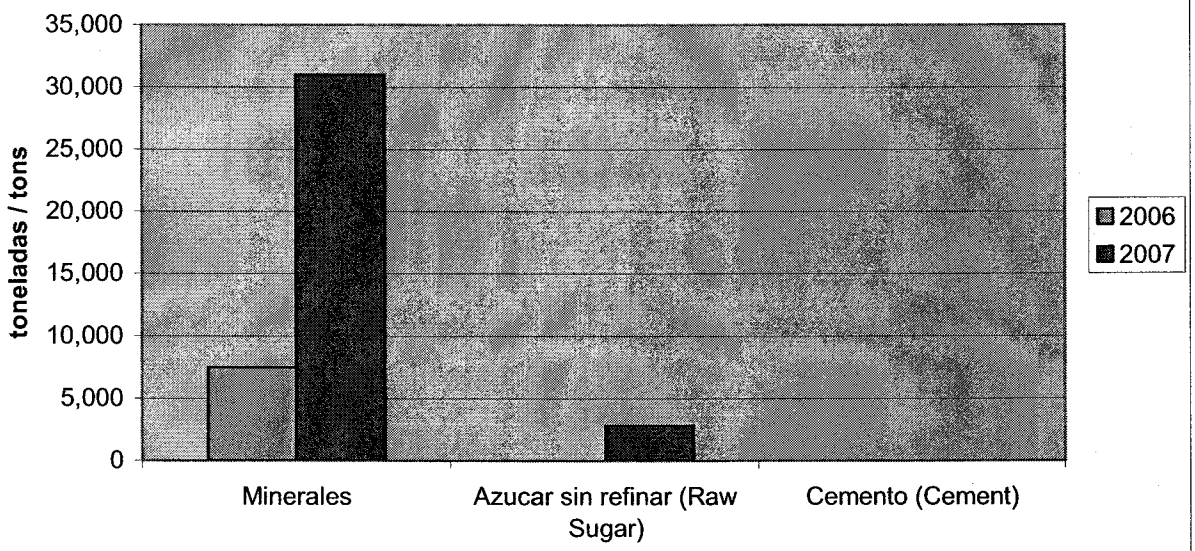


Table 1.2.8-1
Puerto Cortes Dry Bulk Commodities
YTD March 2007 versus 2006

Imports	**2006**	**2007**	**CAGR0607**
Harina de soya (Soy)	40,758	46,711	14.6%
Trigo (Wheat)	61,827	69,684	12.7%
Frijoles (Beans)			
Arroz (Rice)	41,102	13,345	-67.5%
Maiz (Corn)	79,341	63,676	-19.7%
Otros prod. Alimenticios (Other food prod.)			
Fertilizantes (Fertilizer)	45,472	58,758	29.2%
Carbon mineral (Coal)	30,756	31,058	
Productos quimicos (Chemicals)	3,000	5,916	97.2%
Otros minerales (Other Minerals)	1,898		-100.0%
Cebada y malta (Barley and Malt)			
Subtotal Imports	304,154	289,148	-4.9%
Subtotal Without Rice	263,052	275,803	4.8%
Exports	**2006**	**2007**	**CAGR0607**
Minerales	7,500	31,000	313.3%
Azucar sin refinar (Raw Sugar)		2,800	
Cemento (Cement)			
Subtotal Exports	7,500	33,800	350.7%
Total	311,654	322,948	3.6%

Table 1.2.8-1 compares the year to date tons by commodity for Puerto Cortes through March 2007 and through March 2006. As shown in Table 13, during the first quarter of 2007, soy, wheat and fertilizer recorded significant increases. Corn imports lagged with a 19.7% decline compared to 2006 and rice declined significantly due to delays in the CAFTA-DR import certificates. Both the rice and corn are expected to recover. Excluding rice, total imports increased by 4.8% in the first quarter of 2007 compared with 2006. Including rice, the total of imports and exports increased by 3.6% in the first quarter of 2007. The 2007 growth is above the small decline reported in 2006 over 2005, and is slightly less than half the average annual growth rate of 2004 to 2006.The recent trade levels support the continued moderate growth in dry bulk cargo through Puerto Cortes from the elevated base of the last two years.

Aggregate and Coal Projects

Interviews have identified two projects which would significantly increase the drybulk cargo in Puerto Cortes.

A new 300MWe coal fired plant was identified during the interview process. The plant would add 200,000 tons per year of coal imports. The new project coal imports are projected to go on line in 2008 and remain at a steady level throughout the forecast period.

A new project being developed by Agrecasa, a subsidiary of American Aggregates, to export aggregate would add 2 to 4 million tons of exports through Puerto Cortes. The aggregate exports are projected to begin in 2008 at 1,000,000 tons and to increase at 40% per year through 2010 when a level of 2,000,000 tons is reached and continues through 2013 when the maximum projected level of 4,000,000 tons is reached.

Forecast

Fig. 1.2.8-3 Importaciones y exportaciones de carga a granel solido / Dry bulk cargo imports and exports, 2001-2026

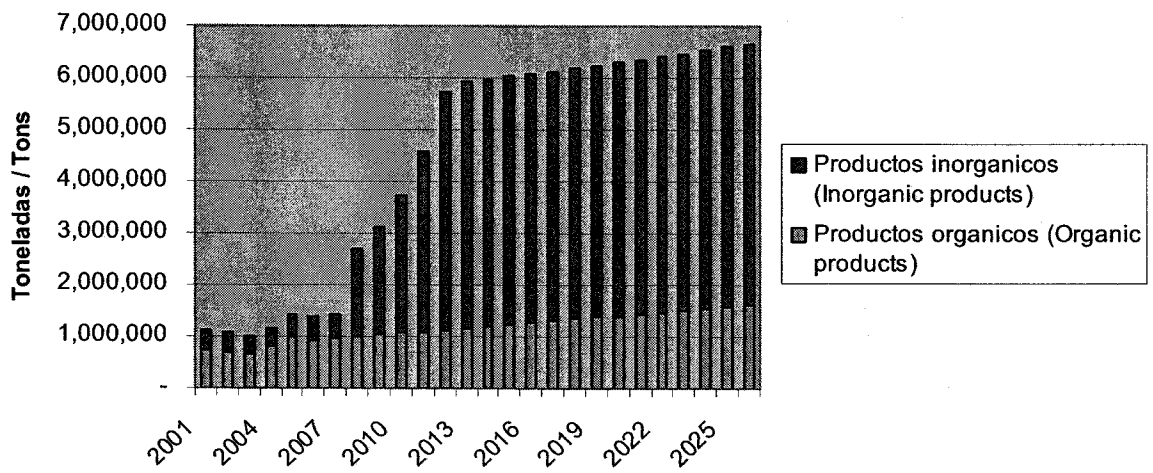


Fig. 1.2.8-4 Importaciones y exportaciones de carga a granel solido: Productos organicos / Dry bulk imports and exports: Organic products, 2001-2026

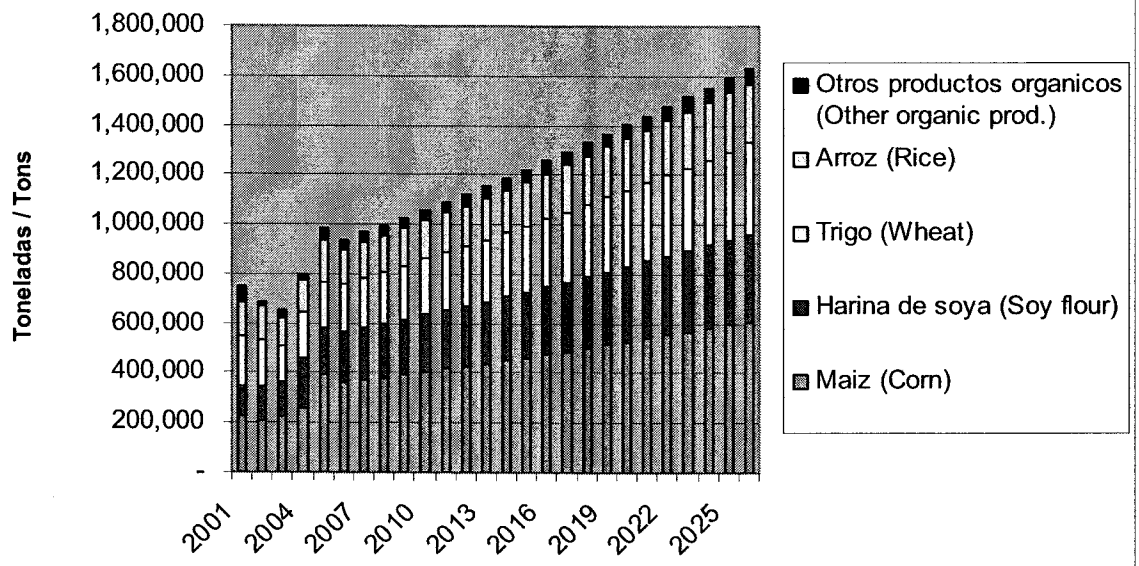


Fig. 1.2.8-5 Importaciones y exportaciones de carga a granel solido: Productos inorganicos
Dry bulk imports and exports: Inorganic products, 2001-2026

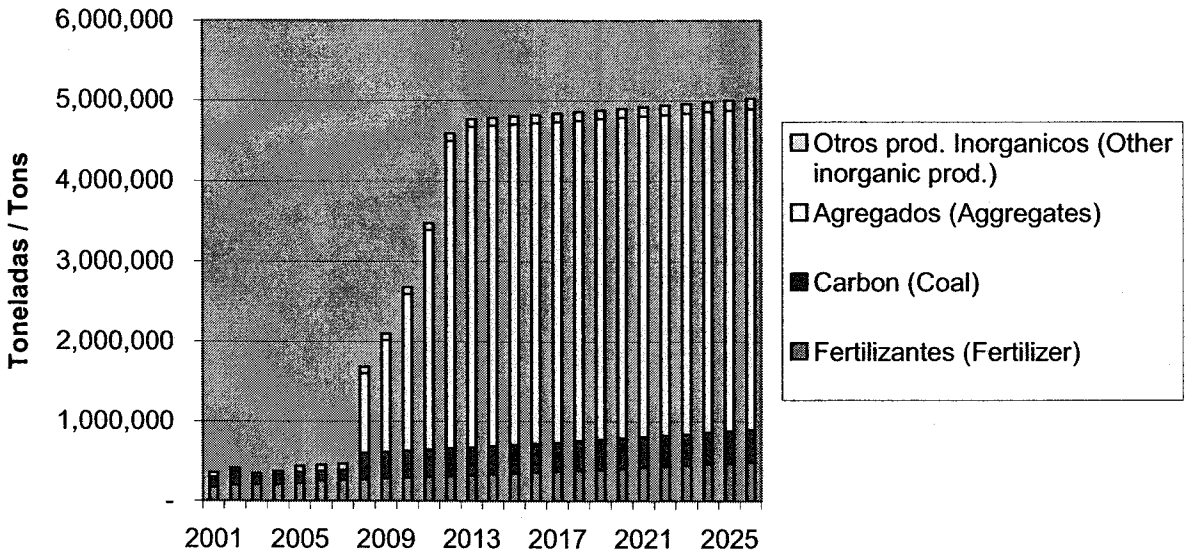


TABLE 1.2.8-2
Historical and forecasted movements of organic and inorganic prodcuts

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Importaciones de productos organicos																										
Harina de soya (Soy flour)	121,043	135,058	136,642	203,997	188,481	202,319	208,793	215,475	222,370	229,486	236,095	242,894	249,890	257,087	264,491	272,108	279,945	288,007	296,302	303,982	311,861	319,944	328,237	336,745	345,474	354,428
Trigo (Wheat)	199,379	182,139	143,658	182,616	188,093	198,095	205,028	212,204	219,631	227,319	234,479	241,865	249,484	257,343	265,449	273,811	282,436	291,332	300,509	309,029	317,790	326,799	336,064	345,591	355,389	365,464
Frijoles (Beans)	-	-	5,118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arroz (Rice)	140,174	135,382	114,764	129,660	163,219	137,250	141,642	146,175	150,852	155,679	160,163	164,776	169,521	174,403	179,426	184,594	189,910	195,379	201,006	206,216	211,562	217,045	222,671	228,443	234,364	240,439
Maiz (Corn)	226,198	213,352	225,484	256,894	392,668	359,823	370,618	381,736	393,188	404,984	415,919	427,148	438,681	450,526	462,690	475,183	488,012	501,189	514,721	527,229	540,040	553,163	566,605	580,374	594,477	608,922
Cebada y malta (Barley and Malt)	-	-	6,360	11,988	11,525	9,377	9,658	9,948	10,247	10,554	10,839	11,132	11,432	11,741	12,058	12,383	12,718	13,061	13,414	13,776	14,148	14,530	14,922	15,325	15,739	16,164
Otros prod. Alimenticios (Other food prod.)	2,256	1,361	8,291	-	2,950	1,478	1,522	1,568	1,615	1,664	1,708	1,755	1,802	1,851	1,901	1,952	2,005	2,059	2,114	2,166	2,218	2,272	2,327	2,384	2,442	2,501
Importaciones de productos organicos	689,050	667,292	640,317	785,155	946,936	908,342	937,262	967,106	997,903	1,029,685	1,059,203	1,089,570	1,120,810	1,152,950	1,186,014	1,220,030	1,255,025	1,291,027	1,328,066	1,362,397	1,397,619	1,433,754	1,470,827	1,508,862	1,547,884	1,587,918
Exportaciones de productos organicos																										
Azucar sin refinar (Sugar)	60,438	15,200	15,000	10,810	36,096	27,310	28,129	28,973	29,842	30,738	31,568	32,420	33,295	34,194	35,117	36,066	37,039	38,039	39,067	40,016	40,988	41,984	43,004	44,049	45,120	46,216
Exportaciones de productos organicos	60,438	15,200	15,000	10,810	36,096	27,310	28,129	28,973	29,842	30,738	31,568	32,420	33,295	34,194	35,117	36,066	37,039	38,039	39,067	40,016	40,988	41,984	43,004	44,049	45,120	46,216
Total imp y exp de productos organicos / Total imports and exports of organic prod.	749,488	682,492	655,317	795,765	983,032	935,652	965,391	996,079	1,027,746	1,060,423	1,090,770	1,121,989	1,154,105	1,187,144	1,221,131	1,256,096	1,292,064	1,329,067	1,367,133	1,402,413	1,438,607	1,475,738	1,513,831	1,552,911	1,593,004	1,634,135
Importaciones de productos inorganicos																										
Fertilizantes (Fertilizer)	172,342	198,767	205,491	205,720	224,253	250,409	259,925	269,802	280,054	290,696	300,638	310,920	321,553	332,550	343,924	355,686	367,850	380,431	393,441	405,552	418,034	430,902	444,165	457,836	471,928	486,454
Carbon mineral (Coal)	123,107	168,774	99,406	126,268	137,711	124,604	128,342	132,192	136,158	140,243	144,029	147,918	151,912	156,014	160,226	164,552	168,995	173,558	178,244	182,575	187,012	191,556	196,211	200,979	205,863	210,865
Productos quimicos (Chemicals)	1,954	3,000	-	-	2,183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Otros minerales (Other Minerals)	-	-	1,988	-	20,823	20,350	20,961	21,589	22,237	22,904	23,523	24,158	24,810	25,480	26,168	26,874	27,600	28,345	29,110	29,896	30,704	31,533	32,384	33,258	34,156	35,078
New Power Plant Coal Project	-	-	-	-	-	-	-	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Importaciones de productos inorganicos / Imports of inorganic prod.	297,403	370,541	306,885	331,988	384,970	395,363	409,227	623,583	638,449	653,843	668,190	682,996	698,275	714,044	730,317	747,112	764,445	782,334	800,796	818,023	835,750	853,990	872,760	892,073	911,947	932,398
Exportaciones de productos inorganicos																										
Minerales (Minerals)	57,337	38,000	36,233	41,540	50,000	52,500	54,075	55,697	57,368	59,089	60,685	62,323	64,006	65,734	67,509	69,332	71,203	73,126	75,100	76,925	78,795	80,709	82,671	84,679	86,737	88,845
Cemento (Cement)	-	-	-	-	-	4,020	4,141	4,265	4,393	4,525	4,647	4,772	4,901	5,033	5,169	5,309	5,452	5,599	5,751	5,890	6,033	6,180	6,330	6,484	6,642	6,803
New Aggregate Project	-	-	-	-	-	-	-	1,000,000	1,400,000	1,960,000	2,744,000	3,841,600	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Exportaciones de productos inorganicos / Exports of inorganic prod.	57,337	38,000	36,233	41,540	50,000	56,520	58,216	1,059,962	1,461,761	2,023,614	2,809,331	3,908,695	4,068,907	4,070,767	4,072,678	4,074,640	4,076,656	4,078,725	4,080,851	4,082,816	4,084,828	4,086,889	4,089,001	4,091,163	4,093,379	4,095,648
Total imp y exp de productos inorganicos Total imports and exports of inorganic prod.	354,740	408,541	343,118	373,528	434,970	451,883	467,443	1,683,545	2,100,210	2,677,457	3,477,521	4,591,691	4,767,182	4,784,811	4,802,995	4,821,753	4,841,101	4,861,059	4,881,647	4,900,839	4,920,578	4,940,880	4,961,760	4,983,237	5,005,326	5,028,046
Total	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	2,679,624	3,127,956	3,737,880	4,568,292	5,713,680	5,921,287	5,971,955	6,024,127	6,077,848	6,133,165	6,190,126	6,248,779	6,303,252	6,359,185	6,416,618	6,475,592	6,536,148	6,598,330	6,662,181

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Productos organicos (Organic products)	749,488	682,492	655,317	795,765	983,032	935,652	965,391	996,079	1,027,746	1,060,423	1,090,770	1,121,989	1,154,105	1,187,144	1,221,131	1,256,096	1,292,064	1,329,067	1,367,133	1,402,413	1,438,607	1,475,738	1,513,831	1,552,911	1,593,004	1,634,135
Productos inorganicos (Inorganic products)	354,740	408,541	343,118	373,528	434,970	451,883	467,443	1,683,545	2,100,210	2,677,457	3,477,521	4,591,691	4,767,182	4,784,811	4,802,995	4,821,753	4,841,101	4,861,059	4,881,647	4,900,839	4,920,578	4,940,880	4,961,760	4,983,237	5,005,326	5,028,046
Total	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	2,679,624	3,127,956	3,737,880	4,568,292	5,713,680	5,921,287	5,971,955	6,024,127	6,077,848	6,133,165	6,190,126	6,248,779	6,303,252	6,359,185	6,416,618	6,475,592	6,536,148	6,598,330	6,662,181

Fig. 1.2.8-6 Actual and forecast dry bulk imports, 2001-2026

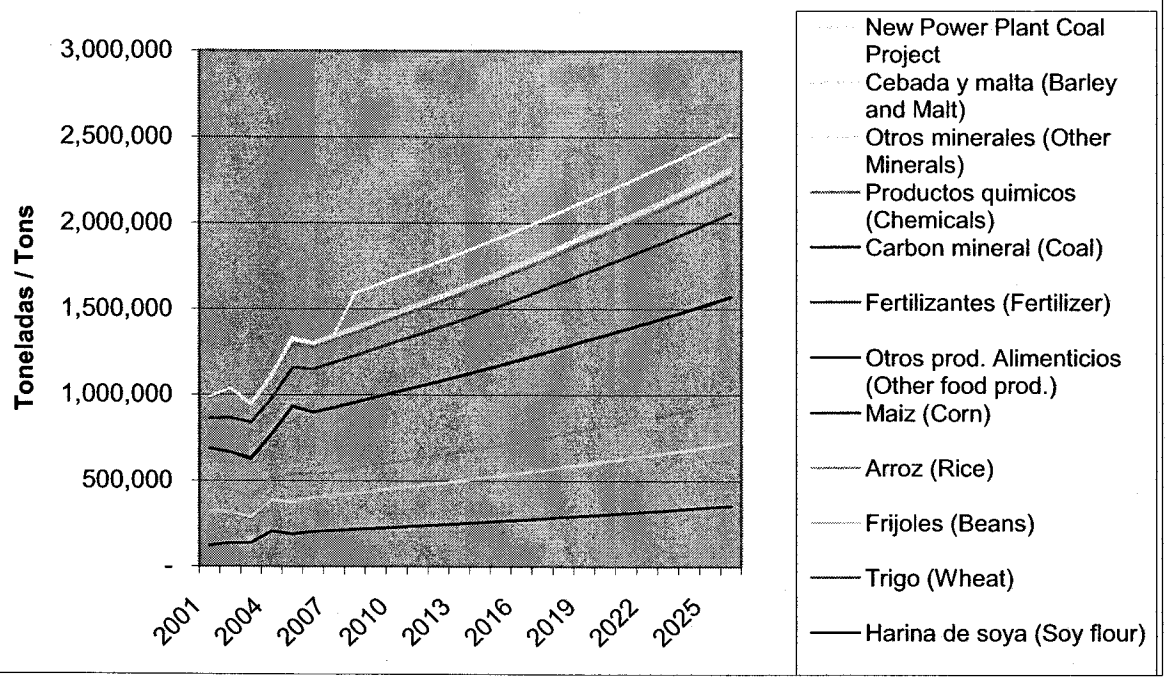


Fig. 1.2.8-7 Actual and forecast dry bulk exports, 2001-2026

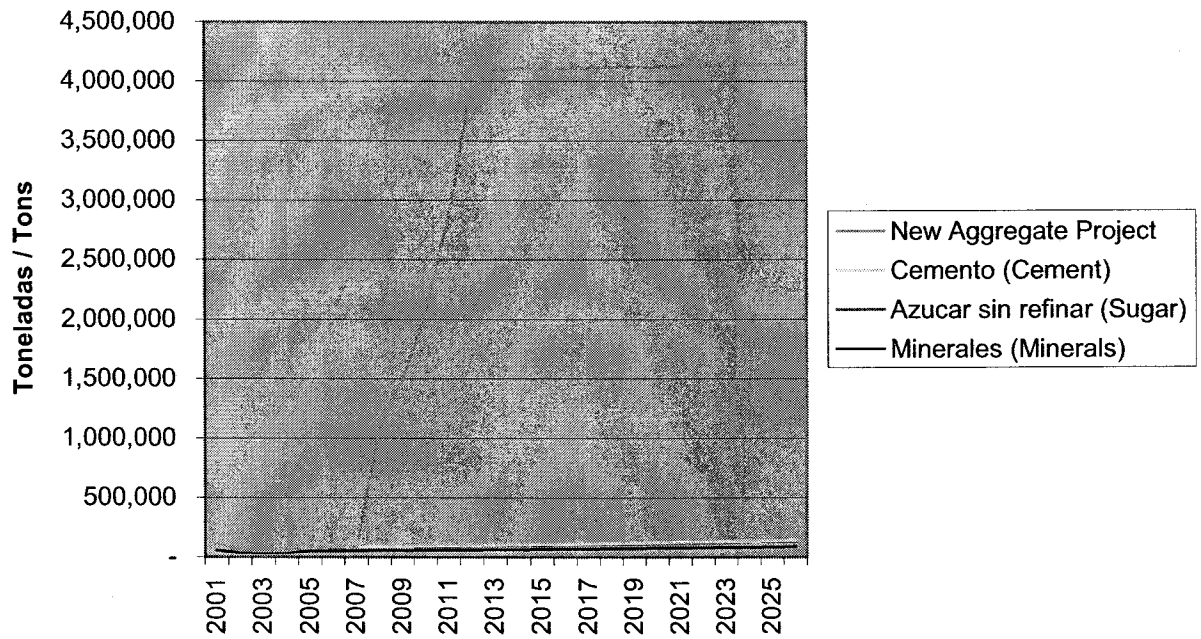


Table 1.2.8-2 summarizes the forecast for Puerto Cortes with and without the new projects. Shifts of trade from neighboring countries are included in Table 1.2.8.4.

The major dry bulk commodities are projected to increase at growth rates above the moderate growth rates from the previous forecast, which averaged 2.27% per year. The long term growth rate for soy is projected to increase to 2.84% per year from 2.62% per year in the previous forecast. Wheat is projected to increase from 2.84% per year to 3.11% per year. Rice is projected to grow at 2.84% per year, similar to the previous forecast. Coal is projected to increase at 2.67% per year compared to the previous forecast of 2.60% per year. Fertilizer, which had been projected based on Global Insight forecasts to decrease at 0.41% per year in the last forecast, is now forecast to increase at 3.38% per year, based on the substantial and continued growth over the past few years and the outlook for continued strong demand. Finally, corn is projected to increase at 2.67% per year versus the previous forecast of 2.84% per year. The slight decrease is due to the elevated levels of corn, especially in 2005, and the recent slight retrenchment from drought elevated import levels. Other bulk commodities are projected to increase at close to the overall average, ranging between 2.67% and 2.76% per year.

Table 1.2.8-3 shows the forecast for Puerto Cortes with and without the new coal and aggregate projects.

Without the new projects, Puerto Cortes dry bulk cargo is projected to increase from 1,387,535 tons in 2006 to 2,462,181 tons in 2026 with average growth of 2.91% per year.

Including the new coal and aggregate projects, Puerto Cortes dry bulk cargo is projected to increase to 6,662,181 tons in 2026, growing at an average of 8.16% per year.

Table 1.2.8-3
Puerto Cortes Forecast with and without New Projects
(Metric Tons)

Imports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Harina de soya (Soy flour)	121,043	135,058	136,642	203,997	188,481	202,319	208,793	215,475	222,370	229,486	236,095	242,894	249,890	257,087	264,491	272,108	279,945	288,007	296,302	303,982	311,861	319,944	328,237	336,745	345,474	354,428
Trigo (Wheat)	199,379	182,139	143,658	182,616	188,093	198,095	205,028	212,204	219,631	227,319	234,479	241,865	249,484	257,343	265,449	273,811	282,436	291,332	300,509	309,029	317,790	326,799	336,064	345,591	355,389	365,464
Frijoles (Beans)			5,118																							
Arroz (Rice)	140,174	135,382	114,764	129,660	163,219	137,250	141,642	146,175	150,852	155,679	160,163	164,776	169,521	174,403	179,426	184,594	189,910	195,379	201,006	206,216	211,562	217,045	222,671	228,443	234,364	240,439
Maiz (Corn)	226,198	213,352	225,484	256,894	392,668	359,823	370,618	381,736	393,188	404,984	415,919	427,148	438,681	450,526	462,690	475,183	488,012	501,189	514,721	527,229	540,040	553,163	566,605	580,374	594,477	608,922
Otros prod. Alimenticios (Other food prod.)	2,256	1,361	8,291		2,950	1,478	1,522	1,568	1,615	1,664	1,708	1,755	1,802	1,851	1,901	1,952	2,005	2,059	2,114	2,166	2,218	2,272	2,327	2,384	2,442	2,501
Fertilizantes (Fertilizer)	172,342	198,767	205,491	205,720	224,253	250,409	259,925	269,802	280,054	290,696	300,638	310,920	321,553	332,550	343,924	355,686	367,850	380,431	393,441	405,552	418,034	430,902	444,165	457,836	471,928	486,454
Carbon mineral (Coal)	123,107	168,774	99,406	126,268	137,711	124,604	128,342	132,192	136,158	140,243	144,029	147,918	151,912	156,014	160,226	164,552	168,995	173,558	178,244	182,575	187,012	191,556	196,211	200,979	205,863	210,865
Productos quimicos (Chemicals)	1,954	3,000			2,183																					
Otros minerales (Other Minerals)			1,988		20,823	20,350	20,961	21,589	22,237	22,904	23,523	24,158	24,810	25,480	26,168	26,874	27,600	28,345	29,110	29,896	30,704	31,533	32,384	33,258	34,156	35,078
Cebada y malta (Barley and Malt)			6,360	11,988	11,525	9,377	9,658	9,948	10,247	10,554	10,839	11,132	11,432	11,741	12,058	12,383	12,718	13,061	13,414	13,776	14,148	14,530	14,922	15,325	15,739	16,164
Subtotal Without New Project	986,453	1,037,833	947,202	1,117,143	1,331,906	1,303,705	1,346,489	1,390,689	1,436,353	1,483,528	1,527,393	1,572,565	1,619,085	1,666,993	1,716,331	1,767,142	1,819,470	1,873,361	1,928,862	1,980,420	2,033,369	2,087,744	2,143,587	2,200,935	2,259,831	2,320,316
New Power Plant Coal Project	0	0	0	0	0	0	0	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Subtotal Imports With New Project	986,453	1,037,833	947,202	1,117,143	1,331,906	1,303,705	1,346,489	1,590,689	1,636,353	1,683,528	1,727,393	1,772,565	1,819,085	1,866,993	1,916,331	1,967,142	2,019,470	2,073,361	2,128,862	2,180,420	2,233,369	2,287,744	2,343,587	2,400,935	2,459,831	2,520,316

Exports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Minerales (Minerals)	57,337	38,000	36,233	41,540	50,000	52,500	54,075	55,697	57,368	59,089	60,685	62,323	64,006	65,734	67,509	69,332	71,203	73,126	75,100	76,925	78,795	80,709	82,671	84,679	86,737	88,845
Azucar sin refinar (Sugar)	60,438	15,200	15,000	10,610	36,096	27,310	28,129	28,973	29,842	30,738	31,568	32,420	33,295	34,194	35,117	36,066	37,039	38,039	39,067	40,016	40,988	41,984	43,004	44,049	45,120	46,216
Cemento (Cement)						4,020	4,141	4,265	4,393	4,525	4,647	4,772	4,901	5,033	5,169	5,309	5,452	5,599	5,751	5,890	6,033	6,180	6,330	6,484	6,642	6,803
Subtotal Exports Without New Project	117,775	53,200	51,233	52,150	86,096	83,830	86,345	88,935	91,603	94,351	96,899	99,515	102,202	104,962	107,795	110,706	113,695	116,765	119,917	122,831	125,816	128,874	132,005	135,213	138,499	141,864
New Aggregate Project	0	0	0	0	0	0	0	1,000,000	1,400,000	1,960,000	2,744,000	3,841,600	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Subtotal Exports With New Project	117,775	53,200	51,233	52,150	86,096	83,830	86,345	1,088,935	1,491,603	2,054,351	2,840,899	3,941,115	4,102,202	4,104,962	4,107,795	4,110,706	4,113,695	4,116,765	4,119,917	4,122,831	4,125,816	4,128,874	4,132,005	4,135,213	4,138,499	4,141,864
Total Imports and Exports Without New Projects	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	1,479,624	1,527,956	1,577,880	1,624,292	1,672,080	1,721,287	1,771,955	1,824,127	1,877,848	1,933,165	1,990,126	2,048,779	2,103,252	2,159,185	2,216,618	2,275,592	2,336,148	2,398,330	2,462,181
Total Imports and Exports With New Projects	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	2,679,624	3,127,956	3,737,880	4,568,292	5,713,680	5,921,287	5,971,955	6,024,127	6,077,848	6,133,165	6,190,126	6,248,779	6,303,252	6,359,185	6,416,618	6,475,592	6,536,148	6,598,330	6,662,181

Percentage year-to-year growth

Imports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Harina de soya (Soy flour)		11.6%	1.2%	49.3%	-7.6%	7.3%	3.2%	3.2%	3.2%	3.2%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Trigo (Wheat)		-8.6%	-21.1%	27.1%	3.0%	5.3%	3.5%	3.5%	3.5%	3.5%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Frijoles (Beans)				-100.0%																						
Arroz (Rice)		-3.42%	-15.23%	12.98%	25.88%	-15.91%	3.2%	3.2%	3.2%	3.2%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Maiz (Corn)		-5.7%	5.7%	13.9%	52.9%	-8.4%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Otros prod. Alimenticios (Other food prod.)		-39.7%	509.2%	-100.0%		-49.9%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Fertilizantes (Fertilizers)		15.3%	3.4%	0.1%	9.0%	11.7%	3.8%	3.8%	3.8%	3.8%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
Carbon mineral (Coal)		37.1%	-41.1%	27.0%	9.1%	-9.5%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Productos quimicos (Chemicals)		53.5%	-100.0%			-100.0%																				
Otros minerales (Other Minerals)				-100.0%		-2.3%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Cebada y malta (Barley and Malt)				88.5%	-3.9%	-18.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Subtotal Imports Without New Project		5.2%	-8.7%	17.9%	19.2%	-2.1%	3.3%	3.3%	3.3%	3.3%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
New Power Plant Coal Project			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Subtotal Imports With New Project			-8.7%	17.9%	19.2%	-2.1%	3.3%	18.1%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%

Exports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Minerales (Minerals)		-33.7%	-4.7%	14.6%	20.4%	5.0%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Azucar sin refinar (Sugar)		-74.9%	-1.3%	-29.3%	240.2%	-24.3%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Cemento (Cement)							3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Subtotal Exports Without New Project		-54.8%	-3.7%	1.8%	65.1%	-2.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
New Aggregate Project			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	40.0%	40.0%	40.0%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Subtotal Exports With New Project		-54.8%	-3.7%	1.8%	65.1%	-2.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Total Imports and Exports Without New Projects		-1.2%	-8.5%	17.1%	21.3%	-2.1%	3.3%	3.3%	3.3%	3.3%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Total Imports and Exports With New Projects		-1.2%	-8.5%	17.1%	21.3%	-2.1%	3.3%	87.0%	16.7%	19.5%	22.2%	25.1%	3.6%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	1.0%	1.0%

Neighboring Country Shift

Table 1.2.8-4 shows the tonnages through Puerto Cortes including a shift of 20% of the grain to Guatemala and El Salvador to Puerto Cortes. This analysis does not include shifts from Nicaragua due to the smaller tonnages and the larger road distance and shorter ocean distance for Nicaragua imports. The shift of 20% of Guatemala and El Salvador grains to Puerto Cortes is projected to take place through a 25% increase in Puerto Cortes grains in 2008 and 2009. Subsequent growth of the adjusted Puerto Cortes tonnages is projected at the previous growth rates. As noted the shift of cargo from Pacific Coast ports assumes improvements in Puerto Cortes handling rates, vessel sizes and drafts and road systems.

Without the new projects, but including the shift from Pacific Coast ports, Puerto Cortes dry bulk cargo is projected to increase from 1,387,535 tons in 2006 to 3,344,886 tons in 2026, with an annual growth rate of 4.50% per year. the 3,344,886 tons compares with the forecast without the shift of 2,462,481, an increase 882,405 tons in 2026.

With the new projects and the shift from Pacific Coast Ports, Puerto Cortes dry bulk cargo is projected to increase to 7,544,886 tons by 2026, an increase of 8.84% per year.

Fig. 1.2.8-8 Actual and forecasted dry bulk imports with neighbor shift, 2001-2007

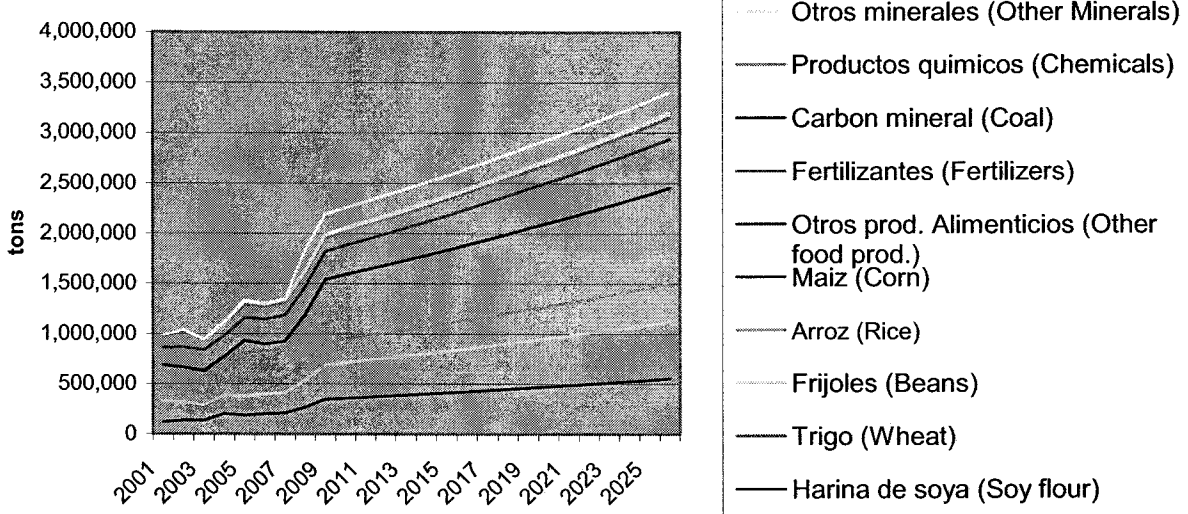


Fig. 1.2.8-9 Actual and forecasted export cargo with neighbor shift, 2001-2026

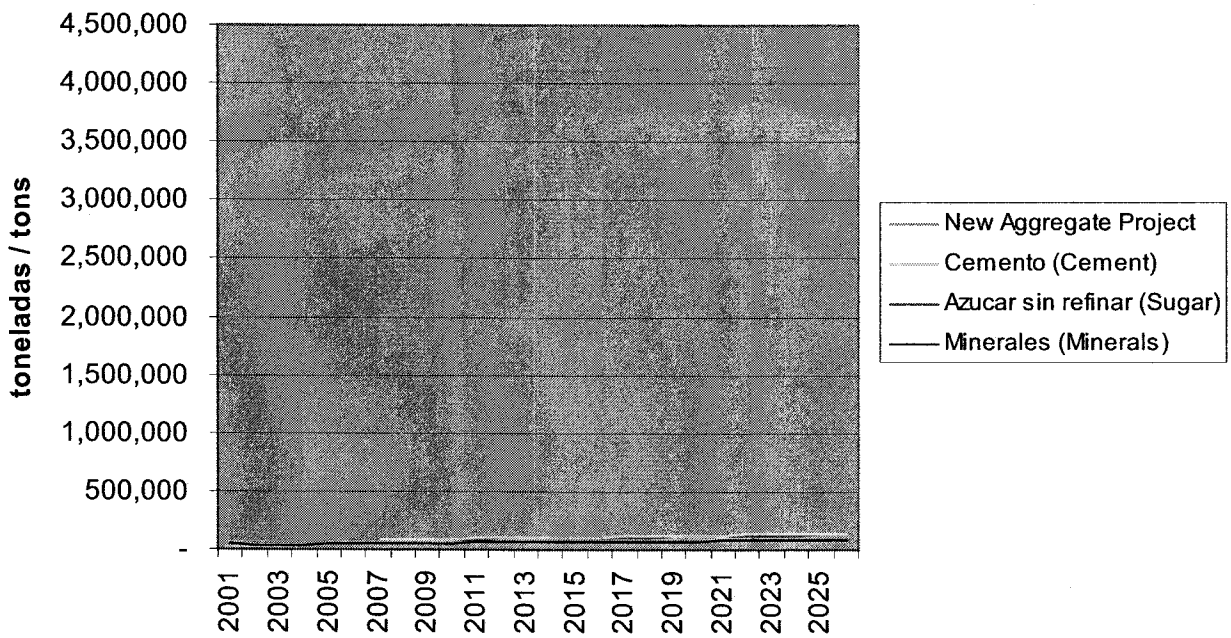


Table 1.2.8-4
Forecast with Neighbor Shift
(Metric Tons)

Imports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Harina de soya (Soy flour)	121,043	135,058	136,642	203,997	188,481	202,319	208,793	269,343	347,453	358,571	368,898	379,522	390,453	401,698	413,267	425,169	437,413	450,011	462,971	474,972	487,283	499,913	512,871	526,165	539,803	553,794
Trigo (Wheat)	199,379	182,139	143,658	182,616	188,093	198,095	205,028	265,255	343,174	355,185	366,374	377,914	389,819	402,098	414,764	427,829	441,306	455,207	469,546	482,858	496,547	510,624	525,100	539,986	555,295	571,038
Frijoles (Beans)			5,118																							
Arroz (Rice)	140,174	135,382	114,764	129,660	163,219	137,250	141,642	182,718	235,706	243,249	250,255	257,462	264,877	272,505	280,353	288,428	296,734	305,280	314,072	322,213	330,565	339,133	347,923	356,942	366,194	375,685
Maiz (Corn)	226,198	213,352	225,484	256,894	392,668	359,823	370,618	477,170	614,357	632,787	649,873	667,419	685,440	703,946	722,953	742,473	762,519	783,108	804,251	823,795	843,813	864,318	885,321	906,834	928,870	951,441
Otros prod. Alimenticios (Other food prod.)	2,256	1,361	8,291		2,950	1,478	1,522	1,568	1,615	1,664	1,708	1,755	1,802	1,851	1,901	1,952	2,005	2,059	2,114	2,166	2,218	2,272	2,327	2,384	2,442	2,501
Fertilizantes (Fertilizers)	172,342	198,767	205,491	205,720	224,253	250,409	259,925	269,802	280,054	290,696	300,638	310,920	321,553	332,550	343,924	355,686	367,850	380,431	393,441	405,552	418,034	430,902	444,165	457,836	471,928	486,454
Carbon mineral (Coal)	123,107	168,774	99,406	126,268	137,711	124,604	128,342	132,192	136,158	140,243	144,029	147,918	151,912	156,014	160,226	164,552	168,995	173,558	178,244	182,575	187,012	191,556	196,211	200,979	205,863	210,865
Productos quimicos (Chemicals)	1,954	3,000			2,183																					
Otros minerales (Other Minerals)			1,988		20,823	20,350	20,961	21,589	22,237	22,904	23,523	24,158	24,810	25,480	26,168	26,874	27,600	28,345	29,110	29,896	30,704	31,533	32,384	33,258	34,156	35,078
Cebada y malta (Barley and Malt)			6,360	11,988	11,525	9,377	9,658	9,948	10,247	10,554	10,839	11,132	11,432	11,741	12,058	12,383	12,718	13,061	13,414	13,776	14,148	14,530	14,922	15,325	15,739	16,164
Subtotal Imports Without New Project	986,453	1,037,833	947,202	1,117,143	1,331,906	1,303,705	1,346,489	1,629,587	1,991,001	2,055,854	2,116,136	2,178,200	2,242,097	2,307,882	2,375,613	2,445,345	2,517,140	2,591,059	2,667,165	2,737,802	2,810,323	2,884,780	2,961,224	3,039,709	3,120,289	3,203,022
New Power Plant Coal Project	0	0	0	0	0	0	0	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Subtotal Imports With New Project	986,453	1,037,833	947,202	1,117,143	1,331,906	1,303,705	1,346,489	1,829,587	2,191,001	2,255,854	2,316,136	2,378,200	2,442,097	2,507,882	2,575,613	2,645,345	2,717,140	2,791,059	2,867,165	2,937,802	3,010,323	3,084,780	3,161,224	3,239,709	3,320,289	3,403,022

Exports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Minerales (Minerals)	57,337	38,000	36,233	41,540	50,000	52,500	54,075	55,697	57,368	59,089	60,685	62,323	64,006	65,734	67,509	69,332	71,203	73,126	75,100	76,925	78,795	80,709	82,671	84,679	86,737	88,845
Azucar sin refinar (Sugar)	60,438	15,200	15,000	10,610	36,096	27,310	28,129	28,973	29,842	30,738	31,568	32,420	33,295	34,194	35,117	36,066	37,039	38,039	39,067	40,016	40,988	41,984	43,004	44,049	45,120	46,216
Cemento (Cement)						4,020	4,141	4,265	4,393	4,525	4,647	4,772	4,901	5,033	5,169	5,309	5,452	5,599	5,751	5,890	6,033	6,180	6,330	6,484	6,642	6,803
Subtotal Exports Without New Project	117,775	53,200	51,233	52,150	86,096	83,830	86,345	88,935	91,603	94,351	96,899	99,515	102,202	104,962	107,795	110,706	113,695	116,765	119,917	122,831	125,816	128,874	132,005	135,213	138,499	141,864
New Aggregate Project	0	0	0	0	0	0	0	1,000,000	1,400,000	1,960,000	2,744,000	3,841,600	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
Subtotal Exports With New Project	117,775	53,200	51,233	52,150	86,096	83,830	86,345	1,088,935	1,491,603	2,054,351	2,840,899	3,941,115	4,102,202	4,104,962	4,107,795	4,110,706	4,113,695	4,116,765	4,119,917	4,122,831	4,125,816	4,128,874	4,132,005	4,135,213	4,138,499	4,141,864

Total Imports and Exports Without New Projects	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	1,718,522	2,082,604	2,150,205	2,213,035	2,277,715	2,344,299	2,412,844	2,483,408	2,556,051	2,630,835	2,707,824	2,787,082	2,860,633	2,936,139	3,013,653	3,093,229	3,174,922	3,258,788	3,344,886
Total Exports and Exports With New Projects	1,104,228	1,091,033	998,435	1,169,293	1,418,002	1,387,535	1,432,834	2,918,522	3,682,604	4,310,205	5,157,035	6,319,315	6,544,299	6,612,844	6,683,408	6,756,051	6,830,835	6,907,824	6,987,082	7,060,633	7,136,139	7,213,653	7,293,229	7,374,922	7,458,788	7,544,886

Table 1.2.8-4
Forecast with Neighbor Shift

Imports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Harina de soya (Soy flour)		11.6%	1.2%	49.3%	-7.6%	7.3%	3.2%	3.2%	3.2%	3.2%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Trigo (Wheat)		-8.6%	-21.1%	27.1%	3.0%	5.3%	3.5%	3.5%	3.5%	3.5%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%
Frijoles (Beans)				-100.0%																						
Arroz (Rice)		-3.42%	-15.23%	12.98%	25.88%	-15.91%	3.2%	3.2%	3.2%	3.2%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Maiz (Corn)		-5.7%	5.7%	13.9%	52.9%	-8.4%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Otros prod. Alimenticios (Other food prod.)		-39.7%	509.2%	-100.0%		-49.9%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Fertilizantes (Fertilizers)		15.3%	3.4%	0.1%	9.0%	11.7%	3.8%	3.8%	3.8%	3.8%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%	3.1%
Carbon mineral (Coal)		37.1%	-41.1%	27.0%	9.1%	-9.5%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Productos quimicos (Chemicals)		53.5%	-100.0%			-100.0%																				
Otros minerales (Other Minerals)				-100.0%		-2.3%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Cebada y malta (Barley and Malt)				88.5%	-3.9%	-18.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Subtotal Imports Without New Project		5.2%	-8.7%	17.9%	19.2%	-2.1%	3.3%	21.0%	22.2%	3.3%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.7%	2.7%	2.7%
New Power Plant Coal Project			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Subtotal With New Project			-8.7%	17.9%	19.2%	-2.1%	3.3%	35.9%	19.8%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

Exports	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Minerales (Minerals)		-33.7%	-4.7%	14.6%	20.4%	5.0%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Azucar sin refinar (Sugar)		-74.9%	-1.3%	-29.3%	240.2%	-24.3%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Cemento (Cement)							3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Subtotal Exports Without New Project		-54.8%	-3.7%	1.8%	65.1%	-2.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
New Aggregate Project			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0%	40.0%	40.0%	40.0%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Subtotal Exports With New Project		-54.8%	-3.7%	1.8%	65.1%	-2.6%	3.0%	3.0%	3.0%	3.0%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%

Total Imports and Exports Without New Projects		-1.2%	-8.5%	17.1%	21.3%	-2.1%	3.3%	19.9%	21.2%	3.2%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.9%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Total Imports and Exports With New Projects		-1.2%	-8.5%	17.1%	21.3%	-2.1%	3.3%	103.7%	26.2%	17.0%	19.6%	22.5%	3.6%	1.0%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%

Conclusions

The combined impact of CAFTA-DR, new projects, and potential Pacific Coast shifts, results in substantially higher dry bulk tonnages than previously forecast.

Without new projects and shifts, Puerto Cortes dry bulk tonnage is projected to increase at 2.92% per year between the elevated tonnage levels of 2006 and 2026 versus 2.27% per year for dry bulk commodity imports in the previous forecast. Dry bulk tonnage increases from 1,387,535 to 2,462,181 tons by 2026.

With the new projects, Puerto Cortes dry bulk tonnage is projected to increase at 8.16% per year between 2006 and 2026. Dry bulk tonnage increases to 6,662,181 tons by 2026.

With the new projects and shifts of Pacific Coast tonnage, Puerto Cortes dry bulk tonnage is projected to increase at 8.84% per year between 2006 and 2026. Dry bulk tonnage increases to 7,544,886 tons by 2026.

If the new projects do not materialize, but the shifts from the Pacific Coast are accomplished, Puerto Cortes dry bulk tonnage is projected to increase at 4.50% per year between 2006 and 2026. Dry bulk tonnage increases to 3,344,886 by 2026.

1.2.9 Preparation of Guidelines for Facilities Planning and Development

Unloading of dry bulk cargoes at the Port of Cortés is well below norms, which results in major costs to the Honduran economy when vessel laytime is charged to importers, resulting in additional costs to Honduran consumers and for raw materials and inputs. The reasons for this include berthing capacity, handling issues and lack of storage at the Port which results in lines of trucks, and hence all of these problems have to be addressed in any solution to the problems. The Port needs:

a. Additional berthing space for dry bulk;
b. Modern dry bulk unloading and loading equipment; and
c. Dry bulk storage at the port.

The following guidelines should be considered in planning and developing dry bulk facilities for the Port of Cortés:

1. Additional berths capable of handling handysize and Panamax vessels are needed.
2. Modern high speed dry bulk unloading and handling equipment is needed able to achieve rates of 1200 tph.
3. Storage at the Port is needed to allow for rapid discharge, which cannot be achieved even with modern high speed and efficient unloading equipment, when waiting for lines of small trucks to take away cargo from large vessels.
4. As requested by users and considering health and product safety, separation of organic products (food grains for human and animal consumption) from aggregates and inorganic products (coal, fertilizer, salt and chemicals) is imperative.
5. For safety and environmental protection, enclosed conveyors and galleries should be used where appropriate, and silos for grains and enclosed storage for fertilizer and chemicals.
6. Specialized handling equipment is needed applicable to the specific commodities to be handled, particularly unloading equipment for multiple organic products and inorganic products, respectively, and loading equipment for aggregates.

Additional specific performance criteria were indicated by importers and their trade associations:

- Separate facilities are needed for "organic" products (rice, corn, soy flour, wheat, malt and sugar) and inorganic products (fertilizer, salt, textile salt and coal).
- The specifications should provide for zero (0%) tolerance for cross-contamination; for instance, 0% cross-contamination between corn and wheat.
- The storage needs to differentiate by product; there are different grades of the same product which have to be kept segregated. There are 4 types and 5 categories of wheat imported.
- The design and construction should provide for an increase of at least 3% in the cargo volume per year, and the unloading rate should be at least 4 times the current rate. The rate, which depends on the product, should be 14,000 tpd.
- Draft should provide for ships of 20,000 to 25,000 DWT minimum and provide for 2 ships of 150 meters LOA at berth at the same time. At present, Pier 3 can accommodate ships of 25,000 tons, but others cannot.
- Waiting time should not exceed 12 hours
- Equipment and assistance for berthing and de-berthing should be always available (sufficient tugs)
- Rapid exit from the port needs to be provided with fast entry and exit from scales.
- A modern scale system is needed with the latest technology and a high rate of connectivity; it should be on network.
- Truck access is needed to have the option of handling cargo directly from ship to truck as well as to conveyor.
- One ship brings various products.
- Unloading needs to respect environmental regulations.

- Loss of product or shrinkage ("mesma") in handling needs to be near 0%.
- Terminal should provide for other services needed by the ship such as fuel, electric power and water.
- Although ships which are currently chartered in sizes ranging from 15,000 to 20,000 DWT, importers want to be able to use larger ship sizes, such as 20-25,000 tons or more. They want to have two berths so that they can handle two 150 m long vessels at the same time. The aggregates company wants to be able to use Panamax ships of 65,000 tons or more.
- When receiving facilities are up to 75 km from Puerto Cortes, the round trip is 150 km and takes at least 3.5 hours. The unloaded product goes to different locations some direct to the plant.
- Large fleets of trucks and hopper trailers are used for direct transshipment from the ship to the plant. A lot of trucks are needed due to the direct shipment to the distant plant. Far fewer trucks would be needed to move cargo from silos at the Port to the plant, likely only a third as many for major commodities, such as rice, corn, soy and wheat. Also, it is impossible with the direct transshipment to achieve unloading rates better than 6,000 tpd, but with intermediate storage it should be possible to attain 14,000 tpd.
- Operations take place 24 hours a day and importers want the stevedore to attain the productivity included in the charter party, which could be 4,500 tons per day
- Many importers, particularly those with locations relatively far from the port, would use storage silos in the Port if available..
- Large companies ship 2,000 tons per hold. Smaller companies consolidate their cargo larger than 2,000 tons. Silos could be 2,000 tons or more.
- Many importers would be willing to use the same silo as other companies if the same product and quality were stored in it.
- There should be belt scales so that they can measure what is put in our taken out of a silo.
- The trucking fleet is the same one used by all importers and if several shipments arrive there is a lot of demand
- Truck capacity is 25 tons for a hopper.
- It is not possible to work over 6,000 tons per day using direct delivery. Major products such as corn, wheat and soy need local port storage
- Due to the smaller volume, sub products can be worked with direct delivery to the plants.
- If ENP developed the facility at their property, some of the importers and associations indicated w willingness to provide guarantees.
- The port provides safe berthing for containerships, for passenger ships and for banana exports. The only ships which cannot rely on getting a berth are the bulk ships.
- The port handles 3,000 – 4,000 tpd or less but other ports are capable of more than 10,000 tpd.

1.2.10 Identification of Opportunities for U.S. Participation

There are opportunities for US vendors in supply of goods and services, including construction materials and services for piers, bulk materials handling and storage equipment, control systems and software, engineering services, as well as providing terminal operation services and technical know-how. The following table presents a preliminary identification of areas of opportunity.

Products	Vendors
Piles and reinforced concrete	Nucor
Dredging and Construction	Great Lakes Dredging, Dredge America, Weeks, Eisner Marine
Unloaders	Heyl & Patterson, Fuller Bulk Handling / FL Schmidt
Conveyors	Continental, Chief Industries, Robins, Link Belt
Electrical controls	General Electric, Honeywell, Allen Bradley, Robertshaw
Terminal control	Autoship, others
Silos and storage	Hoffman, Baker-Pullman, Johnson Bros., International Tank Co., Superior Tank Co.
Scales	Richardson
Mobile equipment	Bobcat, CAT, John Deere
Security equipment	Tyco, ADT, Cisco
Engineering	DMJM Harris, CH2M Hill, Louis Berger, Berger/ABAM, Moffatt & Nichol, EDC, Hendrik Enterprises, Roberts & Schaefer

2 INCEPTION REPORT

2.0 Introduction

2.1 Preliminary Recommendations of Criteria for Development of the Terminal and for Port Capacity

2.1.1 Vessels

Table 2.1.1-1 summarizes the sizes of bulk carrier vessels foreseen. The ships shown range from the smaller handysize vessels of 20,000 dwt in common use at the Port of Cortes in 2006 to larger handysize of 30,000 dwt as well as handymax vessels of 40,000 dwt and larger. Panamax vessels represent the maximum size which can transit the Panama Canal, while Super-Panamax are larger vessels which would be able to transit the third set of locks proposed for the Panama Canal.

Table : Bulk carriers and their characteristics

Table : Barcos graneleros y sus características

DWT TPB	Vessel class Clase de nave	Grain capacity Volumen de granos m3	Aggregates capacity Volumen de agregado) m3	LOA Eslora m	Beam Manga m	Draft Calado m
20,000	SMALL HANDYSIZE	21,000	10,000	142.0	22.0	22.2
30,000	HANDYSIZE	35,000	15,000	173.6	26.5	11.1
38,890	HANDYSIZE	46,100	19,500	180.8	30.5	11.0
42,470	HANDYMAX	52,700	21,300	181.6	30.5	11.1
52,500	HANDYMAX	66,400	26,300	188.5	32.3	12.2
56,000	HANDYMAX	70,800	28,000	190.0	32.3	12.5
55,800	HANDYMAX	72,500	27,900	197.9	32.2	13.1
63,690	PANAMAX	74,940	31,900	225.0	32.2	13.0
65,400	PANAMAX	84,000	32,700	253.9	32.2	12.6
82,900	SUPER-PANAMAX	97,200	41,500	229.0	32.3	14.4
88,000	SUPER-PANAMAX	105,800	44,000	235.0	38.0	12.5

Based on interviews with importers and shippers, a number are interested in using larger handysize vessels, such as 25,000 to 30,000 dwt, compared to the 20,000 dwt common in 2006. Further increases to handymax vessels of 40,000 dwt or even Panamax vessels of 65,000 dwt could occur in the future, to take advantage of economies of scale when using larger vessels. Agrecasa, which is proposing to export aggregates, is interested in using Panamax size vessels.

2.1.2 Size of Shipments Foreseen

Table 2.2.2-NN2 illustrates the size of shipments for the various commodities for the 3-year period ending 2006. Referring to the table, the maximum size of shipments of inorganic products ranged from 4,000 to 33,000 tons, with smaller average shipments. For instance, fertilizer imports had average shipments of 10,000 tons in 2006 and maximum shipments of 20,000 tons. Coal had average shipments of 31,000 tons and maximum shipments of 33,000 tons. Organic products maximum shipment sizes varied from 10,000 tons for wheat to 23,000 tons for corn. For shipment of multiple organic products, shipment sizes averaged 13,000 tons and had a maximum of 24,000 tons. It should be noted that a number of the importers indicated in interviews that they wanted to use larger shipment sizes. It is thus expected that the shipment sizes may grow over time or if berth and storage facilities are available to handle the larger shipment sizes. The current shipment sizes thus represent the shipment sizes constrained by present facility limitations.

BULK MATERIAL HANDLING CONSULTING
PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS

August 2, 2007

DMJM HARRIS - USTDA STUDY
Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras

Table No. 2.1.2-NN2: SUMMARY OF PREVIOUS BULK UNLOADING OPERATIONS

K.Kroeter

ANALYSIS OF PRODUCTS

BULK UNLOADING	YEAR 2004				YEAR 2005				YEAR 2006			
Berths No. 3+4+5	tons	vessels	average		tons	vessels	average		tons	vessels	average	
Total Annual Tons and Vessels	1,140,962 t	105 V	10,866 t/V		1,245,344 t	117 V	10,644 t/V		1,333,509 t	121 V	11,021 t/V	
Non-Organic:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Fertilizer, Urea	158,757 t	18 V	8,820 t/V	20,000 t	163,494 t	18 V	9,083 t/V	21,000 t	216,642 t	21 V	10,316 t/V	20,000 t
Coal, Green Coke	121,763 t	4 V	30,441 t/V	39,000 t	129,186 t	5 V	25,837 t/V	39,000 t	124,604 t	4 V	31,151 t/V	33,000 t
Concentrates	30,500 t	9 V	3,389 t/V	10,000 t	16,500 t	8 V	2,063 t/V	3,000 t	40,053 t	11 V	3,641 t/V	10,000 t
Salt, Sodium Chloride/Sulphate	-	-	- t/V	-	37,531 t	6 V	6,255 t/V	16,000 t	15,022 t	3 V	5,007 t/V	10,000 t
Asphalt, General Cargo, Iron	5,757 t	2 V	2,879 t/V	4,000 t	7,441 t	2 V	3,721 t/V	4,200 t	6,303 t	2 V	3,152 t/V	4,200 t
Total Non-Organic	316,777 t	33 V	9,599 t/V		354,152 t	39 V	9,081 t/V		402,624 t	41 V	9,820 t/V	
Organic:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Multiple Shipmt. Cargo [up to 4]	543,952 t	40 V	13,599 t/V	25,800 t [2]	718,125 t	55 V	13,057 t/V	28,000 t [2]	725,389 t	53 V	13,687 t/V	24,800 t [2]
Single Shipment Cargo	270,621 t	30 V	9,021 t/V	22,200 t	160,374 t	22 V	7,290 t/V	24,000 t	182,735 t	23 V	7,945 t/V	23,100 t
Sugar, raw/granular	9,612 t	2 V	4,806 t/V	10,000 t	12,693 t	1 V	12,693 t/V	13,000 t	22,760 t	4 V	5,690 t/V	9,000 t
Total Organic	824,185 t	72 V	11,447 t/V		891,192 t	78 V	11,426 t/V		930,885 t	80 V	11,636 t/V	
Organic Bulk Products that arrived in a Single Shipment:				Max.Cargo:				Max.Cargo:				Max.Cargo:
Wheat	73,536 t	6 V	12,256 t/V	22,199 t	17,544 t	4 V	4,386 t/V	12,532 t	27,400 t	5 V	5,480 t/V	10,059 t
Wheat Bran	0 t	0 V	- t/V	- t	15,390 t	3 V	5,130 t/V	6,400 t	29,690 t	6 V	4,948 t/V	7,000 t
Rice	7 t	1 V	7 t/V	7 t	34,962 t	4 V	8,741 t/V	15,268 t	47,727 t	4 V	11,932 t/V	17,304 t
Corn	67,154 t	6 V	11,192 t/V	13,185 t	69,791 t	5 V	13,958 t/V	24,000 t	42,836 t	3 V	14,279 t/V	23,100 t
Corn Flour	0 t	0 V	- t/V	- t	12 t	1 V	12 t/V	12 t	10,238 t	1 V	10,238 t/V	10,238 t
Soy Beans	47,408 t	4 V	11,852	16,310 t	10,249 t	2 V	5,125	6,249 t	21,544 t	3 V	7,181 t/V	9,859 t
Soy Flour	39,674 t	3 V	13,225 t/V	19,074 t	0 t	0 V	- t/V	- t	0 t	0 V	- t/V	- t
Malt	9,483 t	3 V	3,161 t/V	4,094 t	5,925 t	2 V	2,963 t/V	2,965 t	3,300 t	1 V	3,300 t/V	3,300 t
Bran	33,359 t	7 V	4,766 t/V	6,325 t	6,500 t	1 V	6,500 t/V	6,500 t	0 t	0 V	- t/V	- t
Total Single Products Cargo	270,621 t	30 V	9,021 t/V	22,200 t	160,374 t	22 V	7,290 t/V	24,000 t	182,735 t	23 V	7,945 t/V	23,100 t

2.1.3 Volume of Cargo in tons per year

Fig. 2.1.3-1 Actual and forecast dry bulk imports, 2001-2026

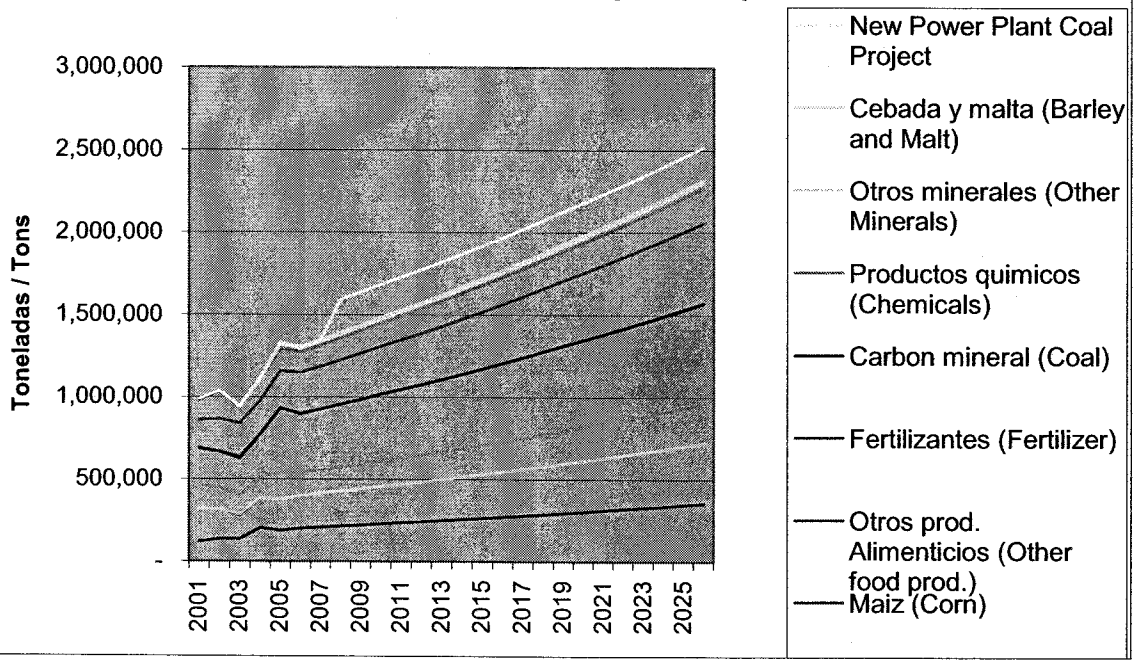


Fig. 2.1.3-1 illustrates the dry bulk imports through the Port of Cortes, which are forecasted to increase from 1,303,000 tons in 2006 to 1,967,000 tons in 2016 and 2,520,000 in 2026. With potential shift of cargo from neighbor countries of Guatemala, Nicaragua and El Salvador, higher growth of import cargo up to 3,403,000 tons in 2026 could occur.

Fig. 2.1.3-2 Actual and forecast dry bulk exports, 2001-2026

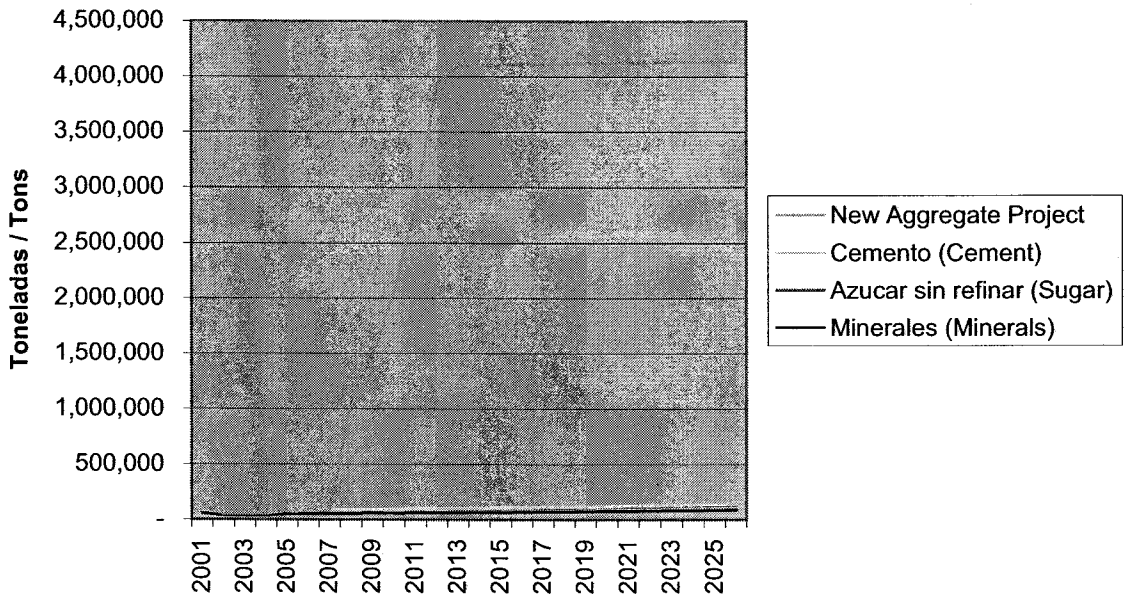


Fig. 2.1.3-2 illustrates the dry bulk exports through the Port of Cortes, which are forecasted to grow from 83,000 tons in 2006 to 2,054,000 in 2010 and 4,110,000 in 2016. With potential shift of cargo from neighbor countries of Guatemala, Nicaragua and El Salvador, higher growth of export cargo up to 7,544,000 in 2026 could occur.

2.1.4 Handling Rates for Different Commodities

The handling rates for the various commodities should provide ship turnaround times in port of not more than 48 hours for a full vessel load, compared to times of 100 hours for a 12,000 ton load at present. Based on vessel sizes in the range of 30,000 to 40,000 tons handymax for organic and inorganic products, handling rates of 1200 tph can be expected to provide the effective rates needed. In the case of aggregates, the company requested loading time for Panamax vessels of 30 hours. A loading rate of 3000 tph would be needed for aggregates. This can be summarized as follows:
Handling rates in hours per ship

- Organics: 36-48 hours, unloading rate of 1200 tph
- Inorganics: 36-48 hours, unloading rate of 1200 tph
- Aggregates: 30 hours as requested by the company, Agrecasa, loading rate of 3000 tph

Type and capacity of equipment: loading/unloading/reclaiming/storage.

- Continuous Ship Unloader for grains 1200 tph free digging;
- Unloading for inorganic products using clamshell grabs: 1200 tph;
- Unloading with Ship gear: 1200 tph with 4 or 5 cranes & 7-10m3 buckets
- Loading of aggregates: Traveling, radial or dual-linear loader of 3000 tph
- Auxiliary: Wheel loaders for cleaning ships holds (100tph), loading coal and non-organics (200 tph) into trucks.
- Type of storage facilities: metal silos for grains, warehouse for fertilizers and, ground storage for coal.

- Conveyor system: Belt conveyors with troughing idlers of 35 or 45 degrees, with hood cover only; or completely enclosed; or arranged in galleries. Maximum speed 2.5 to 3.0 m/sec. Capacities suitable for the above indicated loading and unloading rates. Bucket Elevators and Chain Conveyors for grain handling, silo feeding and silo reclaiming.
- Dust collection: as necessary at each transfer.

Product characteristics:

Material and product:	Density (kg/m3)	Angle of Repose
Grains	700	30-40
Urea/Ammonium Nitrate	700/700	25-30
Phosphate	1000/1300	25-30
Potash	1100-1300	20-30
Aggregates	1700 kg/m3	

2.1.5 Safety and Health Measures

Safety and health of port staff and the public can be protected by providing separate facilities for handling bulk cargo. Such facilities would have controlled access and egress, whether from outside the Port or from other parts of the port precinct. In addition, cargo handling equipment would be contained within the specialized terminal. Vehicular traffic in and out of the terminal would be channeled to minimize movement through the municipality and other parts of the port. Bulk handling operations would be separated from containers, cruise passengers and other port users. The incorporation of environmental controls into the terminal design and their upkeep and maintenance will protect health from air and water contaminants, minimizing product spillage, airborne dust and pollutants. Prevention of spillage of food grains will also help minimize vermin. Training of staff will be required to ensure safety in operating equipment and handling systems.

2.1.6 Environmental Controls

Where feasible such as for grain, enclosed unloaders can be utilized instead of buckets and open hoppers. In order to minimize airborne dust, groundwater runoff and spills, all conveyors and transfer points should be enclosed and be provided where appropriate with dust collection systems. Open storage piles should have dust suppression systems, such as water spray. Water ponds and treatment systems are required for water runoff. Truck routings should be channeled to avoid unnecessary movement through the municipality. Minimizing truck congestion and waiting will avoid airborne pollution from idling vehicles.

2.1.7 Expansion and other Key Parameters

The forecasts include the growth of demand over the years to 2026. For purposes of this study, the expansion has been considered in two phases: an initial phase to serve forecasted demand to the year 2016 and a subsequent expansion to accommodate demand to the year 2026.

2.2 Presentation of Findings in the Inception Report

Following are the principal findings of the Inception Report:

- Geotechnical conditions at Wharf 2 make this a site which of high risk for marine structures.
- Very limited land is available in the vicinity of Wharf 2, making it difficult to provide adequate storage at the Wharf.
- The Wharf 2 site is distant from the main road into the Port of Cortes, making it more costly for truck or conveyor routings, such as for large volumes of aggregate to be exported from the Port.
- The area around the Cabotage Wharf, in the eastern part of the Port of Cortes, Wharf 7, while having relatively limited draft, appears to offer more advantageous geotechnical conditions.
- The Wharf 7 area also is situated closer to the main road into the Port of Cortes, making for better truck and conveyor routings, avoiding most of the Port of Cortes and Municipality of Puerto Cortes.
- Additional berthing space is needed for dry bulk cargo, due to the tremendous congestion and delays at Berths 3 and 4.
- Storage space is needed to avoid the congestion, traffic and delays inherent in the present system of "direct" unloading of bulk carriers to trucks.
- Storage will be a combination of silos, buildings and open storage, depending on the product type. Storage has to provide the ability to receive complete shipments while segregating the many different products handled at the Port of Cortes.
- Complete separation of "organic" products (food grains for human and animal consumption) from aggregates and "inorganic" products (coal, fertilizer, chemicals and salt) is essential to minimize contamination.
- Separation of different organic and inorganic products, for example, separate handling of Soft Red Winter (SRW), Hard Red Winter (HRW) and Dark Northern Spring (DNS) wheat, paddy rice, and other commodities is needed. However, importers expressed a willingness to have products with the same characteristics belonging to different companies stored together.
- Terminal control systems, scales and measurement systems are needed to control product custody and transfer at the terminal.
- Truck loading facilities are needed to move products from storage to hopper trucks.
- Conveyor enclosures and systems are needed to minimize product loss, dust, spillage and contamination.
- Ponds and water treatment are needed to avoid ground water contamination from open storage.

The findings regarding site alternatives and terminal criteria were presented on April 14, 2007 to the management of Empresa Nacional Portuaria.

2.3 Submittal of the Inception Report and Client Comments

Revised alternatives for both organic products and aggregates and inorganic products and discussed with the General Manager, Economic and Financial Advisor and Supervisor of Ports of Empresa Nacional Portuaria on April 14, including preliminary recommendations of DMJM Harris for Wharves 7A and 7B to serve, respectively, the organic and aggregate and inorganic bulk products. Subsequently, comments were received noting that a contract had already been signed for Wharf 2 and approved by the National Congress.

3 DEVELOPMENT OF ALTERNATIVES

3.0 Introduction

Based on the site information, demand forecasts and design criteria developed in Tasks 1 and 2, the DMJM Harris team developed alternative plans for the dry bulk terminal at the Port of Cortés. The plans encompass:

- Alternative recommendations for location of the terminal;
- Preparation of Alternative Layouts for Construction of the New Berth;
- Alternative Layouts for Unloading Equipment;
- Alternative Layouts for Storage, Conveying and Reclaiming Systems;
- Alternatives for Management Information Systems;
- Recommendations for Port Security Equipment and Procedures;
- Financial Analysis and Sources of Financing; and
- Project Implementation Schedule

These aspects are described in the following sections.

3.1 Preparation of Alternative Recommendations for Location of the Terminal

Alternative locations for the terminal were developed, considering subsoil conditions, dredging, vessel maneuvering requirements, truck access, land area and future development.

This analysis covers the main alternatives for new bulk terminals in the Port of. Alternatives were prepared for the bulk terminals of the Port of Cortés. Each alternative includes two components:

- A terminal for aggregates and inorganic products; and
- A terminal for organic products.

The aggregates are an export product. The inorganic products include fertilizers, coal, cement and clinker. The organic products include grains and other products for human and animal consumption, such as wheat, corn, soy bean meal, rice and beans.

It is absolutely necessary that organic products be handled separately from inorganic products. Additionally, it is necessary to segregate the different organic products, for example, separate wheat from rice, as well as the different inorganic products, such as fertilizer from coal.

For the aggregates and inorganics terminal, a private company, Agregados del Caribe, S.A. (Agrecasa) plans to export aggregates in Panamax vessels, which have a length of some 240 m, beam of 34 m and fully laden draft of 14 m. The other importers at present use Handysize or Handymax vessels, in part due to limitations of the Port and its infrastructure. They may use Handymax vessels with lengths between 180 m and 190 m, beam of 27 to 30 m and laden draft of 11 to 12 m or up to Panamax vessels in the future

The wharves for the aggregates and inorganic products terminal were considered to have a length of 425 m each. The length of 425 m affords the space needed for a Panamax vessel of 240 m length or two Handymax vessels, one of 180 m length and one of 180 or 190 m length, plus 25 m space between the vessels, and 15 m on the bow of the first vessel and the stern of the last vessel on each wharf. With the two wharves, one for each terminal, there would be space for one Panamax vessel or two Handymax vessels for aggregates or inorganics.

The wharves for the organic products terminal were considered to have a length of 260 to 320 m. This length would be adequate to moor one Panamax vessel for most such vessels. The longer length would be adequate to moor up to two smaller Handysize vessels.

Together, these two wharves would provide the Port of Cortés with a capability of handling two Panamax vessels, or two Handymax plus two smaller Handysize vessels or some combination. This would provide the Port of Cortés with a high level of capacity for bulk cargo.

Drawing (Dwg.) 3-0 presents the alternative locations considered for the new terminal. Referring to the drawing, the following wharf and pier locations were considered:

Wharf 2: 425 m wharf in front of the mouth of the Quilimaco canal, for aggregates and inorganic products.

Wharf 2A: 425 m wharf west of the mouth of the Quilimaco canal, for aggregates and inorganic products.

Wharf 3A: 150 m westerly extension of existing 201 m long Wharf 3 providing 351 m overall, for organic products.

Wharf 7A: 260 m wharf extended southeast from planned Wharf 6, Phase III (Wharf 6 is shifted 180 m to the northwest in one of the phases of construction), for organics

Wharf 7B: 425 m wharf extended southeast from Wharf 7A; Wharf 7B for aggregates and inorganics

Pier 7A: 260 m pier between Wharf 6 Phase III (shifted as indicated) and the Cabotage Wharf; Pier 7A would be for organics

Pier 7B: 425 m pier southeast of Cabotage Wharf; Pier 7B would be for aggregates and inorganics.

The following alternatives were prepared for the terminals:

Alternative 1: Wharf 7A for organics and Wharf 7B for aggregates and inorganics.

Two new berths would be developed in the same mooring line east of Wharf 6, Phases I, II and III. Wharf 6 has been shifted, which could be in its final or first phase, to the west by 180 m. Phases I, II and III Of. Wharf 6 has been maintained with a total of 1,040 m in all of the alternatives.

The aggregates and inorganics terminal would be developed in Wharf 7B, with a length of 425 m and width of 30 m, and the organics terminal would be developed in Wharf 7A, with a length of 260 m and width of 24 m. Due to space limitations, it is not practical to make Wharf 7A longer than about 260 m in this alternative. These two new wharves could consist of pier-supported structures. The structure should support loading and unloading equipment and serve to moor ships. In case of imports to trucks, these could be loaded onshore by means of conveyor belts, but in most cases, it is planned to handle cargo through intermediate storage between the ship and truck, to reduce the problem of delays. The cabotage wharf would have to be moved to another site. The site of Wharf 2A, in the vicinity of the Quilimaco canal, described subsequently could serve as a new site for the cabotage operations.

The primary rationale for development of this alternative was:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel would be possible, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- The new wharves for bulk cargoes could be an extension of the berthing line of Wharf 6 for

containers, which is already planned.
- The navigation channels and basins planned for Wharf 6 could be utilized for the bulk carriers.

Limitations of this alternative include:

- However, the wharves do not provide as great a separation between organic and inorganic products as for piers.
- In addition, the alternative considered would require additional bulkheads and fill before the wharves, even though parallel to the shore, could be used as marginal wharves.
- The wharves could also not readily be extended.

Alternative 1A: Pier 7A (Phase 1) for organics and Pier 7B (Phase 2) for aggregates and inorganics.

Two new piers would be developed to either side of the cabotage wharf.

Pier 7A would be either 260 m or 320 m long and 24 m.

The pier length was reduced to these lengths following the presentation to Empresa Nacional Portuaria to reduce the estimated cost. The length of 260 m would be minimally adequate to moor most Panamax vessels, which have a length up to about 225 m. Some Panamax vessels which have longer lengths would not be suitable for service to this pier. The length of 320 m would be adequate to moor nearly all Panamax vessels. The greater length would also provide additional safety for vessel maneuvering during berthing and deberthing operations, due to the greater distance from of the end of the ship from the mooring line of Wharf 6. Considering budgetary constraints of ENP which were indicated at the presentation in June 2007, it was recommended that ENP proceed with both options through design and bidding. When the construction bids are received, ENP will be in a better position to ascertain the cost of each of the options, the cost difference between the options and whether the Port can proceed with the preferred 320 m option, or is constrained by budget to the shorter 260 m option.

Pier 7B would be 425 m long and 30 m wide. It could accommodate loading of aggregate to Panamax vessels. It could also accommodate loading and unloading of inorganic products to one or two Handymax vessels.

The primary rationale for development of this alternative was that:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel would be possible, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- By moving the ship moorings to a location further from shore, the piers could reduce dredging costs compared to Alternative 1, where the wharves are collinear with the mooring line for Wharf 6.
- The piers would increase the separation between organic and inorganic products, compared to the wharves in Alternative 1.
- The navigation channels and turning basins planned for Wharf 6 could be used for the bulk carriers.

Alternative 1B: Pier 7 combined pier for organics, aggregates and inorganics

Pier 7 would be developed as a 450 m by 40 m pier to the southeast of the cabotage wharf. The pier

would be able to accommodate one Panamax or two Handysize vessels loading or unloading organics, aggregates or inorganics.

The primary rationale for development of this alternative was that:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel would be possible, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- By moving the ship moorings to a location further from shore, the piers could reduce dredging costs compared to Alternative 1.
- The navigation channels and turning basins planned for Wharf 6 could be used for the bulk carriers.
- The overall demand forecast for the Port of Cortés might theoretically make it possible in terms of overall berth occupancy anticipated to handle all of the dry bulks at a single pier providing berthing for one Panamax or two Handymax vessels.

Limitations of this alternative include:

- However, the combined pier would handle all bulk cargoes on a single pier, which does not comply with the criteria indicated by Port users to separate organic and inorganic products. Combining these products on a single pier raises serious concerns regarding cross-contamination of organic and inorganic products, which are particularly worrisome due to the number of foodstuffs for human and animal consumption handled at the Port of Cortés.
- Due to the larger ships and additional equipment on the pier, the pier would have to be of greater length and width and more costly than the other alternatives.

While including this alternative for comparison, DMJM Harris considers this to be an extremely risky alternative, and strongly advises that it not be developed.

Alternative 2A: Wharf 3A for organics and Wharf 7B for aggregates and inorganics.

A 150 m extension of Wharf 3 would be developed for organics. The extension has been named Wharf 3A.

Wharf 3, with the extension, would then have a total length of 351 m, sufficient to accommodate two medium size Handymax vessels, subject to draft constraints.

Wharf 7B with a length of 425 m would be developed to the east of Wharf 6 for aggregates and inorganics in the same mooring line as Wharf 6. Wharf 7B would be able to accommodate a Panamax vessel or two Handymax vessels.

The primary rationale for development of this alternative was that:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel for aggregates and inorganics would be possible, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- The new wharves for aggregates and inorganics could be an extension of the berthing lines of Wharf 6 for containers, which is already planned.
- The navigation channels and turning basins planned for Wharf 6 could be used for the bulk

carriers for aggregates and inorganics.

Limitations of this alternative include:

- Although Wharf 3A was considered to be developed with adequate structure to modern loading equipment, the adequacy of the existing portion of Wharf 3 to such equipment has not been assessed.
- There is limited space behind Wharf 3 for storage, which would either limit the development of needed port storage or require the demolition of some existing structures at the Port.

Alternative 3A: Wharf 2 for aggregates and inorganics and Wharf 7A for organics

Two new wharves would be developed: Wharf 2 and Wharf 7A.

Wharf 2 of 425 m length and 30 m width would be developed for aggregates and inorganics in front of the Quilimaco canal to the west of Wharf 3. This wharf would be able to accommodate up to Panamax vessels.

Wharf 7A of 260 m would be developed for organics to the east of Wharf 6 on the same mooring line, reserving the other site for future development. The mooring line of Wharf 6 would be continued. The cabotage wharf would continue open in this alternative.

The primary rationale for development of this alternative was that:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel would be possible for organics, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- The new wharf for organics could be an extension of the berthing line of Wharf 6 for containers, which is already planned.
- The navigation channels and turning basins planned for Wharf 6 could be used for the bulk carriers for organics.
- The depths are reportedly greater in the area of Wharf 2 than in the other areas considered.
- Wharf 2 was indicated in the agreement reported in January 2006 between Empresa Nacional Portuaria and Agrecasa, which reportedly authorized construction of a dolphin mooring with private funds and transferred to ENP for use by Agrecasa and other users with a user fee. DMJM Harris does not have information on whether the location indicated in the agreement is the area denoted as Wharf 2, Wharf 2A or if it is specified that precisely.

Limitations of this alternative include:

- However, the geotechnical report regarding this location indicates that it has the "has the subsoil of lowest quality of the entire port area" and "the conditions imply a high risk for foundation of structures on it, since the possibility of obtaining a behavior acceptable over the long term are minimal and the presence of considerable settlements during the useful life of the structure can be guaranteed." It should also be noted that a wharf previously operated by Tela Railroad Company at this general location collapsed.
- The location is also distant from the main entrance to the port area, which would result in approximately 3 km additional conveyor length between the Port and municipality compared to locating the terminal in the eastern region of the port or, if trucks are used, in approximately 10 km additional round trip road truck routing length through the municipality to reach the aggregates

and inorganics terminal.

- The limited space and poor subsoil conditions limit storage behind Wharf 2. However, there is also limited space behind Wharf 3 for storage, which would either limit the development of needed port storage or require the demolition of some existing structures at the Port.

Alternative 3A: Wharf 2A for aggregates and inorganics and Wharf 7A for organics

Wharf 2A of 425 m would be developed for aggregates an inorganics to the west of the creek west of Wharf 3. Wharf 7A or 7B for organics to the east of Wharf 6 in the same mooring line, reserving the other for future development. As was mentioned previously, if Wharf 7A is developed, it would be necessary to move the cabotage wharf to another site, but Wharf 2A is in use in this alternative for other purposes.

The primary rationale for development of this alternative was that:

- The eastern region of the Port is closer to the main road entrance to Puerto Cortés, so that separate gates and shorter land travel would be possible for organics, avoiding congestion of the municipality or main port area;
- The eastern region appears to have better soil conditions than alternative locations such as the Quilimaco canal area.
- The new wharf for organics could be an extension of the berthing line of Wharf 6 for containers, which is already planned.
- The navigation channels and turning basins planned for Wharf 6 could be used for the bulk carriers for organics.
- The depths are reportedly greater in the area of Wharf 2A than in the other areas considered.
- Wharf 2 was indicated in the agreement reported in January 2006 between Empresa Nacional Portuaria and Agrecasa. DMJM Harris does not have information on whether the location indicated in the agreement is the area denoted by us as Wharf 2, Wharf 2A or if it is specified that precisely.
- Wharf 2A appears as potentially not as adverse a location as Wharf 2, in that it, unlike Wharf 2, Wharf 2A is not situated directly in front of the mouth of the Quilimaco canal.

Limitations of this alternative include:

- However, the geotechnical report regarding this location indicates that it has the "has the subsoil of lowest quality of the entire port area" and "the conditions imply a high risk for foundation of structures on it, since the possibility of obtaining a behavior acceptable over the long term are minimal and the presence of considerable settlements during the useful life of the structure can be guaranteed." It should also be noted that a wharf previously operated by Tela Railroad Company at this general location collapsed.
- The location is also distant from the main entrance to the port area, which would result in approximately 3 km additional conveyor length between the Port and municipality compared to locating the terminal in the eastern region of the port or, if trucks are used, in approximately 10 km additional round trip road truck routing length through the municipality to reach the aggregates and inorganics terminal.
- The limited space and poor subsoil conditions limit storage behind Wharf 2A. However, there is also limited space behind Wharf 3 for storage, which would either limit the development of needed port storage or require the demolition of some existing structures at the Port.

3.2 Preparation of Alternative Layouts for Construction of the New Berth

The alternative layouts for construction of the new berth are presented in Drawings (Dwg.) 3-1 to 3-3B. Referring to the drawings, the following alternatives are shown:

Drawing (Dwg.)	Alternative	Berths
3-1	1	Wharves 7A and 7B
3-1A/1	1A Phase 1	Pier 7A
3-1A/.1-a	1A Phase 1	Pier 7A cross section
3-1A/2	1A Phase 2	Pier 7B
3-1A/2-a	1A Phase 2	Pier 7B cross section
3-1B	1B	Pier 7
3-2A	2A	Wharves 3 and 7B
3-3A	3A	Wharves 2 and 7A
3-3A-a	3A	Wharf 2 cross section
3-3B	3B	Wharves 2A and 7B

The alternatives considered are summarized in the following table:

Table 3.2-1: Summary of Berthing Alternatives

Alternative	Organic Products	Aggregates and Inorganic Products
Alt. 1	Wharf 7A (260 m x 24 m)	Wharf 7B (425 m x 30 m)
Alt. 1A Phase 1	Pier 7A (Option 1: 260 m x 24 m Option 2: 320 m x 24 m)	–
Alt. 1A Phase 2	Pier 7A (260 m x 24 m)	Pier 7B (425 m x 30 m)
Alt. 1B	Combined Pier 7B (450 m x 40 m)	Combined Pier 7B (450 m x 40 m)
Alt. 2A	Wharf 3A 351 m (150 + 201)	Wharf 7B (425 m x 30 m)
Alt. 3A	Wharf 7A (260 m x 24 m)	Wharf 2 (425 m x 30 m)
Alt. 3B	Wharf 7A (260 m x 24 m)	Wharf 2A (425 m x 30 m)

Pier 7A and Wharf 7A are 260 m long by 24 m wide structures. Pier 7B and Wharf 7B are 425 m long by 30 m wide structures. Wharf 3A is a 150 m long by 24 m wide extension of the existing Wharf 3. Wharves 2 and 2A are 425 m long by 40 m wide structures. Pier 7 is a 450 m long by 50 m wide structure.

Piers are constructed of pile-supported, 18-inch depth concrete decks on beams over piles. The decks would consist of 10-inch depth pre-fabricated, pre-cast concrete panels reinforced in all directions, with an 8-inch concrete overlay with reinforcement Alternate bars extend out in one direction; the others extend out in the other direction Piles are 36 inch diameter by 1 inch thick coated hollow steel pipe piles. The length of the piles at the location for 7A and 7B is assumed to be 63 m.

The concrete panels are placed on cast pile cap. Steel beams are clamped to top of steel pile. Plywood

formwork is placed over steel clamp. Plywood placed provides working space for concrete. The steel beams can be removed when concrete is semi-cured. The top reinforcing is placed only after pre-cast panels are seated in place. The top reinforcing is not placed into the beam until all of the panels are in place. There is free access to the top, with no interference between reinforcement. Then the top part is cast together with overlay of the panels, and concrete poured. Rails are placed into prepared pockets. When the entire decking is cured and rails are connected, grouting is placed. Rails are welded by resistance welding, which melts the ends of the rails into continuous rail sitting on rubberized setting with epoxy grout pumped underneath. Beams are filled with asphalt, and the channel grooved for rail. Rail is considered to be 6 inches wide by 9 inches high. The channel for the rail is a 1 foot 4 inch pocket.

Pier outfitting includes crane rails, bollards at 15 m centers, fenders at 15 m centers, utilities and conveyor supports.

The silos and roadway access for organic products, and the enclosed and open storage and roadway access for the aggregates and inorganic products are also shown on the drawings. Referring to Drawing 3-1, 3-1A, 3-1B, 3-3A and 3-3B, 18 6,000-ton silos with expansion to 24 6,000-ton silos are shown southeast of Wharf 6 Phase III (with the 180 m shift to the northwest). Referring to Drawing 3-2A, 18 6,000 ton silos increasing to 24 silos are shown north of Wharf 3 and 3A. Silos are considered to be steel on concrete foundations. Steel silos are less costly and have lower dead load. The cost of foundations would depend on geotechnical conditions, which are unknown in most of the locations.

Referring to Drawings 3-1, 3-!A and 3-2A, open storage for coal and aggregates is shown in east of the Cabotage Wharf. Enclosed storage for inorganic products is shown on fill in the Alvarado Lagoon, due to inadequate land area and to avoid interference with the roadway ceded to the municipality as a promenade to the east of the Cabotage Wharf. Referring to Drawings 3-3A, open storage is shown north of Wharf 2, with additional open storage and enclosed storage north of Wharf 3. Similarly, in Drawing 3-3B, open storage is shown north of Wharf 2A, with additional open storage north of Wharf 3. Due to inadequate land area, there is some interference in these alternatives between the storage areas mentioned and existing port structures. Ponds and water treatment are included to treat water runoff from coal piles and avoid contamination of groundwater.

The advantages and disadvantages of each alternative are described on the following pages.

The berth occupancy simulations result in a range of occupancy percentages. While the berth length has not been directly utilized for the analysis, it can be assumed that the shortest berth length is related to the higher occupancy figure and vice versa.

Separate berths for handling organic and inorganic products:

Organic Products Berth (Alternatives 1, 1A Phases 1 and 2, 2A, 3A 3B):

The organic products berth shall be either 260 m long (Alternatives 1, 1A Option 1, 3A, 3B), 320 m long (Alternative 1A Option 2) or 351 m long (Alternative 2A) and shall be about 24 m wide. Under Alternative 1A Option 1 it can accommodate either one Handysize vessel or one Panamax vessel (LOA ~ 260m) and shall be equipped with a 1,200 t/h continuous unloader plus 5 x 300 t/h mobile hopper cars feeding two berth conveyors with connecting conveyor system to the storage silos. Under Alternative 1A Option 2 (Pier L=320m) the berth can accommodate simultaneously two geared or non-geared Handysize vessels (up to about 130 m length overall (LOA)) or one non-geared Panamax vessel. Under Alternative 2A (Wharf L=351m) the berth can accommodate simultaneously two geared or non-geared Handysize vessels (up to about 145 m LOA) or one non-geared Panamax vessel. The equipment shall remain equal to Option 1, which is one 1,200 t/h ship unloader plus 5 x 300 t/h mobile hopper cars feeding two berth conveyors with connecting conveyor system to the storage silos. The ship unloader for Organic Products would preferably be a continuous type (with screw conveyor or bucket elevator) designed to reach all across the holds of Panamax size vessels (Single Machine Berth Alternative).
As an Alternative instead of one 1,200 t/h unloader two 700 t/h unloaders would be provided for the purpose of redundancy. With the presence of two unloaders it will be possible to unload simultaneously two different grain products from the same vessel and transfer it to either one of the two berth conveyors and on to the proper silos (Twin Machines Berth Alternative). If two vessels can be berthed (Option 2) it will also be possible to unload simultaneously from two different vessels. To handle geared vessels, the 5 mobile hoppers will remain in operation for either Alternative.

In-Organic Products Berth: (Alternatives 1, 1A Phase 2, 2A, 3A 3B):

The berth for in-organic products shall be 425 m long (either a Finger Pier or a Marginal Wharf) and approximately 30 m wide to accommodate either two Handysize vessels (LOA ~180m) or one Panamax vessel (LOA ~ 260m). The equipment will consist of one 3,000 t/h traveling shiploader with luffing/slewing boom, tripper car and one berth conveyor for Aggregates, 5 x 300 t/h mobile hopper cars to unload geared vessels feeding two berth conveyors and conveyors to storage and one 1,200 t/h gantry type grab crane to unload non-geared vessels up to Panamax size (Single Machines Berth Alternative).

As an Alternative to one 3,000 t/h machine two 1,500 t/h shiploaders for Aggregates would be installed. The tripper car of the first shiploader will be equipped with a bypass to divide the incoming 3,000 t/h into two flows of 1,500 t/h, so that both shiploaders can load simultaneously (Twin Machines Berth Alternative).

Instead of the 1,200 t/h gantry crane two 700 t/h cranes would be provided for the purpose of redundancy. With the presence of two unloaders it will be possible to unload simultaneously two different Handysize vessels with different products and transfer these to either one of the two berth conveyors and on to the proper storage area (Twin Machines Berth Alternative).

One of the gantry cranes could also operate with a crane hook to transfer 7.5 t Cubetones or bagged materials into vessels, though as indicated another alternative is to handle these at existing berths with mobile equipment.

Combined Berth for Handling Organic and Inorganic Products: (Alternative 1B):

The combined berth for organic and in-organic products shall be 450 m long (finger Pier) and approximately 30 m wide to accommodate either two Handysize vessels (LOA ~195m) of one Panamax vessel (LOA~260m). The equipment will consist of one 3,000 t/h traveling shiploader with luffing/slewing boom, tripper car and one berth conveyor for aggregates, 5 x 300 t/h mobile hopper cars to unload geared vessels feeding three berth conveyors and conveyors to storage and one 1,200 t/h gantry type grab crane to unload organic or inorganic products from non-geared vessels up to Panamax size (Single Machines Berth Alternative).

As an alternative to one 3,000 t/h loader, two 1,500 t/h shiploaders for aggregates would be installed. The tripper car of the first shiploader will be equipped with a bypass to divide the incoming 3,000 t/h into two flows of 1,500 t/h, so that both shiploaders can load simultaneously (Twin Machines Berth Alternative).

Instead of the 1,200 t/h gantry crane two 700 t/h unloaders would be provided for the purpose of redundancy. With the presence of two unloaders it will be possible to unload simultaneously two different Handysize vessels with different products and transfer these to either one of the two berth conveyors and on to the proper storage area (Twin Machines Berth Alternative). It will also be possible to provide one machine as continuous unloader and the other as a gantry crane.

One of the gantry cranes could also operate with a crane hook to transfer 7.5 t Cubetones or bagged materials into vessels, though another alternative is to handle these at existing berths with mobile equipment.

Type of Unloader for Organic Products:

When a dedicated berth for organic products will be implemented, the type of unloader for organic products must be studied in more detail. Continuous unloaders such as pneumatic-type or mechanical-type have been successfully utilized to unload various types of grain.

Pneumatic unloaders are equipped with suction nozzles and a vertical tube to elevate the product out of the ship's hold into a receiving vessel at the gantry. They can unload all easy flowing fine materials, but they will not work very well with sluggish products and bigger lump sizes.

Mechanical unloaders are equipped with a vertical chain/bucket elevator or vertical screw conveyor to elevate the product out of the ship's hold. These types of machines will work with all kinds of organic products, also bigger lump sizes and sluggish products.

These types of continuous unloaders need a special boom and hoist to attach a payloader and place it into the ship's hold for clean-out.

These types of unloaders can easily be enclosed to contain dust and protect the environment. Suction tube and bucket elevator or screw conveyor can be tilted forward by about 20 degrees out of vertical position to reach under the ship's hatch coamings. Rail gauges tend to be smaller then those required for grab cranes.

Grab unloaders are the least sensitive type of machine to handle various kinds of products with quick exchange of grab buckets. They can also be utilized for crane hook operations. Placing of payloaders for hold clean-out is more easy and faster compared to continuous machines; typically the payloaders are attached underneath the buckets.

Environmental protection and dust containment are more difficult to achieve with Grab Cranes.

One of the main problems for organic products is contamination. Each of the organic products (soy, wheat, rice, corn) has multiple grades and is imported by various companies. Cleaning of the unloading gear is therefore required after every unloading of an organic product.

Presently all products are directly trans-loaded from geared vessels via mobile hopper into trucks. In the future there will be up to five mobile hoppers and/or one or two ship unloaders, two conveyor systems, two weighing systems and two elevators to the grain silos. Conveyors and several truck load-out stations are arranged for product reclaiming from the silos.

While the grab unloader can be cleaned more easily (only the receiving hopper needs cleaning), the cleaning of the continuous unloaders (nozzle, pipes, receiving vessel; screw or multiple buckets and boom conveyor) will be more time consuming. However, with the overall amount of cleaning to be done at the new material handling facility, this feature shall not be the most important criteria for or against the selection of any type of unloader.

Type of Unloader for In-Organic Products:

A single grab crane (about 36 ton hook capacity, 1200 t/h nominal "free digging" unloading rate) is proposed to unload non-geared vessels and assist geared vessels, to unload the annual import tonnages (fertilizer, coal, minerals) up to year 2026. This crane shall also be capable to do crane hook operations to handle "Cubetones," if required. Alternatively two 700 t/h cranes (each about 20 ton hook capacity) would be provided.

The proposed in-organic products berth of 425 m length will be capable to simultaneously berth two Handysize geared vessels; one geared vessel could self-unload fertilizer products via mobile hoppers to the conveyor while the gantry crane may load "Cubetones" into the second Handysize vessel.

While it has been safely assumed that all aggregates shall be loaded into Panamax size vessels at single berth occupancy, it will also be possible that the shiploader loads aggregates into a second Handysize vessel at double berth occupancy. This would potentially reduce the calculated basic berth occupancy.

Transfer of "Cubetones" via special harbor cranes, as presently performed, will be more difficult at the proposed pier due to the presence of three berth conveyors. It is therefore recommended to shift this operation to the backside of the new pier (only possible in case of finger pier), loading vessels up to about 20,000 DWT, or to handle the cubetones at an existing pier with mobile equipment. The backside of the pier then has to be equipped with fenders accommodating vessels up to 20,000 DWT. The low berth transfer rate of about 3,000 to 4,000 tons per day will be uneconomical at the front of the new high capacity berth which will be able to achieve unloading rates up to 13,000 tons per day and loading rates up to 38,000 tons per day. Based on this, the "Cubetones" operations have been excluded from the berth occupancy simulations.

Grab Unloader Design Details and Environmental Features

The grab unloader for in-organic products shall be designed such that it will have minimum impact on the environment. For the purpose of spillage control the bucket filling volume must be moderately heaped; bucket lips shall be equipped with adequate seals; buckets shall be equipped with hood covers. The cycle time of the bucket starting with digging of product at the vessel's hold, travel to the discharge hopper, emptying of product and return to the ship's hold must be selected moderately to minimize any

development of dust. Cycle times close to one minute are considered adequate.

The discharge hopper shall be equipped with a dust hood, allowing approach of the bucket from one side only. Dust collectors shall be arranged around the top of the hopper to catch any fugitive dust that may develop. The hopper shall also be equipped with a hinged spillage plate along the seaside edge of the discharge hopper. This spillage plate will be lowered during unloading, to catch any loss of material between the concrete edge of the berth and the fender line. Spilled material shall be returned from the spillage plate to the hopper via chain conveyors or alike.

The discharge hopper shall be equipped with a slewing belt feeder transferring the unloaded product to any of the berth conveyors. It may be possible to load "Cubetones" at the berth from trucks to vessel either by a special crane boom and hook attached to the grab unloader or by means of a separate harbor crane performing this operation while the unloader is in parked position. However, the unloading crane can also perform other operations at the berth, e.g. assisting self-unloading vessels or placing payloaders into holds.

The nominal rate of the unloader has been established as 1,200 t/h. The grab crane requires a hook capacity of ~36 tons and at ~63 cycles per hour the required payload of the grab is 1,200 / 63 = about 19 tons. For heavier materials above 1,000 kg/m3, such as phosphate or potash a grab of 20 m3 is required. For lighter material down to 700 kg/m3, a grab of 25 m3 is required. The weight of these clamshell grabs will range from 15 to 17 tons. Up to 21 tons of heavier material can be unloaded, since 21 t payload + 15 t grab weight are equal to the crane capacity of 36 tons. Up to 19 tons of lighter material can be unloaded, since 19 t payload + 17 t grab weight are equal to the crane capacity of 36 tons.

The cycle time of grab unloaders is determined as "free digging" from the gravity center of the vessel's hold, traveling to the discharge hopper, emptying the bucket content and return to the original point at the vessel. In the beginning the grab unloader will dig from the top of the hold and/or closer to the berth line, which results in shorter cycle times. Such "cream digging" may result in higher unloading rates, up to 20% of the design rate of the unloader. The downstream conveyor system designed for a nominal capacity of 1,200 t/h therefore has to be designed for a "peak rate" of 1,500 t/h.

Cycle times will vary with design speeds and ship sizes and they are also depending on the skill of the operator. Cycle times of 50 to 65 seconds have been assumed in the spreadsheet simulation for vessel sizes ranging from 10,000 to 80,000 DWT.

Mobile hoppers shall be equipped with dust hoods and dust collectors, similar to the receiving hopper at the gantry crane. Slewing feeders shall be provided under the mobile hoppers, capable to reach any one of the berth conveyors.

All belt conveyors shall have fully effective enclosures to ensure that spillage is reduced to an absolute minimum. All conveyor transfers for organic products and fertilizers shall be equipped with self-contained dust collectors. Conveyor transfers for coal, minerals and aggregates shall be equipped with water spray nozzles for dust suppression.

Consignment Sizes:

It is assumed that in the future there will be only moderate increases of the average unloaded consignment sizes. For organic products the present average consignment is ~12,000 tons and would increase to ~12,500 tons in 2016 and to ~13,200 tons in 2026. Similar moderate increases have been assumed for fertilizer products and coal. The consignment size for the new coal project has been kept at about 33,000 tons. For the new aggregates project it has been assumed that all tonnage has to be loaded into Panamax vessels of an average 55,000 tons consignment size. This assumption is conservative for the berth occupancy calculations, since Panamax vessels will occupy the entire berth, not allowing other operations during shiploading.

Spreadsheet Simulation Tables:

Table 3.3-4 Org1 (Alternatives 1, 1A, 2A, 3A and 3B) indicates unloading operations of 1,220,030 tons of organic products for year 2016 in the form of a spreadsheet simulation, with operations broken down into individual time elements, based on actual experience with such operations. For each product a high and low unloading rate has been assumed, utilizing geared vessels or a 1,200 t/h traveling unloader, thus creating a range of upper and lower values. The port availability is shown as 330 days, meaning that 35 days per year were unavailable due to weather, maintenance or holidays.

As a result of these assumptions in year 2016 there will be 98 vessels with an average consignment of 12,449 tons. These will be unloaded at a daily rate of about 8,700 to 9,200 tons in 1.36 to 1.43 days. The "single" occupancy of these vessels ranges from 133 to 140 days, which is 40% to 42% of the available 330 days per year.

The average waiting time for each vessel (as per queuing theory, see chart in Figure 3.3-1: F1 with explanations) is expected to be 0.18 to 0.21 days. Therefore the total time in port for such average consignment and vessel is expected to range from 1.54 to 1.64 days.

A graphic representation with description is given with Figure 3.3-1 F1 showing the ratio of waiting time over berth time (Tw/Tb) at increasing berth occupancy levels in percent. The statistic formulas used in the figure are based on single berth occupancy, while in reality the berth is partially a double occupancy berth. This assumption will yield more conservative results with regard to average vessel waiting and queuing. A limit of 75% occupancy is also considered conservative; many ports in the world can operate economically at berth occupancies of 80% to 85%.

Loading of raw sugar in "Cubetones" represents about 3.1% to 3.3% berth occupancy (6 vessels with an occupancy of about 10 to 11 days). These operations have not been included in the above berth occupancy considerations.

MATERIAL HANDLING CONSULTING
PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS

ORGANIC PRODUCTS BERTH
ALTERNATIVES 1, 1A, 2A, 3A, 3B

August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-4 **Single Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials**

ITEM	DESCRIPTION	TOTALS		YEAR 2016: HANDYSIZE SINGLE OCCUPANCY													EXPLANATIONS
No.	INPUT DATA	YEAR 2016		Unloading Soy		Unloading Wheat		Unloading Rice		Unloading Corn		Unloading Other Organics		Loading Sugar in Cubetones			
1	**Annual tonnage excl. Cubetoones**	1.220		0.272	0.272	0.274	0.274	0.185	0.185	0.475	0.475	0.014	0.014	0.036	0.036	mill.t	**Input**
1a	Average size of cargo	12,449		12,369	12,369	12,446	12,446	12,306	12,306	12,843	12,843	7,168	7,168	6,011	6,011	tons	Input assumption
1b	Number of holds of vessel	Handysize Geared	Handysize Non-geared	4	4	4	4	4	4	4	4	4	4	3	3	holds	Input
1c	**Type of Unloader / Loader**			Geared vessels with four cranes or one 1,200 t/h Unloader										Crane Loading			Input assumption
2a	Crane Grab or Hook Capacity			10.0	36.0	10.0	36.0	10.0	36.0	10.0	36.0	10.0	36.0	36.0	36.0	t	Input
2b	Weight of Grab			5.0	17.0	5.0	17.0	5.0	17.0	5.0	17.0	5.0	17.0			t	Input
2c	Volume of Grab			10.0	25.0	10.0	25.0	10.0	25.0	10.0	25.0	10.0	25.0			m3	Input
2d	Bulk density of Material			0.750	0.750	0.700	0.700	0.700	0.700	0.700	0.700	0.600	0.600			t/m3	Input
2e	Payload of Grab or Cubitone			5.0	18.8	5.0	17.5	5.0	17.5	5.0	17.5	5.0	15.0	7.5	7.5	t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	55.0	60.0	55.0	60.0	55.0	60.0	55.0	60.0	55.0	110.0	120.0	sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	65.5	60.0	65.5	60.0	65.5	60.0	65.5	60.0	65.5	32.7	30.0	c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	1,227	300	1,145	300	1,145	300	1,145	300	982	245	225	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	1.00	0.80	1.00	0.80	1.00	0.80	1.00	0.80	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			4	1	4	1	4	1	4	1	4	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			960	1,227	960	1,145	960	1,145	960	1,145	960	982	245	225	t/h	#5axd#5bxd#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**92%**	**92%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	19.8	15.5	19.9	16.7	19.7	16.5	20.6	17.2	11.5	11.2	28.8	31.4	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.6	2.4	0.6	2.4	0.6	2.4	0.6	2.4	0.6	2.4	1.8	1.8	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	1.0	4.0	1.0	4.0	1.0	4.0	1.0	4.0	1.0	4.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.7	1.8	1.7	1.8	0.9	0.9	1.8	1.9	0.5	0.7	1.2	1.3	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	1.9	2.0	1.9	2.1	1.9	2.1	2.0	2.1	1.2	1.6	1.5	1.7	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			30.6	31.1	30.7	32.5	29.6	31.4	31.5	33.2	20.3	25.4	38.9	41.7	hours	Sum#7 through #17
19	Average transfer rate @ berth time			405	397	405	382	416	392	408	387	353	282	155	144	t/h	#1a/#18
20	Average rate/free digging rate			42%	32%	42%	33%	43%	34%	43%	34%	37%	29%	63%	64%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**														
22	**Berth occupancy per vessel: Tb**	**1.36**	**1.43**	**1.4**	**1.4**	**1.4**	**1.4**	**1.3**	**1.4**	**1.4**	**1.5**	**0.9**	**1.1**	**1.7**	**1.9**	**days**	**#18/#21**
22A	**Berth transfer rate**	**9,162**	**8,714**	**9,106**	**8,940**	**9,119**	**8,604**	**9,357**	**8,816**	**9,187**	**8,712**	**7,949**	**6,343**	**3,480**	**3,242**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**														
23	**Annual tonnage transferred**	**1.220**		**0.272**	**0.272**	**0.274**	**0.274**	**0.185**	**0.185**	**0.475**	**0.475**	**0.014**	**0.014**	**0.036**	**0.036**	**mill.t**	**Input**
24	Number of vessels un/loaded	98		22	22	22	22	15	15	37	37	2	2	6	6	vessels	#23/#1a
25	Berth occupancy - hours	3,196	3,360	717	730	721	764	473	503	1,241	1,309	43	54	249	267	h/y	24 hxd#22x#24
26	Total Berth occupancy - days	133	140	30	30	30	32	20	21	52	55	2	2	10	11	d/y	#22x#24
27	Berth availability - days	330	330	330	330	330	330	330	330	330	330	330	330	335	335	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**9.1%**	**9.2%**	**9.1%**	**9.6%**	**6.0%**	**6.3%**	**15.7%**	**16.5%**	**0.5%**	**0.7%**	**3.1%**	**3.3%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**3.1%**	**3.3%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**													
28b	**Double Berth occupancies percent:**	**0%**	**0%**	**No Panamax Vessels**													
28c	**Single Berth occupancies percent:**	**40%**	**42%**	**All Handysize Vessels geared or non-geared excluding Cubetones Loading**													
28d	**Total Berth occupancy percent:**	**40%**	**42%**	**All products except Cubetones**													#28b+#28c
29	Waiting time factor Tw/Tb assumed	0.135	0.147	s.chart													40% of random
30	Annual waiting time Tw calculated	18	21	d/y													#29x#26
31	**Avg. berth time per vessel: Tb**	**1.36**	**1.43**	**days**													**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.18**	**0.21**	**days**													**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.54**	**1.64**	**days**													**#22 + #31**
33	**Equipment Occupancies**			**137 days average mobile hopper occupancy**										**11 days Crane Occupancy**			**Part∑#26**

Table 3.3-5 Org2 (Alternatives 1, 1A, 2A, 3A and 3B) indicates unloading operations of 1,587,918 tons of organic products for year 2026. At that time there could be 120 Handysize vessels with an average consignment of 13,233 tons. These will be unloaded at a daily rate of approximately 9,300 tons in 1.42 days. These 120 vessels will occupy the berth for 170 days, which represents 52% "single" occupancy of 330 available days.

If in 2026 the berth is lengthened to 320 m and all Organic Products would arrive in Panamax vessels, there would be only 38 vessels with an average consignment of 41,787 tons. These will be unloaded by a mechanical unloader at a daily rate of approximately 10,600 tons in 3.94 days. These 38 vessels will occupy the berth for 150 days, which is 45% "single" occupancy of 330 available days.

The average waiting time for Handysize vessels at 52% occupancy is expected to be 0.31 days. The average waiting time for Panamax vessels at 45% occupancy is expected to be 0.21 days Therefore the average time in port for Handysize vessels is 1.42 + 0.31 = 1.73 days and the average time in port for a Panamax vessel is 3.94 + 0.21 = 4.15 days.

Loading of raw sugar in "Cubetones" represents about 3.9% to 4.2% berth occupancy (7 vessels with an occupancy of about 13 to 14 days). These operations have not been included in the above berth occupancy considerations.

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ORGANIC PRODUCTS BERTH
ALTERNATIVES 1, 1A, 2A, 3A, 3B

August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-5: Single Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials

ITEM	DESCRIPTION	TOTALS		YEAR 2026: PART PANAMAX SINGLE OCCUPANCY													
No.	INPUT DATA	YEAR 2026		Unloading Soy		Unloading Wheat		Unloading Rice		Unloading Corn		Unloading Other Organics		Loading Sugar in Cubetones			EXPLANATIONS
1	**Annual tonnage excl. Cubetoones**	**1.588**		**0.354**	**0.354**	**0.365**	**0.365**	**0.240**	**0.240**	**0.609**	**0.609**	**0.019**	**0.019**	**0.046**	**0.046**	**mill.t**	**Input**
1a	Average size of cargo	13,233	41,787	13,127	39,381	13,052	52,209	13,358	40,073	13,532	40,595	9,332	18,665	6,602	6,602	tons	Input assumption
1b	Number of holds of vessel	Handysize Geared	Up to Panamax Non-geared	4	7	4	7	4	7	4	7	4	5	3	3	holds	Input
1c	**Type of Unloader / Loader**			**Geared vessels with four cranes or one 1,200 t/h Unloader**										**Crane Loading**			Input assumption
2a	Crane Grab or Hook Capacity			10.0	36.0	10.0	36.0	10.0	36.0	10.0	36.0	10.0	36.0	36.0	36.0	t	Input
2b	Weight of Grab			5.0	17.0	5.0	17.0	5.0	17.0	5.0	17.0	5.0	17.0			t	Input
2c	Volume of Grab			10.0	25.0	10.0	25.0	10.0	25.0	10.0	25.0	10.0	25.0			m3	Input
2d	Bulk density of Material			0.750	0.750	0.700	0.700	0.700	0.700	0.700	0.700	0.600	0.600			t/m3	Input
2e	Payload of Grab or Cubitone			5.0	18.8	5.0	17.5	5.0	17.5	5.0	17.5	5.0	15.0	7.5	7.5	t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	55.0	110.0	120.0	sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	65.5	32.7	30.0	c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	1,125	300	1,050	300	1,050	300	1,050	300	982	245	225	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	1.00	0.80	1.00	0.80	1.00	0.80	1.00	0.80	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			4	1	4	1	4	1	4	1	4	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			960	1,125	960	1,050	960	1,050	960	1,050	960	982	245	225	t/h	#5ax#5bx#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	30.0	30.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**	**92%**	**92%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	21.0	53.9	20.9	76.5	21.4	58.7	21.7	59.5	15.0	29.2	31.6	34.5	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.6	4.2	0.6	4.2	0.6	4.2	0.6	4.2	0.6	3.0	1.8	1.8	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	1.0	7.0	1.0	7.0	1.0	7.0	1.0	7.0	1.0	5.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.8	5.2	1.8	7.0	0.9	2.8	1.9	5.7	0.7	1.5	1.3	1.5	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	2.0	5.9	2.0	7.9	2.1	6.3	2.1	6.4	1.5	3.4	1.7	1.8	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			32.0	81.6	31.8	108.1	31.5	84.5	32.7	88.2	24.2	47.6	42.0	45.1	hours	Sum#7 through #17
19	Average transfer rate @ berth time			410	483	410	483	424	474	413	460	386	392	157	146	t/h	#1a/#18
20	Average rate/free digging rate			43%	43%	43%	46%	44%	45%	43%	44%	40%	40%	64%	65%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**														
22	**Berth occupancy per vessel: Tb**	**1.42**	**3.94**	**1.4**	**3.6**	**1.4**	**4.8**	**1.4**	**3.8**	**1.5**	**3.9**	**1.1**	**2.1**	**1.9**	**2.0**	**days**	**#18/#21**
22A	**Berth transfer rate**	**9,294**	**10,606**	**9,234**	**10,857**	**9,222**	**10,866**	**9,542**	**10,670**	**9,298**	**10,356**	**8,674**	**8,825**	**3,541**	**3,295**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**														
23	**Annual tonnage transferred**	**1.588**		**0.354**	**0.354**	**0.365**	**0.365**	**0.240**	**0.240**	**0.609**	**0.609**	**0.019**	**0.019**	**0.046**	**0.046**	**mill.t**	**Input**
24	Number of vessels un/loaded	120	38	27	9	28	7	18	6	45	15	2	1	7	7	vessels	#23/#1a
25	Berth occupancy - hours	4,100	3,593	921	783	951	807	605	541	1,572	1,411	52	51	313	337	h/y	24 hx#22x#24
26	Total Berth occupancy - days	171	150	38	33	40	34	25	23	65	59	2	2	13	14	d/y	#22x#24
27	Berth availability - days	330	330	330	330	330	330	330	330	330	330	330	330	335	335	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**11.6%**	**9.9%**	**12.0%**	**10.2%**	**7.6%**	**6.8%**	**19.8%**	**17.8%**	**0.7%**	**0.6%**	**3.9%**	**4.2%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**3.9%**	**4.2%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**													
28b	**Double Berth occupancies percent:**	**26%**	**0%**	**All geared Handysize Vessels at Double Occupancy**													
28c	**Single Berth occupancies percent:**	**52%**	**45%**	**Either all Handysize or all Panamax Vessels**													
28d	**Selected Berth occupancy percent:**	**52%**	**45%**	**Either all Handysize single occupancy or all Panamax single occupancy**													#28b or #28c
29	Waiting time factor Tw/Tb assumed	0.215	0.166	s.chart													40% of random
30	Annual waiting time Tw calculated	37	25	d/y													#29x#26
31	**Avg. berth time per vessel: Tb**	**1.42**	**3.94**	**days**													**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.31**	**0.21**	**days**													**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.73**	**4.15**	**days**													**#22 + #31**
33	**Equipment Occupancies**			**days combined average 85 mobile hopper and unloader occupancy**				**days average unloader 75 occupancy (Unloading Panamax)**						**14 days Crane Occupancy**			**Part∑#26**

Table 3.3-6 InOrg1 (Alternatives 1, 1A, 2A, 3A and 3B) indicates unloading and loading operations of 4,747,112 tons of in-organic products (fertilizer, coal, minerals and aggregates) for year 2016, with operations broken down into individual time elements, based on actual experience with such operations. For each product a high and low unloading rate has been assumed, utilizing geared vessels or a 1,200 t/h traveling unloader and a 3,000 t/h shiploader for aggregates, thus creating a range of upper and lower values. The port availability is shown as a range from 330 to 340 days, meaning that 25 to 35 days per year were unavailable due to weather, maintenance, holidays. This recognizes that loading or unloading certain products is more or less dependent on rainfall.

As a result of these assumptions in year 2016 there will be 122 vessels with an average consignment of 38,911 tons. These will be unloaded or loaded at a daily rate of about 25,400 to 26,600 tons in 1.46 to 1.54 days. These average figures include loading of 73 aggregates vessels (average Panamax cargo ~54,800 tons) at a rate of about 35,500 tons per day in 1.55 days per ship and unloading of 49 Handysize vessels at a rate of about 16,200 tons per day in 1.43 days. The double occupancy of the Handysize vessels is 0.5 x 49 v x 1.43 days / 335 days = 11% and the single occupancy of the aggregates vessels is 73 x 1.55 days / 340 days = 33%. Combined total is 11% + 33% = 44% berth occupancy.

The average waiting time for each vessel is expected to be 0.22 to 0.25 days. Therefore the total time in port for the average consignment and vessel is expected to range from 1.68 to 1.78 days.

Loading of Concentrates in "Cubetones" or Cement in Bags represents about 7.1% to 7.6% berth occupancy (19 vessels with an occupancy of about 25 to 26 days). These operations have not been included in the above berth occupancy considerations.

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IN-ORGANIC PRODUCTS BERTH
ALTERNATIVES 1, 1A, 2A, 3A, 3B

August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-6: Single or Double Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials

ITEM	DESCRIPTION	TOTALS																	
No.	INPUT DATA	YEAR 2016		Unloading Fertilizer		Unloading Coal		Unloading Minerals		Unloading New Coal		Loading Cement in Cubetones		Loading Concentrates in Cubetones		Loading Aggregates			EXPLANATIONS
1	**Annual tonnage excl. Cubetoones**	**4.747**		**0.356**	**0.356**	**0.165**	**0.165**	**0.027**	**0.027**	**0.200**	**0.200**	**0.005**	**0.005**	**0.069**	**0.069**	**4.000**	**4.000**	**mill.t**	**Input**
1a	Average size of cargo	**38,911**		11,115	11,115	32,910	32,910	4,479	4,479	33,333	33,333	5,309	5,309	3,852	3,852	54,795	54,795	tons	Input assumption
1b	Number of holds of vessel			4	4	5	5	4	4	5	5	3	3	4	4	7	7	holds	Input
1c	**Type of Unloader / Loader**			**Geared vessels with cranes**						**Gantry crane**		**Crane Loading**				**Shiploader**			Input assumption
2a	Crane Grab or Hook Capacity			10.0	10.0	10.0	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0			t	Input
2b	Weight of Grab			5.0	4.0	5.0	4.0	15.0	15.0	17.0	17.0							t	Input
2c	Volume of Grab			10.0	7.0	10.0	7.0	20.0	20.0	25.0	25.0							m3	Input
2d	Bulk density of Material			0.700	1.100	0.800	0.900	1.300	1.800	0.900	0.800							t/m3	Input
2e	Payload of Grab or Cubitone			5.0	6.0	5.0	6.0	21.0	21.0	19.0	19.0	7.5	7.5	7.5	7.5			t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	60.0	60.0	60.0	50.0	55.0	60.0	65.0	110.0	120.0	110.0	120.0			sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	60.0	60.0	60.0	72.0	65.5	60.0	55.4	32.7	30.0	32.7	30.0			c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	360	300	360	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			5	4	5	4	1	1	1	1	1	1	1	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			1,200	1,152	1,200	1,152	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#5ax#5bx#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	25.0	25.0	25.0	25.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**93%**	**93%**	**93%**	**93%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																		
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	14.3	14.8	42.2	44.0	4.6	5.0	45.0	48.7	25.4	27.8	18.5	20.1	21.5	23.0	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.5	0.6	0.6	0.8	2.4	2.4	3.0	3.0	1.8	1.8	2.4	2.4	4.2	4.2	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	0.8	1.0	1.0	1.3	4.0	4.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.2	1.3	1.8	1.8	0.9	0.9	2.1	2.3	1.1	1.2	0.8	0.9	1.0	1.1	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	1.4	1.5	3.9	4.1	1.0	1.0	4.8	5.1	1.4	1.5	1.0	1.1	1.3	1.4	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			23.7	24.7	55.0	57.4	18.3	18.9	65.4	69.6	35.2	37.7	28.2	30.1	34.0	35.7	hours	Sum#7 through #17
19	Average transfer rate @ berth time			470	449	599	573	244	238	510	479	151	141	136	128	1,612	1,536	t/h	#1a/#18
20	Average rate/free digging rate			39%	39%	50%	50%	16%	17%	45%	46%	61%	63%	56%	57%	54%	55%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**																
22	**Berth occupancy per vessel: Tb**	**1.46**	**1.54**	**1.1**	**1.1**	**2.4**	**2.6**	**0.8**	**0.8**	**2.9**	**3.1**	**1.6**	**1.7**	**1.3**	**1.3**	**1.5**	**1.6**	**days**	**#18/#21**
22A	**Berth transfer rate**	**26,593**	**25,348**	**10,566**	**10,109**	**13,467**	**12,895**	**5,501**	**5,345**	**11,473**	**10,775**	**3,394**	**3,167**	**3,069**	**2,882**	**36,261**	**34,561**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**																
23	**Annual tonnage transferred**	**4.747**		**0.356**	**0.356**	**0.165**	**0.165**	**0.027**	**0.027**	**0.200**	**0.200**	**0.005**	**0.005**	**0.069**	**0.069**	**4.000**	**4.000**	**mill.t**	**Input**
24	Number of vessels un/loaded	122		32	32	5	5	6	6	6	6	1	1	18	18	73	73	vessels	#23/#1a
25	Berth occupancy - hours	4,284	4,495	808	844	293	306	117	121	418	445	38	40	542	577	2,647	2,778	h/y	24 hx#22x#24
26	Total Berth occupancy - days	179	187	34	35	12	13	5	5	17	19	2	2	23	24	110	116	d/y	#22x#24
27	Berth availability - days	335	335	330	330	335	335	335	335	335	335	335	335	340	340	340	340	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**10.2%**	**10.7%**	**3.6%**	**3.8%**	**1.5%**	**1.5%**	**5.2%**	**5.5%**	**0.5%**	**0.5%**	**6.6%**	**7.1%**	**32.4%**	**34.0%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**6.6%**	**7.1%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**															
28b	**Double Berth occupancies percent:**	**10%**	**11%**	**All products except Aggregates & Cubetones**															
28c	**Single Berth occupancies percent:**	**32%**	**34%**	**Aggregates only loaded into PANAMAX vessels**															
28d	**Total Berth occupancy percent:**	**43%**	**45%**	**All products except Cubetones**															#28b+#28c
29	Waiting time factor Tw/Tb assumed	0.149	0.162	s.chart															40% of random
30	Annual waiting time Tw calculated	27	30	d/y															#29x#26
31	**Avg. berth time per vessel: Tb**	**1.46**	**1.54**	**days**															**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.22**	**0.25**	**days**															**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.68**	**1.78**	**days**															**#22 + #31**
33	**Equipment Occupancies**			**34 days average mobile hopper occupancy**						**35 days average gantry crane occupancy**						**days avg. 113 shiploader occupancy**			**½ x part∑#26**

Table 3.3-7 InOrg2 (Alternatives 1, 1A, 2A, 3A and 3B) indicates unloading and loading operations of 4,932,398 tons of in-organic products for year 2026. At that time there will be 132 vessels with an average consignment of 37,367 tons. These will be unloaded at a daily rate of approximately 25,000 tons in 1.47 to 1.54 days. These 132 vessels will occupy the berth for 194 to 203 days. 59 Handysize vessels will have about 13% double occupancy and loading of 73 aggregates vessels will have single occupancies of 32% to 34%. Combined total range is 45% to 47% berth occupancy.

The average waiting time for each vessel is expected to be 0.24 to 0.28 days. Therefore the total time in port for the average consignment and vessel is expected to range from 1.71 to 1.82 days.

Loading of concentrates in "Cubetones" or cement in bags represents about 8.9% to 9.4% berth occupancy (22 vessels with an occupancy of about 30 to 32 days). These operations have not been included in the above berth occupancy considerations.

MATERIAL HANDLING CONSULTING
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IN-ORGANIC PRODUCTS BERTH
ALTERNATIVES 1, 1A, 2A, 3A, 3B

August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-7: Single or Double Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials

ITEM	DESCRIPTION	TOTALS																	
No.	INPUT DATA	YEAR 2026		Unloading Fertilizer		Unloading Coal		Unloading Minerals		Unloading New Coal		Loading Cement in Cubetones		Loading Concentrates in Cubetones		Loading Aggregates			EXPLANATIONS
1	**Annual tonnage excl. Cubetoones**	**4.932**		**0.486**	**0.486**	**0.211**	**0.211**	**0.035**	**0.035**	**0.200**	**0.200**	**0.007**	**0.007**	**0.089**	**0.089**	**4.000**	**4.000**	**mill.t**	**Input**
1a	Average size of cargo	37,367		12,161	12,161	35,144	35,144	5,011	5,011	33,333	33,333	6,803	6,803	4,231	4,231	54,795	54,795	tons	Input assumption
1b	Number of holds of vessel			4	4	5	5	4	4	5	5	3	3	4	4	7	7	holds	Input
1c	**Type of Unloader / Loader**			**Geared vessels with cranes**						**Gantry crane**		**Crane Loading**				**Shiploader**			Input assumption
2a	Crane Grab or Hook Capacity			10.0	10.0	10.0	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0			t	Input
2b	Weight of Grab			5.0	4.0	5.0	4.0	15.0	15.0	17.0	17.0							t	Input
2c	Volume of Grab			10.0	7.0	10.0	7.0	20.0	20.0	25.0	25.0							m3	Input
2d	Bulk density of Material			0.700	1.100	0.800	0.900	1.300	1.800	0.900	0.800							t/m3	Input
2e	Payload of Grab or Cubitone			5.0	6.0	5.0	6.0	21.0	21.0	19.0	19.0	7.5	7.5	7.5	7.5			t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	60.0	60.0	60.0	50.0	55.0	60.0	65.0	110.0	120.0	110.0	120.0			sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	60.0	60.0	60.0	72.0	65.5	60.0	55.4	32.7	30.0	32.7	30.0			c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	360	300	360	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			5	4	5	4	1	1	1	1	1	1	1	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			1,200	1,152	1,200	1,152	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#5ax#5bx#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	25.0	25.0	25.0	25.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**93%**	**93%**	**93%**	**93%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																		
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	15.6	16.2	45.1	46.9	5.1	5.6	45.0	48.7	32.6	35.6	20.3	22.1	21.5	23.0	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.5	0.6	0.6	0.8	2.4	2.4	3.0	3.0	1.8	1.8	2.4	2.4	4.2	4.2	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	0.8	1.0	1.0	1.3	4.0	4.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.3	1.4	1.9	2.0	0.9	1.0	2.1	2.3	1.4	1.5	0.9	1.0	1.0	1.1	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	1.5	1.6	4.2	4.4	1.0	1.1	4.8	5.1	1.7	1.9	1.1	1.2	1.3	1.4	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			25.2	26.4	58.2	60.8	19.0	19.6	65.4	69.6	43.0	46.2	30.2	32.2	34.0	35.7	hours	Sum#7 through #17
19	Average transfer rate @ berth time			482	461	604	578	264	256	510	479	158	147	140	131	1,612	1,536	t/h	#1a/#18
20	Average rate/free digging rate			40%	40%	50%	50%	17%	19%	45%	46%	64%	65%	57%	58%	54%	55%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**																
22	**Berth occupancy per vessel: Tb**	**1.47**	**1.54**	**1.1**	**1.2**	**2.6**	**2.7**	**0.8**	**0.9**	**2.9**	**3.1**	**1.9**	**2.1**	**1.3**	**1.4**	**1.5**	**1.6**	**days**	**#18/#21**
22A	**Berth transfer rate**	**25,420**	**24,240**	**10,841**	**10,375**	**13,582**	**13,007**	**5,949**	**5,767**	**11,473**	**10,775**	**3,559**	**3,311**	**3,150**	**2,954**	**36,261**	**34,561**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**																
23	**Annual tonnage transferred**	**4.932**		**0.486**	**0.486**	**0.211**	**0.211**	**0.035**	**0.035**	**0.200**	**0.200**	**0.007**	**0.007**	**0.089**	**0.089**	**4.000**	**4.000**	**mill.t**	**Input**
24	Number of vessels un/loaded	132		40	40	6	6	7	7	6	6	1	1	21	21	73	73	vessels	#23/#1a
25	Berth occupancy - hours	4,657	4,884	1,077	1,125	373	389	142	146	418	445	46	49	677	722	2,647	2,778	h/y	24 hx#22x#24
26	Total Berth occupancy - days	194	203	45	47	16	16	6	6	17	19	2	2	28	30	110	116	d/y	#22x#24
27	Berth availability - days	335	335	330	330	335	335	335	335	335	335	335	335	340	340	340	340	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**13.6%**	**14.2%**	**4.6%**	**4.8%**	**1.8%**	**1.8%**	**5.2%**	**5.5%**	**0.6%**	**0.6%**	**8.3%**	**8.8%**	**32.4%**	**34.0%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**8.3%**	**8.8%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**															
28b	**Double Berth occupancies percent:**	**13%**	**13%**	**All products except Aggregates & Cubetones**															
28c	**Single Berth occupancies percent:**	**32%**	**34%**	**Aggregates only loaded into PANAMAX vessels**															
28d	**Total Berth occupancy percent:**	**45%**	**47%**	**All products except Cubetones**															#28b+#28c
29	Waiting time factor Tw/Tb assumed	0.164	0.179	s.chart															40% of random
30	Annual waiting time Tw calculated	32	36	d/y															#29x#26
31	**Avg. berth time per vessel: Tb**	**1.47**	**1.54**	**days**															**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.24**	**0.28**	**days**															**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.71**	**1.82**	**days**															**#22 + #31**
33	**Equipment Occupancies**			**46 days average mobile hopper occupancy**						**40 days average gantry crane occupancy**						**days avg. 113 shiploader occupancy**			**½ x part∑#26**

Table 3.3-8. Comb1 (Alternative 1B) indicates combined unloading and loading operations of 5,967,142 tons of organic and in-organic products (fertilizer, coal, minerals and aggregates) for year 2016, with operations broken down into individual time elements, based on actual experience with such operations. For each product a high and low unloading rate has been assumed, utilizing geared vessels or a 1,200 t/h traveling unloader and a 3,000 t/h shiploader for aggregates, thus creating a range of upper and lower values. The port availability is shown as a range from 330 to 340 days, meaning that 25 to 35 days per year were unavailable due to weather, maintenance, holidays. This recognizes that loading or unloading certain products is more or less dependent on rainfall.

As a result of these assumptions in year 2016 there will be 220 vessels with an average consignment size of 27,123 tons. These will be unloaded or loaded at a daily rate of about 19,600 to 20,600 tons in 1.32 to 1.38 days. These average figures include loading of 73 aggregates vessels (average cargo 54,800 tons) at a rate of about 35,500 tons per day in 1.55 days per ship and unloading of 147 Handysize vessels at a rate of about 10,150 tons per day in 1.32 days. The double occupancy of the Handysize vessels is 0.5 x 147 v x 1.32 days / 335 days = 29% and the single occupancy of the aggregates vessels is 73 x 1.55 days / 340 days = 33%. Combined total is 29% + 33% = 62% berth occupancy.

The average waiting time for each vessel is expected to be 0.39 to 0.46 days. Therefore the total time in port for the average consignment and vessel is expected to range from 1.71 to 1.84 days.

Loading of concentrates in “Cubetones” or cement in bags represents about 10.2% to 10.9% berth occupancy (25 vessels with an occupancy of about 34 to 37 days). These operations have not been included in the above berth occupancy considerations.

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August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY** **ALTERNATIVE 1B - ONE COMMON BERTH**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-8: Double Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials

ITEM	DESCRIPTION	TOTALS		YEAR 2016:																	
No.	INPUT DATA	YEAR 2016		Unloading Organics		Unloading Fertilizer		Unloading Coal		Unloading Minerals		Unloading New Coal		Loading Sugar in Cubetones		Loading Concentrates +Cement in Cubetones		Loading Aggregates			EXPLANATIONS
1	**Annual tonnage excl. Cubetoones**	**5.967**		**1.220**	**1.220**	**0.356**	**0.356**	**0.165**	**0.165**	**0.027**	**0.027**	**0.200**	**0.200**	**0.036**	**0.036**	**0.075**	**0.075**	**4.000**	**4.000**	**mill.t**	**Input**
1a	Average size of cargo	27,123		12,449	12,449	11,115	11,115	32,910	32,910	4,479	4,479	33,333	33,333	6,011	6,011	3,955	3,955	54,795	54,795	tons	Input assumption
1b	Number of holds of vessel			4	4	4	4	5	5	4	4	5	5	3	3	4	4	7	7	holds	Input
1c	**Type of Unloader / Loader**			**Geared vessels with cranes**						**Gantry crane or Geared vessels w. cranes**								**Shiploader**			Input assumption
2a	Crane Grab or Hook Capacity			10.0	10.0	10.0	10.0	10.0	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0			t	Input
2b	Weight of Grab			5.0	4.0	5.0	4.0	5.0	4.0	15.0	15.0	17.0	17.0							t	Input
2c	Volume of Grab			10.0	7.0	10.0	7.0	10.0	7.0	20.0	20.0	25.0	25.0							m3	Input
2d	Bulk density of Material			0.700	0.900	0.700	1.100	0.800	0.900	1.300	1.800	0.900	0.800							t/m3	Input
2e	Payload of Grab or Cubitone			5.0	6.0	5.0	6.0	5.0	6.0	21.0	21.0	19.0	19.0	7.5	7.5	7.5	7.5			t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	60.0	60.0	60.0	60.0	60.0	50.0	55.0	60.0	65.0	110.0	120.0	110.0	120.0			sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	60.0	60.0	60.0	60.0	60.0	72.0	65.5	60.0	55.4	32.7	30.0	32.7	30.0			c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	360	300	360	300	360	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	0.80	0.80	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			5	4	5	4	5	4	1	1	1	1	1	1	1	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			1,200	1,152	1,200	1,152	1,200	1,152	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#5ax#5bx#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	25.0	25.0	25.0	25.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**90%**	**90%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**93%**	**93%**	**93%**	**93%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																				
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	16.0	16.6	14.3	14.8	42.2	44.0	4.6	5.0	45.0	48.7	28.8	31.4	19.0	20.7	21.5	23.0	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.5	0.6	0.5	0.6	0.6	0.8	2.4	2.4	3.0	3.0	1.8	1.8	2.4	2.4	4.2	4.2	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	0.8	1.0	0.8	1.0	1.0	1.3	4.0	4.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.4	1.5	1.2	1.3	1.8	1.8	0.9	0.9	2.1	2.3	1.2	1.3	0.9	0.9	1.0	1.1	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	1.6	1.6	1.4	1.5	3.9	4.1	1.0	1.0	4.8	5.1	1.5	1.7	1.1	1.2	1.3	1.4	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			25.7	26.8	23.7	24.7	55.0	57.4	18.3	18.9	65.4	69.6	38.9	41.7	28.8	30.7	34.0	35.7	hours	Sum#7 through #17
19	Average transfer rate @ berth time			485	464	470	449	599	573	244	238	510	479	155	144	137	129	1,612	1,536	t/h	#1a/#18
20	Average rate/free digging rate			40%	40%	39%	39%	50%	50%	16%	17%	45%	46%	63%	64%	56%	57%	54%	55%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**																		
22	**Berth occupancy per vessel: Tb**	**1.32**	**1.38**	**1.1**	**1.2**	**1.1**	**1.1**	**2.4**	**2.6**	**0.8**	**0.8**	**2.9**	**3.1**	**1.7**	**1.9**	**1.3**	**1.4**	**1.5**	**1.6**	**days**	**#18/#21**
22A	**Berth transfer rate**	**20,553**	**19,622**	**10,911**	**10,442**	**10,566**	**10,109**	**13,467**	**12,895**	**5,501**	**5,345**	**11,473**	**10,775**	**3,480**	**3,242**	**3,092**	**2,903**	**36,261**	**34,561**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**																		
23	**Annual tonnage transferred**	**5.967**		**1.220**	**1.220**	**0.356**	**0.356**	**0.165**	**0.165**	**0.027**	**0.027**	**0.200**	**0.200**	**0.036**	**0.036**	**0.075**	**0.075**	**4.000**	**4.000**	**mill.t**	**Input**
24	Number of vessels un/loaded	220		98	98	32	32	5	5	6	6	6	6	6	6	19	19	73	73	vessels	#23/#1a
25	Berth occupancy - hours	6,968	7,299	2,684	2,804	808	844	293	306	117	121	418	445	249	267	579	617	2,647	2,778	h/y	24 hx#22x#24
26	Total Berth occupancy - days	290	304	112	117	34	35	12	13	5	5	17	19	10	11	24	26	110	116	d/y	#22x#24
27	Berth availability - days	334	334	330	330	330	330	335	335	335	335	335	335	335	335	340	340	340	340	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**33.9%**	**35.4%**	**10.2%**	**10.7%**	**3.6%**	**3.8%**	**1.5%**	**1.5%**	**5.2%**	**5.5%**	**3.1%**	**3.3%**	**7.1%**	**7.6%**	**32.4%**	**34.0%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**10.2%**	**10.9%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**																	
28b	**Double Berth occupancies percent:**	**27%**	**28%**	**All products except Aggregates & Cubetones**																	
28c	**Single Berth occupancies percent:**	**32%**	**34%**	**Aggregates only loaded into PANAMAX vessels**																	
28d	**Total Berth occupancy percent:**	**60%**	**62%**	**All products except Cubetones**																	#28a+#28b
29	Waiting time factor Tw/Tb assumed	0.296	0.333	s.chart																	40% of random
30	Annual waiting time Tw calculated	86	101	d/y																	#29x#26
31	**Avg. berth time per vessel: Tb**	**1.32**	**1.38**	**days**																	**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.39**	**0.46**	**days**																	**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.71**	**1.84**	**days**																	**#22 + #31**
33	**Equipment Occupancies**			**114 days avg. mobile hopper occup.**						**70 days average gantry crane occupancy**								**days avg. 113 shiploader occupancy**			**½ x part∑#26**

Table 3.3-9 Comb2 (Alternative 1B) indicates unloading and loading operations of 6,520,316 tons of organic and in-organic products for year 2026. At that time there will be 251 vessels with an average consignment of 25,977 tons. These will be unloaded or loaded at a daily rate of approximately 185000 to 19,400 tons in 1.34 to 1.40 days. These 251 vessels will occupy the berth for 194 to 203 days. 178 Handysize vessels will have about 34% to 36% double occupancy and 73 aggregates vessels will have single occupancies of 32% to 34%. Combined total range is 66% to 70% berth occupancy.

The average waiting time for each vessel is expected to be 0.54 to 0.65 days. Therefore the total time in port for the average consignment and vessel is expected to range from 1.88 to 2.05 days

Loading of sugar, concentrates in "Cubetones" or cement in bags represents about 12.7% to 13.6% berth occupancy (22 vessels with an occupancy of about 43 to 46 days). These operations have not been included in the above berth occupancy considerations.

MATERIAL HANDLING CONSULTING
PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS

August 7, 2007
by: K.Kroeter

COMPANY: **DMJM HARRIS - USTDA STUDY** **ALTERNATIVE 1B - ONE COMMON BERTH**
SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**
Table 3.3-9: Double Berth - Occupancy Ship Unloading and Shiploading of Bulk Materials

ITEM	DESCRIPTION	TOTALS		YEAR 2026:																		
No.	INPUT DATA	YEAR 2026		Unloading Organics		Unloading Fertilizer		Unloading Coal		Unloading Minerals		Unloading New Coal		Loading Sugar in Cubetones		Loading Concentrates +Cement in Cubetones		Loading Aggregates			EXPLANATIONS
1	**Annual tonnage excl. Cubetoones**	**6.520**		**1.588**	**1.588**	**0.486**	**0.486**	**0.211**	**0.211**	**0.035**	**0.035**	**0.200**	**0.200**	**0.046**	**0.046**	**0.096**	**0.096**	**4.000**	**4.000**	**mill.t**	**Input**
1a	Average size of cargo	**25,874**		13,233	13,233	12,161	12,161	35,144	35,144	5,011	5,011	33,333	33,333	6,602	6,602	4,414	4,414	54,795	54,795	tons	Input assumption
1b	Number of holds of vessel			4	4	4	4	5	5	4	4	5	5	3	3	4	4	7	7	holds	Input
1c	**Type of Unloader / Loader**			**Geared vessels with cranes**						**Gantry crane or Geared vessels w. cranes**								**Shiploader**			Input assumption
2a	Crane Grab or Hook Capacity			10.0	10.0	10.0	10.0	10.0	10.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0			t	Input
2b	Weight of Grab			5.0	4.0	5.0	4.0	5.0	4.0	15.0	15.0	17.0	17.0							t	Input
2c	Volume of Grab			10.0	7.0	10.0	7.0	10.0	7.0	20.0	20.0	25.0	25.0							m3	Input
2d	Bulk density of Material			0.700	0.900	0.700	1.100	0.800	0.900	1.300	1.800	0.900	0.800							t/m3	Input
2e	Payload of Grab or Cubitone			5.0	6.0	5.0	6.0	5.0	6.0	21.0	21.0	19.0	19.0	7.5	7.5	7.5	7.5			t	#2a - #2b if volume ok
3a	Unloader / Loader cycle time			60.0	60.0	60.0	60.0	60.0	60.0	50.0	55.0	60.0	65.0	110.0	120.0	110.0	120.0			sec.	Input or Calc.
3b	Unloader / Loader cycles per hour			60.0	60.0	60.0	60.0	60.0	60.0	72.0	65.5	60.0	55.4	32.7	30.0	32.7	30.0			c/h	3600 sec/#3a
4	Unloader / Loader nominal rate			300	360	300	360	300	360	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#2ex#3b
5a	Unloader/Loader interference factor			0.80	0.80	0.80	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-	No interf.for one crane
5b	Number of Unloaders / Loaders			5	4	5	4	5	4	1	1	1	1	1	1	1	1	1	1	-	Input
5c	Nominal rate for no. of unloaders/loaders			1,200	1,152	1,200	1,152	1,200	1,152	1,512	1,375	1,140	1,052	245	225	245	225	3,000	2,800	t/h	#5ax#5bx#4
6a	Unavailable time at port (weather, maint.)			35.0	35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	25.0	25.0	25.0	25.0	d/y	Input
6b	**Overall Port Availibility**			**90%**	**90%**	**90%**	**90%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**92%**	**93%**	**93%**	**93%**	**93%**		**(365 d - #6a)/365**
	VESSEL TIME / EVENT																				
7	Move to berth and dock			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	hours	Assumption
8	Customs and Paperwork			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
9	Vessel Problems	Unload	Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
10	Unload/load cargo @ % free digging rate:	65%	85%	17.0	17.7	15.6	16.2	45.1	46.9	5.1	5.6	45.0	48.7	31.6	34.5	21.2	23.1	21.5	23.0	hours	#1a/(%x#5c)
11	Hatch shifting 3 moves/hold [h]:	0.2	0.2	0.5	0.6	0.5	0.6	0.6	0.8	2.4	2.4	3.0	3.0	1.8	1.8	2.4	2.4	4.2	4.2	h/unl.	3movesx[h]x#1b/5b
12	Pay loader moves/hold in and out [h]:	0.5	0	0.8	1.0	0.8	1.0	1.0	1.3	4.0	4.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	h/unl.	2 movesx[h]x#1b/5b
13	Downtime of # 10,11,12:	8%	4%	1.5	1.5	1.3	1.4	1.9	2.0	0.9	1.0	2.1	2.3	1.3	1.5	0.9	1.0	1.0	1.1	hours	%x(#10+#11+#12)
14	Vessel shifting 2 moves/hold [h]:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	hours	2 movesx[h]x#1b/5b
15	Downtime due to weather	9%	5%	1.6	1.7	1.5	1.6	4.2	4.4	1.0	1.1	4.8	5.1	1.7	1.8	1.2	1.3	1.3	1.4	hours	%x(#10+#11+#12)
16	Vessel time/draught survey			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	hours	Assumption
17	Vessel deberthing and transit time			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	hours	Assumption
18	Total berth time per vessel			26.8	28.0	25.2	26.4	58.2	60.8	19.0	19.6	65.4	69.6	42.0	45.1	31.2	33.3	34.0	35.7	hours	Sum#7 through #17
19	Average transfer rate @ berth time			493	472	482	461	604	578	264	256	510	479	157	146	142	133	1,612	1,536	t/h	#1a/#18
20	Average rate/free digging rate			41%	41%	40%	40%	50%	50%	17%	19%	45%	46%	64%	65%	58%	59%	54%	55%		100x(#19/#5c)
21	Operating hours per day			22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	hours	Input Assumption
	OUTPUT - DAILY PROJECTIONS:	**LOW**	**HIGH**																		
22	**Berth occupancy per vessel: Tb**	**1.34**	**1.40**	**1.2**	**1.2**	**1.1**	**1.2**	**2.6**	**2.7**	**0.8**	**0.9**	**2.9**	**3.1**	**1.9**	**2.0**	**1.4**	**1.5**	**1.5**	**1.6**	**days**	**#18/#21**
22A	**Berth transfer rate**	**19,336**	**18,467**	**11,090**	**10,615**	**10,841**	**10,375**	**13,582**	**13,007**	**5,949**	**5,767**	**11,473**	**10,775**	**3,541**	**3,295**	**3,186**	**2,985**	**36,261**	**34,561**	**t/day**	**#1a/#22**
	OUTPUT - ANNUAL PROJECTIONS:	**LOW**	**HIGH**																		
23	**Annual tonnage transferred**	**6.520**		**1.588**	**1.588**	**0.486**	**0.486**	**0.211**	**0.211**	**0.035**	**0.035**	**0.200**	**0.200**	**0.046**	**0.046**	**0.096**	**0.096**	**4.000**	**4.000**	**mill.t**	**Input**
24	Number of vessels un/loaded	252		120	120	40	40	6	6	7	7	6	6	7	7	22	22	73	73	vessels	#23/#1a
25	Berth occupancy - hours	8,093	8,474	3,436	3,590	1,077	1,125	373	389	142	146	418	445	313	337	721	769	2,647	2,778	h/y	24 hx#22x#24
26	Total Berth occupancy - days	337	353	143	150	45	47	16	16	6	6	17	19	13	14	30	32	110	116	d/y	#22x#24
27	Berth availability - days	251	251	330	330	330	330	335	335	335	335	335	335	335	335	340	340	340	340	d/y	365 - #6a
28	**Individual Berth occupancies percent:**	**LOW**	**HIGH**	**43.4%**	**45.3%**	**13.6%**	**14.2%**	**4.6%**	**4.8%**	**1.8%**	**1.8%**	**5.2%**	**5.5%**	**3.9%**	**4.2%**	**8.8%**	**9.4%**	**32.4%**	**34.0%**		100x(#26/#27)
28a	**Cubetone Berth occupancies percent:**	**12.7%**	**13.6%**	**Cubetones loaded via Crane from Trucks on Backside of Berth or elsewhere**																	
28b	**Double Berth occupancies percent:**	**34%**	**36%**	**All products except Aggregates & Cubetones**																	
28c	**Single Berth occupancies percent:**	**32%**	**34%**	**Aggregates only loaded into PANAMAX vessels**																	
28d	**Total Berth occupancy percent:**	**67%**	**70%**	**All products except Cubetones**																	#28a+#28b
29	Waiting time factor Tw/Tb assumed	0.401	0.465	s.chart																	40% of random
30	Annual waiting time Tw calculated	135	164	d/y																	#29x#26
31	**Avg. berth time per vessel: Tb**	**1.34**	**1.40**	**days**																	**=#22**
31	**Avg. waiting time per vessel: Tw**	**0.54**	**0.65**	**days**																	**#30/#24**
32	**Total Vessel Time in Port: Tb+Tw**	**1.88**	**2.05**	**days**																	**#22 + #31**
33	**Equipment Occupancies**			**146 days avg. mobile hopper occup.**						**86 days average gantry crane occupancy**								**days avg. 113 shiploader occupancy**			**½ x part∑#26**

3.4 Preparation of Alternative Layouts for Storage, Conveying and Reclaiming Systems

Storage requirements are indicated on Summary Table 3.3-1 All storage requirements are either based on the average consignment size of the individual product, including a safety margin, or based on the maximum consignment size, or based on a storage volume equal to at least 24 days of the annual throughput in 365 days. Aggregates take an exception, their storage is twice the maximum consignment size which corresponds to 14 days volume of the annual throughput.

Bulk Import Products:
Storage of Organic Products:

Imported organic products mainly consist of soybeans, wheat, rice, corn and small amounts of barley, malt and other organic products such as animal feed. At present various importers (about 3 to 20 per product) bring their trucks to the berth for direct transfer from geared vessel via mobile hopper to the trucks. This operation is very slow and achieves berth transfer rates of only about 2,500 tons per day. Each importer also imports several different grades of the same product, which shall be handled separately, not to be contaminated.

In 2006 at a total of 908,342 tons of organic products were carried in 76 vessels and the average consignment size was close to 12,000 tons. Of the 76 vessels only 23 vessels carried a single product. The other 53 vessels carried in most cases two different grades of product. Furthermore, maximum consignment sizes in the past three years were up to 24,000 tons and 28,000 tons in case of multiple products. If we assume 2 products x 53 vessels + 1 product x 23 vessels, there could have been up to129 different grades of products for different importers.

Future grain imports show 98 to 120 vessels with 3 to 4 days inter-arrival times. Assuming a worst case scenario, where one vessel arrives with 24,000 tons cargo two days late, requiring two days at the berth and the next vessel with 28,000 tons cargo and two grades arriving on time, there will be 52.000 tons of grains in three grades to be loaded into 6,000 ton storage silos, filling about 9 silos in 5 days.

Truck loading operations will show that one 6,000 ton silo can be emptied in a two-shift operation to load trucks. In the third shift that silo has to be cleaned to receive another product for another importer. While it took 5 days to unload the two vessels (24,000 + 28,000 = 52,000 tons), it will take 9 days to empty the silos.

In the meantime another vessel will have arrived, requiring silo space. We also have to assume that some importers will not readily send enough trucks, occupying silo space beyond anticipated time frames.

Based on the above considerations for the year 2016 throughput there shall be 16 silos of 6,000 ton capacity each provided for organic products Two additional silos shall be retained for recycling of overheated or infested products. The total available storage capacity of 108,000 tons (including recycling silos) represents a 32 day storage equivalent for the annual tonnage of the year 2016. For 2026 another six silos shall be added, bringing the total to 24 silos, including 3 silos for recycling. The total available storage capacity of 144,000 tons represents a 33 day storage equivalent for the annual tonnage of the year 2026. Two conveyors of 1,500 t/h design capacity shall convey products from the berth to the silos. Before reaching the silos, sampling and weighing shall be performed separately for each incoming organic product.

From the weighing/sampling tower the product will be re-elevated and distributed via chain conveyors into initially eighteen (future twenty four) storage silos of 6,000 ton capacity each. These silos all have a flat bottom and are equipped with bottom reclaiming devices and a discharge feeder. The silos are equipped with heat tracing systems. In case of infestation the storage system will make recycling of product from one silo to another possible. Bypassing the weighing tower will also be possible. Two 300 t/h reclaiming

conveyors are arranged along the silos. Each conveyor feeds product to the 300 t/h truck load-out stations.

Storage of In-Organic Products:

Storage of Fertilizers:

For fertilizers four covered storage areas (one longitudinal shed with four separations) are based on the average consignment sizes with a capacity of 12,500 tons each and a total of 50,000 tons. The storage building shall be about 330 m long and shall have mobile 1m high concrete partitions between products. To accommodate a maximum consignment of 21,000 tons, operational measures have to be taken and mobile partitions have to be placed such that the maximum consignment can be completely unloaded to the storage without dependency on the truck loading rates.

Overall storage provisions will have a 51 day storage equivalent based on 2016 tonnages and 38 day equivalent based on 2026 annual tonnage. The stacking system from berth unloading to storage requires a design capacity of 1,500 t/h. A tripper conveyor shall be installed in the roof of the building. The tripper discharge chute must be equipped with a telescopic chute to minimize formation of dust.

Storage of Coal:

For Coal open storage space shall be provided, with a 40,000 ton capacity for existing operations based on previous maximum consignment sizes up to 39,000 tons. A separate storage pile with 40,000 ton storage capacity shall also be provided for the New Coal Project. These represent 89 to 69 days equivalent storage for existing coal operations in the future and 73 days equivalent storage for the new coal project both for 2016 and 2026.

Minerals shall be stored in two outdoor piles of ~5,000 tons each, based on a future average consignment size of about 4,000 tons and a maximum consignment size of 6,000 tons.

Storage of Bulk Export Products:

New Aggregate Exports:

New aggregates require consignment sizes of up to 56,000 tons to load into actual Panamax vessels. Future Super Panamax vessels will be able to carry up to 75,000 tons. Consequently, two open stockpiles of 75,000 tons each are provided, representing about 14 days of the annual throughput of 4 million tons for years 2016 and 2026.

Sugar and Cement in Cubetones:

Storage for export products being handled in "Cubetones" shall be provided elsewhere. It shall be equal to a typical average consignment size, which is assumed to be 3,500 tons average and 10,000 tons maximum for concentrates, 5,500 tons average and 13,000 tons maximum for raw sugar and 5,000 to 7,000 tons for cement. Cement may also be carried in Bags instead of "Cubetones". It is assumed that adequate storage will be provided to store these consignment amounts in existing warehouses, as it is actually performed at present. Flat bed trucks achieve handling of "cubetones" from warehouse to berth.

Truck loading facilities for 20-ton truck loads are proposed as follows:

The nominal truck-loading rate is assumed to be 300 tons per hour (15 x 20 t trucks/hour). Each truck load-out shall be capable to handle one truck every 5 to 6 minutes, thus yielding an average loading rate 20 t x 10 to 12 trucks per hour, which is effectively 200 to 240 tons per hour.

Truck Loading of Organic Products:

Five truck loading stations with a nominal loading rate of 300 t/h each are recommended to load 1,220,000 tons of grain. The five truck load-out stations are dedicated to load soy, wheat, rice, corn and other organic products. Overall, up to year 2016 there are 61,000 trucks to be loaded annually, 185 trucks per 16h-day or up to 12 trucks per hour in two-shift operation. This calculates to 12/5 = 2.4 trucks per hour to be loaded at each of the five stations, leaving the necessary time to clean between different grades of products to avoid contamination.
A sixth station shall be added to handle the increased tonnage of 241 trucks per day or up to 15 trucks per hour up to year 2026. This calculates to 15/6 = 2.5 trucks per hour to be loaded at each station. These are average performances. Each truck-load-out station shall be designed for 300 t/h feeding rate, which results in a design capacity of 15 x 20 ton trucks per hour and an effective rate of 10 to 12 x 20 t trucks per hour. Two truck load-outs shall be operating at any given time. In 2006 these two load-outs must handle 15 trucks per hour or 7.5 trucks per hour each, still only 50% of their design capacity.

In 16 hours the two loading stations can achieve 2 x 16 h/day x (200 to 240 t/h) = 6,400 to 7,680 tons per day, which is more then the capacity of one storage silo.

Truck Loading of In-Organic Products:

Fertilizer:

Reclaiming of fertilizers from storage shall be accomplished by a 300 t/h payloader loading fertilizers into a mobile hopper car feeding a reclaim conveyor along the storage shed to the truck load-out. A single truck load-out station will be required to load ~24,000 trucks with 20 tons payload annually up to year 2026. This will result in approximately 4 to 5 trucks per hour in two 8-hour shifts, 330 days per year, which results in a total of 5280 hours per year. Since the truck load-out is designed to load 15 trucks per hour (effectively 10 to 12 trucks per hour), there will be ample time for cleaning to avoid contamination between different fertilizer products.

While a second truck load-out is not required based on occupancy, it may be useful to add one in the future based on redundancy and reliability.

Coal & Minerals:

Reclaiming of coal and minerals shall be achieved by a 300 t/h payloader on each side of the storage yard to load mobile hoppers and yard conveyors each feeding a truck loading station. For existing and new coal operations there will be a combined total of 20,000 to 22,300 trucks with 20 tons payload to be loaded annually. This will be approximately 60 to 68 trucks per day (years 2016 and 2026 respectively). Based on two truck load-out stations, the existing coal loading of up to 32 trucks per day shall be performed at one load-out within 3 to 4 hours while the new coal loading of up to 30 trucks per day shall be performed at the other truck load-out within 3 to 4 hours. Minerals (4 to 5 trucks per day) could be loaded within the two shifts at either one of the truck load-outs. There will be ample time for cleaning between coal and minerals.

Aggregates:

Aggregates are to arrive via overland belt conveyor.

Assuming a conveyor occupancy of 330 days and 22.5 hours per day yields 7,425 hours annually. 4 million tons therefore represent a constant flow of 4,000,000 / 7,425 = 539 t/h. The design capacity for this conveyor has been assumed to be 750 tons per hour. To accommodate stacker travel against the incoming belt conveyor, the stacking system shall be designed for 800 t/h capacity.

The reclaiming system for aggregates from storage to the shiploader requires 3,000 t/h capacity. At this capacity, the use of payloaders and mobile hoppers may not be economical and it is recommended to provide a bucket wheel reclaimer for this task. The bucket wheel reclaimer shall be arranged on separate rails at the center berm between the stockpiles. Both stacker and reclaimer must be capable to pass each other.

Storage Capacity Calculations

The storage sizes based on capacities for the above commodities have been calculated as per Table 3.4-1.

MATERIAL HANDLING CONSULTING

PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS

August 2, 2007

COMPANY: **DMJM HARRIS - USTDA STUDY**

by: K. Kroeter

SUBJECT: **Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras**

Table 3.4-1: Storage Capacity Calculation

Rectangular Covered Storage - Fertilizer						Building Length [m]
Material		**Urea**	**Potash**	**Phosph.**	**AmmNitr.**	
Angle of repose	degr.	25	25	30	30	**4 piles plus access**
Bulk Density	kg/m3	700	1100	1300	700	
Pile Base Height	m	0.00	0.00	0.00	0.00	
Pile Top Height	m	10.00	10.00	12.40	12.40	
Total Pile Length	m	100.00	71.00	55.00	85.00	**330.00**
Pile Base Width	m	44.00	44.00	44.00	44.00	
Pile Top Width	m	1.11	1.11	1.05	1.05	
Pile Top length	m	57.11	28.11	12.05	42.05	
Base Volume	m3	0	0	0	0	
Cone Volume	m3	4,816	4,816	5,990	5,990	
Ends Volume	m3	238	238	278	278	
Main Volume	m3	12,881	6,340	3,364	11,742	
Total Volume	m3	17,935	11,394	9,632	18,011	
Base Capacity	mt	0	0	0	0	
Cone Capacity	mt	3,371	5,298	7,787	4,193	
Ends Capacity	mt	167	262	362	195	
Main Capacity	mt	9,017	6,974	4,373	8,220	
Pile Capacity	**mt**	**12,555**	**12,534**	**12,522**	**12,607**	

Round Silos with flat bottom		
Material		**Grains**
Angle of repose	degr.	35
Bulk Density	kg/m3	700
Bin Diameter	m	24.00
Outlet Diameter	m	24.00
Total Bin Height	m	25.00
Cone Angle with Horiz.	degr.	0
Material Cone Height	m	8.40
Main Height	m	16.60
Lower Cone Height	m	0.00
Material Cone Volume	m3	1,267
Main Volume	m3	7,509
Lower Cone Volume	m3	0
Total Volume	m3	8776
Mat.Cone Capacity	mt	887
Main Capacity	mt	5,256
Lower Cone Capacity	mt	0
Silo Capacity	**mt**	**6,143**

Rectangular Open Storage						
Material		**Coal**	**Mine-rals**	**Storage Length [m]**	**Aggre-gates**	**Storage Length [m]**
Angle of repose	degr.	40	40	**1 coal +1 mi-neral pile**	40	**2 aggre-gate piles**
Bulk Density	kg/m3	800	1300		1600	
Pile Base Height	m	0.00	0.00		0.00	
Pile Top Height	m	15.60	13.00		15.60	
Total Pile Length	m	170.00	33.00		160.00	
Pile Base Width	m	40.00	33.00	**210.00**	40.00	**320.00**
Pile Top Width	m	2.82	2.01		2.82	
Pile Top length	m	132.82	2.01		122.82	
Base Volume	m3	0	0		0	
Cone Volume	m3	5,646	3,268		5,646	
Ends Volume	m3	817	406		817	
Main Volume	m3	44,358	458		41,018	
Total Volume	m3	50,821	4,132		47,481	
Base Capacity	mt	0	0		0	
Cone Capacity	mt	4,517	4,248		9,034	
Ends Capacity	mt	654	527		1,307	
Main Capacity	mt	35,486	596		65,629	
Pile Capacity	**mt**	**40,657**	**5,371**		**75,970**	

For fertilizer storage of 12,500 tons each, the pile base width has been chosen as 44 m and the triangular shaped pile height from 10.0 to 12.4 m. A repose angle of 25° to 30° was assumed. Based on varying bulk densities the required pile lengths are 100m for urea, 71m for potash, 55m for phosphates and 85m for ammonium nitrate. Total inside length of the storage building shall be at least 100m+71m+55m+85m+19m allowance for access = 330m total. The inside width of the building shall be about 55 m to allow access of payloaders. A longitudinal storage shed would have the advantage of higher flexibility over individual circular domes, since removable separators between the commodities can meet varying storage demands.

6,000 ton grain silos will have 24m diameter inside and a 25m overall height. They will have flat bottoms with reclaiming devices.

Coal storage will consist of two parallel piles of 40m base width, 15.6m pile height and be 170m long for 2 x 40,000 tons of coal storage capacity. Minerals storage will consist of conical piles, 33m diameter, about 13 m high. Two cone piles will be arranged, one on each side inline with the coal piles.

Aggregate storage will consist of two 75,000 ton piles arranged in two parallel rows with 40m pile base width, 15.6m pile height and be 2 x160m long.

The enclosed storage building shall be equipped with a forced ventilation system.
All open storage yards shall utilize water spray systems to minimize formation of dust.

Budget Estimates:

The budget estimates include all elements related to the bulk handling system, such as continuous or grab unloaders, shiploader, stackers, reclaimers, conveyors, transfer stations with dust collection units, bucket elevators, chain conveyors, chute-work, grain weighing/sampling tower, grain silos, fertilizer storage building, water spray system for coal handling and storage and truck scales. They also include the electric equipment with motor control centers, power distribution, controls, lighting, grounding, etc. Pay loaders have been included for vessel clean-out and for coal and fertilizer operations. The budget also includes a lump sum for initial spare parts, an allowance for landside concrete footings for conveyors and transfers, foundations and tunnels for grain silos, storage pads for coal and aggregates as well as foundations for the fertilizer storage building. It also includes allowances for Engineering and for Contingencies.

Budget estimates for the Bulk Material Handling Equipment have been provided for each Alternative. These Alternatives feature equivalent equipment for each level of throughput (2016 or 2026). Otherwise they differ only by belt conveyor lengths, depending on wharf or pier lengths and distances between individual berth and storage location for each Alternative.

Table 3.4-2 summarizes the budget estimates for all alternatives:

BULK MATERIAL HANDLING CONSULTING
PORT DEVELOPMENT • CARGO HANDLING SYSTEMS • OFFSHORE TERMINALS
DMJM HARRIS - USTDA STUDY
Feasibility Study for the Port of Cortes Dry Bulk Unloading Terminal Project in Honduras

August 7, 2007
K.Kroeter

TABLE 3.4-2 BUDGET COST ESTIMATE SUMMARY BUDGET ACCURACY ±20%

ALTERNATIVE DRAWING No.	ORGANIC PRODUCTS							AGGREGATES AND IN-ORGANIC PRODUCTS						
	BULK HANDLING EQUIPMENT		Annual Through-put [tons]	Berth Occupancy [%]	Conveyor Lengths [m]	Installed Power [kW]	Budget Estimate US$	BULK HANDLING EQUIPMENT		Annual Through-put [tons]	Berth Occupancy [%]	Conveyor Lengths [m]	Installed Power [kW]	Budget Estimate US$
ALTERNATIVE 1 SK-1	WHARF 7A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h 18 SILOS	Wharf L=260m	1,220,000	40% - 42%	1,600	4,090	42,500,000	WHARF 7B - YEAR 2016 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,747,000	43% - 45%	5,160	6,350	98,900,000
	WHARF 7A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h 24 SILOS	Wharf L=260m	1,588,000	45% - 52%	1,800	4,790	48,700,000	WHARF 7B - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,932,000	45% - 47%	5,160	6,350	98,900,000
ALTERNATIVE 1A PHASE 1 SK-1AP1	PIER 7A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h 18 SILOS	Option 1 Pier L=260m	1,220,000	40% - 42%	1,750	4,090	43,200,000							
	PIER 7A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h 18 SILOS	Option 2 Pier L=320m	1,220,000	40% - 42%	1,870	4,150	44,300,000							
ALTERNATIVE 1A PHASE 2 SK-1AP2 SINGLE MACHINES	PIER 7A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h 24 SILOS	Option 1 Pier L=260m	1,588,000	45% - 52%	2,050	4,790	50,200,000	PIER 7B - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Pier L=425m	4,932,000	45% - 47%	4,970	6,310	97,400,000
	PIER 7A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h 24 SILOS	Option 2 Pier L=320m	1,588,000	45% - 52%	2,170	4,860	51,300,000	PIER 7B - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Pier L=425m	4,932,000	45% - 47%	4,970	6,310	97,400,000
ALTERNATIVE 1A PHASE 2 TWIN MACHINES	PIER 7A - YEAR 2026 5 HOPPER CARS 2 UNLOADERS 700 t/h 24 SILOS	Option 1 Pier L=260m	1,588,000	45% - 52%	2,050	5,290	56,800,000	PIER 7B - YEAR 2026 5 HOPPER CARS 2 SHIPLOADERS 1,500 t/h 2 UNLOADERS 700 t/h	Pier L=425m	4,932,000	45% - 47%	4,970	6,940	113,300,000
	PIER 7A - YEAR 2026 5 HOPPER CARS 2 UNLOADERS 700 t/h 24 SILOS	Option 2 Pier L=320m	1,588,000	45% - 52%	2,170	5,360	58,000,000	PIER 7B - YEAR 2026 5 HOPPER CARS 2 SHIPLOADERS 1,500 t/h 2 UNLOADERS 700 t/h	Pier L=425m	4,932,000	45% - 47%	4,970	6,940	113,300,000
ALTERNATIVE 1B SK-1B SINGLE MACHINES or TWIN MACHINES	COMBINED PIER 7B YEAR 2016 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,2	Pier L=450	5,967,000	60% - 62%	7,540	9,760	137,100,000	COMBINED PIER 7B YEAR 2016 5 HOPPER CARS 2 SHIPLOADERS 1,500 t/h 2 UNLOADERS 700 t/h	Pier L=450	5,967,000	60% - 62%	7,540	10,360	152,900,000
	COMBINED PIER 7B YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Pier L=450m	6,520,000	67% - 70%	7,940	10,430	143,900,000	COMBINED PIER 7B YEAR 2026 5 HOPPER CARS 2 SHIPLOADERS 1,500 t/h 2 UNLOADERS 700 t/h	Pier L=450m	6,520,000	67% - 70%	7,940	11,030	159,800,000
ALTERNATIVE 2A SK-2A	WHARF 3A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h	Wharf L=351m	1,220,000	40% - 42%	2,000	4,470	45,600,000	WHARF 7B - YEAR 2016 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,747,000	43% - 45%	5,160	6,350	98,900,000
	WHARF 3A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h	Wharf L=351m	1,588,000	45% - 52%	2,400	5,090	52,700,000	WHARF 7B - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,932,000	45% - 47%	5,160	6,350	98,900,000
ALTERNATIVE 3A SK-3A	WHARF 7A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h 18 SILOS	Wharf L=260m	1,220,000	40% - 42%	1,600	4,090	42,500,000	WHARF 2 - YEAR 2016 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,747,000	43% - 45%	4,260	5,910	90,800,000
	WHARF 7A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h 24 SILOS	Wharf L=260m	1,588,000	45% - 52%	1,800	4,790	48,700,000	WHARF 2 - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,932,000	45% - 47%	4,260	5,910	90,800,000
ALTERNATIVE 3B SK-3B	WHARF 7A - YEAR 2016 5 HOPPER CARS 1 UNLOADER 1,200 t/h 18 SILOS	Wharf L=260m	1,220,000	40% - 42%	1,600	4,090	42,500,000	WHARF 2A - YEAR 2016 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,747,000	43% - 45%	4,410	5,830	90,300,000
	WHARF 7A - YEAR 2026 5 HOPPER CARS 1 UNLOADER 1,200 t/h 24 SILOS	Wharf L=260m	1,588,000	45% - 52%	1,800	4,790	48,700,000	WHARF 2A - YEAR 2026 5 HOPPER CARS 1 SHIPLOADER 3,000 t/h 1 UNLOADER 1,200 t/h	Wharf L=425m	4,932,000	45% - 47%	4,410	5,830	90,300,000

Budget Costs DO NOT INCLUDE Marine facilities, berth, dredging, navigational aids, main electric power supply, main water supply, water treatment, administrative and maintenance buildings, truck washing facilities, roads, fences, gates, land acquisition,

The above budget estimates have a ±20% level of accuracy

Not included in the above budget estimates are: Marine facilities, berth, dredging, navigational aids, main electric power supply, main water supply, water treatment, administrative and maintenance buildings, truck washing facilities, roads, fences, gates, land acquisition, excavations and backfill, landscaping, custom duties, local taxes, insurances, corporate expenses.

3.5 Preparation of Alternatives for Management Information Systems

This section addresses two major areas of computer software and hardware for dry bulk terminal operations management at the two new bulk terminals at the Port of Cortes. These are the areas of inventory management and computerized maintenance management. It is anticipated that outside companies will be operating the Port's dry bulk terminals, which include two terminals, separated into food grains for human and animal consumption, and aggregates such as coal, fertilizers, etc. It is anticipated that each operating company would provide their own administrative systems, which may need to be interfaced to the dry bulk inventory and maintenance software. Until such companies are selected, the administrative aspect of terminal operations will not be addressed.

Contacts for all vendors are shown, but pricing was not available from all vendors. Software cost information is presented where the vendor provided that data. No attempt was made to cost out hardware for inventory interfaces or standard hardware for PC's and servers.

3.5.1 Dry Bulk Inventory Applications

Four companies were surveyed for dry bulk inventory applications: BinMaster, Thermo Scientific, Tideworks, and Autoship. No attempt was made to select facilities equipment, which the software supports, but applicable equipment is listed for some inventory software. Also, the shipside of the loading/unloading operation was not addressed, but at least one vendor (Autoship) has a very comprehensive software offering for this aspect of the operations. It is also quite possible that the final solution may be a combination of the above mentioned companies (such as Tideworks using BinMaster inventory software supporting level controls, etc.). All of the vendors have extensive Internet capabilities for remote operations or client access to inventory data.

a. Autoship Systems Corporation

Autoship Systems Corporation has expertise in providing complete solutions: Cargo Management, Stowage Planning, and Hydrostatics software.

Connections with Sensors & Control Systems.

The Cargo Stowage Planning and Stability Calculation software incorporates data from tank sensors, draft sensors, and load/unload rate sensors. Data is accepted from all major sensor manufacturers, and can easily be modified to accept data in new formats. The system presents automatic sensor input for stability calculations and load representations, all current and updated according to the refresh rate determined. One click switches from automatic input to manual – for either an individual sensor, or all at once. The system notifies the user of erroneous data.

Bulk Cargo Vessels.

The Bulk Stowage Planning Module accurately models holds, hopper size and placement, and cargo piles. The graphical cargo management and stowage planning tools support both self-unloading and gearless bulk carrier ships. The software accounts for loading and unloading equipment loading method, pile size and location, heel, trim, and cargo hold dimensions.

Cargo stowage and unloading are planned in the same interface by dragging and dropping between the cargo list window and the hold window. Using a highly accurate model of the hold, the program simulates and displays the size, shape, and characteristics of the piles when loading cargo. These calculations are made according to the method of filling, the cargo's angle of repose, the trim and heel of the vessel, and the size and position of the loader heads (whether stationary or moving). More than one loader at a time may be simulated. Likewise, pile shape and characteristics while unloading are calculated and displayed – using computer models of the gates (self-unloading) or the hatches (gearless) being used.

The results of loading, repositioning, or removal of cargo at any selected port are automatically predicted for all future ports in the voyage. Space conflict control is performed in each port, to prevent inadvertent overlapping of different cargoes during the same time period. Throughout the loading and unloading processes, the ship's hydrostatic and stress parameters are constantly calculated by the hydrostatics engine. Data regarding the voyage is easily transferred between planners, vessels, and offices throughout the customer's locations.

Connections with Sensors & Control Systems

The Cargo Stowage Planning and Stability Calculation software incorporates data from tank sensors, draft sensors, and load/unload rate sensors. Data is accepted from all major sensor manufacturers, and can easily be modified to accept data in new formats. Calculations are based on the refresh rate determined by the user.

Terminal Management.

Autoship can partner with any provider of terminal management systems to produce a complete Terminal Management System (TMS).
Autoship can provide the Graphical Planning/Yard Planning System, the Graphical Planning/Vessel Load Planning System, and components of the interfacing systems.

Yard Planning.

The yard planning solutions optimize the stowage, loading, and discharge efficiencies of any yard by making the most effective use of the minimum amount of resources. These solutions involve using advanced capabilities to achieve both preplanning and allocation of randomly arriving cargo.

E-logistics with ASC.

Stargate (an ISP/ASP provider) offers an Internet service whereby ASC's stowage planning products can be used remotely through thin client technology to enable any client anywhere to manage time and cargo without actually installing software on their own computers.

Web site users have all the inherent advantages of load planning, yet won't need the application, the ship models, or even the booking list to reside on their workstation or a local server. Instead, the load planning software is actually resident on a server at Stargate. Remote access through the Internet allows users to run the Stowage Planning Software using any available computer with Internet connection. The type of the computer and its operating system are no longer relevant. Moreover, this client technology allows multiple users to run the same instance of an application at the same time. This means that port captains, stevedores, and chief officers can work interactively on the same stowage plan.

A Carrier Model is managed by a partnership between ASC, the carrier company, and Stargate. Autoship provides the SPS executable (shell) and the ship models, while the carrier company controls user access rights. Stargate provides the secure platform on which the system is run.

Training and Support.

Each shipping management solution is unique, and each requires tailored training and support. Both formal and informal training services are provided throughout the development process. Beta copies of the software are tested and nearing final delivery, representatives travel to the customer location to train the trainers onsite.

b. BinMaster

BinMaster began over 35 years ago and is a leading manufacturer of electromechanical and solid state level indicators and control systems. The level controls provide precise measurement performance in demanding liquid and solid applications.

The SmartBob II controls, detects, and measures as follows:
- Point Level Indicators
- Inventory Measurement
- Solids Flow Detection
- Dust Detection
- Aeration & Vibration

This report addresses the computer software called SMART BOB II eBob Software Version 4 that interfaces to the SmartBob II controls. A potential application diagram is shown on the following page for use of this software. Following this are screen shots of the inventory application. Below is a product selection guide for the various devices supported by this software.

The eBob software can gather data from the SmartBob2 sensors to monitor inventory levels in up to 100 vessels. The software provides a graphical representation of inventory data, including:
- Vessel number and group (view data for up to 20 vessels at one time)
- Vessel contents and title
- Distance to product (headroom)
- Height of product
- Vessel percent full
- Product weight
- Product volume
- Date/time of last and next measurement
- Status of measurement device (descending, retracted, inactive, plus error messages)

A second detail screen provides an expanded data readout for any individual vessel.

The eBob information management system communicates preset or on-demand readings to any PC with Internet access and proper authorization. The eBob system can be programmed to take automatic measurements at preset intervals and allows you to send vital information via email.

Alarm settings provide automatic notification alerts via email if critical inventory levels are reached. A vessel shape correction is available for cone shaped vessels. Microsoft Access files store current and historical measurement data. A basic reporting screen provides comprehensive data from the last measurement of each vessel. A string report is also available to show a history trend of the past 30 measurements for each vessel.

A large array of communication accessories is available to remotely initiate and view vessel measurements including wireless data transmitters.

BinMaster Sensors And Controls

SmartBob2 Silo Inventory Management System

Inventory tracking system featuring Web-based reporting capabilities. Handles vessels up to 180 feet by measuring solids, liquids, and slurries. Dust, steam, noise, dielectric, temperature, and vessel shape pose not problem to SmartBob2.

SmartBob-TSI Silo Inventory Management System

The SmartBob-TSI sensor is designed for use in smaller tanks and silos up to 30 feet tall. SmartBob-TSI is compatible with SmartBob2 and may be combined in one common system.

PROCAP Series Capacitance Probes

The PROCAP Series capacitance sensors provide point level detection and process control for solids, liquids and slurries. PROCAP does not emit RF signals. A new triple-thread screw off lid and dual conduit entries allow for hassle free installation. Over 50 probe combinations to choose from.

Simple Point Level Control

The Diaphragm Switch provides automatic level indication of free flowing dry materials in high, intermediate and low level applications. The unit operates by sensing material pressing against the diaphragm.

Rotary Level Control

The BMRX Series rotaries are is designed to shut down when material is present rather than entering a "stalled" condition. The rotary is designed for controlling solid material storage and flow in bins, vessels, chutes, and conveyors.

Single Blade Vibrating Rods

The signal from the electronic circuit excites the single rod of this instrument to vibrate. When material covers the rod, the vibration stops. Vibration will restart when the blade is uncovered.

Dust Monitoring and Filter Leak Detection

The Particulate Monitor and Transmitter employ a combination of passive-induction and protective-probe technologies. As particulates flow near and around the probe, minute currents are dynamically induced into the probe by flowing particulates. The DSP processes the signal into an absolute output that is reasonably linear to mass. A protective layer over the probe ensures reliable operation with all types of particulate including moist powders and highly conductive dust.

Tilt Switch Level Indicator

Tilt switch suspends in a bin, over an open pile or conveyor. When material level rises, the switch tilts and breaks a circuit. Used to detect high level, installed as a plug detector, or suited as a load sensor when positioned over a conveyer belt or open pit.

Ultrasonic and Pulse Radar Continuous Non-Contact Level Measuring

The SmartSonic features a variety of ultrasonic transmitters and the SmartWave features a variety of pulse radar transmitters. Both transmitters can be programmed to simply send a 4-20 ma analog output or send data to a PC running a calibration/data logging program using RS-485 communications. SmartSonic and Smart Wave PC Software Program provide data logging and complete diagnostic check.

Airbrator
Airbrator combines aeration and vibration to solve the most difficult material flow problems. The design creates a vibration as the air flows between the pad's boot and the bin wall. This provides a very effective flow aid for all types of dry products.

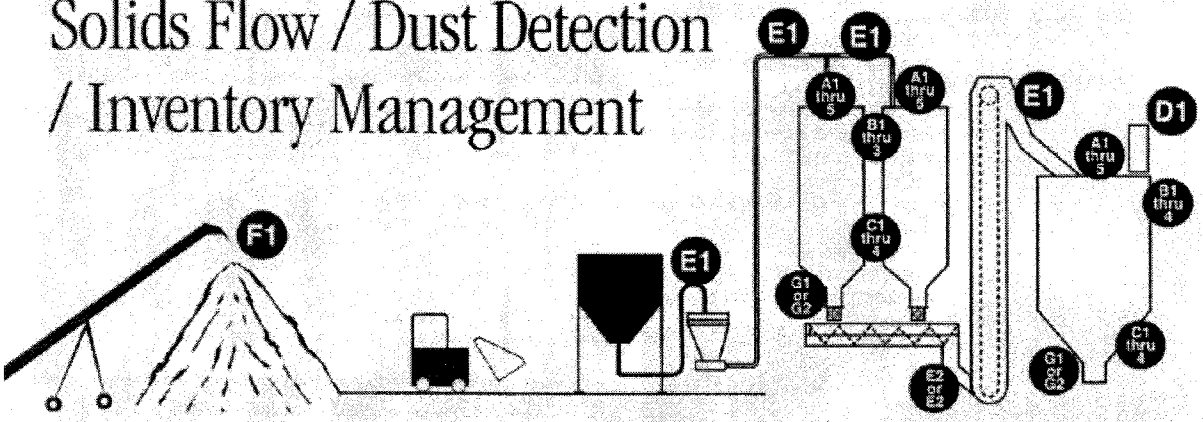
Microwave Solids Flow / No Flow Detection

The Flow Detect1000 is an instrument, which senses flow/no flow conditions of solids and powders in pneumatic pipelines, gravity chutes, and feeders. Doppler shift technology is used by the sensor to determine material flow. The sensor probe is completely non-intrusive, avoiding contact with the flow stream.

BINMASTER

Taking Control...To A Higher Level

Potential Applications Chart of Point Level / Solids Flow / Dust Detection / Inventory Management



BinMaster provides the most rugged, reliable instruments to automate your materials handling and keep your processes running smoothly. Our controls are working throughout the world enduring the toughest applications. Power generation to flour milling, in storage and process tanks or bins, containing many different dry and liquid materials including:

- **Grains**
- **Cement**
- **Aggregates**
- **Fertilizers**
- **Coal & Ores**
- **Feedstuffs**
- **Foods**
- **Oils**
- **Sand**
- **Plastics**
- **Wastewater**
- **Pharmaceuticals**

Choose from a complete line of level, flow and dust detection controls to custom fit your application. You can select a unit to activate a high/low alarm and stop or start machinery; monitor flow/no flow conditions of solids and powders in pipelines, chutes and feeders; continuously monitor for potential hazardous dust concentrations; and, provide level monitoring for inventory history and measurement scheduling.

To learn more about BinMaster's complete line of level flow and dust detection products, contact us at 1-800-278-4241.

Level, Solids Flow and Dust Detection Controls

A. Applications for top mounting
1. SmartBob microprocessor driven on-demand inventory management
2. Pro series capacitance probes
3. Rotary type point level detectors
4. Tilt switch
5. Vibrating Rods

B. Applications for high level side mounting
1. Diaphragm sensor
2. Pro series capacitance probes
3. Rotary type point level detectors
4. Vibrating Rods

C. Applications for low level mounting
1. Diaphragm sensors
2. Pro series capacitance probes
3. Rotary type point level detectors
4. Vibrating Rods

D. Applications for continuous emissions monitoring
1. Dust Detect 1000 & 2000

E. Applications for solids flow and/or plug detection in pneumatic lines, chutes or feeders
1. Flow Detect 1000 microwave solids flow/no flow detector
2. Diaphragm sensor
3. Capacitance Probe

F. Applications for level controls of open piles
1. Tilt Switch

G. Applications for Dry Bulk flow
1. Airpads
2. Airbrators

A Complete Selection of the most Reliable Level, Dry Flow and Dust Detection Controls

BINMASTER

Taking Control...To A Higher Level

DIVISION OF GARNER INDUSTRIES
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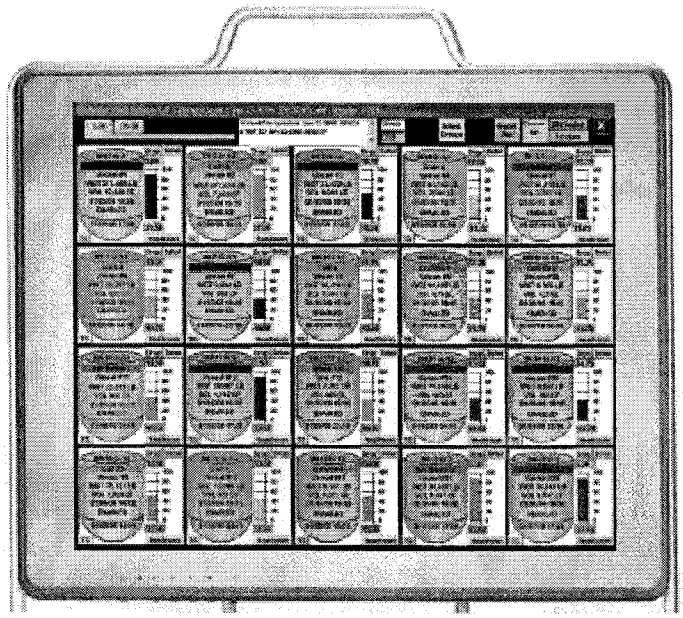
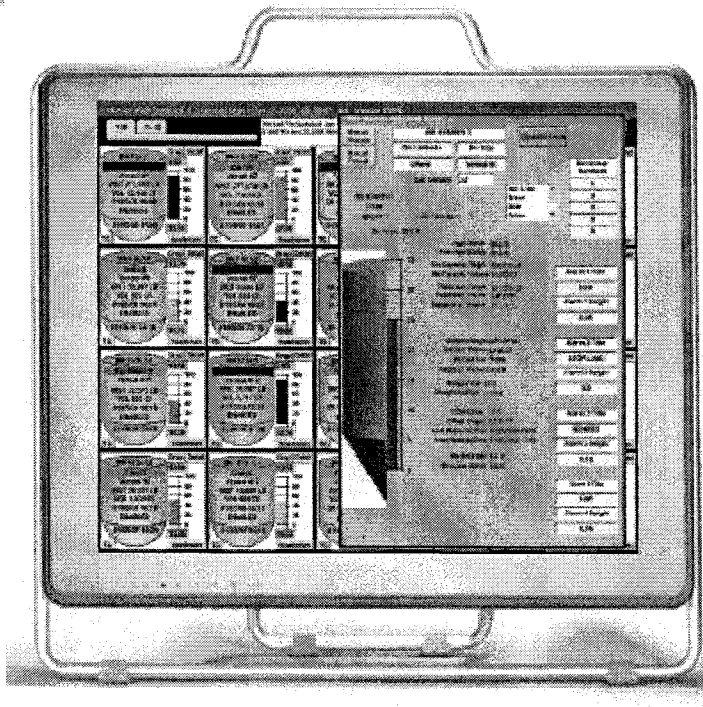
www.binmaster.com

eBob Workstation Main Screen



The main operating screen paints a graphical representation of each of the SmartBob2 sensors that are setup in the system. The main screen interface is the primary control screen for the eBob workstation software. Details of each bin, group selection and measurement control are all accessed from the main screen. The initial display graphically represents up to the first 20 Smartbob2 sensors or less, depending on the number of sensors in the system. Additional tabs appear in the upper left hand corner to view bins greater than 20. Up to 100 sensors may be displayed on the 5 different tabs. Each individual vessel graphic displays the contents, bin labels, groupings, volume, weight measurement, percent full, the time of last measurement, the status of the sensor (enabled or disabled) and the time of next measurement, if the sensor is setup for a measurement.

eBob Workstation Bin Detail Screen

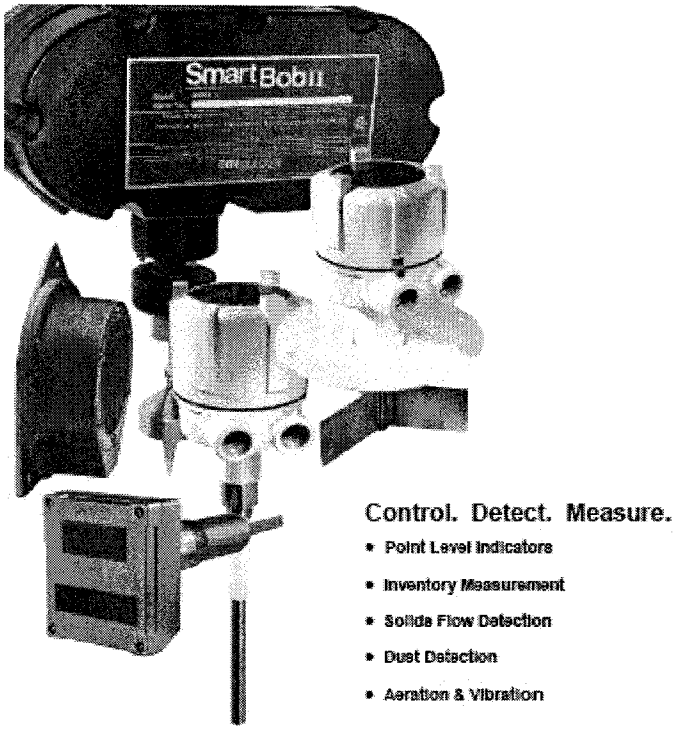


The bin detail screen brings up a large graphic view of an individual vessel. Within the detail screen, manual measurements may be performed or the bob may be instructed to manually retract. The detail screen is an expanded view of the individual bin graphic from the main screen and displays a summary of the vessel information that has been entered in each individual Bin Template. The detail screen displays:

- manual controls
- contents, bin number and title
- vessel height
- group associations
- display colors
- unit density setting
- alarm settings
- last measurement data
- last and next measurement time

Blue highlighted fields in the data screen may be edited to change a particular parameter. When you press update data, the new entries will be saved to the master spreadsheet.

SMART BOB II REMOTE SENSOR



Product Selection Chart

	Point Level Indicators													Continuous Level			Flow & Dust		
	PRECAP 15 II Cap Probe	PRO Remote Cap Probe	PRECAP 15 II FL Cap Probe	PRO HTRC 20 Cap Probe	Compact-PRO Cap Probe	BHRV Rotary	BR-II Nivotrac Rotary	VR-21 Vibrating Rod	VR-41 Vibrating Rod	CVR-500 Vibrating Rod	SVR-420 Vibrating Rod	Diaphragm Switch	Tilt Switch	Sonar-Bob II	Sonar-Sonic	Sonar-Wave	Flow Detect 6000	BM-30 1 Port Monitor	BM-30 LCD 1 Port Monitor
Material																			
Powder	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	*	*	✓	✓	✓
Granular	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	✓	✓	✓
Slurry	✓	✓	✓	✓	*	*	*							✓	✓	✓			
Liquid	✓	✓	✓	✓	✓			*	*					✓	✓	✓			
Material Density																			
Low	*	*	*	*	*	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓	✓
High	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Material Moisture																			
Low	*	*	*	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
High	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓
Temperature																			
High		✓		✓		✓					✓			✓					✓
Pressure																			
Atmospheric	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
Medium	✓	✓	✓	✓				✓	✓	✓	✓		✓	✓					
Vibration																			
Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
High		✓		✓		✓						✓	✓	✓					
Material Coating																			
Minimal	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓
Heavy Build Up		✓		✓									✓	✓		✓	✓	✓	✓
Corrosive																			
Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
High	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
Installation																			
Top Mounted	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Side Mounted	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓	✓	✓
Atmosphere																			
Dust	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Steam								✓		✓	✓		✓	✓		✓			
Vapor	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓

✓ - Applicable * - Consult Factory

c. Thermo Scientific

Thermo Fisher Scientific offers the Ramsey Inventory Management Software (IMS) system to monitor material level in conjunction with the Ramsey Bob II Inventory Management System and provides a graphical representation of up to 130 vessels, along with detailed information on every single vessel.

The Ramsey Bob II Inventory Measurement System completely ignores dust, echoes, vapors, temperature, steam and material densities; it is capable of measuring all liquid, slurry, powder and dry bulk solids applications. This software system can be programmed to take automatic measurements at preset intervals and, in the event of an alarm, it will allow you to send vital information to a pager, email address, or fax machine. One may also access the Ramsey IMS from remote locations. The program is compatible with Windows 95, 98, 2000, XP, and NT.

Thermo offers industrial in-motion weighing, inspection, and monitoring equipment used for process and production control. Products include belt scales, weightbelt feeders, tramp metal detectors, sampling systems, level indicators, conveyor safety switches, constituent analyzers and more.

Gerrard and Associates, a Thermo dealer, supports the list of manufacturers shown on the next page. Following this list is a diagram of the level control device they support.

GERRARD & ASSOCIATES

GROUP	APPLICATION	MANUFACTURER
BULK CONVEYOR SYSTEMS Conveyor	Belt Conveyor, large systems	Dearborn Midwest
	Pipe Conveyor	Koch/DMW
	Air-Supported Conveyor	Hedrick/DMW
	Ash Handling, pneumatic	Delta/Ducon
	Injection Systems, pneumatic	Delta/Ducon
	Belt Conveyor, small systems	Continental Belt
	Conveyor Belt Scales	Thermo
	Belt Conveyor Switches, Safety	Thermo Ramsey
	Bucket Elevators Conveyor	Continental Screw
	Rigid Screw Conveyor	Continental Screw
	Vibrating Conveyors	Carrier Vibrating
BULK STORAGE	Vibrating Bin Dischargers	Carrier
	Flow Promotion – Vibrapad	Cyclonaire
BULK CONTAINER HANDLING	Bulk Bag Discharging & Filling	Cyclonaire
	Bulk Bag Emptying – Vacuum	Pneuveyor
FEEDERS, HEAVY DUTY	Weigh Belt Feeders	Thermo Ramsey
Conveyor	Screw Feeders	Continental Screw
Equipment	Vibrating Feeders	Carrier Vibrating
FEEDERS, LIGHT DUTY	Weighbelt	Thermo Ramsey
	Gravimetric	Thermo Ramsey
	Volumetric	Thermo Ramsey
SCREENERS/CLASSIFIERS Equipment	Scalping / Screening	Carrier Vibrating
METAL SEPARATION-DETECTION	Magnetic Separators	Dings Magnetics
	Tramp Metal Detectors	Thermo Ramsey
DRYERS & COOLERS Equipment	Fluid Bed	Carrier Vibrating
Equipment	Flash	Carrier Vibrating
AIR POLLUTION CONTROL	Dust Collection & Cyclones	Dustex

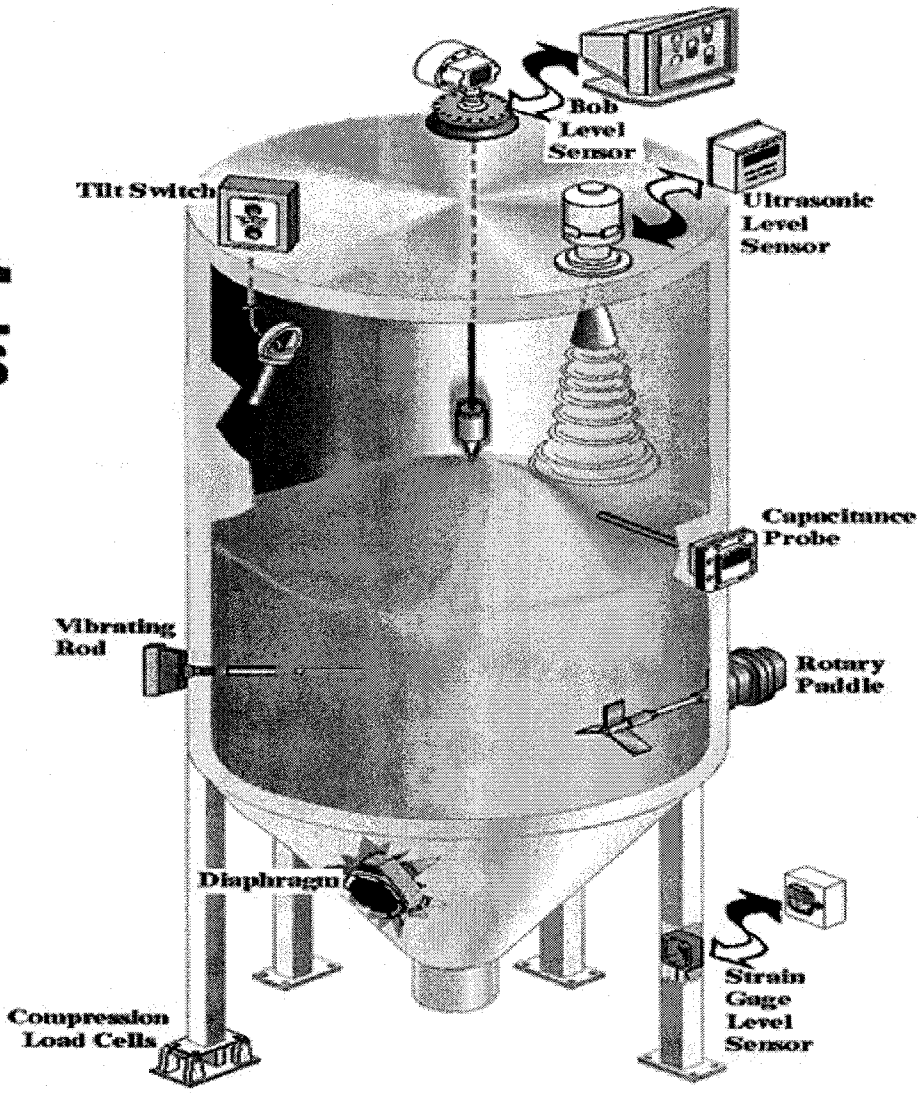
		Airtrol
	Dust Suppression	Airtrol
GATES & VALVES	Severe Duty Rotary Airlocks	Delta/Ducon
	Standard Duty Rotary Airlocks	Delta/Ducon
LEVEL INDICATORS, POINT	Rotary Paddle (solids)	BinMaster
	Capacitance (solids & liquids)	BinMaster
	Vibrating Rod solids & liquids)	BinMaster
LEVEL INDICATORS, CONTINUOUS	Smart Bob (solids & liquids)	BinMaster
	Strain Gauge (solids & liquids)	Thermo Ramsey
	Ultrasonic (solids & liquids)	Thermo Ramsey

GERRARD & ASSOCIATES

Contact information:

Gerrard & Associates
154 Lake Pine Road, Mooresville, NC 28117
Tel. 1-704-664-9594
Fax: 1-704-664-9593
E-Mail: sales@GerrardAssociates.com
Web Site: www.GerrardAssociates.com

LEVEL CONTROL SYSTEMS



d. Tideworks

Tideworks Technology of Seattle, Washington offers three sets of software to manage seaport operations. The module, which we will look at here, is called Genoa, which can handle any type of cargo: automobiles and rolling stock; dry and liquid bulk; break-bulk; and even containers. However, for larger container operations, the Mainsail package is recommended. Our interest here is in management of dry bulk operations.

For mobile operations, Genoa currently interfaces with Psion Teklogix and LXE handheld computer terminals and barcode scanners, but virtually any brand of radio-frequency device can be used. Since Symbol handhelds are already used at the Port, this might be the manufacturer of choice.

Four modules of Genoa that are of interest in dry bulk operations are Genoa Terminal, Genoa Storage, Genoa Comm, and Genoa Online. Genoa Terminal manages all vessel and terminal functions. Prior to the arrival of the ship, cargo information is processed in the system via EDI, spreadsheet uploads or manual entry. The goods are then pre-allocated to the correct storage location on the quay or in the warehouse. The system registers all load and discharge actions; produces all sorts of operational reports; determines contract rates; and produces invoices automatically. Genoa Terminal is fully integrated with Genoa Storage, Genoa Comm, and Genoa Online.

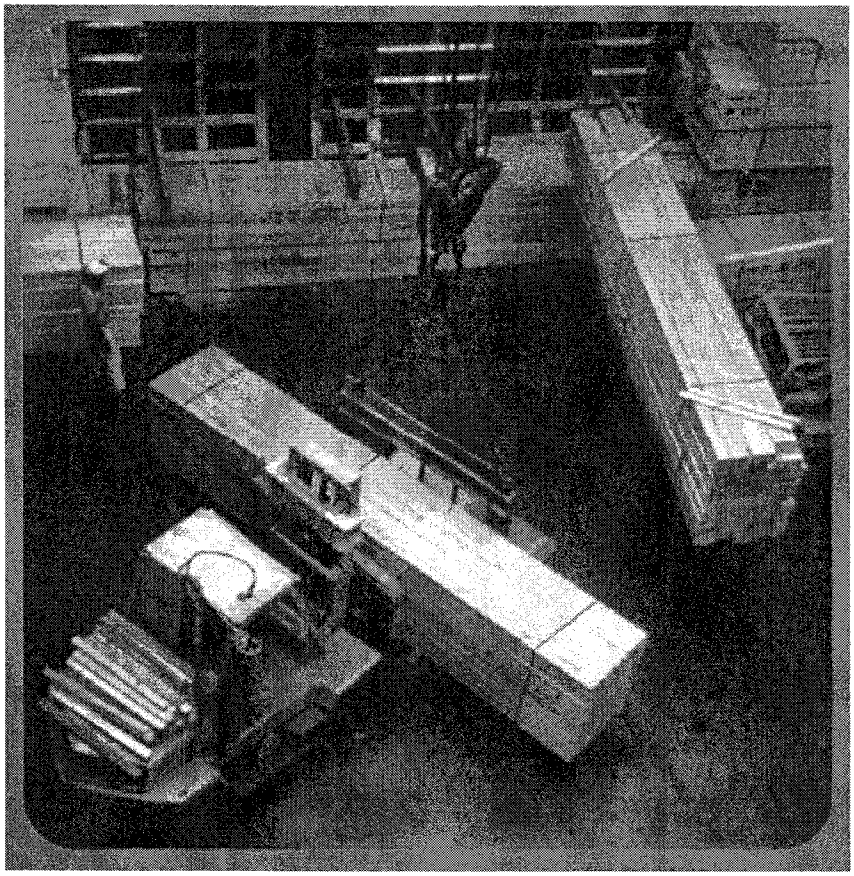
Genoa Storage manages warehousing needs for bulk products. The contracts and rates module can hold complicated rate structures and automatically invoice all storage, demurrage, and service charges.

Genoa Comm provides the communications link to customers and the outside world. Automated fax transmissions, email notifications, or structured communications such as EDI (Electronic Data Interchange) are all processed and handled through this communications software. It can operate standalone or plug into Microsoft Exchange.

Genoa Online provides terminal customers – shippers, carriers, and consignees – immediate access to business critical cargo information, such as latest inventory, historical data, and more online. For example, customers can access their own detailed stock reports and then download into a spreadsheet for their use. A customized, secure Website, Genoa Online displays cargo data in real-time, giving customer's immediate answers to questions about their cargo.

It may be of interest to know that Tideworks already has software in operation at the Port of Cortes. Both the Mainsail and Spinnaker packages for container operations management are being used by the Dole Fruit Company. This means corporate support is already active at the Port.

Tideworks Genoa can manage different types of cargo; of course our interest in this report is in the management of dry bulk operations.



Evaluation of Dry Bulk Inventory Systems

None of the four vendors surveyed offer a complete solution to the inventory software for management of dry bulk commodities at the two terminals. BinMaster and Thermo Scientific have the interfaces to various sensors and measuring devices, but neither has any software pertaining to the shipside of the operation, which we believe is an integral part of the discharge/load planning for dry bulk commodities.

Tideworks' product is called a break-bulk software solution, which they claim can handle dry bulk inventory. There is no indication that they have real-time interfaces with sensors and other data collection devices. It may be that they only have an inventory database. It could not be ascertained if any other dry bulk terminals were currently using their products. It appears that the Dole Fruit Company at the Port of Cortes uses their container products for their operation, but details are not known. There appears to be no shipside software.

Autoships (dealer J. Rohr of Houston) has the shipside software and some of the terminal software, but would have to develop additional terminal software. Their estimate is they have about 70 percent of the software and would have to develop the other 30 percent. The difference between this vendor and the other three is that they state they can implement a complete solution to the two dry bulk terminals. It was not possible to provide enough detailed data for J. Rohr to come up with a cost estimate.

It would appear that Autoships (J.Rohr) has the most complete solution, but without some cost indication, it may not be practical. Since they would have to develop additional software, it may be that a combination of Autoships software and other vendors' terminal management software would be the most cost-effective solution.

It is believed that between the four companies surveyed, a complete solution can be developed with further evaluation of terminal and ship operations.

DRY BULK SOFTWARE VENDORS

VENDOR	LOCATION	CONTACT	NAME OF APPLICATION	LANGUAGE	CONTACT INFO	ADDRESS
Binmaster	Lincoln, NE	Nathan Grube	SMARTBOB eBob Software Version 4		Phone: 402-434=9115 Email: ngrube@garnerindustries.com	Binmaster Division of Garner Industries 7201 North 98th Street Lincoln, NE 68529
Thermo Scientific	Mooresville, NC	Dave Gerrard	Ramsey Bob II Inventory Management		Email: dave@gerrardassociates.com	Gerrard & Associates, Inc. 154 Lake Pine Rd Mooresville, NC 28117
Autoships	Houston, TX	Jim Rohr	under development		Phone: 713-540-3080 Email: jimships@yahoo.com	Jim Rohr ande Associates LLC 16350 Park klTen Place, Suite 100-19 Houston, Texas 77084
Tideworks	Seattle, WA	Harvey Bauer	Genoa	Spanish, English	Sales - phone: 206-654-3640 Fax: 206-382-0443 Email: Harvey.Bauer@tideworks.com	Tideworks Technology 1131 SW Klickitat Way Seattle, WA 98134

Product Pricing

Autoships

It was not possible to provide Autoships (J Rohr dealer) with the detailed information they require to obtain a price estimate. Rohr estimates that they have about 70 percent of the software and would have to develop about 30 percent of the software. To date we do not have an estimate on these two percentages.

BinMaster

BinMaster sells its own PC at $2,000 with the following specifications:

The SmartBob Computer is a desktop PC for controlling SmartkBob2 sensors with the eBob software package and includes the following:
- 2.5 GHz
- Microsoft XP Pro/Office Pro/Internet Explorer
- 256 MB RAM
- 40 GB HD
- 17" LCD Monitor
- CD R/W Drive
- Standard Keyboard
- Two Button Mouse

Several wireless transceivers and accessories are available from $445 to $825 with other accessories from $75 to $245. Universal communication modules and communication tophats range from $350 to $3,550. Manual control console and interface units range from $624 to $780.

The cost of SmartBob II eBob Software Version 4 is $1,195 for controlling 1 to 10 remotes to $2,195 for controlling up to 99 remotes. The Internet version of the software adds about $800 to the cost of the base software.

Thermo Scientific

Cost of the Ramsey IMS is $1,200 per PC or $1,900 for the Internet version.

Tideworks

Preliminary cost estimates by Tideworks are as follows:
Software licensing - $150,000
Implementation costs - $50,000 (including training and go-live support; does not include any software customization – assumes "as is" implementation)
Ongoing software support & maintenance - $30,000 / year

3.5.2 Computerized Maintenance Management Systems

Four vendors were surveyed for computerized maintenance management systems (CMMS, sometimes-called Enterprise Asset Management (EAM)). The vendors are Datastream (now Infor), Eagle, EPAC, and Maximo. This area is more straightforward than the inventory side because it is capable of standing alone without interfaces to special equipment such as conveyors and silos. During the next phase of operational analysis, it should be determined if interfaces are desired to meters, etc. for the equipment managed by the software. No attempt was made to outguess what equipment and facilities would be supported by the CMMS. No limitations were found for the vendors surveyed as to what facilities and equipment they supported.

a. Datastream

Datastream (now part of Infor) is one of the world's largest providers of business software, with approximately $2.1 billion in revenue, and the 10th largest software company in the world. They have offices in 100 countries and serve 70,000 customers worldwide.

The Datastream products that would provide the Port with computerized maintenance management functions are called Datastream 7i and Infor EAM (Enterprise Asset Management) Business Edition. Both systems would need to be implemented.

Datastream 7i includes several modules, which allow customers to collect data and manage their assets. They are as follows:

Application Program Interfaces (API's)

Data Collection API's facilitate communication between server and mobile radio-frequency terminals. Hardware and software are sold as separate advanced modules. Datastream uses Psion Teklogix handheld terminals specifically designed for use with Datastream 7i Mobile applications. A picture of this device is shown on the next page.

Asset

The Asset Module identifies, tracks, locates and analyzes physical assets and facilitates metered usage measurement.

Asset Hierarchy Management

Asset Hierarchy Management allows users to track asset costs and the movement of assets throughout their respective lifecycles. Relationships are set up between equipment, systems, and locations.

Asset Management Services

Where the maintenance organization charges customers for maintenance work this module defines time, material, and labor costs applied under commercial agreements. This calculates job costs and generates invoices and reports.

Audit Trails

Audit Trails provide a flexible way to track changes to data, comments, and attributes.

Budget Management

The Budget Management Module automates budget setup and the subsequent capture, monitoring, control, and analysis of associated maintenance expenditures.

Call Center

The Call Center gives operators and customer service representatives the information needed to handle maintenance, service, and asset management requests.

Depreciation

This module calculates and displays any of four methods of depreciation for assets. These methods include straight-line, double declining rate, sum-of-the-years-digits, and units of production.

Inbox and Scorecard with KPI's

The Inbox functions as a "to-do" list that allows individual users to specify automatically generated numerical counts of items awaiting action such as requisitions or work orders. The Scorecard displays a graphical depiction of Key Performance Indicator's (KPI's) based on user specified parameters. Using dashboard-like gauges, KPI's provide a snapshot of how assets are performing compared to user-defined benchmarks.

Inspection Management

This module works in concert with the Work and Asset Management modules to give companies more control over condition monitoring. These modules also allow for the automatic generation of corrective work actions when an inspection result exceeds a preset limit.

Invoicing

This function links directly with system purchasing records and system receipt functions. Invoices show what has been ordered from a vendor and what has been received.

Linear Assets

This allows the user to define an asset in terms of linear reference details like length, unit of measure, and geographic reference. For example, when work is performed on a portion of a pipeline, the cost and work involved in that repair is attributed to the specific portion of the asset rather than the entire asset.

Materials Management

This module offers tools to monitor and control the inventories of storerooms found in any enterprise.

Messenger

This module enables user-defined recipients to receive email notifications for pre-defined events such as receipt of a part for a particular work order.

Microsoft Project 2003

This provides a two-way interface between Datastream 7i and Microsoft Project.

Preventive Maintenance (PM) Flexibility

Users create PM tasks based on a fixed date, flexible time period, or metered usage.

Project Management

This module handles complex or simple projects by automating the Project Management process from initiation to completion. With the ability to organize budgets, labor and equipment for projects, companies streamline the amount of time, personnel, and money spent on a project.

Purchasing Management

This module helps companies ensure that the right parts are ordered and keeps up with delivery times, vendor performance, payments, and goods receipts. It addresses blanket purchase orders and quotation processing.

Repairable Spares

This allows for the designation of parts or equipment as being "repairable".

Reports

This module contains a variety of pre-defined reports including assets, materials, purchasing, scheduling, work, budget analysis, projects, and commercial services.

Usage Monitoring

This allows an unlimited number of meters to be associated with a single piece of equipment. For example, a vehicle odometer can be used to register usage for tires, transmission, engine, and any other components of the vehicle.

Warranties and Warranty Claims

Allows users to track asset warranties, process warranty claims, and provide for unlimited warranties against any asset.

Work Management

From installing new equipment to issuing corrective or preventive maintenance work orders, the Work Management Module tracks all aspects related to work performed on assets.

Barcoding

Barcoding allows users to design and print labels for assets.

Calibration

This provides a comprehensive calibration program.

Datastream 7i Mobile

Permits the downloading of work assignments from the database.

Integration: Databridge and Web Services Toolkit

Databridge uses extensible markup language (XML) to enable fast and flexible integration with other

enterprise applications.

Web Architecture

This module enables users to access information stored in their application over any Internet or intranet connection.

Web Services

Web Services utilizes extensible markup language (XML) to provide a standard and highly cost-effective way to integrate systems and interfaces.

The Infor EAM Business Edition provides a graphical user interface (GUI) which allows users to access the application through a standard web browser.

DATASTREAM MOBILE SOLUTIONS

b. Eagle

Eagle Technology offers a system called ProTeus V as a solution to the computerized maintenance management system (CMMS). The system offers the unique feature of consolidating all required data entry into one screen. Multiple equipment and multiple labor attachments are also consolidated for ease of use.

The major features of ProTeus are as follows:

Multi-Cycle PM Scheduling

Allows a single master plan to be created for each asset to include all desired scheduling intervals and runtimes. Only tasks applicable to the specific cycle appear when the work order is activated.

Work Order System

Provides automatic work order generation and automatic daily printouts and/or email distribution. Multiple assets can be added to a single work order for service such as inspection or lubrication of equipment. The automatic printing of attachments such as MSDS sheets or parts lists is an added enhancement.

Preferred Selections

Offers queries and quick list arrangement that can be personalized and loaded upon user login.

Email

Distribution of work orders and purchase orders to employees and vendors across the globe 24/7.

Time Card

Facilitates rapid entry of labor hours for all work orders, filtered by employee.

Batch Mode

Allows users to reassign, print and close multiple work orders instantaneously from a single quick list screen. Labor as well as equipment can be easily updated.

File Attachments

Permits the user to attach files to equipment records and work orders. These files may contain maintenance instructions, facility drawings or most any document or drawing used for maintenance.

Reports

Can be viewed and printed from over 100 standard reports. The ability to customize and/or create new ProTeus reports to conform to each business process is provided with the optional Crystal Reports® Software.

Global Language Support

Internationalization of various selected languages allows multinational facilities to view and edit data using their native language.

Global Currency Support

Gives multinational facilities the ability to use the local currency. All costs are stored in base currency for centralized management reports.

Data Export

Permits the export of data from a report to office components such as Microsoft Word and Excel.

Import Utility

Facilitates the import of data from a tab-delimited text file into the most common master files.

Resource Assignment

Gives the scheduler the ability to directly reschedule work orders and/or reassign maintenance personnel to more effectively manage resources.

The major benefits of the system are as follows:
- Automated work order generation
- Manage workloads to correspond with available manpower
- Increases asset life
- Enhanced response time
- Reduction in paperwork and communications cost

The following optional modules are available:

Service Request

Allows users to send service requests from their desktops. Supervisors have the ability to review modify and approve service requests.

Barcode

Provides remote data entry through hand-held scanners. Information can be collected on work orders, equipment runtime can be updated and physical inventory can be adjusted. A picture of the barcode device is shown at the end of this section.

Mobile

Gives technicians the ability to create work orders in the field, record parts used for repairs, update labor and much more with the convenience of a hand-held PDA. Symbol radio frequency computer terminals are already in use at the Port and are supported by this mobile option. A picture of the mobile device is shown at the end of this section.

Audit Trail

Tracks all editing of work orders for Enterprise applications. This will aid in compliance with ISO 9000, FDA, OSHA, and JCAHO standards.

ERP Interface
Allows for the exchange of data between ProTeus Enterprise and an ERP (Entreprise Resource Planning) or accounting system to minimize redundant data-entry.

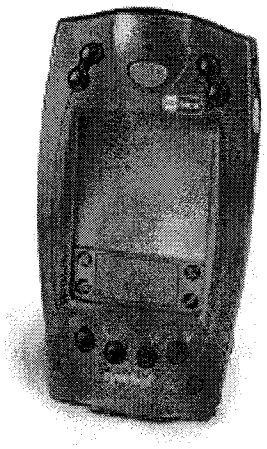
M-Site

Facilitates company-wide access to any ProTeus database in the company's network.

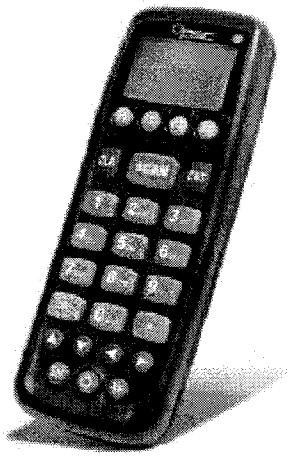
The database technology used by ProTeus is SQL technology ensuring security, data validation, and speed. Elimination of duplicate and corrupt records assures reliable and accurate history. **EAGLE**

MOBILE DEVICES

Symbol Radio Frequency Terminal



Barcode Scanner Used By Proteus



c. EPAC

EPAC offers a very comprehensive package for the Computerized Maintenance Management System (CMMS) or Enterprise Asset Management (EAM). On the following page is a list of features of the system followed by a price list. Following these two items is a couple of pages of screen shots of the system, which shows the comprehensive nature of the software.

There is also a very nice demonstration package available from the vendor and the Port is encouraged to contact EPAC for a copy of this very informative presentation.

The one weakness found in this system is that it is only available in English. There is no Spanish version nor are there plans to create one. The Port would have to decide if this was a drawback for the dry bulk terminals.

The recommended system specifications for EPAC are as follows:

Software
- Operating Systems: Windows 2000/200 Server/ME/2003 Server/XP/Vista
- Databases: MS SQL Server 7/2000/2005, Oracle 91 or MS Access 2000//2003
- Microsoft IIS (Internet Information Services) for Web Applications

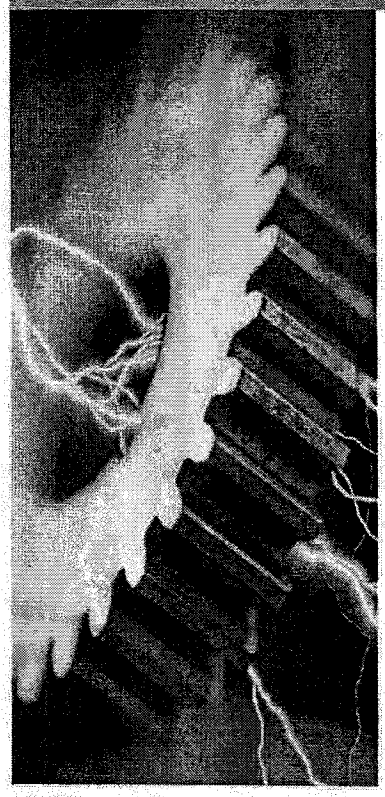
Recommended Minimum Hardware
- Workstation PC; 800 MHz or above, 256 MB RAM
- Network Server: 2.0 GHz or above, 1 GHz RAM
- Storage: 1 GB
- Internet Access for Web Applications and for Support / Upgrades

EPAC offers extensive training and professional services support.

EPAC Software Technologies, Inc.

Enterprise Asset Management
Computerized Maintenance Management Systems

EPAC Features & Functions



The EPAC EAM/CMMS solution is based on a combination of ease of use and functional robustness. By considering the needs of both management and maintenance personnel, *ePAC* offers a variety of powerful features and functions delivered on the Microsoft .Net® platform.

ASSETS

Asset RIME Criticality
MTTR (Mean Time to Repair)
Online MTBR
Auto Bill of Material creation
Real time financial information
Parent/Child relationships with cost roll-up
Lockout/tag out procedures
Asset Move / Renaming

PM PLANNING / SCHEDULING

Blackout dates (seasonal PM's)
Nesting/Shadowing tasks
Calendar: days, weeks, months, years
Variable time fences
Continuous, rollover, read/reset meters
Auto Generate

INVENTORY

Multiple-location Storeroom
Min/Max Levels with auto-set feature
Unlimited suppliers & supplier part numbers
Unlimited manufacturer & manufacturer part numbers
Auto forecasted requisitioning
Auto ABC Stratifcation
Auto-build bill of material for assets
Auto-build dedicated parts list for assets
Order to stock conversion
Actual Costing: FIFO & Average
Where Used

REQUISITIONS / PURCHASING

Approval by dollar amount
Change orders
Consolidated requisitions
Multiple account distributions per line
Seamless interface to external

SECURITY

Security at validated table level
Security at site, group, user level
Add, delete, update, view rights

WORK ORDERS

Automatic e-mail notifications
RIME priority
RCM (Reliability Centered Maintenance)
Root cause analysis by RCM Group
Real-time financial information
Document/Image integration
Downtime tracking
Parts planning
Auto part requisitioning from work order
Quick downtime collection for operators
Auto Follow-Up

SERVICE REQUESTS

Web Based or Client Server
Auto e-mail of status changes
Inquiry capability

MOBILE SOLUTIONS

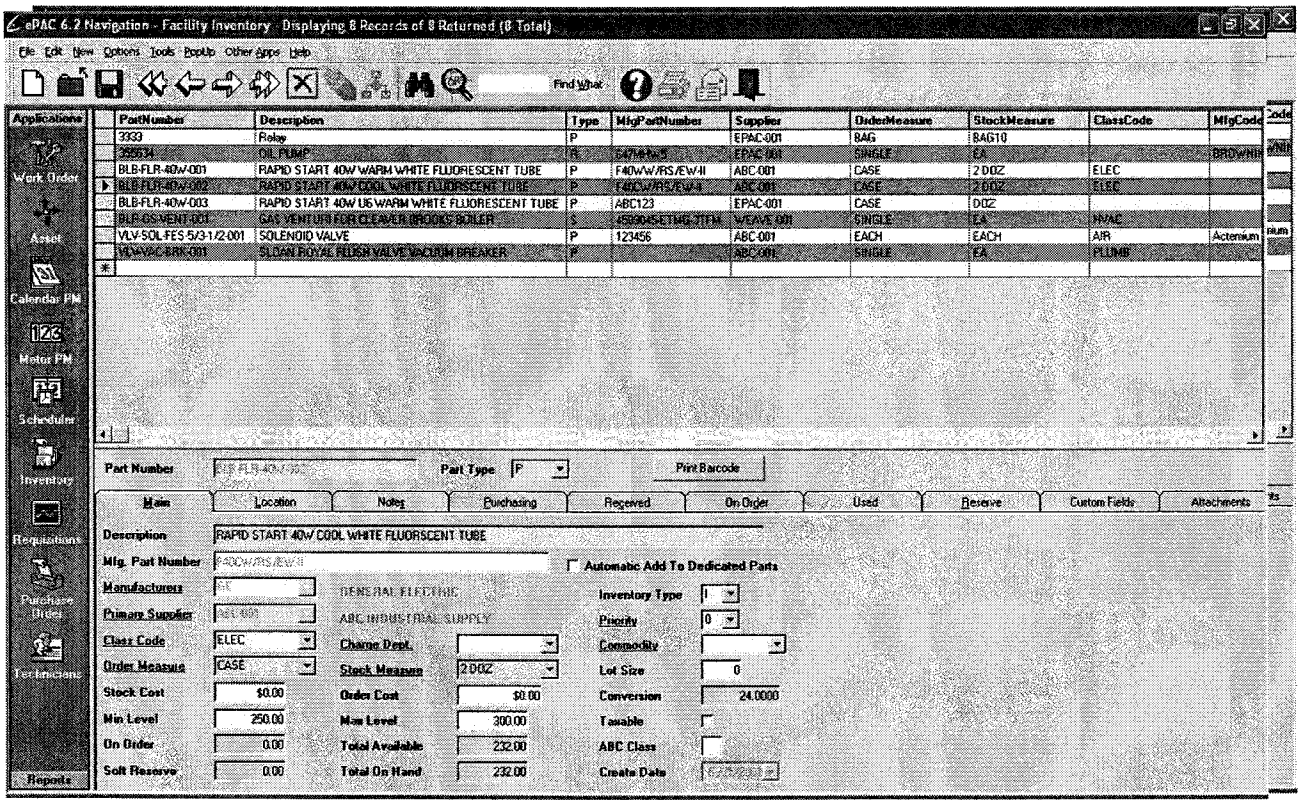
Wireless Asset Management
Wireless Storeroom Management
Wireless Work Order Management
Wireless Inventory Tracking

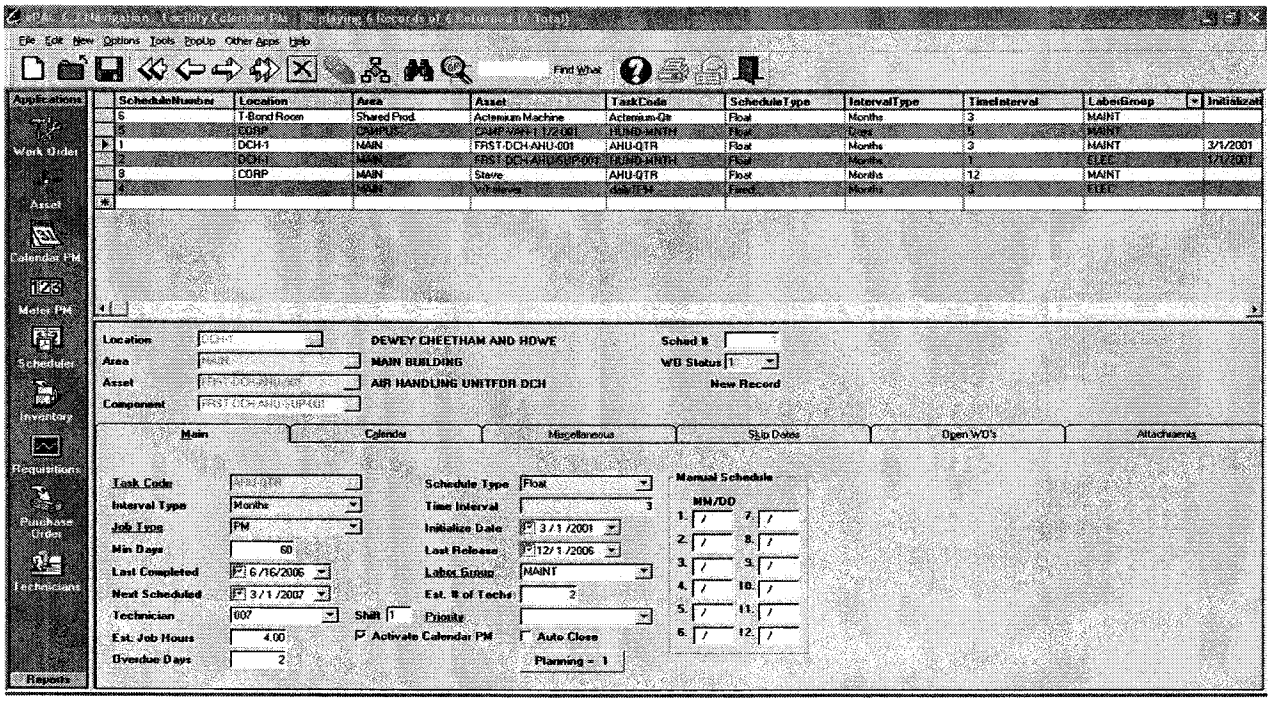
GENERAL

Multi-site/Multi-plant
Advanced Query & Retrieval
Ad-hoc/User defined Reporting
Standardized Reporting – Over 100 Reports
Label Generation
Microsoft Office Product Integration
Form Personalization
Data Collection-Bar Coding
KPI's
Integrated Work Flow
Document Linking
Account Budgets

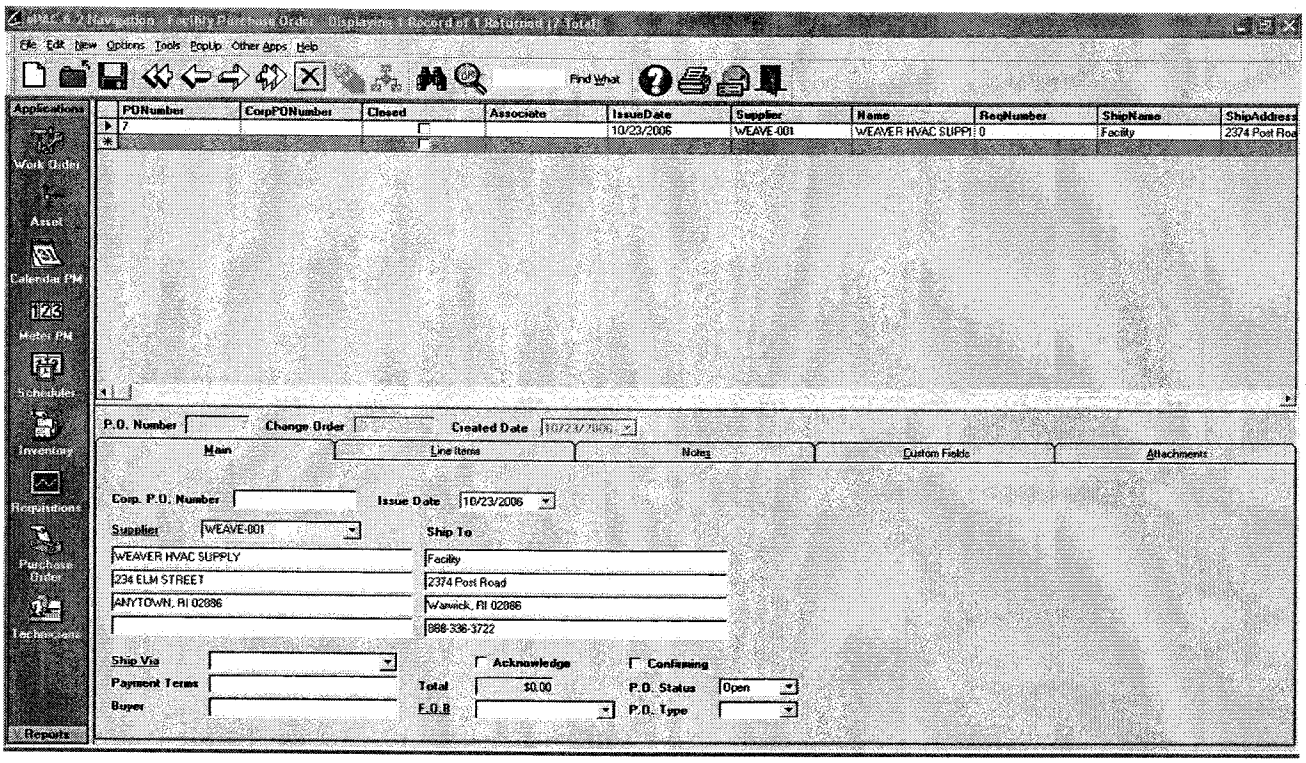
www.epacst.com 888-336-EPAC (3722)

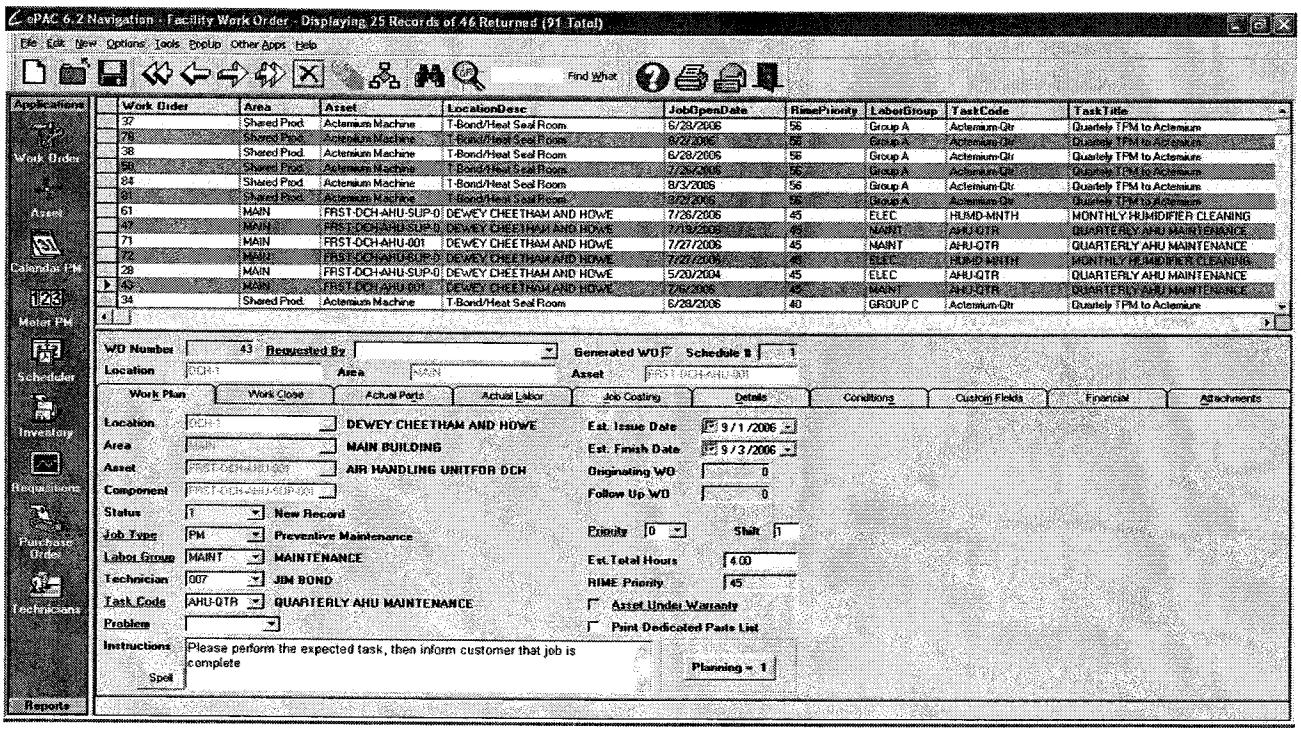
EPAC Inventory and PM (Preventive Maintenance) Scheduling Screens





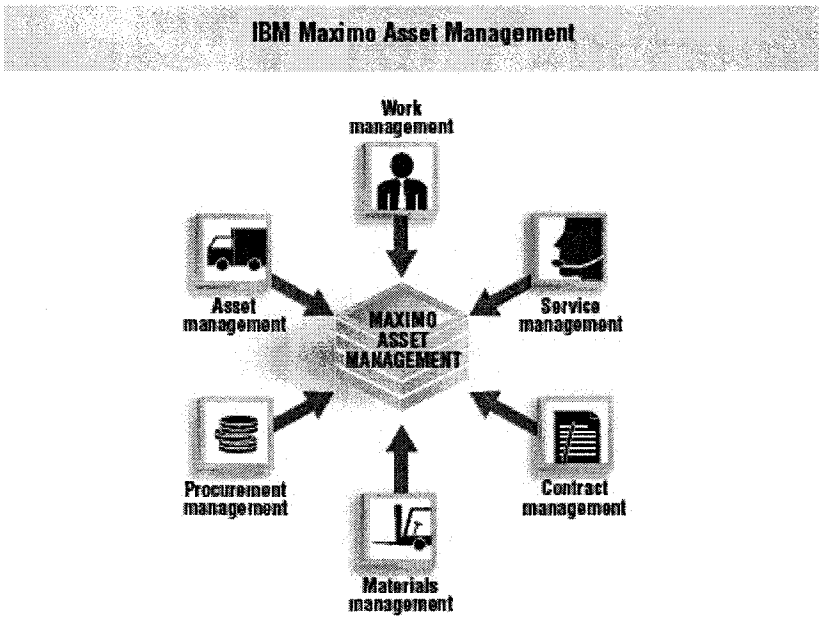
EPAC Purchasing and Work Order Screens





d. Maximo

On October 6, 2006, IBM completed its acquisition of MRO Software, Inc. The web site migrated to IBM.com's Tivoli software site, http://www-306.ibm.com/software/tivoli/ in 2007. Maximo Asset Management consists of six key systems that enable companies to successfully manage assets, including production equipment, facilities, and transportation assets, in alignment with their business objectives.



Maximo Asset Management

Asset data including location, work, and cost history are tracked over time.
Location and equipment hierarchies enable costs to be rolled-up across systems, subsystems, and locations.
Condition monitoring support.

Maximo Work Management

Complete tracking of all work management tasks.
Graphical work scheduler.
Supports preventive maintenance activities.

Maximo Service Management

Features self-service requests for users who can report problems using a browser-based interface, and provides tracking of reported problems.

Maximo Materials Management

Identify and track transactions that move items into or out of inventory, or from one location to another. Inventory optimization and planning tools help companies stock the right level of inventory to meet maintenance demand: includes reorder points, economic order quantities, ABC analysis, and lead time.

Maximo Procurement Management

Set up approved vendors and perform vendor performance analysis.
Automated materials requisitioning based on maintenance schedules.
Interval-based, meter-based, or event-driven purchasing eliminates the need for human intervention.
Supports global purchasing across multiple sites or organizations.

Maximo Contract Management

Associate service level agreements to contracts to monitor vendor performance.
Terms and conditions library enables content to be built once and reused any number of times.
Receive automatic notifications and alerts triggered by key dates within contract, i.e., expiration date, renewal date, etc.
Payment schedule support.

Pricing and contact details were requested from the vendor, but there has been no response. The reason this vendor is referenced is that another vendor of dry bulk inventory software recommended Maximo based on his customer's experience, so they may be a viable solution for CMMS at the new dry bulk terminals.

Evaluation of Computerized Maintenance Management Systems

Each of the four Computerized Maintenance Management System (CMMS) vendors can provide a software solution to the CMMS. There are advantages and disadvantages to each one.

- Datastream is one of the larger vendors in this market and has a worldwide presence. We know they already operate in dry bulk terminals also. They have a Spanish version of the software. Since pricing was not available from Eagle or Maximo, it may be that Datastream is more expensive, but this cannot be determined in this report.
- EPAC has a very nice solution that is less expensive than Datastream, but it is only available in English. It could not be verified if they support any dry bulk facilities.
- Eagle also has a very comprehensive software solution, but we do not have cost data to compare them to EPAC. Their advantage over EPAC is the Spanish version.
- The customers of one of the inventory vendors recommended Maximo, but requests from the company went unanswered. It may be that they were extremely busy with the IBM acquisition. Further analysis of Maximo to include pricing and customer base would be warranted.

Based on the current information, Datastream may be the best solution for CMMS at Port of Cortes. There was also had an indication that they had already had discussions with Datastream for container operations. If that were the case, Datastream would be more familiar with the Port than the other three vendors, but it is not known whether the CMMS will be operated by Empresa Nacional Portuaria or a terminal operator.

Pricing

Datastream

Datastream has provided the following pricing guidelines:

Business Edition:
Named User - $1,599 per user
Concurrent User: - $4,799 per user
Mobile/Barcode - $1,599 per user

Enterprise Edition:
Named User - $4,999 per user
Concurrent User $7,999 per user
Mobile/Barcode - $2,999 per user

Both systems will need to be implemented – the cost for the Business Edition is normally a two week engagement for $18K and the Enterprise Edition engagement is normally 4-6 weeks at $36K to $60K.

Eagle

No pricing data was obtained for Eagle.

EPAC

ePAC Software Technologies, Inc.

Enterprise Asset Management
Computerized Maintenance Management Systems

Price List

Core Modules

Description	Price			Unit
	Access Db	SQL Server Db	Oracle Db	
ePAC Software Licenses ➢ ePAC 7.0 Network / Work Station ➢ ePAC 7.0 Web (100% web based) Work Orders, Assets, Calendar PM, Inventory, Requisitions, Meter PM, Scheduling, Purchasing, Supplier, Query Builder, Document Linking, Reports, Security, Technicians	$ 1295 Not Available	$ 1600 $ 1995	$ 2195 $ 2560	Per Concurrent User

Hosted Option = $99 per month, per concurrent user (Minimum 3 Users)
*** Only requires an internet connection to access**

Add-on Features

Description	Price	Unit
Request Manager Software Licenses ➢ Manages request for maintenance from non-maintenance personnel	$ 995 $ 1980 $ 2980	50 Requestors 100 Requestors Unlimited requestors
Request Notification Pop-up Utility ➢ Notification that new requests have been submitted	$ 495	Bundled Per 5 PCs
Work Order Approval Routing ➢ User defined approval routes ➢ Works with company's email system	$ 2495	Bundled Per 5 Approvers
Requisition/ Purchasing Approval Routing ➢ User define approval routes ➢ Works with company's email system	$ 2495	Bundled Per 5 Approvers
Mobile Work Order Software Licenses ➢ Standard Work Order Functions	$ 495	Per PDA
Mobile Inventory Manager Software Licenses ➢ Issues, receipts and cycle counts	$ 495	Per PDA
Multi-site Software Licenses ➢ Corporate solution providing multiple sites in single database	$ 695	Per Site
Auto Meter Import Software Licenses ➢ Auto import meter readings	$ 995	Add-on
Annual Maintenance Contract ➢ 1st 60 days free ➢ 800 phone support ➢ Future upgrades	18% Of Software List Price Minimum $ 525	Add-on

Crystal Report Writer Professional Version ➢ Provides ability to write custom reports and edit current ePAC reports ➢ Not required to run ePAC's 100 standard reports and forms	***Purchase Crystal Report Writer Professional from any Crystal Distributor***

www.epacst.com 888-336-EPAC (3722)

MAXIMO

Information was requested but not received from Maximo.

COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEMS (CMMS)

VENDOR	LOCATION	CONTACT	NAME OF APPLICATION	LANGUAGE	CONTACT INFO	ADDRESS
Datastream (Infor)	Greenville, SC	Pete Thompson	Datastream 7i	Spanish/English	Phone: 805-684-6404 Email: Pete.Thompson@infor.com Web: www.datastream.net	Datastream Systems, Inc. 50 Datastream Plaza Greenville, SC 29306
Eagle Technologies	Mequon, WI	Sales	ProTeus V	Spanish/English	Email: sales@eaglecmms.com Web: www.eaglecmms.com	Eagle Technology, Inc. 10500 North Port Washington Road Mequon, Wisconsin 53092 USA
EPAC	East Greenwich, RI	Cynthia A. Toti	EPAC CMMS	English May be customized to Spanish	Phone: 888-336-EPAC(3722) Email: ctoti@epacst.com Web: www.epacst.com	EPAC Software Technologies, Inc. The Greenwich Mills 42 Ladd Street East Greenwich, RI 02818
Maximo (IBM)	Bedford, MA	Sales	IBM Maximo Asset Management		Tel: 800-326-5765 Email: maxinfo@us.ibm.com Web: www.mro.com	MRO Software, Inc. 100 Crosby Drive Bedford, MA 01730

3.5.3 Computer Hardware and Software

COMPUTER HARDWARE AND SOFTWARE														
		COMPUTER	SPEED	RAM	STORAGE	MONITOR	KEYBOARD	MOUSE	OPERATING SYSTEM	DATABASE	APPLICATION SOFTWARE	MOBILE	SERVICE BUREAU	WEB SERVICES
COMPUTER MANUFACTURER														
	DELL	PC									Office, Explorer			
	HP	PC									Office, Explorer			
	IBM	PC									Office, Explorer			
	TERLOGIX	Mobile										Yes		
	SYMBOL	Mobile										Yes		
DRY BULK SOFTWARE VENDOR														
	AUTOSHIPS	IBM or HP PC									Under development		Yes	
	BINMASTER	Binmaster PC	2.5 GHz	256 MB	40 GB HD	17" LCD	Standard	Two button	Microsoft XP Pro		Office Pro; Internet Explorer; eBob Software Version 4			Yes
	THERMO SCIENTIFIC	IBM or HP PC							Microsoft XP Pro		Ramsey Bob II Inventory Measurement System			
	TIDEWORKS	IBM or HP PC									Genoa	Yes		
CMMS VENDOR														
	DATASTREAM	Server or hosted service								MS SQL Server	Datastream 7i	Yes	Yes	Yes
	EAGLE									SQL Technology	ProTeus V	Yes		
	EPAC	Network Server Workstation PC	2 GHz or above 800 MHz	1 GHz 256 MB	1 GB				Windows XP	MS SQL Server Oracle 9i MS ACCESS	EPAC CMMS			
	MAXIMO										IBM Maximo Asset Management	Yes		

Where available, computer hardware was recommended, but IBM or Hewlett Packard supports most software for both servers and personal computers or workstations. Radio controlled mobile computers were identified in the preceding sections for those vendors offering that support.
The table indicates information on the compatibility of the software packages and various hardware platforms.

3.6 Review of Environmental Issues and Regulations

3.6.1 INTRODUCTION

Empresa Nacional Portuaria (ENP), entity of the Honduras Government and responsible for the administration of the national ports, is currently developing a process to update its facilities located in Puerto Cortes.

Honduras exports and imports organic and inorganic bulk products. Among the bulk products that it exports are: minerals and cement (inorganic) and sugar (organic). The bulk products that it imports are, among others: concentrated fertilizers, carbon (inorganics), and soy, wheat, rice, corn (organic).

The Feasibility Study for the Port of Cortés Dry Bulk Unloading Terminal Project in Honduras will provide operational guidance and performance criteria to establish an effective working relationship between the ENP and private groups interested in developing the dry bulk unloading terminal. Implementation of this project would expand and modernize dry bulk unloading infrastructure, lessen congestion and improve the overall efficiency of port operations.

Implementation of the project would:

- Provide facilities dedicated to bulks without interference with other port users;
- Improve unloading rates, which would permit a reduction in ship time in port and the freight rates, as well as costs for cargo handling;
- Permit service to Panamax vessels;
- Provide multi-functional equipment and unloading systems capable of handling various types of bulk cargo;
- Provide silos and other intermediate storage facilities, with controls for health and safety, eliminating the need for lines of trucks waiting during the ship time in port;
- Provide facilities for unloading trucks, including inventory control, dust control and waiting areas, reducing traffic congestion in the city;
- Improve the control of environmental problems and noxious dust emissions; and
- Reduce the total handling cost for dry bulks in the port, reducing the cost of imports and raw materials for Honduran industry.

Expanding the capacity of the port to handle dry bulk volumes will improve overall efficiency and competitiveness and Honduras' ability to take advantage of increased international trade under CAFTA-DR.

3.6.2 OBJECTIVES OF THE LEGAL ENVIRONMENTAL ANALYSIS

3.6.2.1 General Objective

To revise the current environmental legislation in Honduras, as well as the environmental regulations from the World Bank that apply to the Project, and make the necessary recommendations to assure environmental control and mitigation during the construction and operational stages.

3.6.2.2 Specific Objectives

The specific objectives are the following:

- Revise current environmental laws and regulations in Honduras, which affect the project.

- Revise the environmental guides and criteria from the World Bank, which apply to the project.

- List the short and long-term preoccupations or impacts from the construction and operation on air quality, noise, social issues and water.

- Propose environmental control and mitigation measures, be these of a structural and/or non-structural kind, cost included.

- Make recommendations and establish criteria for additional research on site.

3.6.3 GENERAL SCOPE OF THE PROJECT

The Study for the Development of the Dry Bulk Terminal has considered in its analysis a group of works, and 2 alternatives have been studied for each of them. The following sections briefly describe the project's components.

3.6.3.1 Dry Bulk Terminal

Organic Dry Bulk Terminal

The Organic Products Berth shall be either 260 m long (OPTION 1) or 320 m long (OPTION 2) and shall be about 24 m wide. Under Option 1 it can accommodate simultaneously two smaller Handysize geared vessels and shall be equipped with 5 x 300 t/h mobile hopper cars feeding two berth conveyors and the conveyor system to the storage silos. Under Option 2 the berth can accommodate simultaneously two somewhat larger geared Handysize vessels or one non-geared Panamax vessel. If Option 2 is realized, it will be necessary to install one 1,200 t/h ship unloader,

As an Alternative instead of one 1,200 t/h unloader two 700 t/h unloaders would be provided for the purpose of redundancy. With the presence of two unloaders it will be possible to unload simultaneously two different grain products from the same vessel and transfer it to either one of the two berth conveyors and on to the proper silos (Twin Machines Berth Alternative).

Inorganic Products Terminal

The Berth for In-Organic Products shall be 425 m long and approximately 30 m wide. The equipment will consist of one 3,000 t/h traveling shiploader with luffing/slewing boom, tripper car and berth conveyor for Aggregates, 5 x 300 t/h mobile hopper cars to unload geared vessels feeding one berth conveyor and conveyors to storage and one 1,200 t/h gantry type grab crane to unload non-geared vessels up to Panamax size (Single Machines Berth Alternative).

As alternative, two 1,500 t/h shiploaders for Aggregates would be installed. The tripper car of the first shiploader will be equipped with a bypass to divide the incoming 3,000 t/h into two flows of 1,500 t/h, so that both shiploaders can load simultaneously (Twin Machines Berth Alternative).

3.6.3.2 Unloader

Organic Products: Continuous unloaders such as Pneumatic Type or Mechanical Type have been successfully utilized to unload various types of grain. These types of unloaders can easily be enclosed to contain dust and protect the environment.

One of the main problems for Organic Products is Contamination. Each of the organic products (Soy,

Wheat, Rice, Corn) has multiple grades and is imported by various companies. Cleaning of the unloading gear is therefore required after every unloading of an organic product.

While the grab unloader can be cleaned more easily, the cleaning of the continuous unloaders will be more time consuming. However, with the overall amount of cleaning to be done at the new material handling facility, this feature shall not be the most important criteria for or against the selection of any type of unloader.

Inorganic Products: A single grab crane is proposed to unload non-geared vessels and assist geared vessels, to unload the annual import tonnages (fertilizer, coal, minerals). Alternatively two 700 t/h cranes would be provided.

3.6.3.3 Consignment Sizes

In the future there will be only moderate increases of the average unloaded consignment sizes. Similar moderate increases have been assumed for Fertilizer Products and Coal. The consignment size for the new coal project has been kept at about 33,000 tons.

3.6.3.4 Storage

Organic Products: Imported organic products mainly consist of Soybean, Wheat, Rice, Corn and small amounts of Barley, Malt and other organic products such as animal feed.

There shall be 16 silos of 6,000 ton capacity each provided for organic products. Two additional silos shall be retained for recycling of overheated or infested products. The total available storage capacity of 108,000 tons (including recycling silos) represents a 32 day storage equivalent for the annual tonnage of the year 2016. For 2026 another six silos shall be added, bringing the total to 24 silos, including 3 silos for recycling. The total available storage capacity of 144,000 tons represents a 33 day storage equivalent for the annual tonnage of the year 2026.

Two conveyors of 1,500 t/h design capacity shall convey products from the berth to the silos. Before reaching the silos, sampling and weighing shall be performed separately for each incoming organic product.

From the weighing/sampling tower the product will be re-elevated and distributed via chain conveyors into storage silos. These silos all have a flat bottom and are equipped with heat tracing systems. In case of infestation the storage system will make recycling of product from one silo to another possible. Bypassing the weighing tower will also be possible.

Inorganic Products:

Storage of Fertilizers: For fertilizers four covered storage areas (one longitudinal shed with four separations) are based on the average consignment sizes with a capacity of 12,500 tons each and a total of 50,000 tons. The storage building shall be about 330 m long and shall have mobile 1m high concrete partitions between products. To accommodate a maximum consignment of 21,000 tons, operational measures have to be taken and mobile partitions have to be placed such that the maximum consignment can be completely unloaded to the storage without dependency on the truck loading rates. A tripper conveyor shall be installed in the roof of the building.

Storage of Coal: An open storage space shall be provided, with a 40,000 ton capacity for existing operations based on previous maximum consignment sizes up to 39,000 tons. A separate storage pile

with 40,000 ton storage capacity shall also be provided for the New Coal Project. These represent 89 to 69 days equivalent storage for existing coal operations in the future and 73 days equivalent storage for the New Coal Project.

Minerals shall be stored in two outdoor piles of 5,000 tons each, based on a future average consignment size of about 4,000 tons and maximum 6,000 ton consignments.

Storage of Bulk Export Products:

New Aggregate Exports: These require consignment sizes of up to 56,000 tons to load into actual Panamax vessels. Future Super size Panamax vessels will be able to carry up to 75,000 tons. Consequently, two open stockpiles of 75,000 tons each are provided, representing about 14 days of the annual throughput of 4 million tons for years 2016 and 2026.

Cubetones: Storage for export products being handled in Cubetones shall be provided elsewhere. It shall be equal to a typical average consignment size, which is assumed to be 3,500 tons average and 10,000 tons maximum for concentrates, 5,500 tons average and 13,000 tons maximum for raw sugar and 5,000 to 7,000 tons for cement. Cement may also be carried in Bags instead of Cubetones.

3.6.3.5 Truck loading facilities for 20-ton truck loads

Truck Loading of Organic Products: Five truck loading stations with a nominal loading rate of 300 t/h each are recommended to load 1,220,000 tons of grain.

A sixth station shall be added to handle the increased tonnage of 241 trucks per day or up to 15 trucks per hour up to year 2026.

Truck Loading of Inorganic Products:

Fertilizer: Reclaiming of fertilizers from storage shall be accomplished by a 300 t/h payloader. A single truck load-out station will be required to load ~24,000 trucks with 20 tons payload annually up to year 2026. This will result in approximately 4 to 5 trucks per hour in two 8-hour shifts, 330 days per year, which results in a total of 5280 hours per year. Since the truck load-out is designed to load 15 trucks per hour (effectively 10 to 12 trucks per hour), there will be ample time for cleaning to avoid contamination between different fertilizer products.

Coal & Minerals: Reclaiming of Coal and Minerals shall be achieved by a 300 t/h payloader on each side of the storage yard. For existing and new coal operations there will be a combined total of 20,000 to 22,300 trucks with 20 tons payload to be loaded annually. This will be approximately 60 to 68 trucks per day (years 2016 and 2026 respectively).

3.6.4 POTENTIAL ENVIRONMENTAL IMPACTS

Given the Works described in the previous Chapter, it is possible to predict the following potential environmental impacts, during the construction and operation stages of the project:

CONSTRUCTION STAGE	PROJECT OPERATION
1. (+) Creation of jobs	1. (+) Creation of jobs
2. (+) Demand increase of services and goods	2. (+) Demand increase of services and goods
3. (-) Alteration of the scenery natural forms	3. (-) Increase of sea traffic
4. (-) Suspension of fine particulate matter	4. (-) Increase of sound pressure in water

5. (-) Contamination risk by marine sediment 6. (-) Contamination risk of the surface water resource 7. (-) Contamination risk of coasts and beaches 8. (-) Movement of heavy machinery and equipment 9. (-) Increase of sound pressure in water 10. (-) Increase of sound pressure in air 11. (-) Generation of hazardous wastes 12. (-) Generation of debris 13. (-) Generation of wastewater 14. (-) Generation of atmospheric emissions 15. (-) Accident risks to third parties 16. (-) Increase of traffic 17. (+) Increase of Basic services infrastructure	5. (-) Increase of sound pressure in air 6. (-) Suspension of fine particulate matter 7. (-) Generation of atmospheric emissions (fixed sources) 8. (-) Generation of atmospheric emissions (mobile sources) 9. (-) Generation of wastewater 10. (-) Accident risks to third parties 11. (-) Contamination risk of the surface water resource 12. (-) Contamination risk of the maritime sediments 13. (-) Contamination risks of coasts and beaches 14. Increased risk of fire and explosion 15. Generation of hazardous wastes 16. Generation of luminal emissions 17. Increased risk of sea accidents

It should be noted that, while there will be an increase in some of the parameters such as fine particulate and contamination of surface water, inherent in there being new project cargoes, such as coal for power plants and aggregates, it is anticipated that these will be controlled through the use of enclosed conveyors, dust suppression sprays and water treatment. At the same time, the recommended new terminal includes equipment which can be expected to reduce the generation of particulate and product spills for existing cargoes, for instance the use of continuous unloaders instead of open grabs and hoppers, and use of enclosed conveyors and truck loading racks with dust curtains instead of open discharge into trucks for organic products. Similarly, while there may be additional accident risks for the incremental traffic to handle new projects, there is likely also to be a reduction in risk for existing cargoes, due to their being shifted to a location in the eastern port, eliminating the need to pass through the city and the central part of the Port. This will be coupled with a reduction in truck traffic peaking, due to the availability of storage at the Port. The net effect of increase or decrease in parameters cannot be determined prior to the environmental impact studies in subsequent stages of the project.

3.6.5 CURRENT ENVIRONMENTAL LEGAL FRAME FOR THE PROJECT

Following is a list of the international, national and municipal legislation checked for this analysis, and the adopted acronyms.

1. Constitution of the Republic of Honduras. Decree No.131, January 1982.
2. Health Code. Decree No.65-91, August 1991.
3. Environmental Health General Rule (Rule GSA). Agreement No.0094, June 1998.
4. Work Code. Decree No.189, July 1959.
5. Environment General Law (LGA). Decree No.104-93, June 1993.
6. General Rule for the Environment Law (Rule LGA). Agreement No.109-93, February 1994.
7. National System of Environmental Impact Assessment Rule (Rule SINEIA). March 1994.

8. Law of Municipalities. Decree No.134-90, November 1990.
9. Solid Waste Management Rule (Rule MRS). Agreement No.378-2001.
10. Installment and Operation Rule for Fuel and Oil-Derived Liquids Deposit Stations (Rule IFEDCLDP). Agreement No.000489, March 1993.
11. Transit Law. January 2006.
12. Vehicle Smoke and Contaminant Gases Regulation Rule (Rule REGCHV). Agreement No.000719, January 2000.
13. Work Accidents and Professional Illnesses Preventive Measures General Rule (RGMPATEP). Executive Agreement No.STSS-001-02.
14. Technical Norms for the Wastewater Discharges to Water Courses and Sewerage Systems (Norms TDARCRAS). Agreement No.058, 1996.
15. United Nations Agreement about Climate Change (Agreement NUCC). Decree No.26-95.
16. Vienna Agreement for the Ozone Layer Protection. August 1993.
17. Implementation Rule of the International Agreement to Prevent Vessel Contamination 1973, and its Amendment Protocol 1978 (Rule MARPOL).
18. Resolution of the Merchant Marine General Direction No.001/2007. May 2007.

Attached to this document, there is an Annex containing a matrix of the environmental legislation analysis and its proper environmental measures.

3.6.6 REFERENCES

- Laws and Regulations as specified in Chapter 5 of this Report.
- Environmental Construction Guide Municipality of San Pedro Sula. Experco Internacional, 2003.
- Environmental Study Port National Company Puerto Cortés. DDH Environnement Ltee. October 2005.

3.7 Preparation of Recommendations for Port Security Equipment and Procedures

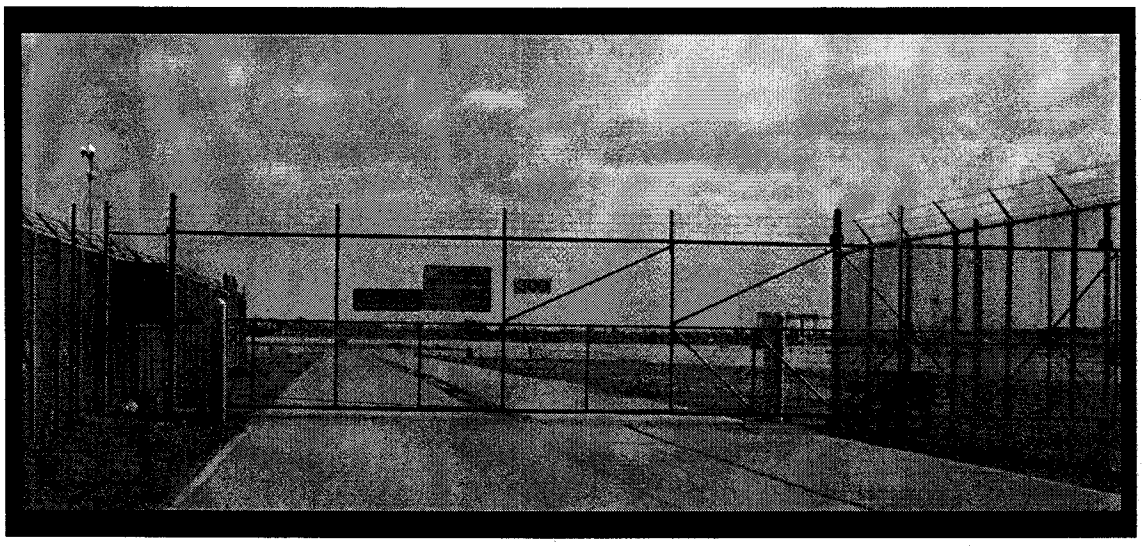
The Empresa Nacional Portuaria de Honduras (ENP) has requested guidance in developing the Port of Cortes Dry Bulk Unloading Terminal Project. One aspect of this is to prepare plans to expand the current port operations to include two additional piers (7A and 7B) in support of inbound organic, inorganic and aggregate materials destined for the United States. These plans include providing recommendations for port security to include security equipment and procedures to protect the dry bulk terminal unloading Project, the wharf, conveyors, storage and truck loading areas, the systems, personnel and property involved in operation of the terminal. This document addresses the equipment components of the plan while a separate document addresses the procedures. DMJM H&N System Solutions was enlisted to provide these services on behalf of DMJM Harris and ENP. As part of this process, DMJM H&N visited the site and performed a Vulnerability Assessment based on the current conditions observed on 12 June 2007. A copy of that assessment is included as part of this report.

Security Equipment
The focus of this recommendation is on the new piers 7A and 7B. No recommendations are provided for addressing any issues found during the Vulnerability Assessment as they are port-wide and should be best addressed by ENP. The equipment proposed will secure the new piers and the operations conducted on those piers only. There is no proposed plan to integrate this system with the existing ENP system other than to provide an interface point for future connectivity to be performed by ENP. The interface will need to be coordinated with ENP to ensure interoperability between the systems if they are to be integrated together at a future date.

The security equipment extends beyond providing just the active components such as CCTV cameras and card access readers. The "system" should be understood to follow the concentric circles of security that begin with protecting the assets (in the center of the circle) and radiating outward to include the gates and fence lines. The perimeter recommendations provided below will address recommended measures to be employed to augment the "active" components of the security system. The active components are that which will be installed by the US recommended firms. The recommendations such as the fence lines and lighting needs to be considered during the A&E design phase of this project.

3.7.1 Perimeter Recommendations
The perimeter in this case includes the fence lines, lighting, gates (vehicle and pedestrian), guardhouse(s) and the waterside itself. These perimeter components are the first line of defense in protecting the assets and the operations of the pier.

a. **Fence Lines**
A new fence line would be required to secure the new piers. All fence lines that do not meet the following minimum guidelines should be repaired or replaced as appropriate:



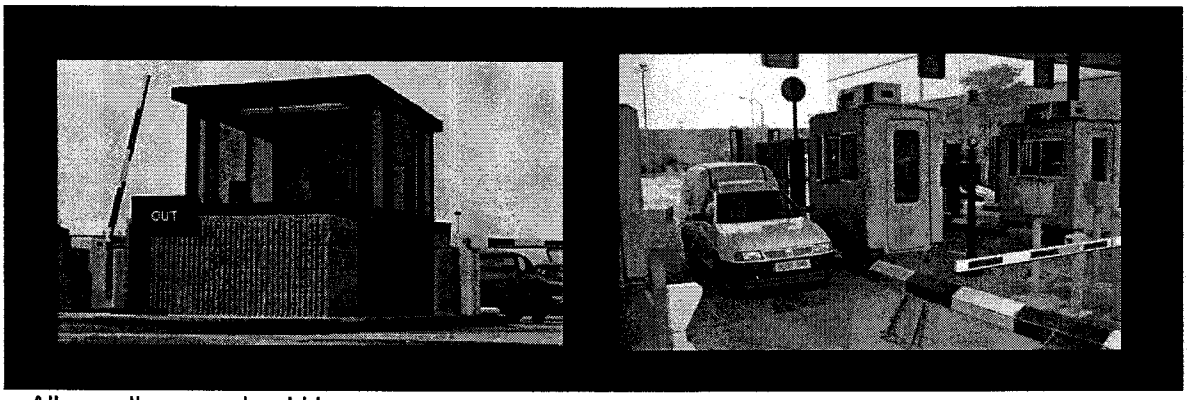
- Eight feet tall with 18" outriggers angled up and outward from protective area
- Outriggers strung with triple-strand barbed wire
- Addition of Concertina wire is optional but is recommended to be installed along perimeter fencing that borders the public side of the fence. Fencing internal to the Port property should not require Concertina wire unless ENP requests that it be installed.
- Fence will be secured within 2" from the ground using tension wire or using permanent foundation in concrete.
- Construct fence using 9-gauge non-reflective metal mesh with 2" openings
- At least ten feet of clear zone should be maintained continuously on both the immediate interior and exterior of the perimeter fence line, wherever possible. This includes the removal of vegetation and other hindrances to perimeter security.
- Drainage pipes over 12 inches in diameter should be secured using ½" rebar in a crossing pattern with a maximum of 8 inch spacing between the bars.

In addition to the new construction, repair and upgrade, a maintenance plan should be developed to address recurring problem areas including vegetative growth that interferes with visibility and perimeter integrity.

All pier fence lines should be extended from the perimeter to no less than ten feet beyond the water or pier edge to provide a clear delineation between each individual pier, preventing unimpeded access between areas and promoting greater access control and personnel accountability.

b. Guardhouses

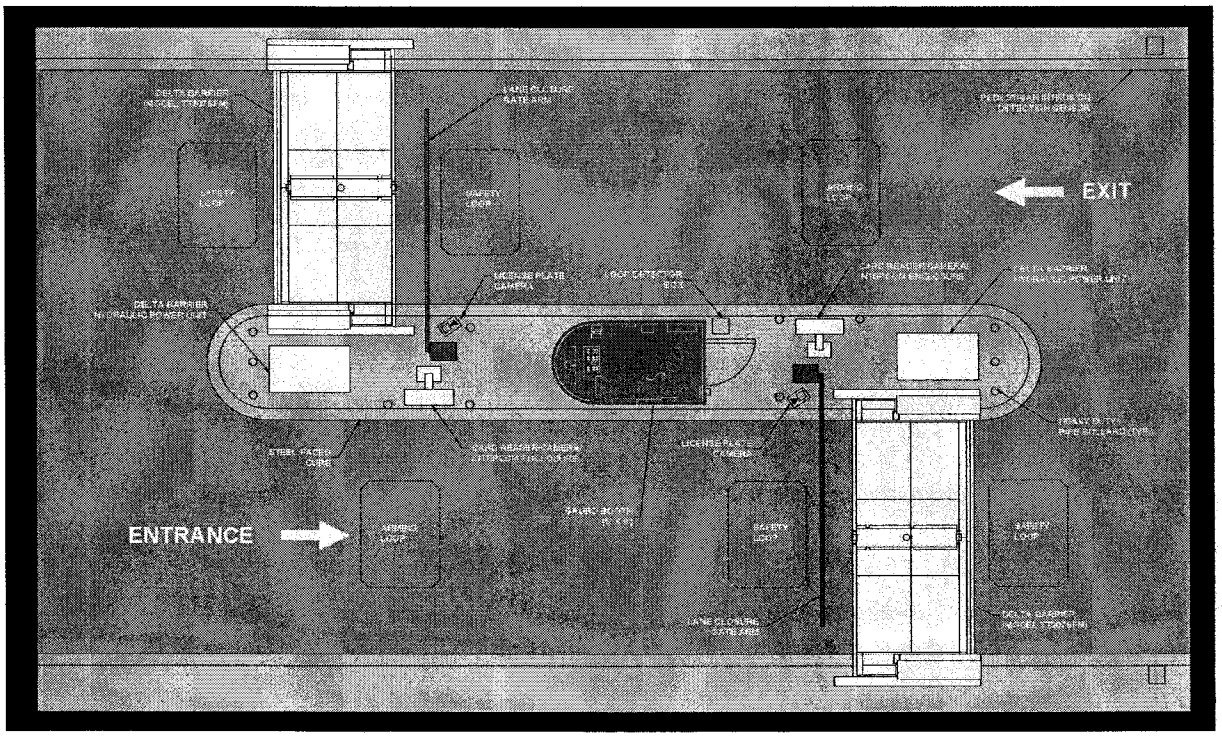
The standing recommendation is to procure and install guardhouses at all entrance and exit points at the new pier facilities. These are in addition to the current guardhouses already installed at the perimeter property line of the Port such as Gate 6, etc. The requirement should be understood to provide the capability to shut down all access to these piers independently of the rest of the port should the need arise. The gate shown below provides a good image of a well fortified guardhouse but the use of Delta Barriers would be replaced using the sliding gate instead. You could also arrange it so that it would only handle one way traffic should there be separate entrances and exits.



All guardhouses should be:

- Be properly positioned to allow incoming/outgoing traffic to stop at the guardhouse door (using lane closure gate arm). The perimeter gate will be a sliding style gate to be used in off-peak times.
- Universally designed portable, prefabricated, durable guard structure built for marine environment
- Equipped with bathroom facilities, water and electricity, land-line telephone capability, and air conditioning.
- Be installed on elevated concrete pads that prevent water seepage under the doors and ponding around the base of the structure.

- They should be equipped with appropriate external light sources, such that the working area of the guardhouse and entry control point is illuminated to 10 foot candles during periods of darkness.
- Internal lighting should be low mounted and appropriate for the maintenance of access control logs and other security related paperwork (it should not illuminate the interior of the guardhouse to the point that the guard can not see out through the windows).
- Power outlets should be sufficient to support the recharging of portable radios, as well as the installation of other electronic equipment such as refrigerators, microwaves, and any other personal comfort items authorized by ENP.
- At no time should an entry control post or position be established without a guardhouse that meets these minimum standards, and no guard should stand a post without having these basic necessities.
- Guardhouses should be equipped with portable fire extinguishers (class appropriate to the area to be protected), hand-held spotlights, basic first-aid kits, orange safety vests, and flashlights with removable traffic direction cones. These items should be inspected by the guard coming on duty, and any missing items should be reported immediately to the ENP Inspector on duty for action/replacement.
- In addition, each guardhouse should be equipped with a covered, lockable bulletin board for display of SOP updates and new information pertinent to the guard force. This bulletin board should be maintained and accessed only by the ENP inspectors, and should be updated frequently. Guardhouses should be equipped with Standard Operating Procedures and Guard Orders that are post-specific. Guards should be required to sign a document attesting to their familiarity with these rules and regulations every quarter.



c. **Gates**

Vehicle gates should be required at all entrance and exit points onto the new piers. There are two styles of gates recommended: sliding gates and lane closure gate arms. Sliding gates should:

- Match the same level of security and composition as the perimeter fence.
- Not allow more than four (4) inches of gap space below the gate when fully closed. If gap is unavoidable due to drainage or other impediments, add speed hump so measured distance is no more than four (4) inches of gap space below the gate when fully closed.
- Be operated using a powered gate operator
- Be coordinated with the guardhouse design
- Use arming loops and safety loops under the road surface
- Be used during off peak or high security periods

The lane closure gate arms are used during peak times when the sliding gate is held open. The lane closure gate arm provides a pause point for the guard to review incoming vehicles or personnel and to record their credentials and identification information. The gate arms are usually wood or plastic and work in conjunction with the arming loops and safety loops under the road surface. They gate arms are lifted at the discretion of the guard electronically.

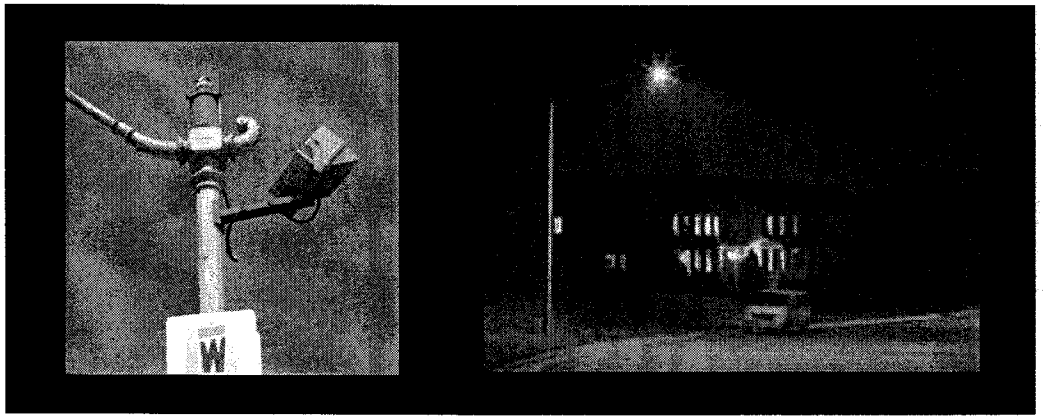
There is no requirement for pedestrian gates at this time.

d. Lighting

Lighting is critical to ensure the security of the perimeter can be observed at night by both guard forces and CCTV cameras. The lighting should illuminate naturally dark corners and areas of dense vegetation within close proximity to the fence line. Ideally, the light levels should provide ~.5 foot candles when measured one foot from the ground.

Security Lighting Application	Average Horizontal Illumination Level on Ground
Large Open Areas	0.5 – 2.0 foot-candles
Buildings	0.5 – 2.0 foot-candles
Perimeter Fence	0.5 foot-candles
Entrances	10 foot-candles
Gatehouses	30 foot-candles
Pedestrian Pathways and Access Routes	4 – 6 foot-candles

The lighting will complement the CCTV cameras that will be equipped with a low light level iris. All entrances and exits, high value assets, and critical operation areas should be properly illuminated using the chart provided above.



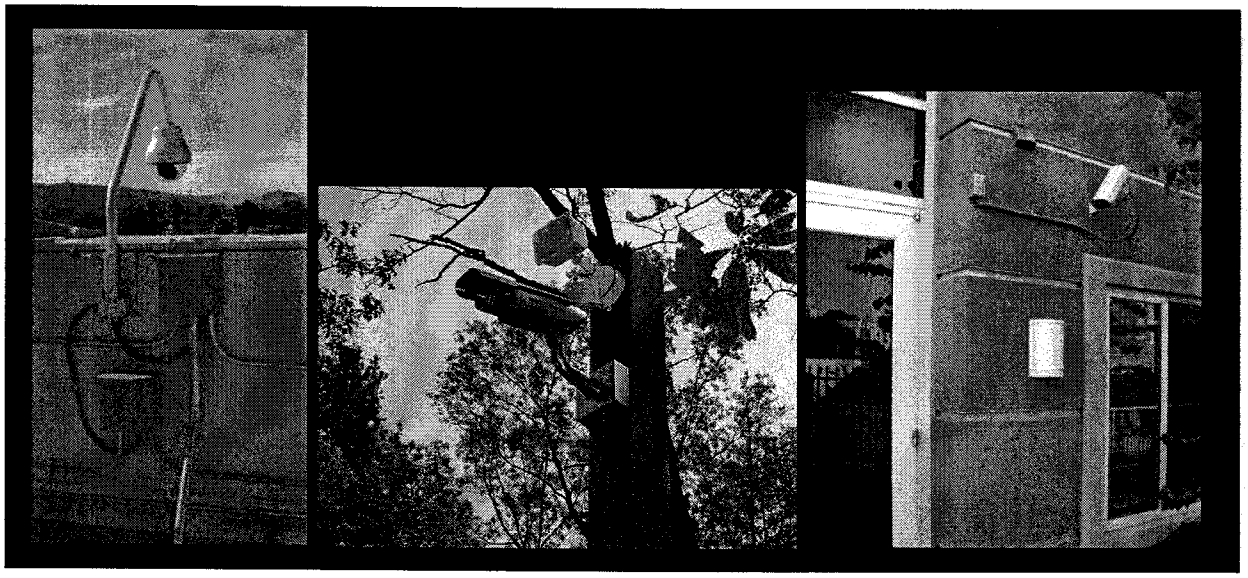
3.7.2 Security Equipment

a. **CCTV Cameras**

There are a number of areas around the new piers that will require the use of CCTV cameras for surveillance purposes. The cameras will:

- Consist of both fixed cameras (fixed on a stationary object/area) and Pan/Tilt/Zoom (PTZ) cameras for object tracking and continuous monitoring of a specific viewing range. The use of both types of cameras provides the best opportunity for capturing specific video events should they occur.
- Be capable of capturing images in both day/night applications.
- Be installed to provide the best viewing angles of all entrances and exits, the conveyor systems, the storage facilities/areas, and the perimeter.
- Be IP based and addressable.
- Use fiber optic cable as the image transmission medium.
- Will be powered using a 24 volt system.
- All cameras mounted externally will be housed in environmentally controlled, weatherproof housings.

- Be mounted to secure structures that will not be easily vibrated or sway under normal weather conditions.
- Be lightning protected.
- All exterior wiring will installed in EMT type conduit
- All interior wiring will be installed in PVC type conduit.
- Two PTZ Long Range IR cameras will be employed for surveillance during night hours and vessel tracking as vessels near the Port.



b. <u>CCTV System</u>

The camera images will need to be stored digitally on video recorders. No more than 8 cameras will connect to a single recorder. The recorders shall be located in a secure space within the new Administration Buildings of each pier. Each system will be independent of each pier will have the capability to interface to each other if required in the future.

For calculation purposes, the following metrics have been used to determine the storage requirements for each system.

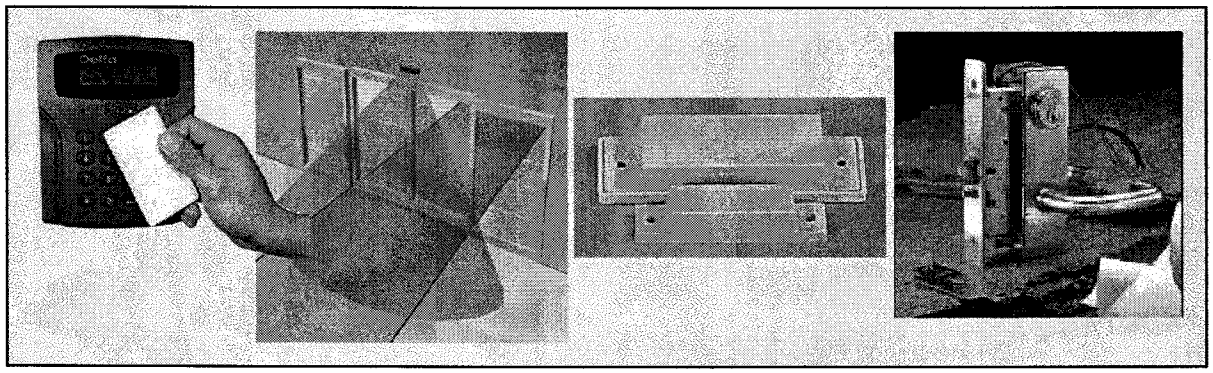
Number of Cameras (Pier 7A):	**30**
Recorded Frames Per Second:	**7.5 fps**
Image Resolution:	**320x240**
Desired Storage (in Days):	**14**
Expected % Motion:	**50%**
To Store All Recorded Video	**5.99 Terabytes**

Number of Cameras (Pier 7B):	**50**
Recorded Frames Per Second:	**7.5 fps**
Image Resolution:	**320x240**
Desired Storage (in Days):	**14**
Expected % Motion:	**50%**
To Store All Recorded Video	**9.98 Terabytes**

Should other metrics be used during the actual implementation, these values would need to be recalculated to determine actual storage needs.

c. **Access Control System (ACS)**

Access control for the piers and the ancillary storage and conveyance systems is essential. The ACS includes access card software/printers, card access readers, door contacts, motion detectors, Request to Exit Buttons, duress buttons, door hardware. These systems, when used together, comprise the access control system.



The access control software will reside on a file server and will be set up to track all access control point events. These events include:

- Card Software/Printers: The current access control system used by ENP was not made available. Therefore, a new system is proposed to create the cards for use on these piers. Should ENP determine that the installed system will be compatible with the new system then this piece of the system may not be required to be purchased.
- Card Access: When an employee uses their Access card an image appears showing that employees picture and which door or gate the employee is entering.
- Door Contacts: Whenever a door is equipped with a door contact switch and the door/gate is opened, an alarm is sent to the access control system. Usually a camera is linked to the alarmed door/gate so when the door is opened a camera will capture whoever is accessing that door (if not equipped with a card reader).

- Motion Detectors: Can be used to trigger an alarm if access to the area is restricted. Can be tied to the CCTV system like the door contact scenario. An example would be if someone was on the conveyance system catwalk and they were detected by a motion detector then the CCTV camera watching the conveyance system would record that event.
- Request to Exit Buttons: The button is located inside the secured space and is used to unlock the door when exiting the secure space. Can be performed using a motion sensor instead.
- Duress Buttons: Used in administrative offices to alert security of an emergency situation. Commonly used by senior management in their offices or can be used in select locations when voice communications may be incapacitated. Usually hidden under the desk in offices (silent alarm) or visibly in common areas for emergency situations. When the button is depressed, security personnel would be notified through the access control system identifying where the button was pushed.
- Door Hardware: The door hardware (electric strike, electric hinge and maglocks) is usually reviewed by the Security Contractor to ensure compatibility with the access control system.

It is imperative that the ACS be seamlessly compatible with the CCTV system.

Table 3.7.2-1: Pier 7A – Security System Cost Estimate

Item No.	Description
1	ACS Bundled System
2	Badging Station Bundled System
3	ACS to CCTV Interface
4	Operator Workstation
5	Nisca Printer
6	16 Reader Controller with 64MB RAM w/2 Hour Backup
7	12/24 VDC, 8/8 Ampere Power Supply, 16 Zone, Negative Trip Boards
8	Smart Cards
9	SWH Multi-technology Reader HID Version with Keypad and LCD Display
10	UL Listed Door Control Module for Single Reader Access Control.
11	Multi-Technology Card Reader
12	12V-12Ah.AGM /SLA Batteries
13	Industrial Aluminum Housing Armored Cable/Wide Gap Closed Loop - Door Contacts
14	Request to Exit PIR, Black
15	Eight output reader bus module
16	Eight input reader bus module
17	Cleaning Kit, 4 cleaning pens, 50 cleaning cards, 50 cleaning pads
18	4 Color Dye-Sublimation Ribbon (250 Cards/roll, 5 panel ribbon) for Nisca 5100 or 5200
19	ACS ID Software License
20	Polyguard Overlaminate, clear, 250 prints/roll. Cheetah II only
21	Heat Roller Unit (softcoat)
22	PR5300 Print Head
23	Resin Bk Ribbon
24	360° Passive Infrared Detector
25	Electric Stike
26	Strike Power Supplies
27	Wireless Remote Door Release Buttons and Controllers
28	Under Desk Mtd. Duress Alarm
29	Zenitel Stento 10 station Intercom
31	Toshiba 5KVA
32	CCTV SYSTEM - 30 CAMERAS Network switches, servers, storage, KVM switch, workstation, and equipment racks including termination, programming and commissioning
33	Rack UPS for switches APC/Tripplite 3kVa

Subtotal	$326,231.79
Installation Labor	$260,985.43
Travel ODC's	$100,000.00
Project Total	$687,217.22
Contingency (20%)	$137,443.44
Grand Total	**$824,660.67**

Table 3.7.2-2: Pier 7B – Security System Cost Estimate

Item No.	Description
1	ACS Bundled System
2	Badging Station Bundled System
3	ACS to CCTV Interface
4	Operator Workstation
5	Nisca Printer
6	16 Reader Controller with 64MB RAM w/2 Hour Backup
7	12/24 VDC, 8/8 Ampere Power Supply, 16 Zone, Negative Trip Boards
8	Smart Cards
9	SWH Multi-technology Reader HID Version with Keypad and LCD Display
10	UL Listed Door Control Module for Single Reader Access Control.
11	Multi-Technology Card Reader
12	12V-12Ah.AGM /SLA Batteries
13	Industrial Aluminum Housing Armored Cable/Wide Gap Closed Loop - Door Contacts
14	Request to Exit PIR, Black
15	Eight output reader bus module
16	Eight input reader bus module
17	Cleaning Kit, 4 cleaning pens, 50 cleaning cards, 50 cleaning pads
18	4 Color Dye-Sublimation Ribbon (250 Cards/roll, 5 panel ribbon) for Nisca 5100 or 5200
19	ACS ID Software License Client license
20	Polyguard Overlaminate, clear, 250 prints/roll. Cheetah II only
21	Heat Roller Unit (softcoat)
22	PR5300 Print Head
23	Resin Bk Ribbon
24	360° Passive Infrared Detector
25	Electric Stike
26	Strike Power Supplies
27	Wireless Remote Door Release Buttons and Controllers
28	Under Desk Mtd. Duress Alarm
29	Zenitel Stento 10 station Intercom
31	Toshiba 5KVA
32	CCTV SYSTEM - 50 CAMERAS Network switches, servers, storage, KVM switch, workstation, and equipment racks including termination, programming and commissioning
33	Rack UPS for switches APC/Tripplite 3kVa

Subtotal	$372,090.09
Installation Labor	$297,672.07
Travel ODC's	$100,000.00
Project Total	$769,762.16
Contingency (20%)	$153,952.43
Grand Total	**$923,714.59**

SELECTED US VENDORS

SIEMENS

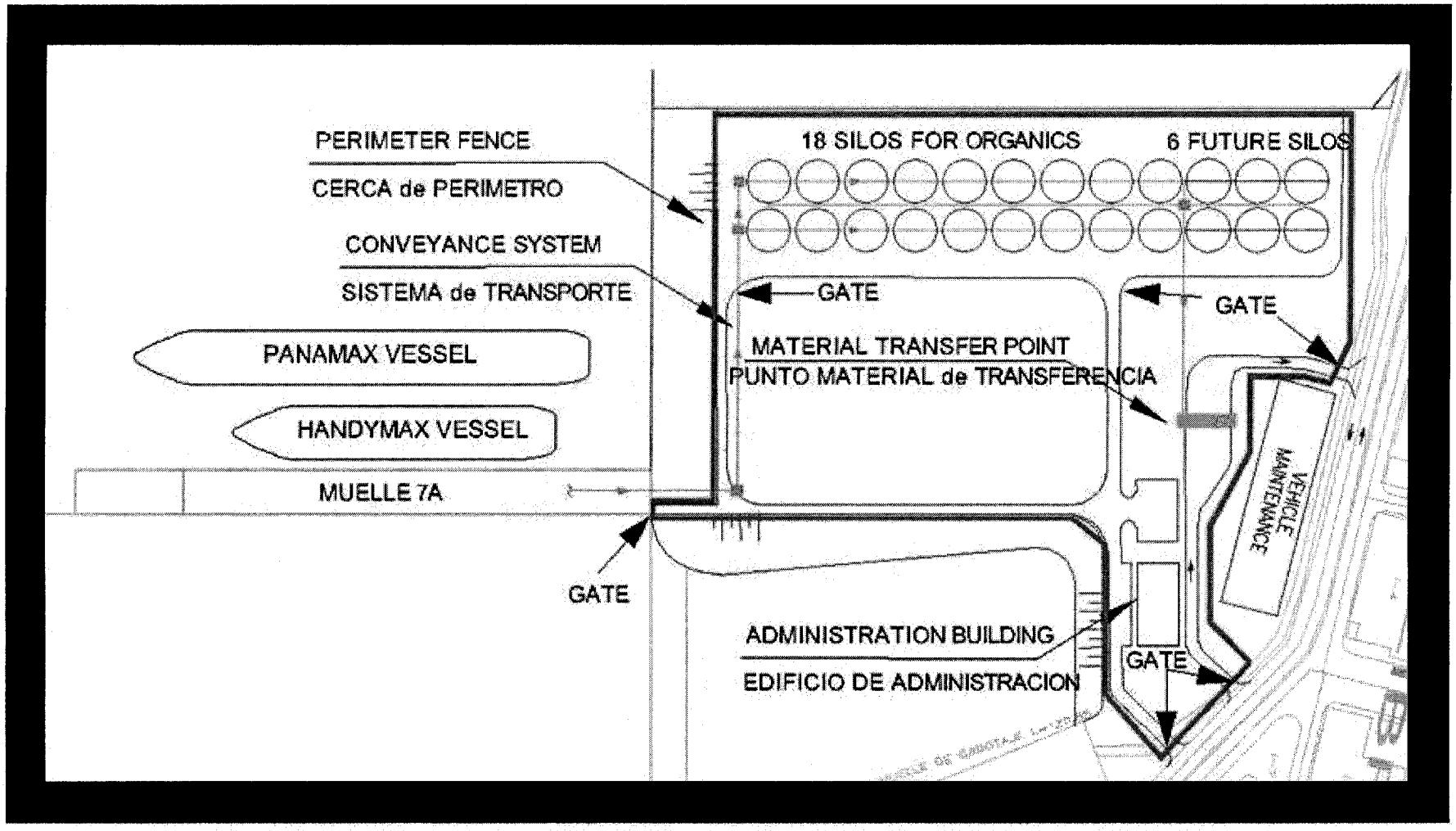
Siemens Building Technologies
10775 Business Center Dr.
Cypress, CA 90630
United States of America
(800) 877-7545
http://www.us.sbt.siemens.com/SES/

SigNet Technologies
Integrated Security ■ Network Solutions

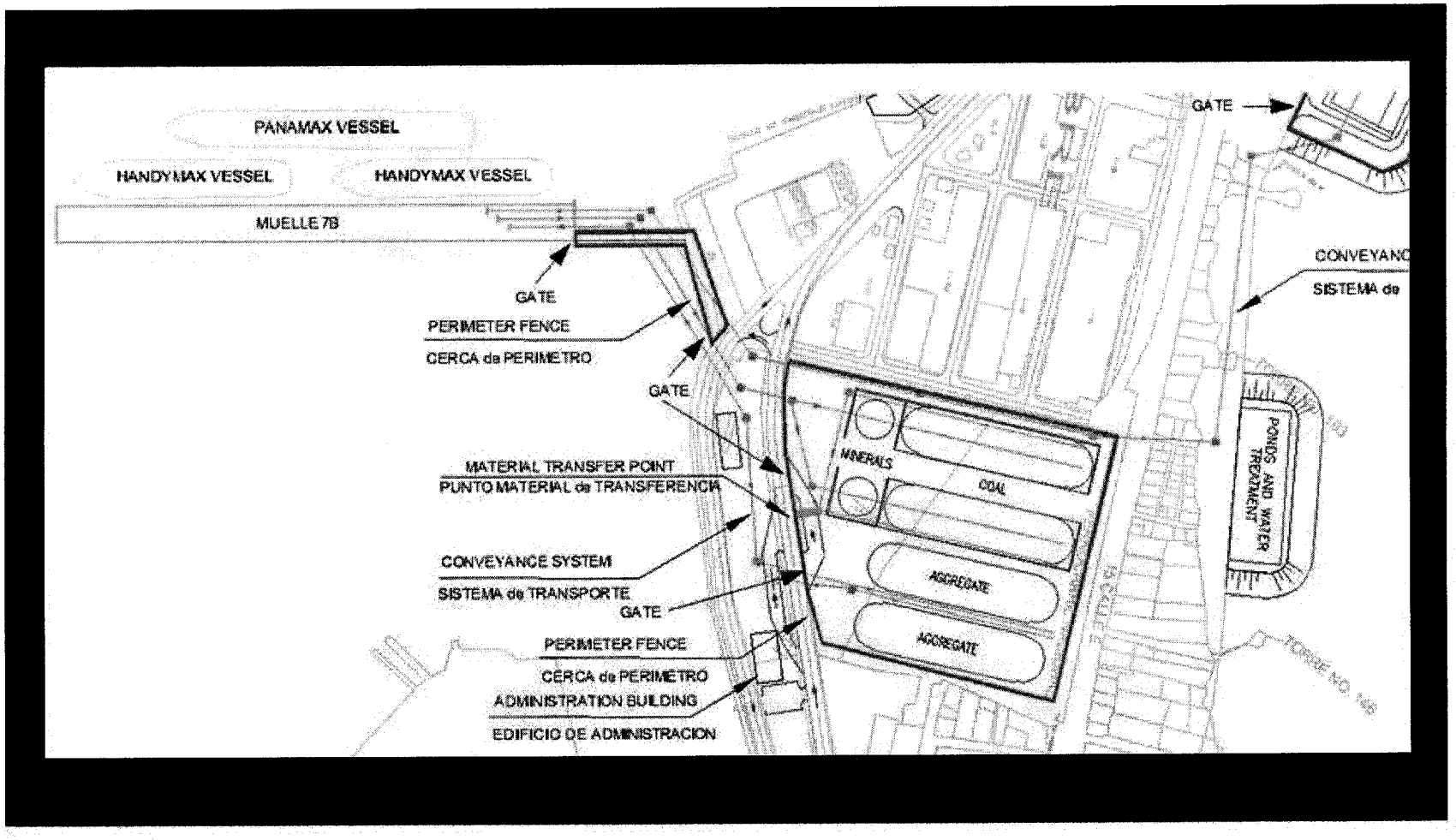
Signet Technologies
12300 Kiln Court, Suite E
Beltsville, MD 20705
United States of America
(240) 264-3295
www.signetinc.com

SIGCOM
Communications • Security

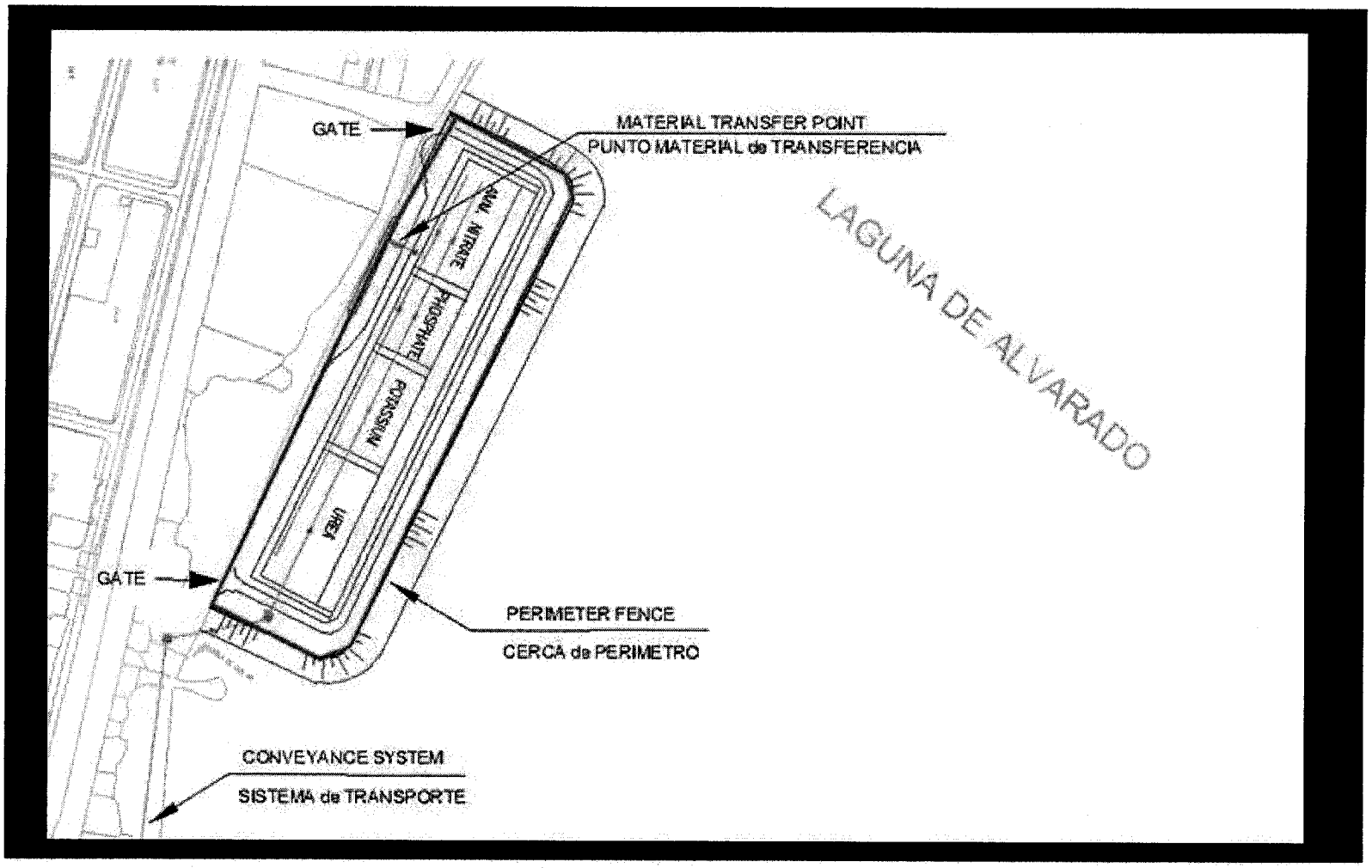
SIGCOM
4230 Beechwood Drive
Greensboro, NC 27410
United States of America
(877) 4SIGCOM
http://www.sigcom.net/


PERIMETER FENCE
CERCA de PERIMETRO
CONVEYANCE SYSTEM
SISTEMA de TRANSPORTE
PANAMAX VESSEL
HANDYMAX VESSEL
MUELLE 7A
GATE
18 SILOS FOR ORGANICS
6 FUTURE SILOS
GATE
MATERIAL TRANSFER POINT
PUNTO MATERIAL de TRANSFERENCIA
GATE
VEHICLE MAINTENANCE
ADMINISTRATION BUILDING
EDIFICIO DE ADMINISTRACION
GATE

PIER 7A



PIER 7B – Section A



PIER 7B – Section B

3.8 Preparation of Financial Analysis and Sources of Financing

9. Financial / Economic Analysis

This section presents the financial analysis for the Port of Cortes dry bulk terminal projects proposed in this report, including:
Alternative 1A Phase 1: Organic Products Terminal – Pier 7A and associated facilities; and
Alternative 1A Phase 2: Aggregates and Inorganic Products Terminal – Pier 7B and associated facilities.

For each type of cargo, organic and inorganic, the analysis is performed on the basis of the total cargos and revenues for a terminal, not on the basis of individual components of the terminal or cargoes. This is due to the difficulty in evaluating the financial feasibility of a single piece of equipment such as an unloader installed at a pier outside of the context of who will own the improvement and what the competitive situation will be with regard to competing terminal operators or stevedoring companies. By matching up projected cargos with scheduled capital improvements, it is possible to confirm the financial analysis of the overall investment program for each terminal. In the case of the grain and minerals terminals, newly improved facilities are assumed to continue to be competing with unimproved facilities, justifying higher tariffs on the basis of higher efficiencies.

- Schedule of capital investments to meet projected demand;
- Proposed capital and financing costs for the project;
- Proposed tariff and revenues for the project; and
- Analysis of debt/asset, debt equity, earnings and debt coverage ratios for the project.

For the dry bulk terminals, which are analyzed as stand-alone commercial enterprises, financial analysis include the following components:

- Projected operating costs for the project;
- Pro forma income statement for the project;
- Pro forma balance sheet for the project;
- Pro forma statement of changes in retained earnings for the project;
- Pro forma statement of changes in financial position (sources and uses of funds) for the project; and
- Rates of return and financial ratios.

TABLE 3.8-1: INVESTMENT COST ESTIMATES

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria

Alternative / Alternativa 1A
Phase 1 / Fase 1: Pier / Espigon 7A
Organic Products Terminal / Terminal de Productos Orgánicos

INVESTMENT COST ESTIMATES / COSTOS ESTIMADOS

	USD Year / Año -1	0	Total
1 Dredging / Dragado	3,796,000	-	3,796,000
2 Wharf structure / Estructura muelle	23,400,000	-	23,400,000
3 Wharf outfitting / Equipamiento del muelle	2,692,000	-	2,692,000
4 Trestle structure / Estructura de vigas	1,050,000	-	1,050,000
5 Landfill compaction / Compactamiento de relleno	298,000	-	298,000
6 Slope protection / Protección pendiente	109,000	-	109,000
7 Subtotal	31,345,000	-	31,345,000
8 Equipment and storage / Equipo y almacenamiento	-	50,200,000	50,200,000
9 Total	31,345,000	50,200,000	81,545,000
10 Land / Terreno	-	-	-

Source: DMJM+HARRIS, Inc. estimates

Table 3.8-1 presents the investment cost estimates for the Alternative 1A Phase 1: Pier 7A Organic Products Terminal. These costs are an input to the financial analysis. This is the terminal designed to serve food grains for human and animal consumption. Referring to the table, the project costs include $31,345,000 for the wharf and dredging and $50,200,000 for equipment and storage. Equipment includes continuous unloaders, conveyors, silos and truck loading racks. Storage includes silos. Details of the costs are presented in sections 3.1 to 3.4.

TABLE 3.8-2: INVESTMENT COST ESTIMATES

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria

Alternative / Alternativa 1A
Phase 2 / Fase 2: Pier / Espigon 7B
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos

INVESTMENT COST ESTIMATES / ESTIMADOS DE COSTO

	USD Year / Año -1	0	Total
1 Dredging / Dragado	8,138,000	-	8,138,000
2 Wharf structure / Estructura muelle	47,813,000	-	47,813,000
3 Wharf outfitting / Equipamiento del muelle	4,400,000	-	4,400,000
4 Trestle structure / Estructura de vigas	2,363,000	-	2,363,000
5 Landfill compaction / Compactamiento de relleno	149,000	-	149,000
6 Slope protection / Protección pendiente	-	-	-
7 Subtotal	62,863,000	-	62,863,000
8 Equipment and storage / Equipo y almacenamiento	-	97,400,000	97,400,000
9 Total	62,863,000	97,400,000	160,263,000
10 Land / Terreno	-	-	-

Source: DMJM+HARRIS, Inc. estimates

Table 3.8-2 presents the investment cost estimates for Alternative 1A Phase 2: Pier 7B Aggregates and Inorganic Products Terminal. This is the terminal designed to serve aggregates, coal, cement, fertilizer, chemicals, salt and other inorganic products. Referring to the table, the investment costs include $62,863,000 for the wharf and dredging and $97,400,000 for equipment and storage. Equipment includes shiploaders and grab unloaders, conveyors, stackers and reclaimers and truck loading racks. Storage includes open and enclosed storage.

TABLE 3.8-3: INVESTMENT COST ESTIMATES

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria

Alternative / Alternativa 1A

INVESTMENT COST ESTIMATES / ESTIMADOS DE COSTO

	USD		Total
	Phase 1 / Fase 1: Pier / Espigon 7A	Phase 2 / Fase 2: Pier / Espigon 7B	
1 Dredging / Dragado	3,796,000	8,138,000	11,934,000
2 Wharf structure / Estructura muelle	23,400,000	47,813,000	71,213,000
3 Wharf outfitting / Equipamiento del muelle	2,692,000	4,400,000	7,092,000
4 Trestle structure / Estructura de vigas	1,050,000	2,363,000	3,413,000
5 Landfill compaction / Compactamiento de relleno	298,000	149,000	447,000
6 Slope protection / Protección pendiente	109,000	-	109,000
7 Subtotal	31,345,000	62,863,000	94,208,000
8 Equipment and storage / Equipo y almacenamiento	50,200,000	97,400,000	147,600,000
9 Total	81,545,000	160,263,000	241,808,000

Source: DMJM Harris estimates

Table 3.8-3 summarizes the investment cost estimates for Alternative 1, Phase 1 (Pier 7A Organic Products Terminal) and Phase 2 (Pier 7B Aggregates and Inorganic Products Terminal). These phases may be built together or sequentially, depending on available resources and requirements. Referring to the table, the investment cost for Phase 1 is $31,345,000 for the wharf and dredging and $50,200,000 for equipment and storage, for a total of $81,545,000. The investment cost for Phase 2 is $62,863,000 for the wharf and dredging and $97,400,000 for equipment and storage, for a total of $160,263,000. The total investment cost for both phases, including both Pier 7A Organic Products Terminal and Pier 7B Aggregates and Inorganic Products Terminal), is $241,808,000.

Assumptions

The following financing assumptions were utilized in the financial analysis:

Financing	
Debt as a percent of total capital	70%
Interest rate on debt	7.75% per year
Term	30 years
Depreciation	20 years straight line
Payout to owners	100% of free cash flow
Operating and maintenance costs	
Operating costs	20 percent of revenues
Maintenance costs	20 percent of fixed assets
Revenue rates	
Organic products	$12.50 per ton
Aggregates and inorganic products	$7.75 per ton

The above average or all-inclusive tariff rates are the required rates to provide return on equity of approximately 9.5% a year based on the aforementioned costs and financing assumptions. For purposes of the financial analysis, such rates could be average or all-inclusive rates, and could be obtained from individual charges, from a combination of various charges and could vary among the constituent cargoes or be uniform across the board, without changing the results.

The analysis to establish a feasible tariff for use of the new facilities would be based on a sharing of cost savings due to the increased speed of the facilities. Such a calculation uses a determination of the time savings from faster unloading of the average load multiplied by an estimated daily charter rate for a handy sized vessel calling at the facility. This is conservative as it does not include potential saving due to lowering waiting time for vessels to berth. A portion of these savings are assumed to be available as the basis for an increased infrastructure charge to fund the new facilities. This assumes that the existing infrastructure charge, even at much higher throughputs, would still be available for the upgrade and maintenance of the existing facilities (berths). However, the available statistics at the Port of Cortes are not sufficient to support a determination of the savings. A few laytime calculations received indicate such savings could be significant, but statistics were not available to quantify such savings across more than a very few of the vessels calling at the port.

Additional savings or offsets are likely to accrue from the use of larger vessels such as would be permitted by the new facility, with greater economies of scale, and the ability to obtain more advantageous charter parties when the experience factor with the Port of Cortes dry bulk handling rates is better.

In addition to the savings on vessel time, the rates to be charged by the facility would be offset against savings in operating costs using the present non-mechanized facility with grab unloaders discharging directly from the ship into trucks. There would also be cost savings in truck waiting time and truck peaking factors. Differences in operating costs cannot be determined, but is likely that a modern mechanized facility with a higher degree of capital improvement will be at least as economical to operate as a nonmechanized facility whose operating costs are already included in the stevedoring fees.

TABLE 3.8-4a: SUMMARY OF PRO FORMA FINANCIALS, YEARS 1-10

CUADR3.8-4a: RESUMEN DE LOS ESTADOS FINANCIEROS PRO FORMA, AÑOS 1-10

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Organic Products Terminal / Terminal de Productos Orgánicos

USD

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 1	2	3	4	5	6	7	8	9	10
REVENUES / INGRESOS										
Dockage / Estadía	0	0	0	0	0	0	0	0	0	0
Wharfage / Muellaje	0	0	0	0	0	0	0	0	0	0
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	13,255,282	13,634,628	14,024,868	14,426,317	14,839,298	15,264,143	15,701,194	16,150,804	16,613,335	17,089,158
Subtotal: Revenues from operations / ingresos de operaciones	13,255,282	13,634,628	14,024,868	14,426,317	14,839,298	15,264,143	15,701,194	16,150,804	16,613,335	17,089,158
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	2,651,056	2,726,926	2,804,974	2,885,263	2,967,860	3,052,829	3,140,239	3,230,161	3,322,667	3,417,832
Maintenance / Mantenimiento	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053
Depreciation / Depreciacion	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053
Interest Expense / Gastos de interes'	4,908,662	4,863,302	4,814,427	4,761,765	4,705,021	4,643,879	4,577,999	4,507,013	4,430,526	4,348,111
Subtotal Expenses / Subtotal gastos	16,339,825	16,370,335	16,399,508	16,427,135	16,452,987	16,476,815	16,498,345	16,517,281	16,533,300	16,546,050
Net Income / Renta neta	(3,084,543)	(2,714,100)	(2,353,033)	(1,979,211)	(1,592,083)	(1,191,065)	(775,544)	(344,870)	101,641	564,715
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228
Total current assets / Total activos corrientes	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228
FIXED ASSETS / ACTIVOS FIJOS										
Land / Terrenos	-	-	-	-	-	-	-	-	-	-
Improvements / Mejors	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069
Accumulated depreciation / depreciacion acumulado	(4,390,053)	(8,780,107)	(13,170,160)	(17,560,214)	(21,950,267)	(26,340,321)	(30,730,374)	(35,120,427)	(39,510,481)	(43,900,534)
Net book value / Valor contable neto	83,411,015	79,020,962	74,630,908	70,240,855	65,850,801	61,460,748	57,070,695	52,680,641	48,290,588	43,900,534
Total Land and Improvements / Total terrenos y mejoras	83,411,015	79,020,962	74,630,908	70,240,855	65,850,801	61,460,748	57,070,695	52,680,641	48,290,588	43,900,534
TOTAL ASSETS / TOTAL ACTIVOS	84,131,243	79,741,190	75,351,136	70,961,083	66,571,029	62,180,976	57,790,922	53,400,869	49,010,816	44,620,762
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	-	-	-	-			-	-	-	-
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	62,752,286	62,121,643	61,442,126	60,709,946	59,921,022	59,070,957	58,155,012	57,168,081	56,104,662	54,958,829
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500
Retained earnings / Ganancias conservadas	(3,084,543)	(6,843,954)	(10,554,490)	(14,212,364)	(17,813,493)	(21,353,481)	(24,827,589)	(28,230,712)	(31,557,347)	(34,801,567)
Private sector equity / Patrimonio sector privado	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	21,378,957	17,619,546	13,909,010	10,251,136	6,650,007	3,110,019	(364,089)	(3,767,212)	(7,093,847)	(10,338,067)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	84,131,243	79,741,190	75,351,136	70,961,083	66,571,029	62,180,976	57,790,922	53,400,869	49,010,816	44,620,762
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	($3,084,543)	($2,714,100)	($2,353,033)	($1,979,211)	($1,592,083)	($1,191,065)	($775,544)	($344,870)	$101,641	$564,715
Payout to owners / Desembolsos a propietarios	0	1,045,311	1,357,503	1,678,662	2,009,047	2,348,923	2,698,564	3,058,252	3,428,276	3,808,935
Change in retained earnings / Cambios en ganancias conservadas	(3,084,543)	(3,759,411)	(3,710,536)	(3,657,874)	(3,601,130)	(3,539,988)	(3,474,108)	(3,403,122)	(3,326,635)	(3,244,220)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$6,214,172	$6,517,649	$6,829,841	$7,151,000	$7,481,385	$7,821,261	$8,170,902	$8,530,590	$8,900,614	$9,281,273
Total Sources / Total Fuentes	6,214,172	6,539,256	6,851,448	7,172,607	7,502,991	7,842,868	8,192,509	8,552,197	8,922,221	9,302,880
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	4,908,662	4,863,302	4,814,427	4,761,765	4,705,021	4,643,879	4,577,999	4,507,013	4,430,526	4,348,111
Repayment of debt / Reembolso de deuda	585,283	630,642	679,517	732,180	788,924	850,065	915,945	986,931	1,063,418	1,145,833
Total Uses / Total Usos	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	720,228	1,045,311	1,357,503	1,678,662	2,009,047	2,348,923	2,698,564	3,058,252	3,428,276	3,808,935
Payout to owners (pay-in) / Desembolso a propietarios	0	1,045,311	1,357,503	1,678,662	2,009,047	2,348,923	2,698,564	3,058,252	3,428,276	3,808,935
Net increase in working capital / Aumento neto en capital circulante	720,228	0	0	0	0	0	0	0	0	0

Table 3.8-4 presents the pro forma income statement, balance sheet, statement of changes in retained earnings and statement of changes in financial position for Alternative 1A Phase 1 Pier 7A Organic Products Terminal. Referring to the table, net income is projected to be negative until year 9, but the project would generate a positive cash flow of about $720,000 in the first year, increasing to about $3,808,000 in year 10 and about $7,735,452 in year 20.

TABLE 3.8-4b: SUMMARY OF PRO FORMA FINANCIALS, YEARS 11-20

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Organic Products Terminal / Terminal de Productos Orgánicos

	USD									
PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	**Year / Año**									
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
REVENUES / INGRESOS										
Dockage / Estadía	0	0	0	0	0	0	0	0	0	0
Wharfage / Muellaje	0	0	0	0	0	0	0	0	0	0
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	17,530,161	17,982,585	18,446,727	18,922,891	19,411,390	19,912,545	20,426,684	20,937,351	21,460,785	21,997,304
Subtotal: Revenues from operations / Ingresos de operaciones	17,530,161	17,982,585	18,446,727	18,922,891	19,411,390	19,912,545	20,426,684	20,937,351	21,460,785	21,997,304
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	3,506,032	3,596,517	3,689,345	3,784,578	3,882,278	3,982,509	4,085,337	4,187,470	4,292,157	4,399,461
Maintenance / Mantenimiento	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053
Depreciation / Depreciacion	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053	4,390,053
Interest Expense / Gastos de interes'	4,259,309	4,163,625	4,060,525	3,949,435	3,829,736	3,700,760	3,561,788	3,412,046	3,250,698	3,076,847
Subtotal Expenses / Subtotal gastos	16,545,448	16,540,249	16,529,977	16,514,120	16,492,121	16,463,375	16,427,231	16,379,623	16,322,962	16,256,415
Net Income / Renta neta	1,006,320	1,463,943	1,938,356	2,430,377	2,940,876	3,470,776	4,021,059	4,579,335	5,159,429	5,762,497
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228
Total current assets / Total activos corrientes	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228	720,228
FIXED ASSETS / ACTIVOS FIJOS										
Land	-	-	-	-	-	-	-	-	-	-
Improvements	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069	87,801,069
Accumulated depreciation / depreciacion acumulado	(48,290,588)	(52,680,641)	(57,070,695)	(61,460,748)	(65,850,801)	(70,240,855)	(74,630,908)	(79,020,962)	(83,411,015)	(87,801,069)
Net book value / Valor contable neto	39,510,481	35,120,427	30,730,374	26,340,321	21,950,267	17,560,214	13,170,160	8,780,107	4,390,053	-
Total Land and Improvements	39,510,481	35,120,427	30,730,374	26,340,321	21,950,267	17,560,214	13,170,160	8,780,107	4,390,053	-
TOTAL ASSETS / TOTAL ACTIVOS	40,230,709	35,840,655	31,450,602	27,060,548	22,670,495	18,280,441	13,890,388	9,500,335	5,110,281	720,228
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO										
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	53,724,194	52,393,874	50,960,455	49,415,945	47,751,737	45,958,552	44,026,395	41,944,496	39,701,250	37,284,152
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500	24,463,500
Retained earnings / Ganancias conservadas	(37,956,985)	(41,016,719)	(43,973,353)	(46,818,897)	(49,544,742)	(52,141,610)	(54,599,507)	(56,907,661)	(59,054,469)	(61,027,424)
Private sector equity	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	(13,493,485)	(16,553,219)	(19,509,853)	(22,355,397)	(25,081,242)	(27,678,110)	(30,136,007)	(32,444,161)	(34,590,969)	(36,563,924)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	40,230,709	35,840,655	31,450,602	27,060,548	22,670,495	18,280,441	13,890,388	9,500,335	5,110,281	720,228
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	$1,006,320	$1,463,943	$1,938,356	$2,430,377	$2,940,876	$3,470,776	$4,021,059	$4,579,335	$5,159,429	$5,762,497
Payout to owners / Desembolsos a propietarios	4,161,738	4,523,677	4,894,990	5,275,922	5,666,721	6,067,644	6,478,956	6,887,490	7,306,237	7,735,452
Change in retained earnings / Cambios en ganancias conservadas	(3,155,418)	(3,059,734)	(2,956,634)	(2,845,544)	(2,725,845)	(2,596,868)	(2,457,897)	(2,308,154)	(2,146,807)	(1,972,956)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$9,634,076	$9,996,015	$10,367,328	$10,748,259	$11,139,059	$11,539,982	$11,951,294	$12,359,827	$12,778,574	$13,207,790
Total Sources / Total Fuentes	9,655,682	10,017,622	10,388,935	10,769,866	11,160,665	11,561,589	11,972,900	12,381,434	12,800,181	13,229,397
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	4,259,309	4,163,625	4,060,525	3,949,435	3,829,736	3,700,760	3,561,788	3,412,046	3,250,698	3,076,847
Repayment of debt / Reembolso de deuda	1,234,635	1,330,320	1,433,419	1,544,509	1,664,209	1,793,185	1,932,157	2,081,899	2,243,246	2,417,098
Total Uses / Total Usos	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945	5,493,945
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	4,161,738	4,523,677	4,894,990	5,275,922	5,666,721	6,067,644	6,478,956	6,887,490	7,306,237	7,735,452
Payout to owners (pay-in) / Desembolso a propietarios	4,161,738	4,523,677	4,894,990	5,275,922	5,666,721	6,067,644	6,478,956	6,887,490	7,306,237	7,735,452
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

TABLE 3.8-5: SUMMARY OF RATES OF RETURN AND FINANCIAL RATIOS

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Organic Products Terminal / Terminal de Productos Orgánicos
Organic Products Terminal / Terminal de Productos Orgánicos

IRR's / TIR

Debt / Deuda	7.75%
Equity / Patrimonio	9.69%
Total	8.41%

NET PRESENT VALUE OVER 20 YRS @ / VALOR NETO ACTUAL SOBRE 20 AÑOS 4.00%

Debt / Deuda	USD 28,043,978
Equity / Patrimonio	USD 22,277,939
Total	USD 50,321,917

DEBT SERVICE COVERAGE / COBERTURA DE SERVICIO DI Year

Year	1	2	3	4	5	6	7	8	9	10
Debt service coverage ratio / Coeficiente de servicio de deuda	1.13	1.19	1.24	1.30	1.36	1.42	1.49	1.55	1.62	1.69

Year	11	12	13	14	15	16	17	18	19	20
Debt service coverage ratio / Coeficiente de servicio de deuda	1.75	1.82	1.89	1.96	2.03	2.10	2.18	2.25	2.33	2.40

Debt service coverage for first 5 years / Cobertura de deuda para los primeros 5 años

Cash from operations / Caja de operaciones	USD 34,194,047
Debt service / Servicio de deuda	USD 27,469,723
Debt service coverage ratio / Coeficiente de servicio de deuda	1.24

Table 3.8-5 presents a summary of the rates of return for Alternative 1A Phase 1 Pier 7A Organic Products Terminal. Referring to the table, the project would provide a return on equity of 9.69%, a net present value over 20 years at 4% per year of approximately $50,321,000 and a debt service coverage ratio for the first 5 years of 1.24.

TABLE 3.8-6a: SUMMARY OF PRO FORMA FINANCIALS, YEARS 1-10

CUADRO 3.8-6a: RESUMEN DE LOS ESTADOS FINANCIEROS PRO FORMA, AÑOS 1-10

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
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Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos
(USD)

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 1	2	3	4	5	6	7	8	9	10
REVENUES / INGRESOS										
Dockage / Estadia	0	0	0	0	0	0	0	0	0	0
Wharfage / Muellaje	0	0	0	0	0	0	0	0	0	0
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	18,742,199	24,342,649	32,141,837	33,370,274	33,493,678	33,620,968	33,752,268	33,887,706	34,027,413	34,171,527
Subtotal: Revenues from operations / ingresos de operaciones	18,742,199	24,342,649	32,141,837	33,370,274	33,493,678	33,620,968	33,752,268	33,887,706	34,027,413	34,171,527
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	3,748,440	4,868,530	6,428,367	6,674,055	6,698,736	6,724,194	6,750,454	6,777,541	6,805,483	6,834,305
Maintenance / Mantenimiento	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594
Depreciation / Depreciacion	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594
Interest Expense / Gastos de interes'	9,652,856	9,563,657	9,467,545	9,363,985	9,252,398	9,132,163	9,002,611	8,863,017	8,712,606	8,550,537
Subtotal Expenses / Subtotal gastos	30,664,485	31,695,376	33,159,101	33,301,228	33,214,322	33,119,545	33,016,253	32,903,747	32,781,277	32,648,031
Net Income / Renta neta	(11,922,286)	(7,352,726)	(1,017,264)	69,046	279,356	501,423	736,015	983,959	1,246,136	1,523,496
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	-	-	-	-	-	-	-	-	-	-
Total current assets / Total activos corrientes	-	-	-	-	-	-	-	-	-	-
FIXED ASSETS / ACTIVOS FIJOS										
Land / Terrenos	-	-	-	-	-	-	-	-	-	-
Improvements / Mejors	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885
Accumulated depreciation / depreciacion acumulado	(8,631,594)	(17,263,189)	(25,894,783)	(34,526,377)	(43,157,971)	(51,789,566)	(60,421,160)	(69,052,754)	(77,684,348)	(86,315,943)
Net book value / Valor contable neto	164,000,291	155,368,697	146,737,102	138,105,508	129,473,914	120,842,320	112,210,725	103,579,131	94,947,537	86,315,943
Total Land and Improvements / Total terrenos y mejoras	164,000,291	155,368,697	146,737,102	138,105,508	129,473,914	120,842,320	112,210,725	103,579,131	94,947,537	86,315,943
TOTAL ASSETS / TOTAL ACTIVOS	164,000,291	155,368,697	146,737,102	138,105,508	129,473,914	120,842,320	112,210,725	103,579,131	94,947,537	86,315,943
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	-	-	-	-			-	-	-	-
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	123,402,029	122,161,874	120,825,607	119,385,780	117,834,366	116,162,717	114,361,515	112,420,720	110,329,514	108,076,239
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900
Retained earnings / Ganancias conservadas	(7,480,638)	(14,872,078)	(22,167,405)	(29,359,172)	(36,439,352)	(43,399,297)	(50,229,690)	(56,920,489)	(63,460,877)	(69,839,197)
Private sector equity / Patrimonio sector privado	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	40,598,262	33,206,822	25,911,495	18,719,728	11,639,548	4,679,603	(2,150,790)	(8,841,589)	(15,381,977)	(21,760,297)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	164,000,291	155,368,697	146,737,102	138,105,508	129,473,914	120,842,320	112,210,725	103,579,131	94,947,537	86,315,943
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	($11,922,286)	($7,352,726)	($1,017,264)	$69,046	$279,356	$501,423	$736,015	$983,959	$1,246,136	$1,523,496
Payout to owners / Desembolsos a propietarios	(4,441,647)	38,713	6,278,063	7,260,813	7,359,536	7,461,368	7,566,408	7,674,758	7,786,524	7,901,815
Change in retained earnings / Cambios en ganancias conservadas	(7,480,638)	(7,391,439)	(7,295,327)	(7,191,767)	(7,080,180)	(6,959,945)	(6,830,393)	(6,690,799)	(6,540,388)	(6,378,319)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$6,362,165	$10,842,525	$17,081,875	$18,064,625	$18,163,348	$18,265,180	$18,370,220	$18,478,570	$18,590,336	$18,705,627
Total Sources / Total Fuentes	6,362,165	10,842,525	17,081,875	18,064,625	18,163,348	18,265,180	18,370,220	18,478,570	18,590,336	18,705,627
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	9,652,856	9,563,657	9,467,545	9,363,985	9,252,398	9,132,163	9,002,611	8,863,017	8,712,606	8,550,537
Repayment of debt / Reembolso de deuda	1,150,956	1,240,155	1,336,267	1,439,828	1,551,414	1,671,649	1,801,202	1,940,795	2,091,206	2,253,275
Total Uses / Total Usos	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	(4,441,647)	38,713	6,278,063	7,260,813	7,359,536	7,461,368	7,566,408	7,674,758	7,786,524	7,901,815
Payout to owners (pay-in) / Desembolso a propietarios	(4,441,647)	38,713	6,278,063	7,260,813	7,359,536	7,461,368	7,566,408	7,674,758	7,786,524	7,901,815
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

Table 3.8-6 presents the pro forma income statement, balance sheet, statement of changes in retained earnings and statement of changes in financial position for Alternative 1A Phase 2 Pier 7B Aggregates and Inorganic Products Terminal. Referring to the table, net income is projected to be negative for the first 3 years, but the project would generate a positive cash flow by the second year, increasing to about $7,901,000 in year 10 and about $9,103,000 in year 20.

TABLE 3.8-6b: SUMMARY OF PRO FORMA FINANCIALS, YEARS 11-20

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos
(USD)

	Year / Año									
PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
REVENUES / INGRESOS										
Dockage / Estadia	0	0	0	0	0	0	0	0	0	0
Wharfage / Muellaje	0	0	0	0	0	0	0	0	0	0
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	34,305,872	34,444,046	34,586,158	34,732,323	34,882,658	35,037,283	35,196,321	35,354,705	35,513,801	35,673,613
Subtotal: Revenues from operations / ingresos de operaciones	34,305,872	34,444,046	34,586,158	34,732,323	34,882,658	35,037,283	35,196,321	35,354,705	35,513,801	35,673,613
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	6,861,174	6,888,809	6,917,232	6,946,465	6,976,532	7,007,457	7,039,264	7,070,941	7,102,760	7,134,723
Maintenance / Mantenimiento	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594
Depreciation / Depreciacion	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594	8,631,594
Interest Expense / Gastos de interes'	8,375,909	8,187,746	7,985,001	7,766,543	7,531,155	7,277,524	7,004,236	6,709,769	6,392,481	6,050,603
Subtotal Expenses / Subtotal gastos	32,500,271	32,339,744	32,165,421	31,976,196	31,770,875	31,548,169	31,306,689	31,043,899	30,758,430	30,448,514
Net Income / Renta neta	1,805,601	2,104,302	2,420,737	2,756,127	3,111,784	3,489,114	3,889,632	4,310,806	4,755,371	5,225,099
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	-	-	-	-	-	-	-	-	-	-
Total current assets / Total activos corrientes	-	-	-	-	-	-	-	-	-	-
FIXED ASSETS / ACTIVOS FIJOS										
Land	-	-	-	-	-	-	-	-	-	-
Improvements	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885	172,631,885
Accumulated depreciation / depreciacion acumulado	(94,947,537)	(103,579,131)	(112,210,725)	(120,842,320)	(129,473,914)	(138,105,508)	(146,737,102)	(155,368,697)	(164,000,291)	(172,631,885)
Net book value / Valor contable neto	77,684,348	69,052,754	60,421,160	51,789,566	43,157,971	34,526,377	25,894,783	17,263,189	8,631,594	-
Total Land and Improvements	77,684,348	69,052,754	60,421,160	51,789,566	43,157,971	34,526,377	25,894,783	17,263,189	8,631,594	-
TOTAL ASSETS / TOTAL ACTIVOS	77,684,348	69,052,754	60,421,160	51,789,566	43,157,971	34,526,377	25,894,783	17,263,189	8,631,594	-
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO										
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	105,648,335	103,032,269	100,213,458	97,176,189	93,903,531	90,377,243	86,577,667	82,483,624	78,072,292	73,319,083
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900	48,078,900
Retained earnings / Ganancias conservadas	(76,042,887)	(82,058,415)	(87,871,198)	(93,465,523)	(98,824,460)	(103,929,766)	(108,761,784)	(113,299,335)	(117,519,598)	(121,397,983)
Private sector equity	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	(27,963,987)	(33,979,515)	(39,792,298)	(45,386,623)	(50,745,560)	(55,850,866)	(60,682,884)	(65,220,435)	(69,440,698)	(73,319,083)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	77,684,348	69,052,754	60,421,160	51,789,566	43,157,971	34,526,377	25,894,783	17,263,189	8,631,594	-
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	$1,805,601	$2,104,302	$2,420,737	$2,756,127	$3,111,784	$3,489,114	$3,889,632	$4,310,806	$4,755,371	$5,225,099
Payout to owners / Desembolsos a propietarios	8,009,291	8,119,830	8,233,520	8,350,452	8,470,720	8,594,420	8,721,650	8,848,357	8,975,634	9,103,484
Change in retained earnings / Cambios en ganancias conservadas	(6,203,691)	(6,015,528)	(5,812,783)	(5,594,325)	(5,358,937)	(5,105,306)	(4,832,018)	(4,537,551)	(4,220,263)	(3,878,385)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$18,813,103	$18,923,642	$19,037,332	$19,154,265	$19,274,532	$19,398,232	$19,525,463	$19,652,169	$19,779,446	$19,907,296
Total Sources / Total Fuentes	18,813,103	18,923,642	19,037,332	19,154,265	19,274,532	19,398,232	19,525,463	19,652,169	19,779,446	19,907,296
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	8,375,909	8,187,746	7,985,001	7,766,543	7,531,155	7,277,524	7,004,236	6,709,769	6,392,481	6,050,603
Repayment of debt / Reembolso de deuda	2,427,904	2,616,066	2,818,811	3,037,269	3,272,658	3,526,289	3,799,576	4,094,043	4,411,331	4,753,210
Total Uses / Total Usos	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812	10,803,812
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USC	8,009,291	8,119,830	8,233,520	8,350,452	8,470,720	8,594,420	8,721,650	8,848,357	8,975,634	9,103,484
Payout to owners (pay-in) / Desembolso a propietarios	8,009,291	8,119,830	8,233,520	8,350,452	8,470,720	8,594,420	8,721,650	8,848,357	8,975,634	9,103,484
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

TABLE 3.8-7: SUMMARY OF RATES OF RETURN AND FINANCIAL RATIOS

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos

IRR's / TIR	
Debt / Deuda	7.75%
Equity / Patrimonio	9.64%
Total	8.35%

NET PRESENT VALUE OVER 20 YRS @ / VALOR NETO ACTUAL SOBRE 20 AÑOS		4.00%
Debt / Deuda	USD	55,179,206
Equity / Patrimonio	USD	37,909,174
Total	USD	93,088,380

DEBT SERVICE COVERAGE / COBERTURA DE SERVICIO DE

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Debt service coverage ratio / Coeficiente de servicio de deuda	0.59	1.00	1.58	1.67	1.68	1.69	1.70	1.71	1.72	1.73

Year	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Debt service coverage ratio / Coeficiente de servicio de deuda	1.74	1.75	1.76	1.77	1.78	1.80	1.81	1.82	1.83	1.84

Debt service coverage for first 5 years / Cobertura de deuda para los primeros 5 años

Cash from operations / Caja de operaciones	USD	70,514,538
Debt service / Servicio de deuda	USD	54,019,061
Debt service coverage ratio / Coeficiente de servicio de deuda		1.31

Table 3.8-7 presents a summary of the rates of return and financial ratios for Alternative 1A Phase 2 Pier 7B Aggregates and Inorganic Products Terminal. Referring to the table, the project is project to provide a return on equity of 9.64%, a net present value over 20 years at 4% of approximately $93,088,000 and a debt coverage ratio over the first 5 years of 1.31.

TABLE 3.8-8: INVESTMENT COST ESTIMATES

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria

Alternative / Alternativa 1A
Berths without Equipment or Storage / Muelles sin Equipo o Almacenamiento
INVESTMENT COST ESTIMATES / COSTOS ESTIMADOS

	USD		Total
	Phase 1 / Fase 1: Pier / Espigon 7A	Phase 2 / Fase 2: Pier / Espigon 7B	
1 Dredging / Dragado	3,796,000	8,138,000	11,934,000
2 Wharf structure / Estructura muelle	23,400,000	47,813,000	71,213,000
3 Wharf outfitting / Equipamiento del muelle	2,692,000	4,400,000	7,092,000
4 Trestle structure / Estructura de vigas	1,050,000	2,363,000	3,413,000
5 Landfill compaction / Compactamiento de relleno	298,000	149,000	447,000
6 Slope protection / Protección pendiente	109,000	-	109,000
7 Subtotal	31,345,000	62,863,000	94,208,000
8 Equipment and storage / Equipo y almacenamiento	-	-	-
9 Total	31,345,000	62,863,000	94,208,000

Source: DMJM Harris estimates

Table 3.8-8 summarizes the investment cost estimates for Alternative 1, Phase 1 (Pier 7A Organic Products Terminal) and Phase 2 (Pier 7B Aggregates and Inorganic Products Terminal) excluding equipment and storage. These phases may be built together or sequentially, depending on available resources and requirements. Referring to the table, the investment cost for Phase 1 is $31,345,000 for the wharf and dredging. The investment cost for Phase 2 is $62,863,000 for the wharf and dredging. The total investment cost for both phases, including both Pier 7A Organic Products Terminal and Pier 7B Aggregates and Inorganic Products Terminal), is $94,208,000 excluding equipment and storage.

Assumptions

The following financing assumptions were utilized in the financial analysis:

Financing	
Debt as a percent of total capital	70%
Interest rate on debt	7.75% per year
Term	30 years
Depreciation	20 years straight line
Payout to owners	100% of free cash flow
Operating and maintenance costs	
Operating costs	20 percent of revenues
Maintenance costs	20 percent of fixed assets

The 2008 tariff factors utilized include:

Dockage	
Time slot	USD per hour per m of vessel length
Midnight to 6:00 am	USD 0.60
6:00 am to noon	USD 0.85
Noon to midnight	USD 1.10
Wharfage	
Unloading	HNL 12.00 per metric ton, equivalent to USD 0.63 per metric ton at an exchange

rate of HNL 18.95 per USD

Loading HNL 6.00 per metric ton, equivalent to USD 0.32 per metric ton at the same exchange rate.

Table 3.8-9: Vessel and Cargo Factors, Estimated Wharfage and Dockage at 2008 rates (USD)

	Organics	Inorganics Aggregates	Fertilizers	Coal and minerals	Weighted Average
Cargo per vessel (tons)	12,449	54,795	11,115	23,025	NA
Vessel size (dwt)	20,000	63,690	20,000	30,000	NA
Vessel length (m)	142	225	142	173.6	NA
Cargo handling rate (tpd)	8,700-9,200	34,500-36,300	10,000	10,000-12,000	NA
Dockage (USD per ton)	USD 0.35	USD 0.13	USD 0.35	USD 0.26	USD 0.15
Wharfage (USD per ton)	USD 0.63	USD 0.32	USD 0.63	USD 0.63	USD 0.37

Table 3.8-9 summarizes the average tariff levels by type of cargo, based on the actual 2008 tariff for the Port of Cortés, together with the 2016 forecasts for vessels and cargo. Referring to the table, the dockage charge would be forecasted to yield an average of $0.35 per ton of cargo for organics, while the wharfage charge would be forecast to yield an average of $0.63 per ton of cargo. The dockage charge would yield an average of $0.15 per ton of cargo for aggregates and inorganics, while the wharfage charge would be expected to yield an average of $0.37 per ton. It should be noted that the dockage and wharfage revenue is not necessarily incremental revenue, associated with the investment in improved facilities, except to the extent that the improved facilities permit the port to handle additional cargo. In addition, the dockage revenue may actually be reduced by improved facilities if, as anticipated, vessels are turned around faster due to improved cargo handling.

The average or all-inclusive tariff rates required to provide return on equity of approximately 9.5% a year based on the aforementioned costs and financing assumptions for the facility excluding equipment and storage exceed the current tariff levels in 2008. For purposes of the financial analysis, such rates could be average or all-inclusive rates, and could be obtained from individual charges, from a combination of various charges and could vary among the constituent cargoes or be uniform across the board, without changing the results. The required rate for organic products is based on an estimated yield of $0.35 per ton of cargo for dockage and $0.63 per ton of cargo for wharfage or a total of $0.98 per ton of cargo from combined wharfage and dockage, based on the present level of tariffs, plus additional revenues of $4.04 per ton of cargo required to achieve the indicated rate of return on equity. The required rate for aggregates and inorganic products is based on an estimated yield of $0.15 per ton of cargo for dockage and $0.37 per ton of cargo for wharfage or a total of $0.52 per ton of cargo from combined wharfage and dockage, based on the present level of tariffs, plus additional revenues of $2.35 per ton of cargo required to achieve the indicated return on equity. The rationale for incremental charges is to recover the capital investment and operating expenses associated with the improved facilities, while sharing the cost savings which would be obtained by shippers due to the more efficient handling and faster vessel turnaround.

Revenue rates
Organic products $5.02 per ton
Aggregates and inorganic products $2.87 per ton

It should be noted that the required rates indicated above are for the berth, and do not cover equipment and storage. The required rates to cover the overall terminal were described previously.

TABLE 3.8-10a: SUMMARY OF PRO FORMA FINANCIALS, YEARS 1-10
CUADRO 3.8-10a: RESUMEN DE LOS ESTADOS FINANCIEROS PRO FORMA, AÑOS 1-10

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Organic Products Terminal / Terminal de Productos Orgánicos - Berth without Equipment and Storage / Muelle sin Equipo o Almacenamiento
USD

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 1	2	3	4	5	6	7	8	9	10
REVENUES / INGRESOS										
Dockage / Estadia	371,148	381,770	392,696	403,937	415,500	427,396	439,633	452,223	465,173	478,496
Wharfage / Muellaje	668,066	687,185	706,853	727,086	747,901	769,313	791,340	814,001	837,312	861,294
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	4,284,107	4,406,712	4,532,837	4,662,586	4,796,061	4,933,371	5,074,626	5,219,940	5,369,430	5,523,216
Subtotal: Revenues from operations / ingresos de operaciones	5,323,321	5,475,666	5,632,387	5,793,609	5,959,462	6,130,080	6,305,600	6,486,163	6,671,915	6,863,006
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	1,064,664	1,095,133	1,126,477	1,158,722	1,191,892	1,226,016	1,261,120	1,297,233	1,334,383	1,372,601
Maintenance / Mantenimiento	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886
Depreciation / Depreciacion	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886
Interest Expense / Gastos de Interes'	1,974,252	1,956,008	1,936,351	1,915,170	1,892,348	1,867,757	1,841,260	1,812,710	1,781,947	1,748,800
Subtotal Expenses / Subtotal gastos	6,526,688	6,538,914	6,550,600	6,561,664	6,572,012	6,581,545	6,590,152	6,597,714	6,604,102	6,609,173
Net Income / Renta neta	(1,203,367)	(1,054,094)	(909,060)	(758,902)	(603,397)	(442,312)	(275,399)	(102,398)	76,967	262,986
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120
Total current assets / Total activos corrientes	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120
FIXED ASSETS / ACTIVOS FIJOS										
Land / Terrenos	-	-	-	-	-	-	-	-	-	-
Improvements / Mejors	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719
Accumulated depreciation / depreciacion acumulado	(1,743,886)	(3,487,772)	(5,231,658)	(6,975,544)	(8,719,430)	(10,463,316)	(12,207,202)	(13,951,087)	(15,694,973)	(17,438,859)
Net book value / Valor contable neto	33,133,833	31,389,947	29,646,061	27,902,175	26,158,289	24,414,403	22,670,517	20,926,631	19,182,745	17,438,859
Total Land and Improvements / Total terrenos y mejoras	33,133,833	31,389,947	29,646,061	27,902,175	26,158,289	24,414,403	22,670,517	20,926,631	19,182,745	17,438,859
TOTAL ASSETS / TOTAL ACTIVOS	33,438,952	31,695,067	29,951,181	28,207,295	26,463,409	24,719,523	22,975,637	21,231,751	19,487,865	17,743,979
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	-	-	-	-			-	-	-	-
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	25,238,819	24,985,176	24,711,876	24,417,395	24,100,092	23,758,198	23,389,807	22,992,865	22,565,161	22,104,310
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500
Retained earnings / Ganancias conservadas	(1,203,367)	(2,693,610)	(4,164,196)	(5,613,600)	(7,040,183)	(8,442,175)	(9,817,670)	(11,164,614)	(12,480,796)	(13,763,831)
Private sector equity / Patrimonio sector privado	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	8,200,133	6,709,890	5,239,304	3,789,900	2,363,317	961,325	(414,170)	(1,761,114)	(3,077,296)	(4,360,331)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	33,438,952	31,695,067	29,951,181	28,207,295	26,463,409	24,719,523	22,975,637	21,231,751	19,487,865	17,743,979
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	($1,203,367)	($1,054,094)	($909,060)	($758,902)	($603,397)	($442,312)	($275,399)	($102,398)	$76,967	$262,986
Payout to owners / Desembolsos a propietarios	0	436,149	561,526	690,503	823,186	959,680	1,100,096	1,244,547	1,393,148	1,546,021
Change in retained earnings / Cambios en ganancias conservadas	(1,203,367)	(1,490,243)	(1,470,586)	(1,449,405)	(1,426,583)	(1,401,992)	(1,375,495)	(1,346,945)	(1,316,182)	(1,283,035)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$2,514,771	$2,636,647	$2,762,024	$2,891,001	$3,023,684	$3,160,178	$3,300,594	$3,445,044	$3,593,646	$3,746,519
Total Sources / Total Fuentes	2,514,771	2,645,801	2,771,177	2,900,155	3,032,837	3,169,331	3,309,747	3,454,198	3,602,800	3,755,672
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	1,974,252	1,956,008	1,936,351	1,915,170	1,892,348	1,867,757	1,841,260	1,812,710	1,781,947	1,748,800
Repayment of debt / Reembolso de deuda	235,399	253,643	273,300	294,481	317,303	341,894	368,391	396,941	427,704	460,851
Total Uses / Total Usos	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	305,120	436,149	561,526	690,503	823,186	959,680	1,100,096	1,244,547	1,393,148	1,546,021
Payout to owners (pay-in) / Desembolso a propietarios	0	436,149	561,526	690,503	823,186	959,680	1,100,096	1,244,547	1,393,148	1,546,021
Net increase in working capital / Aumento neto en capital circulante	305,120	0	0	0	0	0	0	0	0	0

Table 3.8-10 presents the pro forma income statement, balance sheet, statement of changes in retained earnings and statement of changes in financial position for Alternative 1A Phase 1 Pier 7A Organic Products Terminal, excluding equipment and storage. It should be noted that, while the costs and revenues associated with equipment and storage are excluded from this financial analysis, it is assumed that the required equipment and storage are developed at the terminal. Referring to the table, net income is projected to be negative until year 9, but the project would generate a positive cash flow of about $305,120 in the first year, increasing to about $1,546,021 in year 10 and about $3,122,910 in year 20.

TABLE 3.8-10b: SUMMARY OF PRO FORMA FINANCIALS, YEARS 11-20

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Organic Products Terminal / Terminal de Productos Orgánicos - Berth without Equipment and Storage / Muelle sin Equipo o Almacenamiento
USD

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 11	12	13	14	15	16	17	18	19	20
REVENUES / INGRESOS										
Dockage / Estadía	490,845	503,512	516,508	529,841	543,519	557,551	571,947	586,246	600,902	615,925
Wharfage / Muellaje	883,520	906,322	929,715	953,714	978,334	1,003,592	1,029,505	1,055,242	1,081,624	1,108,664
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	5,665,748	5,811,972	5,961,982	6,115,878	6,273,761	6,435,734	6,601,904	6,766,952	6,936,126	7,109,529
Subtotal: Revenues from operations / ingresos de operaciones	7,040,113	7,221,806	7,408,206	7,599,433	7,795,614	7,996,878	8,203,356	8,408,440	8,618,651	8,834,117
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	1,408,023	1,444,361	1,481,641	1,519,887	1,559,123	1,599,376	1,640,671	1,681,688	1,723,730	1,766,823
Maintenance / Mantenimiento	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886
Depreciation / Depreciacion	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886	1,743,886
Interest Expense / Gastos de interes'	1,713,084	1,674,600	1,633,134	1,588,453	1,540,311	1,488,437	1,432,543	1,372,317	1,307,423	1,237,500
Subtotal Expenses / Subtotal gastos	6,608,878	6,606,733	6,602,547	6,596,112	6,587,205	6,575,584	6,560,986	6,541,776	6,518,925	6,492,096
Net Income / Renta neta	440,388	624,227	814,813	1,012,475	1,217,563	1,430,447	1,651,524	1,875,817	2,108,880	2,351,175
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120
Total current assets / Total activos corrientes	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120	305,120
FIXED ASSETS / ACTIVOS FIJOS										
Land	-	-	-	-	-	-	-	-	-	-
Improvements	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719	34,877,719
Accumulated depreciation / depreciacion acumulado	(19,182,745)	(20,926,631)	(22,670,517)	(24,414,403)	(26,158,289)	(27,902,175)	(29,646,061)	(31,389,947)	(33,133,833)	(34,877,719)
Net book value / Valor contable neto	15,694,973	13,951,087	12,207,202	10,463,316	8,719,430	6,975,544	5,231,658	3,487,772	1,743,886	-
Total Land and Improvements	15,694,973	13,951,087	12,207,202	10,463,316	8,719,430	6,975,544	5,231,658	3,487,772	1,743,886	-
TOTAL ASSETS / TOTAL ACTIVOS	16,000,093	14,256,207	12,512,321	10,768,435	9,024,549	7,280,663	5,536,778	3,792,892	2,049,006	305,120
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO										
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	21,607,742	21,072,691	20,496,173	19,874,975	19,205,634	18,484,420	17,707,311	16,869,976	15,967,748	14,995,597
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500	9,403,500
Retained earnings / Ganancias conservadas	(15,011,149)	(16,219,984)	(17,387,352)	(18,510,040)	(19,584,585)	(20,607,256)	(21,574,033)	(22,480,584)	(23,322,242)	(24,093,977)
Private sector equity	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	(5,607,649)	(6,816,484)	(7,983,852)	(9,106,540)	(10,181,085)	(11,203,756)	(12,170,533)	(13,077,084)	(13,918,742)	(14,690,477)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	16,000,093	14,256,207	12,512,321	10,768,435	9,024,549	7,280,663	5,536,778	3,792,892	2,049,006	305,120
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	$440,388	$624,227	$814,813	$1,012,475	$1,217,563	$1,430,447	$1,651,524	$1,875,817	$2,108,880	$2,351,175
Payout to owners / Desembolsos a propietarios	1,687,706	1,833,061	1,982,181	2,135,163	2,292,108	2,453,119	2,618,301	2,782,368	2,950,537	3,122,910
Change in retained earnings / Cambios en ganancias conservadas	(1,247,319)	(1,208,835)	(1,167,368)	(1,122,688)	(1,074,545)	(1,022,671)	(966,777)	(906,551)	(841,658)	(771,735)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$3,888,204	$4,033,559	$4,182,678	$4,335,660	$4,492,605	$4,653,616	$4,818,799	$4,982,866	$5,151,035	$5,323,408
Total Sources / Total Fuentes	3,897,358	4,042,713	4,191,832	4,344,814	4,501,759	4,662,770	4,827,953	4,992,020	5,160,189	5,332,562
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	1,713,084	1,674,600	1,633,134	1,588,453	1,540,311	1,488,437	1,432,543	1,372,317	1,307,423	1,237,500
Repayment of debt / Reembolso de deuda	496,567	535,051	576,518	621,198	669,341	721,215	777,109	837,335	902,228	972,151
Total Uses / Total Usos	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651	2,209,651
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	1,687,706	1,833,061	1,982,181	2,135,163	2,292,108	2,453,119	2,618,301	2,782,368	2,950,537	3,122,910
Payout to owners (pay-in) / Desembolso a propietarios	1,687,706	1,833,061	1,982,181	2,135,163	2,292,108	2,453,119	2,618,301	2,782,368	2,950,537	3,122,910
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

TABLE 3.8-11: SUMMARY OF RATES OF RETURN AND FINANCIAL RATIOS

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Organic Products Terminal / Terminal de Productos Orgánicos - Berth without Equipment and Storage / Muelle sin Equipo o Almacenamiento

IRR's / TIR	
Debt / Deuda	7.75%
Equity / Patrimonio	9.69%
Total	8.41%

NET PRESENT VALUE OVER 20 YRS @ / VALOR NETO ACTUAL SOBRE 20 AÑOS		4.00%
Debt / Deuda	USD	11,752,178
Equity / Patrimonio	USD	9,333,813
Total	USD	21,085,992

DEBT SERVICE COVERAGE / COBERTURA DE SERVICIO DE DEUDA

Year	1	2	3	4	5	6	7	8	9	10
Debt service coverage ratio / Coeficiente de servicio de deuda	1.14	1.19	1.25	1.31	1.37	1.43	1.49	1.56	1.63	1.70

Year	11	12	13	14	15	16	17	18	19	20
Debt service coverage ratio / Coeficiente de servicio de deuda	1.76	1.83	1.89	1.96	2.03	2.11	2.18	2.26	2.33	2.41

Debt service coverage for first 5 years / Cobertura de deuda para los primeros 5 años		
Cash from operations / Caja de operaciones	USD	13,828,127
Debt service / Servicio de deuda	USD	11,048,257
Debt service coverage ratio / Coeficiente de servicio de deuda		1.25

Table 3.8-11 presents a summary of the rates of return for Alternative 1A Phase 1 Pier 7A Organic Products Terminal excluding equipment and storage. Referring to the table, the project would provide a return on equity of 9.69%, a net present value over 20 years at 4% per year of approximately $21,085,992 and a debt service coverage ratio for the first 5 years of 1.25.

TABLE 3.8-12a: SUMMARY OF PRO FORMA FINANCIALS, YEARS 1-10
CUADRO 3.8-12a: RESUMEN DE LOS ESTADOS FINANCIEROS PRO FORMA, AÑOS 1-10

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos - Berth without Equipment and Storage
(USD)

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 1	2	3	4	5	6	7	8	9	10
REVENUES / INGRESOS										
Dockage / Estadía	401,619	521,628	688,754	715,077	717,722	720,449	723,263	726,165	729,159	732,247
Wharfage / Muellaje	990,659	1,286,683	1,698,926	1,763,857	1,770,380	1,777,108	1,784,048	1,791,207	1,798,592	1,806,209
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	6,292,024	8,172,175	10,790,474	11,202,878	11,244,306	11,287,039	11,331,118	11,376,587	11,423,489	11,471,870
Subtotal: Revenues from operations / ingresos de operaciones	7,684,301	9,980,486	13,178,153	13,681,813	13,732,408	13,784,597	13,838,430	13,893,959	13,951,239	14,010,326
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	1,536,860	1,996,097	2,635,631	2,736,363	2,746,482	2,756,919	2,767,686	2,778,792	2,790,248	2,802,065
Maintenance / Mantenimiento	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397
Depreciation / Depreciacion	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397
Interest Expense / Gastos de interes'	3,959,400	3,922,813	3,883,389	3,840,911	3,795,141	3,745,823	3,692,683	3,635,425	3,573,729	3,507,252
Subtotal Expenses / Subtotal gastos	12,491,054	12,913,703	13,513,814	13,572,067	13,536,416	13,497,536	13,455,162	13,409,010	13,358,770	13,304,111
Net Income / Renta neta	(4,806,753)	(2,933,217)	(335,661)	109,745	195,992	287,061	383,267	484,949	592,469	706,215
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	-	-	-	-	-	-	-	-	-	-
Total current assets / Total activos corrientes	-	-	-	-	-	-	-	-	-	-
FIXED ASSETS / ACTIVOS FIJOS										
Land / Terrenos	-	-	-	-	-	-	-	-	-	-
Improvements / Mejors	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935
Accumulated depreciation / depreciacion acumulado	(3,497,397)	(6,994,794)	(10,492,190)	(13,989,587)	(17,486,984)	(20,984,381)	(24,481,777)	(27,979,174)	(31,476,571)	(34,973,968)
Net book value / Valor contable neto	66,450,538	62,953,142	59,455,745	55,958,348	52,460,951	48,963,555	45,466,158	41,968,761	38,471,364	34,973,968
Total Land and Improvements / Total terrenos y mejoras	66,450,538	62,953,142	59,455,745	55,958,348	52,460,951	48,963,555	45,466,158	41,968,761	38,471,364	34,973,968
TOTAL ASSETS / TOTAL ACTIVOS	66,450,538	62,953,142	59,455,745	55,958,348	52,460,951	48,963,555	45,466,158	41,968,761	38,471,364	34,973,968
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	-	-	-	-			-	-	-	-
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	50,616,937	50,108,251	49,560,143	48,969,555	48,333,198	47,647,522	46,908,707	46,112,633	45,254,864	44,330,618
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900
Retained earnings / Ganancias conservadas	(3,025,299)	(6,014,010)	(8,963,298)	(11,870,107)	(14,731,146)	(17,542,868)	(20,301,449)	(23,002,772)	(25,642,400)	(28,215,550)
Private sector equity / Patrimonio sector privado	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	15,833,601	12,844,890	9,895,602	6,988,793	4,127,754	1,316,032	(1,442,549)	(4,143,872)	(6,783,500)	(9,356,650)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	66,450,538	62,953,142	59,455,745	55,958,348	52,460,951	48,963,555	45,466,158	41,968,761	38,471,364	34,973,968
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	($4,806,753)	($2,933,217)	($335,661)	$109,745	$195,992	$287,061	$383,267	$484,949	$592,469	$706,215
Payout to owners / Desembolsos a propietarios	(1,781,454)	55,494	2,613,627	3,016,555	3,057,031	3,098,782	3,141,849	3,186,272	3,232,097	3,279,366
Change in retained earnings / Cambios en ganancias conservadas	(3,025,299)	(2,988,711)	(2,949,288)	(2,906,810)	(2,861,039)	(2,811,721)	(2,758,581)	(2,701,323)	(2,639,628)	(2,573,150)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$2,650,044	$4,486,992	$7,045,126	$7,448,053	$7,488,530	$7,530,281	$7,573,347	$7,617,771	$7,663,595	$7,710,864
Total Sources / Total Fuentes	2,650,044	4,486,992	7,045,126	7,448,053	7,488,530	7,530,281	7,573,347	7,617,771	7,663,595	7,710,864
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	3,959,400	3,922,813	3,883,389	3,840,911	3,795,141	3,745,823	3,692,683	3,635,425	3,573,729	3,507,252
Repayment of debt / Reembolso de deuda	472,098	508,686	548,109	590,587	636,358	685,675	738,815	796,074	857,769	924,246
Total Uses / Total Usos	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USC	(1,781,454)	55,494	2,613,627	3,016,555	3,057,031	3,098,782	3,141,849	3,186,272	3,232,097	3,279,366
Payout to owners (pay-in) / Desembolso a propietarios	(1,781,454)	55,494	2,613,627	3,016,555	3,057,031	3,098,782	3,141,849	3,186,272	3,232,097	3,279,366
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

Table 3.8-12 presents the pro forma income statement, balance sheet, statement of changes in retained earnings and statement of changes in financial position for Alternative 1A Phase 2 Pier 7B Aggregates and Inorganic Products Terminal excluding equipment and storage. It should be noted that, while the costs and revenues associated with equipment and storage are excluded from this financial analysis, it is assumed that the required equipment and storage are developed at the terminal. Referring to the table, net income is projected to be negative for the first 3 years, but the project would generate a positive cash flow by the second year, increasing to about $3,279,366 in year 10 and about $3,772,050 in year 20.

TABLE 3.8-12b: SUMMARY OF PRO FORMA FINANCIALS, YEARS 11-20

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos - Berth without Equipment and Storage
(USD)

PRO FORMA INCOME STATEMENT / DECLARACIÓN DE RENTA PRO FORMA	Year / Año 11	12	13	14	15	16	17	18	19	20
REVENUES / INGRESOS										
Dockage / Estadia	735,126	738,087	741,132	744,264	747,486	750,799	754,207	757,601	761,010	764,435
Wharfage / Muellaje	1,813,310	1,820,614	1,828,126	1,835,851	1,843,798	1,851,971	1,860,377	1,868,749	1,877,158	1,885,605
Land rent / Alquiler de terrenos	0	0	0	0	0	0	0	0	0	0
Crane and other equipment rental / Alquiler de grúas y otro equipo	0	0	0	0	0	0	0	0	0	0
Cargo and ship charges / Cargos a carga y naves	11,516,971	11,563,358	11,611,067	11,660,137	11,710,607	11,762,516	11,815,908	11,869,079	11,922,490	11,976,141
Subtotal: Revenues from operations / ingresos de operaciones	14,065,408	14,122,059	14,180,325	14,240,253	14,301,890	14,365,286	14,430,492	14,495,429	14,560,658	14,626,181
EXPENSES / GASTOS										
Operating expenses / Gastos de operacion	2,813,082	2,824,412	2,836,065	2,848,051	2,860,378	2,873,057	2,886,098	2,899,086	2,912,132	2,925,236
Maintenance / Mantenimiento	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397
Depreciation / Depreciacion	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397	3,497,397
Interest Expense / Gastos de interes'	3,435,623	3,358,443	3,275,281	3,185,674	3,089,122	2,985,088	2,872,992	2,752,207	2,622,062	2,481,831
Subtotal Expenses / Subtotal gastos	13,243,498	13,177,648	13,106,139	13,028,518	12,944,294	12,852,939	12,753,883	12,646,087	12,528,987	12,401,861
Net Income / Renta neta	821,910	944,411	1,074,186	1,211,735	1,357,596	1,512,347	1,676,608	1,849,342	2,031,671	2,224,321
PRO FORMA BALANCE SHEET / BALANCE PRO FORMA										
ASSETS / ACTIVOS										
CURRENT ASSETS / ACTIVOS CORRIENTES										
Cash and investments / Efectivo e inversiones	-	-	-	-	-	-	-	-	-	-
Total current assets / Total activos corrientes	-	-	-	-	-	-	-	-	-	-
FIXED ASSETS / ACTIVOS FIJOS										
Land	-	-	-	-	-	-	-	-	-	-
Improvements	-	-	-	-	-	-	-	-	-	-
Original book value / Valor contable original	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935	69,947,935
Accumulated depreciation / depreciacion acumulado	(38,471,364)	(41,968,761)	(45,466,158)	(48,963,555)	(52,460,951)	(55,958,348)	(59,455,745)	(62,953,142)	(66,450,538)	(69,947,935)
Net book value / Valor contable neto	31,476,571	27,979,174	24,481,777	20,984,381	17,486,984	13,989,587	10,492,190	6,994,794	3,497,397	-
Total Land and Improvements	31,476,571	27,979,174	24,481,777	20,984,381	17,486,984	13,989,587	10,492,190	6,994,794	3,497,397	-
TOTAL ASSETS / TOTAL ACTIVOS	31,476,571	27,979,174	24,481,777	20,984,381	17,486,984	13,989,587	10,492,190	6,994,794	3,497,397	-
LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO										
LIABILITIES / PASIVOS										
Book value of debt / Valor contable de deuda	43,334,742	42,261,687	41,105,469	39,859,645	38,517,269	37,070,859	35,512,352	33,833,061	32,023,625	30,073,958
EQUITY / PATRIMONIO										
Original equity / Patrimonio original	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900	18,858,900
Retained earnings / Ganancias conservadas	(30,717,072)	(33,141,413)	(35,482,592)	(37,734,164)	(39,889,185)	(41,940,172)	(43,879,062)	(45,697,168)	(47,385,128)	(48,932,858)
Private sector equity	-	-	-	-	-	-	-	-	-	-
Total equity / Patrimonio	(11,858,172)	(14,282,513)	(16,623,692)	(18,875,264)	(21,030,285)	(23,081,272)	(25,020,162)	(26,838,268)	(28,526,228)	(30,073,958)
TOTAL LIABILITIES & EQUITY / TOTAL PASIVOS Y PATRIMONIO	31,476,571	27,979,174	24,481,777	20,984,381	17,486,984	13,989,587	10,492,190	6,994,794	3,497,397	-
PRO FORMA STATEMENT OF CHANGES IN RETAINED EARNINGS / DECLARACIÓN PRO FORMA DE CAMBIOS EN GANANCIAS CONSERVADAS										
Net income / Renta neta	$821,910	$944,411	$1,074,186	$1,211,735	$1,357,596	$1,512,347	$1,676,608	$1,849,342	$2,031,671	$2,224,321
Payout to owners / Desembolsos a propietarios	3,323,431	3,368,752	3,415,365	3,463,307	3,512,617	3,563,334	3,615,498	3,667,448	3,719,632	3,772,050
Change in retained earnings / Cambios en ganancias conservadas	(2,501,521)	(2,424,341)	(2,341,179)	(2,251,572)	(2,155,021)	(2,050,987)	(1,938,890)	(1,818,106)	(1,687,961)	(1,547,729)
PRO FORMA STATEMENT OF CHANGES IN FINANCIAL POSITION / DECLARACIÓN PRO FORMA DE CAMBIOS EN POSICIÓN FINANCIERA (SOURCES AND USES OF FUNDS) / (FUENTES Y USOS DE FONDOS)										
SOURCES OF FUNDS / FUENTES DE FONDOS										
Cash from operations / Caja de operaciones	$7,754,929	$7,800,250	$7,846,863	$7,894,805	$7,944,115	$7,994,832	$8,046,997	$8,098,946	$8,151,130	$8,203,548
Total Sources / Total Fuentes	7,754,929	7,800,250	7,846,863	7,894,805	7,944,115	7,994,832	8,046,997	8,098,946	8,151,130	8,203,548
USES OF FUNDS / USOS DE FONDOS										
Interest / Interes	3,435,623	3,358,443	3,275,281	3,185,674	3,089,122	2,985,088	2,872,992	2,752,207	2,622,062	2,481,831
Repayment of debt / Reembolso de deuda	995,875	1,073,056	1,156,218	1,245,824	1,342,376	1,446,410	1,558,507	1,679,291	1,809,436	1,949,667
Total Uses / Total Usos	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498	4,431,498
EXCESS OF SOURCES OVER USES / EXCESO DE FUENTES SOBRE USO	3,323,431	3,368,752	3,415,365	3,463,307	3,512,617	3,563,334	3,615,498	3,667,448	3,719,632	3,772,050
Payout to owners (pay-in) / Desembolso a propietarios	3,323,431	3,368,752	3,415,365	3,463,307	3,512,617	3,563,334	3,615,498	3,667,448	3,719,632	3,772,050
Net increase in working capital / Aumento neto en capital circulante	0	0	0	0	0	0	0	0	0	0

TABLE 3.8-13: SUMMARY OF RATES OF RETURN AND FINANCIAL RATIOS

FEASIBILITY STUDY FOR THE PORT OF CORTES DRY BULK UNLOADING TERMINAL PROJECT IN HONDURAS
ESTUDIO DE FACTIBILIDAD PARA EL PROYECTO DEL TERMINAL DE CARGA A GRANEL SOLIDO DE PUERTO CORTES EN HONDURAS
Prepared by / Preparado por DMJM Harris Prepared for / Preparado para: Empresa Nacional Portuaria
Alternative / Alternativa 1A
Aggregates and Inorganic Products Terminal / Terminal de Agregados y Productos Inorgánicos - Berth without Equipment and Storage

IRR's / TIR	
Debt / Deuda	7.75%
Equity / Patrimonio	9.70%
Total	8.37%

NET PRESENT VALUE OVER 20 YRS @ / VALOR NETO ACTUAL SOBRE 20 AÑOS		4.00%
Debt / Deuda	USD	23,569,219
Equity / Patrimonio	USD	16,453,193
Total	USD	40,022,413

DEBT SERVICE COVERAGE / COBERTURA DE SERVICIO DE DEUDA	**Year**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Debt service coverage ratio / Coeficiente de servicio de deuda		0.60	1.01	1.59	1.68	1.69	1.70	1.71	1.72	1.73	1.74
	Year	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Debt service coverage ratio / Coeficiente de servicio de deuda		1.75	1.76	1.77	1.78	1.79	1.80	1.82	1.83	1.84	1.85

Debt service coverage for first 5 years / Cobertura de deuda para los primeros 5 años		
Cash from operations / Caja de operaciones	USD	29,118,745
Debt service / Servicio de deuda	USD	22,157,491
Debt service coverage ratio / Coeficiente de servicio de deuda		1.31

Table 3.8-13 presents a summary of the rates of return and financial ratios for Alternative 1A Phase 2 Pier 7B Aggregates and Inorganic Products Terminal excluding equipment and storage. Referring to the table, the project is project to provide a return on equity of 9.70%, a net present value over 20 years at 4% of approximately $40,022,413 and a debt service coverage ratio over the first 5 years of 1.31.

Sources of Funding

Financing Requirements and Structure

The feasibility study has identified a series of improvements and additions to accommodate organic and inorganic products and aggregates and their projected growth. These individual improvement projects can be characterized in three major types:

Dredging of channels and basins and shore protection works;
Wharves and trestles, landfill compaction, slope protection; and
Equipment and storage.

Each of these different project types brings with it different potential sources of funding as well as different required returns and mechanisms for repayment.

Dredging of channels and basins and shore protection works

The most notable of these improvements would be the dredging alongside the new wharves, expanding the area planned to be dredged for the navigation channel and turning basin to serve Wharf 6 Container terminal by 100 to 300 m. Dredging is needed because the new dry bulk terminals are in area too shallow for Panamax or Handysize vessels.

The major elements of this work such as dredging the channel and basin, building protective breakwaters and filling in land for terminals would be beyond the scope of any individual private terminal operator and would have to be undertaken and funded by ENP either directly or through borrowed funds from CABEI (BCIE), others or the Government of Honduras. The question of identifying the source of capital and repayment funds for this work is critical as the feasibility of locating any new terminal facilities in the new areas is dependent upon it.

Landfill compaction, slope protection, Wharves and trestles

The wharves and related civil works could be funded a number of ways. ENP can use its financial resources to fund directly or through borrowing to fund these projects. Alternately, with the consolidation of operations, it is possible that specific berths be put out for concessions with the programmed improvements to be supplied by the concessionaire under the terms of their contract. Public private partnerships are another alternative, combining ENP funds with private terminal operators.

Equipment and storage

The loading and unloading equipment of the proposed bulk terminals, conveyors, storage and handling equipment, fall in to this category. Although these could be funded in a number of ways, they are very good candidates for private funding through concession funding, lease arrangements or other options.. On an international basis, concession financing of these facilities is very common and there are experienced sponsors and financiers available. Other alternatives could include a rental of the land directly to the terminal developer or the Port's development of the facility to suit a tenant operator.

Alternative Options and Sources of Funding

Financing for the projected organic products and aggregate and inorganic products terminals can come from a number of sources depending on the financial and institutional parameters of the project. Key considerations in determining the funding for a specific project include:

- **Ownership.** Certain sources of funding are available only to private sector projects. Likewise, some sources, such as American OPIC funding, are only available to projects with some level of U.S. ownership.
- **Cash Flow.** For debt financing, the cash flow generated by the project is the principal source of money to repay the loan. The greater the cash flow in comparison to the total debt, the greater the availability of commercial credit.
- **Recourse.** The parties or facilities that lenders have recourse to. Under various structures, financing for the terminal may be backed by only the terminal's operations and plant, or those of the whole Port or those of outside private sector project sponsors. Increased recourse adds security to the loan, improving lending terms.
- **Guarantees.** Some lending either involves or requires outside guarantees of repayment. Project finance funding often requires guaranteed off-take contracts from the funded projects to insure that the project will make money. Funding of public sector projects often require that the national government guarantee repayment of the debt.
- **Instrument.** Financing can take several forms including equity investment, debt financing, loan guarantees (to lower borrowing costs), or export funding. Each of these instruments has its own variable features such as repayment term, interest rate, recourse and required guarantees.

The following sources of funding are available for projects like the proposed terminals. Not all of them can be utilized for each possible financial structure discussed above. The following summary states the availability and features of each type of financing.

Central American Bank for Economic Integration (CABEI / BCIE)

The Central American Bank for Economic Integration is a leading source of multilateral funding for integration and development of Central America. Its member countries are Honduras, Guatemala, El Salvador, Nicaragua and Costa Rica. Projects considered for funding include ports, road transport, industry and agro-industry, housing and urban development, tourism, water supply and sewage, hospitals and education.

According to published information, the Central American Bank for Economic Integration has agreed to borrowings of approximately USD 160,000,000, of which USD 24,000,000 is for the bulk terminal (described in published reports as Wharf 2) and the rest for the container terminal (Wharf 6).

Inter-American Development Bank (IDB)

The Inter-American Development Bank (IDB) is the oldest and largest regional multilateral development institution, established to help accelerate economic and social development in Latin America and the Caribbean. The IDB has formed a private sector finance group, including development of a new partial risk guarantee instrument, which allows privatized infrastructure projects to attract commercial and institutional funds at better terms and longer tenors. In private sector projects, IDB lends on its own account ("A Loans") and syndicates loans to other, private investors who invest alongside of IDB ("B Loans").

The Inter-American Investment Corporation (IIC) is another investor in private infrastructure that is part of the IDB Group.

IDB and IIC have lent money for privately developed maritime facilities such as:

- Mejillones Port Terminal. A Greenfield port for copper exports in Chile. US$59M total A and B loans. 2001.
- Terminales Portuarias Argentinas in Argentina: US$10M loan, US$50M total cost.

IIC projects for private port facilities have included:

- Terminal 6 S.A. A privately developed oilseed export terminal on the Parana River in Argentina. US$ 1.0M IIC debt and US$3.0M IDB debt. 1989
- Port of M'Bopicua log and chip export facility in Uruguay. US$ 21M IDB A and B loans. 2002

U.S. Export Import Bank (Ex-Im Bank)

The U.S. Ex-Im Bank is an independent U.S. government agency that finances export sales of U.S. goods and services. It is the official export credit agency of the United States and it supplements and encourages, but does not compete with, commercial financing. This funding is available solely for U.S. exports.

The Ex-Im Bank enables U.S. exporters to compete internationally on the basis of product quality, service, and price by neutralizing the effect of export credit subsidies from other governments and by absorbing risks that the private sector will not accept. The Ex-Im Bank offers both direct loans and guarantees of loans made by commercial banks, up to 85% of the total export value from U.S. suppliers. Direct loans are extended to the foreign buyer, not to the U.S. exporter. Loan guarantees are provided to banks financing the export sales of a U.S. supplier. The basis of the guarantee transaction is virtually identical to that of the direct loan, and the impact upon the U.S. exporter and the foreign buyer are virtually indistinguishable from a direct loan transaction.

Long-term financing is available for amounts of $10 million or greater and repayment terms of seven years or more.

Medium term financing is available for amounts of $10 million or less and less than seven year repayment term.

Actual credit terms are subject to negotiation based upon American origin content in the project. Generally speaking, US content above the minimum thresholds can attract more aggressive terms and repayment conditions.

International Finance Corporation (IFC)

The IFC is an arm of the World Bank that provides financing and financial services for private-sector projects.

Like other multilateral lenders such as IADB, IFC loans on A/B structures combining their own money with syndicated loans from the private sector. In addition, IFC will take equity stakes in private sector companies.

IFC A-loans typically have 7 to 12 year maturities but grace and repayment periods are determined on a case-by-case basis. A-loans are usually limited to 25% of total estimated project costs for new facilities. A-loan amounts range from US$1M to US100M. IFC loans can be made with limited or no recourse to sponsors. IFC will actively underwrite the placement of B-Loans in the international financial markets.

Equity investments by the IFC are generally between 5 and 15% of the total project equity and will not take the largest interest or have an interest of over 35%.

Representative IFC lending:

- Manzanillo Container Terminal. Panama. US$25M (A-loan) and syndicated a further US$35M (B-

Loans).

- Manzanillo Container Terminal, Mexico. US$45M A loan. 2004
- Suape International Container Terminal, Brazil. US$6M A-Loan.
- Comercializadora La Junta Marine Terminal. Grain handling terminal in Manzanillo, Mexico. US$4M A-Loan and $US7M B-Loan. 1997

Overseas Private Investment Corporation (OPIC)

OPIC is a U.S. Government agency that provides financing (loans or guarantees) for overseas projects in which there is a significant U.S. private sector ownership interest. This may be the case in a BOOT or concession structure for the proposed terminal.

OPIC loans are secured by a mix of project cash flow, sponsor support and collateral. Funding is sourced through a U.S. sponsor who holds at least 25 percent ownership of the equity in the project. At least 50 percent of the voting interest in the project should be held by private sector participants. Loans can be made to either the U.S. sponsor or to the project itself.

The term of OPIC loans is typically five to fifteen years following a suitable grace period. OPIC guaranteed loans are backed by the full faith and credit of the U.S. government.

Bilateral credit agencies nearly always have country-specific and often project-type specific criteria in mind at given points in time. This means that transportation facilities in Honduras will very likely have a varied audience of enthusiastic supporters among the bilaterals. In the majority of cases, however, the support of the Government of Honduras (GOH) will be required to gain the interest and active support of these agencies.

Equity Investments by Project Sponsors/Developers

Equity investment is a key part of the financial strategy of any project structure. Equity investment determines ownership and control, promotes commitment to the project and reduces the debt repayment burden on the project. Equity can be contributed in either cash or kind, as appropriate. For example, in a public/private partnership, the Port might contribute existing real estate and facilities in return for an equity interest in the project.

Typically, a private or public / private project such as the proposed facilities would have equity investment from all key team members and stake holders. These may include:

- The port (ENP);
- A private terminal development and operations company (for example, Cargill, GATX)
- Key shipping lines potentially calling on the terminal;
- Contractors and engineers working on the project;
- Financial institution members of the project team;
- Institutional investors focused on Latin America and/or private infrastructure;
- Local partners (for example, NAVYSA, Terminales de Cortes, bulk importers and exporters); and
- Other strategic team players with interests in the success of the project (such as Agrecasa);

According to published reports, an agreement between Empresa Nacional Portuaria and Agrecasa, reported in January 2006, reportedly authorized construction of a dolphin mooring with private funds and transferred to ENP for use by Agrecasa and other users with a user fee. The amount envisioned for the project in this agreement is not known to DMJM Harris, but it is likely the project envisioned in the present study for the dry bulk terminal for aggregates and inorganic products is substantially more extensive than described heretofore.

Private Debt Investors

Funding needs not met by equity investors, multilateral lenders and export assistance programs are usually met be private lenders. These lenders are often organized by one of the multilateral lenders (A/B loans) and involve guarantees on the part of the multilateral lender. As with any loan, cost and terms depend on the cash generating capacity of the project along with the recourse terms and the total indebtedness of the project.

Private debt investors include many large international banks as well as certain investment funds focused on Latin America and/or private infrastructure. Sources of private debt financing can also include vendors to the project.

ENP Investment

ENP has the ability to allocate its own funds to develop new facilities. These funds are generated by ENP operations. DMJM Harris does not have information on whether such investments must be approved by the Secretariate of Public Works, Transportation and Housing (SOPTRAVI) or any other entity of the Government of Honduras (GOH). The advantage of this type of funding is that it is controlled by ENP and can be programmed for strategic purposes without depending on negotiation with concessionaires or outside parties. Although ENP has the discretion to do this, any investment made should be able to generate a reasonable rate of return over the long term. In general, investment by ENP could most reasonably be undertaken to provide an equity portion of the investment, coupled with a debt or equity contribution from external sources.

Government of Honduras

Although the port system in Honduras is under the jurisdiction of Empresa Nacional Portuaria, a Government company, the Government of Honduras may be willing to provide additional investment capital for infrastructure projects of national importance. The provision of improved port facilities on the Caribbean such as the new Port of Cortes facilities would be an example of a project that might qualify. The availability of such funding would likely hinge on government budgetary capabilities and priorities and other important projects involving essential infrastructure, education, housing or health services.

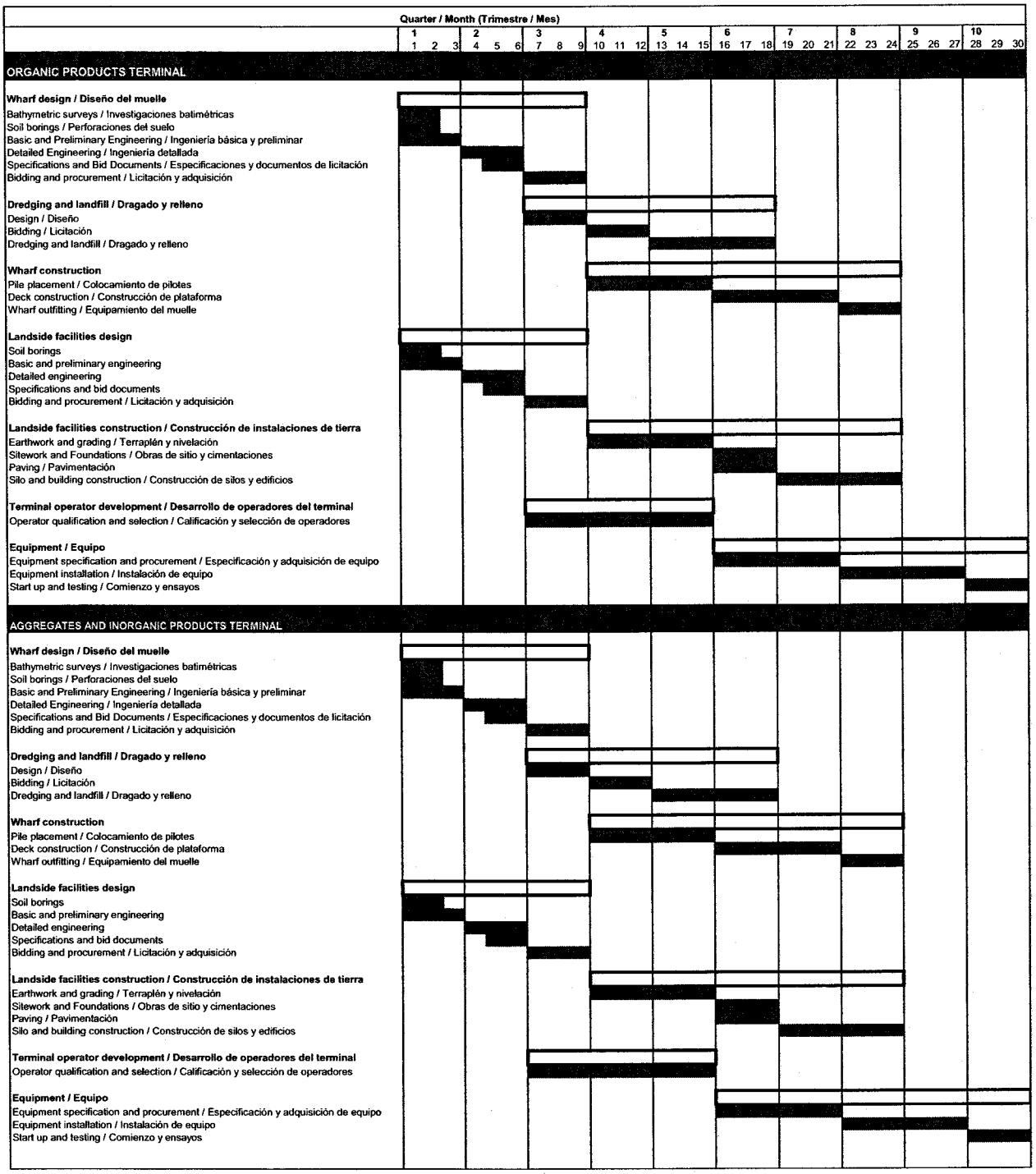
Table 3.8-8 Matrix of Financing Options

Source of Funding	Advantages	Disadvantages
Central American Bank for Economic Integration	Lower cost of debt financing	Additional complication of structure and institutional requirements
Inter-American Development Bank	Lower cost of debt financing.	Additional complication of structure and institutional requirements.
US Export-Import Bank	Lower cost of debt financing for equipment.	Additional complication of limitation on sources of supply.
International Finance Corp.	Lower cost of debt financing.	Additional complication of structure and institutional requirements.
US Overseas Private Investment Corporation	Lower cost of US equity capital due to lower risk	Additional complication of structure and institutional requirements.
Equity		Availability
Project Sponsor/Concessionaire Equity	Theoretically no cost to ENP	Control limited under terms of project or concession agreement.
Private Debt Investment	Reduces equity requirement	Increased cash flow requirement to service interest. Higher rates than multilateral lenders.
ENP Investment	Control by ENP	Potential for investment in non-marketable facilities. Limitation of resources.
Government of Honduras	Potential for investment beyond resources of ENP or concessionaires	Dependent on national government action. Loss of control.

3.9 Development of Project Implementation Schedule

Depending on available resources and requirements, Phases 1 (Organic Products Terminal) and 2 (Aggregates and Inorganic Products Terminal) can be developed concurrently, overlapping or sequentially. Development of each phase or terminal is expected to require approximately 24 to 30 months, including 6 months for detailed engineering, 12 to 18 months for wharf and landside civil works and 6 months for equipment installation and startup, as presented in Figure 3.9-1.

Figure / Figura 3.9-1
PORT OF CORTES DRY BULK UNLOADING TERMINAL / TERMINAL DE GRANELES SÓLIDOS DE PUERTO CORTÉS
PROJECT SCHEDULE



Note: Alternative 1A Phase 2 Pier 7B Aggregates and Inorganic Products Terminal may be commenced concurrently, offset or sequentially with Alternative 1A Phase 1 Pier 7A Organic Products Terminal.

4 DEVELOPMENT IMPACT CONSIDERATIONS

4.0 Introduction

The Port of Cortes Dry Bulk Terminal will have a favorable impact on dry bulk operations in the Port. The benefits deriving from the presence of a modern dedicated facility for port users have been fully investigated in Section 3 of this Report. In addition to the direct benefits generated by the investment and operations of the new terminal, there are a number of developmental impacts that can be attributed to the new terminal. These are principally second or third round impacts that will be produced in the national economy or in the regional economies and transfer of the technology and capacity needed to build and operate the modern dry bulk terminal or terminals at the Port of Cortes.

4.1 Descriptions of Impacts by Category

The discussion of the developmental impacts of the proposed project will be provided under the following subtitles:

- Infrastructure / Industry
- Market-Oriented Reforms
- Human Capacity Building
- Technology Transfer and Productivity Enhancement
- Other Impacts

a. Description of Infrastructure / Industry Impact

The development of the specialized dry bulk terminal in Puerto Cortes will create a technologically advanced materials handling system for dry bulk products. It will provide a much-needed specialized berth to receive bulk carrying vessels as well as modern and flexible cargo handling equipment and storage areas that will greatly expedite the cargo operations and reduce vessel waiting times and cargo unloading rates currently experienced by port users. The new terminal will allow the port users to optimize the flow of cargo from the vessels in a manner that will make most efficient utilization of transport and storage infrastructure.

The beneficiaries will include a broad range of import industries that utilize process and distribute bulk commodities. Cost savings will accrue to local industries, consumers and importers. In addition, considering the substantial volumes of feeds, fertilizers, coal and other raw materials and intermediate goods imported through the Port of Cortes, the cost savings will reduce the costs of production for industries in Honduras, including export industries such as beef. The terminal also includes efficient handling of exports, such as sugar and aggregates, which will benefits exporters directly, reducing port costs and increasing the net income from export activities.

The terminal will constitute an important addition to the national and regional transportation infrastructure and will provide for the efficient and cost effective handling of these products, at present volumes and at the projected volumes in future. The plan provides areas for expansion.

The facilities will also permit the more rational utilization of transport services by permitting temporary the storage of commodities, thereby severing the current constraint on ship operations that is created by the need to immediately evacuate the cargo from the side of the vessel. Interruptions in the flow of trucks under the hoppers result in the suspension of ship unloading operations. With the availability of intermediate storage, the peaking of cargo leaving the port is less severe, requiring a smaller number of trucks in operation over the peak period of the vessel discharge. This will provide an important element of flexibility to the operation, particularly for destinations that are more distant from the Port.

Another aspect that is important to consider is the attractiveness of renovation and modernization of the

rail line between Puerto Cortes, Choloma, San Pedro Sula, Villa Nueva and Potrerillos, located along the road between San Pedro Sula and Tegucigalpa. The location of a good number of industrial users in this corridor may make it a very attractive investment in conjunction with the new dry bulk terminal. This could greatly reduce the truck traffic that bulk cargo movements generate in the roads in Puerto Cortes and the highway between Puerto Cortes and San Pedro Sula. The availability of storage at the Port can also be expected to make it more feasible to use the railroad line for movement of bulk cargo inland, due to a reduction in the peaking factors for land transport and by shifting cargo loading for inland haul away from the side of the vessel.

A World Bank-funded study on restructuring of Ferrocarril Nacional de Honduras, completed in 2001 by US firm Transport and Management Consultants, identified one railway line with potentially profitable cargo traffic that could make it attractive for private sector management and operation, namely the aforementioned line between Puerto Cortés-San Pedro Sula-Potrerillos. While this recommendation has not been implemented, the line between Puerto Cortés and San Pedro Sula was restored to limited service for passengers in June 2006 and carries limited quantities of lumber cargo and bagged fertilizer. In addition, during the site visits to Honduras, DMJM Harris met with a US individual who had prepared an expression of interest to operate the line as a concession, and indicated support from a US short line rail company.

Considering that many of the major dry bulk importers and exporters, such as cement plants, fertilizer plants, flour mills, feed blenders and sugar companies are located along the corridor between Puerto Cortés and Potrerillos and in a number of cases were noted to still have rail sidings, the railroad could be an important element in efficient land transportation of bulk cargo. In addition, the railroad may be able to serve passenger traffic, such as cruise passengers between Puerto Cortés and San Pedro Sula or labor between the various industrial centers along the route, as well as possible future inland container cargo for San Pedro Sula or Tegucigalpa, which can be reached by highway route CA-5 beyond the Potrerillos terminus. It should also be noted that repair of the Puerto Cortés – San Pedro Sula rail line is listed as a priority project for Ferrocarril Nacional de Honduras in the Management Plan of the Presidency of Honduras.

b. Description of Market-oriented Institutional Reforms

The current dry bulk handling activities in Puerto Cortes are directed by private sector stevedoring companies and utilize privately contracted equipment. Personnel of the ENP are limited the checkers. It is contemplated that this model will continue with the new terminal and is consistent with the efforts of the Government of Honduras to modernize the country and to effectively utilize the limited public sector resource to meet pressing social needs, such as health, education and basic infrastructure.

According to reports, Empresa Nacional Portuaria has reached agreement with the Central American Bank for Economic Integration for a USD 160,000,000 borrowing, including USD 24,000,000 to finance the dry bulk terminal. Current expectations are that ENP will proceed with Phase 1, Pier 7A, constructing the pier and undertaking the civil works and dredging indicated below. Additional funds, estimated at approximate $7.5 million, required for civil works and dredging for Pier 7A may come from internal ENP funds or other sources to be determined.

Cost estimates for recommended alternative

Item	Phase 1: Pier 7A	Phase 2: Pier 7B	Total
Civil works and dredging	$31,345,000	$62,863,000	$94,206,000
Equipment	$50,200,000	$97,400,000	$147,600,000
Total	$81,545,000	$160,263,000	$241,806,000

The cost estimates indicate that, for Phase 1 (Pier 7A for organic products) substantial additional funds will be required in order to install the specialized equipment needed to make the new dry bulk terminal work. Otherwise the pier will simply be a new berth used with old handling technology. Additional funds are also needed for Phase 2 (Pier 7B for aggregates and inorganic products).

Besides additional funding, the new bulk terminal can be expected to require a strong infusion of technical know how and expertise in operation of modern bulk handling equipment. Coupled with this is a need for a change in the modes of operation towards a much more coordinated operation. Specifically, at the present bulk commodities are handled at public wharves by two or three separate stevedoring companies under contract to the importers, who bring their own equipment and crews, and use ships' gear. In the future, the recommended alternative includes handling with mainly shore-based equipment, such as continuous unloaders, cranes, conveyors, storage facilities and truck loading stations. The operation of this equipment, scheduling and coordination of its use, cleaning between products and maintenance are likely to require operation by either two terminal operators, one for Pier 7A and another for Pier 7B, or by one terminal operator.

The terminal operator(s) would be required to have the financial, human and technical resources, including know how and capital to carry out this activity. This may lead to a need to select a terminal operator or terminal operators for this purpose. Alternatively, if sufficient resources are available, a developer may be selected and terminal operator(s) selected separately based on competitive bidding among qualified firms. There are a number of firms who would be qualified for such work, either development, operation or both, or it may be that a consortium could be specially formed for this purpose by some of the existing bulk handling stevedores and / or the importers or other port users.

Regardless of the financing mechanism selected by the ENP for the implementation of the construction stage of the project, it is important that the control of the operational aspects of port activity be left with specialized private firms such as now carry out the importing, chartering, unloading, storage, transportation and distribution activities, private consortia or experienced dry bulk terminal operators. However, the need for much greater capital resources and technical know how would appear to require consolidation, formation of consortia and / or participation of larger, better capitalized firms in order to adequately develop and operate the new terminal with all of the capital intensive equipment and systems.

The importers and exporters who utilize the terminal, who at present are captive to the existing system of slow unloading rates, costly ship delays and laytime, and trucking congestion due to the lack of berthing space, modern handling equipment and storage at the port, would benefit substantially from access to lower costs with a modern, efficient dry bulk terminal in the Port of Cortes. If a private terminal operator is selected to operate one or more of the dry bulk piers and terminals at the port, the levels of service to be provided and the tariff to be charged to importers and exporters should be among the factors to be considered in the bid evaluation, in addition to the potential or guaranteed income for ENP.

The proposed dry bulk terminal in Puerto Cortes is complementary to the ongoing efforts to modernize the Honduran economy. Effective use of the technology planned for the terminal will require a thorough review and revamping of the role of the public sector entities that regulate foreign trade. These include the customs, agricultural inspection and health certifications. The processes and procedures employed by these entities must be adjusted to provide for quick and dependable processing of commodities and transactions. Emphasis must be placed on the electronic handling of forms and registrations and pre-clearance of shipments.

c. Description of Human Capacity-building Impacts

The proposed new dry bulk products terminal in Puerto Cortes will require the technological upgrading of the labor force participating in this activity. In some cases, the skills required represent an extension of current activities. In other cases, the presence of new equipment and facilities imply the development of new capabilities in the local labor force.

The labor participating in the new terminal for the Stage 1 development includes the following specializations:

- Crane Operators (12)
- Ship Unloader Operators (4)
- Conveyor Operators (4)
- Silo Complex Operators (6)
- Tractor Trailer Operators (varies by product)
- Trailer Loading Specialist (4)
- Mechanical Equipment Maintenance Specialists (6)
- Terminal Operations Planner (2)
- Terminal Managers and Supervisors (3)
- Accounting and Finance Personnel (4)
- Security Personnel (4)

The operations and maintenance personnel will require training on the specific equipment that each position will be assigned either in operations or in maintenance activities. In many cases, initial training could be provided by the manufacturer of the equipment, either in Puerto Cortes or at the factory where the equipment is assembled. It is important that this training be fully documented, with written materials, audiovisuals and demonstrations so that as personnel change positions, retire or are replaced, the training can be repeated. It is recommended that a training supervisor be charged with the collection and improvement of the initial training materials and courses. This would probably not require a full time position and could be handled by one of the management or supervisory team.

For the supervisory and management personnel, a training course in the management of logistical operations would be useful, in order to focus attention on the variables and factors that influence efficient utilization of the infrastructure of the new terminal. This training may be available in local institutions of higher learning or could be set up for a semester using external resources. Given that the terminal will be operated on a commercial basis, it is most likely that the operating company would fund this level of training.

In addition, it would be useful to provide a brief version of these concepts to major clients of the bulk terminal, in order to establish a framework of cooperative decisions to optimize productivity and reduce costs. This brief presentation could be the responsibility of the terminal management.

Finally, in order to establish the parameters within which the new terminal should operate, the management of the terminal should offer on an annual basis a presentation of the goal and objectives of the operations to the public sector port operations planning, regulatory, safety and heath organizations in Puerto Cortes to foment a cooperative atmosphere between the private and public sector actors and to provide a channel to address areas of friction and ventilate new ideas on how to work together more effectively.

The suggestions of this section of the Final Report is that the dry bulk terminal operator establish a capability to impart instructional courses and seminars on the planning and operation of dry bulk terminals and logistics chain management to various interested parties. Initially, the operator could work with the ENP to request assistance to specialized international, multinational and regional development agencies (TRAINMAR, Interamerican Development Bank, World Bank, UNCTAD, IMO, and the American Association of Port Authorities) or to national development agencies who may offer technical assistance (USTDA, agencies of the European Community nations) to secure the instructional materials and personnel for the first events in order to provide background and materials for those of the operating agency who will have the responsibility to repeat the instructional courses and seminars.

In the first instance, the recommended audiences for these sessions would be:

- Dry bulk terminal operational and maintenance personnel
- Dry bulk terminal management and supervisory personnel
- Managerial and planning personnel from dry bulk terminal client firms
- Personnel from public sector agencies with a role in the dry bulk import and export activities – ENP, Agriculture, Sanitation, Health, Safety and Security

d. Description of Technology Transfer and Productivity Enhancement

The technology used at present in the handling of dry bulk products in Puerto Cortes at the present time is rudimentary. Productivity is low.

This is due, in the first instance, to a combination of lack of available berthing space, given the lack of available berths and the low priority given to dry bulk cargoes by the ENP operations planners. The interruption of operations is frequent in order to provide berthing space to higher priority traffic. The low productivity and lack of dedicated berthing space impedes the chartering of larger and more modern bulk carriers due to their much higher cost of demurrage. This factor results in higher ocean shipping costs for dry bulk products handled in Puerto Cortes. The potential utilization of larger bulk carriers and the avoidance of demurrage costs represent a significant potential enhancement in technology and productivity which could result in substantial cost saving per ton of dry bulk product handled. The new terminal will provide accommodation to handle efficiently vessels up to Panamax size and what is visualized is that the importers will charter Panamax and Handymax ships in replacement to the current vessels that are mainly Handy size.

The unloading of vessels depends on equipment available locally – mobile hoppers and clamshells, of modest capacity. The unloading operation uses ships' cranes and this equipment varies greatly in terms of conditions and capacity. Finally, the flow of product from the vessel is dependent upon the availability of tractor trailers below the hopper alongside the ship in order to continue discharge without interruptions. This flow of trucks is hard to manage, given the number of units required, the round trip to the facilities receiving the materials, road conditions and the need to utilize the only available port scale and the requirements to satisfy import regulations imposed by the local government.

This situation does not lend itself to attracting investment in equipment and facilities, and improvements in one link in the logistics chain is unlikely to result in a positive outcome, given the fact that other elements will frequently not be able to use the enhanced productivity provided.

Without a systemic upgrading, improvements are not attractive to the participants in the port traffic. The proposed new dry bulk terminal for Puerto Cortes addresses the improvement in operations in a systematic manner, so that each link in the logistics chain can be optimized individually and system-wide.

The major elements of the existing and the proposed systems are provided below:

Major Elements of Current and Proposed Dry Bulk Systems at the Port of Cortes

Current System	Proposed System
Shared Berths (with low priority for bulk)	Dedicated Berths with complete separation of bulks from containers and cruise, plus separation of organic and inorganic berths
Small Handy Size Bulk Carriers	Larger Handysize, Handymax and Panamax Bulk Carriers
Ships Gear	Shore Based Continuous Unloaders, Loaders and Cranes
Stevedore Clamshells	Larger Capacity Terminal Clamshells (Inorganics) Continuous Ship Unloader (Organics) Shiploader (Aggregates)
Mobile Hoppers	Large Capacity Hoppers Enclosed and Covered Conveyors & Transfer to Storage Area
No storage resulting in lines of trucks and delays waiting for trucks	Storage silos, piles and buildings reducing ship waiting time, peaking of land transportation and congestion
Only one Tractor Trailer per hopper and open truck loading resulting in product loss, spillage and dust and truck traffic through the main port facility	Protected truck loading facility fed by conveyor with partial enclosures reducing dust Potential for rail car loading
Port truck scales frequently out of order	In-line conveyor belt scales
General port gate	Dedicated gate complex with potential for separate port gate and bulk terminals gates

Unloading productivity

The current dry bulk unloading rate attained in the port, as taken for statistics provided by the ENP shows that in the aggregate, the unloading rates for Puerto Cortes range from 117.0, 113.4 and 107.1 tons per hour for years 2004 to 2006. Berth 3 attained the highest productivity and Berth 5 the lowest, as can be appreciated below:

Dry Bulk Cargo Handling in Puerto Cortes in Average Tons per Hour

Berth	2004	2005	2006
All Berths	117.0	113.4	107.1
Berth 3	130.1	128.2	129.6
Berth 4	108.6	103.1	96.6
Berth 5	106.0	82.5	60.1

In contrast, the nominal productivity of the ship unloading operation for the proposed equipment has been estimated at 1,200 tons per hour for each of the two unloaders. This rate is for optimal free digging rate for the operation. The actual productivity will be less, given the need to dig deeper and the conformation

of the ship holds. A reasonable expectation is that the average unloading rate that can be sustained will be approximately 25 or 30% of the nominal rate, or in the range of 300 tons per hour for an unloader. The transfer and storage equipment and systems have been selected to accommodate this level of production.

The expected average productivity levels for the new terminal are provided below:

Operation	Average Productivity (tph)
Organic Products	270
Inorganic Products – all products	730
Aggregates	950
Others	470

As can be appreciated, the increase in productivity with the new berth and equipment should represent a substantial increase over current dry bulk operations, ranging from more than double to much more. Due to the use of shore-based equipment, the handling rates will also be much less dependent on individual ship characteristics, such as at present where ships' gear is employed. In addition, the availability of storage at the terminal should virtually eliminate vessel delays awaiting long lines of trucks to arrive to take cargo out of the port.

The new terminal will also provide a dedicated berth for bulk operations. This will represent an important improvement in efficiency, as under the current operations, bulk cargoes have lower priority than other cargoes, so that when a vessel transporting higher priority cargo comes to the port, the bulk operations are suspended and the vessel is moved to the anchorage to wait for berth space. Dry bulk operators inform the Consultants that this occurs with great frequency, producing extensive delays and interruptions to operations that reflect negatively on the time in port, results in low productivity, and higher time in port for vessels and make it very difficult to adequately program labor, equipment and trucks.

With the greater productivity in the dry bulk operations for the new terminal, it can be expected that charter party terms will improve and that larger vessels will be sought, as there would be greater likelihood that the ship could be worked faster and greater guarantee that the vessel will be attended quickly. The combination of factors that currently cause the frequent payment of demurrage will addressed so that the incidence of demurrage charges will be significantly reduced.

Terminal Control System Technology

As recommended in this study, the new terminal(s) should also include terminal operating and control systems. These computer-based systems will manage dry bulk storage and terminal management and control, ship stowage planning, product measurement and document preparation. Mobile handsets can be utilized. A terminal operating system is currently utilized by Dole for their cargo handling in the Port of Cortes. A terminal operating system was also recommended for the container operation in the Technical Assistance for the Port of Cortes Modernization Project, a USTDA-funded study completed by DMJM Harris for Empresa Nacional Portuaria. The terminal operating system for the dry bulk terminal(s) will represent an additional implementation of modern port terminal technology at the Port.

Computerized Maintenance Management System Technology

This study also recommends the new terminal(s) should include a computerized maintenance

management system. This system will facilitate management of assets, procurement, maintenance work orders, service and preventive maintenance. A CMMS was also recommended for the Port of Cortes in the Technical Assistance project mentioned previously, which would cover the main terminal. The CMMS recommended here would be an additional implementation for the dry bulk terminal(s).

Security Technology

Security recommendations will also bring technology to the Port of Cortes, including additional security systems for the dry bulk terminal(s) to include dedicated gates with sliding gates, an Access Control System (ACS), Closed Circuit Television (CCTV) with Pan Tilt Zoom (PTZ) and various other features.

e. Description of Other Project Benefits

As part of the Puebla Panama Plan (PPP) for regional transportation and trade integration, Honduras has developed a plan to improve a series of road links to facilitate trade, enhance competitiveness and integrate the regional economies. A key element of this effort is the Logistics Corridor, which will provide modern transportation linkages between the Port of Puerto Cortes and La Union, in El Salvador on the Pacific. There is another link contemplated to the Port of Corinto on Nicaragua's Pacific Coast. These road projects are currently in various stages of planning and execution.

Puerto Cortes is an important resource in the Logistics Corridor concept. The Port already has a regional role in the handling of containerized cargos particularly for El Salvador and Nicaragua. The proposed dry bulk terminal will assist in consolidating and expanding this regional role. With the increase in productivity for dry bulk operations, it may be expected that the routing of dry bulk cargo through Puerto Cortes may become attractive to regional importers. While this development will be constrained by land transportation and distribution costs to a larger degree than containerized shipments, as the share of transportation and distribution costs account for more of the value of the bulk products than containerized cargoes, it still represents an important potential for Puerto Cortes. It is envisaged that this will be particularly true for grain products from the US Gulf Coast destined for El Salvador, Guatemala and Nicaragua. The successful attraction of regional cargo will contribute additional revenue to the ENP and will make the region more competitive.

In the forecasts provided in the present report, the Consultants have developed a scenario providing for a shift of 20% of the grain imports for Guatemala and El Salvador to Puerto Cortes following the successful implementation of the new dry bulk terminal project. This potential depends upon the permanent improvement in the cargo handling rates in Puerto Cortes, an increase in the vessel sizes and improvements to road systems. It also depends upon the facilitation of in-transit regulations, transportation processes and procedures and documentation requirements between the nations of the Central America region.

5 FINAL REPORT

DMJM Harris has prepared the final report for Empresa Nacional Portuaria to develop a feasibility study of the dry bulk terminal project at the Port of Cortes in Honduras. The U.S. Trade and Development Agency (USTDA) provided a grant to fund this study. The development of this terminal would fulfill the following objectives:

1. Provide facilities dedicated to bulks without interference with other port users, such as container traffic and cruise ships;
2. Improve bulk unloading rates, which would permit a reduction in ship time in port and the freight rates, as well as costs for cargo handling;
3. Permit receiving and efficient service to Panamax vessels and larger Handymax ships, with the potential for economies of scale in ocean shipping;
4. Provide multi-functional equipment and unloading systems capable of handling various types of bulk cargo without contamination;
5. Provide silos and other intermediate storage facilities, with controls for health and safety, eliminating the need for lines of trucks and large truck fleets during peak hours and resulting waiting during the ship time in port;
6. Provide facilities for loading and unloading trucks, including inventory control, dust control and waiting areas, reducing traffic congestion in the city;
7. Improve the control of environmental problems and noxious dust emissions associated with present obsolete methods of cargo handling; and
8. Reduce the total handling cost for dry bulks in the port, reducing the cost of imports and raw materials for Honduran industry.

This section includes findings and recommendations, client comments and results,

5.1 Findings and Recommendations

The DMJM Harris team carried out the data collection and review of the commodity forecast, inception report, development of alternatives and development impact considerations. Following are the principal findings under each of these tasks:

1 Data Collection and Review of the Commodity Forecast

Site conditions

Alternative sites for development of the dry bulk terminal, in the western area of the Port near the Quilimaco canal (Wharves 2 or 2A), in the central area (Wharf 3A) and in the vicinity of the Cabotage Wharf (Wharves or Piers 7, 7A and 7B) were visited and available geotechnical reports were reviewed. It was noted that the study by Asociación de Consultores en Ingeniería, S. de R.L., states that the area of Wharf 2 "can be considered as the one which has the subsoil of lowest quality of the entire port area" and that "the conditions imply a high risk for foundation of structures on it, since the possibility of obtaining a behavior acceptable over the long term are minimal and the presence of considerable settlements during the useful life of the structure can be guaranteed." Results of the site investigation are presented in Section 1.1.

Cargo demand and forecasts

The dry bulk cargoes handled in Puerto Cortes are diverse, including 16 organic products and 10 inorganic products, plus fertilizer and coal.

The tonnage of dry bulk cargo increased from 1,104,000 tons in 2001 to 1,387,000 tons in 2006.

The principal commodities are classified food grains and products for human and animal consumption, such as wheat, corn and soy flour, which are called "organic products" and fertilizers, chemicals and other products, called "inorganic products." In addition, a new project for export aggregates has been proposed by Agregados del Caribe (Agrecasa), forecasted to ship initially 2,000,000 tons a year growing to 4,000,000 tons per year. There is another new project for a coal-fired thermal power plant. Without the new projects, Puerto Cortes dry bulk cargo is projected to increase from 1,387,535 tons in 2006 to 2,462,181 tons in 2026 with average growth of 2.91% per year.

Including the new coal and aggregate projects, Puerto Cortes dry bulk cargo is projected to increase to 6,662,181 tons in 2026, growing at an average of 8.16% per year.

Demand forecasts are presented in Section 1.2.

Operations

The following operational deficiencies were noted:

- Operational statistics for the Port of Cortes show that handling rates for bulk cargo averaged only 100 to 130 tons per hour. This means that a 12,000 ton load would take in the range of 100 hours to unload or around 4 days on average, far in excess of a normal target rate of 2 days or 48 hours which is achieved in other ports for much larger vessels.
- There is insufficient berthing available for the ships, as indicated by the high berth occupancies, resulting in the dry bulk carriers being forced to wait for a berth or even sent back to anchorage after having commenced unloading due to the greater priority accorded the other types of vessel, such as containerships, tankers and cruise vessels.
- There is no storage available at the Port, resulting in the need to have "direct" discharge into trucks. With each truck handling in the range of 30 tons, compared to a shipload of 10 to 12,000 tons, 400 truckloads have to be moved for each ship.
- When the buckets are opened to drop dry bulk cargo into the hoppers, there is spillage of bulk material onto the wharves deck and the emission of dust from the products. There are no enclosures to contain dust or dust collection to prevent its escape to the atmosphere.
- The operation depends on the performance of ships' gear, which can vary with different ships and is often substandard.

The following needs and criteria for the bulk terminal were identified were identified:

- Additional berths capable of handling Handysize and Panamax vessels are needed.
- Modern high speed dry bulk unloading and handling equipment is needed able to achieve rates of 1200 tph.
- Storage at the Port is needed to allow for rapid discharge, which cannot be achieved even with modern high speed and efficient unloading equipment, when waiting for lines of small trucks to take away cargo from large vessels.
- As requested by users and considering health and product safety, separation of organic products (food grains for human and animal consumption) from aggregates and inorganic products (coal, fertilizer, salt and chemicals) is imperative.
- For safety and environmental protection, enclosed conveyors and galleries should be used where appropriate, and silos for grains and enclosed storage for fertilizer and chemicals.
- Specialized handling equipment is needed applicable to the specific commodities to be handled, particularly unloading equipment for multiple organic products and inorganic products, respectively, and loading equipment for aggregates.
- Separate facilities are needed for "organic" products (rice, corn, soy flour, wheat, malt and sugar) and inorganic products (fertilizer, salt, textile salt and coal).
- The specifications should provide for zero (0%) tolerance for cross-contamination; for instance, 0% cross-contamination between corn and wheat.

Guidelines for facilities planning are presented in Section 1.2.

There are opportunities for US vendors in supply of goods and services, including construction materials and services for piers, bulk materials handling and storage equipment, control systems and software, engineering services, as well as providing terminal operation services and technical know-how.

The following table presents some of the opportunities. A more detailed listing of US vendors is presented in Appendix A.

Products	Vendors
Piles and reinforced concrete	Nucor
Dredging and Construction	Great Lakes Dredging, Dredge America, Weeks, Eisner Marine
Unloaders	Heyl & Patterson, Fuller Bulk Handling / FL Schmidt
Conveyors	Continental, Chief Industries, Robins, Link Belt
Electrical controls	General Electric, Honeywell, Allen Bradley, Roberts haw
Terminal control	Autoship, others
Silos and storage	Hoffman, Baker-Pullman, Johnson Bros., International Tank Co., Superior Tank Co.
Scales	Richardson
Mobile equipment	Bobcat, CAT, John Deere
Security equipment	Tyco, ADT, Cisco
Engineering	DMJM Harris, CH2M Hill, Louis Berger, Berger/ABAM, Moffatt & Nichol, EDC, Hendrik Enterprises, Roberts & Schaefer

2 Inception Report

The inception report defined the following specific criteria for the bulk terminal:

Handling rates in hours per ship

- Organics: 36-48 hours, unloading rate of 1200 tph
- Inorganics: 36-48 hours, unloading rate of 1200 tph
- Aggregates: 30 hours as requested by the company, Agrecasa, loading rate of 3000 tph

Type and capacity of equipment: loading/unloading/reclaiming/storage.

- Continuous Ship Unloader for grains 1200 tph free digging;
- Unloading for inorganic products using clamshell grabs: 1200 tph;
- Unloading with Ship gear: 1200 tph with 4 or 5 cranes & 7-10m3 buckets
- Loading of aggregates: Traveling, radial or dual-linear loader of 3000 tph
- Auxiliary: Wheel loaders for cleaning ships holds (100tph), loading coal and non-organics (200 tph) into trucks.
- Type of storage facilities: metal silos for grains, warehouse for fertilizers and, ground storage for

coal.

- Conveyor system: Belt conveyors with troughing idlers of 35 or 45 degrees, with hood cover only; or completely enclosed; or arranged in galleries. Maximum speed 2.5 to 3.0 m/sec. Capacities suitable for the above indicated loading and unloading rates. Bucket Elevators and Chain Conveyors for grain handling, silo feeding and silo reclaiming.
- Dust collection: as necessary at each transfer.
- Environmental protection: In order to minimize airborne dust, spillage and groundwater runoff, enclosed continuous unloaders should be used for grain, instead of buckets and open hoppers, all conveyors and transfer points should be enclosed and be provided where appropriate with dust collection systems. Open storage piles should have dust suppression systems, such as water spray. Water ponds and treatment systems are required for water runoff. Truck loading stations should have dust curtains. Truck routings should be channeled to avoid unnecessary movement through the municipality. Minimizing truck congestion and waiting will avoid airborne pollution from idling vehicles.

Principal findings of the inception report are included in Section 1.2.

3 Development of Alternatives

Alternative recommendations for location of the terminal and preparation of Alternative Layouts for Construction of the New Berth

The recommended alternative, Alternative 1A includes Phase 1 (Pier 7A Organic Products Terminal) and Phase 2 (Pier 7B Aggregates and Inorganic Products Terminal).

Pier 7A: 260 m (Option 1) to 320 m (Option 2) x 24 m pier between Wharf 6 Phase III and the Cabotage Wharf; Pier 7A would be for organics

Pier 7B: 425 m x 30 m pier southeast of Cabotage Wharf; Pier 7B would be for aggregates and inorganics.

Its main advantages are:

- Continuation of the dredged area of the maneuvering basin and mooring area from Wharf 6 Phase III to Pier 7A and Pier 7B.
- Reduction of some 3 km in the conveyor belt planned for aggregates to Wharf 7B compared to Wharf 2 or Wharf 2A, eliminating the part of the conveyor between the Port and the City along the entire length of the Port. Such length might have to be elevated or underground, which is costly, and the conveyor would likely generate noise and interference with the Port and municipality.
- Reduction of the routing of the routing of bulk trucks, including aggregates, inorganics and organics by some 10 km for some 100,000 trucks a year based on projected starting quantities of 2,000,000 tons per year of aggregates, or one every 15 minutes.
- Direct entry gates to both new bulk terminals without passing through the Center or the Port of Cortes or going around the municipality of Puerto Cortes.
- Construction of both bulk terminals in better geotechnical conditions than those of Wharf 2 or Wharf 2A, which have been described as the worst in the Port, and posing high risks for foundations, which would have implied major costs for many piles of 50 to 60 m length and limit the ability to store cargo in the immediate vicinity of the wharf without demolishing existing structures at the Port.
- Proximity of the main road out of Puerto Cortés to San Pedro Sula.
- Proximity of the railroad, which could serve as a corridor for a logistics chain for bulks as an alternative to road transport to Choloma, San Pedro Sula, Villa Nueva and Potrerillos.

The estimated investment costs for Alternative 1A Phase 1 Wharf 7A Organic Products Terminal including $31,345,000 for the wharf structure and dredging and $50,200,000 for equipment and storage. The estimated investment costs for Alternative 1A Phase 2 Wharf 7B Aggregates and Inorganic Products include $62,863,000 for the wharf and dredging and $97,400,000 for equipment and storage.

The terminal location and berth alternatives are described in Sections 3.1 and 3.2. U.S. vendors are identified in Appendix A.

Alternative Layouts for Unloading Equipment and Alternative Layouts for Storage, Conveying and Reclaiming Systems

The recommended equipment includes:

- Twin 700 tph continuous unloaders for organic products on Pier 7A. Shore-based equipment will provide greater reliability of loading performance than depending on ships' gear. The advantages of continuous unloaders include better enclosure of product avoiding dust and contamination, and lower loads on the wharf structure. The advantage of twin machines over a single 1,200 tph machine is to provide backup in the event of downtime.
- Twin 700 tph clamshell bucket unloaders for inorganic products on Pier 7B. The advantage of clamshell buckets is to facilitate changeover between products. The advantage of twin machines over a single 1,200 tph machine is to provide backup.
- Twin 1,500 tph shiploaders for aggregates on Pier 7B. The advantage of twin machines over a single 3,000 tph machine is to provide backup.
- Enclosed conveyors for organic products on Pier 7A and for inorganic products on Pier 7B.
- Eighteen to 24 6,000 ton metal silos for organic products between Wharf 6 and the Cabotage Wharf. The main advantages to providing silos are to speed up cargo unloading, avoid ship delays awaiting trucks, and resulting laytime costs.
- Storage yards for aggregates and coal in the eastern area of the port.
- Storage buildings for fertilizers on fill in the Lagoon of Alvarado.
- Truck loading racks, which will minimize the product spillage and dust such as presently takes place when clamshell buckets discharge into open hoppers directly into trucks.

Alternatives for handling equipment are presented in Sections 3.3 and 3.4. U.S. vendors are identified in Appendix A.

Alternatives for Management Information Systems

Computerized terminal control systems and ship stowage programs are recommended for the organic products and aggregates and inorganic products terminals. Computerized maintenance management systems are also recommended. Details are presented in Section 3.5. U.S. vendors are identified in Appendix A.

Review of Environmental Issues and Regulations

The project would have a number of environmental impacts during the construction and operation phase. These would have to be addressed in accordance with Honduran laws and regulations. The project as recommended includes a number of environmental safeguards, such as continuous unloaders for organic products, and enclosed conveyors for organic and inorganic products, and enclosed truck loading racks, which can help reduce dust and spillage compared to the present grab unloaders, open hoppers and trucks, and water treatment facilities to control the impact of groundwater runoff from open storage. Details are presented in Section 3.6 and Appendix B.

Recommendations for Port Security Equipment and Procedures

Security equipment is recommended for the organic products and aggregates and inorganic products terminals to control access, monitor the terminal on the land and seaside and prevent intrusion and introduction of contraband or unauthorized access. Details are presented in Section 3.7. U.S. vendors are identified in Appendix A.

Financial Analysis and Sources of Financing

The Alternative 1A Phase 1 project (Pier 7A Organic Products Terminal) would provide a return on equity of 9.69%, a net present value over 20 years at 4% per year of approximately $50,321,000 and a debt service coverage ratio for the first 5 years of 1.24, based on an average or all-inclusive revenues of $12.50 per ton with the assumptions indicated in Section 3.8. The Alternative 1A Phase 2 project (Pier 7B Aggregates and Inorganic Products Terminal) is projected to provide a return on equity of 9.64%, a net present value over 20 years at 4% of approximately $93,088,000 and a debt coverage over the first 5 years of 1.31, based on average or all-inclusive revenues of $7.75 per ton. These revenues would be have to be offset against savings due to reduction in vessel laytime, charter parties reflecting less delay and economies of scale from use of larger vessels, reduced peaking in truck transportation needs and reduced product shrinkage in handling.

After receiving comments from Empresa Nacional Portuaria, a financial analysis was prepared as requested by the Port for Pier 7A for the berth only, excluding equipment and storage. The results indicated that, at current rates, wharfage and dockage would be expected to provide revenues of approximately $0.98 per ton for organic products. Additional revenue of approximately $4.04 per ton, to provide total revenues of $5.02 per ton of organic products, would be required to provide a rate of return on equity of approximately 9.5% per year on the berth only. A similar analysis was prepared for Pier 7B for the berth only, excluding equipment and storage. The results indicated that, at current rates, wharfage and dockage would be expected to provide revenues of approximately $0.52 per ton for aggregates and inorganic products. Additional revenues of approximately $2.35 per ton would be required to provide total revenues of $2.87 per ton for aggregates and inorganic products and a rate of return on equity of approximately 9.5% per year for the berth only.

Sources of funding indicated in the report include international lending agencies, export import banks, government sources and private investors and developers. Details are presented in Section 3.8.

Project Implementation Schedule

Depending on available resources and requirements, Phases 1 (Organic Products Terminal) and 2 (Aggregates and Inorganic Products Terminal) can be developed concurrently, overlapping or sequentially. Development of each phase or terminal is expected to require approximately 24 to 30 months, including 6 months for detailed engineering, 12 to 18 months for wharf and landside civil works and 6 months for equipment installation and startup, as described in Section 3.9.

4 Development Impact Considerations

The discussion of the developmental impacts of the proposed project will be provided under the following subtitles:

Infrastructure / Industry

The development of the specialized dry bulk terminal in Puerto Cortes will create a technologically advanced materials handling system for dry bulk products. It will provide a much-needed specialized berth to receive bulk carrying vessels as well as modern and flexible cargo handling equipment and storage areas that will greatly expedite the cargo operations and reduce vessel waiting times and cargo

unloading rates currently experienced by port users. The new terminal will allow the port users to optimize the flow of cargo from the vessels in a manner that will make most efficient utilization of transport and storage infrastructure.

The beneficiaries will include a broad range of import industries that utilize process and distribute bulk commodities. Cost savings will accrue to local industries, consumers and importers. In addition, considering the substantial volumes of feeds, fertilizers, coal and other raw materials and intermediate goods imported through the Port of Cortes, the cost savings will reduce the costs of production for industries in Honduras, including export industries such as beef. The terminal also includes efficient handling of exports, such as sugar and aggregates, which will benefits exporters directly, reducing port costs and increasing the net income from export activities.

Another aspect that is important to consider is the attractiveness of renovation and modernization of the rail line between Puerto Cortes, Choloma, San Pedro Sula, Villa Nueva and Potrerillos, located along the road between San Pedro Sula and Tegucigalpa. The location of a good number of industrial users in this corridor may make it a very attractive investment in conjunction with the new dry bulk terminal.

Market-Oriented Reforms

The cost estimates indicate that, for Phase 1 (Pier 7A for organic products) substantial additional funds will be required in order to install the specialized equipment needed to make the new dry bulk terminal work. Otherwise the pier will simply be a new berth used with old handling technology. Additional funds are also needed for Phase 2 (Pier 7B for aggregates and inorganic products).

Besides additional funding, the new bulk terminal can be expected to require a strong infusion of technical know how and expertise in operation of modern bulk handling equipment. Coupled with this is a need for a change in the modes of operation towards a much more coordinated operation. Specifically, at the present bulk commodities are handled at public wharves by two or three separate stevedoring companies under contract to the importers, who bring their own equipment and crews, and use ships' gear. In the future, the recommended alternative includes handling with mainly shore-based equipment, such as continuous unloaders, cranes, conveyors, storage facilities and truck loading stations. The operation of this equipment, scheduling and coordination of its use, cleaning between products and maintenance are likely to require operation by either two terminal operators, one for Pier 7A and another for Pier 7B, or by one terminal operator.

The importers and exporters who utilize the terminal, who at present are captive to the existing system of slow unloading rates, costly ship delays and laytime, and trucking congestion due to the lack of berthing space, modern handling equipment and storage at the port, would benefit substantially from access to lower costs with a modern, efficient dry bulk terminal in the Port of Cortes.

Human Capacity Building

The proposed new dry bulk products terminal in Puerto Cortes will require the technological upgrading of the labor force participating in this activity. In some cases, the skills required represent an extension of current activities. In other cases, the presence of new equipment and facilities imply the development of new capabilities in the local labor force.

The suggestions of this section of the Final Report is that the dry bulk terminal operator establish a capability to impart instructional courses and seminars on the planning and operation of dry bulk terminals and logistics chain management to various interested parties.

Technology Transfer and Productivity Enhancement

The technology used at present in the handling of dry bulk products in Puerto Cortes at the present time

is rudimentary. Productivity is low. This is due, in the first instance, to a combination of lack of available berthing space. The unloading of vessels depends on equipment available locally – mobile hoppers and clamshells, of modest capacity. The unloading operation uses ships' cranes and this equipment varies greatly in terms of conditions and capacity. Finally, the flow of product from the vessel is dependent upon the availability of tractor trailers below the hopper alongside the ship.

The new terminal will provide dedicated berths for bulk operations, modern high capacity cargo handling equipment, conveyors and storage. With the greater productivity in the dry bulk operations for the new terminal, it can be expected that charter party terms will improve and that larger vessels will be sought.

New computerized terminal control systems, computerized maintenance management systems and security technology are also recommended for the dry bulk terminals.

Other Impacts

As part of the Puebla Panama Plan (PPP) for regional transportation and trade integration, Honduras has developed a plan to improve a series of road links to facilitate trade, enhance competitiveness and integrate the regional economies. A key element of this effort is the Logistics Corridor, which will provide modern transportation linkages between the Port of Puerto Cortes and Guatemala, El Salvador and Nicaragua. With the increase in productivity for dry bulk operations, it may be expected that the routing of dry bulk cargo through Puerto Cortes may become attractive to regional importers. While this development will be constrained by land transportation and distribution costs to a larger degree than containerized shipments, as the share of transportation and distribution costs account for more of the value of the bulk products than containerized cargoes, it still represents an important potential for Puerto Cortes.

5.2 Submittal of the Final Report

DMJM Harris has prepared this report, including the comments received from Empresa Nacional Portuaria at the presentation in June 2007.

5.3 Discussion of Client Comments and Results

The presentation of study results included detailed 80-slide PowerPoint final presentation of our findings covering the feasibility study on June 25, 2007 in at the Port of Cortes Administration Building in Puerto Cortés, Honduras, and also the conceptual layouts, plans, cross sectional drawings and cost estimates for all of the alternatives, each including one to two berths and bulk handling equipment for loading, unloading and storage, together with the cargo demand forecasts. The presentation was carried out by key members of the project team, including the DMJM Harris team, Project Manager - Laurence Boorstein, Project Economist / Vice President - Edward Boatman, Principal Port Engineer – Alfred Gutman, Principal Bulk Handling Engineer – Sergio Canales, Saybe y Asociados staff, Technical Director – Hector Reynaud, Senior Environmental Specialist – Diana Betancourt, Senior Structural Engineer – Walter Rivera, and TECNISA staff, Managing Partner – Pedro Pineda Cobos and Senior Port Civil Engineer – Luis B. Gomez. The presentation included findings and recommendations, including our recommendation of Alternative 1A Piers 7A and 7B and the rationale supporting this recommendation. At the request of Empresa Nacional Portuaria, the DMJM Harris team also prepared a revised drawing for Pier 7A and revised cost estimates, prepared an abridged presentation and made an additional presentation to the port users, including stevedoring companies, importers and exporters invited from a list provided by Empresa Nacional Portuaria at the Port of Cortes TRAINMAR Building on June 28, 2007.

The main Client comments were as follows:

- The costs for the alternatives, including the recommended alternative, Alternative 1A, were too high. The amount available was said to be approximately $30 million, including a $24 million

borrowing.

- Based on this limitation, the Client requested to limit the alternative presented to a single pier, Pier 7A for organic products and to change the wharf length to 260 m to reduce the costs. In subsequent discussions, it was agreed to include 260 and 320 m options, for purposes of detailed engineering, which can be bid for construction with two options, and further evaluated once bids are received. The rationale for including both options is that the 320 m option offers advantages in terms of safety of vessels moored from collisions with nearby vessels moored perpendicular on Wharf 6 Phase III during berthing and deberthing and also provides greater flexibility to accommodate two small Handysize vessels, and would be preferred provided the bids turn out to be within available funds. Due to physical and price contingencies, it cannot be determined at this stage, this could best be determined after geotechnical studies, detailed engineering and bids are received.

- Change the unit costs to better reflect local costs for materials in Honduras, and recalculate the construction cost estimates for all eight alternatives. DMJM Harris, working with Saybe y Asociados, has revised the construction cost estimates accordingly.

- Change the contingency percentages for construction costs. In discussion it was agreed to maintain the contingency percentages which are deemed appropriate pending detailed design and site investigations which would better pin down uncertainties associated with the site.

- Include a new dredging design ENP provided for Wharf 6 instead of the one provided in April 2007 changing the locations which ENP had developed for that project, changing the location of the access channel and turning basin for the Port moving them north closer to shore, changing the location and quantity of additional dredging calculated as being required to add the new bulk wharves. DMJM Harris revised the calculations to reflect the new dredging design received in June 2007.

- Use new bathymetric data from May 2007 ENP provided at the June meetings, instead of the data provided in April, changing the information regarding current depths and also indicating differently the location of the naval base facilities resulting in a conflict with wharves proposed based on data ENP provided earlier. Subsequent to this information, DMJM Harris has revised the drawings of the location of Pier 7B and Wharf 7B in several alternatives to eliminate the conflict with the location of the naval base as indicated on the newer drawings provided by ENP in June 2007. In addition, the dredging quantities presented in June 2007 have been recalculated to reflect the new bathymetric data received after the presentation, and ENP's new plans for dredging for Wharf 6.

- The storage areas indicated in the western part of the port in several alternatives which move dry bulks, particularly aggregates and inorganic products, through Wharf 2 or Wharf 2A, it was noted, conflicted with the present locations of port structures, including the TRAINMAR building. However, this storage was located at these locations due to the very limited land area to the west of the Quilimaco canal, and the very poor subsoil conditions at that location, which restrict storage of substantial volumes of heavy bulk cargo at that location, mandating the use of storage at another location. Accordingly, these drawings have not been revised, because a feasible alternative location to that storage has not been identified, other than not to fully provide for storage requirements in these alternatives where there is interference between cargo handling and storage requirements and existing port structures. This interference of required storage with existing port structures as a deficiency of the alternatives which include it.

- In addition, ENP informed that the area adjoining the cabotage wharf had been effectively ceded to the municipality of Puerto Cortes for use as a waterfront promenade, creating a conflict with

several of the wharves and fill areas drawn in several alternatives and requiring changing the locations of various wharves and fill areas in the alternatives. Subsequently, DMJM Harris revised several of the drawings which included Pier 7, Pier 7B or Wharf 7B for aggregates and inorganic products, which were affected by the conflict with the waterfront promenade and required more storage than could be now be made available in the eastern portion of the port. In the new drawings, the storage areas displaced from the eastern area of the port by this change have been relocated to fill in the Lagoon of Alvarado (Laguna de Alvarado). It should be noted that subsequent detailed design will need to assess the feasibility of this location or alternatives, including the future uses of the lagoon and the presence of high voltage towers and sewer outfall pipes which appear on the base maps. In addition to revising the locations of the storage on the affected drawings, DMJM Harris has revised the cost estimates for the bulk handling equipment to reflect the change in conveyor length to reach the new locations for the storage facilities.

Based on ENP providing these revised inputs and changes at the end of June 2007, DMJM Harris prepared the revisions to the alternatives regarding wharves, piers, storage areas and bulk handling equipment, the estimated costs, the recommended alternative and its costs and developed the subsequent financial, economic and environmental tasks. DMJM Harris also redesigned and redrew in CAD the various wharf, pier and storage alternatives, as presented in this report. The updated terminal layouts and revised cost estimates were included in preparing the economic / financial and environmental evaluations included in the draft final report submitted in September and October 2007. Following receipt of Client comments in December 2007 and January 2008, requesting an additional financial analysis for a berth only case, this final report was prepared and submitted to the Client.

The report presents the data collection and review of the commodity forecasts, facilities and site conditions, development of alternatives for berths, unloading equipment, storage, conveying and reclaiming systems, management information systems, and the recommended alternative with review of environmental considerations and issues, security equipment and procedures, financial analysis, project implementation schedule and development impact considerations.

The recommended alternative, Alternative 1A includes Phase 1 (Pier 7A Organic Products Terminal) and Phase 2 (Pier 7B Aggregates and Inorganic Products Terminal).

Pier 7A: 260 m (Option 1) to 320 m (Option 2) x 24 m pier between Wharf 6 Phase III and the Cabotage Wharf; Pier 7A would be for organics

The recommended equipment includes:

- Twin 700 tph continuous unloaders for organic products. Shore-based equipment will provide greater reliability of loading performance than depending on ships' gear. The advantages of continuous unloaders include better enclosure of product avoiding dust and contamination, and lower loads on the wharf structure. The advantage of twin machines over a single 1,200 tph machine is to provide backup in the event of downtime.
- Enclosed conveyors for organic products.
- Eighteen to 24 6,000 ton metal silos for organic products between Wharf 6 and the Cabotage Wharf. The main advantages to providing silos are to speed up cargo unloading, avoid ship delays awaiting trucks, and resulting laytime costs.
- Truck loading racks, which will minimize the product spillage and dust such as presently takes place when clamshell buckets discharge into open hoppers directly into trucks.
- Computerized terminal control systems and ship stowage programs are recommended.
- Computerized maintenance management systems are also recommended.
- Security equipment is recommended to control access, monitor the terminal on the land and seaside and prevent intrusion and introduction of contraband or unauthorized access.
- The project as recommended includes a number of environmental safeguards, such as

continuous unloaders, enclosed conveyors, and enclosed truck loading racks, which can help reduce dust and spillage compared to the present grab unloaders, open hoppers and trucks.

Pier 7B: 425 m x 30 m pier southeast of Cabotage Wharf; Pier 7B would be for aggregates and inorganics.

The recommended equipment includes:

- Twin 700 tph clamshell bucket unloaders for inorganic products. The advantage of clamshell buckets is to facilitate changeover between products. The advantage of twin machines over a single 1,200 tph machine is to provide backup.
- Twin 1,500 tph shiploaders for aggregates. The advantage of twin machines over a single 3,000 tph machine is to provide backup.
- Enclosed conveyors for inorganic products.
- Storage yards for aggregates and coal in the eastern area of the port.
- Storage buildings for fertilizers on fill in the Lagoon of Alvarado.
- Truck loading racks, which will minimize the product spillage and dust such as presently takes place when clamshell buckets discharge into open hoppers directly into trucks.
- Computerized terminal control systems and ship stowage programs are recommended.
- Computerized maintenance management systems are also recommended.
- Security equipment is recommended to control access, monitor the terminal on the land and seaside and prevent intrusion and introduction of contraband or unauthorized access.
- The project as recommended includes a number of environmental safeguards, such as enclosed conveyors, enclosed truck loading racks, which can help reduce dust and spillage compared to the present grab unloaders, open hoppers and trucks, and water treatment facilities to control the impact of groundwater runoff from open storage.

The final report includes a list of suppliers, including potential sources of U.S. equipment and services in Appendix A.

A. U.S. SOURCES OF SUPPLY

1 Cargo Handling

Sources of supply for cargo handling systems and port-related goods and services are listed below. The U.S. sources of supply shown are some representative vendors and are not to be considered as exclusive sources or an endorsement or preferred supplier.

1.1 U.S. Suppliers to Grain, Feed and Milling Industries

A. Linear Actuators – Electric

Andco Actuators
16240 Port Northwest Dr.
Houston, TX 77041
Phone: (832) 590-2306
Phone: (800) 945-9898
Fax: (713) 849-2879
Website: http://www.andcoactuators.com

B. Aeration Fans and Ductwork

Airlanco
P.O. Box 398
Falls City, NE 68355
Phone: (800) 500-9777
Website: http://www.alancomfg.com

The Boone Group
P.O. Box 369
1773 219th Lane
Boone, IA 50036
Phone: (800) 265-2010
Fax: (515) 432-5262
Website: http://www.rolfesatboone.com

C. Elevator Automation

CompuWeigh Corporation
50 Middle Quarter Rd
Woodbury, CT 06798
Phone: (203) 699-9000
Fax: (203) 699-9488
Website: http://www.compuweigh.com

Information in this Appendix was prepared by DMJM Harris Inc. Information in Section 11 was prepared by DMJM H&N. The information in Section 1.1 was provided by The Hendrik Group, Inc.

D. Belting

Fenner Dunlop Americas
21 Laredo Drive
Scottdale, GA, 30079
Phone: (800) 241-1863
Phone: (404) 292-5272
Fax: (404) 297-3174
Website: http://www.fennerdunlopamericas.com

E. Bucket Elevators

Hayes & Stolz Industrial Manufacturing Co.
3521 Hemphill Street
Fort Worth, TX 76110
Phone: (800) 725-7272
Phone: (817) 926-3391
Fax: (871) 926-4133
Website: http://www.hayes-stolz.com

InterSystems
13330 "I" Street
Omaha, NE 68137
Phone: (800) 228-1483
Phone: (402) 330-1500
Fax: (402) 330-3350
Website: http://www.intersystems.net

Rapat Corporation
919 O'Donnell Street
Hawley, MN 56549-4310
Phone: (800) 874-1935
Phone: (218) 483-3344
Fax: (218) 483-3535
Website: http://www.rapat.com

Schlagel, Inc.
491 North Emerson
Cambridge, MN 55008
Phone: (800) 328-8002
Phone: (763) 689-5991
Fax: (763) 689-5310
Website: http://www.schlagel.com

F. Belt Conveyors – Air Supported – Totally Enclosed

The Hendrik Group, Inc.
193 Sprain Brook Road
Woodbury, CT 06798
Phone: (203) 263-7025
Fax: (203) 263-7425
Website: http://www.thehendrikgroup.com

Tramco, Inc.
1020 East 19th Street
Wichita, KS 67214
Phone: (316) 264-4604
Fax: (316) 264-7965
Website: http://www.tramcoinc.com

G. Conveyors – Drag – En masse – Chain

Buhler, Inc.
13105 12th Avenue North,
Plymouth, MN 55441-4509
P.O.Box 9497
Minneapolis, MN 55440-9497
Phone: (763) 847-9900
Fax: (763) 847-9911
Website: http://www.buhlergroup.com

InterSystems
13330 "I" Street
Omaha, NE 68137
Phone: (800) 228-1483
Phone: (402) 330-1500
Fax: (402) 330-3350
Website: http://www.intersystems.net

Schlagel, Inc.
491 North Emerson
Cambridge, MN 55008
Phone: (800) 328-8002
Phone: (763) 689-5991
Fax: (763) 689-5310
Website: http://www.schlagel.com

Tramco, Inc.
1020 East 19th Street
Wichita, KS 67214
Phone: (316) 264-4604
Fax: (316) 264-7965
Website: http://www.tramcoinc.com

H. Conveyor Controls – Motion Sensors, Misalignment Switches and Chute Plug Switches

4B Elevator Components
729 Sabrina Drive
East Peoria, IL 61611
Phone: (309) 698-5611
Fax: (309) 698-5615
Website: http://www.go4b.com

Conveyor Components Company
130 Seltzer Road
P.O. Box 167
Croswell, MI 48422
Phone: (800) 233-3233
Phone: (810) 679-4170
Fax: (810) 679-4510
Website: http://www.conveyorcomponents.com

Process Control Systems
327 Lake Hazeltine Drive
Chaska, MN 55318
Phone: (800) 3280738
Phone: (952) 361-3026
Website: http://www.maxigard.com

I. Conveyors – Screw

Screw Conveyor Corporation
700 Hoffman Street
Hammond, Indiana 46327-1894
Phone: (219) 931-1450
Fax: (219) 931-0209
Website: http://www.screwconveyor.com

J. Dust Collectors and Dust Collection Design

Airlanco
P.O. Box 398
Falls City, NE 68355
Phone: (800) 500-9777
Website: http://www.alancomfg.com

Donaldson Company, Inc.
P.O. Box 1299
1400 West 94th Street
Minneapolis, MN 55440
Phone: (888) 338-3878
Website: http://www.donaldson.com

MAC Equipment
PO Box 205
810 South Old Highway 75 South
Sabetha, KS 66534
Phone: (800) 223-2191
Phone: (785) 284-2191
Fax: (785) 284-3565
Website: http://www.macequipment.com

K. Explosion Protection Equipment

Fenwal Protection Systems
400 Main Street
Ashland, MA 01721
Phone: (508) 881-2000
Website: http://www.fenwalprotection.com

L. Flat Storage Buildings

Behlen Manufacturing Company
PO Box 569
4025 E. 23rd Street
Columbus, NE 68601
Phone: (402) 564-3111
Fax: (402) 563-7405
Website: http://www.behlenmfg.com

M. Grain Temperature Systems

The Boone Group
P.O. Box 369
1773 219th Lane
Boone, IA 50036
Phone: (800) 265-2010
Fax: (515) 432-5262
Website: http://www.rolfesatboone.com

SafeGrain Incorporated
3530 Irwin Simpson Road
Mason, Ohio 45040
Phone: (800) 659-8250
Phone: (513) 398-2500
Fax: (513) 398-2536
Website: http://www.safegrain.com

Tri-States Grain Conditioning, Inc. TSGC
PO Box 468
Spirit Lake, IA
Phone: (800) GET-TEMP
Phone: (712) 336-0199
Fax: (712) 336-0299
Website: http://www.tsgcinc.com

N. Magnets and Magnetic Separators

Bunting Magnetics Company
500 S. Spencer Avenue
PO Box 468
Newton, KS 67114-0468
Phone: (800) 835-2526
Phone: (316) 284-2020
Fax: (316) 283-4975
Website: http://www.buntingmagnetics.com

Eriez
2200 Asbury Road
PO Box 10608
Erie, PA 16514-0608
Phone: (888) 800-3743
Phone: (814) 835-6000
Fax: (814) 838-4960
Website: http://www.eriez.com

Industrial Magnetics, Inc.
1240 S M75
PO Box 80
Boyne City, MI 49712
Phone: (800) 662-4638
Phone: (231) 582-3100
Fax: (231) 582-0622
Website: http://www.magnetics.com

O. Manlifts and Elevators

American Hoist Manlift, Inc.
15811 Annico Drive, Unit 5
Homer Glen, IL 60491
Phone: (708) 499-3416
Fax: (708) 499-3467
Website: http://www.americanbeltmanlift.com

Perma Tron Elevator, Inc.
PO Box 1800
Denison, TX 75021
Phone: (800) 874-0856
Phone: (903) 463-4511
Fax: (903) 465-0327
Website: http://www.perma-tron.com

Schumacher Elevator Company
One Schumacher Way
PO Box 393
Denver, Iowa 50622
Phone: 319) 984-5676
Fax: (319) 984-6316
Website: http://www.schumacherelevator.com

P. Bulk Scales

CompuWeigh Corporation
50 Middle Quarter Rd
Woodbury, CT 06798
Phone: (203) 699-9000
Fax: (203) 699-9488
Website: http://www.compuweigh.com

C&A Scales
PO Box 270
25300 Old Lincoln Highway
Crescent, IA 51526
Phone: (800) 369-8566
Phone: (712) 545-3461
Fax: (712) 545-3343
Website: http://www.candascales.com

InterSystems
13330 "I" Street
Omaha, NE 68137
Phone: (800) 228-1483
Phone: (402) 330-1500
Fax: (402) 330-3350
Website: http://www.intersystems.net

Q. Steel Silos

Brock Grain Systems
CTB, Inc.
611 North Higbee Street
PO Box 2000
Milford, IN 46542-2000
Phone: (574) 658-4191
Fax: (574-658-3471
Website: http://www.ctbinc.com

Behlen Manufacturing Company
PO Box 569
4025 E. 23rd Street
Columbus, NE 68601
Phone: (402) 564-3111
Fax: (402) 563-7405
Website: http://www.behlenmfg.com

Columbian TecTank
5400 Kansas Ave.
Kansas City, KS 66110
Phone: (913) 621-3700
Fax: (913) 621-2145
Website: http://www.columbiantectank.com

Chief Industries, Inc.
3942 West Old Highway 30
PO Box 2078
Grand Island, NE 68802-2078
Phone: (308) 389-7200
Fax: (308) 389-7221
Website: http://www.chiefind.com

1.2 Bulk Material Handling and Storage

Products: Belt and chain conveyors, Bucket elevators, silos

Supplier: **CHIEF Industries, Inc.**
Address: 3942 West Old Highway 30
PO Box 2078
Grand Island, NE 68802-2078

Chief Agri/Industrial Division
P.O. Box 848
Kearney, NE 68848
USA
Telephone: 1-308-389-7200 (Corporate), 1-308 238 2737, 1-308-237-3186 (Agri/Ind)
Fax: 1-308-389-7221 (Corporate), 1-308 237 2650 (Agri/Ind)
E-mail: corporate@chiefind.com; agri@chiefind.com
Contact: Mr. Oscar Coello
Web: http://www.chiefind.com

Products: Mechanical unloaders (continuous or clamshell), bucket elevators

Supplier: **Fuller Bulk Handling / FL Smidth**
Address: Pneumatic Transport
F.L.Smidth Inc.
2040 Avenue C
Bethlehem PA 18017-2188
USA
Telephone: 1-610-264-6055
Fax: 1-610-264-6307
E-mail: michael.gregory@flsmidth.com
Contact: Michael Gregory, District Sales Manager
Web: http://www.fullerbulkhandling.com

Products: Mechanical unloaders (continuous or clamshell)

Supplier: **Heyl & Patterson Inc.**
Address: 2000 Cliff Mine Rd
Park West Two Suite 300
Pittsburgh, PA 15275
USA
Telephone: 1-412-788-9810
Fax: 1-412-788-9822
E-mail: info@heylpatterson.com
Contact: Jerry Spehar
Web: http://www.heylpatterson.com

Products: Complete bulk handling systems, mechanical unloaders (continuous or clamshell), belt and chain conveyors, bucket elevators

Supplier: **ThyssenKrupp Robins, Inc.**
Address: 7730 E. Belleview Ave., # 404,
Greenwood Village, CO 80111-5820
USA
Telephone: 1-303-770-0808
Fax: 1-303-770-4522
E-mail: sales@krupprobins.com; kri@krupprobins.com
Contact: Ingolf Neubecker
Web: http://www.krupprobins.com

Products: Complete handling systems, mechanical unloaders (continuous or clamshell), belt and chain conveyors, bucket elevators

Supplier: **METSO Minerals Materials Handling**
Address: 1500 Corporate Dr Ste 300
Canonsburg, PA 15317
USA
Telephone: 1-412 269 5000
Fax: 1-412 269 5030
E-mail: tim.sexton@metso.com
Contact: Mr. Thimothy Sexton
Web: http://www.metso.com

Products: Complete materials handling systems, belt and chain conveyors, bucket elevators, silos

Supplier: **Roberts & Schaefer Company**
Address: 222 S. Riverside Plaza, Suite 1800
Chicago, IL 60606-3986
USA
Telephone: 1-312-236-7292
Fax: 1- 312-726-2872
E-mail: bobw@eni.com; info@r-s.com
Contact: Robert Williams
Web: http://www.r-s.com

Products: Belt and chain conveyors, bucket elevators, silos

Supplier: **SCAFCO Corporation; Grain Systems**
Address: 6200 E. Main Avenue
PO Box11215
Spokane, WA 99211-1215
USA
Telephone: 1-509-535-1571
Fax: 1-509-535- 9130
E-mail: mail@scafco.com
Contact: Sales
Web: http://www.scafco.com

Products: Materials handling

Supplier: **EDC, Inc.**
Address: 67 Ramapo Rd.
Mahwah NJ 07430
USA
Telephone: 1-201-684-1220
Fax: 1-201-684-1224
E-mail: info@edcincorp.com
Contact: Walter R. Herbst, President; Walter J. Herbst, Vice President
Web: http://www.edcincorp.com

Products: Conveyors

Supplier: **Continental Conveyor & Equipment Co., Inc.**
Address: 438 Industrial Drive
P.O. Box 400
Winfield AL 35594-0400
USA
Telephone: 1-205-487-6492
Fax: 1-205-487-4233
E-mail: info@continentalconveyor.com
Contact: Sales
Web: http://www.continentalconveyor.com

Supplier: **FMC Corp.**
Address: Conveyor Equipment Division
1 Link Belt Dr
P O Box 1370
Tupelo MS 38802

400 Highpoint Drive
Chalfont, PA 18914
USA
Telephone: 1-662-869-5711 (Mississippi), 1-215 822 4556 (Pennsylvania)
Fax: 1-662 869 7401 (Mississippi), 1-215 822 4520 (Pennsylvania)
E-mail: mhsol.info@fmcti.com; mary.plesh@fmcti.com
Contact: Deborah Goddard (Mississippi); Mary Plesh (Pennsylvania)
Web: http://www.fmcconveyors.com

Supplier: **Hendrik Enterprises, Inc.**
Address: 193 Sprain Brook Rd,
Woodbury CT 06798
USA
Telephone: 1-203-263-7025
Fax: 1-203-263-7425
E-mail: support@thehendrikgroup.com
Contact: Mr. Henk Hartsuiker
Web: http://www.thehendrikgroup.com

1.3 Electric motors and drives

Supplier:	**GE Industrial Systems**
Address:	790 Nw 107th Ave Ste 200 Miami, FL 33172-3158 USA
Telephone	1-305-551-5155; 1-305-551-5176
Fax:	1-305-551-5129
Web:	http://www.geindustrial.com

1.4 Breakbulk and Bulk Mobile Equipment

A. Forklifts

Supplier: **CDI Equipment, Ltd.**
Address: 926 N. Sam Houston Parkway
Houston, TX 77032
USA
Telephone: 1-903-753-4481
Fax: 1-903-758-6320
E-mail: rreed@casece.com
Contact: Renny Reed
Web www.casece.com/dws/dealers/esscorp

Supplier: **Lee Tractor Co., Inc.**
Address: 10203 Airline Highway
St. Rose, LA 70087
USA
Telephone: 1-504-467-6794
Fax: 1-504-467-6799
E-mail: leetractorsales@bellsouth.net
Contact: Don Mensen
Web NA

Manufacturer:

Supplier: **Case Equipment**
CNH America LLC
Address: 7000 Durand Ave
Racine, WI 53406
USA
Telephone: 1-262-636-7055
Web site http://www.casece.com

Supplier: **Clark Equipment Company (Inc)**
Address: 200 Chestnut Ridge Rd
Woodcliff Lake, NJ 07677-7703
USA
Telephone: 1-201-573-0123
E-mail: NA
Contact: NA

B. Front Loaders

Supplier: **Rush Equipment Center**
Address: 10100 N Loop East
Houston, TX 77029
USA
Telephone: 1-713-679-6700
Fax 1-713-674-0305
E-mail: fullere@rush-enterprises.com
Contact: Ed Fuller
Web: http://www.rushequipcenters.com

Supplier:	**Brookside Equipment Sales, Inc**
Address:	7707 Mosley Rd. Houston, TX 77017 USA
Telephone:	1-713-943-7100
Fax:	1-713-943-9102
E-mail:	operez@brooksideusa.com
Contact:	Octavio Perez
Web:	http://www.brooksideusa.com

Supplier:	**Sunshine Equipment Co., Inc.**
Address:	2300 Hwy 70E Donaldsonville, LA 70346 USA
Telephone:	1-225-473-9861
Fax:	1-225-473-3059
Web:	http://www.sunequip.com

Supplier:	**Duhon Machinery**
Address:	10460 West Airline Highway St. Rose, Louisiana 70087 USA
Telephone:	1-504-466-5495
Fax:	1-504-466-5539
E-mail:	sales@duhonmachinery.com
Contact:	Sid Duhon
Web:	http://www.duhonmachinery.com

Supplier:	**Bobcat of Houston**
Address:	8464 Gulf Freeway Houston, TX 77017 USA
Telephone:	1-713-645-1234
Fax:	1-281-477-8734
E-mail:	mikes@bobcatofhouston.com
Contact:	Mike Strittmatter
Web:	http://www.bobcatofhouston.com

Manufacturers:

Supplier:	**John Deere**
Address:	Deere & Company 1 John Deere Place Moline, IL 61265 USA
Telephone:	1-309-765-8000
Fax:	1-309-765-5671
Web site	http://www.deere.com

Supplier:	**Bobcat Company**
Address:	250 E. Beaton Dr. West Fargo, ND 58078 USA
Telephone:	1-701-241-8700
Web site	http://www.bobcat.com

C. Dozers

Supplier:	**Mustang Tractor & Equipment Co.**
Address:	12800 Northwest Fwy Houston, TX 77040 USA
Telephone:	1-713-460-2000
Fax:	NA
E-mail:	tfisk@mustangcat.com
Contact:	Todd Fisk
Web:	http://mustang.cat.com

Supplier:	**Louisiana Machinery Co.**
Address:	3799 W Airline Hwy Reserve, LA 70084 USA
Telephone:	1-985-536-1121
E-mail:	gweimer@louisianamachinery.com
Contact:	Greg Weimer
Web:	http://louisiana.cat.com

Manufacturer:

Supplier:	**Caterpillar Inc.**
Address:	100 NE Adams St. Peoria, IL 61629 USA
Telephone:	1-309-675-1000
Fax:	1-309-675-1182
Web site	http://www.cat.com

2 Control Systems

Supplier:	**Rockwell Automation**
Address:	US Bank Center 777 East Wisconsin Avenue Suite 1400 Milwaukee, WI 53202 Allen Bradley and Rockwell Software: Rockwell Automation 1201 South Second Street Milwaukee, Wisconsin 53204-2496 USA
Telephone:	1-414-212-5200 (Corporate Headquarters), 1-414-382-2000 (Allen Bradley and Rockwell software)
Fax	1-414-382-4444 (Allen Bradley and Rockwell software)
E-mail:	NA
Contact:	Sales
Web:	http://www.rockwellautomation.com

Supplier:	**Robertshaw Industrial Products Division** 1602 Mustang Drive Maryville, TN 37801 USA
Telephone:	1-865-981-3100, 1-800-228-7429 (toll free in USA)
Fax:	1-865-981-3168
E-mail:	NA
Contact:	Sales
Web:	http://www.robertshaw.com

Supplier:	**Honeywell International Inc.** 101 Columbia Road Morristown, NJ 07962 USA
Telephone:	1-973-455-2000
Fax:	1-973-455-4807
E-mail:	NA
Contact:	Sales
Web:	http://www.honeywell.com

3 Marine Terminal Planning and Engineering

Supplier: **DMJM Harris**
Address: 20 Exchange Pl 12th Fl
New York NY 10005-3262
USA
Telephone: 1-212-701-2868
Fax: 1-212-701-2801
E-mail: abbas.sarmad@dmjmharris.com
Contact: Abbas Sarmad, P.E.
Web: http://www.dmjmharris.com

Supplier: **The Louis Berger Group, Inc.**
Address: 100 Halsted Street
East Orange, NJ 07018
USA
Telephone: 1-973-678-1960
Fax: 1-973-672-4284
E-mail: ishafran@louisberger.com
Contact: Isaac Shafran, Senior Vice President
Web: http://louisberger.com

Supplier: **BERGER/ABAM Engineers, Inc.**
Address: 33301 Ninth Avenue South, Suite 300
Federal Way, WA 98003
USA
Telephone: 1-206-431-2300; 1-888/600-2374 (toll free in USA)
Fax: 1-206-431-2250
E-mail: Vk.kumar@abam.com
Contact: V.K.Kumar
Web: http://www.bergerabam.com

Supplier: **URS Corporation**
Address: 600 Montgomery Street
26th Floor
San Francisco, CA 94111-2728
USA
Telephone: 1-415-774-2700
Fax: 1-1-415-398-1905
E-mail: surface_transportation@urscorp.com
Contact: NA
Web: http://www.urscorp.com

Supplier: **CH2M HILL Transportation Services**
Address: 9191 South Jamaica St
Englewood, CO 80112
USA
Telephone: 1-877-741.5221; 1-303-771-0900
Fax: NA
E-mail: transportation@ch2m.com
Contact: Port and Maritime Services
Web: http://www.ch2m.com

Supplier:	**Moffatt & Nichol**
Address:	320 Golden Shore Suite 300 Long Beach, CA 90802 USA
Telephone:	1-562- 590-6500
Fax:	1-562-590-6512
E-mail:	mhorton@moffattnichol.com
Contact:	Michael Horton
Web:	http://www.moffattnichol.com

Supplier:	**HPA, Inc.**
Address:	22 Cortlandt Street, 33rd Floor New York, NY 10007 USA
Telephone:	1-212-608-3990
Fax:	1-212-566-5059
E-mail:	hpany@hpa.com
Contact:	Jonathan Goldstick
Web:	http://www.hpa.com

4 Cargo Operations Training

Supplier:	**SSA Marine**
Address:	1131 SW Klickitat Way Seattle WA 98134 USA
Telephone:	1-206-623-0304, 1-800-422-3505
Fax:	1-206-623-0179
E-mail:	info@ssamarine.com
Contact:	Sales
Web:	http://www.ssamarine.com

Supplier:	**Port of New Orleans**
Address:	1350 Port of New Orleans Pl PO Box 60046, New Orleans, LA 70160 USA
Telephone:	1-504-522-2551
Fax:	1-504-524-4156
E-mail:	knightt@portno.com
Contact:	Ted Knight
Web:	http://www.portno.com

5 Berth Components

5.1 Berth Fenders

Supplier:	**Svedala Industries Inc. Svedala-Trellex**
	Metso Minerals Industries Inc.
Address:	3588 Main Street,
	Keokuk, IA 52632
	USA
Telephone:	1-319-524-8430
Fax:	1-319-524-7290
E-mail:	Larry.kester@metso.com
Contact:	Larry Kester
Web:	NA

Supplier:	**Maritime International, Inc.**
Address:	100 E Vermilion,
	Lafayette, LA 70501
	USA
Telephone:	1-337-237-1611
Fax:	1-337-237-6770
E-mail:	info@maritime-international.co
Contact:	John Deats
Web:	http://www.maritime-international.com

5.2 Bollards

Supplier:	**Blue Water Marine Division**
	International Marine and Specialty Supply
Address:	P.O. Box 266599
	Houston, TX 77207-6599
	7509 Wynlea St.,
	Houston, TX 77061
	USA
Telephone:	1-713-645-0192
Fax:	1-713-643-2292
E-mail:	oilcovery-bluewater@worldnet.att.net
Contact:	Steve Jannik, Patricia Valle
Web:	NA

Supplier:	**Maritime International, Inc.**
Address:	204 Ida Rd.
	Broussard LA 70518
	USA
Telephone:	1-337-837-7160
Fax:	1-337-837-3610
E-mail:	sales@maritime-international.com, info@maritime-international.com
Contact:	John Deats
Web:	http://www.maritime-international.com

Supplier:	**J.C. MacElroy Company, Inc.**
Address:	91 Ethel Road West
	P.O. Box 850,
	Piscataway, NJ 08855
	USA
Telephone:	1-732-572-7100
Fax:	1-732-572-7112
E-mail:	info@macelroy.com
Contact:	Sales
Web:	http://www.macelroy.com

Supplier:	**Anchor Marine & Industrial Supply Co., Inc.**
Address:	P.O. Box 58645
	Houston, TX 77258-8645
	USA
	6545 Lindbergh
	Houston, Texas 77087
	USA
Telephone:	1-713-644-1183, 1-800-233-8014 (toll free in USA)
Fax:	1-713-644-1185
E-mail:	sales@anchormarinehouston.com
Contact:	Sales
Web:	http://www.anchormarinehouston.com

5.3 Rail

A. Crane Rail, Railroad Rail

Supplier: **Birmingham Rail Division**
Birmingham Rail & Locomotive Co
Address: P. O. Box 530157
Birmingham, AL 35253-0157
USA
Telephone: 1-205-424-7245(RAIL); 1-800-241-2260;
Fax: 1-205-424-7436
E-mail: bhamrail@aol.com; jtingle@birminghamrail.com
Contact: Jane Tingle
Web: http://www.bhamrail.com

Supplier: **L.B.Foster Co.**
Address: International Sales,
7015 Fairbanks-North Houston Rd.
Houston, TX 77040
USA

Sales, Crane Systems
L. B. Foster Company
125 Windsor Drive, Ste. 122
Oak Brook, IL 60523
USA
Telephone: 1-713-466-2700, 1-713-466-2766 (Texas)
1-630-954-1450 X 105 (Illinois)
Fax: 1-713-466-2706 (Texas); 1-630-954-1429 (Illinois)
E-mail: vmiller@lbfosterco.com, sfisher@lbfosterco.com, glippard@lbfosterco.com, lruemler@lbfosterco.com.

Contact: Chip Miller, Sales Manager, Crane Systems (Illinois),
Lia Turner, International District Sales Manager (Houston)
Sam Fisher, Sr. VP; Greg Lippard, VP; Laurie Ruemler
Web: http://www.lbfoster.com

Supplier: **Atlantic Track and Turnout Co.**
Crane Runway Division
Address: St. Clair Industrial Park, RD#3,
St. Clair, PA 17970
USA
Telephone: 1-570-429-1462
Fax: 1-570-429-2273
E-mail: frankj@atlantictrack.com
Contact: Frank J. Jroski
Web: http://www.atlantictrack.com

B. Crane Rail Accessories

Supplier:	**Cavotec Gantrex USA Inc.**
Address:	Corporate Sales Office 275 Curry Hollow Road Pittsburgh, PA 15236 USA Latin America Sales: 14300 Cornerstone Village Dr, Suite 111 Houston, TX 77014
Telephone:	1-412-655-1400; 1-800-242-6873 (Corporate Sales, Pittsburgh); 1-281-893-0027 (Latin America Sales, Houston)
Fax:	1-412-655-3814 (Corporate Sales, Pittsburgh); 1-281-893-4512 (Latin America Sales, Houston)
E-mail:	mark.veydt@cavotec.com, tom.berringer@cavotec.com or art.avlon@cavotec.com (Corporate sales) kendell.short@cavotec.com or sergio.bozzetti@cavotec.com (Latin America Sales)
Contact:	Kendall Short or Sergio Bozzetti, Latin America Sales, Houston
Web:	http://www.gantrex.com

Supplier:	**Atlantic Track and Turnout Co.** Crane Runway Division
Address:	St. Clair Industrial Park, RD#3, St. Clair, PA 17970 USA
Telephone:	1-570-429-1462
Fax:	1-570-429-2273
E-mail:	frankj@atlantictrack.com
Contact:	Frank J. Jroski
Web:	http://www.atlantictrack.com

C. Crane Rail Welding Systems

Supplier:	**Orgo-Thermit, Inc.**
Address:	3500 Colonial Drive North, Manchester, NJ 08733 USA
Telephone:	1-732-657-5781
Fax:	1-732-657-5899
E-mail:	info@orgothermit.com
Contact:	Sales office
Web:	http://www.orgothermit.com

Supplier:	**Cavotec Gantrex USA Inc.**
Address:	Corporate Sales Office 275 Curry Hollow Road Pittsburgh, PA 15236 USA Latin America Sales: 14300 Cornerstone Village Dr, Suite 111 Houston, TX 77014
Telephone:	1-412-655-1400; 1-800-242-6873 (Corporate Sales, Pittsburgh); 1-281-893-0027 (Latin America Sales, Houston)
Fax:	1-412-655-3814 (Corporate Sales, Pittsburgh); 1-281-893-4512 (Latin America Sales, Houston)
E-mail:	mark.veydt@cavotec.com, tom.berringer@cavotec.com or art.avlon@cavotec.com (Corporate sales) kendell.short@cavotec.com or sergio.bozzetti@cavotec.com (Latin America Sales)
Contact:	Kendall Short or Sergio Bozzetti, Latin America Sales, Houston
Web:	http://www.gantrex.com

Supplier:	**Holland Industrial Maintenance**
Address:	1000 Holland Drive, Crete, IL 60417-2120 USA
Telephone:	1-708-672-2300
Fax:	1-708-672-0119
E-mail:	bsikora@hollandco.com; webmail@hollandco.com
Contact:	Bruce W. Sikora, National Sales Manager
Web:	http://www.hollandco.com

D. Panzerbelt and Cable Horns

Supplier: **Cavotec Gantrex USA Inc.**
Address: Corporate Sales Office
275 Curry Hollow Road
Pittsburgh, PA 15236
USA

Latin America Sales:
14300 Cornerstone Village Dr, Suite 111
Houston, TX 77014
Telephone: 1-412-655-1400; 1-800-242-6873 (Corporate Sales, Pittsburgh);
1-281-893-0027 (Latin America Sales, Houston)
Fax: 1-412-655-3814 (Corporate Sales, Pittsburgh);
1-281-893-4512 (Latin America Sales, Houston)
E-mail: mark.veydt@cavotec.com, tom.berringer@cavotec.com or art.avlon@cavotec.com
(Corporate sales)
kendell.short@cavotec.com or sergio.bozzetti@cavotec.com
(Latin America Sales)
Contact: Kendall Short or Sergio Bozzetti, Latin America Sales, Houston
Web: http://www.gantrex.com

Supplier: **Atlantic Track and Turnout Co.**
Crane Runway Division
Address: St. Clair Industrial Park, RD#3,
St. Clair, PA 17970
USA
Telephone: 1-570-429-1462
Fax: 1-570-429-2273
E-mail: frankj@atlantictrack.com
Contact: Frank J. Jroski
Web: http://www.atlantictrack.com

5.4 Epoxy and Cementitious Grout

Supplier:	**Five Star Products, Inc.**
Address:	750 Commerce Drive Fairfield, CT 06825 USA
Telephone:	1-203-336-7900
Fax:	1-203-336-7930
E-mail:	sales@fivestarproducts.com
Contact:	Sales
Web:	http://www.fivestarproducts.com

Supplier:	**Conesco, Inc.**
Address:	1551 Pioneer Road, Salt Lake City, UT 84104 USA
Telephone:	1-801-972-8777
Fax:	1-801-972-8315
E-mail:	info@conescoinc.com
Contact:	Sales
Web:	http://www.conescoinc.com

Supplier:	**Texas Resins Corporation**
Address:	1400 S. Sherman #118 Richardson, TX 75081 USA
Telephone:	1-972-480-8775
Fax:	1-972-480-8337
E-mail:	sales@texasresins.com
Contact:	Sales
Web:	http://www.texasresins.com

5.5 Concrete Additives

Supplier:	**Grace Construction Products**
Address:	62 Whittemore Avenue Cambridge, MA 02140-1692 USA
Telephone:	1-617-876-1400; 1-877-423-6491
Fax:	1-617-498-4311; 1-877-423-6492
E-mail:	concrete@grace.com
Contact:	Sales
Web:	http://www.graceconstruction.com

Supplier:	**Sika Corporation**
Address:	201 Polito Avenue Lyndhurst, NJ 07071 USA
Telephone:	1-201-933-8800
Fax:	1-201-933-6225
E-mail:	Chilinski.jim@sika.corp.com
Contact:	Jim Chilinski
Web:	http://www.sika.com

Supplier:	**Degussa Admixtures, Inc.**
Address:	23700 Chagrin Boulevard Cleveland, OH 44122
Telephone:	1-216-839-7500
Fax:	1-216-839-8821
E-mail:	askdai@degussa.com
Contact:	Sales
Web:	http://www.degussaadmixtures.com

5.6 Coatings

Supplier: **Carboline Company**
Address: 350 Hanley Industrial Court,
St. Louis, MO 63144-1599
USA

Carboline distributor for Central America:
StonCor Mexico
Av. Vasconcelos No. 152 INT2C,
Col. Santa Eugracia, San Pedro Garza Garcia, NL 66260,
Mexico
Telephone: 314-644-1000 (Missouri); 5281-8625-4550 (Mexico)
Fax: 314-644-4617 (Missouri); 5281-8626-4580 (Mexico)

E-mail: carbolineUSA@carboline.com (USA); mexico@stoncor.com (Mexico)
Contact: Sales Department
Web: http://www.carboline.com

Supplier: **Ameron International**
Address: 1200 Bluegrass Lakes Parkway, Suite 100
Alpharetta GA 30004
USA
Telephone: 1-678-393-0653 ext. 304; 1-800-926-3766 ext. 304 (toll free in USA)
Fax: 1-678-566-2698
E-mail: marketing@ameroncoatings.com
Contact: Marketing
Web: http://www.ameroncoatings.com

Supplier: **The Sherwin – Williams Company, International Division**
Address: Orlando, FL
USA
Telephone: 1-407-658-0132
Fax: 1-407-658-8340
E-mail: sw2488@sherwin.com; globalsales@sherwin.com
Contact: Jose Perez
Web: http://www.sherwin-williams.com

Supplier: **Industrial Coating Enterprises, Inc.**
Address: 951 Buckeye Ave
Bldg C
Newark, OH 43056
USA
Telephone: 1-740- 344-3797,1-740-398-6190
Fax: 1-740-344-3797
E-mail: sales@indcoatings.com
Contact: Sales
Web: http://www.indcoatings.com

5.7 Drilled Shafts

Supplier: **A.H. Beck Foundation Company, Inc.**
Address: 5123 Blanco Road
San Antonio TX 78216
USA
Telephone: 1-210-342-5261
Fax: 1-210-342-4965
E-mail: ahbeck@ahbeck.com
Contact: A.H. Beck III, President, B.N. Langford, Vice President
Web: NA

Supplier: **Case Atlantic Company**
Address: 13065 40th Street North,
Clearwater, FL 33762-4219
USA
Telephone: 1-727-572-7740
Fax: 1-727-571-1393
E-mail: nbosborn@casefoundation.com
Contact: Nigel Osborn, President, Larry Blough, Vice President
Web: http://www.casefoundation.com

Supplier: **Treviicos Corp., South**
Address: 4701 W. Hillsborough Ave
2nd Floor
Tampa, FL 33614
USA
Telephone: 1-727-723-0322
Fax: 1-727-723-3661
E-mail: bkouri@treviicos.com; info@treviicos.com
Contact: Bud Khouri, Area Mgr
Web: http://www.treviicos.com

Supplier: **McKinney Drilling Company**
Address: 1130 Annapolis Rd
Suite 103
Odenton, MD 21113
USA
Telephone: 1-410-874-1235
Fax: 1-410-551-1236
E-mail: NA
Contact: Robert C. Banks, President, Jack A. Raines, Vice President
Web: http://www.mckinneydrilling.com

Supplier: **Texas Shafts, Inc.**
Address: P.O. Box 79218
Fort Worth, TX 76179-0218
USA
Telephone: 1-817-439-2000
Fax: 1-817-439-2105
E-mail: txshafts@swbell.net; rpool@texashafts.com
Contact: Ty Savage, President, Roger Pool, Vice President
Web: http://texashafts.com

Supplier:	**N.L. Schutte Foundation Drilling, Inc.**
Address:	10606 Spangler Road Dallas, TX 75220 P.O. Box 541865 Dallas, TX 75354-1865 USA
Telephone:	1-972-556-0330
Fax:	1-972-556-0968
E-mail:	nls@mindspring.com
Contact:	Clayton Stephens, VP, James Bailey, Chief Estimator
Web:	http://www.Contractors.Com/NLschuttefoundationdrLg

5.8 Welding Electrodes

Supplier:	**The Lincoln Electric Company**
	Lincoln Electric Latin America
Address:	Beacon Station at Grand Park
	9960 N.W. 116 Way, Suite #8
	Medley, FL 33178
	USA
Telephone:	1-305-888-3203
Fax:	1-305-888-3224
E-mail:	norm_sted@lincolnelectric.com
Contact:	Norm M. Sted, Regional Manager Central America and Caribbean
Web:	http://www.lincolnelectric.com

Supplier:	**J.W. Harris Co., Inc.**
Address:	4501 Quality Place,
	Mason, OH 45040
Telephone:	1-513-754-2000; 1-800-733-4533 (Toll free in USA)
Fax:	1-513-754-8700
E-mail:	Rwood@JWHarris.com; salesinfo@jwharris.com; international@jwharris.com
Contact:	Rhonda Wood
Web:	http://www.jwharris.com

Supplier:	**Thermadyne Holdings Corporation**
Address:	16052 Swingley Ridge Road, Suite 300
	St. Louis, MO 63017
	USA
	Thermadyne-Caribbean (serving South Florida and Caribbean)
	9907 Northwest 20th Street
	Pembroke Pines, FL 33024
	USA
Telephone:	1-636-728-3000 (St Louis); 1-954-442-9983 (Florida)
Fax:	1-954-602-1430 (Florida)
E-mail:	NA
Contact:	Sales
Web:	http://www.thermadyne.com

5.9 Steel Plate

Supplier:	**Mittal Steel**
Address:	Mittal Steel USA Flat Products Sales and Marketing 1 South Dearborn Chicago, IL 60603
	Burns Harbor Facility P.O. Box 248 Chesterton, IN 46304 USA
Telephone:	1-312-899-3300 (Flat products); 219-787-7414 (Burns Harbor plate)
Fax:	NA
E-mail:	spixley@intlsteel.com
Contact:	Shelby Pixley – Manager of Plate Sales, Burns Harbor Plate
Web:	http://www.mittalsteel.com

Supplier:	**Oregon Steel Mills**
Address:	1000-T S.W. Broadway, Suite 2200 Portland, OR 97205
	Plate and Coil Sales 14400 N Rivergate Blvd Portland, OR 97203 USA
Telephone:	1-503-240-5240 (plate and coil sales) or 1-800-468-8913 (toll free in USA) 1-503-223-9228, 1-800-547-9451 (toll free in USA)
Fax:	1-503-240-5291 (plate and coil sales), 1-503-240-5232
E-mail:	NA
Contact:	Mike Buckentin
Web:	http://www.oregonsteel.com

Supplier:	**United States Steel Plate Products**
Address:	United States Steel Corporation Plate in Coils Sales 3010 Highland Parkway Suite 575 Downers Grove, IL 60515
Telephone:	1-630-990-5200 1-800-447-4338
Contact:	George Thompson, General Manager – Service Center
Web:	http://www.ussteel.com

Supplier:	**Nucor Corporation**
Address:	2100 Rexford Road Charlotte, NC 28211
Tel	1-(704) 366-7000
Fax	1-(704) 362-4208 (fax)
e-mail:	info@nucor.com
Web	www.nucor.com

5.10 Re-bar

Supplier:	CMC Steel Texas,
Address:	1 Steel Mill Drive, Seguin TX 78156-0911;
Telephone:	1-830-372-8200,
Fax	1-830-372-8555
Web	http://www.cmcsteeltexas.com

Supplier:	Gerdau Ameristeel
Address:	2025 Tigertail Blvd. Dania Beach, FL 33004
Tel.	1-(954) 921-2500
Contacts:	Division Manager: Steve Parks, ext. 222 email: sparks@gerdauameristeel.com Contract Sales Representative: Ben Bryant email: bbryant@gerdauameristeel.com
Web:	http://www.Gerdauameristeel.com

Supplier:	**Nucor Corporation**
Address:	2100 Rexford Road Charlotte, NC 28211
Tel	1-(704) 366-7000
Fax	1-(704) 362-4208 (fax)
e-mail:	info@nucor.com
Web	www.nucor.com

Supplier:	**Midamerica Steel and Wire** Oklahoma Steel & Wire (Mid-America Steel)
Address:	P. O. Box 220 Highway 70 South Madill OK 73446
Tel.	800 654-4164
Fax	1-580 795-7422 Fax
e-mail	sales@oklahomasteel.com
Web	http://www.okbrandwire.com

5.11 Rebar Couplers

Supplier:	**ERICO Solon, USA**
Address:	34600 Solon Road, Solon, OH 44139 USA
Telephone:	1-440-248-0100
Fax:	1-440-248-0723
E-mail:	NA
Contact:	Sales
Web:	http://www.erico.com

Supplier:	**Bar-Lock (MBT) Coupler Systems**
Address:	4204 Meririan Street, Suite 220 Bellingham, WA 98226 P.O. Box 28280, Bellingham, WA 98228-0280 USA
Telephone:	1-360-738-1891, 1-800-755-4888
Fax:	1-360-738-1887
E-mail:	sales@barlock.com
Contact:	Sales
Web:	http://www.barlock.com

5.12 Epoxy Anchors

Supplier:	**Five Star Products, Inc.**
Address:	750 Commerce Drive Fairfield, CT 06825 USA
Telephone:	1-203-336-7900
Fax:	1-203-336-7930
E-mail:	sales@fivestarproducts.com
Contact:	Sales
Web:	http://www.fivestarproducts.com

Supplier:	**ITW Ramset/Red Head**
Address:	1300 North Michael Drive, Wood Dale, IL 60191 USA
Telephone:	1-630-350-0370
Fax:	1-630-350-7985
E-mail:	postmaster@itw-ramset.com
Contact:	Sales
Web:	http://www.ramset-redhead.com

Supplier:	**Drillco National Group**
Address:	P.O. Box 2182, Long Island City, NY 11102 USA
Telephone:	1-718-726-9801or 1-800-391-0052 (toll free in USA)
Fax:	1-718-956-3759
E-mail:	info@drillcodevices.com
Contact:	Sales
Web:	http://www.drillcogroup.com

5.13 Pipe Piles

Supplier:	**Skyline Steel LLC,**
Address:	8 Woodhollow Road, Parsippany NJ 07054;
Telephone:	1-973-428-6100,
Fax	1-973-428-7399.
Web	http://www.skylinesteel.com

Supplier:	**Midstate Steel Corp.,**
Address:	PO Box 5388 Midland TX 79704;
Telephone	1-432-686-7779,
Fax	1-432-687-5567
Web	http://www.midstate-steel.com

Supplier:	**Florida Pipe and Steel, Inc.**
Address:	6685 Forest Hill Blvd. Suite #207 West Palm Beach, Florida 33413 USA
Telephone:	1-561-642-181, 1-800-823-3436
Fax:	1-561-642-7478
E-mail:	Steel4sale@aol.com
Contact:	Vince Bianco, President
Web:	http://www.steel4sale.com

Supplier:	**American Steel Pipe** Division of American Cast Iron Pipe Company
Address:	1501 31st Avenue North, Birmingham, AL 35207 P.O. Box 2727, Birmingham, Alabama 35202-2727 USA
Telephone:	1-205-325-7744
Fax:	1-205-325-8194
E-mail:	jnoland@acipco.com
Contact:	Jon Noland, Division Manager, General Sales
Web:	http://www.acipco.com/steel

6 Electrical

6.1 Light Towers

Supplier:	**Holophane**
Address:	214 Oakwood Ave, Newark, OH 43055 USA
Telephone:	1-740-349-4436
Fax:	1-740-349-4438
E-mail:	customerservice@holophane.com
Contact:	International sales
Web:	http://www.holophane.com

Supplier:	**Lithonia Lighting**
Address:	1400 Lester Rd Conyers GA 30012
Telephone:	1-770-922-9000
Fax:	1-770-922-1677
Web:	http://www.lithonia.com

Supplier:	**GE Supply**
Address:	9100 Purdue Road, Suite 400, Indianapolis, IN 46268 USA
Telephone:	1-317-554-3701; 1-800-243-7313
Fax:	1-317-554-3847
E-mail:	
Contact:	National Sales Center
Web:	http://www.gesupply.com

Supplier:	**Cooper Lighting**
Address:	1121 Highway 74 South Peachtree City, GA 30269 USA
Telephone:	1-770-486-4800
Fax:	NA
E-mail:	NA
Contact:	International Sales
Web:	http://www.cooperlighting.com

6.2 Electrical Controls and Substation

Supplier:	**GE Supply**
Address:	7602 Woodland Drive Suite 200 Indianapolis, IN 46278 USA
Telephone:	1-317-554-3701; 1-800-243-7313
Fax:	1-513-774-2221
E-mail:	NA
Contact:	National Sales Center, Bart Runner, Branch Manager
Web:	http://www.gesupply.com

Supplier:	**Cutler-Hammer US - Miami**
Address:	7975 NW 154th Street, Suite 410, Miami Lakes, FL 33016 USA
Telephone:	1-305-512-3200
Fax:	1-305-512-8079
E-mail:	NA
Contact:	Sales
Web:	http://www.ch.cutler-hammer.com

Supplier:	**Siemens Energy & Automation, Inc.**
Address:	186 Wood Avenue South, Iselin, NJ 08830 USA
Telephone:	1-732-603-5839, 1-732-452-2300
Fax:	1-732-906-3851, 1-732-767-1713
E-mail:	NA
Contact:	International Business Unit
Web:	http://www.sea.siemens.com

7 Mechanical

7.1 Piping Systems

Supplier:	**Puget Sound Pipe and Supply Company**
Address:	7816 South 202nd Street, Kent, WA 98032 USA
Telephone:	1-253-796-9350
Fax:	1-253-796-9355
E-mail:	r.new@pspipe.com; puget@pspipe.com
Contact:	Rich Newton
Web:	http://www.pugetpipe.com

Supplier:	**Pacific Pipe Company**
Address:	2000 Powell St, Emeryville, CA 94608-1804 USA
Telephone:	1-510-452-0122
Fax:	1-510-763-7838
E-mail:	NA
Contact:	Sales
Web:	http://www.pacificpipe.com

Supplier:	**Kelly Pipe Co., LLC**
Address:	11680 Bloomfield Avenue, P.O. Box 2827, Santa Fe Springs, CA 90670 USA
Telephone:	1-562-868-0456
Fax:	1-562-863-4695
E-mail:	NA
Contact:	Sales
Web:	http://www.kellypipe.com

8 Dredging Contractors

Supplier:	**Great Lakes Dredge & Dock Company**
Address:	2122 York Road Oak Brook, IL 60523 USA
Telephone:	1-630-574-3000
Fax:	1-630-574-2909
E-mail:	NA
Contact:	International Division
Web:	http://www.gldd.com

Supplier:	**Weeks Marine, Inc.**
Address:	4 Commerce Drive Cranford, NJ 07016-3598 Dredging: 304 Gaille Drive Innwoods Business Park Covington, LA 70433 USA
Telephone:	1-908-272-4010 (New Jersey); 1-985-875-2500 (Louisiana)
Fax:	1-908-272-4740 (New Jersey) 1-985- 875-2572 (Louisiana)
E-mail:	dredging@weeksmarine.com
Contact:	Brion Lindholm, Senior Vice President Eric Ellefsen, Vice President Business Manager
Web:	http://www.weeksmarine.com

Supplier:	**C.F. Bean LLC**
Address:	1055 St. Charles Ave. Suite 520 New Orleans, LA 70130 USA
Telephone:	1-504-587-8701, 1-504-587-8600
Fax:	1-504-587-8717
E-mail:	ataylor@cfbean.com; marketing@cfbean.com
Contact:	Jim Bean, CEO Ancil Taylor, Vice President
Web:	http://www.cfbean.com

Supplier:	**Dredge America, Inc.**
Address:	9555 NW Highway N Kansas City, MO 64153 USA
Telephone:	1-816-330-3100 (Missouri); 1-904.223.5777 (Florida)
Fax:	1-816-330-3103 (Missouri)
E-mail:	dan@dredgeamerica.com; info@dredgeamerica.com
Contact:	Dan McDougal, President
Web:	http://www.dredgeamerica.com

Product: Engineering of Dredging

Supplier:	**Gahagan & Bryant Associates, Inc.**
Address:	3802 W. Bay to Bay Blvd. #B-22 Tampa, FL 33629-6826 USA
Telephone:	1-813-831-4408
Fax:	1-813-831-4216
E-mail:	jfbryant@gba-inc.com cmbryant@gba-inc.com gbryant@gba-inc.com
Contact:	J. Frank Bryant, President Clay Bryant, Vice President Grady Bryant, Vice President
Web:	http://www.gba-inc.com

9 Navigation Aids and Buoys

Supplier:	**Tideland Signal Corporation**
Address:	4310 Directors Row P.O. Box 52430, Houston, TX 77052 USA
Telephone:	1-713-681-6101; 800-231-2778
Fax:	1-713-681-6233
E-mail:	samerica-sales@tidelandsignal.com
Contact:	Sales
Web:	http://www.tidelandsignal.com

Supplier:	**Automatic Power, Inc.**
Address:	213 Hutcheson Street P.O. Box 230738, Houston, TX 77223 USA
Telephone:	1-713-228-5208 or 1-757-253-2817
Fax:	1-713-228-3717 or 1-757-220-8166
E-mail:	sales@automaticpower.com; APIAtlantic@aol.com
Contact:	Ira Krams
Web:	http://www.automaticpower.com

Supplier:	**EDKO, Inc.**
Address:	1019 Airpark Dr. Sugar Grove, IL 60554 USA
Telephone:	1-630-556-4499, 800-800-EDKO (toll free)
Fax:	1-630-556-4478
E-mail:	sales@edko.com
Contact:	Sales
Web:	http://www.edko.com

10 Information Technology

Sources of supply for IT systems are listed below. The U.S. sources of supply shown are some representative vendors and are not to be considered as exclusive sources or an endorsement or preferred supplier.

10.1 Computer Hardware

Supplier:	**Dell Inc.**
	Dell Latin America
Address:	One Dell Way
	Round Rock, Texas 78682
	USA
Telephone:	1-512-728-4379 / 1-800-433-9014 (toll free in USA);
	1-512-723-0020; 800-0123 ask for 866-686-9848 (toll free in Honduras)
Fax:	NA
E-mail:	NA
Contact:	Customer Service
Web:	http://www.dell.com

Supplier:	**Hewlett Packard (Latin America)**
Address:	Waterford Building, 9th Floor
	5200 Blue Lagoon Drive
	Miami, FL 33126
	USA
Telephone:	1-305-267-4220
Fax:	1-305-265-5550
E-mail:	NA
Contact:	Customer Service
Web:	http://www.hp.com

Supplier:	**IBM Corporation**
Address:	1133 Westchester Avenue
	White Plains, NY 10604
	USA
Telephone:	1-800-426-4968 (toll free in USA)
Fax:	NA
E-mail:	NA
Contact:	Customer Service
Web:	http://www.ibm.com/products/us

Supplier:	**Psion Teklogix**
Address:	1810 Airport Exchange Blvd., Suite 500
	Erlanger, KY 41018
	USA
Telephone:	1-800-322-3437 (toll free in USA)
Fax:	NA
E-mail:	NA
Contact:	Customer Service
Web:	http://www.psionteklogix.com

Supplier:	**Symbol Technologies, Inc**
Address:	Latin America Headquarters 2730 University Drive Coral Springs, FL 33065 USA
Telephone:	1-954-255-2610
Fax:	1-954-340-9454
E-mail:	NA
Contact:	Customer Service
Web:	http://www.symbol.com

10.2 Software

A. Financial Software

Supplier: **Microsoft Great Plains Business Solutions**
Address: One Lone Tree Road
Fargo, ND 58104-3911
USA
Telephone: 1-701-281-6500
Fax: NA
E-mail: mbsorder@microsoft.com
Contact: NA
Web: http://www.microsoft.com

Supplier: **Oracle Corp**
Address: 500 Oracle Parkway
Redwood Shores, CA 94065
USA
Telephone: 1-650-506-7000, 1-800-672-2531 (Toll free in USA)
800-0123 then ask for 1-888-900-6500 (Toll free in Honduras)
Fax: 1-650-506-7200 800-ORACLE1 (Toll free in USA)
Fax: NA
E-mail: preguntas_ww@oracle.com
Contact: Sales / Ventas
Web: http://www.oracle.com

Note: J.D. Edwards and PeopleSoft were acquired by Oracle; information on these product lines is also available from Oracle

Supplier: **Lawson Software**
Address: 380 St. Peter Street
St. Paul, MN 55102-1302
USA
Telephone: 1-651-767-7000
Fax:
E-mail: nick.buse@lawson.com
Contact: Nick Buse
Web: http://www.lawson.com

Supplier: **Softbrands**
Address: Two Meridian Crossings, Suite 800
Minneapolis, MN 55423
USA
Telephone: 1-612-851-1500
Fax: 1-612-851-1560
E-mail: info@softbrands.com
Contact: Sales
Web: http://www.softbrands.com

Supplier:	**SSA Global**
Address:	500 West Madison Street, Suite 1600 Chicago, Illinois 60661 USA
Telephone:	1-312-258-6000
Fax:	1-312-474-7500
E-mail:	support@ssaglobal.com
Contact:	
Web:	http://www.ssaglobal.com

B. Terminal Operating Systems Software

Vendor: **Binmaster**
Division of Garner Industries
Address: 7201 North 98th Street
Lincoln, NE 68529
Phone: 1-402-434-9115
Email: ngrube@garnerindustries.com
Web http://www.binmaster.com

Vendor: **Thermoscientific /Gerrard & Associates, Inc.**
Address: 154 Lake Pine Rd
Mooresville, NC 28117
Tel: 1-704-664-9594
Fax: 1-704-664-9593
Email: dave@gerrardassociates.com
Web: http://www.gerrardassociates.com

Vendor: **Autoships / Jim Rohr and Associates LLC**
22027 Castle Springs
Katy, Texas 77450
Contact: Jim Rohr
Tel: +1-713-540-3080
Fax: +1-281-829-9394
Email sales@jimrohr.com
Web http://www.jimrohr.com
Web: http://cargomanagement.autoships.com

Supplier: **Tideworks Technology**
Address: 1129 SW Klickitat Way
Seattle, WA 98134
USA

"Sales - phone: 206-654-3640
Fax: 206-382-0443

Tideworks Technology — Central/South America
Torre Edison Plaza
Via Ricardo J. Alfaro y Calle 10, El Paical
Panama, Republic of Panama
Telephone: 1-206-654-3640 (Washington state), 1-206-382-4470, 507-321-7027 (Panama)
Fax: 1-206-382-0443 (Washington state), 1-206-382-0443 (Washington). 507-430-9839
(Panama)
E-mail: Harvey.Bauer@tideworks.com; sales@tideworks.com
Contact: Harvey Bauer, Sales
Web: http://www.tideworks.com

Supplier:	**Embarcadero Systems Corporation**
Address:	1701 Harbor Bay Parkway Alameda, CA 94502 USA
Telephone:	1-510-749-7400, 1-866-ESC-0088 (1-866-372-088) (toll free in USA)
Fax:	1-510-749-3800
E-mail:	info@esystem.com
Contact:	Sales
Web:	http://www.embarcaderosystems.com

Supplier:	**Navis LLC**
Address:	1000 Broadway, Suite 150 Oakland, CA 94607 USA
Telephone:	1-510-267-5000
Fax:	1-510-267-5100
E-mail:	Mbardi@navis.com
Contact:	Martin Bardi
Web:	http://www.navis.com/home.jsp

C. Maintenance And Repair

Sources of supply for M & R systems are listed below. The U.S. sources of supply shown are some representative vendors and are not to be considered as exclusive sources or an endorsement or preferred supplier.

Maintenance Software

Supplier:	**Datastream**
Address:	50 Datastream Plaza Greenville, SC 29605-3451 USA
Telephone:	805-684-6404 1-864-422-5001, 1-800-955-6775 Ext. 5459 or 2534 (toll free in USA)
Fax:	1-864-422-5000, 1-864-236-2651
E-mail:	Pete.Thompson@infor.com; info@datastream.net
Contacts:	Pete Thompson Cecily Rivington, John M. Sterling III Christel Novella
Web:	http://www.datastream.net
Product:	Datastream 7i

Supplier:	**Eagle Technology, Inc.**
Address:	10500 N. Port Washington Rd. Mequon, WI 53094 USA
Telephone:	1-262-241-3845, 1-800-388-3268 ext 233 (toll free in USA)
Fax:	1-414-241-5248
E-mail:	sales@eaglecmms.com
Contact:	Ted Pyle, Regional and International Sales Manager
Web:	http://www.eaglecmms.com
Product:	Proteus IV
	Latin America: Sta. Genoveva #1228 Col. La Purisima 67129 Guadalupe, N.L. Mexico
Telephone	+52(81)8394-9064
E-mail	eaglemx@eaglemxcmms.com

Supplier:	**EPAC Software Technologies, Inc.**
Address:	42 Ladd St. East Greenwich, R.I. 02818
Tel	1-407-656-0834; 888-336-EPAC(3722)
Contact:	Don Scraper, Sales
Email:	ctoti@epacst.com
Website:	http://www.epacst.com
Product:	EPAC CMMS

Supplier:	**MRO Software, Inc.**
Address:	100 Crosby Drive Bedford, MA 01730
Tel:	1-800-326-5765
Email:	maxinfo@us.ibm.com
Web:	http://www.mro.com

Supplier:	**LookSoftware, Inc.**
Address:	121 Lake Latimer Cove Kennesaw, GA 30144 USA
Telephone:	1-610-685-LOOK (1-610-685-5665)
Fax:	1-610-685-5669
E-mail:	Info@looksoftware.com
Contact:	NA
Web:	http://www.looksoftware.com

Note: Enterprise Asset Manager (EAM) was formerly marketed as MainTracker from Elke and BPCS Plant Maintenance from SSA Global.

Supplier:	**Spear Technologies**
Address:	436 – 14th Street, Suite 200 Oakland, CA 94612 USA
Telephone:	1-510-267-3333
Fax:	1-510-267-3344
E-mail:	Sales@speartechnologies.com
Contact:	Sales
Web:	http://www.speartechnologies.com

Supplier:	**Qqest Asset management Services**
Address:	9350 South 150 East Suite 300 Sandy, Utah 84070 USA
Telephone	1-801-262-1611, 1-800-730-9965 (toll free in USA)
Fax	1-801-281-3566
Contact:	Brandon Gunn, Sales Representative
Web:	http://www.managerplus.com
Product:	Manager Plus

Supplier:	**Maintenance Connection Inc.**
Address:	1947 Galileo Ct. Suite 101 Davis, CA 95616
Telephone:	1-888-567-3434 (toll free in USA)
Fax:	1-888-567-3434 (toll free in USA)
E-mail:	sales@maintenanceconnection.com
Contact:	Cary Yokum
Website:	http://www.maintenanceconnection.com
Product:	Maintenance Connection

Supplier:	**eMaint Enterprises, LLC**
Address:	7 Chester Ave. Medford, NJ 08005 USA
Telephone:	1-609-714-1689 ext. 170
E-mail:	matthew.oles@emaint.com
Contac:	Matthew Oles
Website:	http://www.emaint.com
Product:	eMAINT X3

10.3 Power Systems

Supplier: **American Power Conversion Corp. (APC)**
Address: 1332 Fairgrounds Road
W. Kingston, RI 02892

Regional office for Honduras:
5301 Blue Lagoon Dr Suite 610
Miami, Florida 33126
USA

Telephone: 1-305-266-5005 x202 (Florida); 1-877-272-2722
Fax: NA
E-mail: NA
Contact: Sales
Web: http://www.apc.com

Supplier: **Eaton Corporation**
Address: Eaton Center
1111 Superior Avenue
Cleveland, OH 44114-2584
USA
Telephone: 1-216-523-4400; 1-800-386-1911 (toll free from USA)
Fax:
E-mail: customer@eaton.com
Contact: Customer Service
Web: http://www.eaton.com

Supplier: **Liebert Corporation**
Address: 1050 Dearborn Drive
Columbus, Ohio 43085
USA
Telephone: 1-614-888-0246
Fax: 1-614-841-6022
E-mail: info@liebert.com
Contact: Sales
Web: http://www.liebert.com

Supplier: **Tripp Lite**
Address: 1111 W. 35th Street
Chicago, IL 60609 USA
Telephone: 1-773-869-1234, 1-773-869-1111
Fax: 1-773-869-1177, 1-773-869-1329
E-mail: NA
Contact: Support Specialist
Web: http://www.tripplite.com

11. Security Products

Vendor: **Siemens Building Technologies**
Address: 10775 Business Center Dr.
Cypress, CA 90630
United States of America
Tel. 1-(800) 877-7545
Web: http://www.us.sbt.siemens.com/SES/

Vendor: **Signet Technologies**
Address: 12300 Kiln Court, Suite E
Beltsville, MD 20705
United States of America
Tel. (240) 264-3295
Web www.signetinc.com

Vendor: **SIGCOM**
Address: 4230 Beechwood Drive
Greensboro, NC 27410
United States of America
Tel (877) 4SIGCOM
Web http://www.sigcom.net/
+

Product: Security systems

Supplier: **ADEMCO**
Address: 180-T Michael Dr.
Syosset, NY 11791
USA
Telephone: 1-516-921-6704, 1-800-645-7492 (toll free in USA)
Fax 1-516-496-7454
E-mail: NA
Contact: Sales
Web: http://www.ademco.com

Supplier: **Honeywell Security**
Address: 2700 Blankenbaker Pkwy Ste 150
Louisville KY 40299
USA
Telephone: 1-502-297-5700; 1-800-467-5875 (toll free in USA)
Fax: 1-502-666-7021
Web: http://www.security.honeywell.com

Product:	Security gates, slide/swing gate operators, access control equipment, systems integration, industrial barrier gates & navigational lights
Supplier:	**EDKO, Inc.**
Address:	1019 Airpark Dr. Sugar Grove, IL 60554 USA
Telephone:	1-630-556-4499, 800-800-EDKO (toll free in USA)
Fax:	1-630-556-4478
E-mail	sales@edko.com
Contact:	Sales
Web:	http://www.edko.com

12 Selected Building Products

Products: Industrial buildings

Supplier: **Washington Group International, Inc.**
Address: 720 Park Blvd.
Boise, ID 83712
USA
Telephone: 1-208-386-5000
Fax: 1-208-386-7186
E-mail: NA
Contact: NA
Web http://www.wgint.com

Products: Telecommunications

Supplier: **Lucent Technologies, Inc.**
600 Mountain Ave.
Murray Hill, NJ 07974-2008
USA
Telephone: 1-908-582-8500, 1-888-4-LUCENT (toll free in USA)
Fax: 1-908-508-2576
E-mail: NA
Contact: Sales
Web: http://www.lucent.com

Supplier: **Cisco Systems, Inc.**
170 W. Tasman Dr.
San Jose, CA 95134
USA
Telephone: 1-650-404-3500, 1-800-533-NETS (toll free in USA)
Fax: 1-408-526-4100
E-mail: NA
Contact: Sales
Web: http://www.cisco.com

Supplier: **Graybar Electric Co., Inc.**
Address: 34 N. Meramec Avenue
St. Louis, MO 63105
USA
Telephone: 1-314-573-9200,1-800-GRAYBAR(1-800-472-9227) (toll free in USA)
Fax: 1-314-573-9455
E-mail: NA
Contact: Sales
Web: http://www.graybar.com

Product: Indoor and outdoor lighting

Supplier: **Holophane**
214 Oakwood Ave.
Newark, OH 43055
USA
Telephone: 1-740-345-9631
Fax: 1-740-349-4426
E-mail: NA
Contact: Sales
Web: http://www.holophane.com

Supplier: **Lithonia Lighting**
Address: 1400 Lester Rd.
Conyers, GA 30012
USA
Telephone: 1-770-922-9000
Fax: 1-770-922-1677
E-mail: NA
Contact: Sales
Web: http://www.lithonia.com

Product: Street, outdoor and area lighting

Supplier: **Unique Solutions Div., Holophane Lighting Corp.**
515-T McKinley Ave.
Newark, OH 43055
Telephone: 1-740-349-4160
Fax: 1-800-346-5923 (toll free in USA)
E-mail: NA
Contact: Unique Solutions
Web: http://www.holophane.com

Product: Electrical control systems and circuit breakers

Supplier: **Eaton Corp., Cutler-Hammer Group**
Address: 1000 Cherrington Pkwy
Moon Township, PA 15108
USA
Telephone: 1-412-893-3300
Fax: NA
E-mail: NA
Contact: Sales
Web: http://www.cutler-hammer.com

Product: Power distribution

Supplier: **GE Industrial Systems**
Address: 1635 Broadway
Fort Wayne, IN 46802
USA
Telephone: 1-260-439-2000,1-770-644-7713
Fax 1-770-644-7713
E-mail: NA
Contact: Sales
Web: http://www.geindustrial.com

Product: Other industrial electrical products

Supplier: GE Industrial Systems
Telephone: 1-305-551-5176
Fax: 1-305-551-5129

Product: Air conditioning

Supplier: **Carrier Corp.**
Address: Carrier Pkwy., A&R Bldg.
Syracuse, NY 13221-4808

Latin America sales:
Carrier Interamerica Corporation – CMS – Sales
3450 NW 115 Ave
Miami FL 33178
USA

Telephone: 1-315-432-6000(New York), 800-227-7437 (toll free)
1-305-590-1000 (Latin America sales / Florida)
Fax: 1-315-432-7583 (New York),
1-305-590-1090 (Latin America sales / Florida)
E-mail: ricardo.e.corrie@carrier.utc.com
Contact: Ricardo E. Corrie
Web: http://www.carrier.com

13 Fire Protection

Sources of supply for fire protection systems are listed below. The U.S. sources of supply shown are some representative vendors and are not to be considered as exclusive sources or an endorsement or preferred supplier.

13.1 Fire Protection and Suppression Systems

Product: Sprinkler heads, alarm valves, waterflow and tamper switches, etc.

Supplier: **Reliable Automatic Sprinkler Company, Inc.**
Address: 525 North MacQuesten Parkway
Mt. Vernon NY 10552
USA

Latin America Sales office:
2200 Luna Road
Suite 160
Carrollton, TX 75006
Tel: Fax:

Telephone: 1-972-243-1472 (Texas), 1-919-668-3470 (New York), 1-800-431-1588 (toll free in USA)
Fax: 1-972-243-1428 (Texas), 1-800-848-6051 (toll free in USA)
E-mail: sbernal@reliablesprinkler.com
Contact: Sylvia Bernal, Latin America Sales Representative
Web: http://www.reliablesprinkler.com

Supplier: **Viking Corporation**
Address: 210 North Industrial Park Rd
Hastings, MI 49058
USA
Telephone: 1-269-945-9501,1-800-968-9501 (toll free in USA)
Fax: 1-269-945-9599
E-mail: techsvcs@vikingcorp.com
Contact: Sales
Web: http://www.vikingcorp.com

Product: Sprinkler heads, alarm valves, waterflow and tamper switches, etc., grooved fittings and couplings

Supplier: **Tyco Fire and Building Products**
451 N. Cannon Ave
Lansdale PA 19446

Latin America headquarters:
1802 SW 2nd St.
Pompano Beach FL 33069
USA
Telephone: 1-954-781-0866 (Florida), 1-215-362-0700 (Pennsylvania), 1-800-523-6512 (toll free in USA)
Fax: 1-954-781-9330 (Florida), 1-215-362-4731 (Pennsylvania)
Contact: Sales
Web: http://www.tyco-fire.com

Product: Grooved fittings and couplings, fire protection valves

Supplier: **Victaulic**
Address: 4901 Kesslersville Rd
Easton PA 18040
P.O. Box 31
Easton, PA 18044-0031
USA
Telephone: 1-610-559-3300, 1-800-PICK-VIC, (1-800-742-5842) (toll free in USA)
Fax: 1-610-559-3608, 1-610-250-8817
E-mail: vical@victaulic.com
Contact: Latin America Sales
Web: http://www.victaulic.com

Product: Threaded and flanged pipe fittings

Supplier: **Anvilstar Fire Products Division**
Address: 110 Corporate Dr, Ste 10
P.O. Box 3180
Portsmouth NH 03801
USA
Telephone: 1-708-534-1414,1-603-422-8000
Fax: 1-708-534-5441, 1-603-422-8033
E-mail: NA
Contact: Customer Service
Web: http://www.anvilintl.com

Product: Fire pumps

Supplier: **A-C Fire Pump Systems**
Address: 8200 N. Austin Ave
Morton Grove, IL 60053
USA
Telephone: 1-847-966-3700
Fax: 1-847-966-1914
Web: http://www.acfirepump.com

Supplier: **Patterson Pump**
Address: 2129 Ayersville Rd
P.O. Box 790
Toccoa GA 30577
Telephone: 1-706-866-2101
Fax: 1-706-866-0023
E-mail: fpsales@pattersonpumps.com
Contact: Fire Pump Sales
Web: http://www.pattersonpumps.com

Supplier:	**Aurora Pump**
	Pentair Pump Group
Address:	800 Airport Rd
	North Aurora IL 60542
	USA
Telephone:	1-630-859-7000
Fax	1-630-859-7060 (USA), 630-859-1226 (International)
E-mail:	aurora_info@pentairpump.com
Contact:	Sales
Web:	http://www.aurorapump.com

Supplier:	**Reddy-Buffaloes Pump, Inc.**
Address:	PO Box 557
	1 Dixie Drive
	Baxley GA 31513
Telephone:	1-912-367-6345
Fax:	1-912-367-5024
E-mail:	sales@rbpump.com
Contact	Sales
Web:	http://www.rbpump.com

Product: Fire alarm systems

Supplier:	**SimplexGrinnell**
Address:	100 Simplex Drive
	Westminster MA 01441
	USA
Telephone:	1-978-731-2500, 1-800-SIMPLEX (toll free in USA)
Fax:	1-978-731-7856
E-mail:	NA
Contact:	Sales
Web:	http://www.simplexgrinnell.com

Product:	**Notifier**
Address:	12 Clintonville Road
	Northford CT 06472-1653
	USA
Telephone:	1-203-484-716,1-800-289-3473 (toll free in USA)
Fax:	1-203-484-7118
E-mail:	NA
Contact:	Sales
Web:	http://www.notifier.com

Supplier:	**Siemens Building Technologies, Inc.**
	Fire Safety
Address:	8 Fernwood Rd
	Florham Park, NJ 07932
	Latin America:
	3371 Executive Way
	Miramar FL 33025
	USA
Telephone:	1-954-433-7328 (Florida), 1-973-593-2600 (New Jersey), 1-800-222-0108 (toll free in USA)
Fax:	1-954-433-7329 (Florida), 1-973-593-6665 (New Jersey)
E-mail:	roger.ariza@siemens.com
Contact:	Roger Ariza, Regional Manager, Latin America
Web:	http://www.sbt.siemens.com/fis
Product:	Fabricated sprinkler piping

Supplier:	**GEM Fabrication**
Address:	10230 Statesville Blvd
	P.O. Box 309
	Cleveland NC 27013
	USA
Telephone:	1-704-278-6700,1-800-845-2023 (toll free in the US)
E-mail:	gemfab@gemfab.com
Contact	Sales
Web:	http://www.gemfabrication.com
Product:	Fabricated sprinkler piping, ductile iron and PVC underground piping, fittings, valves, hydrants, etc.

Supplier:	**Hughes Supply**
Address:	4295 Kearney St
	Denver CO 80216
	USA
Telephone:	1-303-394-0004,1-303-329-0013
E-mail	NA
Contact	Sales
Web:	http://www.hughessupply.com
Product:	Fabricated sprinkler piping

Supplier:	**Quality Fabrication and Supply**
Address:	255 Primera Blvd., Suite 230
	Lake Mary FL 32746
	USA
Telephone:	1-407-585-3222, 1-407-585-3284
E-mail:	dgc@qualityfab.net
Contact:	David Capalino, VP, Sales and Marketing
Web:	http://www.qualityfab.net

Product: Ductile iron pipe, fittings

Supplier: **USA Pipe and Foundry Company**
Address: 3000 30th Ave N
P. O. Box 10406
Birmingham, AL 35202
USA
Telephone: 1-205-254-7442, 866-DIP-PIPE (toll free in USA)
Fax 1-205- 254-7165
E-mail: NA
Contact: Sales
Web: http://www.uspipe.com

Supplier: **Griffin Pipe Products**
Address: 1400 Opus Pl, Ste 700
Downers Grove IL 60515
USA
Telephone: 1-630-719-6500
Fax NA
E-mail: NA
Contact: Sales
Web: http://www.griffinpipe.com

Product: Underground PVC pipe, fittings

Supplier: **National Pipe and Plastics, Inc.**
Address: 3421 Old Vestal Rd
Vestal NY 13850
USA
Telephone: 1-607-729-9381, 1-800-836-4350 (toll free in USA)
Fax 1-607-729-6130
E-mail: rjm@nationalpipe.com
Contact: Sales
Web: http://www.nationalpipe.com

Product: Valves, fire hydrants

Supplier: **Kennedy Valve Company**
Address: 1021 East Water St
Elmira NY 14902
USA
Telephone: 1-607-734-2211
Fax 1-800-952-4771 (toll free in USA)
E-mail: NA
Contact: Sales
Web: http://www.kennedyvalve.com

Supplier:	**Mueller Company**
Address:	500 West Eldorado St Decatur IL 62525 USA
Telephone:	1-281-590-4600 (Texas),1-217-423-4471 (Illinois), 1-800-423-1323 (toll free in USA)
Fax:	1-419-710-0098
E-mail:	NA
Contact:	Abraham Quijada - International Sales Manager (Texas)
Web:	http://www.muellercompany.com
Product:	Fire Protection and Suppression Systems

Supplier:	**Hiller Systems**
Address:	833 Principal La Chesapeake VA 23320 USA
Telephone:	1-757-549-9123
Fax:	1-757-549-1083
E-mail:	sales@hillersystemsinc.com
Contact:	Sales
Web:	http://www.hillersystemsinc.com

Supplier:	**Koetter Fire Protection**
Address:	10351 Olympic Dr Dallas TX 75220 USA
Telephone:	1-214-358-3593, 1-800-441-0394 (toll free in USA)
Fax:	1-214-350-9930
E-mail:	NA
Contact:	Sales
Web	http://www.koetterfire.com

Supplier:	**SimplexGrinnell**
Address:	100 Simplex Drive Westminster MA 01441 USA
Telephone:	1-978-731-2500, 1-800-SIMPLEX (toll free in USA)
Fax:	1-978-731-7856
E-mail:	NA
Contact:	Sales
Web:	http://www.simplexgrinnell.com

13.2 Fire Protection Engineering

Supplier:	**Clark Nexsen**
Address:	6160 Kempsville Ci, Ste 200A Smithfield Building Norfolk VA 23502 USA
Telephone:	1-757-455-5800
Fax	1-757-455-5638
E-mail:	cborn@clarknexsen.com
Contact:	Christopher Born, Director, Fire Protection Engineering
Web:	http://www.clarknexsen.com

Supplier:	**Aon**
Address:	Aon Center 200 East Randolph Chicago IL 60601 USA
Telephone:	1-312-381-1000
Contact:	Fire Protection Engineering Service
Web:	http://www.aon.com

Supplier:	**Schirmer Engineering Corporation**
Address:	Chicago - Corporate HQ 707 Lake Cook Road Deerfield IL 60015-4997 USA
Telephone:	1-847- 272-8340
Fax:	1-847- 272-2365
E-mail:	jim_bichauski@schirmereng.com
Contact:	Jim Bichauski
Web:	http://www.schirmereng.com

Supplier:	**Hughes Associates Inc.**
Address:	3610 Commerce Dr Baltimore MD 21227-1652 USA
Telephone:	1-410-737-8677
Fax:	1-410-737-8688
E-mail:	info@haifire.com
Contact:	Sales
Web:	http://www.haifire.com

Supplier:	**The RJA Group, Inc.**
Address:	600 West Fulton St, Ste 500 Chicago, IL 60661 USA
Telephone:	1-312-879-7200. 1-312- 879-7220
Fax	NA
E-mail:	NA
Contact:	Sales
Web:	http://www.rjagroup.com

CONSTRUCTION STAGE

Environmental Factor	Identified Impact	Project Actions that Generate Impact	Applicable Regulation	Environmental Measures
Air	Air quality degradation because of air emissions	▪ Use and maintenance of heavy equipment and machinery ▪ Handling of construction materials and debris ▪ Wharf construction activities and auxiliary installations	▪ Municipalities will not authorize on urban or rural areas, industrial activities or any other kind that generate toxic emanations and smells, which may lessen public welfare and health, may be harmful to human health or public or private goods, flora and fauna and the ecosystem as a whole (Art.62 LGA). ▪ It is an environmental crime 1) Expel or discharge in the atmosphere active or potentially hazardous contaminants, which cause or may cause death of one or more persons or serious damages to human health or the ecosystem (Art.92 LGA). ▪ It is understood as atmospheric contamination the damaging of its purity because of the presence in higher concentrations to those permitted of agents such as solid particles, dust, smoke, sound waves, as well as the presence or emanation of smells that diminish public welfare (Art.46 Health Code). ▪ Parties will take appropriate measures,	▪ Equipment and heavy machinery must have dust control devices. ▪ Utilize only equipment and heavy machinery in good conditions, to reduce risks of oil, lubricants and hydrocarbons leaks, noise emissions and atmospheric contaminants. ▪ Spray water on the areas used by vehicles, for dust control purposes. ▪ The original design of containers must not be modified in order to increase their cargo capacity in volume or weight, related to the chassis cargo capacity. ▪ Vehicles must have appropriate containers, in good conditions, so that the cargo in them is totally contained, and avoid leaks, material losses or drainage of wet material during transportation. Discharge doors must remain adequately secured and hermetically closed during transportation. ▪ It is an obligation to cover with an awning the transported cargo in order to avoid its dispersion or emissions. This awning must be made of a resistant material to avoid breaking or tearing, and must be firmly

			according to arrangements in this Agreement and the current protocols in which they are parties, to protect human health and environment against adverse effects or that may result from human activities which modify or may modify the ozone layer (Art.2 Vienna Agreement). ▪ Parties should take cautionary measures to prevent or reduce to a minimum causes for climate change and reduce its adverse effects (Art.3.3 Agreement NUCC). ▪ This Rule regulates the emission of contaminant gases and smoke from vehicles which drive on public roads in the nation, limits established in Tables 1 and 2 of Art.6 (Art.1 Rule REGCHVA). ▪ Vehicles destined to transport hazardous substances and materials, must carry signs and warning signals related to the transported cargo, as well as specifications and cargo capacities, company name, business or individual owner (Art.40 Transit Law). ▪ It is a serious infraction: 17) Transport powder products, sand, gravel, sawdust or others capable of being dispersed with the wind, without covering such materials with awnings (Art.98 Transit Law).	held to the external walls of the container.

			▪ Specifies permitted maximum values of emission applicable to atmospheric contaminants and vibrations (Art.69 Environmental Rule MPC).	
Soil	Degradation of soil quality and marine sediments	▪ Use and maintenance of heavy equipment and machinery ▪ Handling of construction materials and debris ▪ Wharf construction activities and auxiliary installations ▪ Hydrocarbon leaks ▪ Dredging ▪ Temporary camps	▪ Execution of civil works on the coast shall be done so as to not damage the coastal land strip and not to cause significant ecological effects, after EIA (Art.58 LGA). ▪ It is a serious infraction: 18) Drive a vehicle which leaks fuel or other liquids on the road (Art.98 Transit Law).	▪ Soils compacted by vehicles, equipment and machinery must be restored, once the work is finished. ▪ Upon ending each day's work, the area must be freed of wastes, debris, and stocks or similar. ▪ Utilize dismountable temporary camps. ▪ Plan use of heavy machinery, in order to minimize the required time and displacements. ▪ Sediment contamination levels must be analyzed, prior to dredging. These analyses will determine additional measures which must be implemented in the disposal site for these sediments. ▪ Utilize vehicles which exert little pressure on the land. ▪ Delimit accessed and working areas, to limit machinery movement to these zones and so avoid soil compacting due to the unnecessary machinery movement. ▪ In case of leak or loss of any material or element from vehicles in public space areas, this must be immediately picked up by whoever is responsible of the transportation, having for such activity the necessary equipment. Also, if because of

				this, an accident occurs, the contractor will be responsible for damages caused to third parties and the environment.
Surface Water	▪ Degradation of water quality (ocean) ▪ Change in water use	▪ Use ad maintenance of equipment and machinery ▪ Hydrocarbon leaks ▪ Wharf construction activities and auxiliary installations ▪ Dredging ▪ Temporary camps	▪ It is banned to discharge on national water every kind of contaminant wastes, be those solid, liquid or gaseous, tending to affect public or aquatic life's health, damage water quality for its destined purposed or alter the general ecological balance (Art.32 LGA) ▪ It is an environmental crime: 2) Discharge hazardous contaminants whose use is banned or without prior treatment, in the national oceans, or infiltrate in soil or subsoil, wastewater or wastes that cause or may cause death of one or more persons, or serious damage to human health or the general ecosystem (Art.92 LGA). ▪ It is banned to discharge wastewater, garbage, industry wastes of every kind and size, on beaches closet o cities, without a permit from the Health Region or Area authority (Art.25 Rule GSA). ▪ The Health Region or Area authority will only authorize domestic, industrial and mining establishments, the discharge of liquid wastes to coastal beaches, when the treatment system for such liquid wastes, guarantees the discharge to comply with the Norms to Regulate	

			Wastewater Discharges to Water Bodies and Sewerage Systems (Art.28 Rule GSA). ▪ It is banned to discharge wastewater on oceans, which does not comply with the Norms to Regulate Wastewater Discharges to Water Bodies and Sewerage Systems (Art.44 Rule GSA). ▪ Every person who carries out activities that generate discharges must comply with the arrangements described in these norms (Art.4 Norms TRDARCRAS). ▪ Wastewater, prior to their discharge in a sewerage system, must be treated disregarding their origin. Domestic wastewaters are not included (Art.32 Environmental Rule MPC). ▪ The contamination of water bodies by sediments is forbidden, caused as a result of land movements, filling, leveling or bad piling of materials, and with no erosion control works (Art.108 Environmental Rule MPC).	
Noise	Increase of noise levels	▪ Use and maintenance of heavy equipment and heavy machinery ▪ Handling of construction materials ▪ Wharf	▪ It is a light infraction: 5) Exceed noise and emissions levels, through the exhaust system and noise devices (Art.100 Transit Law). ▪ Establishes maximum permitted levels of noise, to which workers should be exposed (Art.353-354 RGMPATEP). ▪ Specifies emission alarm values caused by noise for occupational exposure	▪ Noise levels that exceed 40 dBA during the day, and 45 dBA at night, must not be generated. ▪ Restrict use of equipment and heavy machinery to the day schedule (6:00 a.m.-6:00 p.m.). When work must be done at night, prior to a permit from municipal authorities, this work must be limited to noise-reduced activities.

		construction activities and auxiliary installations	(Art.69,70 Environmental Rule MPC). ▪ If during the construction of new roads, highways, ports, airports, port projects or any other fixed installation of public or private interest, source-based mitigation measures do not allow compliance with inmission maximum permitted values, those establishments affected by noise must be protected through accoustic isolation or any other similar measure, paid by the owner of the installation (Art.85 Environmental Rule MPC).	▪ Machinery used for land movement and other equipment, must be provided with silencers. ▪ Avoid unnecessary operation of engines.
Biodiversity	Decrease and/or alteration of biodiversity	▪ Dredging ▪ Wharf construction activities and auxiliary installation ▪ Use and maintenance of heavy equipment and machinery ▪ Temporary camps		▪ Deposit sites for the dredged material must not be placed where there is forest coverage. ▪ Illegal hunting of sea species in the working area will be prohibited.
Social Issues	Work safety and hygiene	▪ Generation of jobs ▪ Use and maintenance of heavy	▪ Every employer is responsible for a) Providing and keeping within the production process, a working environment in adequate hygiene and safety conditions, and establishing work	▪ Implement signals as by current legislation. ▪ Before starting activities at the Works site, a Program for safety and health at work must be presented, which includes

		equipment and machinery ▪ Handling of construction materials ▪ Wharf construction and auxiliary installations	systems with minimum health risks; b) Adopt effective measures to protect and preserve the workers' health, through the installation, operation and maintenance of the necessary systems and equipment for protection and prevention of working accidents and occupational illnesses (Art.104 Health Code). ▪ In every working place necessary measures will be adopted to avoid the presence of physical, chemical and biological agents in the air, in such levels and concentrations, that may pose health and welfare risks for the workers or the general population (Art.114 Health Code). ▪ Every workplace must have trained staff, equipment and devices for firefighting available, that can be immediately used, with a maximum efficiency (Art.120 Health Code). ▪ For those jobs whose nature poses risk to the worker, the company will be forced to diminish such risk in their working environment (Art.123 Health Code). ▪ The working site must have adequate means and services for the prevention and immediate treatment of risks resulting from occupational and non-	measures to be adopted by the contractor to control the dangers associated with the handling of materials, services or equipment and tools to be used. Also, a Contingency Plan must be presented, which specifies the actions to be taken should and emergency in the works site. ▪ Provide the employees with initial and continuous training in health and safety, which must include among others, the following topics: a) Responsibilities in accidents prevention and keeping a safe nice working environment; b) General safety and health norms and procedures; c) Procedures related to response to emergencies and contingencies; d) Procedures to report accidents and correct unsafe conditions and practices. ▪ Employees must use personal protection equipment (PPE) necessary to keep their exposure within acceptable limits, and be duly trained in the correct use of this equipment. ▪ Employees must wear appropriate apparel for the weather and working conditions, being the minimum acceptable: short-sleeved shirt, long pants and boots or leather shoes or made from some other protective material. ▪ Every construction area is helmet-use area. Both employees and visitors will be

			occupational exposures (Art.128 Rule GSA). ▪ Every company is obliged to provide and arrange for working sites that guarantee safety and health of all employees (Art.391 Work Code). ▪ The employer is responsible for the repair of professional risks that may occur to their employees (Art.413 Work Code). ▪ The employers are obliged, among other things: Guarantee safety and health of employees in all company-related activities; adopt appropriate measures to protect, encourage and promote health of employees; adopt adequate measures to create and keep in their working centers the best safety and health conditions; supply their employees with the necessary personal protection equipment for free; post on visible spots and spread among employees the instructions and prevention measures to be adopted on safety and health during work; complete training programs on risks to which employees are exposed (Art.9 RGMPATEP). ▪ An occupational safety guard must be called, with functions such as, among others: inform the employer of danger situation in working posts, and propose	provided and required usage of head-protecting gear. ▪ Extinguishers and portable medicine cabinets will be provided in the Works site, which will be maintained in operating conditions, and must be adequately positioned, clearly marked and immediately accessible. ▪ Hand tools must be used, inspected and maintained according to the manufacturer's instructions and recommendations, and must be used only for those purposed for which they have been designed. ▪ Machinery and mechanized equipment must be operated only by qualified staff. ▪ There must be portable latrines in the works site, one per every 15 employees.

			measures that he/she judges must be adopted; examine issued related to order, cleanliness, environment, machinery and working process; deliver first aid to those involved in accidents (Art.31 RGMPATEP). ▪ Employers will timely inform all the employees about risks posed by their labors, preventive measures and correct work methods (Art.37 RGMPATEP). ▪ Employees must be informed regarding the deposition and adequate removal of wastes generated by the company, and the reduction and control mechanisms in case of accidents (Art.39 RGMPATEP). ▪ Employers must organize and guarantee the operation of a safety and health at work program in their companies (Art.44-48 RGMPATEP). ▪ There will be at least a toilet per each 15 employees, which will be kept duly disinfected and deodorized (Art.70 RGMPATEP). ▪ There will be a site destined for a medical clinic, with medicines and devices needed for medical assistance. There will be medicine cabinets conveniently signed and signposted (Art.73 RGMPATEP). ▪ Hand tools will be kept in perfect conditions. Operatives will conveniently	

			use and care for them, and will receive precise instructions on their correct use (Art.106 RGMPATEP). ▪ Material for firefighting will not be used for other purposes and their location, obstacle-free, will be known to all persons who must use it (Art.212-213 RGMPATEP). ▪ Safety and health signals will be made through safety colors, panel signals, signals for obstacles, hazardous places and traffic lanes, light or acoustic signals (Art.228-268 RGMPATEP). ▪ When in a work post there is a contaminated environment, the use of personal equipment for the protection of respiratory tracts will be mandatory. Norms regarding such equipment are described (Art.296-301 RGMPATEP). ▪ The company will have an evacuation and contingency plan in cases of fire, explosion and massive product leaks (Art.420 RGMPATEP). ▪ Equipment, means and installations for first aid must be conveniently signaled for a prompt assistance to those involved in accidents (Art.425 RGMPATEP). ▪ Staff trained in first aid, must be available for any possibility in very shift; must be trained in techniques for	

			assistance in case of accidents (Art.426-427 RGMPATEP).	
	Safety and hygiene of the bordering population	▪ Handling of construction materials and debris ▪ Atmospheric emissions ▪ Noise	▪ The right to health protection is acknowledged. It is a public duty to participate in the promotion and preservation of personal and community health (Art.145 Constitution) ▪ The State, companies, mercantile societies, NGOs and any other person are under the obligation to permanently develop, execute and authorize accident prevention programs that may cause environmental damage to air quality and natural resources (Art.82 Rule LGA).	▪ Use delimitation signals such as: barricades, metallic fences, reflective strips with their own support, guide cones, etc, in order to totally isolate the working perimeter. ▪ Inform the population of the importance and purpose of the Project, through pamphlets and other communication media.
Management of Hazardous Products	Soil and surface water contamination	▪ Use and maintenance of heavy equipment and machinery ▪ Alternate generation of electricity		▪ Floors must be waterproofed and the necessary temporary solutions must be implemented to collect oil-related wastes in sites where there may be fuel, lubricant and oil wastes. ▪ Constantly supervise heavy equipment and machinery, to prevent accidental spills. ▪ Sites for the temporary storage of hydrocarbons, lubricants and other hazardous substances must be located in an isolated place, with a fence that may protect it from impacts, and at least 150 m from the coastline. ▪ These temporary storage sites must be surface tanks, never underground; or, by lack of tanks, barrels in perfect conditions, with no kind of cracks.

				▪ The temporary storage will never be directly on the floor, and with devices to collect or absorb small leaks that occur in the handling of these materials. ▪ Every handling of hydrocarbons, lubricants and other contaminant products must be done under constant surveillance, in order to avoid spills.
Solid Wastes	▪ Soil contamination ▪ Surface water contamination ▪ Vector breeding areas	▪ Temporary camps ▪ Wharf construction activities and auxiliary installations	▪ Organic and solid wastes, will be technically treated to avoid alterations on soil and water, as well as to avoid air contamination (Art.66 LGA). ▪ It is banned to use water as a final disposal site for solid wastes (Art.34 Health Code) ▪ It is forbidden to throw away garbage of any kind, in sites that have not been previously authorized by the Municipal Authority (Art.63 Rule MRS). ▪ Garbage burning is forbidden (Art.65 Rule MRS). ▪ It is banned to dispose or abandon garbage openly, in public roads or areas, empty lots and water bodies (Art.68 Rule MRS). ▪ It is banned to deposit hazardous wastes with no prior treatment; their treatment methods, management and final disposal must be previously authorized by the UGA-MPC (Art.92 Environmental Rule MPC).	▪ Containers must be provided as garbage deposits ▪ Hazardous wastes must not be mixed with debris or any other kind of garbage. ▪ Wastes must not be disposed of in public space areas. ▪ Wastes must not be burned. ▪ A feasibility study must be made on methods and sites for the disposal of solid wastes and debris generated by the construction activities. ▪ The necessary actions must be made to obtain municipal authorization for the disposal of the solid wastes generated by the project construction.

Environmental Management		▪ All	▪ Projects tending to contaminate or degrade national environmental and natural resources, will be proceeded by an Environmental Impact Assessment (EIA), which will permit the prevention of possible negative effects (Art.5 LGA) ▪ The establishment of industries that tend to deteriorate the environment, will be subject to a prior EIA, that will certify the discharges or emissions will not disturb or damage inhabitants, soil, water, air, wild flora and fauna (Art.53 LGA). ▪ The municipalities will take specific environmental contamination control measures, according to ruling natural, social and economic conditions (Art.75 LGA). ▪ Included within the activities that must present an EIA, as foreseen by Art.5 of this Law are, whatsoever activities capable to cause severe damages to ecological balance (Art.78 LGA). ▪ The activity referred to in Art.78 will not be executed until the assessment has been approved and the license has been granted (Art.79 LGA). ▪ It is an administrative infraction: 3) do potentially contaminant activities without the necessary licenses or permits (Art.96 LGA).	▪ Prior to the start of Works, the necessary specialists must be hired for the following studies: a) Environmental Impact Assessment; b) Design of the sewerage system and wastewater treatment. ▪ Once these studies are finished, necessary actions must be made to obtain the Environmental License for both the Project and the wastewater treatment system. Likewise, a request for a Sanitary License must be filed afterwards.

			▪ For the construction and operation of every kind of establishments, it is required a Sanitary License given by the Health Secretary (Art.222 Health Code). ▪ Every person that aims to build a wastewater final disposal system, must obtain an Environmental License and the approval from the Health Region or Area authority, in order to avoid contamination of soil, air and water (Art.33 Rule GSA). ▪ In order to comply with Art.33, those interested will present the Health Region or Area authority with a request, along with drawings of the sewerage and final treatment system, as well as an operation and maintenance plan plus its Environmental License (Art.34 Rule GSA). ▪ Every person that aims to create an activity which operation and maintenance processes generate atmospheric contamination or constitute health hazards, must obtain approval from the Health General Direction, the Health Secretary, Municipal Government, presenting to that effect the Environmental License (Art.53 Rule GSA). ▪ Every project must have an environmental license before the start of operations (Art.33 Rule SINEIA). ▪ The Municipalities must: 2) Control and	

			regulate urban development, land use and administration of municipal land; 7) Protection of ecology and environment; 11) Granting permits for resource exploitation (Art.13 Law of Municipalities). ▪ SERNA expressed that it delegates to the Environmental Management Unit of the Puerto Cortes Municipality, the procedures for Environmental Licenses needed by public and private projects, within the municipality of Puerto Cortes (Third Clause Environmental Management Decentralization Agreement). ▪ Sector 9, Infrastructure: Marine dredging, creation of artificial beaches, alteration of coastal line and similar - All Category 3. Sector 10, Mines: Non-metallic mineral exploitation - Category 3. Category 3: Projects that require presenting an Environmental Impact Assessment (Environmental Categorization Table). ▪ The establishments that require a municipal environmental permit prior to their start of operations are...Storage tanks for solid and liquid loose products. An Environmental Authorization will be demanded, as requested by the UGA-MPC and	

			according to the Categorization Table of SERNA (Art.15 Environmental Rule MPC). ▪ The extraction or transportation of: soil, stone, lime, marble, sand, plaster and other mineral substances used for construction, decoration and the ceramic industry is forbidden, without a permit from SERNA, DEFOMIN and the Municipality of Puerto Cortes (Art.131 Environmental Rule MPC).	

OPERATION STAGE

Environmental Factor	Identified Impact	Project Actions that Generate Impact	Applicable Regulation	Environmental Measures
Air	Degradation of air quality	▪ Transfer of loose product ▪ Ground transportation ▪ Maintenance and repair operations	▪ Municipalities will not authorize on urban or rural areas, industrial activities or any other kind that generate toxic emanations and smells, which may lessen public welfare and health, may be harmful to human health or public or private goods, flora and fauna and the ecosystem as a whole (Art.62 LGA). ▪ It is an environmental crime 1) Expel or discharge in the atmosphere active or potentially hazardous contaminants, which cause or may cause death of one or more persons or serious damages to human health or the ecosystem (Art.92 LGA). ▪ It is understood as atmospheric contamination the damaging of its purity because of the presence in higher concentrations to those permitted of agents such as solid particles, dust, smoke, sound waves, as well as the presence or emanation of smells that diminish public welfare (Art.46 Health Code). ▪ Parties will take appropriate measures,	▪ Create and keep a periodic maintenance program for heavy equipment and vessels, in order to reduce atmospheric emissions, and ensure these are within the established limits. ▪ Transportation of merchandise must be done in vehicles covered with awnings. ▪ The limit for atmospheric emissions as particulate matter is of 100 mg/m^3, according to WB regulations. The concentration of contaminants, measured exactly in the project limits, must not exceed an annual average of 50 micrograms per cubic meter.

			according to arrangements in this Agreement and the current protocols in which they are parties, to protect human health and environment against adverse effects or that may result from human activities which modify or may modify the ozone layer (Art.2 Vienna Agreement). ▪ Parties should take cautionary measures to prevent or reduce to a minimum causes for climate change and reduce its adverse effects (Art.3.3 Agreement NUCC). ▪ This Rule regulates the emission of contaminant gases and smoke from vehicles which drive on public roads in the nation, limits established in Tables 1 and 2 of Art.6 (Art.1 Rule REGCHVA). ▪ Vehicles destined to transport hazardous substances and materials, must carry signs and warning signals related to the transported cargo, as well as specifications and cargo capacities, company name, business or individual owner (Art.40 Transit Law). ▪ It is a serious infraction: 17) Transport powder products, sand, gravel, sawdust or others capable of being dispersed with the wind, without covering such materials with awnings (Art.98 Transit Law). ▪ Specifies permitted maximum values of emission applicable to atmospheric	

			contaminants and vibrations (Art.69 Environmental Rule MPC).	
Soil	Degradation of soil quality and marine sediments	▪ Maintenance and repair operations ▪ Management of hazardous materials ▪ Ground transportation ▪ Transfer of loose products	▪ It is a serious infraction: 18) Drive a vehicle which leaks fuel or other liquids on the road (Art.98 Transit Law).	▪ Create procedures for the correct storage, management and control of hazardous materials, solid and liquid wastes, in order to avoid spills unto soil and water. ▪ Create procedures for the merchandise transfer activities, in order to avoid their spill unto soil and water. ▪ Give periodic maintenance to the equipment used for ground transportation, to avoid leaks of fuel, lubricants or other on the ground. ▪ Maintenance and repair operations, must preferably be carried out in service stations within the urban area, and not in the project area, it being an environmentally sensitive area.
Surface Water	Degradation of water quality (ocean)	▪ Transfer of loose product ▪ Sea transportation ▪ Ground transportation ▪ Maintenance and repair operations ▪ Management of hazardous materials	▪ It is banned to discharge on national water every kind of contaminant wastes, be those solid, liquid or gaseous, tending to affect public or aquatic life's health, damage water quality for its destined purposed or alter the general ecological balance (Art.32 LGA) ▪ It is an environmental crime: 2) Discharge hazardous contaminants whose use is banned or without prior treatment, in the national oceans, or infiltrate in soil or subsoil, wastewater or wastes that cause or may cause death of one or more	▪ Ensure a correct management, storage and disposal of hazardous materials, solid and liquid wastes generated by the project's installations, in order to avoid their contact with water. ▪ The wastewater treatment system must comply with the national norms that regulate their discharges to water bodies. ▪ A municipal authorization must be obtained for the final disposal site of solid wastes generated by the project. ▪ Make sure every vessel to use the wharf, have a management plan for their ballast

			persons, or serious damage to human health or the general ecosystem (Art.92 LGA). ▪ It is banned to discharge wastewater, garbage, industry wastes of every kind and size, on beaches closet o cities, without a permit from the Health Region or Area authority (Art.25 Rule GSA). ▪ The Health Region or Area authority will only authorize domestic, industrial and mining establishments, the discharge of liquid wastes to coastal beaches, when the treatment system for such liquid wastes, guarantees the discharge to comply with the Norms to Regulate Wastewater Discharges to Water Bodies and Sewerage Systems (Art.28 Rule GSA). ▪ It is banned to discharge wastewater on oceans, which does not comply with the Norms to Regulate Wastewater Discharges to Water Bodies and Sewerage Systems (Art.44 Rule GSA). ▪ Every person who carries out activities that generate discharges must comply with the arrangements described in these norms (Art.4 Norms TRDARCRAS). ▪ Each discharge to a water body, must comply with the general physical, chemical and bacteriological characteristics, which allowed maximum concentrations are specified in Table 1 of	water. ▪ A fine system must be created for those found disposing of wastes on the ocean.

			these norms (Art.6 Norms TDARCRAS). ▪ Wastewater, prior to their discharge in a sewerage system, must be treated disregarding their origin. Domestic wastewaters are not included (Art.32 Environmental Rule MPC). ▪ Every entity that manages or operates a vessel terminal, is obliged to provide that establishment with mechanisms for the reception of oily wastes. These mechanisms will be installed following the descriptions in Rule 12 of Appendix I of the MARPOL Agreement (Art.37 Rule MARPOL). ▪ For vessel terminals which oily residues come from engine rooms or equipments destined to purify fuel and oils generated by the vessel engines; the storage capacity must be calculated considering vessel traffic and will not ever be less than 30 m^3 (Art.38,39 Rule MARPOL). ▪ The oily residues reception service at ports must be authorized by the Environmental Authority, through an Environmental License (Art.41-a Rule MARPOL). ▪ Every public or private entity that manages, operates or represents reception mechanisms and/or oily waste treatment must have a coherent system of adequate and approved handling	

			installations and practices. This strategy must be a systematic plan which clearly establishes the way oily wastes must be handled. This strategy must also include practices for collection, transportation, handling and elimination of oily wastes (Art.46 Rule MARPOL). ▪ Every public or private entity that manages, operates or represents reception mechanisms and/or oily waste treatment, must have a Contingency Plan that clearly states the detailed proceedings to be taken in case of problems in the reception and treatment installations, problems with the collection and transportation of oily wastes from the vessels to the reception and treatment devices, and from these devices to their final destination (Art.47 Rule MARPOL). ▪ Every public or private entity that manages, operates or represents reception mechanisms and/or oily waste treatment, is responsible to fight contamination in the plant area. It is also responsible of the area cleaning that may turned out contaminated due to accidents during the transportation from the vessel area to the reception plant, and from there to the final delivery place. Whatever the case, there is always	

			responsibility to communicate the Maritime Association of Honduras and the Environmental Authority (Art.48 Rule MARPOL). ▪ It is forbidden to discharge hazardous loose substance, ballast water or other residues unto water bodies, the vessels must hold these residues to discharge them unto the reception plants created for such purposes (Art.69 Rule MARPOL). ▪ Every vessel that transports loose chemicals, must have an emergency plan in case of contamination by liquid hazardous substances, approved by the Maritime Association of Honduras (Art.73 Rule MARPOL). ▪ Terminals, operators and receivers of loose chemical products must have wash water reception plants, standardized by the Maritime Association of Honduras and the Environmental Authority (Art.77 Rule MARPOL).	
Noise	Increase in noise levels	▪ Transfer of loose products ▪ Sea transportation ▪ Ground transportation ▪ Maintenance and repair	▪ It is a light infraction: 5) Exceed noise and emissions levels, through the exhaust system and noise devices (Art.100 Transit Law). ▪ Establishes maximum permitted levels of noise, to which workers should be exposed (Art.353-354 RGMPATEP). ▪ Specifies emission alarm values caused by noise for occupational exposure	▪ Avoid, as possible, night-time noisy activities (6pm-6am). ▪ Provide potentially noisy equipment periodic maintenance. ▪ Provide hearing protection equipment to those employees exposed to high noise levels during their work journey. ▪ As per WB norms, noise levels immediately outside the Project limits must not exceed

		operations	(Art.69,70 Environmental Rule MPC).	70dBA, be it day or night.
Biodiversity	Decrease and/or alteration of biodiversity	▪ Transfer of loose products ▪ Sea transportation ▪ Maintenance and repair operations ▪ Management of hazardous materials ▪ Employees' installations		▪ Create a conscience among the employees about the importance of biodiversity in the area. ▪ Comply with the suggested measures for factors such as water, soil, air and noise, since these factors have direct effects over sea biodiversity.
Social Issues	Work safety and hygiene	▪ All	▪ Every employer is responsible for a) Providing and keeping within the production process, a working environment in adequate hygiene and safety conditions, and establishing work systems with minimum health risks; b) Adopt effective measures to protect and preserve the workers' health, through the installation, operation and maintenance of the necessary systems and equipment for protection and prevention of working accidents and occupational illnesses (Art.104 Health Code). ▪ In every working place necessary measures will be adopted to avoid the presence of physical, chemical and biological agents in the air, in such levels	▪ Implement signals as by current legislation. ▪ A Program for safety and health at work must be presented, which includes measures to be adopted by the contractor to control the dangers associated with the handling of materials, services or equipment and tools to be used. Also, a Contingency Plan must be presented, which specifies the actions to be taken should and emergency in the works site. ▪ Provide the employees with initial and continuous training in health and safety, which must include among others, the following topics: a) Responsibilities in accidents prevention and keeping a safe nice working environment; b) General safety and health norms and procedures; c)

			and concentrations, that may pose health and welfare risks for the workers or the general population (Art.114 Health Code). ▪ Every workplace must have trained staff, equipment and devices for firefighting available, that can be immediately used, with a maximum efficiency (Art.120 Health Code). ▪ For those jobs whose nature poses risk to the worker, the company will be forced to diminish such risk in their working environment (Art.123 Health Code). ▪ Every industrial company must comply with the following statements: c) Have an emergency medicine cabinet duly equipped for first aid; h) Instruct its employees about the risks to which they are exposed, as well as the methods or procedures that must be considered for the prevention and control of such risks; j) Install adequate equipment for the protection, control and prevention of professional risks and other illnesses; n) Take preventive measures to reduce or eliminate professional risks in situations where employees are exposed to 1. Smoke, dust and toxic gases, 2. Excessive noise and vibration, 6. Operations that may cause accidental burns, injuries or crushing, etc; o) at	Procedures related to response to emergencies and contingencies; d) Procedures to report accidents and correct unsafe conditions and practices. ▪ Employees must use personal protection equipment (PPE) necessary to keep their exposure within acceptable limits, and be duly trained in the correct use of this equipment. ▪ Employees must wear appropriate apparel for the weather and working conditions, being the minimum acceptable: short-sleeved shirt, long pants and boots or leather shoes or made from some other protective material. ▪ Extinguishers and medicine cabinets will be provided within the project, which will be kept in operating conditions, and must be adequately positioned, clearly marked and immediately accessible. ▪ Machinery and mechanized equipment must be operated only by qualified staff. ▪ Sanitary installations must be provided within the project, at a rate of one per every 15 employees. ▪ A mixed committee of hygiene and safety must be organized, composed by an equal number of representatives from the employer and the employees, according to the total number of employees from every shift. This committee must have all duties

			work sites the use of procedures or materials that spread air contaminants in the area will not be allowed, as long as necessary cautions have not been taken to keep such contaminant from damaging the human body (Art.125 Rule GSA). ▪ The working site must have adequate means and services for the prevention and immediate treatment of risks resulting from occupational and non-occupational exposures (Art.128 Rule GSA). ▪ Every company is obliged to provide and arrange for working sites that guarantee safety and health of all employees (Art.391 Work Code). ▪ The employer is responsible for the repair of professional risks that may occur to their employees (Art.413 Work Code). ▪ The employers are obliged, among other things: Guarantee safety and health of employees in all company-related activities; adopt appropriate measures to protect, encourage and promote health of employees; adopt adequate measures to create and keep in their working centers the best safety and health conditions; supply their employees with the necessary personal protection	specified by the RGMPATEP. ▪ An occupational safety guard must be called within the Project, with all duties as specified by the RGMPATEP. ▪ Provisional installations must be constructed to protect employees from weather factors. ▪ The safety norms for fixed machinery installations established by the RGMPATEP, must be followed. ▪ Hand tools must be used, inspected and maintained according to the manufacturer's instructions and recommendations, and must be used only for those purposed for which they have been designed.

			equipment for free; post on visible spots and spread among employees the instructions and prevention measures to be adopted on safety and health during work; complete training programs on risks to which employees are exposed (Art.9 RGMPATEP). ▪ A mixed committee of hygiene and safety will be organized, composed by an equal number of representatives from the employer and the employees (Art.12 RGMPATEP). ▪ The hygiene and safety committee will have the following duties, among others: Verify the compliance of the health and safety programs at work; verify the supply of personal protection equipment to employees; promote interest among the employees for medical check; verify that all employees receive information on health and safety at work and risk preventive measures; promote broadcasting of health and safety at work; verify the efficient organizations of fire and first aid brigades (Art.25 RGMPATEP). ▪ An occupational safety guard must be called, with functions such as, among others: inform the employer of danger situation in working posts, and propose measures that he/she judges must be	

			adopted; examine issued related to order, cleanliness, environment, machinery and working process; deliver first aid to those involved in accidents (Art.31 RGMPATEP). ▪ Employers will timely inform all the employees about risks posed by their labors, preventive measures and correct work methods (Art.37 RGMPATEP). ▪ Employees must be informed regarding the deposition and adequate removal of wastes generated by the company, and the reduction and control mechanisms in case of accidents (Art.39 RGMPATEP). ▪ Employers must organize and guarantee the operation of a safety and health at work program in their companies (Art.44-48 RGMPATEP). ▪ There will be at least a toilet per each 15 employees, which will be kept duly disinfected and deodorized (Art.70 RGMPATEP). ▪ There will be a site destined for a medical clinic, with medicines and devices needed for medical assistance. There will be medicine cabinets conveniently signed and signposted (Art.73 RGMPATEP). ▪ When work is outdoors and there 20 or more employees, provisional installations must be constructed to shelter employees from weather factors (Art.74	

			RGMPATEP). ▪ Establish safety norms for fixed machinery installations, such as cogwheels, protection and safety devices, personal protection, switched, maintenance, alarm, signaling, among others; it also establishes safety norms for portable machinery (Art.82-105 RGMPATEP). ▪ Hand tools will be kept in perfect conditions. Operatives will conveniently use and care for them, and will receive precise instructions on their correct use (Art.106 RGMPATEP). ▪ Material for firefighting will not be used for other purposes and their location, obstacle-free, will be known to all persons who must use it (Art.212-213 RGMPATEP). ▪ All the fire protection, detection, alarm and fighting devices, will be kept in good conditions. By no means, will they remain more than 6 months without inspection (Art.220 RGMPATEP). ▪ Safety and health signals will be made through safety colors, panel signals, signals for obstacles, hazardous places and traffic lanes, light or acoustic signals (Art.228-268 RGMPATEP). ▪ Personal protection equipment for head (helmets), face (masks) and eyes	

			(protective goggles), hearing and respiratory tracts will be used, in all work posts where there are possible injury risks. Norms regarding such equipment are described (Art.278-301 RGMPATEP). ▪ The company will have an evacuation and contingency plan in cases of fire, explosion and massive product leaks (Art.420 RGMPATEP). ▪ Equipment, means and installations for first aid must be conveniently signaled for a prompt assistance to those involved in accidents (Art.425 RGMPATEP). ▪ Staff trained in first aid, must be available for any possibility in very shift; must be trained in techniques for assistance in case of accidents (Art.426-427 RGMPATEP).	
	Safety and hygiene of the surrounding population	▪ All	The State, companies, mercantile societies, NGOs and any other person are under the obligation to permanently develop, execute and authorize accident prevention programs that may cause environmental damage to air quality and natural resources (Art.82 Rule LGA).	▪ The Access of third parties during the operational activities of the project must be prohibited. ▪ Avoid at all costs stagnated water and waste accumulation, in order to avoid vector breeding-areas within the project.
Management of hazardous products	▪ Soil contamination ▪ Surface water contamination	▪ Ground transportation ▪ Sea transportation ▪ Handling of hazardous	▪ Fuel deposits must have enough extinguishers for any emergency, placed in adequate sites (Art.14 Rule IFEDCLDP). ▪ Near the deposits and in visible places, signs will be posted with red background and white letters 15 cm high that say "NO	▪ All safety measures specified in national regulation for fuel deposits within the area of the project, must be followed. ▪ Comply with all impact mitigation and prevention measures on soil and water, regarding handling, storage and control of

		materials	SMOKING" (Art.15 Rule IFEDCLDP). ▪ Burned oil must be collected in appropriate recipients to avoid environmental contamination (Art.18 Rule IFEDCLDP). ▪ Store rooms for flammable materials must have inflammable and waterproof floors, in order to avoid spills (Art.211 RGMPATEP). ▪ Every public or private entity that manages, operates or represents a vessel terminal, is obliged to provide that establishment with mechanisms for the reception of hazardous liquid or solid substances or residues, as specified by the technical norms adopted by the Maritime Association of Honduras, the Environmental Authority and the Public Health Secretary, as well as the current national regulations (Art.81 Rule MARPOL).	hazardous materials and wastes.
Solid Wastes	▪ Soil contamination ▪ Surface water contamination ▪ Vector breeding areas	▪ Employees' installations ▪ Maintenance and repair operations ▪ Transfer of loose products ▪ Ground transportation	▪ Organic and solid wastes, will be technically treated to avoid alterations on soil and water, as well as to avoid air contamination (Art.66 LGA). ▪ It is banned to use water as a final disposal site for solid wastes (Art.34 Health Code) ▪ When the responsible entity for the garbage collection service, cannot provide such service due to the nature,	▪ Comply with the recommended environmental measures to manage and control solid wastes generated by the project activities. ▪ The utilization of sites different tan those authorized by the Municipality for the disposal of the solid wastes generated by the project, or their burning, is prohibited. ▪ In order to obtain such authorization, a feasibility study must be made by field

			location or volume of the garbage produced, this obligation will fall upon the person or company who produce those wastes, as well as their transportation and final disposal, duly authorized by the municipalities (Art.75 Rule GSA). ▪ When because of the nature, location or volume of the garbage produced, the Municipality is not under the obligation to collect them, such obligation will fall upon the person who produces them, as well as their transportation to the final disposal site, prior authorization from the Municipality (Art.20 Rule MRS). ▪ It is forbidden to throw away garbage of any kind, in sites that have not been previously authorized by the Municipal Authority (Art.63 Rule MRS). ▪ Garbage burning is forbidden (Art.65 Rule MRS). ▪ It is banned to dispose or abandon garbage openly, in public roads or areas, empty lots and water bodies (Art.68 Rule MRS). ▪ The garbage discharge must be done in the reception devices. At ports where there are no such devices to satisfy the vessels operational needs, alternate systems will be used, approved by the Maritime Association of Honduras and	specialists, to determine the best option for the management and final disposal of the generated wastes, considering their nature and volume. ▪ Leakages generated by the solid waste treatment system, must be monthly analyzed, utilizing sampling points strategically located.

			the Environmental Authority, if they do not contaminate the water (Art.98 Rule MARPOL). ▪ Sediments, sludge and solid substances from waste treatment system and others such as ashes, phlegm and similar, must not be discharged upon surface or underground waters or the sewerage system (Art.36 Environmental Rule MPC). ▪ It is banned to deposit hazardous wastes with no prior treatment; their treatment methods, management and final disposal must be previously authorized by the UGA-MPC (Art.92 Environmental Rule MPC). ▪ 1) Every big slip must have storage containers for wastes in the following shape and color: Green (for glass), blue (paper and carton) and yellow (metals and plastics); 2) Accumulated garbage must be discharged in arrival ports, which must be supervised by the port captains and the Environmental Management Unit of the Port Municipality for its final disposal; 3) No kind of plastic, glass, metal or hydrocarbon wastes can be discharged on sea, no matter what the reason (Resolution Merchant Marine Direction 001/2007).	
Environmental Management		▪ All	▪ The municipalities will take specific environmental contamination control	▪ The request for an Environmental License for the operation stage of the Project, must

			measures, according to ruling natural, social and economic conditions (Art.75 LGA). ▪ Included within the activities that must present an EIA, as foreseen by Art.5 of this Law are, whatsoever activities capable to cause severe damages to ecological balance (Art.78 LGA). ▪ The activity referred to in Art.78 will not be executed until the assessment has been approved and the license has been granted (Art.79 LGA). ▪ It is an administrative infraction: 3) do potentially contaminant activities without the necessary licenses or permits (Art.96 LGA). ▪ For the construction and operation of every kind of establishments, it is required a Sanitary License given by the Health Secretary (Art.222 Health Code). ▪ The Municipalities must: 2) Control and regulate urban development, land use and administration of municipal land; 7) Protection of ecology and environment; 11) Granting permits for resource exploitation (Art.13 Law of Municipalities). ▪ Users that perform commercial, port, industrial storage, hospital or farming economical activities, are under the obligation to register with the UGA-MPC	be included within the EIA to be presented prior to the beginning of its construction activities. The same procedure should apply to the request for a Sanitary License.

			(Art.56 Environmental Rule MPC). ▪ The following users must obtain Operation and Discharge permits (from the UGA-MPC): a) Those responsible of domestic wastewater discharges, not connected to the public sewerage system; b) Those responsible of wastewater discharges (Art.60 Environmental Rule MPC). ▪ The companies that import loose products, tending to cause negative environmental effects during their transfer and transportation to storage sites, must cover the expenses of the UGA for supervision purposes. These expenses include transportation, meals, extra hours and qualified professional fees (Art.118 Environmental Rule MPC).	