

ABSTRACT

Title of Thesis: APPLYING WEB-BASED PROJECT MANAGEMENT
TECHNIQUES TO DREDGING PROJECTS

Gustavo A. Vecino, Master of Science, 2007

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The success of a dredging project depends upon an optimal flow of project information to the project stakeholders. The logistics of dredging project information management demand an information system capable of delivering project information in real time over multiple geographic locations from the very concept of the project to its completion. Traditional project information distribution systems are limited in numerous ways, including the lack of real-time information delivery. Applying *web-based technologies* to implement real-time information delivery brings new opportunities to the dredging industry and leverages the management of dredging projects functions and processes.

The application of web-based technology enables the collection, processing, and distribution of project information that enables project functions to be implemented at all levels of project management in real time. The Real Time Project Management (RTPM) concepts take advantage of the Web-based Project Management Application (WPMA) to deliver real-time project information to dredging project stakeholders.

**APPLYING WEB-BASED PROJECT MANAGEMENT TECHNIQUES TO
DREDGING PROJECTS**

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Science
2007

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SECTION I – DREDGING PROJECT MANAGEMENT

Chapter 1: Introduction

Inadequate flow of project information to owners and project managers (PM's) during dredging operations and the limited dredging technical expertise of the typical project management team both prevent the owners from controlling project management key indices. Similarly, the absence of project information flow to the contractor during the pre-construction phase limits the contractor's ability to define a well thought-out dredging strategy. Either of these two conditions can lead to an unsuccessful project and to potential economic disaster for both parties.

Access to project key indices enables owners and project managers to assess dredging performance and to evaluate the causes of contractor deviation from planned performance. Therefore, during the dredging project, transparency of contractor operations throughout comprehensive information submission to the owner contract is imperative for owner understanding and management of the contractor's needs and rights. For example, contractors need to receive quality responses from the owner when changes in the contract conditions arise. In order for this to take place, owners need to have the information that will allow them to perform the correct assessments.

In addition, contractor's maximum project performance is a result of a well thought-out dredging strategy. This is the result of the contractor's knowledge of the project, and it is achieved through a comprehensive sharing of information between the owner's team and the potential contractors from the early stages of the project.

Chapter 2. Review of Dredging Projects

Past and Present

Dredging has been used for thousands of years. According to Herbich (2000), “Dredging is an ancient art but a relatively new science.” Dredging was used as early as 4,000 B.C. in Egypt for channel maintenance, and later, all over Europe as a tool to maintain navigational channels, for land protection against flooding, to develop new maritime ports, and as support for civil engineering projects. In America, the dredging industry has been supporting maritime infrastructures by maintaining and building new channels, ports, and other facilities, as well as protecting and maintaining rivers, lakes, shorelines, beaches, and by developing land fills and mining operations. The dredging market has maintained its pace, and today it is a major contributor to the economy.

Importance of Dredging

The market demand in the dredging sector has remained stable because of the need for the development of infrastructures which support social and economical development of countries. Dredging contributes to the construction and maintenance of navigational channels and ports, which encourages international trade, an important function in every country’s economy. When countries confront the need to recover from major natural disasters, dredging accomplishes an important role by cleaning and rebuilding marine infrastructures, beaches, and shorelines. These

challenging and demanding construction needs have challenged the dredging industry to develop improved strategies to operate and control dredging operations.

Major improvements have taken place in dredging technology to cope with the difficult challenges of the work. The major progress in the industry infrastructure has taken place in regard to the technical aspects of the equipment involved, especially pertaining to the hydraulic transport of material, instrumentation, electronic controls, and automation, which are at the core of dredging processes. This improvement in technology has allowed for higher productivity and efficiency, generally preserving reasonable costs for dredging projects. The strategic role in the economy, the capital cost to develop dredging projects, and the level of specialization have created a niche in the construction market for the dredging sector.

As mentioned above, great attention has been placed on the improvement of dredging techniques and technologies. Although the dredging discipline has been studied, taking into consideration its technical and operational aspects, limited attention has been given to the management of dredging projects.

Uses of Dredge Material

Dredges have been used to dig soil from the bottom of various bodies of water, and to transport it to placement sites. Dredges are used to recover material that is suitable for construction projects, such as mining operations, and open-water dredging to recover sand for filling or for beach nourishment operations. Fine material dredged

from the bottom of navigational channels for maintenance is being used for marshes and soil nourishment. There are abundant possibilities for the uses of dredged material; these processes will be developed as the need to optimize placement sites arises.

An interesting example of the use of dredged material for filling is the construction of artificial islands created on the Dubai Waterfront (see Figure 1). During a decade of dredging, contractors have removed, from the seabed between Dubai shoreline and international water limits, approximately 2 billion cubic meters of sand for the construction of the islands (*World Dredging Magazine, 2006*).

Figure 1. View of the artificial islands constructed on Dubai Waterfronts, United Arab Emirates (*World Dredging Magazine, 2006*).



Environment

Dredge operations are used to clean up environmentally hazardous materials from the bottoms of various bodies of water and to protect habitats of species by removing any hazardous materials for proper disposal or by supplying material to improve the environmental infrastructure. Because of poor regulations in the past, various uncontrolled processes in the industry have polluted waterbeds. In some cases, layers of new sediments have covered these contaminated areas, which have in some way sealed them from interfacing with the environment. Eventually, when these areas are programmed for cleanup or for engineering projects, special attention must be given to the dredging process to control the emission of contaminants into the environment.

2.1 Dredging Engineering

Dredging Engineering refers to the application of science and the empirical knowledge of dredging to solve construction needs when a dredging operation is required. The application of different disciplines has contributed to the development of dredging engineering concepts and theories and, foremost, the development of dredging equipment. Mechanical engineering, geotechnical and soil studies, civil engineering, electrical engineering, and marine architecture and economics have shaped dredging engineering into a powerful tool. The application of the various engineering disciplines to dredging projects, dredging operations, and the development of dredging equipment have formed the dredging engineering discipline.

Mechanical engineers contribute to dredging by providing solutions for all mechanical applications within dredging equipment development. The design of pump systems, which includes the pump itself, the engines driving the system, and hydraulic systems driving concordance systems are some of the applications that are designed and built under the responsibility of mechanical engineers.

The geotechnical and soil conditions are at the heart of understanding dredge project performance. They define important parameters for assessing hydraulic transport of solids and identify possible uses of the dredged material from the engineering standpoint. The entire array of soil materials that can be found in dredging projects can be divided into two groups: fine material which comprises silts and clays, and granular material which comprises sand, gravel, cobbles, boulders and rock. These two concepts impose important parameters when determining the equipment to use, the production performance, and uses for the material being dredged.

Electrical engineers play an important role in the design of dredging equipment by supplying all solutions for mechanical controls and automation. Control for hydraulic systems, automation of equipment functions, and hydrographic systems are core functionalities that the electrical engineering branch can deliver to build dredging equipment.

Civil engineers coordinate and manage the dredging project, bringing together the entire system and assembling the diverse components needed to develop the dredging application. The civil engineer's objective is to manage the project from start to finish, and deliver the project in time and under budget. This task requires special knowledge and the skills to glue the various disciplines into one solid concept.

Environmental Solutions

Dredged material is being used to build and reestablish environmental habitats. The material dredged during maintenance of navigational channels contains nutrients and has the structure that makes it suitable for environmental purposes. Building and restoring wetlands and marsh nourishment are some of the principal applications for use of dredged material. There is a great effort to find beneficial uses for dredged material, and one utilization that has been experimented with is the environmental application.

An example of the use of dredged material for environmental restoration is the "Poplar Island Habitat Restoration Project" in the Chesapeake Bay near Baltimore, Maryland. This project includes restoring 1,000 acres of land, of which fifty percent will be converted into wetlands. This structure is used as a Dredge Material Containment Facility and will use 40 million cubic yards of material dredged from the Bay's navigational channels.

The need to find new placement sites for dredged material has triggered the development of engineering solutions for the use of dredged material in environmental applications. This recent development has encouraged innovative investigation and exploration of the behavior of dredged material. Investigations conducted by Gahagan and Bryant (GBA), and published by Western Dredging Association (WEDA) at the Twenty-Sixth Technical Conference in July 2004, *“Poplar Island Environmental Restoration Project Dredge Material Volume Tracking for Tidal Wetland Construction,”* shows the complexity of wetlands design considerations and the use of dredged material from navigational channels for environmental applications.

As stated in the previous paragraph, the development of the “Poplar Island Habitat Restoration Project” in the Chesapeake Bay is an example of how the dredged material can be used to build, restore, and nourish environmental habitats. Poplar Island was reduced from approximately 1,100 acres to four acres due to weather, hurricanes, and storms over approximately 200 years.

The need to place dredged material coming from the maintenance of navigational channels in confined facilities and the expectation of spending approximately 350 million dollars over 20 years to place this material inspired the idea of rebuilding Poplar Island with this material. The Port of Baltimore generates approximately 1.5 billion dollars per year for Baltimore’s economy. The restoration of Poplar Island began in 1996 using the material dredged from navigational channels in the Bay area.

The project will be completed in 2014, and a total of approximately 40 million cubic yards of maintenance material will be used by that date. Fifty percent of the island area will be used to build uplands, and the other fifty percent will be used to build inter-tidal wetlands.

Natural Disasters

The ability to move large amounts of material efficiently to relatively distant locations makes dredging appropriate to solve shoreline erosion problems caused by storms and hurricanes. Dredging also helps clean rivers and navigational channels by removing sedimentation produced by storms and natural disasters.

2.2 The Nature of Dredging Projects

Field Operations

Dredging takes place in open waters, lakes, rivers, bays, and other bodies of water, and in various complex and restrictive environments. Safety rules and regulations are rigid and demanding, and are enforced under the contractor's dominion. Due to the high cost of dredging operations, projects need to be completed efficiently; therefore, high-performance equipment needs to be employed in order to maintain costs within a reasonable range.

Dredging projects usually remove and transport large amounts of material to defined placement sites. This amount could range from thousands to billions of cubic yards of material. Even the operation of small projects requires a fleet of floating

equipment to accomplish the job in an economical and timely manner. For large contracts, various types of dredges and supporting equipment may be required.

Job Performance and Measurements

Because dredging project work is performed under water, the assessment of dredging project performance becomes a complex activity. Measurement of dredging performance and assessment of the subsurface conditions need to be conducted through indirect methods such as hydrographic survey and geotechnical subsurface investigations. The volume of material dredged is measured by performing before-and-after dredging hydrographic surveys of the waterbed surface to estimate the volume between both surfaces.

Evaluating job performance based on the quantity of materials dredged cannot be performed definitively until the job has been completed or partially completed. An initial hydrographic survey, called the before-dredging survey, is performed to measure the initial surface and to assess the dredged material volume. Afterward, when dredging is completed or partial payments are required, interim or final surveys, called after-dredging surveys, are performed to assess the actual surface conditions. The volume calculated between these two surfaces is the estimated actual volume dredged.

Project Participants

Dredging projects are typically designed and developed by the owner's project team, who also manages the contract for the project. This arrangement reduces the project's

direct participants to the owner and the contractor. In this case, the contract has been managed with professionals working under the owner's enterprise and expertise, which is not always the dredging discipline. This approach to the development of dredging projects introduces technical and managerial "blind spots" in the life cycle of the project and directs projects into unsuccessful management strategies from the owner's point of view.

Payment Method

Typically, due to the complexity of assessing dredged material quantitatively and qualitatively, the payment method used for dredging contracts is the *unit-price*. Measurement of dredged material for payment purposes cannot be assessed accurately before the job has been completed or partially completed as mentioned in the "Job Performance and Measurement" section above.

2.3 Dredging Equipment

A dredge is a machine on a boat or a barge used to dig material from waterbeds in order to be transported to a placement site or a fill area. There are several classes of dredges: hydraulic cutter head dredges, hopper dredges, plain hydraulic suction dredges, and mechanical dredges. Each one of these types of dredges has its own capabilities and functions.

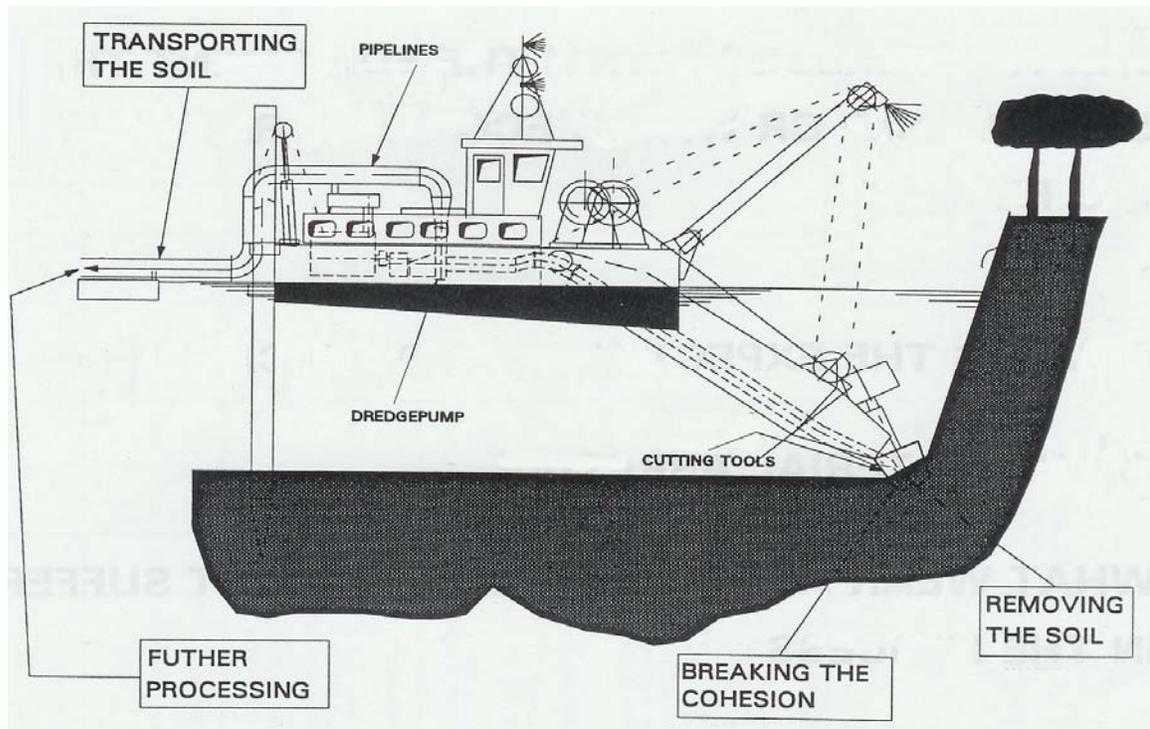
The Hydraulic Cutter Suction Dredge

A Hydraulic cutter-suction dredge is assembled on a non-self-propelled barge and is relatively static during the dredging operation. Figure 2 depicts a hydraulic dredge with the cutter-head lifted out of the water. This dredge uses a cutter-head to break the cohesion of the material and convey the material to the suction (Figure 3), and a pumping system to hydraulically transport the material to the placement site through a pipeline. These dredges are used to excavate in areas where navigation is difficult, and the placement site is in its pumping-range distance. These dredges are also used to excavate harder materials due to their capacity to break the soil with the cutter head.

Figure 2. IHC Hydraulic Cutter-head Dredge (IHC Advertising Material, 2005)



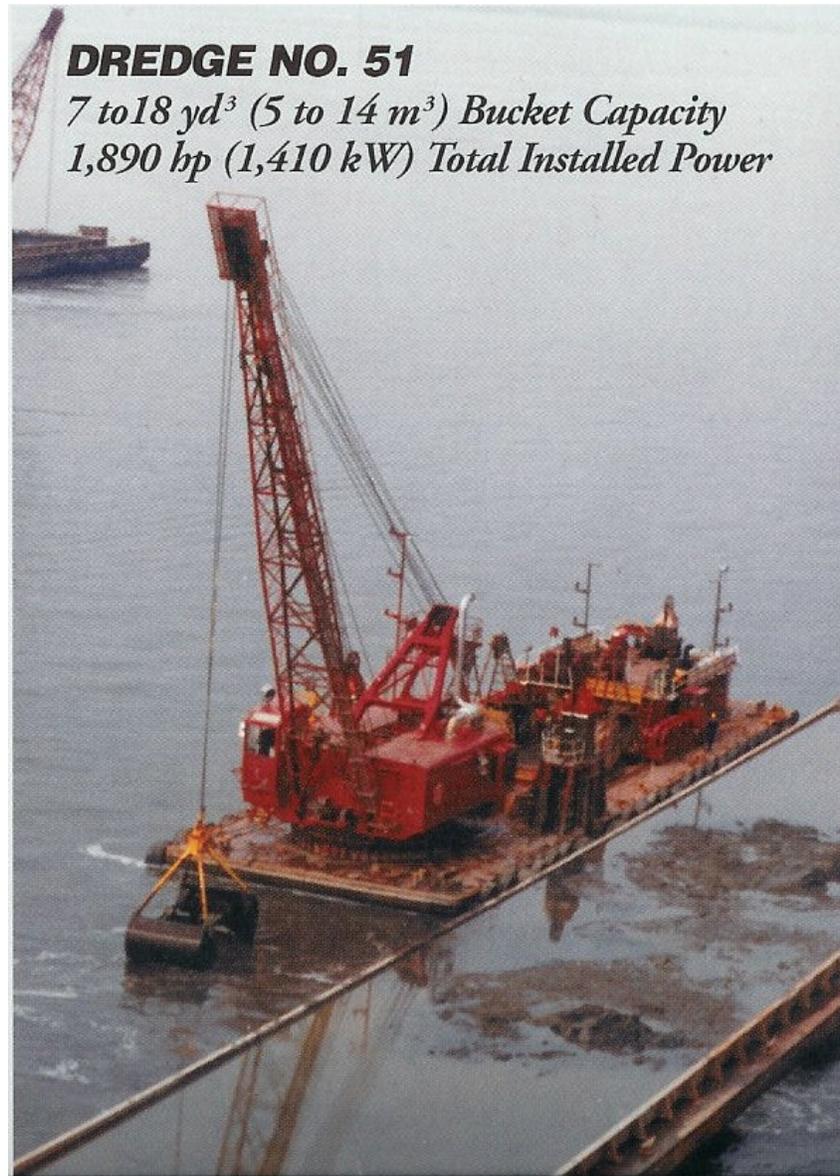
Figure 3. Cutter-head dredge cutting, pumping, and transporting function (MTI Holland BV, 1997)



The Mechanical Dredge

A mechanical dredge is a crane-mounted barge (Figure 4) with a clamshell bucket to dig material from the bottom of waterbeds. It is used to dredge relatively soft material, and it needs hopper barges and tugs to assist in transporting the material to placement sites.

Figure 4. GLDD Mechanical Dredge loading a Hooper barge, (GLDD Advertising Material, 2005)



The Hopper Dredge

A Hopper dredge is a ship that has the capability to store the material dredged onboard during the dredging operation (Figure 5). It drops one or two arms from the sides of the ship to the bottom of the seabed to retrieve the material to be placed in the

hopper (Figure 6). A hopper dredge requires a large navigational area in order to operate, but it can transport the material over large distances. It is used for mining sand from the seabed for large construction filling operations (Figure 7), and to build and maintain channels.

Figure 5. Cutter-head navigating to placement site (IHC Advertising Material, 2005)

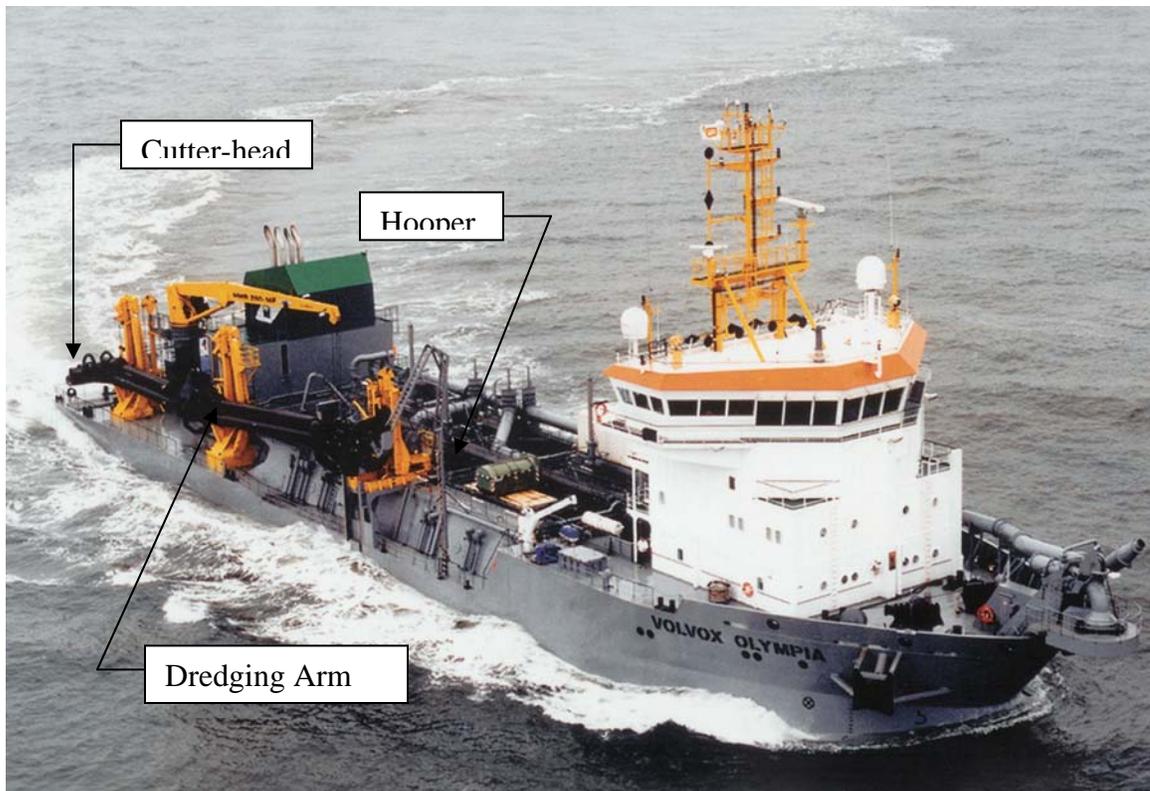


Figure 6. Hooper Dredge cutting, pumping, and transporting function (MTI Holland BV, 1997)

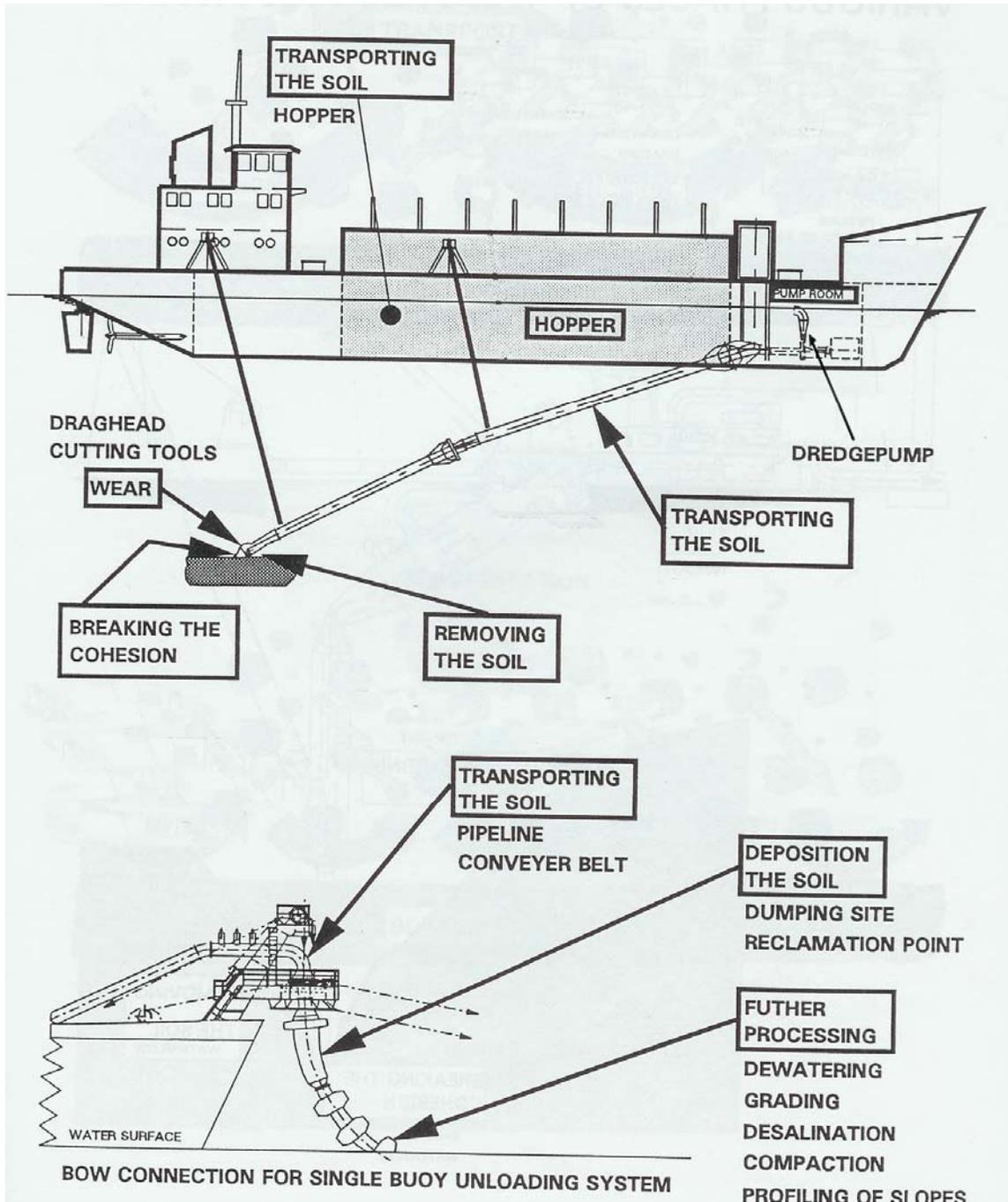


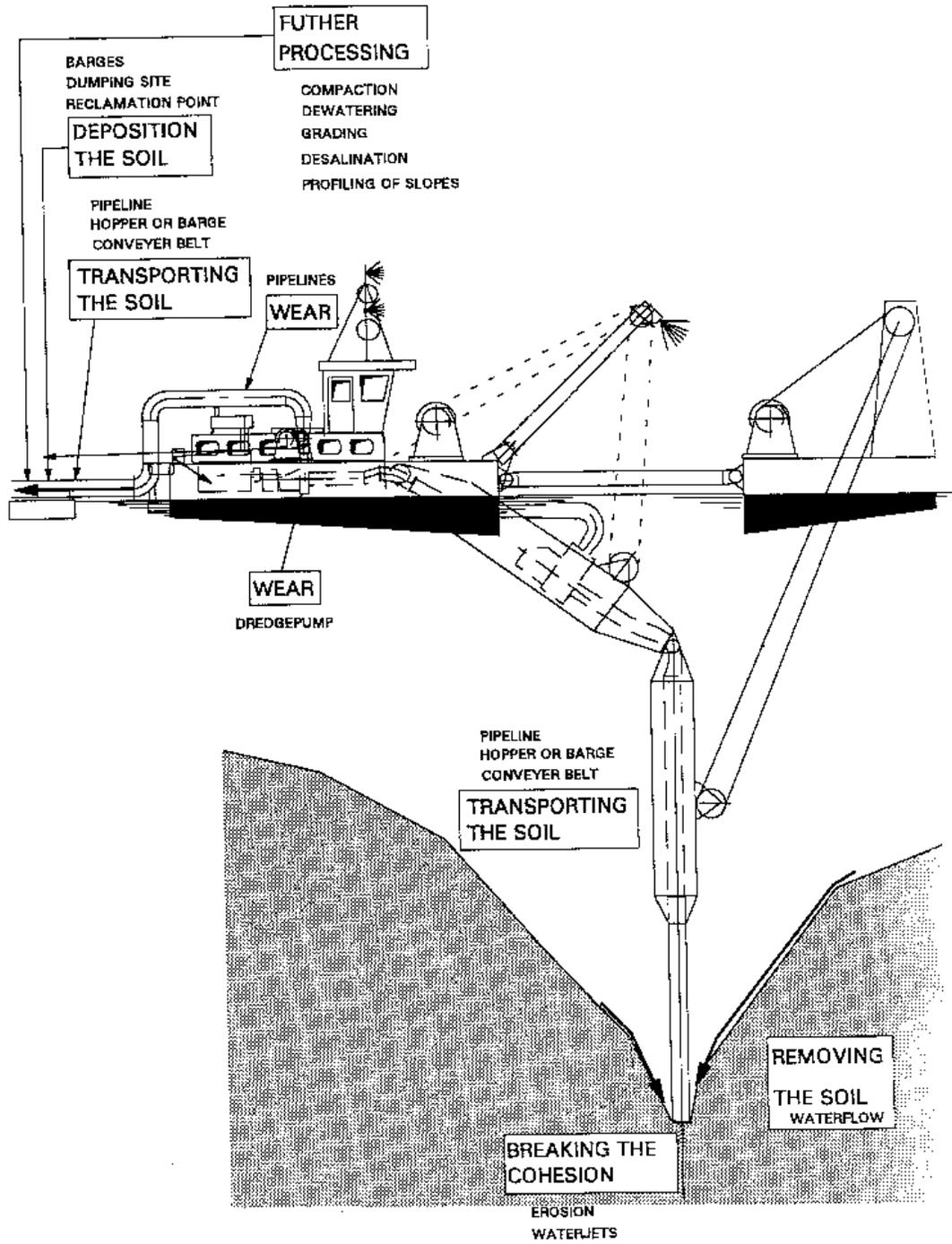
Figure 7. Hopper Dredge side-casting material (IHC Advertising Material, 2005)



The Plain Suction Dredge

A Plain hydraulic suction dredge (Figure 8) is similar to the cutter head dredges, but it does not have a cutter head. It is used for a more limited operation and for dredging very soft and loose material.

Figure 8. Plain Suction Dredge (MTI Holland BV, 2005)



The Backhoe Dredge

The backhoe dredge is used to excavate harder material.

Figure 9. Backhoe Dredge (*World Dredging Magazine, 2005*)



2.4 Dredge Material

“A wrong pre-assessment of the soil to be removed can result in extremely high cost, late completion (penalty), and disastrous financial consequences for the owner or contractor” (MTI Holland BV, 1997).

Dredged material encountered in dredging projects is of a diverse nature, but when viewed from the dredging perspective, dredged material can be defined as fine material typically composed of silts and clays, and granular material typically composed of sand, gravel, cobbles, and boulders.

All dredging jobs generally fall into one of the two main categories - maintenance dredging and new work dredging. The material encountered in maintenance work is soft silt and clay with high water content. This material is transported by currents and tide fluctuations to navigational channels, turning basins, marinas, and other marine facilities. New work dredging deals with material in areas that have not been previously dredged and have undergone consolidation. New work material could be composed of consolidated and low water content silt and clay, and granular material including sand, gravel, cobbles, and boulders.

We can conclude that the material encountered in maintenance dredging is generally very soft material, while the material encountered in new work dredging can vary from soft to hard silt and clay, and from loose to very dense granular materials. In the

following two sections, the general characteristics of the primary material involved in dredging operations are defined.

Silts and Clays

Silts and clays are encountered in various forms, ranging from very soft to hard conditions as depicted in Table 1. The condition of silt and clay defines important parameters for the equipment to be used in the project, the project performance, and project cost. When encountered in soft conditions, silts and clays are very easy to dredge and transport. However, when encountered in hard and stiff conditions, special equipment and dredging strategies are required.

In dredging jobs, generally the new work dredging is performed first to open or deepen channels, turning basins, marinas, and other marine structures. After the new work is done, currents and tide fluctuations move fine sediments into these structures, and maintenance must be performed to preserve navigational depths. As an example, four million cubic yards of sediment (very soft silt and clay) are dredged from the navigational channels in the Baltimore Bay area, and a variable amount of new work is dredged from new areas every year. Specifically, in the Baltimore harbor, due to environmental restrictions, the material is dredged mechanically and placed into barges, transported to a Dredge Material Containment Facility (DMCF), and unloaded hydraulically.

The mechanical dredge used in this operation features a 21-cubic yard clamshell, and the hydraulic unloader features two 30-inch hydraulic pumps, one on the hull and the other on the suction. When performing on very soft maintenance material, these equipments working simultaneously could produce an average of 25,000 cubic yards per day. In contrast, when performing new-work dredging on medium-stiff to very-stiff silt and clay using the same operation described above, the production can drop to 6,000 cubic yards per day.

When performing dredging on maintenance work using a hydraulic dredge with similar characteristics as the unloader described earlier, a production of approximately 50,000 cubic yards per day can be achieved. In contrast, when performing on new work, production can vary from approximately 30,000 cubic yards for medium stiff silt or clay to 10,000 cubic yards per day for hard silt or clay. This difference in production between maintenance dredging and new work dredging, for a mechanical dredge and a hydraulic dredge, demonstrates how the type of material dredged can affect the equipment performance.

Granular Material

Granular material also exists naturally in diverse forms and has important effects on dredging projects. Sand is encountered in loose to very dense conditions. Loose sand is relatively easy to dredge and transport, but as the density or the grain size of the in-situ material increases, the dredging process becomes more difficult, including not only the actual dredging of the material, but also the hydraulic transportation of the material.

Table 1. Clay Characteristics from the Unified Soil Classification System (USCS).

CLAY CONSISTENCY	THUMB PENETRATION	SPT, N BLOWS/ FT.	Undrained Shear Strength c (PSF)	Unconfined Compressive Strength q_u
			TORVANE	Pocket Penetrometer
VERY SOFT	Easily penetrated several inches by thumb. Exudes between thumb and finger's when squeezed in hand.	< 2	250	500
SOFT	Easily penetrated one inch by thumb. Molded by light finger pressure.	2 - 4	250 - 500	500 - 1000
MEDIUM STIFF	Can be penetrated over 1/4" by thumb with moderate effort. Molded by strong finger pressure.	4 - 8	500 - 1000	1000 - 2000
STIFF	Indented about 1/4" by thumb but penetrated only with great effort.	8 - 15	1000 - 2000	2000 - 4000
VERY STIFF	Readily indented by thumbnail.	15 - 30	2000 - 4000	4000 - 8000
HARD	Indented with difficulty by thumbnail.	> 30	> 4000	> 8000

When dredging granular material with hydraulic dredges, the impact of the grain size on the dredge production is considerable. The density of the slurry transported through a pipeline depends significantly on the grain size of the material in the slurry. As the grain size of the material transported increases, the slurry velocity needs to increase significantly to maintain the material in suspension. The energy needed to increase this velocity is limited by the pump capacity and is a fixed value; therefore, a reduction of slurry density must be attained in order to allow enough energy to increase slurry velocity. Table 2 shows the classification of granular material and corresponding grain size.

Table 2. Granular Material Characteristics from the USCS.

Unified Soil Classification System (USCS)			
	MILLIMETERS	INCHES	SIEVE SIZES
BOULDERS	> 300	> 11.8	-
COBBLES	75 - 300	2.9 - 11.8	-
GRAVEL:			
COARSE	75 - 19	2.9 - .75	-
FINE	19 - 4.8	.75 - .19	3/4" - No. 4
SAND:			
COARSE	4.8 - 2.0	.19 - .08	No. 4 - No. 10 
MEDIUM	2.0 - .43	.08 - .02	No. 10 - No. 40 
FINE	.43 - .08	.02 - .003	No. 40 - No. 200 
FINES:			
SILTS	< .08	< .003	< No. 200
CLAYS	< .08	< .003	< No. 200 

The conditions of the granular material in-situ also influence the amount of material the dredge is able to excavate and convey to the dredge suction by the cutter-head. This also limits dredge production and defines the type of dredge to be used. Larger dredges are used to excavate consolidated and dense material.

Table 3. Sand Conditions and Type USCS.

SOILTYPE	SPT, N Blows/ft.	Relative Density, %	FIELD TEST
VERY LOOSE SAND	4	0 - 15	Easily penetrated with 1/2" reinforcing rod pushed by hand.
LOOSE SAND	4 - 10	15 - 35	Easily penetrated with 1/2" reinforcing rod pushed by hand.
MEDIUM DENSE SAND	10 - 30	35 - 65	Penetrated a foot with 1/2" reinforcing rod driven with 5-lb hammer.
DENSE SAND	30 - 50	65 - 85	Penetrated a foot with 1/2" reinforcing rod driven with 5-lb hammer.
VERY DENSE SAND	50	85 - 100	Penetrated only a few inches with 1/2" reinforcing rod driven with 5-lb hammer.

2.5 Dredging Contracts

The possibility of inadequate performance by the contractor during dredging operations can lead to various contract disputes. In dredging operations, unforeseeable ground conditions are the primary reason for contract claims and disagreements which may arise. For example, boulders, ordnance, obstructions, debris, consolidation losses, stockpiles, and quality of fill material are factors adversely affecting dredging operations.

Dredging revolves entirely around underground material which is investigated, and the resulting data is then interpreted. The contractor then assumes the accuracy of the data and is required to speculate as to the probability of encountering adverse conditions, ultimately prompting risk analysis. This scenario obligates the contractor to decide if he will include the risk in his estimate or ignore the potential problem. Successful risk management will fairly allocate the risks, which are often inherent in a dredging project, and will reduce contract disputes.

In the dredging industry, a contract is an agreement between the owner and the contractor to develop the owner's project in terms of the conditions defined in the project specifications. Naturally, the owner and contractor each have always had their own unique perspective of the dredging contract. This may seem logical as each party has the same end goals but varying responsibilities and financial interests. The owner's primary concerns regarding the contract are related to quality, budget, schedule, and environment, whereas for the contractor, the specifications, payment

conditions, schedule, and performance are of greatest importance. These contrasting concerns have frequently distracted both parties from unifying their efforts and activities to develop a collaborative relationship during the development of the dredging contract, and have the potential to bring many difficulties into the relationship between owner and contractor.

As a result of the contrasting views held by the owner and contractor, the owner generally develops the preliminary investigation and studies during the pre-construction phase without the participation of the contractor. Nevertheless, in the specifications, the most significant risks are allocated to the contractor. Dredging contractors are brought into the process during the procurement stage and have a limited time to assess the project in its entirety. The lack of the contractor's involvement in the pre-construction phase often leads to insufficient investigation, poor contract decisions, and inadequate administration, severely compromising the contractor's performance and the ultimate success of the venture.

2.6 Management of Dredging Projects

As mentioned in Section 2, "The Nature of Dredging," dredging takes place in complex and restrictive environments. The management of dredging projects is a difficult task due to complicated logistics and the need to limit the duration of the project. Measurement and evaluation of project performance used for project control are done subjectively by remote sensing technologies, and not by direct observation of inspectors.

To properly manage a dredging project, the management team should have a complete knowledge of the project conditions and the contractor equipment capability. In the past, and today in some cases, professionals working for the owner's entity, whose experience and expertise are not in the dredging industry, manage dredging projects. This fact adds a layer of complexity to the successful management of a dredging project. Bringing an independent management team with expertise in dredging into the project in its early stages and implementing strategic information technologies will facilitate and ensure the development of a successful project and will help avoid future difficulties that can arise.

For example, during the widening of a turning basin of an important marine terminal, the contractor claimed that the information submitted by the owner in the specifications concerning the material to be dredged did not correspond to the material actually encountered. The contractors warned the owner of a claim for change in contract conditions due to the presence of material of greater grain size than what was stipulated in the contract specifications. At the end of the dredging operation, the contractor submitted a claim for approximately \$800,000. The claim was submitted in a document describing the value of the time that it took the contractor to complete the job in contrast to the time it would have taken the contractor to dredge the material in accordance with his original interpretation of the specifications. However, on this particular contract, the owner had a team of dredging experts at the job site on a continuing basis in order to perform the

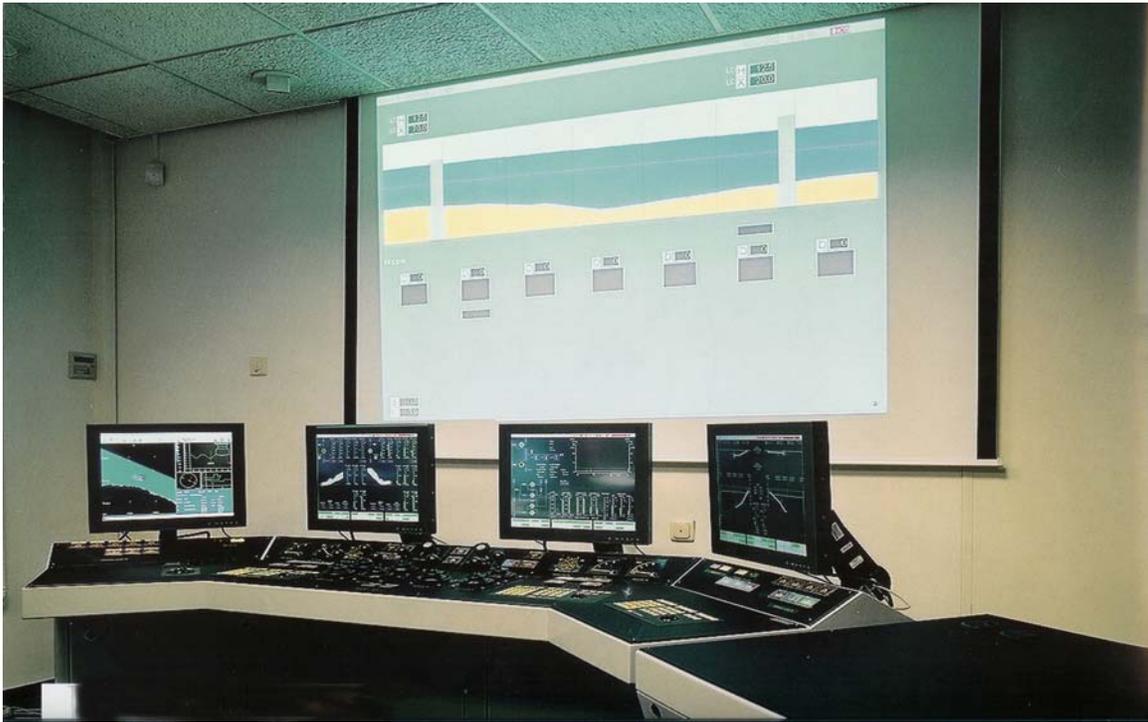
inspection and gather the information needed to support the project manager in decision-making.

The information gathered by the inspection team during the dredging operation helped to determine that the reason for the contractor low performance was not related to the type of material encountered, as the contractor suggested in his claim. The analysis of the information demonstrated that the cause for the contractor delay was the failure of the equipment to handle the material. During dredging operations, it is important that the project management team have the means of acquiring reliable project information. The information that could help manage and assess dredging project performance is highly customized to the nature of dredging projects. The reason for the contractor fault in the above example could be that the contractor failed to assign the right equipment to the job, or that the actual equipment was under deficient maintenance and it could not handle the conditions of the job efficiently.

Chapter 3. State of the Art in Dredging Technology

The need to undertake larger and more demanding dredging projects and the need to maintain dredging costs at a competitive level have driven dredge builders to implement state-of-the-art technology in the production of new dredges. The most notable technology improvements have been in the transport of slurry, dredge automation, electronic controls, and hydrographic survey instrumentation. Figure 10 shows the operation room of a cutter-suction dredge.

Figure 10. Cutter-suction Dredge Operation Room (IHC Advertising Material)



3.1 Hydrographic Surveying

Technology improvements in hydrographic survey instrumentation have enhanced the quality and efficiency of topographic measurements, enabling timely and accurate quantities. Hydrographic surveying has gone from measuring angles from shore to shore across rivers and channels using a sextant or a simple measuring line, to the current ability to log the position of soundings (depth measurements) simply by driving a boat armed with a geodesic position system and a modern echo-sounder. This technology enables the user to load real-time information to a computer, and plot depths and volumes right on the spot. The obsolete methods were limited to post-processing of information gathered, whereas the current technology allows real-time processing of data. These improvements have also promoted and facilitated project management functions by enabling access to accurate and timely information of the project conditions and performance.

3.2 Slurry Transport

Slurry transport is the most important and improved area in dredging equipment technology. The majority of dredging projects are performed using hydraulic transport of dredge material. When dredging, the material is removed from its in-situ stage and conveyed to the suction entrance where it enters the system pipeline until it reaches the final or intermediate placement site. Here is where the efficiency of transporting the dredged material is maximized.

The hydraulic transport of material is accomplished by relatively large pumping systems. The dredge pumping system is designed to transport a mixture of solids and water called *slurry*. The system will reach its maximum performance when the slurry mix is loaded with the maximum amount of solids permitted by the system characteristics. The dredge operator must have access to the most efficient system available, and be trained to understand the impact of each of the pumping factors on the system performance. During a hydraulic cutter-head dredging operation, the natural assumption might be that increasing the pump speed to its maximum level would produce maximum output of solids. However, this assumption is erroneous. The amount of solids transported through the system suction is limited by the velocity in the suction line - at higher-than-optimal velocity, the slurry's solid content will need to be reduced. Recent improvements in pump design and a better understanding of slurry behavior in pipes have greatly improved the efficiency of slurry transport systems.

3.3 Dredging equipment

A well-chosen dredge is the core determiner of a dredging project's success. The dredging equipment and its attendant plant execute all dredging work, but the primary factor for a successful project is the dredge performance. The number of dredges on a project is limited due to high operating and ownership costs. For example, in a two million-dollar dredging contract, a three million-dollar dredge may be used. This fact requires that the dredging project be limited in duration. If the dredge equipment is

not efficient, the high cost of the dredge equipment and its operating cost will cause the project to be financially unsuccessful.

As mentioned in Chapter 3, the nature of the material and the project conditions define the type of dredge required. For example, in a new work project where the material to be dredged is rock, depending on the nature of the rock, a very specific dredge may be required, as is shown in the table below.

Table 4. General Characteristics of Soils and Rocks for Dredging Purposes

Soil Type	Dredgability characteristics				
	Backhoe Dredge	Mechanical Dredge	Plain Suction Dredge	Cutter-Head Dredge	Hooper Dredge
Rock: Igneous	N.A	N.A	N.A	N.A	N.A
Rock: Sedimentary	Low	Low	N.A	Very Low	N.A
Rock: Metamorphic	N.A	N.A	N.A	N.A	N.A
Boulders	Fair	N.A	N.A	N.A	N.A
Cobbles/Gravel	Medium	Very Low	N.A	Low	Very Low
Gravel	Good	Low	N.A	Medium	Low
Sand/Gravel	Very Good	Medium	Low	Good	Medium
Medium/fine sand	Good but Low Performance	Good	Good	Very Good	Very Good
Cemented sand	Good	Low	N.A	Good	Low
Soft Silt Clay	N.A	Very Good	N.A	Very Good	Good
Firm silt/clay	Good	Good	N.A	Good	Low

3.4 Dredging Projects

Most dredging projects are performed as part of major infrastructure development solutions. The application of such a dredging project occurs in the context of a governmental project. In the U.S., most dredging projects are financed at the federal (Army Corps of Engineers) and state (Maryland Port Authority) levels. Therefore, the majority of dredging projects is managed by governmental entities and developed under their contract delivery system policies.

In the U.S., most dredging projects are developed under the design-bid-build project delivery system. This system, with its roots in the 19th century, has raised intense criticism because it does not deliver peace of mind to the project owner; rather, it is structured to deliver poor collaboration between owner and contractor. It also provides an opening for claims and change orders. These design-bid-build project delivery system flaws, in addition to the environment in which dredging projects are performed as explained in Sections 2.5 and 2.6, make dredging a difficult undertaking for project managers.

3.5 Project Management

Project management in dredging contracts today has its own “culture,” depending on the country in which it takes place. For example, the U.S. Corp of Engineers is one of the entities with major impact in the dredging management culture within the United States. Several methods and means developed by the Corps of Engineers are now used as models by other entities and are interpreted as a rule of thumb in the

dredging industry. For example, the dredge daily reporting methods and the contractor quality control function are used as tools to implement the means of the owner's project management functionality. In this case, the owner leaves the responsibility of the information management and the quality assurance of the project to the contractor. In this model, the owner of the project is a passive entity with practically no involvement in the management dredging operation.

In various South American countries, the dredging industry culture is under-developed, and knowledge and expertise of the dredging process has only recently begun to develop. Project owners hire a team of construction auditors to do the inspection of the dredging project, although these auditors often have limited expertise, inviting numerous and substantial difficulties to the project. When an inspector on a dredging job is not knowledgeable and well-versed in the industry, the contractor will take the lead and manage the contract, often with costly penalties to the owner due to contractor claims. In addition, due to the lack of expertise of the project management team, a project can fail altogether. For example, in Colombia, South America, a dredging contract was awarded to a European contractor to deepen the navigational channel that serves the access to the Port of Cartagena. The specifications and the contract conditions were issued without a comprehensive investigation of the subsurface conditions. This caused the contractor to assign the wrong equipment to the job, which was shipped from another country, incurring considerable cost. The equipment acquired was not appropriate to the conditions of the dredging project, the job never commenced, and the contractor subsequently

brought a claim for compensation due to the inaccuracies of the original contract specifications and conditions.

In Europe, the dredging culture is ancient and well-developed. There is broad knowledge and experience in project management, as well as a commitment on both sides – the owner’s and the contractor’s - to share power in the domain of the contract in order to bring about an optimal outcome, ultimately benefiting both parties. The “win-win” negotiation philosophy is the common ground to maximize success.

Within this European dredging culture, the role of the “consultant” is emphasized due to his expertise and understanding of the importance of improving communication between owners and contractors. This dredging culture well understands the importance of sharing pre-construction information as a management tool to improve dredging performance, and resources are optimized due to increased understanding of the project characteristics.

3.6 Project Information

Three important phases can be differentiated during a dredging project life cycle: the pre-construction phase, the procurement phase, and the construction phase. Each one of these phases generates relevant information. The pre-construction phase and the construction phase generates information related directly to the project entity as a whole and, optimally, should unite the owner and contractor to the common goals which are defined in the project specifications. It is important to understand the implications of the pre-construction and the construction phase information in the

development of the dredging project. The pre-construction information “describes the site, defines the nature of the ground, describes physical and environmental constraints, and identifies operational, statutory and legal constraints. This information is as important as the specifications in describing to the contractor the nature of the work to be done” (Land 2006).

The pre-construction information will be generated by data gathered during: the geological and geotechnical investigations; the hydrographic survey investigations that include tides, currents, waves, and bathymetry; meteorology investigations that comprise wind, fog, ice, and rainfall. Pre-construction information may also be generated by data gathered during operational and legal constraints investigations, obstruction and archeology investigations, and environmental constraints investigations. (Land 2006).

The construction information will be generated by the data gathered during the contractor performance on the job. It will define the project cost, project schedule, and project performance. The contractor will use this information to assess his work performance and by the owner to assess project performance indices.

Chapter 4. Case Study: Construction of a New Dredge Material Containment Facility (DMCF).

4.1. Objective

The objective of this section is to present the construction of a new DMCF as a case study that illustrates a typical dredging project and its resulting project management issues. This case study will primarily consider the dredging aspect of the construction from the project management perspective.

4.2. Introduction

The State of Maryland requires port terminals to maintain existing channels and often to expand access channels in order to accommodate the pace of modern commercial trends. International commerce of consumer goods, cars, equipment, food, fuel, etc., continues to grow, requiring larger cargo ships that must access ports with increased size and depth of channel infrastructures. The Maryland Port Authority (MPA) is the agency responsible for implementing the work needed to meet the community's economic and social requirements as they are related to its marine port facilities. In order to maintain the navigational channel systems to access the Port of Baltimore Marine Terminals, the MPA plans and coordinates the maintenance of the harbor's access channels to maintain their operational depths. In the state of Maryland, by law, all material dredged in the Baltimore harbor needs to be placed in a contained area. In order to maintain the channel system, the MPA needed to build a DMCF to

replace the current facility, Hart Miller Island, which will be closed as required by law in 2009. In order to provide a material placement site which can accommodate the yearly dredging demands, the MPA planned and designed a DMCF to be built at a new site in the Baltimore harbor (see map in Figure 11).

Navigational channel design depths are preserved by implementing periodic maintenance work dredging operations. Navigational channel systems require channel depths to be maintained for navigational purposes and to meet safety requirements. Navigational channel safety requirements are defined by the U.S. Army Corps of Engineers (USACE) Design Standards for marine waterways, and by the Permanent International Association of Navigation Congresses Standards (PIANC).

In other cases, for example a new work dredging project, the dredging operation will include new construction of channels or turning basins, or widening or deepening of existing structures. The dredging for the proposed DMCF is a new work dredging project.

Scope

The new DMCF project will include the construction of 5,100 feet of dike and 1,200 feet of cofferdam which requires the dredging of 1.6 million cubic yards of unsuitable material, and 3.3 million cubic yards of material suitable for the dike construction. This material is currently being dredged from the site itself as well as from the

widening and deepening of Seagirt and Dundalk marine terminal entrance channels. The total duration of the construction will be approximately two years. The construction engineer's "initial" cost estimate explained below is approximately \$49 million dollars. The unsuitable material is being dredged and placed at Hart Miller Island DMCF using a hydraulic unloading (pump-out) system.

The scope of this case study encompasses the project management issues that will arise from a typical dredging operation and their solutions, which is the focus of this research. This case study will focus on the dredging portion of the initial construction activity.

Initial Construction Cost

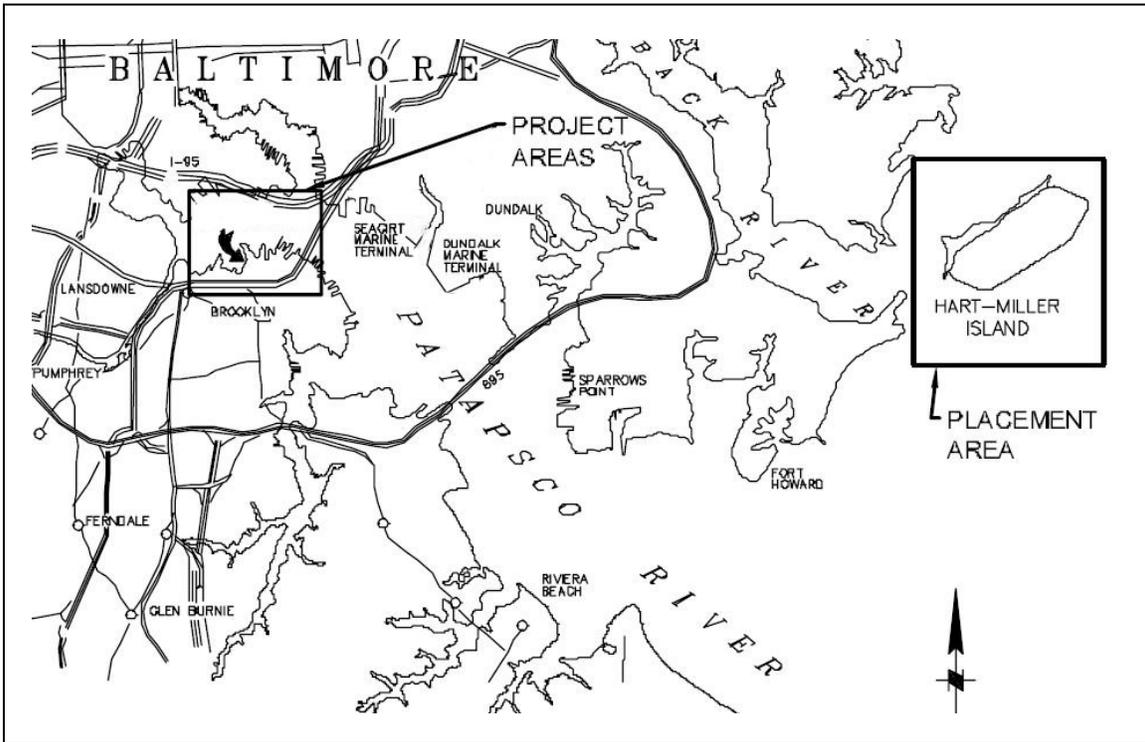
The initial construction cost includes only the cost to build the facility and does not include the initial studies and design costs, nor the post site development activities cost, which can include: dredge material management, site management and monitoring, future dike-raising, dredging, dredged material transport, and placement costs. The initial construction activity encompasses phase 3 of the project life cycle.

Life Cycle

Figure 12 depicts the project life cycle and the initial construction of the new DMCF. The project began with a reconnaissance study that defined the engineering analysis required for the construction of the upland placement site at the proposed DMCF. The reconnaissance study was then followed by a feasibility study to determine the

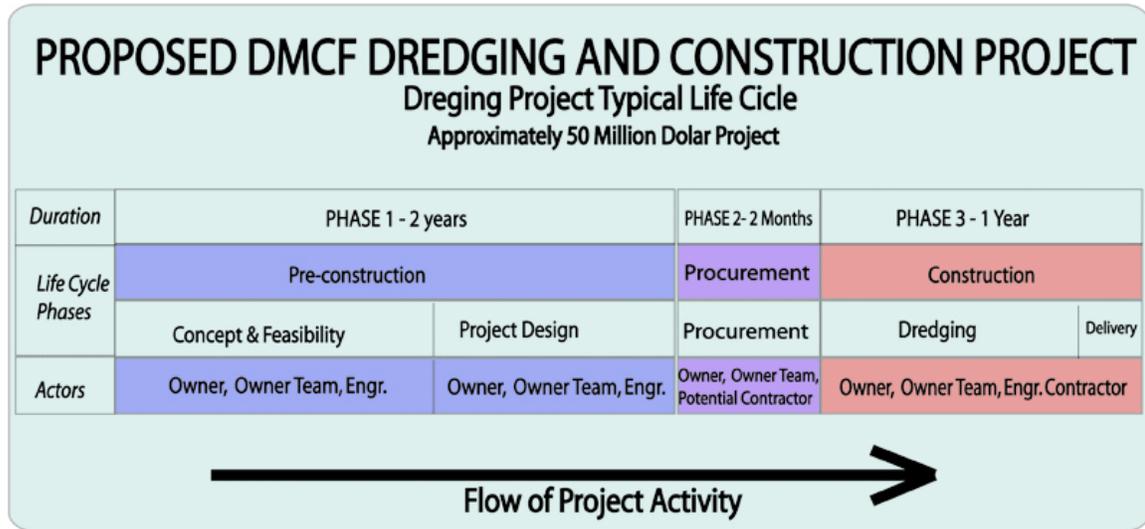
economic and technical viability of the project. The feasibility study demonstrated that the project's technical and economical goals were viable, and the project moved to the design phase. During the design phase, the specifications and plans to implement the project requirements were developed.

Figure 11. Vicinity map of the proposed DMCF (Courtesy of GBA Inc, 2005)



In accordance with the plans and specifications, the procurement team offered a public solicitation for bids on the proposed project. After the bids were submitted and the lowest qualified bid was selected, the contract was awarded. Finally, a “notice to proceed” was issued, and the dredging operation commenced.

Figure 12. Project initial construction life cycle



Project Management Consideration

During the pre-construction phase of the DMCF, significant factors arose which are central to the discussion of the dredging project management issues addressed in this paper. The most critical factors were the lack of participation by the contractor in the project’s activities during pre-construction and the lack of information-sharing during the construction phase. It is critical to examine each of these problematic issues in detail as they serve to illustrate what can occur in a typical dredging project.

The project management plan used for the development of the new DMCF and depicted in the life cycle illustration reveals the complete absence of contractor

participation during the two years of the project detail studies and investigations. Rather, the contractor was required to comprehend the project details and present a price for its construction in a two-month period (procurement phase). Clearly, if the contractor is not able to decipher the intricate difficulties and complex conditions of the project, the development of the project will be at risk, and the project price will ultimately be affected. Additionally, if this risk is not considered and it arises during construction, the contractor will claim for differences in the contract conditions. Ultimately, the contractor's lack of participation in the initial phases of the project could cause project cost to be increased arbitrarily and disproportionately, to the detriment of the owner's interest.

Similarly, there is an absence of an information system to facilitate the gathering of data during construction and to automate the process of transforming that data into usable information. Currently, paper forms are used to gather data during project construction, project information is processed manually, and reports are generated by hand. In addition, there is a lack of a communication plan that defines the flow of information and identifies whom the information will target. The lack of an information system and a communication plan make it difficult for information-sharing to occur during construction. With the lack of information-sharing, the decision-making process is hindered, and the project cost and schedule are affected.

Although other aspects of the project described in this case study do not address the specific issues which are the concern of this paper, they are presented in an effort to promote understanding of the project development management process.

4.3. Reconnaissance Study

The objective of the reconnaissance study was to conduct the site engineering analysis by implementing the preliminary investigations and the initial project cost and schedule. The reconnaissance study identified the investigations that needed to be conducted during the feasibility study. The preliminary investigations included the subsurface investigation, hydrographic surveys, weather studies, maritime traffic study, determination of the dredge material placement site, and selection of equipment to be used. The initial project cost was developed based on cost analysis supported by historical data, and the schedule was the result of a work breakdown analysis.

The DMCF requires a confining dike to be built in the water to create the space needed for the containment of the dredged material. The dike will be built with sand borrowed from within the site as shown in Figure 13. The on-site material suitable for dike construction is beneath approximately 15 feet of unsuitable material. This unsuitable material is currently being dredged and transported to Hart Miller Island DMCF. The space created by the removal of the borrowed material on-site will increase the site's capacity to hold future dredged material, therefore increasing facility cost benefit.

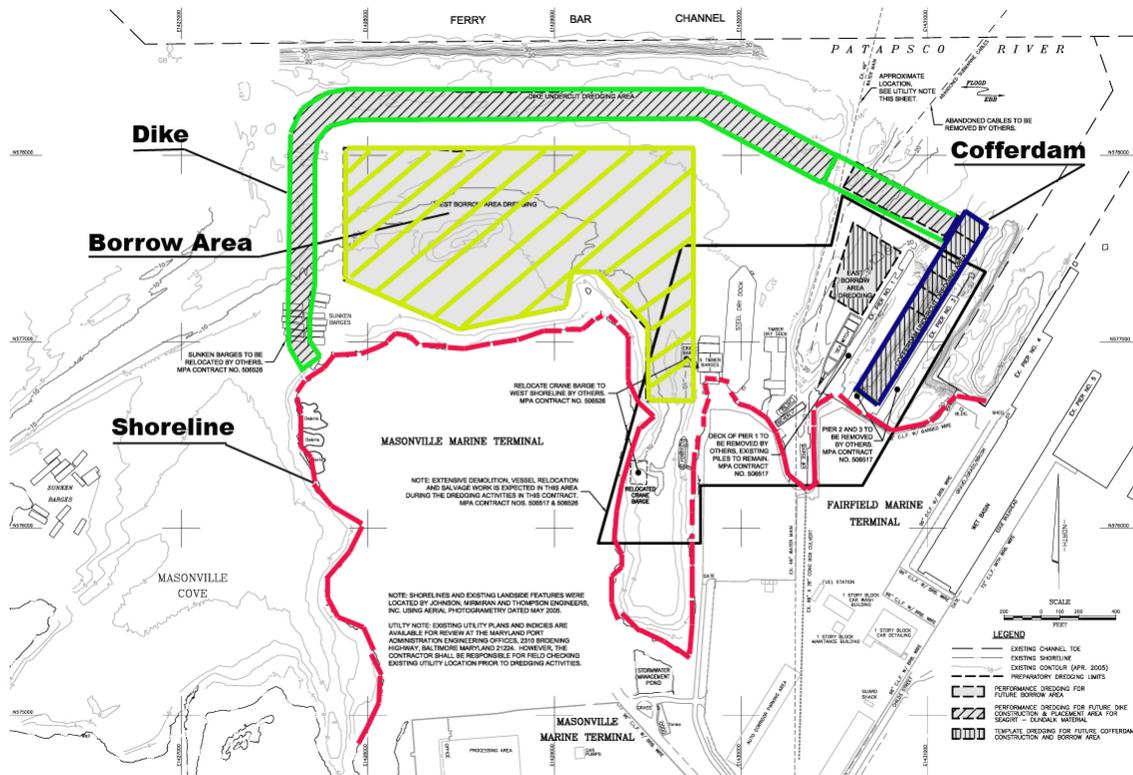
In order to define an achievable design for the final alignment of the confining dike, several alignments were presented to the stakeholders (see Figure 14). After considering the geotechnical information gathered during the subsurface investigations, the environmental impact on the area, and the site characteristics for each alignment, alignment No. 2 was considered to be the most feasible alternative.

Project Requirements

The project objective is to build a structure that will serve as a DMCF during its operational life and then be converted into an upland area facility for the Port of Baltimore. The construction of the DMCF is in accordance with the studies of beneficial use of dredged material and harbor management issues addressed by the Dredge Material Management Act of 2001 (Safe Passage, 2001).

The construction of the DMCF requires the following dredging activities: the dredging of the unsuitable material within the footprint of the dike in order to provide an appropriate foundation for the dike structure (see Figure 13); the stripping of additional unsuitable material located above the area that contains material to be borrowed for dike construction (see Figure 13); and the dredging of the borrowed material and placement in the dike template. Additional dredging will provide the remaining material required to complete the dike construction. This additional material will be dredged during the deepening and widening of the nearby Seagirt and Dundalk access channel and then placed at the new DMCF (See Table 5 for quantity of material needed and quantity availability).

Figure 13. DMCF shoreline, dike, and borrow area (Courtesy of GBA Inc.)



Within the template for the dredging of the Seagirt and Dundalk access channel, there is suitable material available for dike construction which can be used to complete the new DMCF. Coordinating the schedules of these two dredging projects will eliminate the necessity of buying additional material or beginning a new-work dredging project elsewhere to provide supplemental material.

Table 5. Distribution and availability of granular material needed for the construction of the DMCF.

Description	Needed for Dike Construction (cy)	Borrowed on Site (cy)	Imported from Segirt/Dundalk Dredging (cy)
Granular Material Suitable for Construction	3,300,000	1,100,000	2,200,000

Preliminary Investigation

The sub-surface investigation identified the material encountered in the area currently being dredged. This investigation included the implementation of soil borings and sampling procedures to determine the geotechnical characteristics of the soil. Figure 15 depicts a sample of granular material collected during a field investigation at the proposed DMCF, and Figure 16 illustrates a sample of fine grain material (silt/clay) obtained during the same field investigation. The depths at which the samples were recovered was variable. Material characterization is essential in dredging investigations, because it dictates the equipment to be used, procedures to be employed, and the productivity of the dredging operation.

Hydrographic surveys were performed primarily to measure the volume of material to be dredged. Figure 17 depicts a typical cross section of the area to be dredged. This cross section shows a profile of the bottom surface and a template of the section to be dredged, indicating with gray shading the material to be dredged.

The weather investigation is implemented through weather standards and databases available on the Internet, e.g., the National Oceanic and Atmospheric Administration (NOAA, 2007). The maritime traffic study is developed by consulting the Port of Baltimore administration database, as well as Port history and trends.

Figure 15. Sample of granular material recovered from the Masonville Marine Terminal during geotechnical investigation.



Figure 16. Sample of fine grain material (silt/clay) recovered from Masonville Marine Terminal during geotechnical investigation.



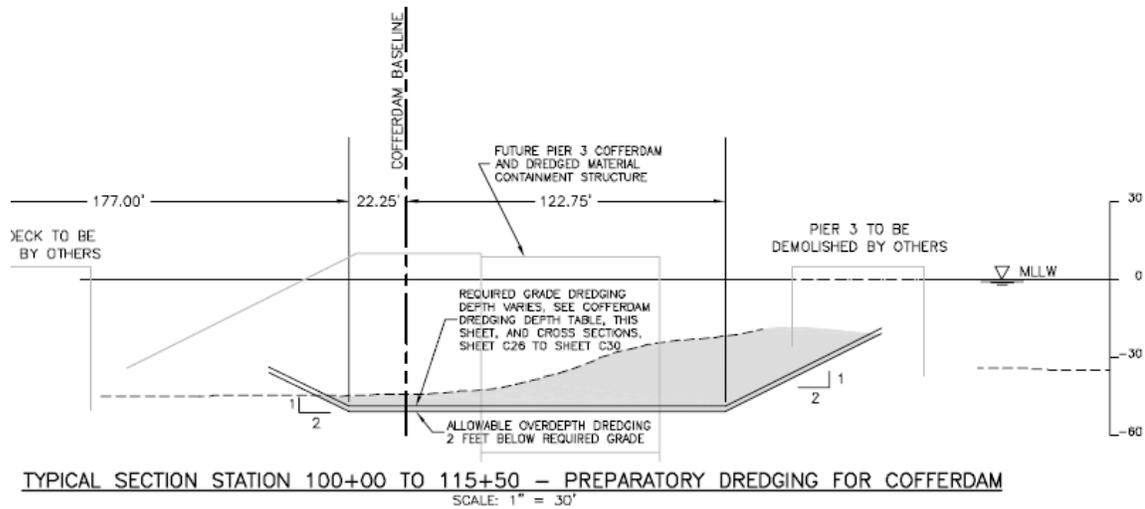
The selection of the dredged material placement site to be used for placement of unsuitable materials that is dredged at the construction site was made through consideration of proximity to the construction site as well as by evaluation of environmental and permit protocols.

Selection of the Dredging Equipment

Selection of the dredging equipment to be used was determined by the material to be dredged, the equipment characteristics and performance, and the availability and initial assessment of the mobilization costs. As discussed in Section 2.1 the type of

material to be dredged is of great importance in assessing the equipment and its performance.

Figure 17. Typical cross-section of a dredging cut (Courtesy of GBA Inc., 2005)



The geotechnical investigations during the new DMCF reconnaissance study were vital in assessing and defining the proper equipment to be used. During the reconnaissance study, the geotechnical investigation results were used to evaluate the parameters that define the dredgeability of the soil. The type of material and its characteristics were investigated in order to define the grain size, density, stiffness, and the relation of these parameters to the dredging equipment to be used. Table 4 can be used for an initial assessment of the dredge equipment needed.

The DMCF Cost and schedule

The total life cost of the proposed DMCF, which includes the construction life cycle plus the operational life, equals the sum of the following component costs: feasibility, design, initial construction, site development, and future dike-raising. In addition, all dredging costs, all transport and placement costs, and the costs related to the community enhancement program must be added to arrive at the total cost of the DMCF. The following describe the assumptions made during the cost estimation.

- The cost is based on historical data of similar jobs.
- The initial construction cost includes cofferdam construction, dike construction and stabilization, installation of spillways, and site infrastructure.

Figures 18 and 18-A depict the initial construction and total operational cost of the project and show the cost to use the site per cubic yard of dredged material placed during the operational life of the site.

The schedule developed in this phase encompasses the initial construction (see Figure 19). The project schedule was developed and includes the initial construction phase of the project. This schedule includes mobilization and demobilization, cofferdam construction, dredging, and dike grading and armoring. The dredging operation includes the stripping of the unsuitable material from the dike and cofferdam footprint, the stripping of the borrow area, the dredging of the borrowed material, and the hydraulic filling of the dike section.

Figure 18. New DMCF Construction Cost

INITIAL CONSTRUCTION COST (Reconalsance Level)				
<i>Construction Element</i>	<i>Unkt Cost</i>	<i>Units</i>	<i>Quantity</i>	<i>Cost</i>
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill	12 \$/cy		3,300,000	\$39,600,000
Unsuitable Excavation/Placement	7.5 \$/cy		2,800,000	\$26,333,100
Stone Work	39.00 \$/ton		53,800	\$2,098,200
Road Stone	11.00 \$/sy		23,166	\$254,826
Spillways	200,000 \$/per		2	\$400,000
Geotextile	4.00 \$/sy			\$432,944
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	1,000,000 \$/job		1	\$1,000,000
Demolition	5000000 \$/job		1	\$5,000,000
Storm Drains	3,260,000 \$/job		1	\$3,260,000
Contingency Cost	15%			\$8,112,938
Initial Construction Cost				\$92,993,000

Figure 18-A. Total Construction Cost

Site Characteristics		
<i>Item</i>	<i>Value</i>	<i>Units</i>
<i>Site Capacity</i>	15.0	<i>mcy</i>
<i>Site Effective Acreage</i>	110	<i>acres</i>
<i>Annual Placement</i>	0.5	<i>mcy</i>
<i>Site Life</i>	28.2	<i>years</i>
<i>Perimeter Dike</i>	13,310	<i>lf</i>

Total Site Costs (Reconalsance Level)				
<i>Item</i>	<i>Unit</i>	<i>Unit Rate</i>	<i>Quantity</i>	<i>Item Cost</i>
A. Initial Construction Costs				\$93,000,000
B. Site Development Costs				\$22,291,510
C. Dike Raising				\$9,414,000
E. Dredging, Transportation, & Placement Costs				\$102,130,729
Subtotal Cost A+B+C+D				\$198,835,430
F. Contingency Cost		15%		\$20,495,436
Total Cost A+B+C+D+E+F				\$219,330,866
Total Unit Cost				\$14.62
Total Unit Cost Rounded				\$15.00

Figure 19. Construction Schedule (Courtesy of GBA Inc., 2005.)

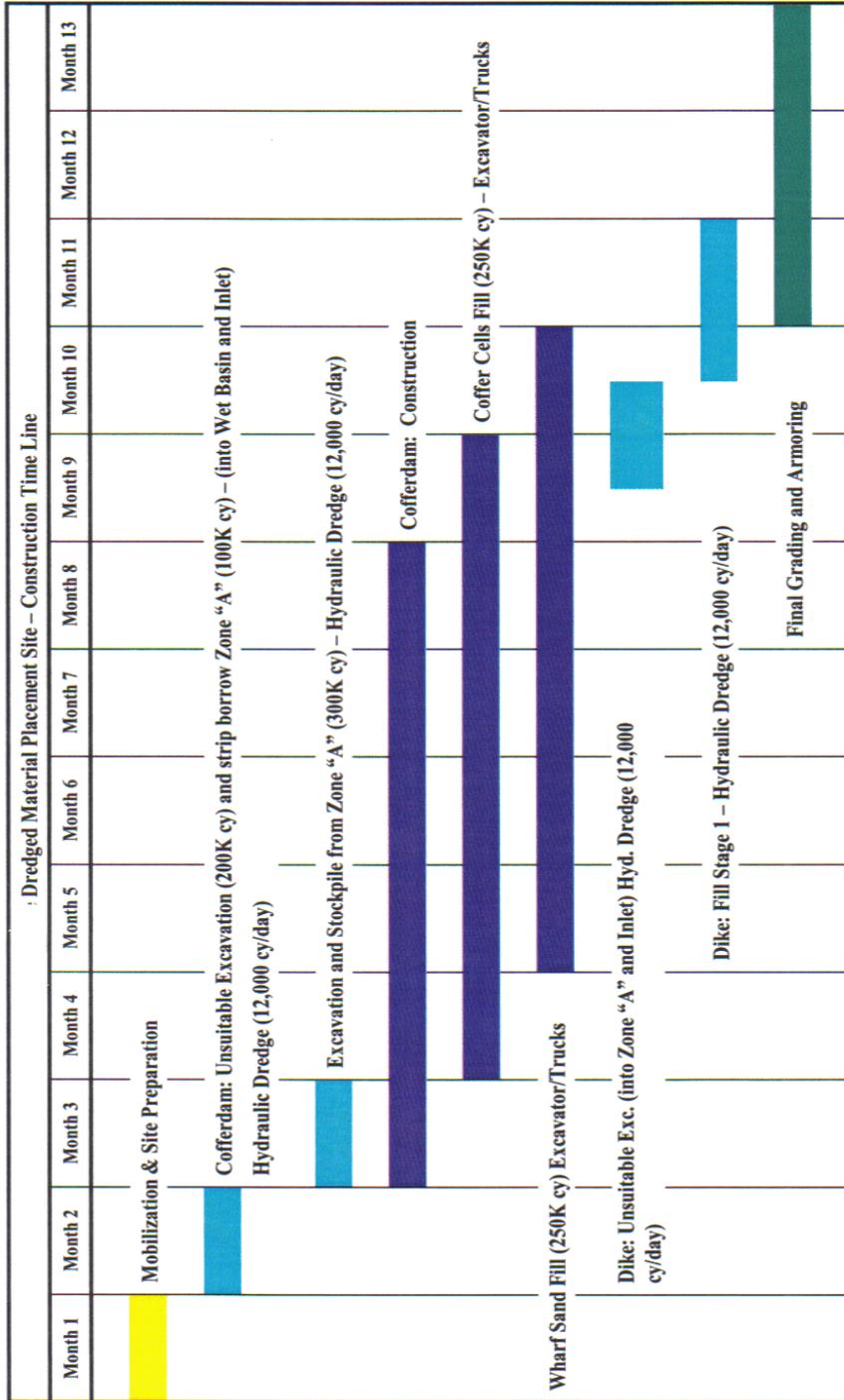


Figure 4-2 Construction Schedule: Initial Perimeter Dike - Elevation +10ft MLLW

4.4. Feasibility Study

After the project reconnaissance study was approved, the project moved to the project feasibility study phase. At this point in the life cycle of the project, a more meticulous technical investigation was conducted, and the cost and schedule developed at the reconnaissance level was updated. The initial construction cost estimation was updated based on the Work Breakdown Structure (WBS) of the activities shown in the reconnaissance study cost and schedule. The technical investigations include: the additional geotechnical investigations conducted to obtain a complete understanding of the subsurface characteristics of the project area; the availability of the equipment needed to perform the dredging project; the assessment of environmental impact conditions of the site; and federal and state environmental regulatory agency requirements.

Geotechnical Investigation

The subsurface geotechnical investigation of the project area was important in the assessment of the dredging project. Project cost, duration, and the type of equipment to be used depended greatly on the type of material encountered during the geotechnical investigations. The characteristics of the material identified during the soil investigations were typically the type of soil, grain size and distribution, moisture content, and specific gravity. Figure 20 depicts a typical log sheet used during the proposed DMCF geotechnical field investigations. Figure 18 shows a typical laboratory report form with the results of the investigations.

Figure 20. Typical Geotechnical Investigation Field Log Sheet (Courtesy of GBA Inc., 2005.)

					BORING LOG				
PROJECT Masonville Sediment Sampling					PROJECT NO. 05571-04		BORING NO. EB-01		
SITE			BEGUN 11/30/01	COMPLETED 11/30/05		HOLE SIZE		GROUND ELEVATION	
COORDINATES			DEPTH WATER ENC. 11.02'	AT END DRILL		AT 24 HRS		CAVED DEPTH	
DRILLER Johnny Sies			WEIGHT OF HAMMER 140 LBS	HEIGHT OF FALL 30"		TYPE OF CORE		DEPTH OF BORING 29.7	
TYPE OF DRILL RIG & METHOD D-50			DEPTH TO ROCK	LOGGED BY: C. Jacobs			PAGE NO. 1 OF 1		
DEPTH	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY	
0	0.0		Open Water						Water Depth @ 10:15=11.7' Water El: +0.7
5									
10									
	-11.7		Black, wet, Clayey SILT, trace fine to coarse Sand and fine to medium Gravel (Muck) (ML)	S-1	24"	1/3"WOR/24"	DS	10"	Strong Hydrocarbon odor S1,S2,S3 Sight Hydrocarbon odor S4,S5,S6
				S-2	24"	WOR/24"	DS	7"	
				S-3	24"	WOR/24"	DS	6"	
	-18.7		Greenish gray, very moist, Clayey SILT (MH)	S-4	24"	WOR/24"	DS	22"	
				S-5	24"	1/24"	DS	6"	
	-22.7		Orange brown, wet, fine to coarse SAND and GRAVEL, trace to little SILT (GM-SM)	S-6	24"	6-13-13-15	DS	0.5"	
	-24.7		Orange brown to tan, moist, Clayey SILT, trace fine SAND (ML)	S-7	24"	5-3-3-3	DS	14"	
	-27.7		Orange brown, wet, fine to coarse SAND and fine GRAVEL, trace Silt (SP-SM)	S-8	24"	1-2-3-7	DS	19"	
	-29.7		Bottom of Report @ 29.7'	S-9	24"	4-10-12-23	DS	12"	
30									
35									

Figure 21. Typical Geotechnical Laboratory Report (Courtesy of GBA Inc., 2005.)

REPORT OF LABORATORY TEST RESULTS

Boring No.	Sample No.	Depth	Wet Soil + Pan	Dry Soil + Pan	Water	Pan	Dry Soil	% Moist	LL	PI	
B - 101	1	38.5'	227.36	115.72	111.64	55.91	59.81	186.7	69	21	
	3	43.5'	185.91	101.16	84.75	48.43	52.73	160.7			
	4	46.0'	204.19	117.85	86.34	51.63	66.22	130.4	63	15	
	6	53.5'	293.55	257.39	36.16	51.04	206.35	17.5			
	7	58.5'	329.24	309.1	20.14	52.29	256.81	7.8			
	8	63.5'	193.45	172.11	21.34	51.17	120.94	17.6			
	11	78.5'	244.49	208.22	36.27	48.54	159.68	22.7			
	2	31.0'	199.39	129.26	70.13	52.41	76.85	91.3	51	17	
B - 102	5	38.5'	179.9	111.89	68.01	49.6	62.29	109.2	51	15	
	7	43.5'	174.85	113.67	61.18	49.67	64	95.6	57	22	
	9	48.5'	230.54	191.93	38.61	52.37	139.56	27.7			
	10	53.5'	267.63	224.05	43.58	51.6	172.45	25.3			
	11	58.5'	249.91	219.71	30.2	48.45	171.26	17.6			
	12	63.5'	331.99	303.5	28.49	49.47	254.03	11.2			
	15	78.5'	278.89	244.64	34.25	49.56	195.08	17.6			
	16	83.5'	199.96	179.85	20.11	48.83	131.02	15.3			
	B - 102 A	T-1	9' - 11'	453.93	357.73	96.2	51.96	305.77	31.5		
	B - 103	1	28.5'	221.97	139.08	82.89	52.36	86.72	95.6	53	21
4		43.5'	251.43	224.7	26.73	52.41	172.29	15.5			
6		53.5'	240.66	206.76	33.9	54.98	151.78	22.3			
7		58.5'	200.38	175.9	24.48	54.77	121.13	20.2			
12		83.5'	204.22	183.27	20.95	48.44	134.83	15.5			
B - 104		1	48.5'	192.64	108.29	84.35	52.39	55.9	150.9	60	24
PT - 1		30.0'	445.73	301.86	143.87	51.01	250.85	57.4			
	2	32.0'	166.27	102.53	63.74	51.55	50.98	125.0	66	20	
	3	38.5'	188.29	179.15	9.14	50.35	128.8	7.1			

During the feasibility study, the complete geotechnical investigations served to validate the information gathered during the reconnaissance study. During the reconnaissance study, the soil investigation borings were done following a sparse distribution pattern over the project area. At the feasibility level, the density of borings over the area was increased to define specific areas and target specific objectives.

Environmental Impact Study (EIS)

Any action on federal property requiring federal funding or a federal permit must comply with the National Environmental Pollution Act (NEPA.) Since a federal permit was required for the construction of the DMCF, the proposed construction needed to comply with the NEPA regulations as part of the regulatory process. The U.S. Army Corps of Engineers (USACE) required the Maryland Port Authority (MPA) to submit an Environmental Impact Study (EIS) with the environmental permit application. The USACE acts as a federal leading agency and as a liaison for reviews by other agencies. The EIS was performed by a specialized organization on behalf of MPA. The EIS and the permit application were submitted by the USACE to the Federal Environmental Protection Agency (EPA) for approval.

Project Cost and Schedule

The project schedule and the project cost analysis review were implemented simultaneously with the project plan review. At this stage of the life cycle, the project was organized into the second level of the project's activities structure, or

Work Breakdown Structure (WBS). At the feasibility level, the project WBS was defined in accordance with the information available at this level; the schedule developed during the reconnaissance study defined a first-level breakdown of the “initial” construction phase. The cost analysis performed in the reconnaissance study for the total cost of the proposed DMCF was refined during the feasibility study using three different dike elevations, referred to in Figures 22, 23, and 24 as Alternatives 1, 2, and 3. These alternatives correspond to the three elevations at which the initial dike could be built. Project work breakdown structure and project quantities are depicted in Figure 22. The initial construction cost and the total construction cost for the three alternatives are defined in Figures 23 and 24. The cost estimation accuracy will be determined by the level of detail of the WBS, by the historical information available from previous similar jobs, and by the level of experience of the team in analyzing costs of similar projects.

During the cost benefit analysis depicted in Figure 24, two important factors was analyzed - the initial cost of the project and the total “use-cost” (or operational life cost) of the project. In Figure 24, the site characteristic analysis was used to calculate the total cost of placing one cubic yard of material into the facility. The site characteristics analysis is depicted in Figure 25.

Figure 22. DMCF WBS and Quantities (Courtesy of GBA Inc., 2005.)

Masonville Terminal Expansion (Expanded Foot Print) Super.

Table B-2: Initial Construction Quantities (case 3)

	Alternative A +10 Dike			Alternative B +20 Dike			Alternative C +36 Dike		
	LF	CY/LF	CY	LF	CY/LF	CY	LF	CY/LF	CY
Cofferdam (Quantities & Costs by MIN)									
Cofferdam to +10 -			108,944			108,944			108,944
Unsuitable Excavation			175,894			175,894			175,894
Granular (Sand) Backfill of Cofferdam Cells -			140,741			140,741			140,741
Wharf Inboard Fill -			69,028			69,028			69,028
Unsuitable Backfill									
Unsuitable Excavation									
Cofferdam -	SF	Depth	CY	SF	Depth	CY	SF	Depth	CY
Below dike -	182,500	15.0	108,944	182,500	15.0	108,944	182,500	15.0	108,944
Above borrow area A -	2,693,313	14.0	1,386,633	3,402,808	14.0	1,764,262	4,498,436	14.0	2,316,968
Above borrow area B -	238,044	8.0	70,532	238,044	8.0	70,532	238,044	8.0	70,532
Total -	410,168	8.0	121,531	410,168	8.0	121,531	410,168	8.0	121,531
			1,068,000			2,063,000			2,816,000
Borrow Pit Excavation									
Sand from Borrow area A -	238,044	36	308,576	238,044	36	308,576	238,044	36	308,576
Sand from Borrow area B -	410,168	60	759,572	410,168	60	759,572	410,168	60	759,572
Total -			1,068,000			1,068,000			1,068,000
Hydraulic Fill Material									
Unsuitable Backfill -	LF	CY/LF	CY	LF	CY/LF	CY	LF	CY/LF	CY
Initial Perimeter Dike Section -	8,600	171.2	1,466,660	8,600	214.5	1,823,260	8,600	279.5	2,376,966
Cofferdam Backfill & Inboard Fill -	8,500	101.6	863,636	8,500	218.9	1,860,362	8,500	362.5	2,989,826
Shovelme dike to +10 -	2,700	8.0	318,000	2,700	8.0	318,000	2,700	8.0	318,000
10% Loose from Hydraulic Placement -			265,660			402,137			670,962
Total -			2,822,956			4,423,509			6,280,473
Perimeter Dike Stone Work									
250 LB. Slope Armor to elev. +7 -	LF	Tone/LF	Tone	LF	Tone/LF	Tone	LF	Tone/LF	Tone
	8,600	8.8	74,811	8,600	8.8	74,811	8,600	8.8	74,811
Dike Raising									
Dike Raising to +20 -	LF	CY/LF	CY	LF	CY/LF	CY	LF	CY/LF	CY
Dike Raising to +36 -	7,212	30.0	144,240	3,761	20.0	76,220	3,761	20.0	76,220
Dike Raising to +42 -	6,247	26.7	216,920	6,706	26.7	232,160	5,671	26.7	156,560
Total -	5,767	6.7	38,447	6,226	6.7	41,507	6,632	6.7	44,213
			462,807			348,987			276,963
Miscellaneous									
Road Stone -	LF	SY/LF	SY	LF	SY/LF	SY	LF	SY/LF	SY
	11,200	2.2	24,640	11,200	2.2	24,640	11,200	2.2	24,640
Armor Geotextile -	8,500	6.6	61,222	8,500	6.6	61,222	8,500	6.6	61,222
Roadway Geotextile -	11,200	2.6	28,120	11,200	2.6	28,120	11,200	2.6	28,120

Figure 23. Initial Construction Cost Estimation Alternatives (Courtesy of GBA Inc., 2005.)

Massonville Terminal Expansion (Expanded Foot Print) Super.

		Alternative A +10 Dibs			Alternative B +20 Dibs			Alternative C +38 Dibs			
		Unit	Unit Rate	Qty	Cost \$	Job	Qty	Cost \$	Job	Qty	Cost \$
Modernization/Rehabilitation		I.S.	\$3,000,000		\$3,000,000			\$3,000,000			\$3,000,000
	Clamshell Hydraulic Dredge										
Relocate 48" waterline		L.S.	\$2,250,000		\$2,250,000			\$2,250,000			\$2,250,000
Cofferdam Construction		LF	\$3,400	1,250	\$4,250,000		1,250	\$4,250,000		1,250	\$4,250,000
Unsuitable Excavation w/Hydraulic Dredge		C.Y.	\$4.50	1,696,000	\$7,632,000		2,003,000	\$9,263,500		2,616,300	\$11,772,000
Hydraulic Fill											
Clam Shell Dredge from Caspiti Channel - 13 Miles One Way Barge Transport - Dike Fill Hydraulically from Barge		C.Y.	\$2.25	1,854,586	\$4,172,819		3,355,530	\$7,549,696		5,212,473	\$11,726,065
		C.Y.	\$1.30	1,854,586	\$2,410,962		3,355,530	\$4,362,162		5,212,473	\$6,776,215
		C.Y.	\$6.30	1,854,586	\$11,127,517		3,355,530	\$20,133,058		5,212,473	\$31,274,840
Succopile Fill Hydraulically from Onsite - Dike Fill Hydraulically from Onsite - Mechanical Fill of Cofferdams -		C.Y.	\$5.50	175,684	\$966,319		175,684	\$966,319		175,684	\$966,319
		C.Y.	\$8.00	892,306	\$7,138,448		892,306	\$7,138,448		892,306	\$7,138,448
		C.Y.	\$3.00	175,684	\$527,053		175,684	\$527,053		175,684	\$527,053
Geotextile under armor & road stone		S.Y.	\$4.30	110,342	\$471,369		110,342	\$471,369		110,342	\$471,369
Stone Work											
	Slope Armor -	Ton	\$30.00	74,611	\$2,209,833		74,611	\$2,209,833		74,611	\$2,209,833
Road Stone		S.Y.	\$11.00	24,640	\$271,040		24,640	\$271,040		24,640	\$271,040
Spillways		Each	\$200,000	2	\$400,000		2	\$400,000		2	\$400,000
TOTAL CONSTRUCTION COSTS					\$45,712,775			\$61,694,883			\$81,820,598

Figure 24. Total project use cost analysis of the project or cost-benefit analysis (Courtesy of GBA Inc., 2005.)

Masonville Terminal Expansion (Expanded Foot Print) Super.

Table C-2: Total Site Use Cost Analysis (Case 3)

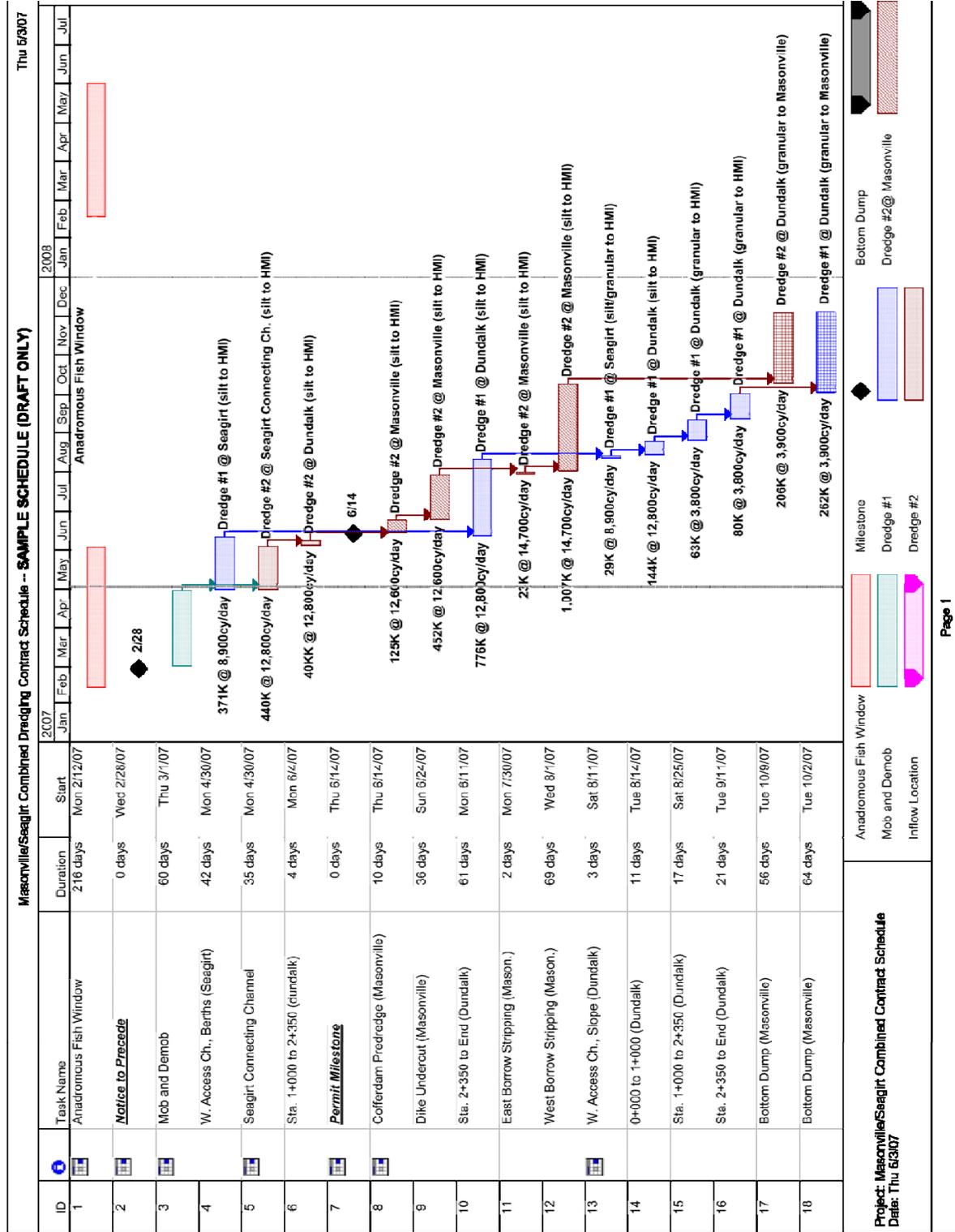
Item	Unit	Unit Rate	Alternative A +10 Dike		Alternative B +20 Dike		Alternative C +36 Dike	
			Quantity	Item Cost	Quantity	Item Cost	Quantity	Item Cost
A. Initial Construction Costs								
Initial Construction Costs								
Initial Construction Costs				\$2,92			\$3,08	\$4,38
B. Site Development Costs				\$28,281,940		\$17,288,500		\$19,684,500
Dredged Material Management	Year	\$122,500	34	\$4,165,000	29	\$3,552,500	33	\$4,042,500
Site Maintenance	Year	\$24,000	34	\$7,616,000	29	\$6,496,000	33	\$7,392,000
Site Monitoring and Reporting	Year	\$250,000	34	\$8,500,000	29	\$7,250,000	33	\$8,250,000
C. Dike Raising			402,607	\$3,623,400	348,887	\$3,138,980	275,983	\$2,483,940
D. Dredging, Transportation & Placement Costs				\$115,565,942		\$116,311,080		\$128,283,748
Moil and Demol	Year	\$750,000	34	\$25,500,000	29	\$21,750,000	33	\$24,750,000
Dredging	Mo	\$2.25	16.68	\$37,527,450	17.51	\$39,400,454	19.36	\$43,555,728
Transport	Mo	\$0.90	16.68	\$15,010,964	17.51	\$15,760,182	19.36	\$17,422,281
Placement	Mo	\$2.25	16.68	\$37,527,450	17.51	\$39,400,454	19.36	\$43,555,728
E. Masonville Cove Enhancement				\$1,000,000		\$1,000,000		\$1,000,000
SUBTOTAL COST A+B+C+D+E				\$188,183,137		\$202,447,663		\$237,372,786
Contingency		15.00%		\$28,377,471		\$30,367,149		\$35,605,918
TOTAL COST A+B+C+D+E				\$217,560,608		\$232,814,813		\$272,978,704
TOTAL UNIT COST				\$13.94		\$13.30		\$14.10
TOTAL UNIT COST (rounded)				\$13.09		\$13.00		\$14.00

Figure 25. Site Characteristics (Courtesy of GBA Inc., 2005.)

Masonville Terminal Expansion (Expanded Foot Print) Super
 Table B-1: Site Characteristics (Case 3)

	Alternative A +10 Dike	Alternative B +20 Dike	Alternative C +36 Dike
Site Dimensions			
Masonville Expanded Shoreline Area -	200.0 Acres	200.0 Acres	148.0 Acres
Pier 4-5 Expanded Shoreline Area -	5.3 Acres	5.3 Acres	5.3 Acres
Cofferdam Length -	1,250 LF	1,250 LF	1,250 LF
Containment Dike Baseline Length -	8,500 LF	8,500 LF	8,500 LF
Shoreline Dike Length -	2,700 LF	2,700 LF	2,700 LF
Average Water Depth -	13 FT	13 FT	13 FT
Dredged Material Storage Volume			
Volume above sea level -	7.75 MCY	8.60 MCY	10.20 MCY
Volume below sea level -	3.10 MCY	2.85 MCY	2.80 MCY
Volume in borrow pit -	1.26 MCY	1.26 MCY	1.26 MCY
Unsuitable Excavation (placed on site) -	(1.70) MCY	(2.06) MCY	(2.62) MCY
Pier 4-5 Volume Available -	0.16 MCY	0.16 MCY	0.16 MCY
Total Volume -	10.57 MCY	10.81 MCY	11.80 MCY
Dredged Material Storage Capacity			
V.O. Ratio above sea level -	0.65	0.65	0.65
V.O. Ratio below sea level -	0.75	0.75	0.75
Site Capacity below sea level -	5.81 MCY	6.61 MCY	5.41 MCY
Site Capacity above sea level -	11.92 MCY	13.23 MCY	15.69 MCY
Reduction from Unsuitable Excavation -	(1.27) MCY	(1.55) MCY	(1.96) MCY
Pier 4-5 Capacity Available -	0.21 MCY	0.21 MCY	0.21 MCY
Site Capacity to First Dike Raising -	7.81 MCY	10.30 MCY	13.63 MCY
Site Capacity from First Dike Raising to +42 -	8.77 MCY	7.22 MCY	5.63 MCY
Total Optimal Site Capacity -	16.68 MCY	17.51 MCY	19.36 MCY
Site Life			
Out Material Bunking Factor -	1.3	1.3	1.3
Annual Cut Volume before first dike raising -	0.50 MCY	0.60 MCY	0.60 MCY
Avg. Annual Lift Thick. to First Dike Rais. -	3.5 Feet	3.4 Feet	3.4 Feet
Site Life to First Dike Raising -	16 Years	17 Years	23 Years
Annual Cut Volume after first dike raising -	0.50 MCY	0.60 MCY	0.60 MCY
Average Annual Lift Thickness from 1st Dike to +42 -	4.3 Feet	3.9 Feet	3.2 Feet
Site Life from 1st Dike to +42 -	18 Years	12 Years	10 Years
Site Operating Life -	34 Years	28 Years	33 Years

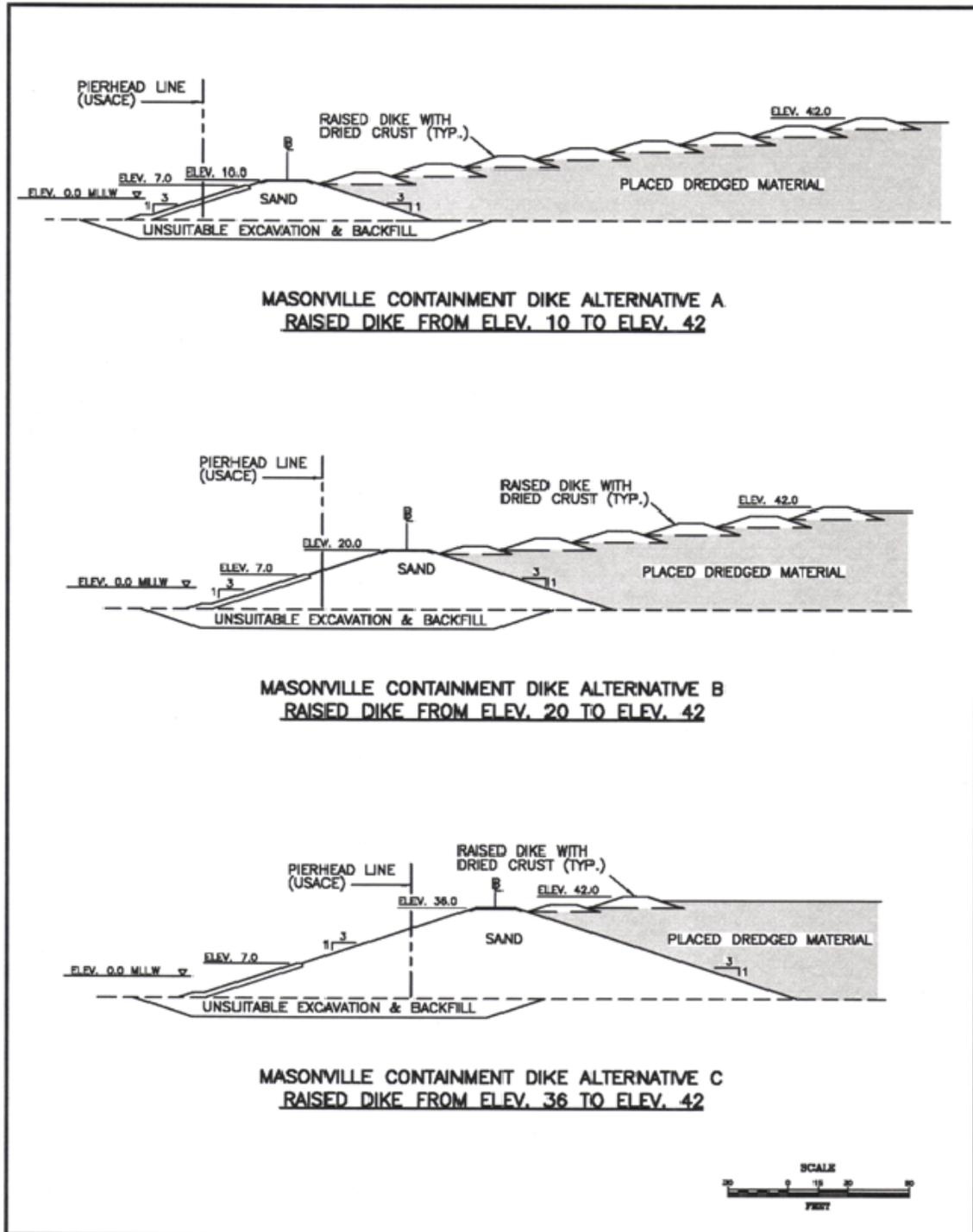
Figure 26. Proposed Feasibility Level DMCF Construction Schedule (Courtesy of GBA Inc., 2005.)



4.5. Specifications and Design

The selected alignment of the dike resulted from five preliminary alignments that were considered for the project based on information previously evaluated. The containment structure to be built consists of three containment components: an armored sand dike, a cofferdam, and a shoreline sand dike. A portion of the sand needed to build the dike will be recovered on site by means of dredging. Table 5 shows quantities of sand needed for dike construction and the amount that can be borrowed from the site. The additional material will be dredged and transported from the deepening and widening of the Seagirt and Dundalk Marine Terminals access channel. Figure 28 depicts the dike cross section of the armored sand dike.

Figure 28. Dike Cross section (Courtesy of GBA Inc., 2005.)



Dike Cross Sections

4.6. Dredging Operation During the Construction of the DMCF

By the time construction began, the final design of the project had been implemented and the procurement of the dredging contract was complete. During the planning stage for the construction, the project managers understood the need for a monitoring and controlling process; therefore, an inspection team for the dredging operation was formulated and assembled. However, there was a lack of effort by the project management team to implement an information system and communication plan for the dredging operation. Additionally, the inspection team lacked the necessary experience and specialized training to assist a dredging operation.

During the dredging operation, the raw data is logged by the equipment operator. It is then manually reviewed and processed by the contractor's project engineers and project manager and submitted as a contractor report to the owner's project manager. Finally, these reports are reviewed and processed by the owner's team and converted to a usable format in order to analyze the operation. The report formats used to gather the data during the operation are depicted in Appendix A, Figures A-1 to A-9.

The data gathered encompasses the effective operation time of the equipment, overall production of the operation, equipment performance for each activity, and the condition in which each activity is performed. This information, in conjunction with the planned schedule baseline, permits the implementation of the earned value analysis to track the project's progress.

During this case study, the data had been gathered on paper forms which are difficult to process and distribute. Manually transferring the data from paper forms to desktop applications for information processing and subsequently reporting the information are both time-consuming and inefficient. In this case, the contractor is responsive and is willing to share the information, but the system used to gather and process the information is inefficient and ineffective. In addition, the time required to manually assemble the gathered data into a report is onerous and greatly limits the amount of time available to analyze and interpret the information. The end-goal of the data collection is the analysis and interpretation of data for the purpose of assessing the project performance, and monitoring and controlling the operation. Obviously, it is counter-productive to spend exorbitant amounts of time to gather and manually handle information if there is no time left for analysis and interpretation.

The integration of various technologies - communication technologies, information technologies, database technologies, and project management techniques - can enhance dredging project management functions. The raw data in a dredging project can be retrieved electronically by means of a touch screen installed in the operator's room, and backed up with computers installed in the engineer's and superintendent's offices for monitoring and controlling. This information will be processed automatically and rendered to any user who has the corresponding permission to access the system. With a web-based application, users from any geographical location will be able to view in real time the information generated during the

dredging operation. Ultimately, with this increased technology, efficiency of communication and information management is optimized, improving the decision-making ability of both the contractor and the management team.

Chapter 5. Dredging Project Management

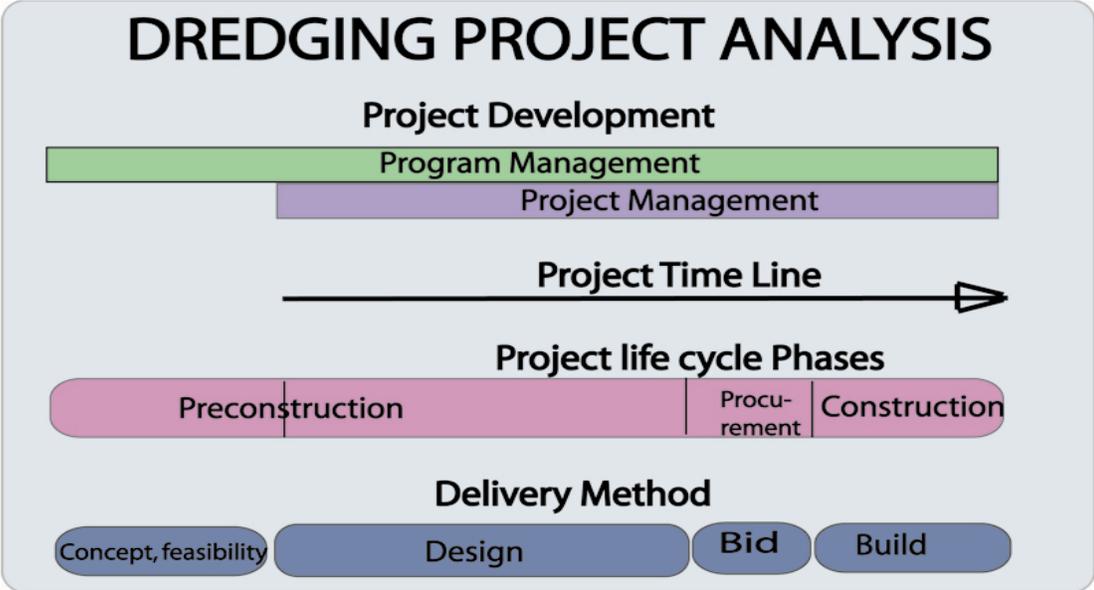
5.1 Introduction

The success of a dredging project depends on the efficiency with which project management strategies have been applied. Planning, executing, and controlling are the core functions of dredging project management, and these functions depend entirely on the project management techniques and tools used during the project life cycle. Identifying the business rules, processes, and constraints involved in a dredging project is necessary in order to improve and optimize project management strategies needed for a successful dredging project operation. This process can also enhance understanding of the technologies required to improve and assist the project management functions. Effective project management strategies and their application to problem-solving will determine the success of a project.

In order to analyze dredging project management functions and processes, we use the project life cycle to separate the project development into standard steps (see Figure 29). In Figure 29, the initiating processes were added to the project life cycle, which are part of the preconstruction phase. These processes have an important role in the implementation of the project. The project initiating process includes the concept and feasibility studies. As part of the initiating processes, the concept study gathers the information needed to support the selected project and the requirements or expectations for the project. The studies and investigations implemented in these initiating processes are directed to assess the basic characteristics of the requirements

in order to validate their initial viability. Subsequently, the feasibility study takes an in-depth look at the project characteristics and makes a final assessment of the project feasibility. These investigations complement the studies done at the conceptual level and take the project to the final definition of its viability, enabling the decision-makers to either assign the corresponding resources to initiate the project or to abandon it.

Figure 29. Dredging project life cycle.



During the design phase, project managers convert the description of the requirements into project specifications. All aspects of the system should be designed to provide the physical specifics of the project components. The deliverables of this phase will be a complete description of the project, the project specifications, and project

drawings. Finally, the construction phase encompasses the dredging operation. In this phase, the design materializes, and the project is physically implemented.

5.2. Overview of Dredging Project Management

The objective of this overview is to focus our attention on the analysis of the processes implemented during the management of a current dredging project, and then apply techniques and tools to optimize the processes. It is important to note that each one of these phases delivers very important information to the subsequent phase. The concept study phase delivers vital information in the form of defined requirements to the feasibility study phase. Similarly, the feasibility phase delivers information in the form of requirements specifications to the design phase. Finally, the design phase conveys information in the form of specifications and drawings to the dredging phase. This streamlined process maintains project consistency during its life cycle.

Pre-Construction

A project that needs federal government approval and financing is required to conduct a concept study to determine whether the project can solve local and regional water resource problems. Based on the concept study reports, the federal government and the non-federal sponsor jointly decide whether a full feasibility study is warranted, (USACE).

Conceptual Study – During the conceptual study the project requirements are identified and the following project characteristics are investigated: project environmental impact, soil investigations, weather, equipment availability, conceptual cost assessment, value engineering, and initial schedule assessment. In addition, as part of the concept study deliverables, there will be a list of recommended tasks to be implemented during the next phase in the event the project should continue to the next phase. This information is vital for an initial assessment of the viability of the project. When the concept study is completed, a higher level decision-making team will decide if the project should continue to the next phase or not. If a go-ahead decision is granted, the project will continue to the next phase – the feasibility phase. The following studies are required by the federal government, and should be included in the feasibility report (USACE, 2003):

- Definition of the problems and opportunities related to water resources; identification and potential solutions.
- Estimation of the benefits and cost of the solutions to determine prospects for a feasible project; appraisal of the federal interest in potential solutions.
- Determination as to whether or not further studies are appropriate.
- Estimation of the feasibility phase cost.
- Corps and non-federal sponsors must agree to share equally in the cost of the feasibility study.

Feasibility Study – During this phase the project characteristics and the recommended tasks defined in the concept study will be reviewed and implemented, and any

additional investigations needed to assess the project feasibility will be undertaken. In this phase, it is very important to continue the value engineering assessment; this process will validate the feasibility of the project requirements and its construction methods. At the end of the feasibility study, the project initiation process will be completed and a decision will be made in regard to the project feasibility and its continuation to the design phase. The following studies are required by the federal government, and should be included in the feasibility report, (USACE):

- Further planning and evaluation of alternative solutions to water resource problems.
- Detailed estimation of the benefits and costs of the alternatives to determine what plans merit federal participation.
- Preparation of a feasibility report recommending solutions to water resource problems, and subsequent Congressional authorization.
- Preparation of a letter of intent to financially participate in recommended plan implementation, as demonstrated by mutual concurrence in a draft Local Cooperative Agreement (LCA) for implementation of the project. Letter of intent to be prepared by the State or local entity.

Design – After the project has been approved, it will move into the design phase. During this phase, the project design will be implemented and the requirements will be turned into the physical components of the dredging project. The following are examples of physical components of dredging projects: navigational channels and

infrastructures, port and marine structures, land filling, coastal infrastructure, and environmental remediation design and specifications.

Dredging – The dredging operation corresponds to the construction phase in the life cycle of the project. During this phase, the project's physical implementation is executed in accordance with the project contract and specifications. As soon as this phase begins, all project management plans and strategies will need to be in place. These plans define the activities and controls that will take place during implementation. The dredging management plan will encompass the dredging operation plan, the information plan, and the inspection plan.

5.2 Dredging Project Management Problems

In dredging projects, the owner team and the contractor both encounter significant problems during pre-construction and construction related to deficiencies in the management of the dredging project. The lack of teamwork between the contractor and the owner, and the lack of a system that addresses the dredging contractor's and owner's information needs, are the primary reasons for dredging project failure. In addition, the differences in owner and contractor responsibilities and objectives naturally create a lack of collaboration during a dredging project's life cycle, thereby exacerbating the lack of teamwork. However, the application of project management techniques, information and communication technologies can address these problematic issues.

Dredging project management issues related to owner and contractor performance and the lack of team-work and collaboration between owners and contractors during the dredging operation can be addressed by applying successful project management techniques. For example, pre-qualifying potential contractors in the early stages of the project pre-construction phase and developing a comprehensive information and communication management plan are techniques that will improve the performance of dredging projects comprehensively. These project management techniques are key factors in sharing early project information with potential contractors, and for distributing information generated by the project to owners and the contractors during the life cycle of a project. Consequently, successful dredging projects depend entirely on the project management techniques applied and the technologies used as tools.

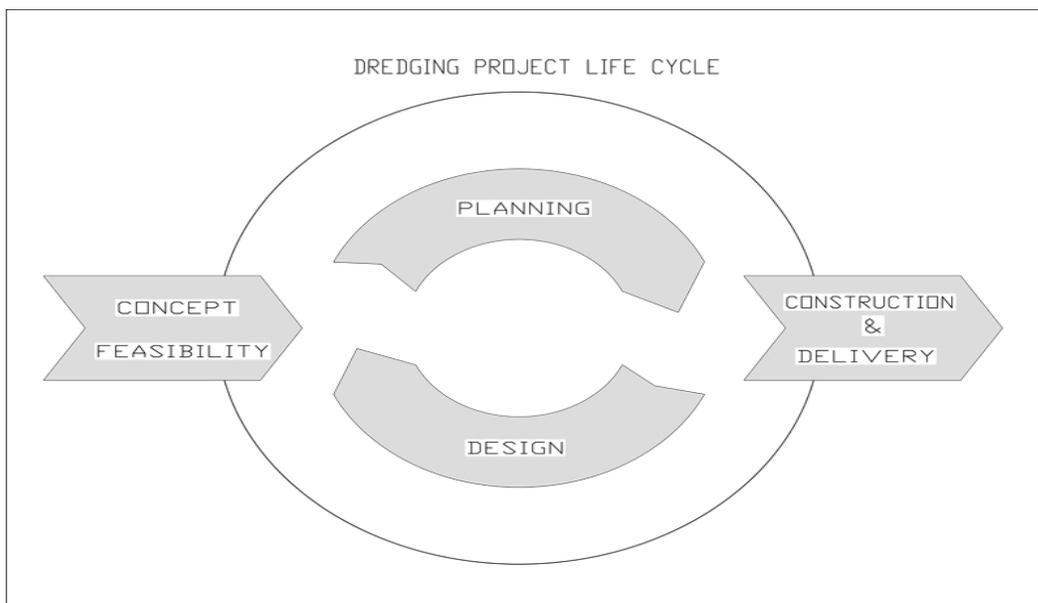
Problems related to the management of dredging projects can be defined and analyzed by looking at the management functions, processes, and constraints during each of the major phases described above. First, most dredging projects are currently delivered under the *design-bid-build* system. Under this delivery system, the life cycle of a dredging project is divided into three major phases described in Figure 31: pre-construction, procurement, and construction. Problems inherent with the design-bid-build delivery system undermine dredging project performance due to the lack of information-sharing between owner and contractor during the initial phases of a dredging project life cycle. During these phases, the contractor or potential contractors are isolated from the project investigations, studies, and value engineering

processes. This condition places a high level of constraints on the contractor's ability to define contract conditions and prevents the project from capitalizing on the contractor's knowledge. Finally, during the construction phase, the flow of information to owners and contractors is inhibited and, as a result, information is unevenly distributed. Resolving the problems encountered during the management of dredging projects requires that the flow of information between the parties throughout the life of the project be greatly enhanced.

Figure 30 depicts the relationship between the project management processes and the dredging project life cycle phases. This figure demonstrates how the information flows from the concept and feasibility phases to the design phase and finally to the construction and project delivery. Figure 31 depicts the players involved in the life cycle of a medium-sized dredging project. As shown, during the pre-construction phase, only the designers and the project management team are involved in the project. Typically, the contractor is involved only during the procurement and construction phases. Under this project delivery system, the information is delivered to the contractor during the procurement phase, and the contractor is forced to define his prices based on a limited time period in which to ascertain the project conditions. This lack of information flow to the contractor introduces a risk that the contractor must assess and incorporate into his contract price. Dredging contracts are delivered using the unit price payment system, and the risk will be included in the unit price with no opportunity for the owner to be reimbursed in the event that risk does not occur. However, if the potential contractors are receiving comprehensive information

and are involved in the information plan for the project in its early stages, the real project conditions are more likely to be accurately assessed by both the owner and the contractor, and any risks can be properly allocated. If no actual risk is present, the owner can recover the cost.

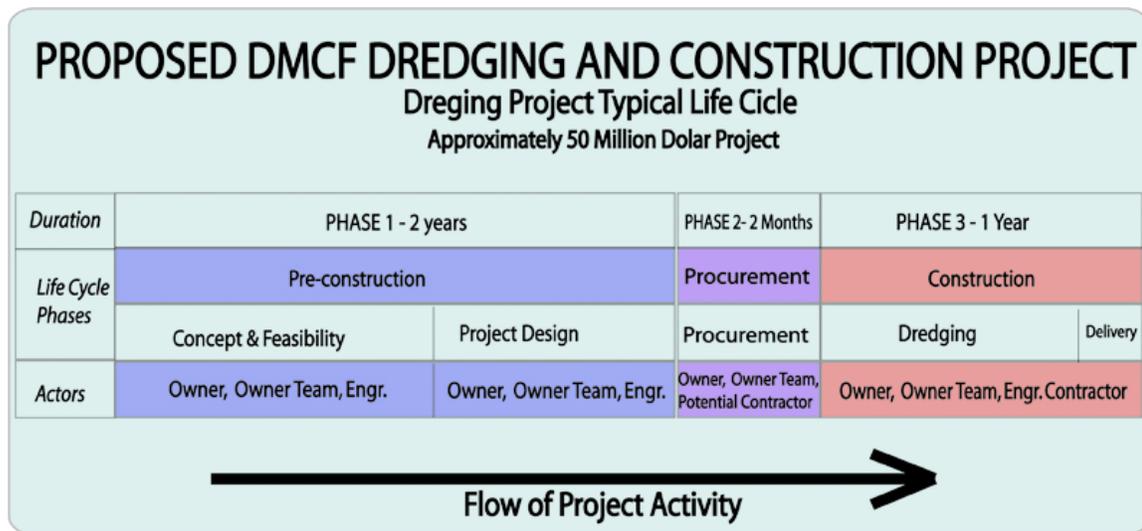
Figure 30. Dredging Project Life Cycle Processes



Similarly, the flow of project information to the owner during the construction phase is generally limited and as such, is inconsistent with a proper project management control system. As mentioned in Section 3.5 “Project Management,” the tendency in the U.S. is to assign the responsibility for the information management to the contractor, and work inspection is generally kept to a minimum. This tendency often has the effect of releasing the project manager (PM) from liability for changes in the scope of the project, and therefore, all the risk is allocated to the contractor.

However, this lack of information-gathering by the owner during the project will ultimately be counterproductive. While the owner may assume he is released from liability by having this “hands-off” approach, when the contractor later brings a claim, the owner will not have proper information to refute the claim.

Figure 31. Dredging Project Life Cycle and Actors



In a traditional project setting during the pre-construction phase, the contractor is not present in the project investigations and, therefore, he does not have thorough access to appropriate and timely information. Often, the owner’s team fails to provide full disclosure of all project information gathered during the pre-construction phase in the specifications or in the contract documents which are provided to the contractor. Due to the limited time which the contractor has to evaluate available information and present his bid, often the contractor is unable to discover the undisclosed information and subsequently, he may fail to present a favorable bid. Often, the PM’s intention is

to avoid releasing or providing information that could be interpreted differently by the contractor. Frequently, the thinking behind this intention is, “If we state this information in the contract documents, the contractor could use it against us later. We will submit the geotechnical information, and it is the contractor’s responsibility to obtain any further information he needs in order to formulate his bid.”

For example, a dredging project is to be undertaken, and the bid is designed so that the bid items will be priced not by type of material, but by areas to be dredged. However, the areas are defined by type of material (though this is not stated in the contract). One of the areas, “Area B,” is subdivided into two distinct volumes (B1, and B2), vertically aligned, which are also considered as distinct bid-items. The top volume (B1) is specified to be placed at a site used for the disposal of unsuitable material, and the bottom volume (B2) is defined as material suitable for construction which will be transported to a construction site. A natural assumption by the contractor might be that the top volume that is going to be disposed of will most likely consist of unsuitable material and is expected to be soft material that is easy to dredge. The contractor would likely also assume that the bottom material which is suitable for construction will be granular and will likely be difficult to dredge. During the bid, the contractor will assign a price to each corresponding bid item based on the information provided to him.

Continuing with this example, during the dredging of the top volume B1, the contractor discovers that approximately 60 percent of the material is granular and

difficult to dredge, although he assumed that the material was soft during the bidding process. In addition, the volume of granular material in B1 is approximately 500,000 cubic yards, and therefore, this discovery will be costly and financially detrimental to the contractor. Consequently, the contractor will likely notify the owner of a change in the contract conditions and will argue that he did not have time to fully investigate the contract documents, or that in his interpretation of the geotechnical documents provided, he could not have foreseen the actual subsurface conditions. In addition, he will argue that this information was expressly withheld by the owner in the contract documents. Often, this conflict will result in a legal dispute.

If all information had been shared between the owner team and the potential contractors during the geotechnical investigation, the bid participants would have had the correct information in order to assess the proper cost, thereby avoiding any future disputes. The contract documents and the geotechnical information are typically provided to the contractor about two months prior to the bid due date. However, to understand and master the project information, as in the case discussed above, it took the project team two years of studies and investigations. Obviously, the disparity of access to information between project owner and the contractor, which is inherent in the current industry environment, frequently becomes problematic. Exposing project information to potential bidders during the pre-construction phase will enhance the contractor's understanding of the project, thereby improving the project bid prices and the quality of the construction process.

Construction

Similar to the difficulties present during pre-construction, during the construction operation of the project, the owner struggles to gather the information needed to assess the project's future performance. The information he is able to gather is recorded in a burdensome format that is difficult to interpret and, therefore, is not conducive to an effective assessment of the operation. The owner must be able to retrieve comprehensive and accurate information from the contract operation in order to properly assess and track project performance; this information will also be useful for future project planning. In order to validate the accuracy of the project information supplied by the contractor, the owner will assemble a team of qualified inspectors during construction. Currently, it is not usual to have an inspection team scrutinize detailed information submitted by the contractor during the operation. Therefore, the owner frequently is at the contractor's mercy when it comes to subsequent contractor claims. For example, on a hydraulic dredge, the contractor daily report regularly submitted to the owner frequently does not include information regarding the pump system's "revolutions per minute" (RPM) or information regarding pump "operating pressure." This information is important for the owner's team to be able to assess equipment performance at any given point in time during the operation. In this example, without this information, the owner is at a disadvantage when faced with a contractor claim that a process required more time than originally proposed, resulting in financial claim against the owner.

The lack of project information flowing to the owner's team is problematic. In one recent dredging project, the contractor was directed to use a mechanical dredge and hopper barges to be discharged at a DMCF. In the contractor daily report, the information regarding the unloading time and material unloaded to the DMCF was calculated for total daily production, not by distinct load. At the end of the project, the contractor claimed for "changes in contract conditions" due to differences in the material dredged. The contractor presented a detailed claim document with arguments supporting how the material affected his performance. The owner could not assess the claim facts correctly due to the lack of quality of information gathered during the operation. The owner was unable to define whether the delays actually occurred as a result of the type of material dredged, or if the delays were due to poor equipment performance, because he did not have regular, detailed information from the operation. Without a steady stream of specific and well-monitored information, the owner cannot successfully assess later contractor claims.

Summary

Teamwork and collaboration between owner and contractor are essential factors in the success of dredging projects. From the concept to the conclusion of a dredging project, communication and teamwork between owner and potential contractors during pre-construction, and between owner and the awarded contractor during operation, are vital. This thesis research proposes the web-based project management application (WPMA) as a tool that integrates communication and information

technologies with project management techniques to enhance collaboration between owner and contractors during the life cycle of a dredging project.

During the pre-construction phase, which includes activities ranging from the concept to the procurement phase, the WPMA will host the project information gathered during the studies and investigations. Stakeholders and potential contractors will have access to this information in the system in accordance with predetermined roles and permissions. Similarly, during the construction phase, which includes the dredging operation, the WPMA is the tool used to gather and automatically process the initial project data and the data generated during operation. The initial project data is the project general information, contract information, and contractor equipment information. This initial data includes contractor proposed schedule, contractor prices, and contractor performance, which is used as a baseline for project monitoring and controlling. The information gathered during the dredging operation is the result of assembling the raw data collected from the different dredging activities in a usable format. This information will define the project activity performance and it is compared with the proposed baseline for project monitoring and controlling. The WPMA will perform all the communication and information processes needed to bring the owner and the contractor into a collaborative environment.

5.3 Scope of Project Management Problems

Problems in dredging projects can be far-reaching, affecting both the delivery of project requirements and the satisfaction of stakeholders and contractors. These

problems primarily arise due to the lack of communication and information-sharing. For example, a dredging project is created to deepen an existing channel to access a marine port facility. The overall objective of developing this project is to enhance the port facility accessibility. A successful dredging project will deliver the right channel that will satisfy the intended vessel traffic. If the requirements are not satisfied, the project will fail, and social and economical consequences could result. Similarly, the achievement of stakeholder and contractor satisfaction is a responsibility of the dredging project management team, and it is an important factor in successful projects. Satisfaction of stakeholders facilitates and enhances the allocation of resources, the decision-making process, and the transitions through the project's various phases. Likewise, contractor satisfaction facilitates project development and a successful project delivery. If the contractor is happy, he is more likely to be diligent about meeting project requirements. Therefore, enhancing communication and improving information-sharing between project participants facilitates the achievement of project requirements and increases stakeholder satisfaction.

Where people are involved, the human aspects of teamwork cannot be ignored. A spirit of collaboration and transparency between project participants are essential components of accomplishing project goals. Without thorough communication and information-sharing, it is very difficult to create a collaborative environment, and transparency will not be present; therefore, the delivery of project requirements and satisfaction of the parties will be compromised. Collaboration in project management can be defined as an act of working together to achieve the same goal. Transparency

in project management is the act of sharing truthful and clear information between project participants. Collaboration and transparency can be achieved by opening communication channels to make timely project information available to all parties, and between project participants.

Chapter 6. Problem Resolution Techniques in Dredging Project Management

6.1 Tools for Resolution

Established principles of project management, information management, and communication infrastructure are tools that can be used in the resolution of problems that arise during dredging projects. Project management strategies will procure the correct environment and resources during the life cycle of the project. Information management will assist in enhancing the flow and quality of project information to project participants, and between them. Similarly, the communication infrastructure will offer the technology needed to distribute the information. The implementation of these tools will help create the collaboration and transparency needed to achieve project goals and project party satisfaction.

6.2 Project Management Strategies

Project management strategies will help create an optimal environment so that the dredging work can be performed efficiently, and it will assign the correct resources to optimize project performance. During dredging projects, the owner, the project management team, and the designers are present during the entire life cycle of the project. However, the contractor is typically involved only during the procurement and construction phases. The contractor's limited participation in the flow of information during the pre-construction phase generates difficulties during project construction and the delivery of the project. A win-win strategy would be to involve

potential contractors in the project from the very beginning of the project development.

6.3 Information Management

The information generated by the project during the pre-construction phase will need to be organized and made accessible in a way that informs both project stakeholders and pre-qualified contractors. Similarly, during the construction phase, the information generated by the project should be accessible to the owner and his team in order to assess the project's performance, and to assist them in their decision-making process. A good information management plan will improve overall project performance, and will greatly increase the likelihood of a successful venture.

6.4 Communication Infrastructure

The communication infrastructure is the vehicle for the project information flow, and the effectiveness of information management is largely determined by the type of communication infrastructure used. A web-based infrastructure offers users accessibility to the information without having to use special software on the client's computer. The use of a web-based infrastructure will accomplish our goal of efficient and effective information distribution within the fragmented dredging project environment.

SECTION II –WPMA DEVELOPMENT

Chapter 7. Solution of the Problem

7.1. Project Management Strategy

Pre-Construction Phase

As stated earlier, currently in the dredging industry, potential contractors are not involved in the pre-construction phase at all. However, as a part of an effective project management strategy, the owner should advertise the project concept to potential contractors and begin the contractor pre-qualification phase during pre-construction. At this stage, all the interested parties are present, and the bulk of initial project information is gathered.

The lack of the contractor's involvement in the pre-construction phase is an inherent flaw in the design-bid-build method, which is the standard delivery method used in the industry today. This, in turn, introduces more risk into the contractor's proposal, opens the door for later claims, reduces the opportunity for value engineering, and works against the development of a collaborative spirit between all the players in the project. However, by offering to interested contractors the opportunity to explore a new contract prospect, and to develop their interest in the project as they are provided with significant information, the owner will overcome difficulties and limitations

often associated with the design-bid-build delivery method. As the project concept phase evolves to the feasibility and design phase, all project information will continue to be made available to qualified contractors in a collaborative environment using communication tools.

In order to develop the project concept, the owner should hire a program manager. The program manager will be in charge of the development of the project concept study and if approved, will initiate the feasibility study. In addition, the program manager will be in charge of staffing his team, which should include the design team. At this point, the design team will begin to develop the soil investigations needed to evaluate the geotechnical conditions of the area to be dredged, and will initiate pre-design work. The project management team will begin implementing environmental assessment, pre-design work assessment, initial cost and schedule, value engineering, pre-qualification of potential contractors, and definition of the project requirements.

With the approval of the concept study, the project will move to the next activity of the preconstruction phase - the feasibility study - and the concept study should be published, with the information made available to stakeholders and pre-qualified contractors for further value engineering assessment. During the feasibility study, the environmental impact study should be implemented and submitted to the appropriate regulatory agency. Similarly, further implementation of the pre-design work assessment, implementation of new project cost estimation and project schedule, and the analysis of the project requirements must be performed. In addition, a risk

analysis and cost benefit analysis of the project will be developed. During this stage, the participation of stakeholders and pre-qualified contractors in the decision-making and value engineering is critical for the success of the project. With the culmination and approval of the feasibility study, the project will move to a new activity in the project life cycle – design development.

The design will define the project specifications and drawings, and the final engineer's project cost and schedule. During the design, the project begins a cyclical process of analysis, synthesis, design implementation, and value engineering of the project requirements until refinement of the design is completed. In addition, the contract documents will be implemented during this phase, and the information generated will be available in real time to stakeholders and pre-qualified contractors. With the culmination of the design, the project will be ready to move on to the procurement phase, and subsequently, to the construction phase.

Construction Phase – The Dredging Operation and Project Delivery

During the construction phase, the owner and contractor are both heavily involved in the daily activities of the dredging operation, each having their own specific responsibilities, with the mutual goal of a successful project delivery. The owner's responsibility is to oversee the entire project and to assure that there is continued compliance with project requirements. The owner will apply project management strategies, information technology, and a communication infrastructure as tools to thoroughly and successfully manage the dredging operation, as well as to address any

project management problems that may arise. Similarly, the contractor applies the same basic tools and standard project management strategies to carry out his operation. While the owner and contractor are working independently to accomplish their individual objectives, it is essential that an integration of information take place, as well as optimal communication as part of a collaborative effort. The Web-based Project Management Application (WPMA) is presented as the key to the integration of the project management philosophy with both information and communication technologies. This application is the solution to both the owner's and contractor's project management needs, leading to a successful dredging project where the objectives of both the owner and contractor can be realized.

From the owner's point of view, it is important to implement "quality inspection" during the construction phase as part of the overall project management strategy. From a project management perspective, it is important that the owner understand that having a team of dredging experts to assist in the inspection during the dredging operation will help avoid potential problems during dredging and during project delivery. The inspection team will gather the appropriate data during the dredging operation that will empower the owner to assess any potential conflict and will allow him to execute timely decisions.

The inspection team will be hired, and the hydrographic survey service will be contracted to perform the before-dredging survey, at which point they will carry out any necessary periodic surveys. Involving the inspection team early on in the

dredging phase will allow ample time to train the inspectors. In addition, some of the requirements in the inspection plan will be implemented into the project specifications, such as the information to be submitted by the contractor to the owner during the procurement phase and during the dredging operation. During the dredging phase, the inspection team will gather the necessary data, process it, and distribute the information generated. Bringing the inspection team to the project in a timely manner will allow them to properly plan project assessment during construction.

During project delivery, the project manager, with the help of the inspection team, will assess whether the requirements have been met according to the project specifications, will support the owner should any claim arise, and will implement the project's as-built drawings. The determination that the project requirements have been met will be made through hydrographic surveys. Should any claim arise, the owner will have all the information necessary to evaluate the claim.

7.2. Information Management

As discussed in the Project Management Strategy section above, information management is an essential tool for facilitating project management and avoiding problems that can arise during a dredging operation. Information management includes the gathering, processing, and distribution of information generated by the daily activities of the project in order to facilitate the effective and efficient operation of the project. Timely information is crucial in implementing successful dredging

project management processes. During the pre-construction phase, pertinent project information should be readily available to stakeholders and potential contractors. This information includes concept and feasibility studies and the design development. Similarly, during the construction phase, all data gathered during the dredging operation should be available to the owner and contractor in real time. A comprehensive information management plan is the core dynamic for defining and implementing the quality, quantity, structure, and flow of all information to be shared during a successful dredging operation.

Information Structure and Flow - Pre-construction Phase

During the pre-construction phase, the information generated by the concept and feasibility studies and information gathered during the design phase should be available to stakeholders and pre-qualified contractors. The information contained in the concept study depicts the data gathered during the investigations originally performed to evaluate the viability of the concept. The information contained in the feasibility study is composed of the data gathered during the concept study as well as additional data gathered during the completion of the feasibility study. The information generated by the design phase includes all drawings, specifications, and the design report. There is no need to format this information differently from its original format, and its publication does not require automation. It will be presented to its intended audience using the WPMA. These reports and documents will be uploaded to the website and published as they are developed.

Information Structure and Flow - Dredging Phase

In this phase, the information management is more dynamic and interactive. Data needs to be automated for daily submission, processing, and distribution. During the construction phase, the information gathered by the contractor should be gathered, formatted, and submitted in accordance with the requirements in the specifications. As part of the information plan, and in order to further the collaborative atmosphere of the project, the project management team will meet with the contractor to design and customize the format for the data to be submitted by the contractor, ensuring that the needs of both the owner and contractor are met. The format requirements will be enumerated in the specifications. Under this information plan, the owner will obtain the necessary information to assess the contractor performance, and the contractor will acquire information necessary to efficiently and effectively carry out his operation. The WPMA will be standardized for a typical dredging operation, although it can easily be customized to a particular operation for optimal information-sharing. The distribution of the information will be accomplished by applying the appropriate level of authorization to the users of the WPMA. The WPMA makes possible the systematic, automated, consistent, and real-time collection and distribution of the information submitted by the contractor.

The basic data to be submitted by the contractor includes the contractor's initial information and subsequently, the daily reports of the data generated during the actual

operation. The contractor's initial information is comprised of personnel addresses and contact information; contractor equipment information, which includes dredges, unloaders, tugs, barges, and additional equipment used for support such as booster pumps, and earth-moving equipment; and the operation plan baseline in the form of a schedule. The project daily reports are comprised of the data generated on a daily basis by the operation, including equipment performance figures, dredged material characteristics, weather information, and a host of additional daily activities.

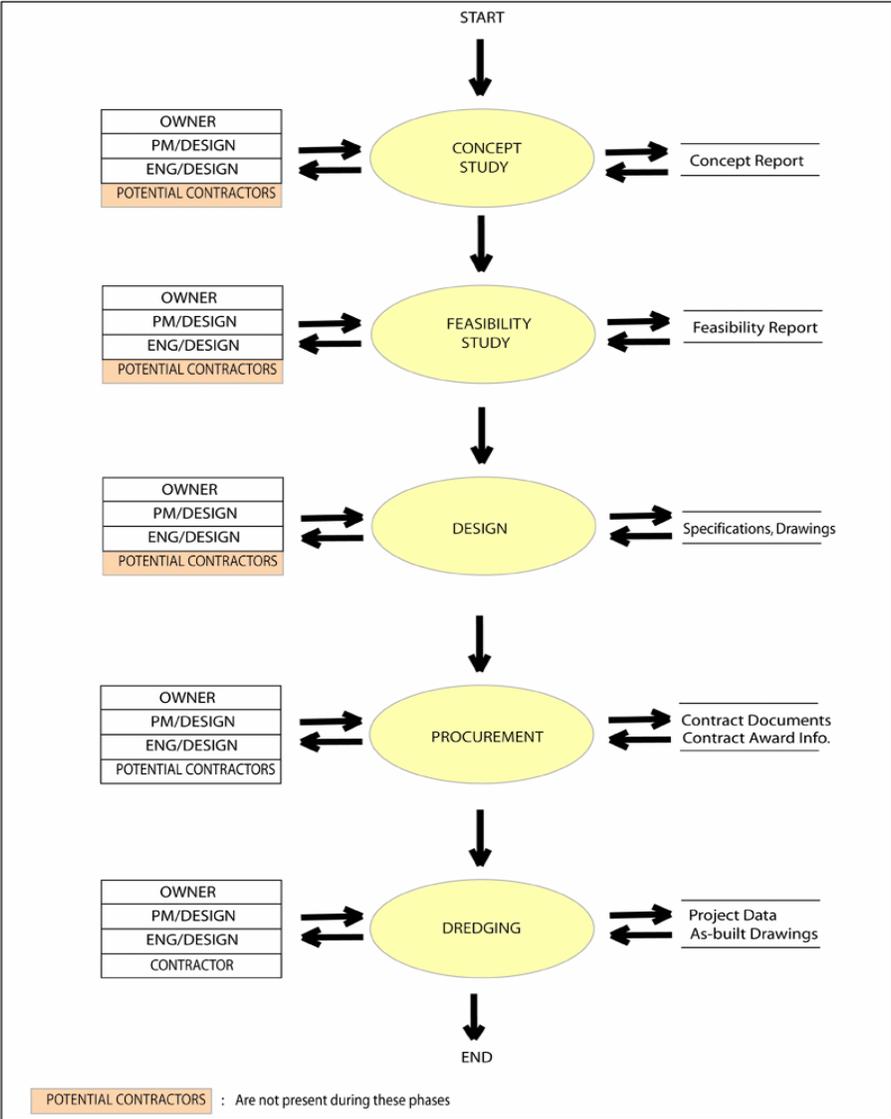
According to the WPMA set-up, the initial information and daily reports will be submitted by the contractor using forms on the web-site. Figures A-1 to A-10 in Appendix "A" are Excel-formatted models depicting the data that will be submitted by the contractor. In conclusion, the information management plan includes gathering the data submitted by the contractor, processing and reporting this information to the appropriate users, and displaying the information in the optimal format.

7.3. Communication Management

The WPMA is the communication management structure that will integrate stakeholders and will assist PM teams in gathering data and distributing information throughout the entire life cycle of the project. Figure 32 depicts the potential contractor accessing project information from the beginning of the life of the project. This enables pre-qualified contractors to acquire project information and to access

technical data from the earliest stages of the project, creates a collaborative environment, and empowers the owner with the information needed to assess the project during the construction phase. Early participation of potential contractors adds a new layer of value engineering to the project, which helps reduce risks, enhances quality, and maintains costs within reasonable limits.

Figure 32. Proposed Dredging Project Information Flow



7.4 A Web-based Project Management Application

The WPMA is the system developed based on this thesis research to improve the management of dredging projects. The WPMA will become the tool to implement the project management functions, and the information hub that connects the project's team together in a collaborative environment (see Figure 33). The WPMA is the paradigm in which owners, project managers, and contractors, interact to plan, execute, and control, the project. These functions have become the platform used to develop the application prototype.

The WPMA system will run on the Internet, and it is designed to host all the functions necessary for the management of dredging projects. Project planning, project control, information management, document management, communication management, project cost and budgeting, and scheduling are the functions that will be implemented by the WPMA. The WPMA prototype that will be presented with this thesis research will only feature four functions: project management, reporting, project control, and document management function. Each one of these functions features input and output functionalities for the gathering and reporting of information. The WPMA is an application supported by a server to manage the application interface; a database to store, manage, and automate information processes; and a reporting service application to implement and automate the reporting functionalities (see Figure 34).

Figure 33. Web-based Project Management Application System Information Flow

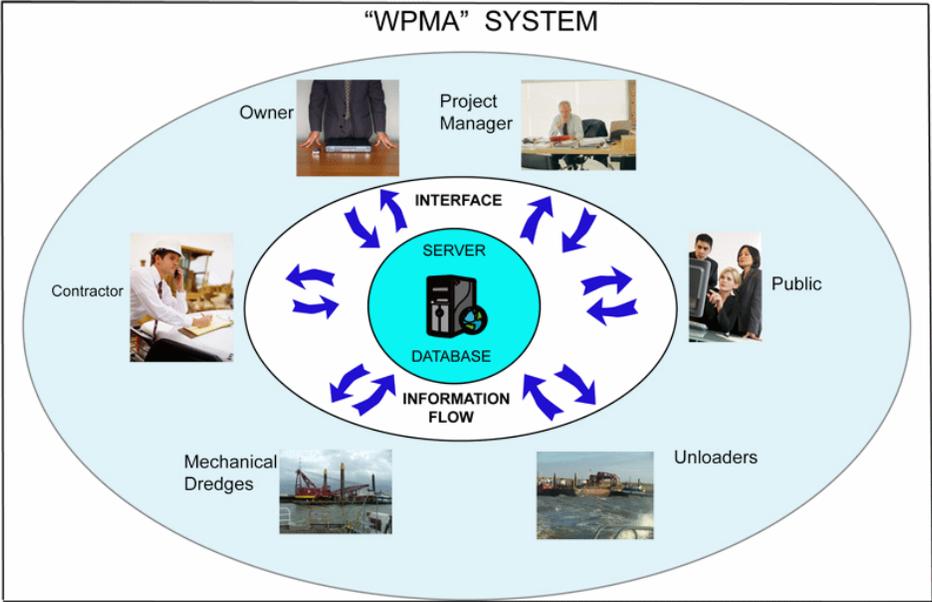
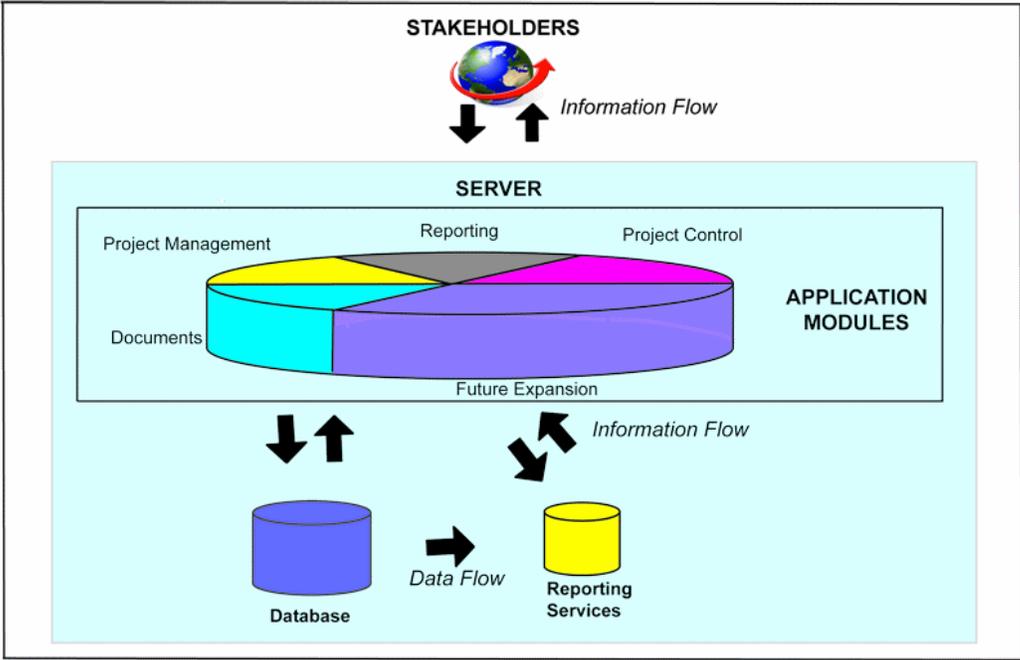


Figure 34. WPMA Functional Structure



The WPMA is subdivided into modules. These modules are designed strategically to permit and organize the application into areas with different functions and user accessibility. The application is divided into four modules: the project management module, the reporting module, the project control module, and the document module.

The project management module stores all initial project data. The initial data is comprised of the owner data, the contractor data, and the project construction initial data. The access to this module is limited to the administrator of the application and the PM. The reporting module stores the daily data submitted by the contractor, and is accessed by the contractor personnel in charge of reporting the daily data, the PM and the application administrator. The project control module renders the engineer's daily reports, the weekly summary reports, and the production performance graphic. This module is accessed by the owner, the owner team, and the contractor PM. The document module, which manages all documents generated by the project during the pre-construction and procurement phases, is accessed by all the stakeholders.

Chapter 8. Planning and Analysis of the WPMA System

The WPMA system is designed by partitioning the system into modules based on the dredging project management functions defined previously. In order to accomplish the goal of managing the project functions and to connect the project's team together in a collaborative environment, the system prototype needs to have the following functions: project management capabilities, project control capabilities, reporting capabilities, and document management capabilities. The definitions of the functions performed by each one of these modules are described in the following sections.

The core objective of the WPMA architecture is to create a seamless information management structure between all its modules, so that all project management functions can be performed under a single Application Programming Interface (API). This system should have the characteristics of a network, designed to permit information flow from various points of the data creation, data management, and data accessibility. For example, data access and management take place in the main office, data creation takes place on-site, and data access typically occurs off-site. In addition, the WPMA should be designed for future improvements and implementation of other modules such as the communication module, the cost and budgeting module, and the scheduling module.

Management Module

The Management Module will retrieve the initial construction project information which includes client, project, contractor, equipment, and contract information. Retrieval, storage and rendering of information entering the system are the main functions of the Management Module. This module will be designed to support future implementation and to interface with future modules which may be developed. The information will be retrieved and rendered by the use of the web application input and output forms. For example, the project manager will submit all the initial project information to the system by filling out the corresponding forms. Part of the initial construction information will be submitted by the contractor to the PM before the beginning of the dredging operation. This information includes the equipment, dredging plan, and schedule, which will be used as the project base line information. In addition, basic project information will be submitted by the PM in support of the information to be distributed. This module will be accessed only by the PM and the application administrator.

Reporting Module

The Reporting Module function allows controlled access to the contractor's daily data submissions interface. Retrieval, storage, and rendering of information entering the system are the main functions of the Reporting Module. This module will be designed to support future implementation and to interface with future modules that may be developed. The information will be retrieved and rendered by the use of the web application input and output forms. The contractor daily data submission comprises

the information related to the project performance: the dredges' daily reports, the unloaders' daily report, and the tugs' daily reports. The inspector daily data submissions will be implemented in a future release of the application and will encompass the information needed to perform the quality assurance of the project. This module is accessed by the contractor representative authorized to access the module, which is the personnel responsible for data input, inspectors, PM, and the application administrator.

In the final implementation of the WPMA application, the bulk of information will be input by the equipment operator who is at the data creation end, and data submissions will be performed through a touch-screen technology. This feature will be implemented in the application due to the hands-off requirement of a heavy equipment operator. For example, dredge and unloader operators are limited in their ability to perform input by key wording. This information-gathering strategy is important for implementing an effective information management structure. The information is entered at the lower end of the data creation, and no additional handling of the information is needed.

Control Module

The Control Module allows controlled access and renders the engineer's daily reports, the, the weekly summary report and the production performance graphic. Rendering information processed by the system is the main function of the Control Module. The reporting function will be performed by a specialized application that works in

conjunction with the database to render formatted information. This module will be designed to support future implementation of and interface with future modules developed. This module is accessed by the owner, the owner team, and the contractor PM.

Document Management Module

The Document Management Module functions allow controlled access to the documentation published by the project. Using this module, potential contractors and others will be able to access all the information generated during studies and investigations, and throughout the life cycle of the project. Retrieval, storage, and rendering of the information entering the system are the main functions of the Document Module. This module will be designed to support future implementation of and interface with future modules developed. The main function of this module is to assemble and make available the project documentation generated during preconstruction and procurement, and in future implementations, all documents generated during construction. The documentation currently encompasses the studies and investigations, design documents and drawings, and contract documents. An important characteristic of this module is that it will permit the participation of potential contractors in the project during the preconstruction phase.

8.1. WPMA Development Plan

The WPMA development will include three components: system development, system testing, and system operation. The system development component

encompasses the requirement gathering, design, and code development. The system-testing component covers the verification and validation of the WPMA. Finally, the system operation component will provide the user guide and the WPMA installation guide that will permit the user to install and operate the system.

Organization

The implementation of the WPMA required the following structure: the programmer (the author), will be responsible for the development of the application and will be assisted by two consultants - a software engineer and a professional programmer. The information needed to develop the application will be gathered from the author's knowledge and actual work experience in the dredging field.

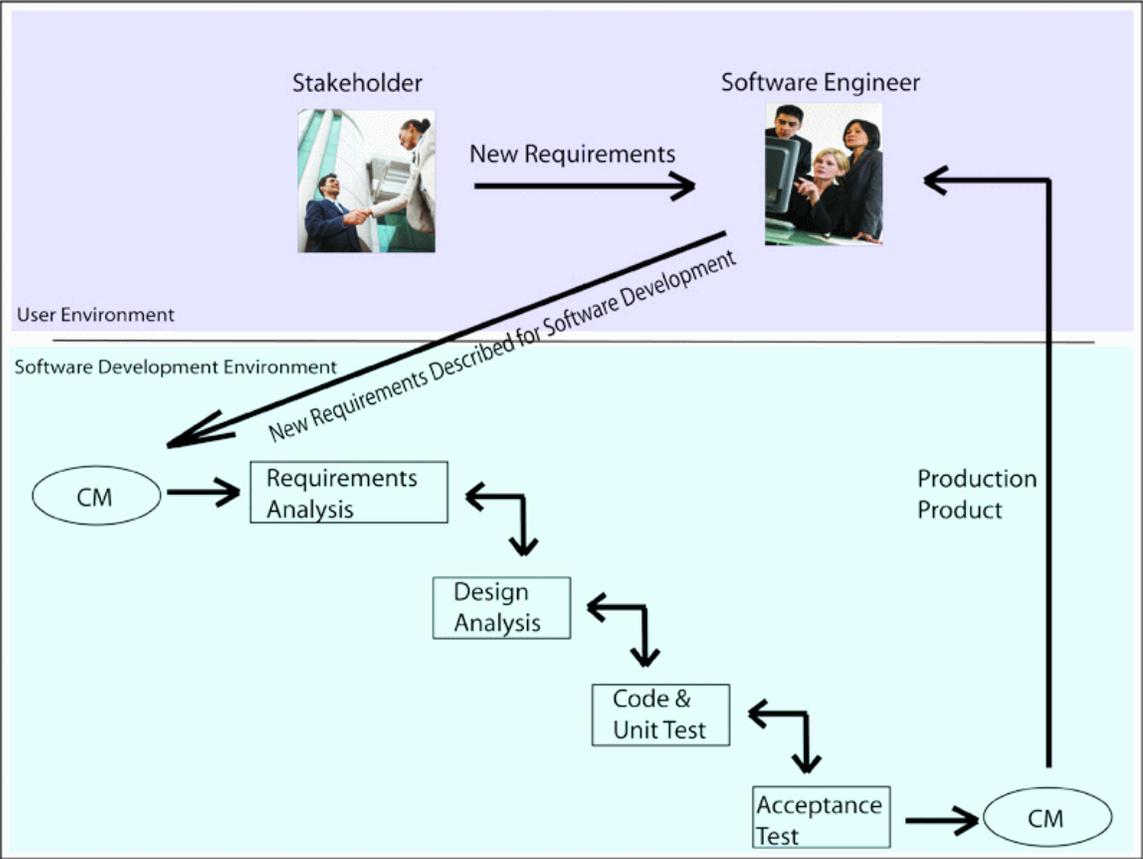
Managerial Processes

The management objective of the project is to deliver the WPMA in a timely and cost-effective manner. The WPMA is a small project with a short schedule, and the people involved are very knowledgeable in all aspects of dredging. These characteristics strongly suggest using a *phased operational prototype* model to complete the project.

As shown in Figure 35, the operational prototype model involves the software engineer working with the customer directly to develop an initial application prototype and a more complete application over time. The software engineer will work directly with the customer to develop staged implementations and to gain a more thorough understanding of the user needs. After acquiring knowledge of the

customer's needs, the engineer will formalize the requirements, design, code, and testing of the program, and will deliver a functional prototype to the customer. If the prototype satisfies the customer needs, then the prototype will be developed as a fully functional product.

Figure 35. Phased Operational Prototype Model (Based on ENPM 611 Class Notes UMD.)



8.2. Software Requirements

2.2.1. Requirements Definitions

Current Functional Requirements

General – The WPMA prototype should have the capability to be accessed through the Internet, retrieve project data from the appropriate user via the Internet, store the data in a database, and deliver specific information to appropriate team players including owners, stakeholders, potential contractors, and the owner’s management team.

Project Management – The WPMA should have project management capability to retrieve and process the following information: the project’s initial information (dates, cost, location, etc.), client information (owner), contract information (bid, design documents, etc.), contractor information, and equipment information. The information shown in the report forms depicted in Appendix “A,” Figures A-1 to A-6, depict the sample data used in this module and was used during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-1.

Reporting – The WPMA should have reporting capability to collect the contractor daily operation reports from the dredges, unloaders, and tugs. The information in the report forms shown in Appendix “A”, Figures A-7 to A-9, depicts sample data that

was used during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-2. Future implementation of this module will include project inspection daily reports.

Project Control – The WPMA should provide the engineer’s daily report, the weekly summary report, and production performance graphics. The information provided is based on data gathered through the project management and reporting capabilities, which has been processed automatically by the WPMA, distributing the reports generated to specific reporting levels - the owner, the owner and contractor project managers, and the stakeholders. The information in the report forms shown in Appendix “A,” Figure A-10, depicts sample data and it has been used during database development and system testing.

Document Management – This capability should support input and output functionalities to manage the project documentation. The core function is to publish the documents generated during the project preconstruction, procurement, and construction phases. These documents encompass studies, investigations, design, and contract documents.

Future Functional Requirements

General – The following system capabilities should be taken into consideration in order to support future releases of the WPMA application:

- The WPMA should have the capability to connect to a local server in the event that an Internet connection is not available.
- The WPMA should have the capability to manage cost and budgeting input and output information.
- The WPMA should have the capability to manage project scheduling functions.
- The WPMA should have the capability to manage hydrographic information to access project positioning functions.
- The WPMA should have the capability to manage communications between project team players. Communication may take the form of e-mail, correspondence, and file transfer functions.
- The WPMA users should have the capability to create their own accounts for security purposes.

Reporting – The application should have input and output capabilities to manage the information generated by the owner’s inspection team. This information will be used to validate the daily information gathered and submitted by the contractor.

Design Constraints

Physical Implementation Characteristics

- The WPMA application will be hosted on a dedicated server.
- The application should be coded using Microsoft infrastructure.
- The code for the web-end will be written in ASP.NET.

- The application should be connected to the Internet using a server running Internet Information Services.
- The database used should be SQL Server 2005 and the reporting capability should be implemented using the Reporting Services application, which comes with SQL server environment.

User Constraints

The users of the system will be:

- The Owner
- The Owner's team
- The Contractor
- The Public

Future Design Constraints

- The WPMA should be capable of retrieving data using x,y coordinates to process positioning information.
- At the input-end where data is entered by equipment operators, the WPMA will feature the option to use the standard input methodology, which is keyboarding and touch screen technology.

2.2.2. Requirement Specifications

R1. The WPMA shall be a web-based application running on a server that has access to the Internet.

R2. The WPMA shall be accessed through a web browser for data and documentation input and for data, information, and documentation output. The data is defined in the Current Functional Requirements Section 2.2.1.

R3. The WPMA shall implement data input, data output, reporting capabilities, and data management capabilities in accordance with corresponding roles. The different role for the management of data and information are: the Owner, the Contractor, the Owner's Team, and the Contractor's team.

R4. The WPMA shall have the capability to authenticate the corresponding users in accordance with their corresponding roles for data and information management. This capability will be enabled through the WPMA logging and certification capabilities for users at any geographical location that have an Internet connection.

R5. The WPMA shall store the information entering the system on a database for future processing.

R6. The WPMA shall have automatic data processing capability. Data entering the system will be automatically processed for reporting capabilities.

R7. The WPMA shall have automatic and real-time reporting service capabilities. These reports will be delivered in accordance with the established roles and schedule times: the data and roles are defined in the Requirements Specification R3.

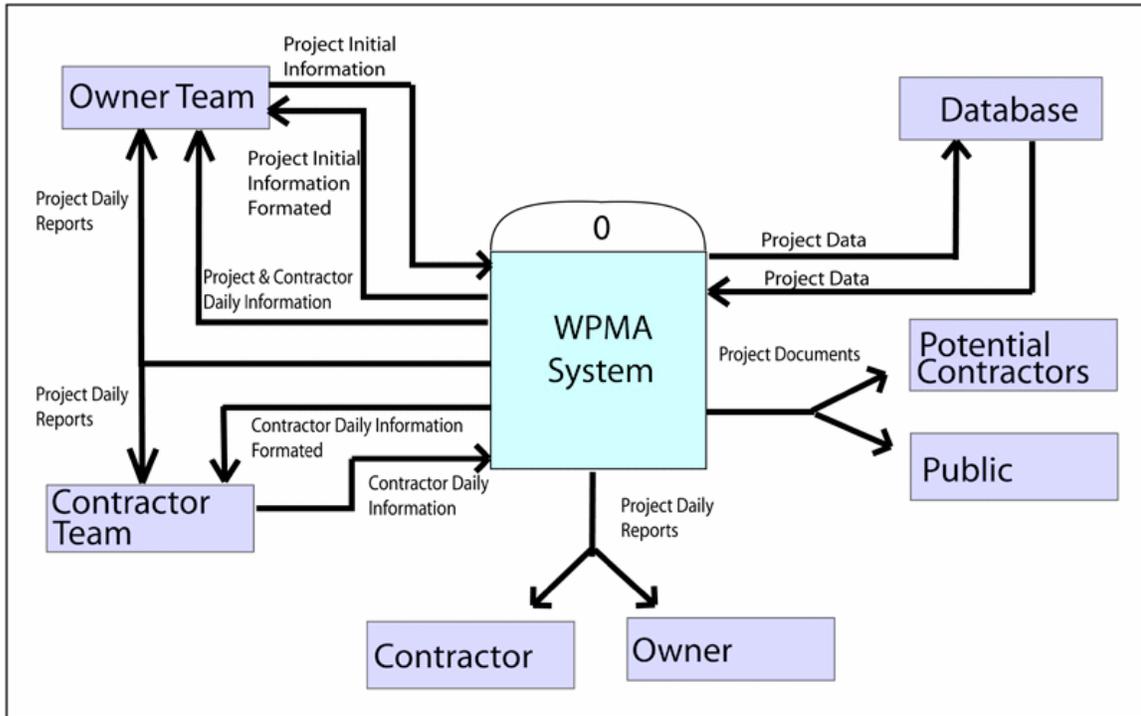
R8. The WPMA shall have the capability to host several projects through the project creation function.

R9. The WPMA shall have the capability for users to create and edit their own login account.

8.3. Data Flow Diagram

A general overview of the data flow is depicted in the System Context Diagram in Figure 37. The flow diagram shows the data and information input and output functions and the tools used to implement the WPMA infrastructure.

Figure 37. WPMA System, Context Diagram



Decomposition Description

The system is subdivided into four modules: 1. the Project Management module; 2. the Reporting Module; 3. the Project Control Module; 4. the Document Management Module (see Figure 38). The decomposition process was completed based on system functions.

1. Project Management Module

This module collects and stores in a database the project, contractor, and contract initial information and establishes a baseline for the project control. This module

collects the information using forms. This information is entered and managed by the project manager, who is in charge of setting up the project in the system.

2. Reporting Module

This module collects the information generated on the field in real time. This information is entered by the equipment operators directly from the operator's room and validated in real time by the superintendent (captain) and project manager from their corresponding locations.

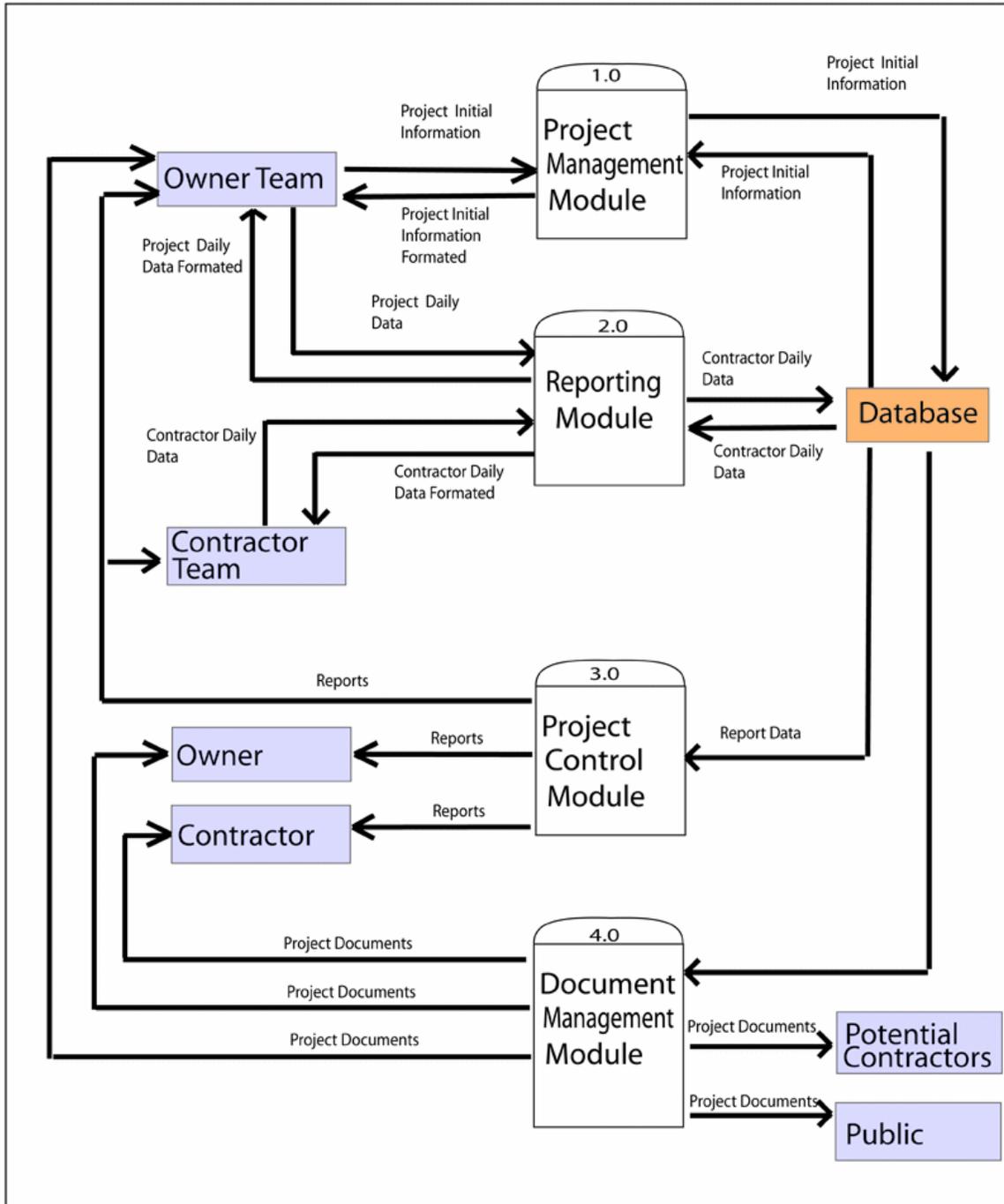
3. Project Control Module

This module automates and processes the data collected through modules 1 and 2 and delivers real-time project information in the form of reports to the various levels of project stakeholders.

4. Document Management Module

This module makes available the documentation generated during the project preconstruction, procurement, and construction phases.

Figure 38. WPMA System Decomposition, Level 0 of the DFD



8.4. Data Decomposition

Collection of Project Initial Information (Project Management Module)

The initial data collected and entered into the system by the PM creates the project baseline and the project identity. The system retrieves the information, stores it in the database, and renders it immediately to the PM. The PM validates the data, accepting or editing it (see Figure 39). The data included in this module is defined in Appendix B, Section B-1.

Collection of Contractor and Project Daily Data (Reporting Module)

The daily data collected and entered by the equipment operators during the dredging operation is stored for future processing and reporting. The system retrieves the information, stores it in the database, and renders it immediately to the equipment operator. Similarly, the field superintendent and the project manager can access this data in real time to validate it (see Figure 40). The data included in this module is defined in Appendix B, Section B-2.

Real-Time Reporting of Project Information (Project Control Module)

In this module, the data collected within the Project Management module and the Reporting module is processed and converted to information in the form of reports. These reports are distributed to the corresponding levels of management for project control and decision-making. This module generates the project daily, weekly summary report, and the production performance graphics (see Figure 41).

Figure 39. Project Management Module, DFD Decomposition Level 1

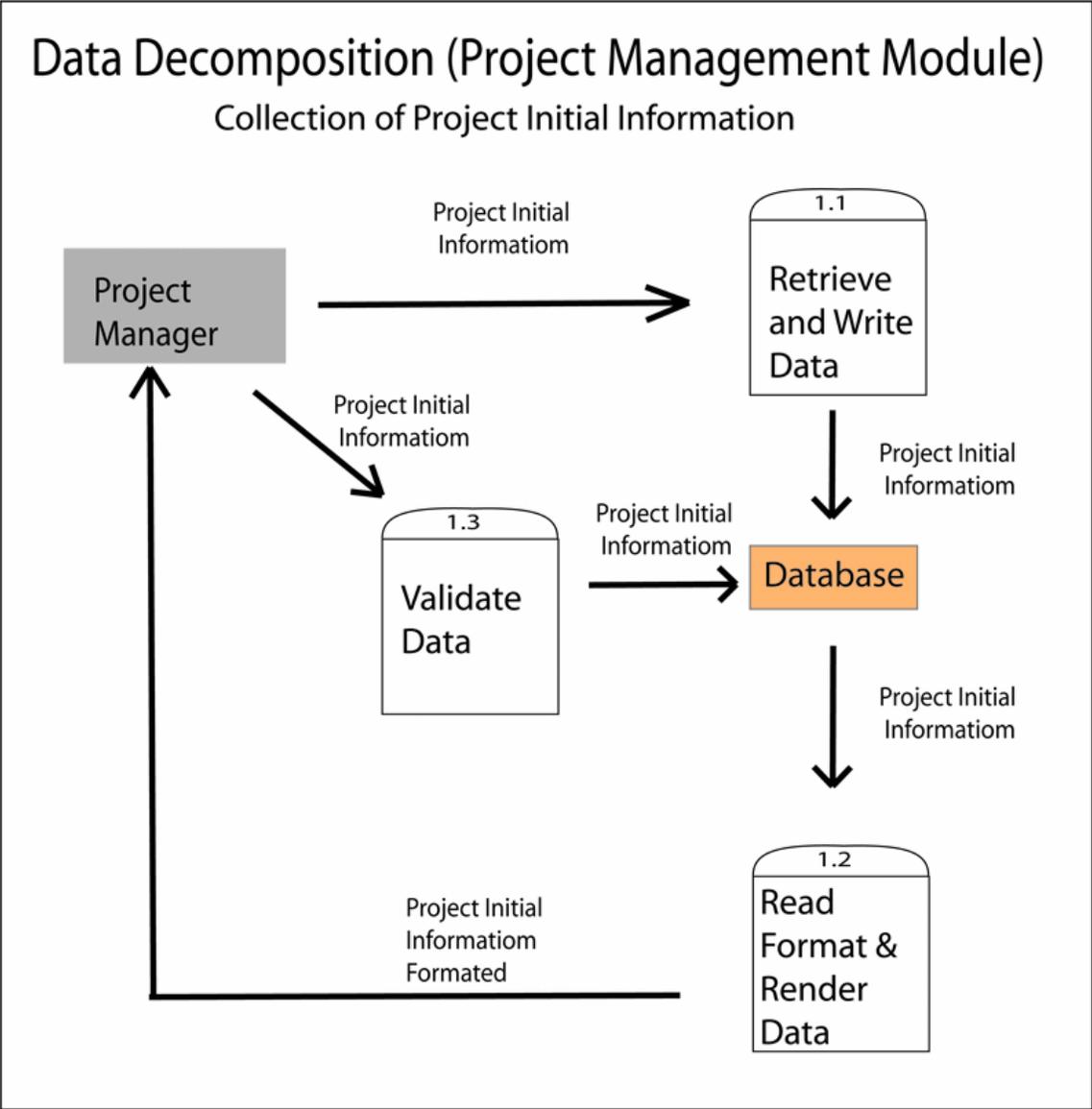


Figure 40. Reporting Module, DFD Decomposition Level 1

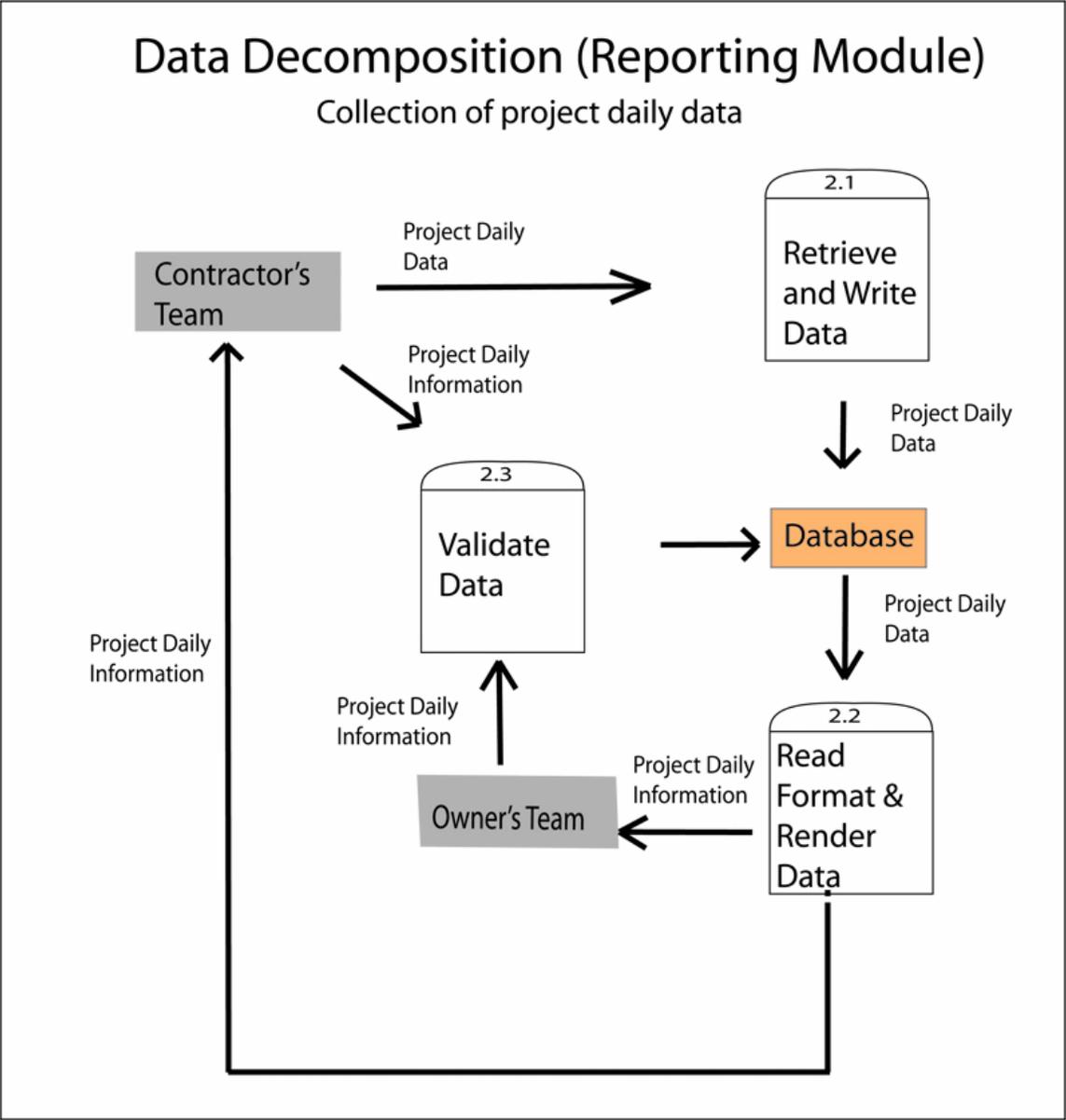
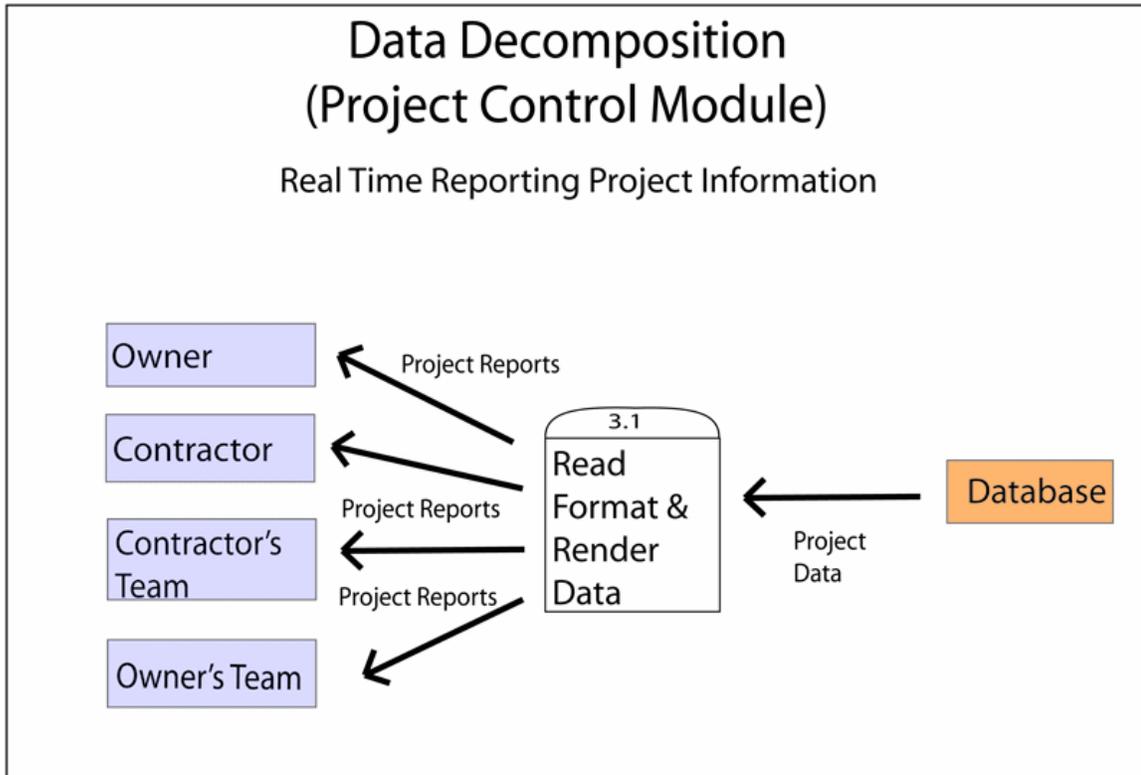


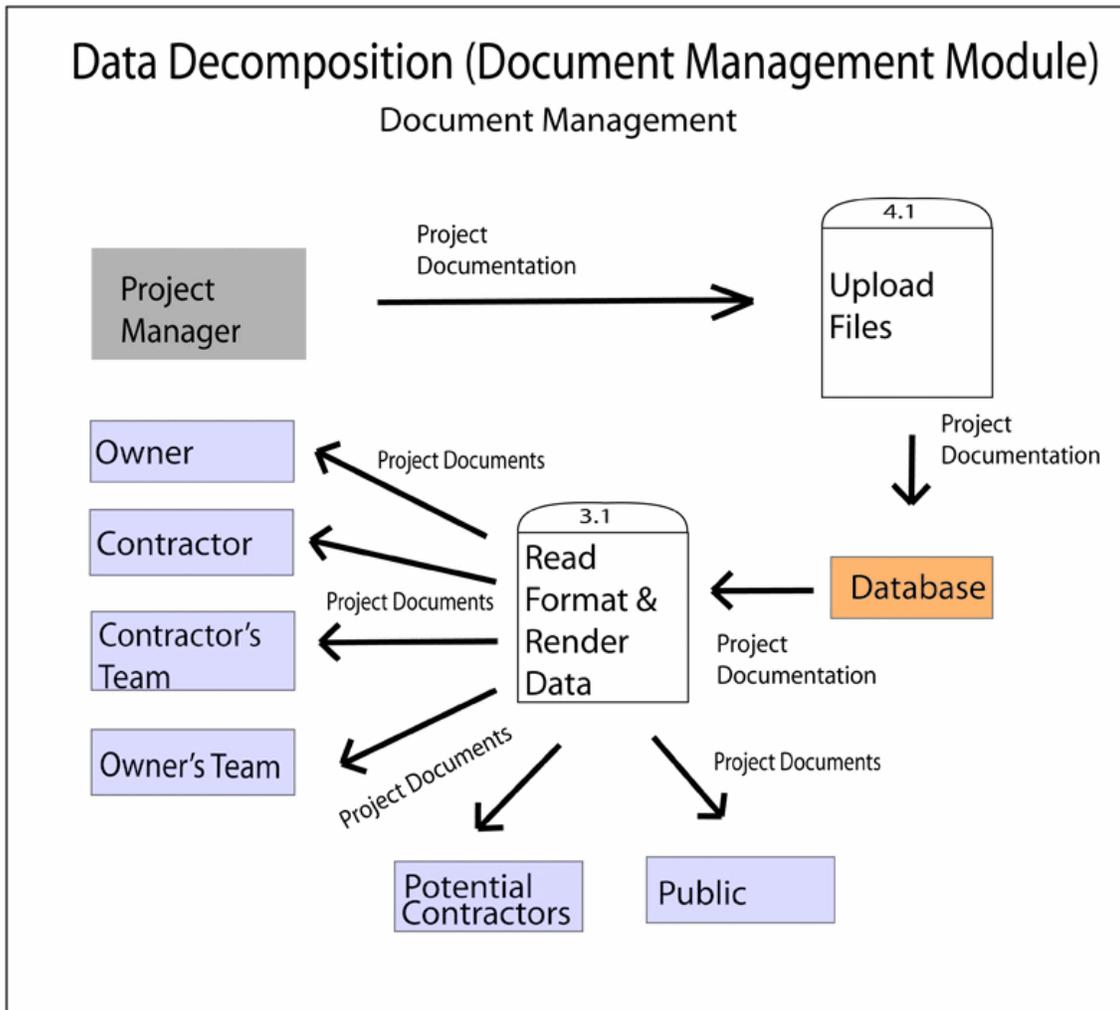
Figure 41. Project Control Module, DFD Decomposition Level 1



Project Documentation Management (Document Management Module)

The documentation generated during the project life cycle is available to stakeholders through this module. The PM has management privileges to upload the corresponding documents to the application environment. This module works as a file library (see Figure 42).

Figure 42. Document Management Module, DFD Decomposition Level 1



8.5. Dependency Description

Inter-module Dependency

Figure 42 shows a graphical view of the inter-module dependencies. These dependencies are defined as follows:

- Project Management and Reporting module dependencies – The Project Management module captures the project initial information and establishes the project base line. This information is entered into the system during the initial phases of the life cycle. All information gathered by this module should be collected before the startup of the construction phase. During the construction phase, the project reporting and project control modules depend heavily on the information defined in this module (see Figure 42). The data gathered by the Reporting module is related to the Project Management Module through the dependencies defined by the data structure, shown in Figures 44 and 45. Data populated by the Project Management module is related to data collected by the Reporting module.
- Reporting and Project Control module dependencies - The data collected by the Reporting module during the construction phase and stored under the structure defined by the Project Management module project base line is then processed by the Project Control module to generate the project daily reports, the weekly summary report, and the production performance graphic.
- Document Management module dependencies – The document module does not have any dependencies with the other modules. This is a stand-alone module in the

application. This module collects project documentation at the discretion of the PM and makes it accessible to the stakeholders that have the corresponding privileges.

8.6. Data Dependencies

In general, the data managed by the modules is loosely coupled within the modules in which they reside. Each data entity is a stand-alone entity with the exception of a few that will be described below.

Data dependency within the Project Management module

Within the Project Management module, the data collected from the users does not change; this data is stored directly in the database with no changes to its properties. There are no dependencies within the data collected in the Project Management module.

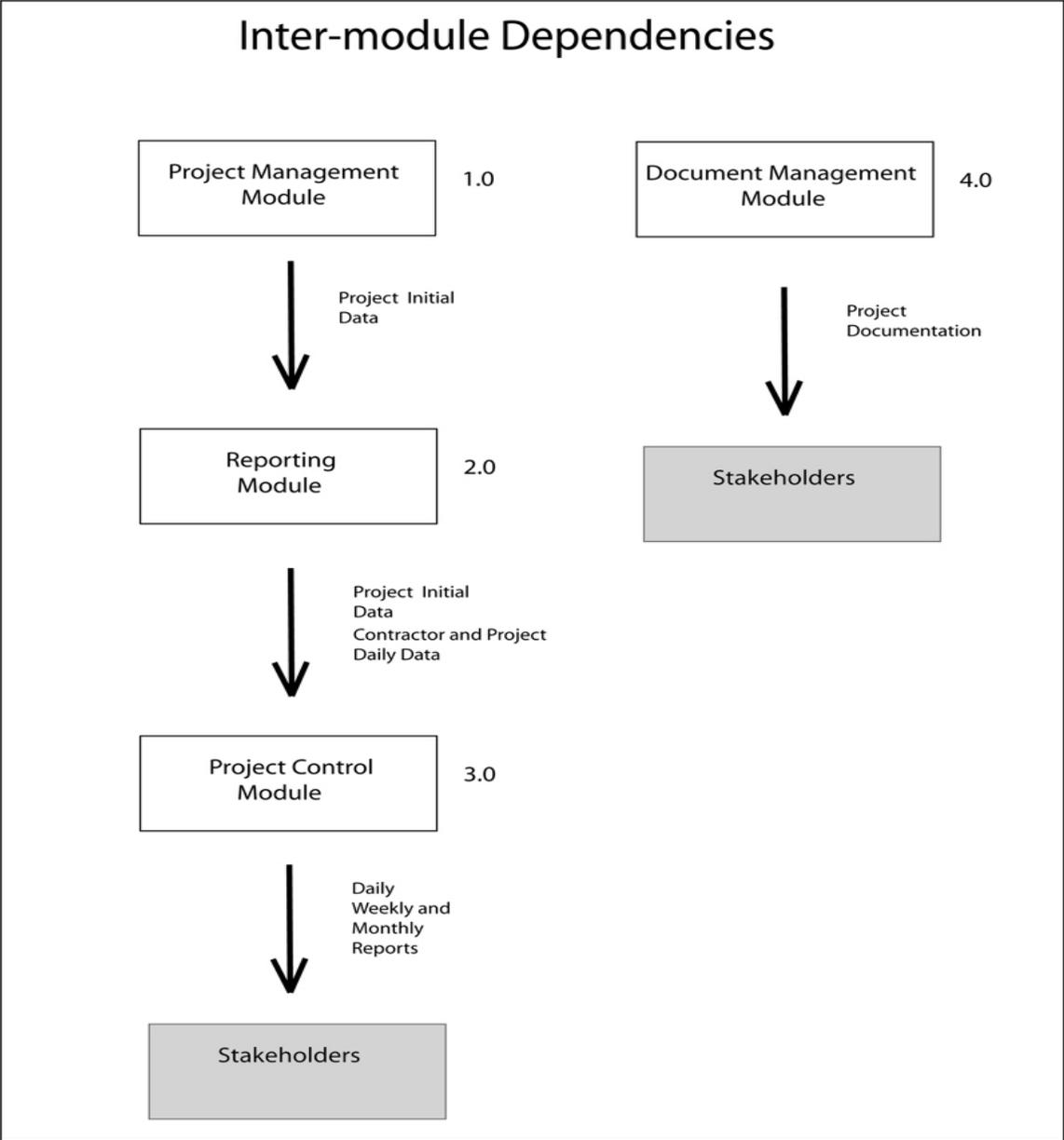
Data dependency within the Reporting module

Within the Reporting module, the data collected from the users does not change; this data is stored directly in the database with no changes to its properties. There are no dependencies within the data collected in the Reporting module.

Data dependency within the Project Control module

Within the Project Control module, the bulk of the data transformation and data processing is performed. The data is retrieved from the database, processed, and saved into virtual data sets for reporting, and is destroyed when the process gets out of scope. There are no permanent changes to the original data.

Figure 42. Inter-module Dependencies



Data dependency within the Document Management module

Within the Document Management module, the data collected from the users does not change; this data is stored directly in the database with no changes to its properties. There are no dependencies within the data collected in the Document Management module.

Chapter 9. WPMA Software Design

9.1 Introduction

Dredging projects are implemented within a complex information environment. The Web-based Project Management application (WPMA) was created to enhance the dredging project management function, to facilitate collaboration among project team members, and to satisfy and facilitate stakeholders' information needs. In this section, the design specifications of the WPMA system is implemented based on the requirements defined in Section 2.2.

9.1.1 Design Overview

Purpose

The purpose is to design an information system that manages dredging projects information and facilitates collaboration among the members of the project team. This goal is accomplished through the implementation of a web-based information system that will automate the collection, processing, and distribution of project information. The system will retrieve data and distribute real-time project information simultaneously from different geographical locations of the data creation, data management, and data and information accessibility.

Scope

The scope of the system design encompasses the management of the information required to satisfy the project team needs. The project team includes the owner and the owner's team, the contractor and the contractor's team, the potential contractors, and the public. In this phase, the system design was based on the requirements gathered in Section 2.2, "Software Requirements."

The final design defines the specifications for the physical implementation of the features defined in the requirements, the prototype of each screen, the system architecture, and the database structure. The following system functions were implemented:

- Collection of Project Initial Information
- Collection of Contractor and Project Daily Data
- Real-Time Reporting Project Information
- Document Management

The design was initiated by organizing the requirements into logical groupings and steps. This helped determine the layout for the screens and code. This modeling phase involved documenting the flow of the activities throughout the system and the way the code was organized and structured. The objective was to create a "blue print" of how to create the application.

9.1.2. Requirement Traceability Matrix

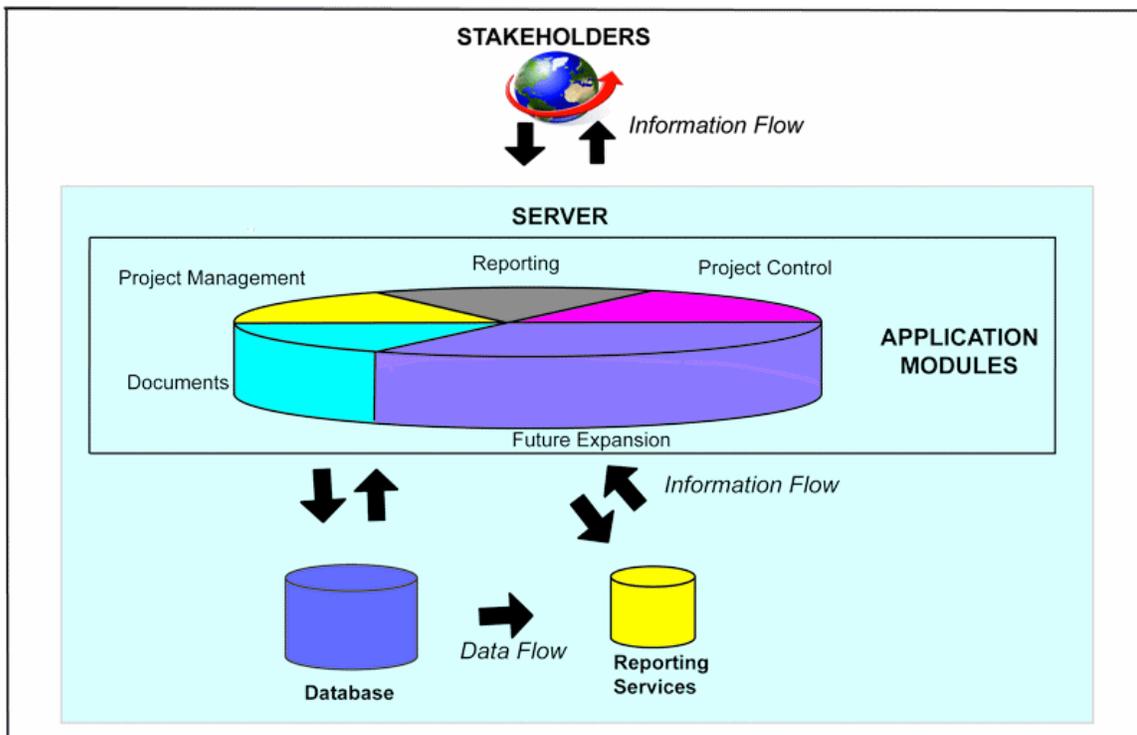
Req. Spec. NO.	Requirement	Design Function
R1	Application Internet connectivity	MS Small Business Server hosting the WPMA web-based application
R2	Use of web-browser interface	ASP.NET 2.0 and HTML framework
R3	Application authentication and authorization capabilities for Owner, Contractor, Owner's Team, Contractor's Team	ASP.NET 2.0 authentication and authorization framework
R4	Retrieve Store application input in a database	ASP.NET 2.0 Web-Forms for data collection and Server Controls for database connectivity, MSSQL2005 database
R5	Application data processing and reporting capabilities	MSSQL2005 Reporting Services application
R6	Reporting authentication and authorization capabilities for Owner, Contractor, Owner's Team, Contractor's Team	MSSQL2005 Reporting Services application
R7	Application multiple project creation capability	Project creation process.

9.2. System Architecture

9.2.1. Chosen System architecture

The application is a tier two, managed client-server, online system, with a centralized database. This application runs on MS infrastructure and uses ASP.NET and C# language framework to develop the application interface. In order to achieve a highly integrated environment, SQL server 2005 was selected as the database. Similarly, the Reporting Services service was integrated into the application to attain project reporting capabilities and the decision support system needed. In addition, Sharepoint framework was introduced to implement the collaboration capability of the system.

Figure 43. System Architecture



Data Structure

As a result of the study done in the analysis phase of the system development life cycle, the requirement structure shows four major functions to be performed by the system. These four functions are: retrieval of project initial information, retrieval of contractor daily reports, reporting of project information to different levels of management, and; making available the project documentation to stakeholders.

Figures 44 to 46 show the system data structure for modules 1 to 3 as a result of the study done in the analysis phase of the system development life cycle. These data structures are the result of decomposing the inter-module dependency depicted in Section 2.6 Data Dependencies, Figure 42.

Project Management Module Data Structure, Module 1

The Project Management Module Data Structure is depicted in Figure 44.

Reporting Module Data Structure, Module 2

The Reporting Module Data Structure is depicted in Figure 45.

Figure 44. Project Management, Module 1, Data Structure

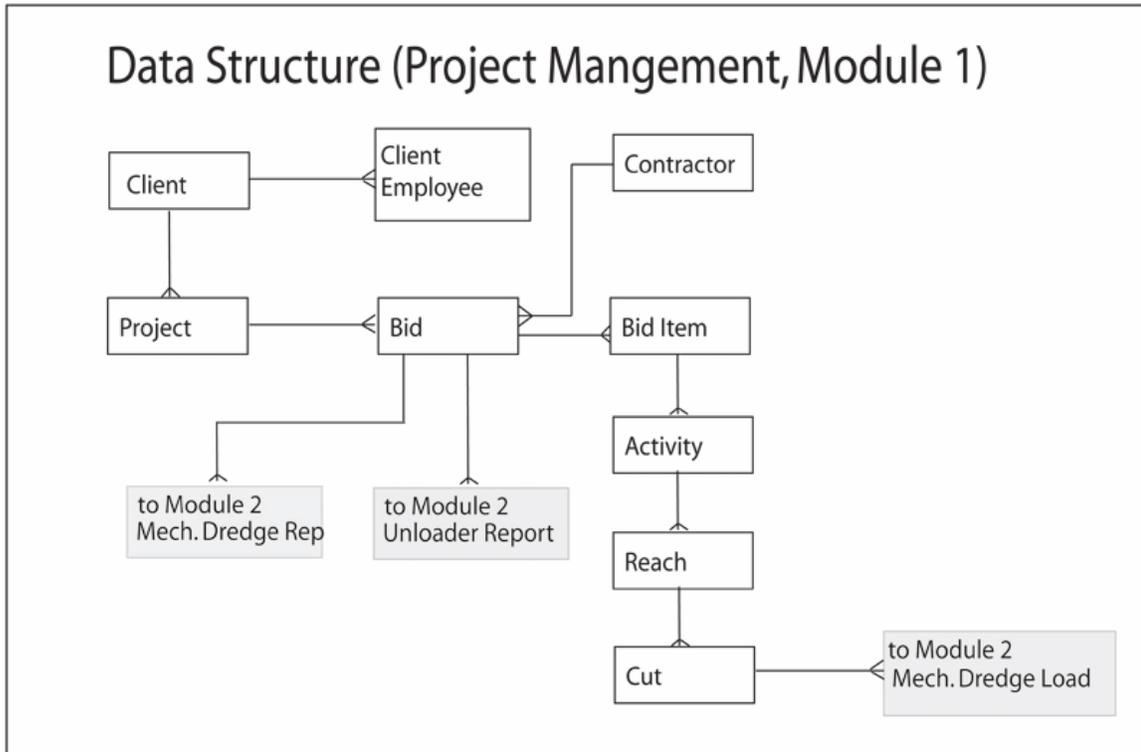
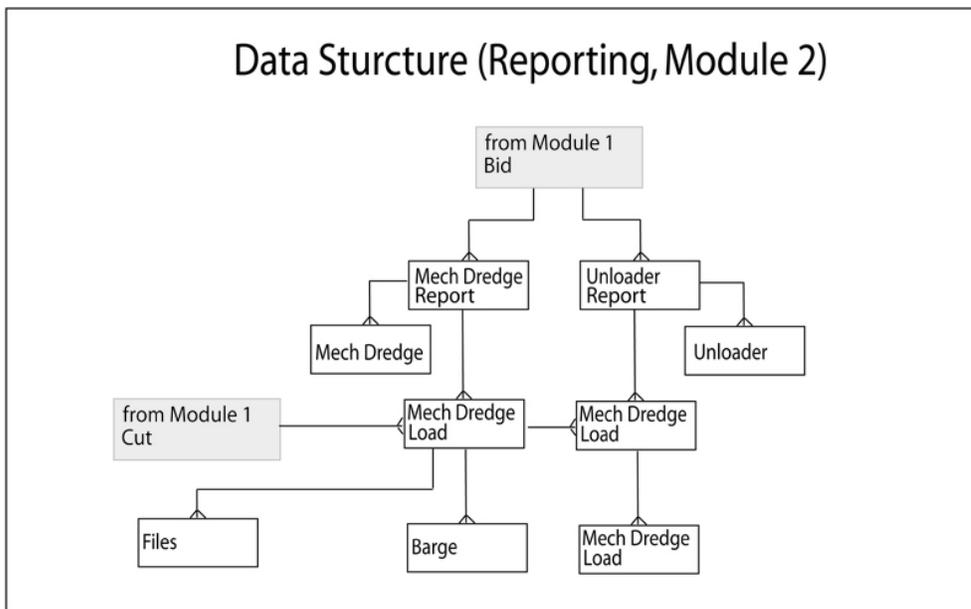


Figure 45. Reporting, Module 2, Data Structure



Project Control Module Data Structure, Module 3.

The Project Control Module Data Structure is depicted in Figures 46a and 46b. Figure 46b shows how the Project Control Module virtual data sets are implemented throughout the interface of the Project Management Module and the Reporting module.

Figure 46 a. Project Control, Module 3, Data Structure

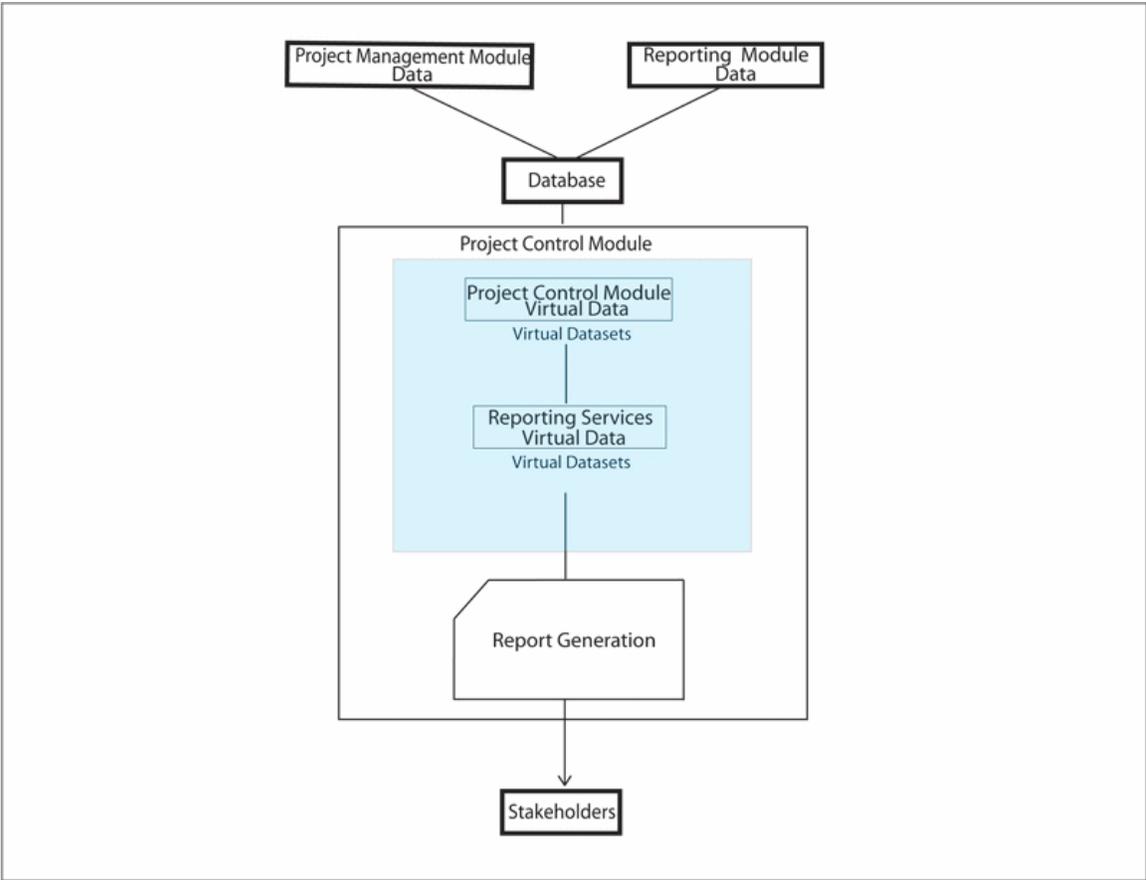
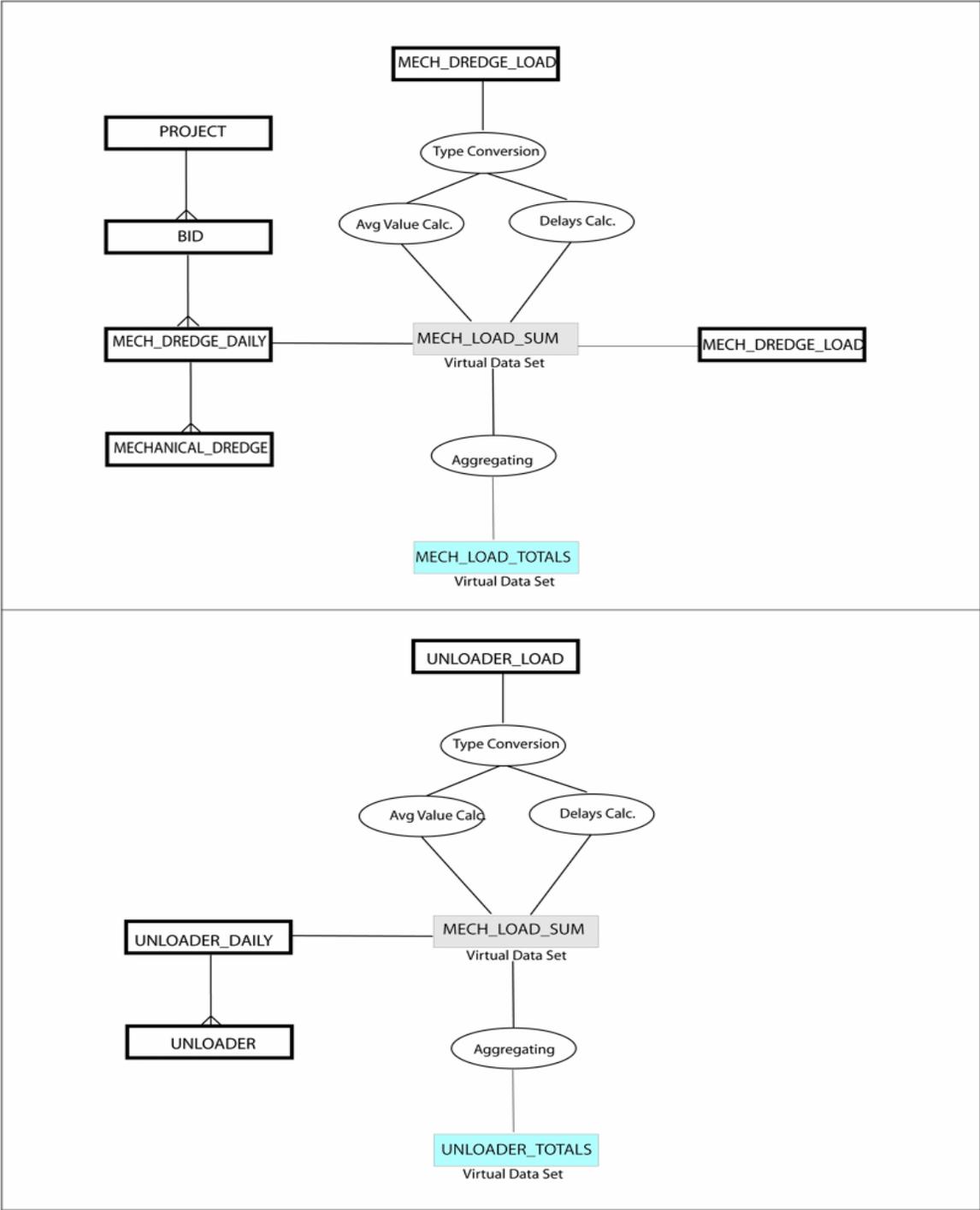


Figure 46 b. Project Control, Virtual Data Sets implementation structure



9.2.2. Discussion of alternative design

The final design was defined by the following initial design alternatives for the system:

- **Client application with a database running on a local central server**
- **Web-based application running on a local central server**
- **Web-based application running on a remote managed server**

9.2.3. Interface description

Project Management Module Interfaces – This module interfaces with the Reporting module and delivers data for the virtual data sets implemented during project reports generated by the Project Control module. This relationship is depicted in Figures 44, 45, and 46. Other interfaces of this module are the users and the database. This module collects data from the PM and writes it to the database.

Reporting Module Interfaces – This module interfaces with the Project Management module and delivers data for the virtual data sets implemented during project reports generation by the Project Control module. This relationship is depicted in Figures 44, 45, and 46. Other interfaces of this module are the users and the database. This module collects data from the equipment operators, field superintendent (captain), and PM, and writes it to the database.

Project Control Module – This module interfaces with the Project Management module and the Reporting module and delivers data for the virtual data set implemented during project reports generation by the Project Control module. This relation is depicted in Figures 46. This module also interfaces with the database. This module calls the Reporting Services service, which calls the database for data, and process and renders the resulting information. The modules expose links to the reports, which can be viewed by selected levels of management. The levels are determined by the authentication and authorization configuration of the Reporting Services service.

Document Management Module – This module interfaces with the users and the database. Users will access this module to download documents, upload pictures, send messages, and to perform task management.

9.3 Detailed Description of Components

Component 1

The Project Management Module is the system Component 1. This Module collects all the initial data related to the project. This information is the foundation for establishing the project base line. Figure 39 shows the Primitive DFD for this module. The overall function of this module is to retrieve information from the user authorized to utilize this module, store it on a database, and render it back formatted into a table for user validation. The data involved in this process is depicted in Appendix A. Figures A-1 to A-6 depict the sample data used in this module and used

during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-1. Similarly, the data structure is depicted in Figure 44.

This module encompasses the following subcomponents:

- **Retrieve and Write Data** – Retrieve data from the user (Project Initial Data) and write it to the database. The information is retrieved through a Web Form interface and is written to the database through a database connection.
 - **Read Format Render Data** – Read the data just written to the database, format it into a table, and render it to the user interface immediately after the data is entered into the database.
 - **Validate Data** – Data is viewed by the user immediately after the data is rendered back from the database for validation. If the data is correct, no further data manipulation or processing is needed. If the data is incorrect, the data can be updated, edited, or erased and can be created all over again.

Component 2

The Reporting Module is the system Component 2. This module collects all the project daily data. This data, in conjunction with the data collected with Project Management Module, is used to assess project performance. Figure 40 shows the Primitive DFD for this module. The over all function of this module is to retrieve information from the users authorized to use this module, store it on a database, and render it back formatted into a table for user validation. The information in the report forms shown in Appendix “A,” Figures A-7 to A-9, depicts sample data that was used

during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-2. Similarly, the data structure is depicted in Figure 45.

This module encompasses the following subcomponents:

- **Retrieve and Write Data** – Retrieve data from the user (Project daily data) and write it to the database. The information is retrieved through a Web Form interface and is written to the database through a database connection.
- **Read Format Render Data** – Read the data just written to the database, format it into a table, and render it to the user interface immediately after the data is entered to the database.
- **Validate Data** – Data is viewed by the user immediately after the data is rendered back from the database for validation. If the data is correct, no further data manipulation or processing is needed. If the data is incorrect, the data can be updated, edited, or erased and can be created all over again.

Component 3

The Project Control Module is the system Component 3. This module retrieves data from the database in the form of data sets and processes and formats the information required to report project information to selected levels of the organization management. Figure 41 shows the Primitive DFD for this module. The overall function of this module is to read data from the database, process it, and format it into reports for automatic rendering and delivery. The information in the report forms shown in Appendix “A,” Figure A-10, depicts the sample data and it has been used

during database development and system testing. Similarly, the data structure is depicted in Figure 46a and 46b.

This module encompasses the following subcomponent:

- **Data Set Creation** – The data set is created virtually by the Reporting Services service for data delivery and processing.
- **Report Rendering** – This process is performed by the Reporting Services service and uses the data set for processes required to deliver the corresponding reports.

Reports

The reports created by this module are:

- Daily Detail Dredge Report
- Daily Detail Unloader Report

Component 4

The Document Management Module is the system Component 4. This module creates an environment in which stakeholders collaborate and share documentation, communicate, upload files and pictures, and manage tasks.

This module encompasses the following subcomponent:

- **Upload Documents** – This task is performed by Sharepoint. Authorized users can upload and download files for sharing, reviewing, and revising.

- **Upload Files** – This task is performed by Sharepoint. Authorized users can upload and download authorized files.
- **Render List of Documentation** – This task is performed by Sharepoint. The application renders a comprehensive list of the documents contained in the system.
- **Render List of Pictures** – This task is performed by Sharepoint. The application renders a comprehensive list of the pictures contained in the system.

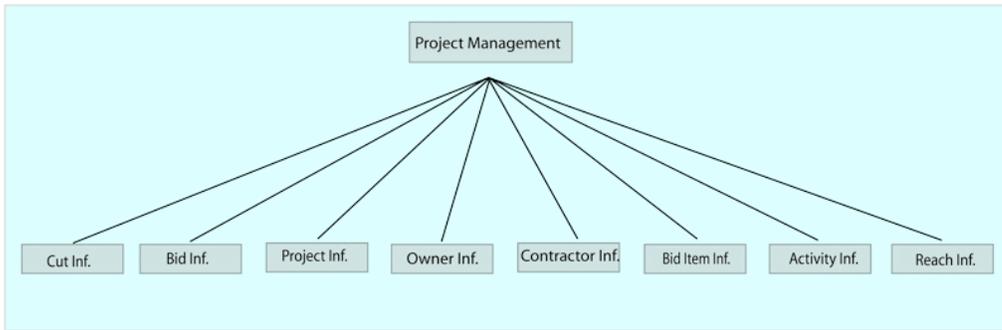
9.4 User Interface Design

3.1. Description of the User Interface

The application begins with an introductory Home Page, which gives an overview of the application objective. This page renders a link to the application login page. The application login page will serve as the WPMA authentication tool to identify the user and subsequently authorize access to the different levels of the application interface. The most relevant of the WPMA screens are depicted in Appendix C.

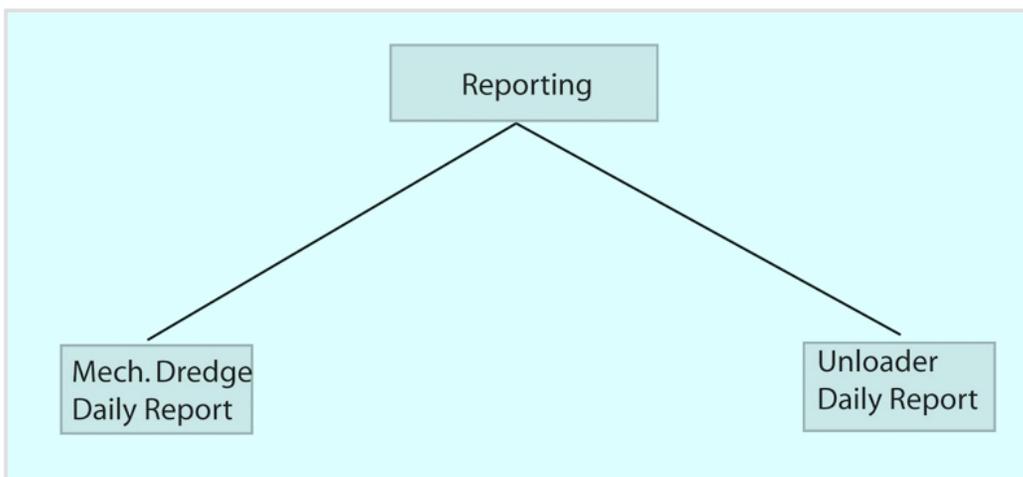
Project Management Module Interfaces – This module features the user interfaces needed for data collection, data management, and data rendering. Each interface in this module features a form used to collect the corresponding data and a grid table used to render the corresponding data contained in the database. The data sample that was used to design the user interface is defined in Appendix “A.” Figures A-1 to A-6 depict the sample data used in this module and which was used during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-1. Similarly, the data structure is depicted in Figure 44.

Figure 47. Project Management Module User Interface Structure



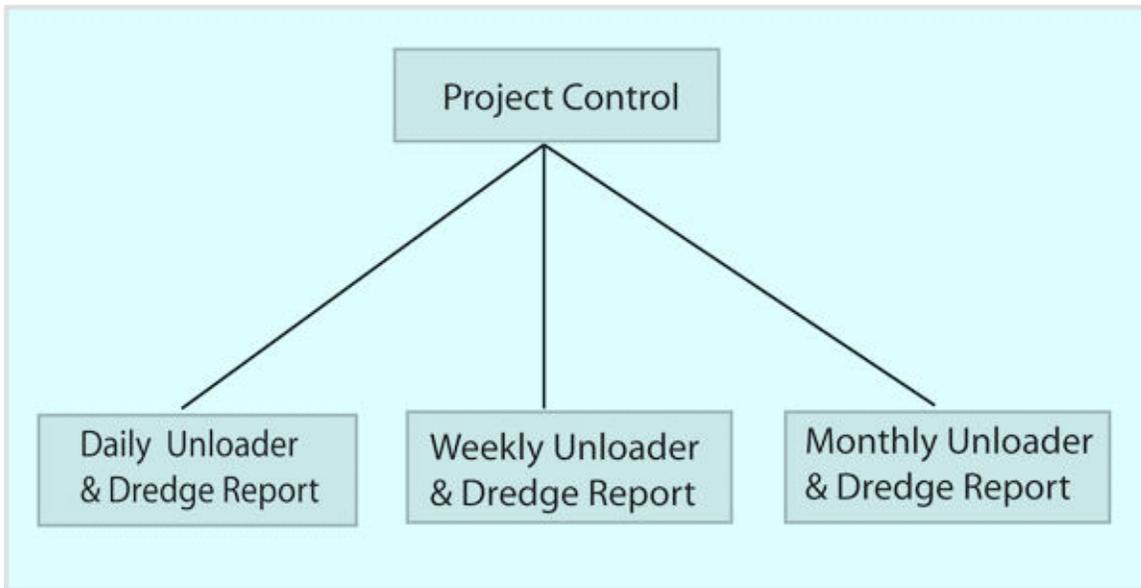
Reporting Module Interfaces – This module features the user interfaces needed for data collection, data management, and data rendering. Each interface in this module features a form used to collect the corresponding data and a grid table used to render the corresponding data contained in the database. The information in the report forms shown in Appendix “A,” Figures A-7 to A-9, depicts sample data that was used during database development and system testing. Each of the requirements for this module is detailed in Appendix B, Section B-2. Similarly, the data structure is depicted in Figure 45. Figure 48 depicts the user interface structure.

Figure 48. Reporting Module User Interface Structure



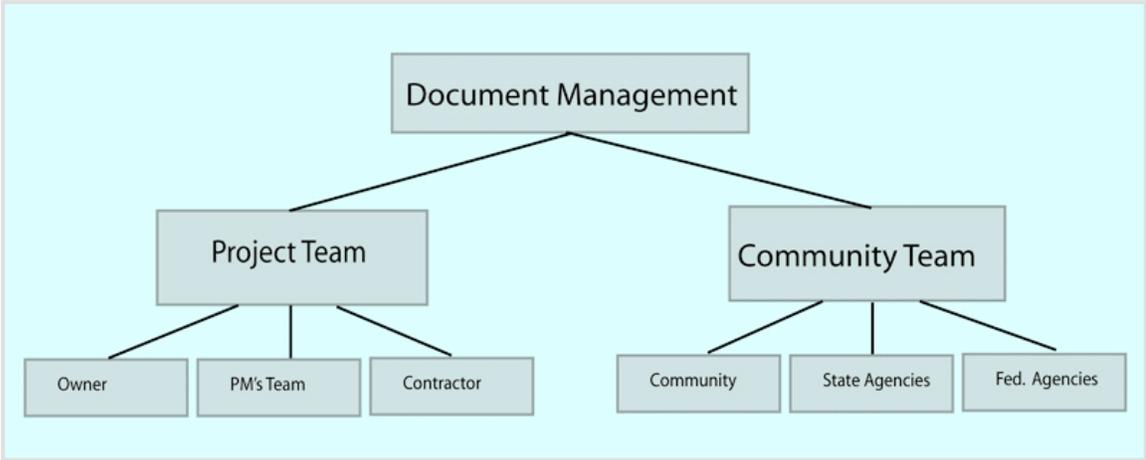
Project Control Module – This module features the user interfaces needed to render the project reports (see Figure 49). This function is implemented by MS Reporting Services application. This module interface links to the Reporting Services application pages, which runs on an independent web application.

Figure 49. Project Control Module Interface Structure



Document Management Module – This module stands alone in regard to data interface (see Figure 50). It creates an environment where project’s stakeholders collaborate, share documentation, communicate, upload files and pictures, and manage tasks. The user interfaces are implemented by MS Sharepoint framework. The user interfaces are web forms designed to create a collaborative environment for project stakeholders.

Figure 50. Document Management Module Interface Structure



Chapter 10. Software Implementation

The WPMA framework will serve as a repository to store the data gathered during the life cycle of the project and as an engine that automates the processing of the data and the distribution of the information to different levels of management. Section II implements the solution for the information system that confronts the problems addressed in prior sections. Chapter 1 explains how the WPMA addresses the problems encountered during the management of dredging projects. Chapter 2 plans the development of the application and implements the analysis of the information system needed to meet the requirements. Chapter 3 defines the system architecture and the physical implementation of the application. This chapter explains the software code and how to run the application using the case study discussed in Chapter 4 of Section I as an example.

Roles and Privileges

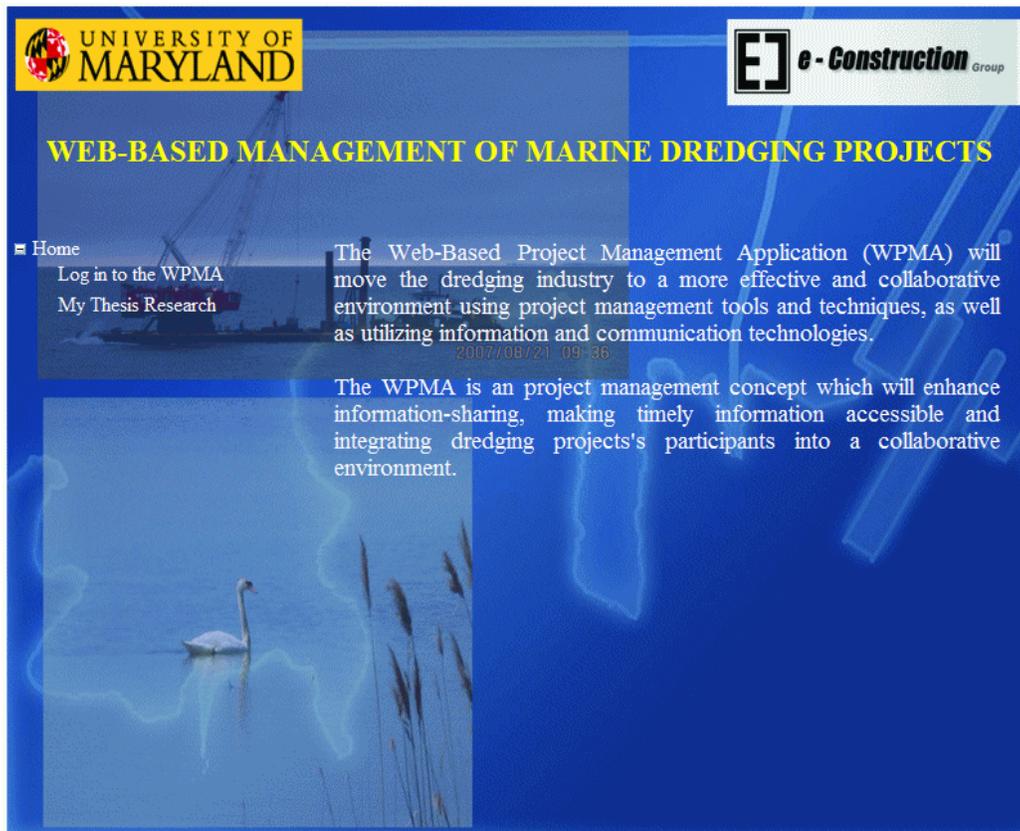
The application security is configured to handle five different roles: the Owner, the Owner Team, the Contractor, the Contractor Team, and the Project Manager (PM). Each one of the users will belong to one or more of these roles and will benefit from the privileges associated with that role. The project Owner and high level management staff will be assigned to the role called "Owner." Usually all management levels above the PM will be in this role. The Owner team members, generally the PM and all project staff, will belong to the role called "Owner Team." Contractor's higher level of management, generally levels above the PM, will belong to the role called "Contractor." All contractor personnel and staff assigned to the

project will belong to the role called the “Contractor Team.” Owner and Contractor PM’s and other authorized personnel will belong to the role called “PM.” Role privileges will be established by the PM.

10.1. Home Page

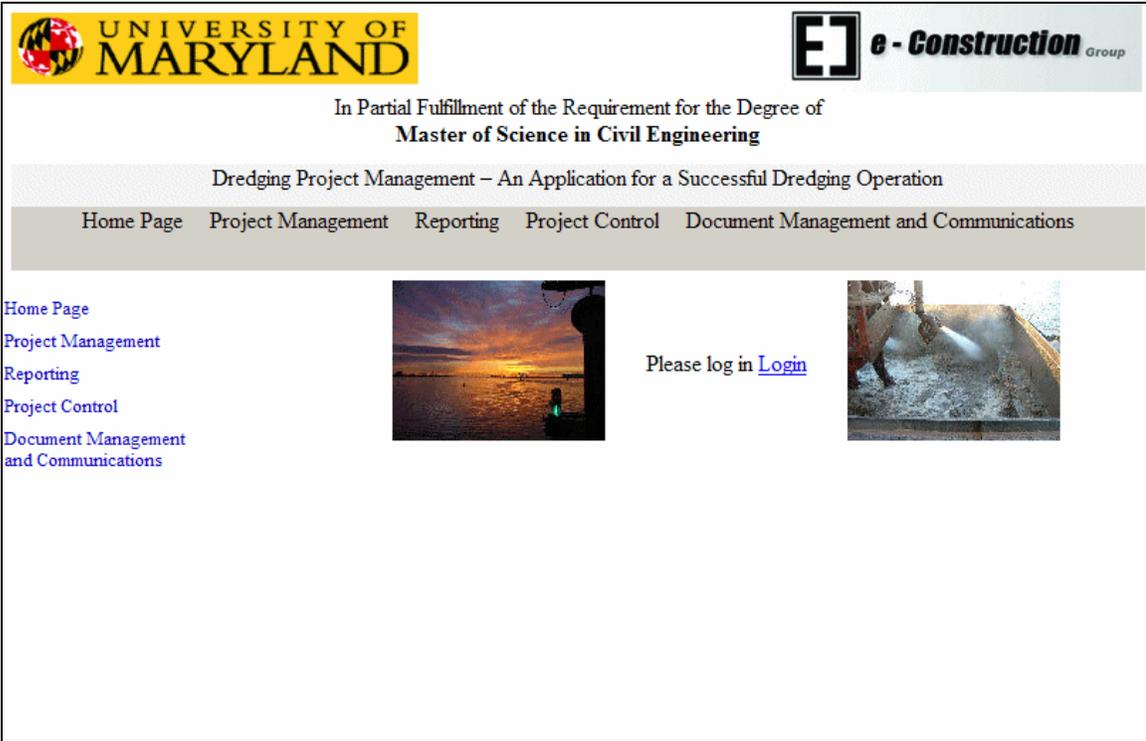
Home Page – The description of the application functions will begin with the description of the application Home Page depicted in Figure 51. The code for the Home Page and its functions are shown in Appendix C, Section C-1. This page serves as the doorway to the application and contains an explanation of the application purpose. This page contains two links on the left hand side: one link directs the user to the WPMA application, and the other link directs the user to the Thesis Research and the application documentation.

Figure 51. WPMA Home Page



Login Page – Figure 52 depicts the screen shot for the WPMA Login Page. The code for this page and its functions are shown in Appendix C, Section C-2. The Login Page applies the security for the web application. This page features a menu bar bellow the page banner, a quick link bar on the left hand side of the screen, and the page content in the center of the page containing the log in control and two photographs. Programmatically, this page is assembled from two different types of page structures - the master page and the content page. The master page is a standardized shell structure that applies customized functions and style to all the pages of the web application, giving the site uniformity. The content page is displayed in a placeholder control of the master page.

Figure 52. Depicts the WPMA Login Page



The Login Page contains links to the four application modules: the Project Management Module, the Reporting Module, the Project Control Module, and the document Management and Communication Module. When the customer clicks on any of the links, he will be directed to a page customized for the corresponding module with a login control. After applying his credential, he will be redirected to the module central page. On the other hand, if the client clicks the login link first, he will be directed to a generic login page with a login control, and after applying his credentials, he will be redirected to the initial page but in a logged-in mode. At this stage, the user can decide to logout or to select a link to one of the modules.

10.2. Project Management Module

This module is used to create the project in the WPMA and to store the project initial information that will be used as the project baseline by the other modules. This module encompasses several user interfaces. The Central page serves as the entrance to the module's various data input forms: the Owner Information Input Form, the Contractor Information Input Form, The Project information Input Form, the Bid Information Input Form, The Bid Item Information Input Form, the Activity Information Input Form, The Reach Information Input Load, and the Cut Information Input Load. Figure 53 to 57 depicts the Project Management's primary user interfaces. The code is shown in Appendix C, Section C-3.

The data gathered in the Project Management module serves as a base for the other modules. All other modules use the Project Management module data to assemble the information used in the reports (see Figure 58 for the module ERD). For example: the foundation of the data gathered by the Reporting module during a dredging operation is the equipment performance. This information is collected daily and assessed on every load that the dredge or unloader performs. Each load is related to the project depending on the cut it came from and the contract (Bid) it belongs to. In this way, the type of material, the position of the dredge, and the performance during dredging or the performance during the unloading operation for each load will be related to other important project entities, such as Activity, Bid Item, Bid, Contractor, and Project. For report generation and in future project assessments the

application can evaluate different equipment performances depending on the type of material, the geographical areas, the contract, and the project under which the job has been performed.

Figure 53. WPMA Project Management Central Page

In Partial Fulfillment of the Requirement for the Degree of
Master of Science in Civil Engineering

Dredging Project Management – An Application for a Successful Dredging Operation

Home Page Project Management Reporting Project Control Document Management and Communications

Congratulations " orlandovecino ". You are logged in to the Project Management information submission area.

[INPUT CLIENT INFORMATION](#)

[INPUT CONTRACTOR INFORMATION](#)

[INPUT BID INFORMATION](#)

[INPUT BID ITEMS INFORMATION](#)

[INPUT ACTIVITY INFORMATION](#)

[INPUT REACH INFORMATION](#)

[INPUT CUT INFORMATION](#)

[Home Page : Project Management](#)

Figure 54. WPMA Owner Information Input Form

COMPANY INFORMATION -- PROJECT OWNER

Company Name: Maryland Port Administration
 Street Address: 2050 Baltimore Street
 City: Baltimore
 State: Maryland
 Zip Code: 21022
 Phone: 410-824-2345
 Representative Name: John Walsh
 Email: jwalls@pob.com
 Comments: No comments

[Edit](#) [Delete](#) [New](#)
[Input Employee Information](#)
[Input Project Information](#)

	Client Name	Street Address	City	State	Zip	Phone	representativename	Email	Comments
Select	Maryland Port Administration	2050 Baltimore Street	Baltimore	Maryland	21022	410-824-2345	John Walsh	jwalls@pob.com	No comments
Select	Maryland Environmental Services	2150 Chesapeake Road	Columbia	Maryland	20234	410-885-2678	Robert Mcmilan	rmacmilan@mas.com	No comments

Figure 55. WPMA Contractor Information Input Page

CONTRACTOR INFORMATION

Name: GBADe
 Street Address: 2345 Yellow Brick Road
 City: Baltimore
 State: Maryland
 Zip Code: 23456
 Phone: 234-567-7869
 Representative Name: Gustavo Vecino
 Comments: No comments

[Edit](#) [Delete](#) [New](#)
[Back to Contract Information](#)
[Next to Contractor Employee Inf.](#)

	Contractor Name	Address	City	State	Zip Code	Phone	Representative	Comments
Select	GBADe	2345 Yellow Brick Road	Baltimore	Maryland	23456	234-567-7869	Gustavo Vecino	No comments
Select	DPM	4567 Colling Point	Baltimore	Maryland	23987	410-765-4356	James Bond	No Comments

Figure 56. WPMA Project Information Input Form

[Back](#) [Next](#)

PROJECT INFORMATION

Project Name	Seagirt Dundalk
Location	Baltimore Harbor
Street Address	Baltimore Street
City	Baltimore
State	Maryland
Zip Code	21345
Phone	410-884-2993
Project Pay Unit	cy
Quantity	4,500,000.00
Project Unit Price	\$11.00
Project Start Date	4/15/2007
Project End Date	1/15/2008
Type Of Dredging Work	New Work
Comments	No Comments

[Edit](#) [Delete](#) [New](#)

Figure 57. WPMA Bid Information Input Form

[Back](#) [Next](#)

CONTRACT INFORMATION

Contract Number	07-07-07
Contract Name	Seagirt-Dundalk-Masonville Dredging
Contract Unit	cy
Contract Quantity	4,600,000.00
Contract Unit Price	\$12.00
Contract Start Date	3/15/2007
Contract End Date	1/3/2008
Comments	No comments

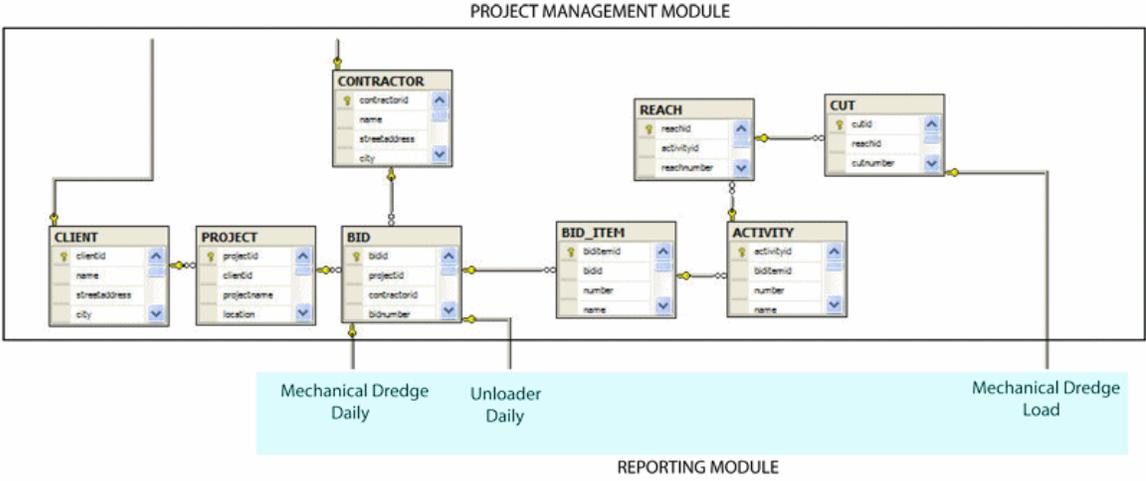
[Edit](#) [Delete](#) [New](#)

[Back to Project Information](#)

[Input Bid Item Information](#)
or
[Input Contractor Information](#)

	Contract Number	Contract Name	Unit	Quantity	Unit Price	Start Date	End Date	Comments
Select	07-07-07	Seagirt-Dundalk-Masonville Dredging	cy	4600000	12	3/15/2007 12:00:00 AM	1/3/2008 12:00:00 AM	No comments

Figure 58. WPMA Project Management Module ERD



10.3 Reporting Module

The Reporting module collects data from the unloaders and dredges and stores it in the data base, from where it is available in real time to the users. The reporting module features the forms to collect the Mechanical Dredge Daily Report and the Unloader Daily Report. Each one of the forms has a sub-form, which collects the load data for each Daily Report. Figure 59 to 63 depicts the user interfaces featured by this module. The code for the Mechanical Dredge Daily Report and the Mechanical Dredge Load information is shown in Appendix C, Section C-4.

Figure 59. Reporting Module Central Page

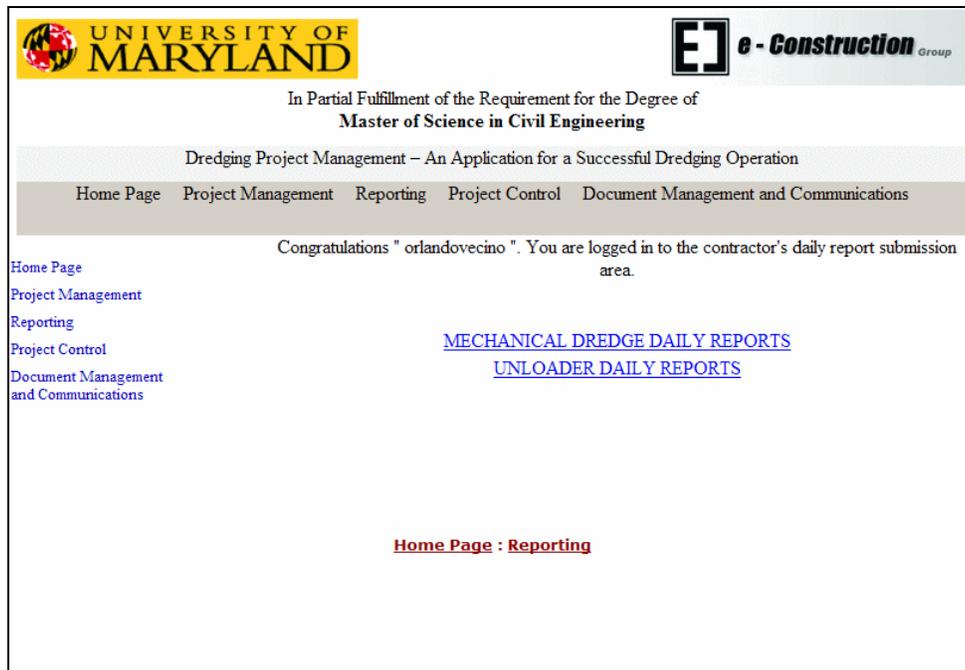


Figure 62. Unloader Daily Report Page

UNLOADER REPORT

Report Number:

Report Date:

Date Reported:

Winds:

Seas:

Skies:

Reported by:

Comments:

[Edit](#) [Delete](#) [New](#)

[Input Load Information](#)

Report No	Reported Date	Date Reported	Wind	Seas	Skies	Reported By	Comments
Select 320-2	4/19/2007 12:00:00 AM	4/18/2001 12:00:00 AM	N-NW 10-15 MPH	1-2 feet	Clear	G. Vecino	No comments
Select 320-3	4/20/2007 12:00:00 AM	4/19/2007 12:00:00 AM	N-NW 5-10 MPH	0-1 feet	Clear	A. Giseppe	No comments
Select 320-4	4/21/2007 12:00:00 AM	4/20/2007 12:00:00 AM	N-NE 5-10 MPH	0-1 feet	Clear	a> Giseppe	No comments
Select 320-5	4/22/2007 12:00:00 AM	4/21/2007 12:00:00 AM	N 5-10 MPH	4-5 feet	Clear	G. Vecino	No Comments
Select 320-6	4/23/2007 12:00:00 AM	4/22/2007 12:00:00 AM	S SE 0-10 MPH	1 feet	Clear	G. Vecino	No comments
Select 320-7	4/24/2007 12:00:00 AM	4/23/2007 12:00:00 AM	S SE 0-10 MPH	1 feet	Clear	G. Vecino	No comments
Select 320-8	4/25/2007 12:00:00 AM	4/24/2005 12:00:00 AM	N 5-10 MPH	1 feet	Clear	G. Vecino	No comments
Select 320-9	4/26/2007 12:00:00 AM	4/25/2007 12:00:00 AM	N 5-10 MPH	1 feet	Clear	G. Vecino	No comments
Select 320-10	4/27/2007 12:00:00 AM	4/26/2007 12:00:00 AM	N 5-10 MPH	1 feet	Clear	G. Vecino	No comments
Select 320-11	4/28/2007 12:00:00 AM	4/27/2007 12:00:00 AM	N 5-10 MPH	1 feet	Clear	G. Vecino	No comments

Figure 63. Unloader Load Information Page

Unloader Load Information Input

Wait for Barge: DELAY START END Inflow Station:

Change Scow: DELAY START END

Start Loading: DELAY START END

End Loading: DELAY START END

Miscellaneous: DELAY START END

Barge Left: DELAY START END

Comments:

[Edit](#) [Delete](#) [New](#)
[Back to Unloader Report](#)

10.4. Document Management Module

The first task to accomplish when a dredging project is selected and implementation starts is to define its concept and feasibility. These tasks encompass extensive investigations that are finalized in two comprehensive reports - the Conceptual Report and the Feasibility Report. As a result, a large list of documents and drawings will need to be organized and stored in the repository which may be accessible by stakeholders from different geographical locations. In addition, management strategies to accomplish potential contractor participation from the early stages of the project life cycle may need to be implemented. The Document Management module will serve these needs.

This module publishes the project documents and drawings. In the early stages of the project life cycle, this module serve as the platform from which the potential contractors and the public will grasp the project characteristics, as the support platform for the project's team documentation management, and as the support for the value engineering processes. The Document Management module core components are: The Project Team Collaboration and Documentation site and the Community Team Collaboration and Documentation Site. These top level sites can be developed and customized by users with special privileges in to a collection of sites that serves as a repository for the project documentation. Figures 64 and 65 depict the user interfaces featured by this module. The Document Management Module runs on the Microsoft Reporting Services environment. Programmatically, this module is a web-based component designed by Microsoft to support reporting functions.

Figure 64. Documentation Management and Communications Central Page

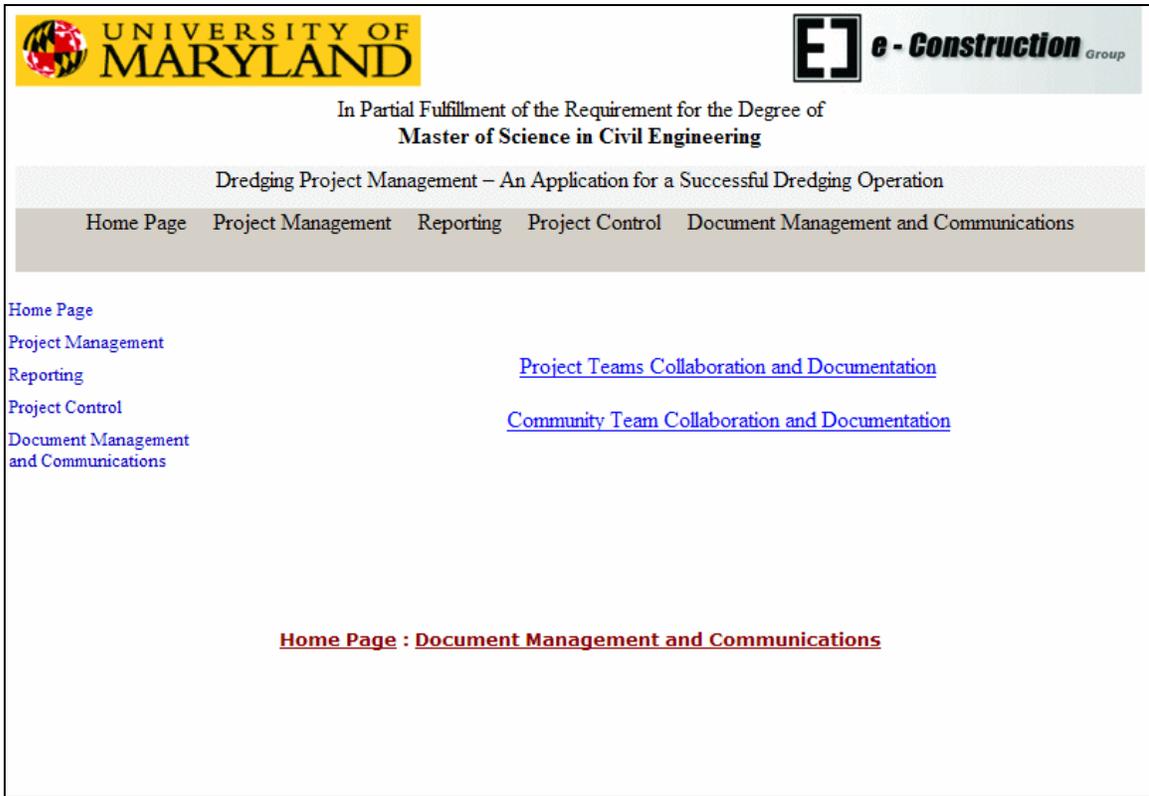
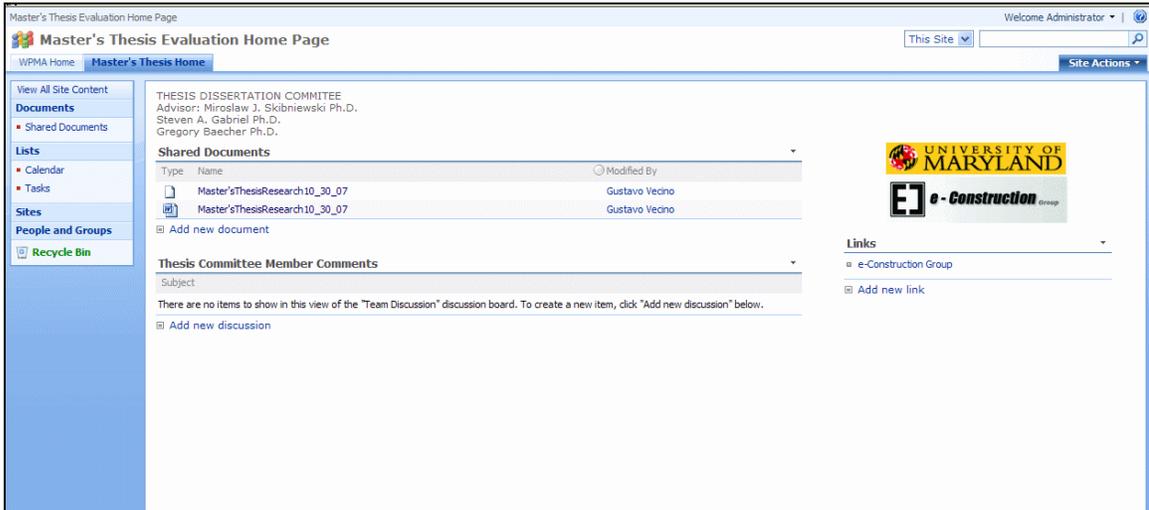


Figure 65. WPMA Project Team Page



10.5. Project Control Module

During the construction phase, the Project Control module is the WPMA component that automates the WPMA information Processes. This feature is important for creating a real-time information flow to the various levels of project management. The Project Control Module processes the data stored in the database and automates the report generation procedures. This module features the following reports: the dredges and unloaders daily reports, the project weekly summary report, the production performance graphics. Figures 66 to 67 depict the Project Control Module user interfaces. The Project Control Module runs on Microsoft Sharepoint environment. Programmatically this module is a web-based component designed by Microsoft to support document management and collaboration.

Figure 66. Dredge Daily Report

Project	Date Reported	Report #	Dredge #	Skids	Seas	Wind	Comments					
Seagirt Dundalk	11/8/2007	530-202	550	Rain	1-2 feet	NW 0-5 MPH	No comments					
LOAD INF.		DELAYS (hours)				DURATION (hours)		PRODUCTION				
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total Delay	Tot Loading	Effective Loading	Avg Dig (cy)	Avg Pay (cy)	CY/Hr
2030	254		.2	Before Loading Detail	Loading Detail	After Loading Detail	.2	1.9	1.9	852	852	445
2032	255		.2	Before Loading Detail	Loading Detail	After Loading Detail	.2	6.8	6.8	2,556	2,556	374
2034	113		.2	Before Loading Detail	Loading Detail	After Loading Detail	.2	6.8	6.8	2,487	2,487	368
LOAD INF.		Click for Details DELAYS (hours)				DURATION (hours)		PRODUCTION				
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total Delay	Tot Loading	Effective Loading	Avg Dig (cy)	Avg Pay (cy)	CY/Hr
TOTAL	3		.5				.5	15.5	15.5	5,895	5,095	1,107

Figure 67. Unloader Daily Report

SQL Server Reporting Services
 Home > UnloaderDailyReport >
TodayUnloaderReport

Home | Site Settings | Help
 Search for: Go

View Properties

1 of 2 100% Find | Next Select a format Export

Today's Unloader Report Summary

Project	Report Date	Report #	Unloader	Skies	Seas	Wind	Comments						
	11/5/2007	320-202	320	Rain	1-2 feet	NW 5-10 MPH	No comments						
LOAD INF.			DELAYS (hours)					DURATION (hours)				PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Dig (cy)	CY/Hr		
2030	254		.2				.2	2.1	2.1		852	409	
2032	255		.2				.2	2.8	2.8		2,556	902	
2034	113		.2				.2	4.1	4.1		2,487	609	
2031	110		.2				.2	3.1	3.1		2,261	733	
2033	112		.2				.2	2.4	2.4		2,796	1,157	
2035	254		.2				.2	2.3	2.3		2,878	1,233	
TOTALS	6		1				1	16.8	16.8		13,830	841	
Reported By:													
TOTALS	6		1				1	16.8	16.8		13,830	841	

Figure 68. Dredge Weekly Summary Report

SQL Server Reporting Services
 Home > WeeklyReport >
WeeklyAccumulated

Home | Site Settings | Help
 Search for: Go

View Properties

1 of 2 100% Find | Next Select a format Export

Dredge Weekly Summary Report

Project	Week start at:	Week #	Planned Qty (CY)	Comments									
Seagirt Dundalk	4/15/2007	1	168,080	No Comments									
LOAD INF.			DELAYS (hours)					DURATION (hours)				PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Dig (cy)	Avg Pay (cy)	CY/Hr	
Report - S50-1	Dredge # 550												
SUB-TOTALS	19	22.5	7	3.5	4.4	6.4	58.4	62.6	58.2	50,327	43,711	903	
Report - S51-2	Dredge # 551												
SUB-TOTALS	19	28.4	2.5	8.3	5.7	4.5	55	58	52.3	53,878	51,405	1,059	
TOTALS	38	50.9	9.5	11.8	10	10.9	113.5	120.5	110.5	104,205	95,116	981	
Reported By: G. Vecino											Accumulated Pay Qty		95,116
Project	Week start at:	Week #	Planned Qty (CY)	Comments									
Seagirt Dundalk	4/23/2007	2	147,070	No comments									
LOAD INF.			DELAYS (hours)					DURATION (hours)				PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Dig (cy)	Avg Pay (cy)	CY/Hr	
Report - S50-6	Dredge # 550												
SUB-TOTALS	37	67.8	18.6	5.8	9.4	2	103.5	103.3	93.9	68,477	61,215	847	
Report - S51-6	Dredge # 551												
SUB-TOTALS	36	80.4	4.1	-1126	7.8	5.3	-1028.4	94.6	86.8	68,696	60,116	967	
TOTALS	73	148.2	22.7	-1120.2	17.2	7.3	-924.9	197.9	180.7	137,173	121,331	904	
Reported By: G. Vecino											Accumulated Pay Qty		216,447
Project	Week start at:	Week #	Planned Qty (CY)	Comments									

Figure 69. Unloader Weekly Summary Report

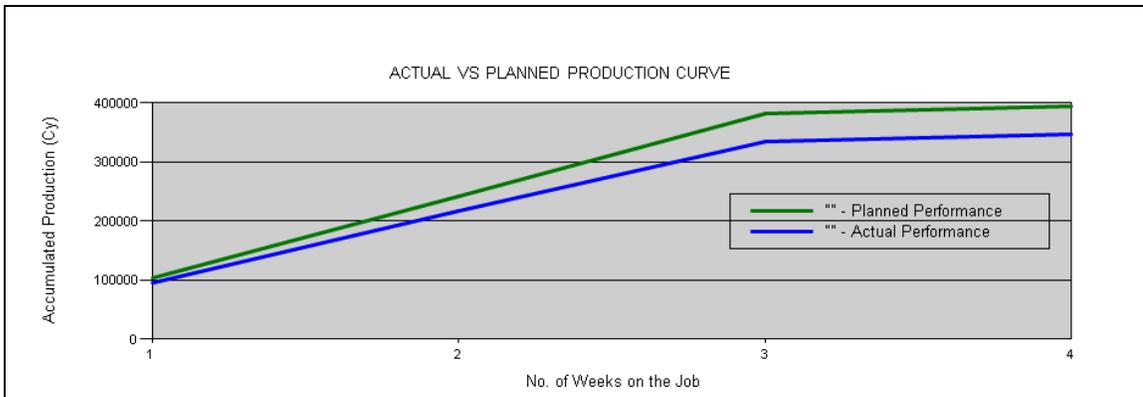
SQL Server Reporting Services
[Home](#) > [WeeklyReports](#) > **WeeklyAccumulated**
[View](#) [Properties](#) [Home](#) | [Site Settings](#) | [Help](#)
 Search for:

14 4 1 of 2 100% Find | Next Select a format Export

Unloader Weekly Summary Report

Project	Week start at:	Week #	Unloader	Skies	Seas	Wind	Comments				
	4/15/2007	1	320	Clear	1-2 feet	N-NW 10-15 MPH	No comments				
LOAD INF.			DELAYS (hours)				DURATION (hours)			PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Pay (cy)	CY/Hr
TOTALS	38	13.1	14.3	10	.8		38.2	56	55.2	95,116	2,299
Planned Qty (cy)		Reported Qty (cy)	Production Variance	Production Index							
168,080		96,736	-71,344	.58							
Project	Week start at:	Week #	Unloader	Skies	Seas	Wind	Comments				
	4/23/2007	2	320	Clear	1 feet	S SE 6-10 MPH	No comments				
LOAD INF.			DELAYS (hours)				DURATION (hours)			PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Pay (cy)	CY/Hr
TOTALS	73	5.3	30.9	37.5	5.7	1.6	80.9	140.7	135.1	121,331	1,496
Planned Qty (cy)		Reported Qty (cy)	Production Variance	Production Index							
315,150		216,447	-98,703	.69							
Project	Week start at:	Week #	Unloader	Skies	Seas	Wind	Comments				
	4/30/2007	3	320	Clear	1 feet	N 5-10 MPH	No comments				
LOAD INF.			DELAYS (hours)				DURATION (hours)			PRODUCTION	
Load #	Barge #	Waiting for Barge	Changing Barge	Before Loading	During Loading	After Loading	Total	Tot Loading	Effective Loading	Avg Pay (cy)	CY/Hr
TOTALS	68	26.8	31.3	-6.2	4.9		56.8	90.6	85.7	118,980	1,729
Planned Qty (cy)		Reported Qty (cy)	Production Variance	Production Index							
482,220		335,427	-126,793	.73							

Figure 70. Project Production Performance



SECTION III – CONCLUSION AND RECOMMENDATION

Chapter 11. Conclusion

Clearly there is a need in the dredging industry to implement innovative processes to successfully and effectively manage dredging projects. Technical improvements in dredging operations and in their supporting equipment, changes in environmental regulations, and the continual variations in dredging project environments all contribute to make dredging project management increasingly complex and challenging. The application of web-based project management techniques is the key to assisting the dredging project stakeholders in their corresponding management responsibilities. The WPMA was developed as a tool to aid the dredging industry in the area of project management, leveraging modern technologies to support stakeholders' management responsibilities.

The WPMA assists in the management of a dredging project from its conception to its conclusion. This is accomplished by establishing a collaborative environment where stakeholders will share information and where communication will be optimized by the effective collection, automation, and distribution of project information. In addition, the WPMA creates a foundation for the planning, forecasting, and assessment of future projects. These features are essential, because they release managers from the burden of manually processing information, allowing more time

for analysis, planning, inspection, and supervision. These key features of the WPMA are summarized in the following paragraphs.

Collaboration – Sharing project information and facilitating a friendly environment for communication are key ingredients in building an atmosphere of collaboration. The WPMA utilizes the power of the Internet to create a hub where project stake holders can meet, share, and collaborate.

Performance – By facilitating the collection, automation, and distribution of project information, the WPMA enhances project performance and boosts project productivity. The fundamental nature of the WPMA requires precise planning of a dredging project and its performance, and combined with an optimal flow of real-time information, enhances decision-making and overall control of project performance.

Reliability – Full utilization of the WPMA as both a technological tool and a project management strategy establishes the reliability of each dredging project on several levels. Because the framework of the WPMA involves potential contractors in the project from its earliest stages, the possibility of significant risk is greatly limited, and value engineering is more effectively performed. In addition, automation of data processing and real-time communication reduce the possibility of human error, ensuring the reliability of the information system as a whole. Finally, because the WPMA creates a collaborative environment in which all of the key players work

together cooperatively, transparency occurs, confidence is increased, and the ultimate success of the project is ensured.

Chapter 12. Recommendations

As a result of the in-depth research into project management needs within the dredging industry, the idea of the Web-based Project Management Application began to take shape, and innovative project management techniques and strategies emerged. Now is an opportune time to fully develop not only the technological aspects of the WPMA, but also the theory and strategic framework which is truly at the core of this research. The recommendations are to continue the development of the necessary software application, to educate the industry as to the far-reaching benefits of the WPMA, and ultimately to commercialize the WPMA.

12.1 WPMA Development

The design section of this thesis (Section 3, WPMA Software Design) provides the specifications from which the first release of the WPMA prototype was developed. The methodology used in the development of the WPMA is a cycled process used to optimize the application prototype, and we are currently in the first cycle in the development of the WPMA. The key components developed in this prototype are: the Project Management Module; the Reporting Module; the Project Control Module; and the Document Management Module. Future requirements will determine the implementation of additional modules.

“Future Functional Requirements” in Section 2.2.1 describes the modules and other functions to be implemented in the second cycle of the WPMA development process.

These modules are: Cost and Budgeting, Scheduling, and Communication. Other additional functions defined in the future requirements include the capability to connect to a local area network in the event the Internet connection fails. In addition, current modules will be enhanced. For example, the project control module will show the dredge position within the current geographical area and will be able to log the location of the dredge in real time. This feature will serve several objectives: assessment of dredging operations in relation to dredged areas; material dredged; equipment performance; and cost. Similarly, real-time dredge positioning will allow real-time assessment of the volume dredged, improving the information quality and automating daily volume calculations.

12.2 Educating the Industry

The far-reaching benefits of the WPMA and the great need within the dredging industry for innovative and successful project management strategies demand that we provide the necessary information and education in all aspects of the WPMA. This can be accomplished through participation in industry conferences, such as the annual Conference and Workshop on Contract Management for Dredging and Maritime Construction conducted by the Central Dredging Association, as well as networking with other professionals and company representatives within the dredging industry. In addition, the website associated with the WPMA is an educational resource in itself, allowing visitors to explore the WPMA framework. The publication of educational articles in industry journals and magazines can also be a useful

educational tool. There are numerous possibilities for informing and educating the dredging industry about this ground-breaking project management paradigm.

12.3 WPMA Commercialization

The implementation and commercialization of the WPMA into the dredging industry market is a promising endeavor. Commercializing the WPMA to the dredging industry will result in the following benefits to its users: the automation of monotonous manual tasks and reduction in errors; the provision of innovative services to customers; an increase in organizational efficiency, flexibility, and morale. These benefits can be measured by the reduced cost of projects, the increased profit margin for contractors through improvement in personnel performance and enhanced decision-making functions, and finally, by overall project performance.

12.4 Implementation Scenario

The implementation of the WPMA began with the motivation to store dredging project information in a repository. This would have facilitated the assessment of actual projects by accessing historical information. When applied to dredging projects, this idea generated the possibility of automating project management processes, project data processing, reporting, document management, communication processes, cost and budget, and scheduling. The concept for the WPMA evolved and changed, and as a result, the final framework now has even more far-reaching and diverse capabilities than originally imagined. The WPMA not only stores project information, but also automates the collection, processing, and distribution of the

information for project planning, control, forecasting, and assessment of actual and future dredging projects.

Investigation and planning revealed that the avenue most suited to the nature of the project was the implementation of an operational prototype as the methodology for the development of the application. Four core initial modules were defined to commence the development of the application. These modules lay the foundation for an architecture that is open, scalable, and flexible, permitting virtually unlimited future expansions. The operating system selected is reliable, with a high level of integration among the tools necessary to develop the application. The development and production tools needed for the application were: Visual Studio 2005, Small Business Server 2003, SqlServer 2005, Reporting Services, SherePoint V3.

At this stage in the life cycle of the application, the first revision of the prototype can be performed, finalizing its first cycle. During the development and implementation of the prototype, all unit functions were tested and operational before continuing to higher levels of code. At the current stage, the application has been tested for all unit functions, and all initial requirements have been met.

APPENDIX A –PROJECT REPORT FORMS

Figure A-1. Project Information

MPA LOGO		PROJECT INFORMATION REPORT			MES LOGO
		Type of Work	Maintenance	X	New Work
PROJECT INFORMATION					
Project ID	MPA0107				
Project Name:	Seagirt Widening and Deepening				
Contract No.:	7/7/2015				
Location:	Baltimore Harbor				
Owner Name	MPA				
Representative					
Project Manager					
Address					
Phone					
Project Unit					
Project City					
Project Start Date					
Unit Price (\$)					
CONTRACTOR INFORMATION					
Contractor Name					
Representative					
Project Manager					
Superintendent					
Address					
Phone					

Figure A-4. Unloader Information Submittal

MPA LOGO		UNLOADER INFORMATION SHEET										MES LOGO	
PROJECT INFORMATION													
Project ID	MPA0107	Project Name:	Seagirt Widening and Deepening							Date			
Contract No.:	7/7/2015	Owner:	MPA							Reported By:			
Location:	Baltimore Harbor	Contractor:	GLDD										
UNLOADER INFORMATION													
Unloader ID	Name	Type	Official No.	Home Port	Hull Dimensions			Power		Fuel Cpty. (gal)	Water Cpty. (gal)	Comments	
					Width	Length	Height	Type	Rated HP				
PUMP INFORMATION													
Unloader ID	Pump Type	Manufacturer Name	Model / Serial No.	Owner ID	Suction Dia. (in)	Discharg Dia. (in)	Impeller Dia. (in)	Engine Rated		Comments			
								RPM	Gear Relia		HP		
	Main Pump												
	Snorkle Pump												
	D/Water Pump												

Figure A-8. Unloader Daily Report.

MPALOGO	UNLOADER DAILY REPORT										MES LOGO		
PROJECT INFORMATION			WORK ACTIVITY			EQUIPMENT INFORMATION			WEATHER INFORMATION			REPORT INFORMATION	
Project Name Seagrass Widening and Deepening		Activity Maintenance	Unloader No. 1		Unloader No. 2	Equipment Type		Wind	Seas		Report No.	Report Date	
Contract No.: 7/7/2015		Location: Baltimore Harbor	New Work	Equipment Name:	Seas	Skies	Date Reported						
Load No.	Scow No.	PIPELINE		UNLOADER PUMPS		BOOSTER PUMPS		CELL CONDITIONS		RECIRCULATION UNIT		SPECIAL COMMENTS	
		Start	Finish	CY Dig	Diameter (ft)	Main Pump (PSI)	Snoke Pump (PSI)	Dilution Pump (PSI)	Booster No. 1 (PSI)	Booster No. 2 (PSI)	Inflow Station		Pond Elevation
DELAYS													
Change Scow													
Weather													
Wait for Light Scow													
Wait for Tug													
Scow Repair													
Shore Work													
Floating Pipeline													
Shore Pipeline													
Work Disposal Site													
Main Pump Repairs													
Snoke Pump Repairs													
Booster Pump Repairs													
Recirculation Pump Repairs													
Engine Room Repairs													
Winch/Wires Repairs													
Hydraulic Rams Repairs													
Water Monitor's Repairs													
Clean Snoke Pump													
Clean Main Pump													
Clean Shearer Pins													
Make Up Water Pump													
Fuel XFR													
Miscellaneous													
Load No													
ATTENDANT PLANT													
ID													
NAME													
ID													
NAME													
PERSONNEL													
Contractor Name													
AREA													
No.													
PM Name													
Supervisory & Administrative													
Captain Name													
Unloader Crew													
Reported By													
Attendant Plant Crew													
Position													
CONTRACTOR COMMENTS													

**APPENDIX B –APPLICATION REQUIREMENT
DEFINITION**

B-1. Project management Module Data Requirements

7.3.2.1 The initial construction project information shall collect the following information: Client, project, contractor, equipment, bid, bid items, and activity information. The data defining that define the initial construction project information is depicted in the Appendix X, Section XX.

Client Information

Fields	Type	Field Size	Format
Name	Text	50	
Address	Text	50	
Phone	Text	50	
Email	Text	50	

Project Information

Fields	Type	Field Size	Form
Project Name	Text	50	
Contract No.	Text	15	
Location	Text	50	
Owner Name	Text	50	
Representative	Text	50	
Project Manager	Text	50	
Address	Text	50	
Phone	Text	12	
Project Unit	Text	5	
Project Quantity	Number	8	0 decimals
Unit Price (\$)	Number	12	0 decimals
Project Start Date	Date		mm/dd/yyyy
Type of Work	List Box		
Contractor Name	Text	50	
Representative	Text	50	
Project Manager Name	Text	50	
Superintendent	Text	50	
Address	Text	50	
Phone	Text	12	

Bid Information

Activity ID	Text	15
Project ID	Text	15
Activity No.	Text	15
Activity Name	Text	50
Description	Text	100

Bid Item Information

Fields	Type	Field Size	Format
Activity ID	Text	15	
Project ID	Text	15	
Activity No.	Text	15	
Activity Name	Text	50	
Description	Text	100	

Activity Information

Fields	Type	Field Size	Format
Sub-activity ID	Text	15	
Activity ID	Text	15	
Sub-activity No.	Text	5	
Sub-activity Name	Text	50	
Unit	Text	5	
Planned Qty	Number	6	0 decimal
Unit Cost	Number	8	2 decimal
Early Start	Date		mm/dd/yyyy
Early Finish	Date		mm/dd/yyyy

Contractor Information

Fields	Type	Field Size	Format
Name	Text	50	
Address	Text	50	
Phone	Text	50	
Email	Text	50	

Equipment Information

Fields	Type	Field Size	Format
Equipment ID	Text	15	
Project ID	Text	15	
Name	Text	50	

Type	Text	15	
Rated HP	Number	6	0 decimals

Bucket Information

Fields	Type	Field Size	Format
Bucket ID	Text	15	
Equipment ID	Text	15	
Manufacturer Name	Text	50	
Owner's ID	Text	15	
Type	Text	15	
Model/Serial No.	Text	15	
Struck (CY)	Number	5	0
decimals			
Weight	Number	6	0 decimals

Pump Information

Fields	Type	Field Size	Format
Pump ID	Text	15	
Equipment ID	Text	15	
Pump Type	Text	50	
Manufacturer Name	Text	50	
Model/Serial No.	Text	15	
Suction Diameter (in)	Number	4	0 decimals
Discharge Diameter	Number	4	0 decimals
Impeller Diameter	Number	4	0 decimals
Engine Rated RPM	Number	6	0 decimals
Gear Relation	Number	4	2 decimals
Engine Rated HP	Number	6	0 decimals
Comments	Text	100	

Tug Information

Fields	Type	Field Size	Format
Tug ID	Text	15	
Equipment ID	Text	15	
Name	Text	50	
Type	Text	50	
Rated HP	Number	6	0 decimals

Scow Information

Fields	Type	Field Size	Format
Scow ID	Text	15	

Equipment ID	Text	15	
Name	Text	50	
Type	Text	50	
Width (ft)	Number	4	0 decimals
Height (ft)	Number	4	0 decimals
Length (ft)	Number	4	0 decimals
Capacity (cy)	Number	6	0 decimals

Barge Information

Fields	Type	Field Size	Format
Barge ID	Text	15	
Equipment ID	Text	15	
Name	Text	50	
Type	Text	50	
Width (ft)	Number	4	0 decimals
Height (ft)	Number	4	0 decimals
Length (ft)	Number	4	0 decimals

Pump-unit Information

Fields	Type	Field Size	Format
Pump-unit ID	Text	15	
Equipment ID	Text	15	
Type	Text	50	
Manufacturer Name	Text	50	
Model/Serial No.	Text	15	
Suction Diameter (in)	Number	4	0 decimals
Discharge Diameter	Number	4	0 decimals
Impeller Diameter	Number	4	0 decimals
Drive Rated RPM	Number	6	0 decimals
Gear Relation	Number	4	2 decimals
Drive Rated HP	Number	6	0 decimals

Comments

B-2. Reporting Module Data Requirements.

7.3.4.1 The Reporting Module Capability shall collect the contractor daily operation report from the dredges, Unloaders, and Tugs.

The Dredge Report information shall contain the following:

Dredge Report Information

Fields	Type	Field Size	Format
Report ID	Text	15	
Project ID	Text	15	
Report No.	Text	15	
Report Date	Date		mm/dd/yyyy
Date Reported	Date		mm/dd/yyyy
Wind	Text	20	
Seas	Text	20	
Skies	Text	20	
Supervisory/Administrative decimals	Number	5	0
Dredge Crew decimals	Number	5	0
Equipment Name	Text	50	
Contractor Name	Text	50	
Project Manager Name	Text	50	
Dredge Captain Name	Text	50	
Reported by	Text	50	
Contractor Remarks	Text	200	

Dredge Load Information

Fields	Type	Field Size	Format
Load ID	Text	15	
Report ID	Text	15	
Load No.	Text	10	
Activity ID	Text	15	
Sub-activity Name	Text	50	
Bucket ID	Text	15	

Scow No.	Text	10	
Reach No.	Text	10	
Cut No.	Text	15	
Station From	Text	15	
Station To	Text	10	
Range From	Text	5	
Range To	Text	5	
Start Loading	Time		hh:mm:PM
Finish Loading	Time		hh:mm:PM
Traffic Delay	Number	6	2 decimals
Weather Delay	Number	6	2 decimals
Waiting for Light Scow	Number	6	2 decimals
Wait for tug	Decimal	6	2 decimals
Wait For Survey (Contractor)	Decimal	6	2 decimals
Wait For Survey (Owner)	Decimal	6	2 decimals
Scow Repairs	Decimal	6	2 decimals
Dredge Repairs	Decimal	6	2 decimals
Bucket Repairs	Decimal	6	2 decimals
Fuel XFR	Decimal	6	2 decimals
Handling Debris	Decimal	6	2 decimals
Grease	Decimal	6	2 decimals
Set Ahead/ Back	Decimal	6	2 decimals
Paint Mark	Decimal	6	2 decimals
Positioning System	Decimal	6	2 decimals
Change Scow	Decimal	6	2 decimals
Move to New Cut	Decimal	6	2 decimals
Inspection by Owner decimals	Decimal	6	2
Miscellaneous	Decimal	6	2 decimals
Avg. Dig Face	Number	4	1 decimal
Avg. Dig width	Number	4	0 decimal
Travel	Number	5	0 decimal
Area	Number	7	0 decimal
Dig Qty	Number	7	0 decimal
Pay Qty	Number	7	0 decimal
Comments	Text	200	

Dredge-Attendant-Plant Information

Fields	Type	Field Size	Format
Plant ID	Text	15	
Report ID	Text	15	
Plant Name	Text	15	

7.3.4 The Communication Retrieval Capability shall collect the following information from the Unloader Report: Unloader, Load, and Unloader-Attendant-Plant Information.

7.3.4.1 The Unloader Report information shall contain the following:

Unloader Information

Fields	Type	Field Size	Format
Report ID	Text	15	
Project ID	Text	15	
Report No.	Text	15	
Report Date	Date		mm/dd/yyyy
Date Reported	Date		mm/dd/yyyy
Wind	Text	20	
Seas	Text	20	
Skies	Text	20	
Supervisory/Administrative decimals	Number	5	0
Unloader Crew	Number	5	0 decimals
Unloader Name	Text	50	
Contractor Name	Text	50	
Project Manager Name	Text	50	
Unloader Captain Name	Text	50	
Reported by	Text	50	
Contractor Remarks	Text	200	

7.3.4.2 The Unloader Load information shall contain the following:

Unloader Load Information

Fields	Type	Field Size	Format
Load ID	Text	15	
Report ID	Text	15	
Load No.	Text	10	
Scow No.	Text	10	
Start Unloading	Number	6	2 decimals
Finish Unloading	Number	6	2 decimals
CY Dig	Number	6	0 decimals
Pipe Line Diameter (in)	Number	3	0 decimals
Pipeline Length (ft)	Number	6	0 decimals
Main Pump (PSI)	Number	3	0 decimals
Snorkel Pump (PSI)	Number	6	0 decimals

Dilution Water Pump (PSI)	Number	6	0 decimals
Booster No. 1 (PSI)	Number	6	0
decimals			
Booster No. 2 (PSI)	Number	6	0
decimals			
Inflow Station	Text	8	
Pond Elevation (ft)	Number	3	0 decimals
Recirculation Start	Number	6	2 decimals
Recirculation Stop	Number	6	2 decimals
Recirculation (PSI)	Number	3	0 decimals
Change Scow	Number	3	0 decimals
Weather	Number	6	2 decimals
Waiting for Light Scow	Number	6	2 decimals
Wait for Tug	Number	6	2
decimals			
Scow Repairs	Number	6	2 decimals
Shore Work	Number	6	2 decimals
Floating Pipeline	Number	6	2 decimals
Shore Pipeline	Number	6	2 decimals
Work at Disposal Site	Number	6	2 decimals
Main Pump Repair	Number	6	2 decimals
Snorkel Pump Repair	Number	6	2 decimals
Booster Pump Repair	Number	6	2 decimals
Recirculation Pump Repair	Number	6	2
decimals			
Engine Room Repair	Number	6	2 decimals
Winches & Wires	Number	6	2 decimals
Hydraulic Rams	Number	6	2 decimals
Water Monitors	Number	6	2 decimals
Clean Snorkel	Number	6	2 decimals
Clean Main Pump	Number	6	2 decimals
Clean Sheared Pins	Number	6	2 decimals
Dilution Water Pump	Number	6	2 decimals
Fuel XFR	Number	6	2 decimals
Miscellaneous	Number	6	2 decimals

Unloader-Attendant-Plant Information

Fields	Type	Field Size	Format
Plant ID	Text	15	
Report ID	Text	15	
	Plant Name		

7.3.5.1 The Tug Report information shall contain the following:

Tug Information

Fields	Type	Field Size	Format
Report ID	Text	15	
Project ID	Text	15	
Report No.	Text	15	
Report Date	Date		mm/dd/yyyy
Date Reported	Date		mm/dd/yyyy
Wind	Text	20	
Seas	Text	20	
Skies	Text	20	
Tug Crew	Number	5	0 decimals
Tug Name	Text	50	
Contractor Name	Text	50	
Tug Captain Name	Text	50	
Reported by	Text	50	
Contractor Remarks	Text	200	

7.3.5.2 The Tug Report information shall contain the following:

Tug Load Information

Fields	Type	Field Size	Format
Load ID	Text	15	
Report ID	Text	15	
Load No.	Text	10	
Scow No.	Text	10	
Start Towing Loaded	Number	6	2
decimals			
End Towing Loaded	Number	6	2 decimals
Draft Loaded	Number	5	2
decimals			
Draft Empty	Number	5	2 decimals
Start Towing Empty	Number	6	2
decimals			
End Towing Empty	Number	6	2 decimals
Final Location	Text	15	
Start Traveling S/Alone Btwn/Plants	Number	6	2 decimals
End Traveling S/Alone Btwn/Plants	Number	6	2 decimals
Final Location	Text	15	
Start Traveling S/Alone Btwn/Others	Number	6	2 decimals
End Traveling S/Alone Btwn/Others	Number	6	2 decimals
Final Location	Text	15	
Start Delays	Number	6	2 decimals
End Delays	Number	6	2 decimals
Comments	Text	15	

APPENDIX C – APPLICATION SOFTWARE CODE

C.1 WPMA Home Page Code

C-1.1. Master Page

Listing C-1.1. Master.master

```
<%@ Master Language="C#" AutoEventWireup="true"
CodeFile="LoginToWPMA.master.cs" Inherits="LoginToWPMA" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
    <title>Dredging Project Management</title>
</head>
<body style="vertical-align: middle; text-align: center;">
    <div style="width: 810px; position: static; height: 650px;">
        <!--
        <div style="width: 810px; position: static; height: 650px;
background-color: #0054ac;">
            -->
                <form id="form1" runat="server" >

                    <div style=" width:800px; position: relative; height:650px;
background-image: url(App_Themes/Images/background.gif);">
                        <!--
                        Logo Banner1 115px height
                        -->

                        <!--
                        <div style="width:800px; height: 115px; position:
static; text-align: left; background-color: #ffffff;">
                            -->
                            <div style="width:800px; height: 115px; position:
static; text-align: left;">

                                </div>

                                <!--
                                Greeting Banner2 30px height
                                -->
                                <!--
                                <div style=" width:800px; position: relative; height:
30px; background-color: whitesmoke; text-align: center;">
                                    -->
                                    <div style=" width:800px; position: relative; height:
30px; text-align: center;">
```

```

        <asp:Label ID="Label1" runat="server" Text="WPMA -
An Application for a Successful Dredging Operation - Revolutionary
Ideas" ForeColor="Yellow" Font-Bold="True" Font-Size="X-
Large"></asp:Label>

    </div>

    <!--
Menu Banner3 325px height
-->
    <!--
    <div style=" width:800px; position: relative; height:
25px; background-color: scrollbar;">
    -->
    <div style=" width:800px; position: relative; height:
25px;">

    </div>

    <!--
Body 250px height
-->
    <div style=" width:800px; position: relative; height:
500px;">

        <!--
        <div style="clear: left; float: left; position:
static; width: 225px; height: 550px; background-color: #ffffff; text-
align: left;">
        -->
        <div style="clear: left; float: left; position:
static; width: 225px; height: 550px; text-align: left;">
            &nbsp;
            <asp:TreeView ID="TreeView1" runat="server"
DataSourceID="XmlDataSource1" Width="329px" ForeColor="White">
                <DataBindings>
                    <asp:TreeNodeBinding
DataMember="Application" TextField="#InnerText"
NavigateUrl="~/Default1.aspx" />
                    <asp:TreeNodeBinding
DataMember="Documents" TextField="#InnerText" />
                    <asp:TreeNodeBinding
DataMember="DredgingProjectManagement" TextField="#InnerText" />
                </DataBindings>
            </asp:TreeView>
            <asp:XmlDataSource ID="XmlDataSource1"
runat="server" DataFile="~/InitialMenu.xml"></asp:XmlDataSource>

        </div>

    <!--

```

```

        <div style="width: 575px; height: 550px; clear:
none; float: right; position: relative; background-color: #ffffff;">
        -->
        <div style="width: 575px; height: 550px; clear:
none; float: right; position: relative;">
            <asp:contentplaceholder
id="ContentPlaceHolder1" runat="server">
            </asp:contentplaceholder>
        </div>
    </div>

    </div>

    <!--
    <div class="footerbg" style="position: relative; width:
800px; height: 50px; background-color: threedlightshadow; top:
175px;">
    -->
    <div class="footerbg" style="position: relative; width:
800px; height: 50px; top: 175px;">

        <div style=" width: 800px; position: relative;
height: 50px; text-align: center; vertical-align: middle; ">

            Copyright &copy; 2005 Gustavo Vecino.
gvecino@verizon.net
        </div>

    </div>

    </form>
</div>
</body>
</html>

```

Default Page

Listing C-1.2. Default.aspx

```

<%@ Page Language="C#" MasterPageFile="~/LoginToWPMA.master"
AutoEventWireup="true" CodeFile="Default.aspx.cs" Inherits="_Default"
Title="Dredging Project Management" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
<div style="position: static; width: 525px; height: 550px;">

```

```

<table style="text-align: left;">
  <tr>

    <td style="width: 525px; height: 150px; text-align:
justify;">
      <span style="color: #ff0033">
<span>News!</span><br />
</span>
      <span style="color: #ffffff; font-size: 14pt;">
The Web-Based Project Management Application (WPMA)
will move the dredging industry
to a more effective and collaborative environment
using the most advanced project
management tools and techniques, as well as
utilizing cutting-edge information and
communication technologies<br />
<br />
The WPMA is an innovative project management concept
wich will enhance information-sharing,
making timely information accessible and integrating
the dredging projects's participants
into a collaborative environment.<br />
</span>
    </td>

  </tr>

  <tr>
    <td style="width: 525px; height: 200px; text-align:
center;">
      <span style="color: #ffffff; font-size: 14pt;">You
can learn more and get on board now by participating
with the E-Construction group at the University
of Maryland. Your support of this
revolutionary project can....<br />
</span>
<br />
      <span style="color: #ff0000"><span style="font-size:
14pt">BRING YOUR DREDGING PROJECT MANAGEMENT INTO THE 21ST CENTURY
AND BEYOND!<br />
</span>
      <span style="color: #ffff33; font-size:
14pt;">ASK US HOW!<br />
</span>
<br />
      <span style="color: #ffff66">e - Construction
group<br />
          Doctor Mirosław J. Skibniewski
(mirek@umd.edu)<br />
          Gustavo Vecino
(gvecino@verizon.net)</span></span></td>

```

```

        </tr>
    </table>
</div>
</asp:Content>

```

C-2 WPMA Login Page Code

C-2.1. Default1.aspx

```

<%@ Page Language="C#" MasterPageFile="~/WpmaHomePage.master"
AutoEventWireup="true" CodeFile="Default1.aspx.cs" Inherits="_Default"
Title="Dredge Data Home Page" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
    <div style="position: static; width: 650px; height: 250px;">

        <table>
            <tr>
                <td style="width: 200px; height: 125px;">

                    <asp:Image ID="Image3" runat="server"
ImageUrl="App_Themes/Images/Amanecer.JPG" />

                </td>

                <td style="width: 250px; height: 125px;">
                    <asp:LoginView ID="LoginView1" runat="server">
                        <LoggedInTemplate>
                            You are logged in as<br />
                            <asp:LoginName ID="LoginName1"
runat="server" />
                            <br />
                            <br />
                        </LoggedInTemplate>
                        <AnonymousTemplate>
                            Please log in
                        </AnonymousTemplate>
                    </asp:LoginView>
                    <asp:LoginStatus ID="LoginStatus1" runat="server" />
                </td>

                <td style="width: 200px; height: 125px;">

```

```

                <asp:Image ID="Image2" runat="server"
ImageUrl="App_Themes/Images/Unloading.JPG" />
            </td>
        </tr>
        <tr>
            <td style="width: 200px; height: 125px;">

                </td>

            <td style="width: 250px; height: 125px;">

                </td>

            <td style="width: 200px; height: 125px;">

                </td>
        </tr>
    </table>
</div>
</asp:Content>

```

Listing C-2.2. Login Page

Login.aspx

```

<%@ Page Language="C#" MasterPageFile="~/MasterPage.master"
AutoEventWireup="true" CodeFile="Login.aspx.cs" Inherits="Login"
Title="Log In Page" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
    <asp:Login ID="Login1" runat="server" ForeColor="White">
        </asp:Login>
</asp:Content>

```

C-3. Project Management Module Code

Listing C-3.1. Project Initial Information

```
<%@ Page Language="C#" MasterPageFile="~/LoginToWPMA.master"
AutoEventWireup="true" CodeFile="ProjectInitialInformation.aspx.cs"
Inherits="ProjectInitialInformation_ProjectInitialInformation"
Title="Untitled Page" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
    <div style="text-align: center;">
        <div>

            <asp:LoginView ID="LoginView1" runat="server">
                <RoleGroups>
                    <asp:RoleGroup Roles="administrators,PM">
                        <ContentTemplate>
                            Congratilation
                            <asp:LoginName ID="LoginName1" runat="server" />
                            you are logged in to the the Project Management
information submission forms area.
                            <br />
                            <br />
                            <br />

                            <table>
                                <tr>
                                    <td>
                                        <asp:LinkButton ID="LinkButton1"
runat="server" PostBackUrl="ClientData.aspx">INPUT CLIENT
INFORMATION</asp:LinkButton>
                                    </td>
                                </tr>
                                <tr>
                                    <td>
                                        <asp:LinkButton ID="LinkButton2"
runat="server" PostBackUrl="ContractorData.aspx">INPUT CONTRACTOR
INFORMATION</asp:LinkButton>
                                    </td>
                                </tr>
                                <tr>
                                    <td>
                                        <asp:LinkButton ID="LinkButton3"
runat="server" PostBackUrl="ProjectData.aspx">INPUT CONTRACT
INFORMATION</asp:LinkButton>
                                    </td>
                                </tr>
                            </table>
                        </ContentTemplate>
                    </asp:RoleGroup>
                    <asp:RoleGroup Roles="Owner, Contractor">
                        <ContentTemplate>
                            <p>
```

This section of the application is dedicated to the gathering of project information. Please contact the Project Manager in regard to accessing this page.

```

        </p>
        </ContentTemplate>
    </asp:RoleGroup>
</RoleGroups>
<AnonymousTemplate>
<div>
    If you are not a project manager please talk with the
Administrator
    or email your request to admon@dredgedata.com
    <br />
    <br />

    Other ways, if you are a project manager please Log In with your
credentials.<asp:LoginView ID="LoginView2" runat="server">
    <LoggedInTemplate>
        ok
    </LoggedInTemplate>
    <AnonymousTemplate>
        <asp:Login ID="Login1" runat="server">
        </asp:Login>
    </AnonymousTemplate>
    </asp:LoginView>
</div>
    </AnonymousTemplate>

    </asp:LoginView>

</div>

</div>
</asp:Content>

```

Listing C-3.2. Owner Information Page

```

<%@ Page Language="C#" MasterPageFile="~/wpma2.master"
AutoEventWireup="true" CodeFile="ClientData.aspx.cs"
Inherits="ClientData" Title="Client Information" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
<div>
<asp:SqlDataSource ID="SqlDataSource1" runat="server"
    ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString
%>" DeleteCommand="DELETE FROM [CLIENT] WHERE [clientid] = @clientid"
    InsertCommand="INSERT INTO [CLIENT] ([name], [streetaddress],
[city], [state], [zip], [phone], [representativename], [email],
[comments]) VALUES (@name, @streetaddress, @city, @state, @zip,
@phone, @representativename, @email, @comments)"

```

```

        SelectCommand="SELECT * FROM [CLIENT] WHERE [clientid] =
@clientid" UpdateCommand="UPDATE [CLIENT] SET [name] = @name,
[streetaddress] = @streetaddress, [city] = @city, [state] = @state,
[zip] = @zip, [phone] = @phone, [representativename] =
@representativename, [email] = @email, [comments] = @comments WHERE
[clientid] = @clientid">
        <DeleteParameters>
            <asp:Parameter Name="clientid" Type="Int32" />
        </DeleteParameters>
        <UpdateParameters>
            <asp:Parameter Name="name" Type="String" />
            <asp:Parameter Name="streetaddress" Type="String" />
            <asp:Parameter Name="city" Type="String" />
            <asp:Parameter Name="state" Type="String" />
            <asp:Parameter Name="zip" Type="String" />
            <asp:Parameter Name="phone" Type="String" />
            <asp:Parameter Name="representativename" Type="String" />
            <asp:Parameter Name="email" Type="String" />
            <asp:Parameter Name="comments" Type="String" />
            <asp:Parameter Name="clientid" Type="Int32" />
        </UpdateParameters>
        <InsertParameters>
            <asp:Parameter Name="name" Type="String" />
            <asp:Parameter Name="streetaddress" Type="String" />
            <asp:Parameter Name="city" Type="String" />
            <asp:Parameter Name="state" Type="String" />
            <asp:Parameter Name="zip" Type="String" />
            <asp:Parameter Name="phone" Type="String" />
            <asp:Parameter Name="representativename" Type="String" />
            <asp:Parameter Name="email" Type="String" />
            <asp:Parameter Name="comments" Type="String" />
        </InsertParameters>
        <SelectParameters>
            <asp:ControlParameter ControlID="GridView1" DefaultValue="1"
Name="clientid" PropertyName="SelectedValue" />
        </SelectParameters>
    </asp:SqlDataSource>
    <asp:FormView ID="FormView1" runat="server" AllowPaging="True"
DataKeyNames="clientid"
DataSourceID="SqlDataSource1"
OnItemInserted="FormView1_ItemInserted"
OnItemDeleted="FormView1_ItemDeleted"
OnItemUpdated="FormView1_ItemUpdated">

        <EditItemTemplate>
            <table style="text-align: left;">
                <tr>
                    <td>
                        <asp:Label ID="Label1" runat="server"
Text="Company Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="160px"></asp:Label>
                    </td>
                    <td>

```

```

        <asp:TextBox ID="nameTextBox" runat="server" Text='<%#
Bind("name") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
            Text="Street Address"
Width="160px"></asp:Label></td>
        <td>
            <asp:TextBox ID="streetaddressTextBox" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
            Text="City"
Width="160px"></asp:Label></td>
        <td>
            <asp:TextBox ID="cityTextBox" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <td>
                <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="State"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="stateTextBox" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Zip Code"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="zipTextBox" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

    </tr>

```

```

        <tr>
            <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Phone"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="phoneTextBox" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Representative Name"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="representativenameTextBox" runat="server"
Text='<%# Bind("representativename") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Email"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="emailTextBox" runat="server" Text='<%#
Bind("email") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
        <tr>
            <td style="height: 26px">
                <asp:Label ID="Label10" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Commets"
Width="160px"></asp:Label></td>
            <td style="height: 26px">
                <asp:TextBox ID="commentsTextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Height="38px"
Width="300px"></asp:TextBox></td>
        </tr>
    </table>
    <asp:LinkButton ID="UpdateButton" runat="server"
CausesValidation="True" CommandName="Update"
    Text="Update" ForeColor="Yellow"></asp:LinkButton>

```

```

        <asp:LinkButton ID="UpdateCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
        Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
    </EditItemTemplate>
    <InsertItemTemplate>
        <table style="text-align: left;">
            <tr>
                <td>
                    <asp:Label ID="Label1" runat="server"
Text="Company Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="160px"></asp:Label>
                </td>
                <td>
                    <asp:TextBox ID="nameTextBox" runat="server" Text='<%#
Bind("name") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Street Address"
Width="160px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="streetaddressTextBox" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="City"
Width="160px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="cityTextBox" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="State"
Width="160px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="stateTextBox" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
            </tr>
        </table>
    </InsertItemTemplate>

```

```

        <tr>
            <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Zip Code"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="zipTextBox" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Phone"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="phoneTextBox" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Representative Name"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="representativenameTextBox" runat="server"
Text='<%# Bind("representativename") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Email"
Width="160px"></asp:Label></td>
            <td>
                <asp:TextBox ID="emailTextBox" runat="server" Text='<%#
Bind("email") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

        </tr>
            <td>
                <asp:Label ID="Label10" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"

```

```

                Text="Commets"
Width="160px"></asp:Label></td>
        <td>
            <asp:TextBox ID="commentsTextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Height="40px"
Width="300px"></asp:TextBox></td>

        </tr>
    </table>
    <asp:LinkButton ID="InsertButton" runat="server"
CausesValidation="True" CommandName="Insert"
    Text="Insert" ForeColor="Yellow"></asp:LinkButton>
    <asp:LinkButton ID="InsertCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
    Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
</InsertItemTemplate>
<ItemTemplate>
    <table style="text-align: left;">
        <tr>
            <td>
                <asp:Label ID="Label1" runat="server"
Text="Company Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="160px"></asp:Label>
            </td>
            <td>
                <asp:Label ID="nameLabel" runat="server" Text='<%#
Bind("name") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Street Address"
Width="160px"></asp:Label></td>
                <td>
                    <asp:Label ID="streetaddressLabel" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>

                </tr>
            <tr>
                <td style="height: 21px">
                    <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="City"
Width="160px"></asp:Label></td>
                <td style="height: 21px">
                    <asp:Label ID="cityLabel" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

                </tr>
    </table>

```

```

        <tr>
            <td>
                <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="State"
Width="160px"></asp:Label></td>
            <td>
                <asp:Label ID="stateLabel" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Zip Code"
Width="160px"></asp:Label></td>
            <td>
                <asp:Label ID="zipLabel" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Phone"
Width="160px"></asp:Label></td>
            <td>
                <asp:Label ID="phoneLabel" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Representative Name"
Width="160px"></asp:Label></td>
            <td>
                <asp:Label ID="representativenamelabel" runat="server"
Text='<%# Bind("representativenam") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"

```



```

<div>
  <asp:SqlDataSource ID="SqlDataSource2" runat="server"
  ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString2 %">
  SelectCommand="SELECT * FROM [CLIENT]"></asp:SqlDataSource>
  <asp:GridView ID="GridView1" runat="server" AllowPaging="True"
  AllowSorting="True" AutoGenerateColumns="False"
  DataKeyNames="clientid" DataSourceID="SqlDataSource2" CellPadding="4"
  ForeColor="#333333" GridLines="None">
    <Columns>
      <asp:CommandField ShowSelectButton="True" />
      <asp:BoundField DataField="name" HeaderText="Client Name"
  SortExpression="name" />
      <asp:BoundField DataField="streetaddress"
  HeaderText="Street Address" SortExpression="streetaddress" />
      <asp:BoundField DataField="city" HeaderText="City"
  SortExpression="city" />
      <asp:BoundField DataField="state" HeaderText="State"
  SortExpression="state" />
      <asp:BoundField DataField="Zip" HeaderText="Zip"
  SortExpression="Zip" />
      <asp:BoundField DataField="phone" HeaderText="Phone"
  SortExpression="phone" />
      <asp:BoundField DataField="representativename"
  HeaderText="representativename" SortExpression="representativename" />
      <asp:BoundField DataField="email" HeaderText="Email"
  SortExpression="email" />
      <asp:BoundField DataField="comments" HeaderText="Comments"
  SortExpression="comments" />
    </Columns>
    <FooterStyle BackColor="#5D7B9D" Font-Bold="True"
  ForeColor="White" />
    <RowStyle BackColor="#F7F6F3" ForeColor="#333333" />
    <EditRowStyle BackColor="#999999" />
    <SelectedRowStyle BackColor="#E2DED6" Font-Bold="True"
  ForeColor="#333333" />
    <PagerStyle BackColor="#284775" ForeColor="White"
  HorizontalAlign="Center" />
    <HeaderStyle BackColor="#5D7B9D" Font-Bold="True"
  ForeColor="White" />
    <AlternatingRowStyle BackColor="White" ForeColor="#284775" />
  </asp:GridView>
</div>
</asp:Content>

```

Listing C-3.3. Contractor Information Page

```

<%@ Page Language="C#" MasterPageFile="~/wpma2.master"
AutoEventWireup="true" CodeFile="ContractorData.aspx.cs"
Inherits="ContractorDate" Title="Untitled Page" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">
<div>
    <asp:SqlDataSource ID="SqlDataSource1" runat="server"
        ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString
%>" DeleteCommand="DELETE FROM [CONTRACTOR] WHERE [contractorid] =
@original_contractorid"
        InsertCommand="INSERT INTO [CONTRACTOR] ([bidid], [name],
[streetaddress], [city], [state], [zip], [phone],
[representativename], [comments]) VALUES (@bidid, @name,
@streetaddress, @city, @state, @zip, @phone, @representativename,
@comments)"
        OldValuesParameterFormatString="original_{0}"
        SelectCommand="SELECT * FROM [CONTRACTOR] where contractorid =
@contractorid"
        UpdateCommand="UPDATE [CONTRACTOR] SET [name] = @name,
[streetaddress] = @streetaddress, [city] = @city, [state] = @state,
[zip] = @zip, [phone] = @phone, [representativename] =
@representativename, [comments] = @comments WHERE [contractorid] =
@original_contractorid">
        <DeleteParameters>
            <asp:Parameter Name="original_contractorid" Type="Int32"
/>
        </DeleteParameters>
        <UpdateParameters>
            <asp:Parameter Name="name" Type="String" />
            <asp:Parameter Name="streetaddress" Type="String" />
            <asp:Parameter Name="city" Type="String" />
            <asp:Parameter Name="state" Type="String" />
            <asp:Parameter Name="zip" Type="String" />
            <asp:Parameter Name="phone" Type="String" />
            <asp:Parameter Name="representativename" Type="String" />
            <asp:Parameter Name="comments" Type="String" />
            <asp:Parameter Name="original_contractorid" Type="Int32"
/>
        </UpdateParameters>
        <InsertParameters>
            <asp:Parameter Name="bidid" Type="Int32" />
            <asp:Parameter Name="name" Type="String" />
            <asp:Parameter Name="streetaddress" Type="String" />
            <asp:Parameter Name="city" Type="String" />
            <asp:Parameter Name="state" Type="String" />
            <asp:Parameter Name="zip" Type="String" />
            <asp:Parameter Name="phone" Type="String" />
            <asp:Parameter Name="representativename" Type="String" />
            <asp:Parameter Name="comments" Type="String" />
        </InsertParameters>
        <SelectParameters>
            <asp:ControlParameter ControlID="GridView1"
DefaultValue="1" Name="contractorid"
                PropertyName="SelectedValue" />
        </SelectParameters>
    </asp:SqlDataSource>

```

```

    <asp:FormView ID="FormView1" runat="server"
DataKeyNames="contractorid" DataSourceID="SqlDataSource1"
AllowPaging="True" OnItemInserted="FormView1_ItemInserted"
OnItemDeleted="FormView1_ItemDeleted"
OnItemUpdated="FormView1_ItemUpdated">
    <EditItemTemplate>
        <table style="text-align: left;">
            <tr>
                <td>
                    <asp:Label ID="Label1" runat="server"
Text="Name" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="130px"></asp:Label>
                </td>
                <td>
                    <asp:TextBox ID="nameTextBox" runat="server" Text='<%#
Bind("name") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox>&nbsp;  </td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
Text="Street Address"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="streetaddressTextBox" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
Text="City"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="cityTextBox" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
Text="State"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="stateTextBox" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

```

```

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Zip Code"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="zipTextBox" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Phone"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="phoneTextBox" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Representative Name"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="representativenametextbox" runat="server"
Text='<%# Bind("representativenam") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Comments"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="commentstextbox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

        </tr>
    </table>
    <asp:LinkButton ID="UpdateButton" runat="server"
CausesValidation="True" CommandName="Update"
        Text="Update" ForeColor="Yellow"></asp:LinkButton>
    <asp:LinkButton ID="UpdateCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"

```



```

                <asp:TextBox ID="stateTextBox" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Zip Code"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="zipTextBox" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Phone"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="phoneTextBox" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Representative Name"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="representativenametextBox" runat="server"
Text='<%# Bind("representativenam") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Comments"
Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="commentstextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
        </table>

```

```

        <asp:LinkButton ID="InsertButton" runat="server"
CausesValidation="True" CommandName="Insert"
        Text="Insert" ForeColor="Yellow"></asp:LinkButton>
        <asp:LinkButton ID="InsertCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
        Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
    </InsertItemTemplate>
    <ItemTemplate>
        <table style="text-align: left;">
        <tr>
            <td>
                <asp:Label ID="Label1" runat="server"
Text="Name" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="130px"></asp:Label>
            </td>
            <td>
                <asp:Label ID="nameLabel" runat="server" Text='<%#
Bind("name") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Street Address"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="streetaddressLabel" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:Label></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="City"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="cityLabel" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="State"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="stateLabel" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>
    </tr>
    </table>
    </ItemTemplate>
</table>

```

```

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Zip Code"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="zipLabel" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>
            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Phone"
Width="130px"></asp:Label></td>
                <td>
                    <asp:Label ID="phoneLabel" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>
                </tr>
            <tr>
                <td>
                    <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Representative Name"
Width="130px"></asp:Label></td>
                <td>
                    <asp:Label ID="representativenameLabel" runat="server"
Text='<%# Bind("representativename") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:Label></td>
                </tr>
            <tr>
                <td>
                    <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Commets"
Width="130px"></asp:Label></td>
                <td>
                    <asp:Label ID="commentsLabel" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>
                </tr>
        </table>
        <asp:LinkButton ID="EditButton" runat="server"
CausesValidation="False" CommandName="Edit"
        Text="Edit" ForeColor="Yellow"></asp:LinkButton>

```

```

        <asp:LinkButton ID="DeleteButton" runat="server"
CausesValidation="False" CommandName="Delete"
        Text="Delete" ForeColor="Yellow"></asp:LinkButton>
        <asp:LinkButton ID="NewButton" runat="server"
CausesValidation="False" CommandName="New"
        Text="New" ForeColor="Yellow"></asp:LinkButton>
    </ItemTemplate>
    <FooterTemplate>
        <br />
        &nbsp;<asp:LinkButton ID="LinkButton1" runat="server"
ForeColor="Yellow" PostBackUrl="~/BidData.aspx">Back to Contract
Information</asp:LinkButton><br />
        <br />
        &nbsp;&nbsp;&nbsp;<asp:LinkButton
        ID="LinkButton4" runat="server" ForeColor="Yellow"
PostBackUrl="~/ContractorEmployee.aspx">Next to Contractor Employee
Inf.</asp:LinkButton>
    </FooterTemplate>
    <HeaderTemplate>
        <span style="color: #ffff00">CONTRACTOR INFORMATION</span>
    </HeaderTemplate>
</asp:FormView>
</div>
<div>
    <asp:SqlDataSource ID="SqlDataSource2" runat="server"
ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString2 %">
SelectCommand="SELECT * FROM [CONTRACTOR]"></asp:SqlDataSource>
    <asp:GridView ID="GridView1" runat="server" AllowPaging="True"
AllowSorting="True"
        AutoGenerateColumns="False" CellPadding="4"
DataKeyNames="contractorid" DataSourceID="SqlDataSource2"
        ForeColor="#333333" GridLines="None">
        <FooterStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
        <Columns>
            <asp:CommandField ShowSelectButton="True" />
            <asp:BoundField DataField="name" HeaderText=" Contractor
Name" SortExpression="name" />
            <asp:BoundField DataField="streetaddress"
HeaderText="Address" SortExpression="streetaddress" />
            <asp:BoundField DataField="city" HeaderText="City"
SortExpression="city" />
            <asp:BoundField DataField="state" HeaderText="State"
SortExpression="state" />
            <asp:BoundField DataField="zip" HeaderText="Zip Code"
SortExpression="zip" />
            <asp:BoundField DataField="phone" HeaderText="Phone"
SortExpression="phone" />
            <asp:BoundField DataField="representativename"
HeaderText="Representative" SortExpression="representativename" />
            <asp:BoundField DataField="comments"
HeaderText="Comments" SortExpression="comments" />
        </Columns>
        <RowStyle BackColor="#F7F6F3" ForeColor="#333333" />
        <EditRowStyle BackColor="#999999" />

```

```

        <SelectedRowStyle BackColor="#E2DED6" Font-Bold="True"
ForeColor="#333333" />
        <PagerStyle BackColor="#284775" ForeColor="White"
HorizontalAlign="Center" />
        <HeaderStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
        <AlternatingRowStyle BackColor="White" ForeColor="#284775" />
    </asp:GridView>
    <br />
    <br />
    <br />
    <br />
    <br />
</div>
</asp:Content>

```

Listing C-3.4. Project Information

```

<%@ Page Language="C#" MasterPageFile="~/wpma2.master"
AutoEventWireup="true" CodeFile="ProjectData.aspx.cs"
Inherits="ProjectData" Title="Project Information" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">

    <div style="clear: none; float: right; position: static;">
        <asp:LinkButton ID="LinkButton3" runat="server"
ForeColor="Yellow"
PostBackUrl="~/ClientData.aspx">Back</asp:LinkButton>
        <asp:LinkButton ID="LinkButton4" runat="server"
ForeColor="Yellow" PostBackUrl="~/BidData.aspx">Next</asp:LinkButton>
    </div>

    <br />
    <div style="width: 90%; position: relative; top: 30px; text-align:
center;">
        &nbsp;  <asp:SqlDataSource ID="SqlDataSource1" runat="server"
ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString %>"
DeleteCommand="DELETE FROM [PROJECT] WHERE [projectid] =
@projectid" InsertCommand="INSERT INTO [PROJECT] ([clientid],
[projectname], [location], [streetaddress], [city], [state], [zip],
[phone], [unit], [quantity], [unitprice], [startdate], [enddate],
[typeofwork], [comments]) VALUES (@clientid, @projectname, @location,
@streetaddress, @city, @state, @zip, @phone, @unit, @quantity,
@unitprice, @startdate, @enddate, @typeofwork, @comments)"
SelectCommand="SELECT * FROM [PROJECT] WHERE ([projectid]
= @projectid)" UpdateCommand="UPDATE [PROJECT] SET [projectname] =
@projectname, [location] = @location, [streetaddress] =
@streetaddress, [city] = @city, [state] = @state, [zip] = @zip,
[phone] = @phone, [unit] = @unit, [quantity] = @quantity, [unitprice]
= @unitprice, [startdate] = @startdate, [enddate] = @enddate,
[typeofwork] = @typeofwork, [comments] = @comments WHERE [projectid] =
@projectid">
        <DeleteParameters>

```

```

        <asp:Parameter Name="projectid" Type="Int32" />
</DeleteParameters>
<UpdateParameters>

    <asp:Parameter Name="projectname" Type="String" />
    <asp:Parameter Name="location" Type="String" />
    <asp:Parameter Name="streetaddress" Type="String" />
    <asp:Parameter Name="city" Type="String" />
    <asp:Parameter Name="state" Type="String" />
    <asp:Parameter Name="zip" Type="String" />
    <asp:Parameter Name="phone" Type="String" />
    <asp:Parameter Name="unit" Type="String" />
    <asp:Parameter Name="quantity" Type="Decimal" />
    <asp:Parameter Name="unitprice" Type="Decimal" />
    <asp:Parameter Name="startdate" Type="DateTime" />
    <asp:Parameter Name="enddate" Type="DateTime" />
    <asp:Parameter Name="typeofwork" Type="String" />
    <asp:Parameter Name="comments" Type="String" />
    <asp:Parameter Name="projectid" Type="Int32" />
</UpdateParameters>
<InsertParameters>
    <asp:Parameter Name="clientid" Type="Int32" />
    <asp:Parameter Name="projectname" Type="String" />
    <asp:Parameter Name="location" Type="String" />
    <asp:Parameter Name="streetaddress" Type="String" />
    <asp:Parameter Name="city" Type="String" />
    <asp:Parameter Name="state" Type="String" />
    <asp:Parameter Name="zip" Type="String" />
    <asp:Parameter Name="phone" Type="String" />
    <asp:Parameter Name="unit" Type="String" />
    <asp:Parameter Name="quantity" Type="Decimal" />
    <asp:Parameter Name="unitprice" Type="Decimal" />
    <asp:Parameter Name="startdate" Type="DateTime" />
    <asp:Parameter Name="enddate" Type="DateTime" />
    <asp:Parameter Name="typeofwork" Type="String" />
    <asp:Parameter Name="comments" Type="String" />
</InsertParameters>
<SelectParameters>
    <asp:ControlParameter ControlID="GridView1"
DefaultValue="1" Name="projectid" PropertyName="SelectedValue"
        Type="Int32" />
</SelectParameters>
</asp:SqlDataSource>
<asp:FormView ID="FormView1" runat="server"
DataKeyNames="projectid" DataSourceID="SqlDataSource1"
AllowPaging="True" OnItemInserted="FormView1_ItemInserted"
OnItemDeleted="FormView1_ItemDeleted"
OnItemUpdated="FormView1_ItemUpdated">
    <EditItemTemplate>
        <table style="text-align: left;">

            <tr>
                <td>
                    <asp:Label ID="Label2" runat="server"
Text="Project Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                <td>

```

```

                <asp:TextBox ID="projectnameTextBox" runat="server"
Text='<%# Bind("projectname") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label3" runat="server"
Text="Location" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="locationTextBox" runat="server"
Text='<%# Bind("location") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label4" runat="server"
Text="Street Address" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="streetaddressTextBox" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label5" runat="server"
Text="City" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="cityTextBox" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label6" runat="server"
Text="State" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="stateTextBox" runat="server"
Text='<%# Bind("state") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

            </tr>

```

```

        <tr>
            <td>
                <asp:Label ID="Label7" runat="server"
Text="Zip Code" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="zipTextBox" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label8" runat="server"
Text="Phone" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="phoneTextBox" runat="server"
Text='<%# Bind("phone") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label9" runat="server"
Text="Project Pay Unit" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:DropDownList ID="DropDownList2"
runat="server" AppendDataBoundItems="True" AutoPostBack="True"
DataSource='<%# Bind("unit") %>'
SelectedValue='<%# Bind("unit") %>' Width="299px">
                <asp:ListItem
Selected="True">cy</asp:ListItem>
                <asp:ListItem>cm</asp:ListItem>
                <asp:ListItem>cf</asp:ListItem>
                <asp:ListItem>sqf</asp:ListItem>
                </asp:DropDownList></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label10" runat="server"
Text="Quantity" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="quantityTextBox" runat="server"
Text='<%# Bind("quantity", "{0:N}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

```

```

        <tr>
            <td>
                <asp:Label ID="Label11" runat="server"
Text="Project Unit Price" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="unitpriceTextBox" runat="server"
Text='<%# Bind("unitprice") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label12" runat="server"
Text="Project Start Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="startdateTextBox" runat="server"
Text='<%# Bind("startdate", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label13" runat="server"
Text="Project End Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="enddateTextBox" runat="server"
Text='<%# Bind("enddate", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>
                <asp:Label ID="Label14" runat="server"
Text="Type Of Dredging Work" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="typeofworkTextBox" runat="server"
Text='<%# Bind("typeofwork", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
        </tr>

        <tr>
            <td>

```

```

                                <asp:Label ID="Label15" runat="server"
Text="Comments" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label>
                                </td>
                                <td>
                                <asp:TextBox ID="commentsTextBox" runat="server"
Text='<%# Bind("comments") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Height="40px"
Width="300px"></asp:TextBox></td>

                                </tr>

                                </table>

                                <br />
                                <asp:LinkButton ID="UpdateButton" runat="server"
CausesValidation="True" CommandName="Update"
                                Text="Update" ForeColor="Yellow"></asp:LinkButton>
                                <asp:LinkButton ID="UpdateCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
                                Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
                                </EditItemTemplate>
                                <InsertItemTemplate>
                                <table style="text-align: left;">
                                <tr>
                                <td>
                                <asp:Label ID="Label1" runat="server"
Text="Company Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label>
                                </td>
                                <td>
                                <asp:DropDownList ID="DropDownList1"
runat="server" AutoPostBack="True" DataSource='<%# Eval("clientid")
%>'
                                DataSourceID="SqlDataSource1"
DataTextField="name" DataValueField="clientid"
                                SelectedValue='<%# Bind("clientid")
%>' BackColor="White" Width="300px">
                                </asp:DropDownList>
                                </td>
                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label2" runat="server"
Text="Project Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                                <td>
                                <asp:TextBox ID="projectnameTextBox" runat="server"
Text='<%# Bind("projectname") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>
                                </tr>
                                <tr>
                                <td>

```

```

                                <asp:Label ID="Label3" runat="server"
Text="Location" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                                <td>
                                <asp:TextBox ID="locationTextBox" runat="server"
Text='<%# Bind("location") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

                                </tr>

                                <tr>
                                <td>
                                <asp:Label ID="Label4" runat="server"
Text="Street Address" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                                <td>
                                <asp:TextBox ID="streetaddressTextBox" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

                                </tr>

                                <tr>
                                <td>
                                <asp:Label ID="Label5" runat="server"
Text="City" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
                                <td>
                                <asp:TextBox ID="cityTextBox" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

                                </tr>

                                <tr>
                                <td>
                                <asp:Label ID="Label6" runat="server"
Text="State" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
                                <td>
                                <asp:TextBox ID="stateTextBox" runat="server"
Text='<%# Bind("state") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

                                </tr>

                                <tr>
                                <td>
                                <asp:Label ID="Label7" runat="server"
Text="Zip Code" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
                                <td>

```

```

Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:TextBox></td>

</tr>

<tr>
<td>
<asp:Label ID="Label8" runat="server"
Text="Phone" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
<td>
<asp:TextBox ID="phoneTextBox" runat="server"
Text='<%# Bind("phone") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

</tr>

<tr>
<td>
<asp:Label ID="Label9" runat="server"
Text="Prject Pay Unit" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
<td>
<asp:DropDownList ID="DropDownList3"
runat="server" AppendDataBoundItems="True" AutoPostBack="True"
DataSource='<%# Bind("unit") %>'
SelectedValue='<%# Bind("unit") %>' Width="303px">
<asp:ListItem
Selected="True">cy</asp:ListItem>
<asp:ListItem>cm</asp:ListItem>
<asp:ListItem>cf</asp:ListItem>
<asp:ListItem>sqf</asp:ListItem>
</asp:DropDownList></td>

</tr>

<tr>
<td>
<asp:Label ID="Label10" runat="server"
Text="Quantity" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
<td>
<asp:TextBox ID="quantityTextBox" runat="server"
Text='<%# Bind("quantity") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

</tr>

<tr>
<td>
<asp:Label ID="Label11" runat="server"
Text="Project Unit Price" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>

```

```

        <td>
            <asp:TextBox ID="unitpriceTextBox" runat="server"
Text='<%# Bind("unitprice") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label12" runat="server"
Text="Project Start Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="startdateTextBox" runat="server"
Text='<%# Bind("startdate") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label13" runat="server"
Text="Project End Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="enddateTextBox" runat="server"
Text='<%# Bind("enddate") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label14" runat="server"
Text="Type Of Dredging Work" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:TextBox ID="typeofworkTextBox" runat="server"
Text='<%# Bind("typeofwork") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:TextBox></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label15" runat="server"
Text="Comments" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label>
            </td>
            <td>
                <asp:TextBox ID="commentsTextBox" runat="server"
Text='<%# Bind("comments") %>' BackColor="White" BorderStyle="Inset"

```

```

Font-Names="Verdana" Font-Size="10pt" Width="300px"
Height="40px"></asp:TextBox></td>

</tr>

</table>

<br />
<asp:LinkButton ID="InsertButton" runat="server"
CausesValidation="True" CommandName="Insert"
Text="Insert" ForeColor="Yellow"></asp:LinkButton>
<asp:LinkButton ID="InsertCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
<asp:SqlDataSource ID="SqlDataSource1" runat="server"
ConnectionString="<%$ ConnectionStrings:WPMAConnectionString2 %>"
SelectCommand="SELECT [clientid],
[name] FROM [CLIENT]"></asp:SqlDataSource>
</InsertItemTemplate>
<ItemTemplate>
<table style="text-align: left;">

<tr>
<td>
<asp:Label ID="Label2" runat="server"
Text="Project Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
<td>
<asp:Label ID="projectnameLabel" runat="server"
Text='<%# Bind("projectname") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>

</tr>

<tr>
<td>
<asp:Label ID="Label3" runat="server"
Text="Location" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
<td>
<asp:Label ID="locationLabel" runat="server" Text='<%#
Bind("location") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

</tr>

<tr>
<td>
<asp:Label ID="Label4" runat="server"
Text="Street Address" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
<td>
<asp:Label ID="streetaddressLabel" runat="server"
Text='<%# Bind("streetaddress") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>

```

```

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label5" runat="server"
Text="City" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="cityLabel" runat="server" Text='<%#
Bind("city") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
            </tr>

        <tr>
            <td>
                <asp:Label ID="Label6" runat="server"
Text="State" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="stateLabel" runat="server" Text='<%#
Bind("state") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
            </tr>

        <tr>
            <td>
                <asp:Label ID="Label7" runat="server"
Text="Zip Code" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="zipLabel" runat="server" Text='<%#
Bind("zip") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
            </tr>

        <tr>
            <td>
                <asp:Label ID="Label8" runat="server"
Text="Phone" Font-Names="Verdana" Font-Size="10pt" ForeColor="White"
Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="phoneLabel" runat="server" Text='<%#
Bind("phone") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
            </tr>

        <tr>
            <td>
                <asp:Label ID="Label9" runat="server"
Text="Prject Pay Unit" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>

```

```

        <asp:Label ID="unitLabel" runat="server" Text='<%#
Bind("unit") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label10" runat="server"
Text="Quantity" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="quantityLabel" runat="server" Text='<%#
Bind("quantity", "{0:N}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label11" runat="server"
Text="Project Unit Price" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="unitpriceLabel" runat="server"
Text='<%# Bind("unitprice", "{0:C}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label12" runat="server"
Text="Project Start Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="startdateLabel" runat="server"
Text='<%# Bind("startdate", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="300px"></asp:Label></td>

        </tr>

        <tr>
            <td>
                <asp:Label ID="Label13" runat="server"
Text="Project End Date" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
            <td>
                <asp:Label ID="enddateLabel" runat="server" Text='<%#
Bind("enddate", "{0:d}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>

        </tr>

        <tr>

```

```

        <td>
            <asp:Label ID="Label14" runat="server"
Text="Type Of Dredging Work" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label></td>
        <td>
            <asp:Label ID="typeofworkLabel" runat="server"
Text='<%# Bind("typeofwork") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="300px"></asp:Label></td>
    </tr>

    <tr>
        <td>
            <asp:Label ID="Label15" runat="server"
Text="Comments" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="180px"></asp:Label>
        </td>
        <td>
            <asp:Label ID="commentsLabel" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="300px"
Height="40px"></asp:Label></td>
    </tr>
</table>
<br />
<asp:LinkButton ID="EditButton" runat="server"
CausesValidation="False" CommandName="Edit"
Text="Edit" ForeColor="Yellow"></asp:LinkButton>
<asp:LinkButton ID="DeleteButton" runat="server"
CausesValidation="False" CommandName="Delete"
Text="Delete" ForeColor="Yellow"></asp:LinkButton>
<asp:LinkButton ID="NewButton" runat="server"
CausesValidation="False" CommandName="New"
Text="New" ForeColor="Yellow"></asp:LinkButton>
<br />
<br />
</ItemTemplate>
<FooterTemplate>
<br />
<asp:LinkButton ID="LinkButton2" runat="server"
ForeColor="Yellow" PostBackUrl="~/ClientData.aspx">Back to Client
Information</asp:LinkButton><br />
<br />
<asp:LinkButton ID="LinkButton1" runat="server"
ForeColor="Yellow" PostBackUrl="~/BidData.aspx">Input Contract
Information</asp:LinkButton>
</FooterTemplate>
<HeaderTemplate>
<span style="color: #ffff00">PROJECT
INFORMATION</span>
</HeaderTemplate>

</asp:FormView>
<br />

```

```

        <br />
    </div>
    <br />
    <br />
    <div>
        <asp:SqlDataSource ID="SqlDataSource2" runat="server"
ConnectionString="<%$ ConnectionStrings:WPMAConnectionString %>"
SelectCommand="SELECT * FROM [PROJECT]"></asp:SqlDataSource>
        <br />
        <br />
        <asp:GridView ID="GridView1" runat="server"
AutoGenerateColumns="False" DataKeyNames="projectid"
DataSourceID="SqlDataSource2" AllowPaging="True"
AllowSorting="True" ForeColor="#333333" CellPadding="4"
GridLines="None">
            <Columns>
                <asp:CommandField ShowSelectButton="True" />
                <asp:BoundField DataField="projectname"
HeaderText="Name" SortExpression="projectname" />
                <asp:BoundField DataField="location"
HeaderText="Location" SortExpression="location" />
                <asp:BoundField DataField="city" HeaderText="City"
SortExpression="city" />
                <asp:BoundField DataField="state" HeaderText="State"
SortExpression="state" />
                <asp:TemplateField HeaderText="Quantity">
                    <ItemTemplate>
                        <asp:TextBox ID="TextBox1" runat="server"
Text='<%# Bind("quantity", "{0:N}") %>'></asp:TextBox>
                    </ItemTemplate>
                    <ItemStyle Width="50px" />
                </asp:TemplateField>
            </Columns>
            <FooterStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
            <RowStyle BackColor="#F7F6F3" ForeColor="#333333" />
            <EditRowStyle BackColor="#999999" />
            <SelectedRowStyle BackColor="#E2DED6" Font-Bold="True"
ForeColor="#333333" />
            <PagerStyle BackColor="#284775" ForeColor="White"
HorizontalAlign="Center" />
            <HeaderStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
            <AlternatingRowStyle BackColor="White" ForeColor="#284775"
/>
        </asp:GridView>
    </div>
</asp:Content>

```

C-4. Reporting Module Code

Listing C-4.1. Mechanical Dredge Daily Report

```
<%@ Page Language="C#" MasterPageFile="~/wpma2.master"
AutoEventWireup="true" CodeFile="MechDredgeDaily.aspx.cs"
Inherits="MechDredgeDaily" Title="Mechanical Dredge Daily Report" %>
<asp:Content ID="Content1" ContentPlaceHolderID="ContentPlaceHolder1"
Runat="Server">

    <!--Panel 1

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXX
                XXXXXXXXXXXXX
                XXXXX

    -->

    <asp:Panel ID="Panel1" runat="server" Height="500" Width="1200"
HorizontalAlign="Center" BackColor=" #0054ac" Wrap="false">

        <br />
        <span style="color: #ffffff">&nbsp;  MECHANICAL DREDGE DAILY
REPORT</span><span><br />
        </span>
        <br />
        <asp:GridView ID="GridView1" runat="server" AllowPaging="True"
AllowSorting="True"
            AutoGenerateColumns="False" DataKeyNames="reportid"
DataSourceID="SqlDataSource3"
            ForeColor="#333333" Font-Names="Verdana" Font-Size="10pt"
CellPadding="4" GridLines="None" OnSelectedIndexChanged="Page_Load">
            <Columns>
```

```

        <asp:CommandField ShowSelectButton="True"
ShowDeleteButton="True" ShowEditButton="True" HeaderText="Clik
&quot;Select&quot; for Load Detail" ShowHeader="True" >
        <HeaderStyle BackColor="Navy" ForeColor="White" />
        </asp:CommandField>
        <asp:BoundField DataField="number" HeaderText="Report
Number" SortExpression="number" />
        <asp:BoundField DataField="reportdate"
HeaderText="Report Date" SortExpression="reportdate" />
        <asp:BoundField DataField="datereported"
HeaderText="Date Reported" SortExpression="datereported" />
        <asp:BoundField DataField="wind" HeaderText="Wind"
SortExpression="wind" />
        <asp:BoundField DataField="skies" HeaderText="Skies"
SortExpression="skies" />
        <asp:BoundField DataField="reportedby"
HeaderText="Reported by:" SortExpression="reportedby" />
        <asp:BoundField DataField="comments"
HeaderText="Comments:" SortExpression="comments" />
        <asp:HyperLinkField />
    </Columns>
    <FooterStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
    <RowStyle BackColor="#F7F6F3" ForeColor="#333333" />
    <EditRowStyle BackColor="#999999" />
    <SelectedRowStyle BackColor="#E2DED6" Font-Bold="True"
ForeColor="#333333" />
    <PagerStyle BackColor="#284775" ForeColor="White"
HorizontalAlign="Center" />
    <HeaderStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
    <AlternatingRowStyle BackColor="White" ForeColor="#284775"
/>
</asp:GridView>
    <asp:SqlDataSource ID="SqlDataSource3" runat="server"
ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString %>"
SelectCommand="SELECT * FROM [MECHDREDGE_DAILY]" DeleteCommand="DELETE
FROM [MECHDREDGE_DAILY] WHERE [reportid] = @reportid"
InsertCommand="INSERT INTO [MECHDREDGE_DAILY] ([bidid],
[mechdredgeid], [weekid], [number], [reportdate], [datereported],
[wind], [seas], [skies],[reportedby], [comments]) VALUES (@bidid,
@mechdredgeid, @weekid, @number, @reportdate, @datereported, @wind,
@seas, @skies, @reportedby, @comments)" UpdateCommand="UPDATE
[MECHDREDGE_DAILY] SET [bidid] = @bidid, [mechdredgeid] =
@mechdredgeid, [weekid] = @weekid, [number] = @number, [reportdate] =
@reportdate, [datereported] = @datereported, [wind] = @wind, [seas] =
@seas, [skies] = @skies, [reportedby] = @reportedby, [comments] =
@comments WHERE [reportid] = @reportid">
    <DeleteParameters>
        <asp:Parameter Name="reportid" Type="Int32" />
    </DeleteParameters>
    <UpdateParameters>
        <asp:Parameter Name="bidid" Type="Int32" />
        <asp:Parameter Name="mechdredgeid" Type="Int32" />
        <asp:Parameter Name="weekid" Type="Int32" />
        <asp:Parameter Name="number" Type="String" />
        <asp:Parameter Name="reportdate" Type="DateTime" />

```

```

        <asp:Parameter Name="datereported" Type="DateTime" />
        <asp:Parameter Name="wind" Type="String" />
        <asp:Parameter Name="seas" Type="String" />
        <asp:Parameter Name="skies" Type="String" />
        <asp:Parameter Name="reportedby" Type="String" />
        <asp:Parameter Name="comments" Type="String" />
        <asp:Parameter Name="reportid" Type="Int32" />
    </UpdateParameters>
    <InsertParameters>
        <asp:Parameter Name="bidid" Type="Int32" />
        <asp:Parameter Name="mechdredgeid" Type="Int32" />
        <asp:Parameter Name="weekid" Type="Int32" />
        <asp:Parameter Name="number" Type="String" />
        <asp:Parameter Name="reportdate" Type="DateTime" />
        <asp:Parameter Name="datereported" Type="DateTime" />
        <asp:Parameter Name="wind" Type="String" />
        <asp:Parameter Name="seas" Type="String" />
        <asp:Parameter Name="skies" Type="String" />
        <asp:Parameter Name="reportedby" Type="String" />
        <asp:Parameter Name="comments" Type="String" />
    </InsertParameters>
</asp:SqlDataSource>

<!-- Start Nested Panel 2

    xxxxxxxxxxxxxxxxxxxxxx
    xxxxxxxxxxxxxxxxxxxxxx
    xxxxxxxxxxxxxx
    xxxxx

-->

    <asp:Panel ID="Panel4" runat="server" Height="50px" Width="1200px"
HorizontalAlign="Center" BackColor="Aquamarine">
        <table>
            <tr>
                <td>
                    <asp:Button ID="Button1" runat="server" Text="Create a
New Report" OnClick="Button1_Click" />
                </td>
                <td>
                    <asp:Button ID="Button2" runat="server" Text="Create a
New Load" OnClick="Button2_Click" />
                </td>
                <td>
                    <asp:Button ID="Button3" runat="server" Text="Button" />
                </td>
            </tr>
        </table>
    </asp:Panel>
<!--End Nested Panel 2

```

```

                xxxxxxxx
                xxxxxxxxxxxxxx
                xxxxxxxxxxxxxxxxxxxxxx
                xxxxxxxxxxxxxxxxxxxxxxxx

        -->
</asp:Panel>

<!--End Panel 1

                xxxxxxxx
                xxxxxxxxxxxxxx
                xxxxxxxxxxxxxxxxxxxxxx
                xxxxxxxxxxxxxxxxxxxxxxxx

        -->

<!--

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
        -->

<asp:Panel>
</asp:Panel>

<!--Start Panel 3

                xxxxxxxxxxxxxxxxxxxxxx
                xxxxxxxxxxxxxx
                xxxxxxxxxx
                xxxxx

        -->

<asp:Panel ID="Panel2" runat="server" Height="600" Width="1200"
HorizontalAlign="Center"
BackImageUrl=" ../App_Themes/Images/LogoRepite2.jpg">

<div style="width: 1100px; height: 600px; text-align: center;">

```

```

        <div style="width: 350px; text-align: left; float: left; height:
600px; ">
        <asp:SqlDataSource ID="SqlDataSource1" runat="server"
ConnectionString="<%"$ ConnectionStrings:WPMAConnectionString %>"
        DeleteCommand="DELETE FROM [MECHDREDGE_DAILY] WHERE [reportid]
= @reportid" InsertCommand="INSERT INTO [MECHDREDGE_DAILY] ([bidid],
[mechdredgeid], [number], [reportdate], [datereported], [wind],
[seas], [skies], [reportedby], [comments]) VALUES (@bidid,
@mechdredgeid, @number, @reportdate, @datereported, @wind, @seas,
@skies, @reportedby, @comments)"
        SelectCommand="SELECT * FROM [MECHDREDGE_DAILY] WHERE
([reportid] = @reportid)" UpdateCommand="UPDATE [MECHDREDGE_DAILY] SET
[number] = @number, [reportdate] = @reportdate, [datereported] =
@datereported, [wind] = @wind, [seas] = @seas, [skies] = @skies,
[reportedby] = @reportedby, [comments] = @comments WHERE [reportid] =
@reportid">
        <DeleteParameters>
        <asp:Parameter Name="reportid" Type="Int32" />
        </DeleteParameters>
        <UpdateParameters>
        <asp:Parameter Name="number" Type="String" />
        <asp:Parameter Name="reportdate" Type="DateTime" />
        <asp:Parameter Name="datereported" Type="DateTime" />
        <asp:Parameter Name="wind" Type="String" />
        <asp:Parameter Name="seas" Type="String" />
        <asp:Parameter Name="skies" Type="String" />
        <asp:Parameter Name="reportedby" Type="String" />
        <asp:Parameter Name="comments" Type="String" />
        <asp:Parameter Name="reportid" Type="Int32" />
        </UpdateParameters>
        <InsertParameters>
        <asp:Parameter Name="bidid" Type="Int32" />
        <asp:Parameter Name="mechdredgeid" Type="Int32" />
        <asp:Parameter Name="number" Type="String" />
        <asp:Parameter Name="reportdate" Type="DateTime" />
        <asp:Parameter Name="datereported" Type="DateTime" />
        <asp:Parameter Name="wind" Type="String" />
        <asp:Parameter Name="seas" Type="String" />
        <asp:Parameter Name="skies" Type="String" />
        <asp:Parameter Name="reportedby" Type="String" />
        <asp:Parameter Name="comments" Type="String" />
        </InsertParameters>
        <SelectParameters>
        <asp:ControlParameter ControlID="GridView1"
DefaultValue="1" Name="reportid" PropertyName="SelectedValue"
Type="Int32" />
        </SelectParameters>
        </asp:SqlDataSource>
        <asp:FormView ID="FormView1" runat="server"
DataKeyNames="reportid" DataSourceID="SqlDataSource1"
OnItemInserted="FormView1_ItemInserted"
OnItemDeleted="FormView1_ItemDeleted"
OnItemUpdated="FormView1_ItemUpdated" DefaultMode="Insert"
BackColor="#0000C0">
        <EditItemTemplate>
        <table style="text-align: left;">
        <tr>

```

```

        <td>
            <asp:Label ID="Label1" runat="server"
Text="Report Number" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="130px"></asp:Label>
        </td>
        <td>
            <asp:TextBox ID="numberTextBox" runat="server" Text='<%#
Bind("number") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Report Date"
Width="130px"></asp:Label></td>
        <td>
            <asp:TextBox ID="reportdateTextBox" runat="server"
Text='<%# Bind("reportdate", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Date Reported"
Width="130px"></asp:Label></td>
        <td>
            <asp:TextBox ID="datereportedTextBox" runat="server"
Text='<%# Bind("datereported", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Wind"
Width="130px"></asp:Label></td>
        <td>
            <asp:TextBox ID="windTextBox" runat="server" Text='<%#
Bind("wind") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Seas"
Width="130px"></asp:Label></td>
        <td>

```

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                <asp:TextBox ID="seasTextBox" runat="server" Text='<%#
Bind("seas") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Skies"
                    Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="skiesTextBox" runat="server" Text='<%#
Bind("skies") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Reported by"
                    Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="reportedbyTextBox" runat="server"
                    Text='<%# Bind("reportedby") %>' BackColor="White" BorderStyle="Inset"
                    Font-Names="Verdana" Font-Size="10pt"
                    Width="200px"></asp:TextBox></td>

            </tr>
            <tr>
                <td>
                    <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Comments"
                    Width="130px"></asp:Label></td>
                <td>
                    <asp:TextBox ID="commentsTextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

            </tr>
        </table>
        <asp:LinkButton ID="UpdateButton" runat="server"
        CausesValidation="True" CommandName="Update"
            Text="Update" ForeColor="Yellow"></asp:LinkButton>
        <asp:LinkButton ID="UpdateCancelButton" runat="server"
        CausesValidation="False" CommandName="Cancel"
            Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
    </EditItemTemplate>
    <InsertItemTemplate>
        <table style="text-align: left;">
            <tr>
                <td>

```

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                <asp:Label ID="Label10" runat="server"
Text="Contract Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="130px"></asp:Label>
            </td>
            <td>
                <asp:DropDownList ID="DropDownList1"
runat="server" BackColor="White" DataSource='<%# Bind("bidid") %>'
                DataSourceID="SqlDataSource4"
DataTextField="contractname" DataValueField="bidid"
                Font-Names="Verdana" Font-Size="10pt"
SelectedValue='<%# Bind("bidid") %>'
                Width="205px">
            </asp:DropDownList><asp:SqlDataSource
ID="SqlDataSource4" runat="server" ConnectionString="<%$
ConnectionStrings:WPMACConnectionString3 %>"
                SelectCommand="SELECT [bidid],
[contractname] FROM [BID]"></asp:SqlDataSource>
            </td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label2" runat="server"
Text="Dredge Name" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="130px"></asp:Label>
            </td>
            <td>
                <asp:DropDownList ID="DropDownList2"
runat="server" BackColor="White" DataSource='<%# Bind("mechdredgeid")
%>'
                DataSourceID="SqlDataSource3"
DataTextField="name" DataValueField="mechdredgeid"
                Font-Names="Verdana" Font-Size="10pt"
SelectedValue='<%# Bind("mechdredgeid") %>'
                Width="205px">
            </asp:DropDownList><asp:SqlDataSource
ID="SqlDataSource3" runat="server" ConnectionString="<%$
ConnectionStrings:WPMACConnectionString4 %>"
                SelectCommand="SELECT [mechdredgeid],
[name] FROM [MECHANICAL_DREDGE]"></asp:SqlDataSource>
            </td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label1" runat="server"
Text="Report Number" Font-Names="Verdana" Font-Size="10pt"
ForeColor="White" Width="130px"></asp:Label>
            </td>
            <td>
                <asp:TextBox ID="numberTextBox" runat="server" Text='<%#
Bind("number") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>
        </tr>
        <tr>
            <td>

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                <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Report Date"
Width="130px"></asp:Label></td>
                <td>
                <asp:TextBox ID="reportdateTextBox" runat="server"
Text='<%# Bind("reportdate", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

                </tr>
                <tr>
                <td>
                <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Date Reported"
Width="130px"></asp:Label></td>
                <td>
                <asp:TextBox ID="datereportedTextBox" runat="server"
Text='<%# Bind("datereported", "{0:d}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

                </tr>
                <tr>
                <td>
                <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Wind"
Width="130px"></asp:Label></td>
                <td>
                <asp:TextBox ID="windTextBox" runat="server" Text='<%#
Bind("wind") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

                </tr>
                <tr>
                <td>
                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Seas"
Width="130px"></asp:Label></td>
                <td>
                <asp:TextBox ID="seasTextBox" runat="server" Text='<%#
Bind("seas") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

                </tr>
                <tr>
                <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Skies"
Width="130px"></asp:Label></td>
                <td>

```

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        <asp:TextBox ID="skiesTextBox" runat="server" Text='<%#
Bind("skies") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

    </tr>
    <tr>
        <td>
            <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                Text="Reported by"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="reportedbyTextBox" runat="server"
Text='<%# Bind("reportedby") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt"
Width="200px"></asp:TextBox></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="White"
                    Text="Comments"
Width="130px"></asp:Label></td>
            <td>
                <asp:TextBox ID="commentsTextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:TextBox></td>

        </tr>
    </table>
    <asp:LinkButton ID="InsertButton" runat="server"
CausesValidation="True" CommandName="Insert"
        Text="Insert" ForeColor="Yellow"></asp:LinkButton>
    <asp:LinkButton ID="InsertCancelButton" runat="server"
CausesValidation="False" CommandName="Cancel"
        Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
    <asp:SqlDataSource ID="SqlDataSource1" runat="server"
ConnectionString='<%$ ConnectionStrings:WPMAConnectionString2 %>'
        SelectCommand="SELECT [bidid], [number] FROM
[BID]"></asp:SqlDataSource>
    <asp:SqlDataSource ID="SqlDataSource2" runat="server"
ConnectionString='<%$ ConnectionStrings:WPMAConnectionString3 %>'
        SelectCommand="SELECT [mechdredgeid], [name] FROM
[MECHDREDGE]"></asp:SqlDataSource>
    </InsertItemTemplate>
    <ItemTemplate>
        <table style="text-align: left;">
            <tr>
                <td>
                    <asp:Label ID="Label11" runat="server"
Text="Report Number" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Black" Width="130px"></asp:Label>
                </td>
                <td>

```

```

                                <asp:Label ID="numberLabel" runat="server"
Text='<%# Bind("number") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label3" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                                Text="Report Date"
Width="130px"></asp:Label></td>
                                <td>
                                <asp:Label ID="reportdateLabel" runat="server" Text='<%#
Bind("reportdate", "{0:d}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label4" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                                Text="Date Reported"
Width="130px"></asp:Label></td>
                                <td>
                                <asp:Label ID="datereportedLabel" runat="server" Text='<%#
Bind("datereported", "{0:d}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label5" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                                Text="Wind"
Width="130px"></asp:Label></td>
                                <td>
                                <asp:Label ID="windLabel" runat="server" Text='<%#
Bind("wind") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label6" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                                Text="Seas"
Width="130px"></asp:Label></td>
                                <td>
                                <asp:Label ID="seasLabel" runat="server" Text='<%#
Bind("seas") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

                                </tr>
                                <tr>
                                <td>
                                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"

```

```

                                Text="Skies"
Width="130px"></asp:Label></td>
        <td>
            <asp:Label ID="skiesLabel" runat="server" Text='<%#
Bind("skies") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label8" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                    Text="Reported by"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="reportedbyLabel" runat="server" Text='<%#
Bind("reportedby") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

        </tr>
        <tr>
            <td>
                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="10pt" ForeColor="Black"
                    Text="Comments"
Width="130px"></asp:Label></td>
            <td>
                <asp:Label ID="commentsLabel" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="10pt" Width="200px"></asp:Label></td>

        </tr>

    </table>

    <asp:LinkButton ID="NewButton" runat="server"
CausesValidation="False" CommandName="New"
        Text="New" ForeColor="Yellow"></asp:LinkButton>
</ItemTemplate>
<HeaderTemplate>
    <span style="color: #ccffff">
        <span>MECHANICAL DREDGE -- DAILY REPORT</span> </span>
</HeaderTemplate>
<FooterTemplate>

</FooterTemplate>
</asp:FormView>
<br />

</div>

<!--     Divisin between Dredge Report input and Load report input
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX

```



```

[delay4start] = @delay4start, [delay4end] = @delay4end, [endloading] =
@endloading, [pos1] = @pos1, [post1start] = @post1start, [postlend] =
@postlend, [pos2] = @pos2, [post2start] = @post2start, [post2end] =
@post2end, [pos3] = @pos3, [post3start] = @post3start, [post3end] =
@post3end, [bargelleft] = @bargelleft, [avgpayqty] = @avgpayqty,
[avgdigface] = @avgdigface, [avgdigwidth] = @avgdigwidth, [travel] =
@travel, [comments] = @comments WHERE [loadid] = @loadid">
  <DeleteParameters>
    <asp:Parameter Name="loadid" Type="Int32" />
  </DeleteParameters>
  <UpdateParameters>
    <asp:Parameter Name="reportid" Type="Int32" />
    <asp:Parameter Name="cutid" Type="Int32" />
    <asp:Parameter Name="bargeid" Type="Int32" />
    <asp:Parameter Name="loadnumber" Type="String" />
    <asp:Parameter Name="movetocutstart" Type="DateTime" />
    <asp:Parameter Name="movetocutend" Type="DateTime" />
    <asp:Parameter Name="waitforbarge" Type="DateTime" />
    <asp:Parameter Name="bargearrive" Type="DateTime" />
    <asp:Parameter Name="changescowstart" Type="DateTime" />
    <asp:Parameter Name="changescowend" Type="DateTime" />
    <asp:Parameter Name="pre1" Type="String" />
    <asp:Parameter Name="pre1start" Type="DateTime" />
    <asp:Parameter Name="pre1end" Type="DateTime" />
    <asp:Parameter Name="pre2" Type="String" />
    <asp:Parameter Name="pre2start" Type="DateTime" />
    <asp:Parameter Name="pre2end" Type="DateTime" />
    <asp:Parameter Name="pre3" Type="String" />
    <asp:Parameter Name="pre3start" Type="DateTime" />
    <asp:Parameter Name="pre3end" Type="DateTime" />
    <asp:Parameter Name="pre4" Type="String" />
    <asp:Parameter Name="pre4start" Type="DateTime" />
    <asp:Parameter Name="pre4end" Type="DateTime" />
    <asp:Parameter Name="startloading" Type="DateTime" />
    <asp:Parameter Name="del1" Type="String" />
    <asp:Parameter Name="delay1start" Type="DateTime" />
    <asp:Parameter Name="delay1end" Type="DateTime" />
    <asp:Parameter Name="del2" Type="String" />
    <asp:Parameter Name="delay2start" Type="DateTime" />
    <asp:Parameter Name="delay2end" Type="DateTime" />
    <asp:Parameter Name="del3" Type="String" />
    <asp:Parameter Name="delay3start" Type="DateTime" />
    <asp:Parameter Name="delay3end" Type="DateTime" />
    <asp:Parameter Name="del4" Type="String" />
    <asp:Parameter Name="delay4start" Type="DateTime" />
    <asp:Parameter Name="delay4end" Type="DateTime" />
    <asp:Parameter Name="endloading" Type="DateTime" />
    <asp:Parameter Name="pos1" Type="String" />
    <asp:Parameter Name="post1start" Type="DateTime" />
    <asp:Parameter Name="post1end" Type="DateTime" />
    <asp:Parameter Name="pos2" Type="String" />
    <asp:Parameter Name="post2start" Type="DateTime" />
    <asp:Parameter Name="post2end" Type="DateTime" />
    <asp:Parameter Name="pos3" Type="String" />
    <asp:Parameter Name="post3start" Type="DateTime" />
    <asp:Parameter Name="post3end" Type="DateTime" />
    <asp:Parameter Name="bargelleft" Type="DateTime" />

```

```

    <asp:Parameter Name="avgpayqty" Type="Decimal" />
    <asp:Parameter Name="avgdigface" Type="Decimal" />
    <asp:Parameter Name="avgdigwidth" Type="Decimal" />
    <asp:Parameter Name="travel" Type="Decimal" />
    <asp:Parameter Name="comments" Type="String" />
    <asp:Parameter Name="loadid" Type="Int32" />
</UpdateParameters>
<InsertParameters>
    <asp:Parameter Name="reportid" Type="Int32" />
    <asp:Parameter Name="cutid" Type="Int32" />
    <asp:Parameter Name="bargeid" Type="Int32" />
    <asp:Parameter Name="loadnumber" Type="String" />
    <asp:Parameter Name="movetocutstart" Type="DateTime" />
    <asp:Parameter Name="movetocutend" Type="DateTime" />
    <asp:Parameter Name="waitforbarge" Type="DateTime" />
    <asp:Parameter Name="bargearrive" Type="DateTime" />
    <asp:Parameter Name="changescowstart" Type="DateTime" />
    <asp:Parameter Name="changescowend" Type="DateTime" />
    <asp:Parameter Name="pre1" Type="String" />
    <asp:Parameter Name="pre1start" Type="DateTime" />
    <asp:Parameter Name="pre1end" Type="DateTime" />
    <asp:Parameter Name="pre2" Type="String" />
    <asp:Parameter Name="pre2start" Type="DateTime" />
    <asp:Parameter Name="pre2end" Type="DateTime" />
    <asp:Parameter Name="pre3" Type="String" />
    <asp:Parameter Name="pre3start" Type="DateTime" />
    <asp:Parameter Name="pre3end" Type="DateTime" />
    <asp:Parameter Name="pre4" Type="String" />
    <asp:Parameter Name="pre4start" Type="DateTime" />
    <asp:Parameter Name="pre4end" Type="DateTime" />
    <asp:Parameter Name="startloading" Type="DateTime" />
    <asp:Parameter Name="del1" Type="String" />
    <asp:Parameter Name="delay1start" Type="DateTime" />
    <asp:Parameter Name="delay1end" Type="DateTime" />
    <asp:Parameter Name="del2" Type="String" />
    <asp:Parameter Name="delay2start" Type="DateTime" />
    <asp:Parameter Name="delay2end" Type="DateTime" />
    <asp:Parameter Name="del3" Type="String" />
    <asp:Parameter Name="delay3start" Type="DateTime" />
    <asp:Parameter Name="delay3end" Type="DateTime" />
    <asp:Parameter Name="del4" Type="String" />
    <asp:Parameter Name="delay4start" Type="DateTime" />
    <asp:Parameter Name="delay4end" Type="DateTime" />
    <asp:Parameter Name="endloading" Type="DateTime" />
    <asp:Parameter Name="pos1" Type="String" />
    <asp:Parameter Name="post1start" Type="DateTime" />
    <asp:Parameter Name="post1end" Type="DateTime" />
    <asp:Parameter Name="pos2" Type="String" />
    <asp:Parameter Name="post2start" Type="DateTime" />
    <asp:Parameter Name="post2end" Type="DateTime" />
    <asp:Parameter Name="pos3" Type="String" />
    <asp:Parameter Name="post3start" Type="DateTime" />
    <asp:Parameter Name="post3end" Type="DateTime" />
    <asp:Parameter Name="bargelleft" Type="DateTime" />
    <asp:Parameter Name="avgpayqty" Type="Decimal" />
    <asp:Parameter Name="avgdigface" Type="Decimal" />
    <asp:Parameter Name="avgdigwidth" Type="Decimal" />

```



```

        </tr>
        <tr>
            <td style="text-align: center">
                <asp:Label ID="Label35" runat="server"
                Text="DELAY" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
                ForeColor="Yellow" Width="100px"></asp:Label></td>
            <td style="text-align: center">
                <asp:Label ID="Label29" runat="server"
                Text="START" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
                ForeColor="Yellow"></asp:Label></td>
            <td style="text-align: center">
                <asp:Label ID="Label30" runat="server"
                Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
                ForeColor="Yellow"></asp:Label></td>
            <td>
            </td>
            <td>
            </td>
            <td>
                <asp:Label ID="Label67" runat="server" Font-
                Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Avg Dig Quantity"
                Width="100px"></asp:Label></td>
            <td>
                <asp:TextBox ID="TextBox6" runat="server"
                BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
                Font-Size="8pt" ForeColor="Black"
                Text='<%# Bind("avgpayqty") %>' Width="70px"></asp:TextBox></td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label36" runat="server"
                Text="Move to New Cut" Font-Names="Verdana" Font-Size="9pt"
                ForeColor="White" Width="100px"></asp:Label></td>
            <td>
                <asp:TextBox ID="movetocutstartTextBox" runat="server"
                Text='<%# Bind("movetocutstart") %>' BackColor="White"
                BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
                Width="70px"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="movetocutendTextBox" runat="server"
                Text='<%# Bind("movetocutend") %>' BackColor="White"
                BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
                Width="70px"></asp:TextBox></td>
            <td>
            </td>
            <td>
            </td>
            <td>
                <asp:Label ID="Label54" runat="server" Font-
                Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Avg Dig Face"
                Width="100px"></asp:Label></td>
            <td>

```

```

        <asp:TextBox ID="avgdigfaceTextBox" runat="server"
Text='<%# Bind("avgdigface") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:TextBox></td>
    </tr>
    <tr>
        <td style="height: 40px">
            <asp:Label ID="Label37" runat="server"
Text="Wait for Barge" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
            <td style="height: 40px">
                <asp:TextBox ID="waitforbargeTextBox" runat="server"
Text='<%# Bind("waitforbarge") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:TextBox></td>
                <td style="height: 40px">
                    <asp:TextBox ID="bargearriveTextBox" runat="server"
Text='<%# Bind("bargearrive") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:TextBox></td>
                    <td style="height: 40px">
                        </td>
                    <td style="height: 40px">
                        </td>
                    <td style="height: 40px">
                        <asp:Label ID="Label53" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Avg Dig Width"
Width="100px"></asp:Label></td>
                        <td style="height: 40px">
                            <asp:TextBox ID="avgdigqtyTextBox" runat="server"
Text='<%# Bind("avgdigwidth") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:TextBox></td>
                        </tr>
                    <tr>
                        <td>
                            <asp:Label ID="Label64" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Change Barge"></asp:Label></td>
                        <td>
                            <asp:TextBox ID="TextBox1" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
Font-Size="8pt" ForeColor="Black"
Text='<%# Bind("changescowstart") %>' Width="70px"></asp:TextBox></td>
                            <td>
                                <asp:TextBox ID="TextBox2" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
Font-Size="8pt" ForeColor="Black"
Text='<%# Bind("changescowend") %>' Width="70px"></asp:TextBox></td>
                            <td>
                                </td>
                            </td>
                            <td>
                                </td>
                            <td>
                                <asp:Label ID="Label52" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"

```



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        <td><asp:DropDownList ID="DropDownList15"
runat="server" SelectedValue='<%# Bind("pre2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
    <asp:ListItem Selected="True"></asp:ListItem>
    <asp:ListItem>Traffic</asp:ListItem>
    <asp:ListItem>Weather</asp:ListItem>
    <asp:ListItem>Survey</asp:ListItem>
    <asp:ListItem>Scow Repair</asp:ListItem>
    <asp:ListItem>Dredge Repair</asp:ListItem>
    <asp:ListItem>Bucket Repair</asp:ListItem>
    <asp:ListItem>Fuel XFR</asp:ListItem>
    <asp:ListItem>Handling Debris</asp:ListItem>
    <asp:ListItem>Grease</asp:ListItem>
    <asp:ListItem>Set Ahead/back</asp:ListItem>
    <asp:ListItem>Paint Marks</asp:ListItem>
    <asp:ListItem>Positioning
System</asp:ListItem>
    <asp:ListItem>Inspection</asp:ListItem>
    <asp:ListItem>Micellaneous</asp:ListItem>
</asp:DropDownList></td>
<td>
    <asp:TextBox ID="pre2startTextBox" runat="server"
Text='<%# Bind("pre2start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
    <td>
    <asp:TextBox ID="pre2endTextBox" runat="server" Text='<%#
Bind("pre2end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
    <td>
</td>
    <td>
</td>
    <td>
</td>
    <td>
</td>
</tr>
<tr>
    <td><asp:DropDownList ID="DropDownList16"
runat="server" SelectedValue='<%# Bind("pre3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
    <asp:ListItem Selected="True"></asp:ListItem>
    <asp:ListItem>Traffic</asp:ListItem>
    <asp:ListItem>Weather</asp:ListItem>
    <asp:ListItem>Survey</asp:ListItem>
    <asp:ListItem>Scow Repair</asp:ListItem>
    <asp:ListItem>Dredge Repair</asp:ListItem>
    <asp:ListItem>Bucket Repair</asp:ListItem>
    <asp:ListItem>Fuel XFR</asp:ListItem>
    <asp:ListItem>Handling Debris</asp:ListItem>
    <asp:ListItem>Grease</asp:ListItem>
    <asp:ListItem>Set Ahead/back</asp:ListItem>
    <asp:ListItem>Paint Marks</asp:ListItem>
    <asp:ListItem>Positioning
System</asp:ListItem>

```

```

                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
            </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="pre3startTextBox" runat="server"
Text='<%# Bind("pre3start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="pre3endTextBox" runat="server" Text='<%#
Bind("pre3end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
            <td>
            </td>
            <td>
            </td>
            <td>
            </td>
            <td>
            </td>
            </tr>
            <tr>
                <td><asp:DropDownList ID="DropDownList17"
runat="server" SelectedValue='<%# Bind("pre4") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                    <asp:ListItem Selected="True"></asp:ListItem>
                    <asp:ListItem>Traffic</asp:ListItem>
                    <asp:ListItem>Weather</asp:ListItem>
                    <asp:ListItem>Survey</asp:ListItem>
                    <asp:ListItem>Scow Repair</asp:ListItem>
                    <asp:ListItem>Dredge Repair</asp:ListItem>
                    <asp:ListItem>Bucket Repair</asp:ListItem>
                    <asp:ListItem>Fuel XFR</asp:ListItem>
                    <asp:ListItem>Handling Debris</asp:ListItem>
                    <asp:ListItem>Grease</asp:ListItem>
                    <asp:ListItem>Set Ahead/back</asp:ListItem>
                    <asp:ListItem>Paint Marks</asp:ListItem>
                    <asp:ListItem>Positioning
System</asp:ListItem>
                    <asp:ListItem>Inspection</asp:ListItem>
                    <asp:ListItem>Micellaneous</asp:ListItem>
                </asp:DropDownList></td>
                <td>
                    <asp:TextBox ID="pre4startTextBox" runat="server"
Text='<%# Bind("pre4start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
                <td>
                    <asp:TextBox ID="pre4endTextBox" runat="server" Text='<%#
Bind("pre4end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="Black"></asp:TextBox></td>
                <td>
                </td>
                <td style="text-align: center">

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                <asp:Label ID="Label32" runat="server"
Text="DELAY" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
                <td style="text-align: center">
                <asp:Label ID="Label33" runat="server"
Text="START" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
                <td style="text-align: center">
                <asp:Label ID="Label34" runat="server"
Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
            </tr>
            <tr>
                <td>
                <asp:Label ID="Label42" runat="server"
Text="Start Loading" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
                <td>
                <asp:TextBox ID="startloadingTextBox" runat="server"
Text='<%# Bind("startloading") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:TextBox></td>
                <td>
                </td>
                <td>
                </td>
                <td>
                <asp:Label ID="Label31" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="End Loading"
Width="100px"></asp:Label></td>
                <td>
                </td>
                <td>
                <asp:TextBox ID="endloadingTextBox" runat="server"
Text='<%# Bind("endloading") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:TextBox></td>
            </tr>
            <tr>
                <td><asp:DropDownList ID="DropDownList18"
runat="server" SelectedValue='<%# Bind("dell") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>

```

```

                <asp:ListItem>Micellaneous</asp:ListItem>
            </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="delaylstartTextBox" runat="server"
Text='<%# Bind("delaylstart") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="delaylendTextBox" runat="server"
Text='<%# Bind("delaylend") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
            <td>
            </td>
            <td><asp:DropDownList ID="DropDownList22"
runat="server" SelectedValue='<%# Bind("pos1") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
            </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="postlstartTextBox" runat="server"
Text='<%# Bind("postlstart") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="postlendTextBox" runat="server" Text='<%#
Bind("postlend") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
        </tr>
        <tr>
            <td><asp:DropDownList ID="DropDownList19"
runat="server" SelectedValue='<%# Bind("del2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>

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        <asp:ListItem>Handling Debris</asp:ListItem>
        <asp:ListItem>Grease</asp:ListItem>
        <asp:ListItem>Set Ahead/back</asp:ListItem>
        <asp:ListItem>Paint Marks</asp:ListItem>
        <asp:ListItem>Positioning
System</asp:ListItem>
        <asp:ListItem>Inspection</asp:ListItem>
        <asp:ListItem>Micellaneous</asp:ListItem>
    </asp:DropDownList></td>
    <td>
        <asp:TextBox ID="delay2startTextBox" runat="server"
Text='<%# Bind("delay2start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    <td>
        <asp:TextBox ID="delay2endTextBox" runat="server"
Text='<%# Bind("delay2end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    <td>
    </td>
    </td>
    <td><asp:DropDownList ID="DropDownList23"
runat="server" SelectedValue='<%# Bind("pos2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
    <asp:ListItem Selected="True"></asp:ListItem>
    <asp:ListItem>Traffic</asp:ListItem>
    <asp:ListItem>Weather</asp:ListItem>
    <asp:ListItem>Survey</asp:ListItem>
    <asp:ListItem>Scow Repair</asp:ListItem>
    <asp:ListItem>Dredge Repair</asp:ListItem>
    <asp:ListItem>Bucket Repair</asp:ListItem>
    <asp:ListItem>Fuel XFR</asp:ListItem>
    <asp:ListItem>Handling Debris</asp:ListItem>
    <asp:ListItem>Grease</asp:ListItem>
    <asp:ListItem>Set Ahead/back</asp:ListItem>
    <asp:ListItem>Paint Marks</asp:ListItem>
    <asp:ListItem>Positioning
System</asp:ListItem>
        <asp:ListItem>Inspection</asp:ListItem>
        <asp:ListItem>Micellaneous</asp:ListItem>
    </asp:DropDownList></td>
    <td>
        <asp:TextBox ID="post2startTextBox" runat="server"
Text='<%# Bind("post2start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    <td>
        <asp:TextBox ID="post2endTextBox" runat="server" Text='<%#
Bind("post2end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    </tr>
    <tr>
        <td><asp:DropDownList ID="DropDownList20"
runat="server" SelectedValue='<%# Bind("del3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
    <asp:ListItem Selected="True"></asp:ListItem>

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        <asp:ListItem>Traffic</asp:ListItem>
        <asp:ListItem>Weather</asp:ListItem>
        <asp:ListItem>Survey</asp:ListItem>
        <asp:ListItem>Scow Repair</asp:ListItem>
        <asp:ListItem>Dredge Repair</asp:ListItem>
        <asp:ListItem>Bucket Repair</asp:ListItem>
        <asp:ListItem>Fuel XFR</asp:ListItem>
        <asp:ListItem>Handling Debris</asp:ListItem>
        <asp:ListItem>Grease</asp:ListItem>
        <asp:ListItem>Set Ahead/back</asp:ListItem>
        <asp:ListItem>Paint Marks</asp:ListItem>
        <asp:ListItem>Positioning
System</asp:ListItem>
        <asp:ListItem>Inspection</asp:ListItem>
        <asp:ListItem>Micellaneous</asp:ListItem>
    </asp:DropDownList></td>
    <td>
        <asp:TextBox ID="delay3startTextBox" runat="server"
Text='<%# Bind("delay3start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    <td>
        <asp:TextBox ID="delay3endTextBox" runat="server"
Text='<%# Bind("delay3end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    </td>
    <td><asp:DropDownList ID="DropDownList24"
runat="server" SelectedValue='<%# Bind("pos3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
        <asp:ListItem Selected="True"></asp:ListItem>
        <asp:ListItem>Traffic</asp:ListItem>
        <asp:ListItem>Weather</asp:ListItem>
        <asp:ListItem>Survey</asp:ListItem>
        <asp:ListItem>Scow Repair</asp:ListItem>
        <asp:ListItem>Dredge Repair</asp:ListItem>
        <asp:ListItem>Bucket Repair</asp:ListItem>
        <asp:ListItem>Fuel XFR</asp:ListItem>
        <asp:ListItem>Handling Debris</asp:ListItem>
        <asp:ListItem>Grease</asp:ListItem>
        <asp:ListItem>Set Ahead/back</asp:ListItem>
        <asp:ListItem>Paint Marks</asp:ListItem>
        <asp:ListItem>Positioning
System</asp:ListItem>
        <asp:ListItem>Inspection</asp:ListItem>
        <asp:ListItem>Micellaneous</asp:ListItem>
    </asp:DropDownList></td>
    <td>
        <asp:TextBox ID="post3startTextBox" runat="server"
Text='<%# Bind("post3start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
    <td>
        <asp:TextBox ID="post3endTextBox" runat="server" Text='<%#
Bind("post3end") %>' BackColor="White" BorderStyle="Inset" Font-

```

```

Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
</tr>

<tr>
<td><asp:DropDownList ID="DropDownList21"
runat="server" SelectedValue='<%# Bind("del4") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
<asp:ListItem Selected="True"></asp:ListItem>
<asp:ListItem>Traffic</asp:ListItem>
<asp:ListItem>Weather</asp:ListItem>
<asp:ListItem>Survey</asp:ListItem>
<asp:ListItem>Scow Repair</asp:ListItem>
<asp:ListItem>Dredge Repair</asp:ListItem>
<asp:ListItem>Bucket Repair</asp:ListItem>
<asp:ListItem>Fuel XFR</asp:ListItem>
<asp:ListItem>Handling Debris</asp:ListItem>
<asp:ListItem>Grease</asp:ListItem>
<asp:ListItem>Set Ahead/back</asp:ListItem>
<asp:ListItem>Paint Marks</asp:ListItem>
<asp:ListItem>Positioning
System</asp:ListItem>
<asp:ListItem>Inspection</asp:ListItem>
<asp:ListItem>Micellaneous</asp:ListItem>
</asp:DropDownList></td>
<td>
<asp:TextBox ID="delay4startTextBox" runat="server"
Text='<%# Bind("delay4start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
<td>
<asp:TextBox ID="delay4endTextBox" runat="server"
Text='<%# Bind("delay4end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"
ForeColor="LightSteelBlue"></asp:TextBox></td>
<td>
</td>
</tr>
<tr>
<td>
<asp:Label ID="Label51" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Barge Left"
Width="100px"></asp:Label></td>
<td>
</td>
<td>
<asp:TextBox ID="bargelleftTextBox" runat="server"
Text='<%# Bind("bargelleft") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:TextBox></td>
</tr>
<tr>
<td>
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<td>
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        </td>
        <td>
        </td>
        <td>
        </td>
        <td>
        </td>
    </tr>
</table>
<br />
    &nbsp;<asp:Label ID="Label55" runat="server" Font-
Names="Verdana" Font-Size="9pt"
    ForeColor="White" Text="Comments"
Width="100px"></asp:Label>&nbsp;<asp:TextBox
ID="commentsTextBox" runat="server" Text='<%# Bind("comments") %>'
BackColor="White" BorderStyle="Inset" Font-Names="Verdana" Font-
Size="8pt" Height="40px" Width="400px"></asp:TextBox><br />
    <br />
    <asp:LinkButton ID="UpdateButton" runat="server"
CausesValidation="True" CommandName="Update"
    Text="Update" ForeColor="Yellow"></asp:LinkButton>
    &nbsp;<asp:LinkButton ID="UpdateCancelButton"
runat="server" CausesValidation="False" CommandName="Cancel"
    Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
</EditItemTemplate>
<InsertItemTemplate>
    <table style="text-align: left;">
        <tr>
            <td>
                <asp:Label ID="Label49" runat="server"
Text="Load Number" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
            <td>
                <asp:TextBox ID="loadnumberTextBox" runat="server"
Text='<%# Bind("loadnumber") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td>
            </td>
            <td>
            </td>
            <td>
            </td>
            <td>
            </td>
            <td>
            </td>
        </tr>
    </table>
    <br />
    <table>
        <tr>
            <td>
                &nbsp;<asp:Label ID="Label46" runat="server"
Text="Report Number" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
            <td>

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```

                <asp:SqlDataSource ID="SqlDataSource3"
runat="server" ConnectionString="<%$
ConnectionStrings:WPMAConnectionString1 %>"
                SelectCommand="SELECT [reportid], [number]
FROM [MECHDREDGE_DAILY]"></asp:SqlDataSource>
                &nbsp;<asp:DropDownList ID="DropDownList1"
runat="server" DataSource='<%# Bind("reportid") %>'
                DataSourceID="SqlDataSource3"
DataTextField="number" DataValueField="reportid"
                SelectedValue='<%# Bind("reportid") %>'>
                </asp:DropDownList></td>
                <td>
                &nbsp;<asp:Label ID="Label47" runat="server"
Text="Cut Number" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
                <td>
                &nbsp;<asp:SqlDataSource ID="SqlDataSource4"
runat="server" ConnectionString="<%$
ConnectionStrings:WPMAConnectionString2 %>"
                SelectCommand="SELECT [cutid], [cutnumber]
FROM [CUT]"></asp:SqlDataSource>
                <asp:DropDownList ID="DropDownList2"
runat="server" DataSource='<%# Eval("cutid") %>'
                DataSourceID="SqlDataSource4"
DataTextField="cutnumber" DataValueField="cutid"
                SelectedValue='<%# Bind("cutid") %>'>
                </asp:DropDownList>&nbsp;</td>
                <td>
                <asp:Label ID="Label48" runat="server"
Text="Barge Number" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label>&nbsp;</td>
                <td>
                <asp:SqlDataSource ID="SqlDataSource5"
runat="server" ConnectionString="<%$
ConnectionStrings:WPMAConnectionString4 %>"
                SelectCommand="SELECT [bargeid],
[bargenumber] FROM [BARGE]"></asp:SqlDataSource>
                <asp:DropDownList ID="DropDownList3"
runat="server" DataSource='<%# Bind("bargeid") %>'
                DataSourceID="SqlDataSource5"
DataTextField="bargenumber" DataValueField="bargeid"
                SelectedValue='<%# Bind("bargeid") %>'>
                </asp:DropDownList>&nbsp;</td>
        </tr>
        <tr>
                <td style="text-align: center">
                <asp:Label ID="Label38" runat="server"
Text="DELAY" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
                <td style="text-align: center">
                <asp:Label ID="Label39" runat="server"
Text="START" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>

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        <td style="text-align: center">
            <asp:Label ID="Label40" runat="server"
Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
        <td>
            </td>
        <td>
            </td>
        <td>
            </td>
        <td>
            </td>
    </tr>
    <tr>
        <td>
            <asp:Label ID="Label58" runat="server"
Text="Move to New Cut" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
        <td>
            <asp:TextBox ID="movetocutstartTextBox" runat="server"
Text='<%# Bind("movetocutstart") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
        <td>
            <asp:TextBox ID="movetocutendTextBox" runat="server"
Text='<%# Bind("movetocutend") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
        <td>
            </td>
        <td>
            </td>
        <td>
            <asp:Label ID="Label68" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Avg Dig Quantity"
Width="100px"></asp:Label></td>
        <td>
            <asp:TextBox ID="TextBox7" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
Font-Size="8pt" ForeColor="Black"
Text='<%# Bind("avgpayqty") %>' Width="70px"></asp:TextBox></td>
    </tr>

    <tr>
        <td style="height: 21px">
            <asp:Label ID="Label50" runat="server"
Text="Wait for Barge" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
        <td style="height: 21px">
            <asp:TextBox ID="waitforbargeTextBox" runat="server"
Text='<%# Bind("waitforbarge") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
        <td style="height: 21px">

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                <asp:TextBox ID="bargearriveTextBox" runat="server"
Text='<%# Bind("bargearrive") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
                <td style="height: 21px">
</td>
                <td style="height: 21px">
</td>
                <td style="height: 21px">
                <asp:Label ID="Label56" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Avg Dig Face"
Width="100px"></asp:Label></td>
                <td style="height: 21px">
                <asp:TextBox ID="avgdigfaceTextBox" runat="server"
Text='<%# Bind("avgdigface") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            </tr>
            <tr>
                <td style="height: 24px">
                <asp:Label ID="Label65" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Change Barge"></asp:Label></td>
                <td style="height: 24px">
                <asp:TextBox ID="TextBox3" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
                Font-Size="9pt" ForeColor="Black"
Text='<%# Bind("changescowstart") %>' Width="70px"></asp:TextBox></td>
                <td style="height: 24px">
                <asp:TextBox ID="TextBox4" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
                Font-Size="9pt" ForeColor="Black"
Text='<%# Bind("changescowend") %>' Width="70px"></asp:TextBox></td>
                <td style="height: 24px">
</td>
                <td style="height: 24px">
</td>
                <td style="height: 24px">
                <asp:Label ID="Label57" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Avg Dig Width"
Width="100px"></asp:Label></td>
                <td style="height: 24px">
                <asp:TextBox ID="avgdigqtyTextBox" runat="server"
Text='<%# Bind("avgdigwidth") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
            </tr>
            <tr>
                <td>
                <asp:DropDownList ID="DropDownList4"
runat="server" SelectedValue='<%# Bind("pre1") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem
Selected="True"></asp:ListItem>

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                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>
            </asp:DropDownList></td>
        <td>
            <asp:TextBox ID="prelstartTextBox" runat="server"
Text='<%# Bind("prelstart") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        <td>
            <asp:TextBox ID="prelendTextBox" runat="server" Text='<%#
Bind("prelend") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        <td>
        </td>
        <td>
        </td>
        <td>
            <asp:Label ID="Label59" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Travel"
Width="100px"></asp:Label></td>
        <td>
            <asp:TextBox ID="travelTextBox" runat="server" Text='<%#
Bind("travel") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
    </tr>
    <tr>
        <td style="height: 21px">
            <asp:DropDownList ID="DropDownList5"
runat="server" SelectedValue='<%# Bind("pre2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem
Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>

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                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>
            </asp:DropDownList></td>
            <td style="height: 21px">
                <asp:TextBox ID="pre2startTextBox" runat="server"
Text='<%# Bind("pre2start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td style="height: 21px">
                <asp:TextBox ID="pre2endTextBox" runat="server" Text='<%#
Bind("pre2end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td style="height: 21px">
</td>
            <td style="height: 21px">
</td>
            <td style="height: 21px">
</td>
            <td style="height: 21px">
                <asp:DropDownList ID="DropDownList6"
runat="server" SelectedValue='<%# Bind("pre3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem
Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>

```

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        </asp:DropDownList></td>
        <td>
            <asp:TextBox ID="pre3startTextBox" runat="server"
Text='<%# Bind("pre3start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        <td>
            <asp:TextBox ID="pre3endTextBox" runat="server" Text='<%#
Bind("pre3end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        <td>
        </td>
        </td>
        </td>
        </td>
        </td>
        </td>
    </tr>

    <tr>
        <td>
            <asp:DropDownList ID="DropDownList7"
runat="server" SelectedValue='<%# Bind("pre4") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem
Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>
            </asp:DropDownList></td>
        <td>
            <asp:TextBox ID="pre4startTextBox" runat="server"
Text='<%# Bind("pre4start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        <td>
            <asp:TextBox ID="pre4endTextBox" runat="server" Text='<%#
Bind("pre4end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>

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        <td>
        </td>
        <td style="text-align: center">
            <asp:Label ID="Label43" runat="server"
Text="DELAY" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
            <td style="text-align: center">
                <asp:Label ID="Label44" runat="server"
Text="START" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
            <td style="text-align: center">
                <asp:Label ID="Label45" runat="server"
Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label41" runat="server"
Text="Start Loading" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>
            <td>
                <asp:TextBox ID="startloadingTextBox" runat="server"
Text='<%# Bind("startloading") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
            <td>
            </td>
            <td>
            </td>
            <td>
                <asp:Label ID="Label60" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="End Loading"
Width="100px"></asp:Label></td>
            <td>
            </td>
            <td>
                <asp:TextBox ID="endloadingTextBox" runat="server"
Text='<%# Bind("endloading") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        </tr>
        <tr>
            <td style="height: 26px">
                <asp:DropDownList ID="DropDownList8"
runat="server" SelectedValue='<%# Bind("dell") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                    <asp:ListItem
Selected="True"></asp:ListItem>
                    <asp:ListItem>Traffic</asp:ListItem>
                    <asp:ListItem>Weather</asp:ListItem>
                    <asp:ListItem>Survey</asp:ListItem>
                    <asp:ListItem>Scow Repair</asp:ListItem>
                    <asp:ListItem>Dredge Repair</asp:ListItem>
                    <asp:ListItem>Bucket Repair</asp:ListItem>
                    <asp:ListItem>Fuel XFR</asp:ListItem>

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                                <asp:ListItem>Handling
Debris</asp:ListItem>
                                <asp:ListItem>Grease</asp:ListItem>
                                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                                <asp:ListItem>Paint Marks</asp:ListItem>
                                <asp:ListItem>Positioning
System</asp:ListItem>
                                <asp:ListItem>Inspection</asp:ListItem>
                                <asp:ListItem>Micellaneous</asp:ListItem>
                                <asp:ListItem></asp:ListItem>
                                </asp:DropDownList></td>
                                <td style="height: 26px">
                                    <asp:TextBox ID="delaylstartTextBox" runat="server"
Text='<%# Bind("delaylstart") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
                                <td style="height: 26px">
                                    <asp:TextBox ID="delaylendTextBox" runat="server"
Text='<%# Bind("delaylend") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
                                <td style="height: 26px">
                                </td>
                                <td style="height: 26px">
                                    <asp:DropDownList ID="DropDownList12"
runat="server" SelectedValue='<%# Bind("pos1") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                                        <asp:ListItem
Selected="True"></asp:ListItem>
                                        <asp:ListItem>Wait for Tug</asp:ListItem>
                                        <asp:ListItem>Traffic</asp:ListItem>
                                        <asp:ListItem>Weather</asp:ListItem>
                                        <asp:ListItem>Scow Repair</asp:ListItem>
                                        <asp:ListItem>Handling
Debris</asp:ListItem>
                                        <asp:ListItem>Inspection</asp:ListItem>
                                        <asp:ListItem>Micellaneous</asp:ListItem>
                                        <asp:ListItem></asp:ListItem>
                                    </asp:DropDownList></td>
                                <td style="height: 26px">
                                    <asp:TextBox ID="postlstartTextBox" runat="server"
Text='<%# Bind("postlstart") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
                                <td style="height: 26px">
                                    <asp:TextBox ID="postlendTextBox" runat="server" Text='<%#
Bind("postlend") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
                                </tr>
                                <tr>
                                <td>
                                    <asp:DropDownList ID="DropDownList9"
runat="server" SelectedValue='<%# Bind("del2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">

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                <asp:ListItem
Selected="True"></asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Survey</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Dredge Repair</asp:ListItem>
                <asp:ListItem>Bucket Repair</asp:ListItem>
                <asp:ListItem>Fuel XFR</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Grease</asp:ListItem>
                <asp:ListItem>Set
Ahead/back</asp:ListItem>
                <asp:ListItem>Paint Marks</asp:ListItem>
                <asp:ListItem>Positioning
System</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>
            </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="delay2startTextBox" runat="server"
Text='<%# Bind("delay2start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="delay2endTextBox" runat="server"
Text='<%# Bind("delay2end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td>
            </td>
            <td>
                <asp:DropDownList ID="DropDownList13"
runat="server" SelectedValue='<%# Bind("pos2") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                <asp:ListItem
Selected="True"></asp:ListItem>
                <asp:ListItem>Wait for Tug</asp:ListItem>
                <asp:ListItem>Traffic</asp:ListItem>
                <asp:ListItem>Weather</asp:ListItem>
                <asp:ListItem>Scow Repair</asp:ListItem>
                <asp:ListItem>Handling
Debris</asp:ListItem>
                <asp:ListItem>Inspection</asp:ListItem>
                <asp:ListItem>Micellaneous</asp:ListItem>
                <asp:ListItem></asp:ListItem>
            </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="post2startTextBox" runat="server"
Text='<%# Bind("post2start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="post2endTextBox" runat="server" Text='<%#
Bind("post2end") %>' BackColor="White" BorderStyle="Inset" Font-

```

```

Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
</tr>
<tr>
<td style="height: 24px">
<asp:DropDownList ID="DropDownList10"
runat="server" SelectedValue='<%# Bind("del3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
<asp:ListItem
Selected="True"></asp:ListItem>
<asp:ListItem>Traffic</asp:ListItem>
<asp:ListItem>Weather</asp:ListItem>
<asp:ListItem>Survey</asp:ListItem>
<asp:ListItem>Scow Repair</asp:ListItem>
<asp:ListItem>Dredge Repair</asp:ListItem>
<asp:ListItem>Bucket Repair</asp:ListItem>
<asp:ListItem>Fuel XFR</asp:ListItem>
<asp:ListItem>Handling
Debris</asp:ListItem>
<asp:ListItem>Grease</asp:ListItem>
<asp:ListItem>Set
Ahead/back</asp:ListItem>
<asp:ListItem>Paint Marks</asp:ListItem>
<asp:ListItem>Positioning
System</asp:ListItem>
<asp:ListItem>Inspection</asp:ListItem>
<asp:ListItem>Micellaneous</asp:ListItem>
<asp:ListItem></asp:ListItem>
</asp:DropDownList></td>
<td style="height: 24px">
<asp:TextBox ID="delay3startTextBox" runat="server"
Text='<%# Bind("delay3start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
<td style="height: 24px">
<asp:TextBox ID="delay3endTextBox" runat="server"
Text='<%# Bind("delay3end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
<td style="height: 24px">
</td>
<td style="height: 24px">
<asp:DropDownList ID="DropDownList14"
runat="server" SelectedValue='<%# Bind("pos3") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
<asp:ListItem
Selected="True"></asp:ListItem>
<asp:ListItem>Wait for Tug</asp:ListItem>
<asp:ListItem>Traffic</asp:ListItem>
<asp:ListItem>Weather</asp:ListItem>
<asp:ListItem>Scow Repair</asp:ListItem>
<asp:ListItem>Handling
Debris</asp:ListItem>
<asp:ListItem>Inspection</asp:ListItem>
<asp:ListItem>Micellaneous</asp:ListItem>
<asp:ListItem></asp:ListItem>
</asp:DropDownList></td>

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        <td style="height: 24px">
            <asp:TextBox ID="post3startTextBox" runat="server"
Text='<%# Bind("post3start") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td style="height: 24px">
                <asp:TextBox ID="post3endTextBox" runat="server" Text='<%#
Bind("post3end") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
        </tr>
        <tr>
            <td>
                <asp:DropDownList ID="DropDownList11"
runat="server" SelectedValue='<%# Bind("del4") %>'
BackColor="LightSteelBlue" ForeColor="MediumBlue">
                    <asp:ListItem
Selected="True"></asp:ListItem>
                    <asp:ListItem>Traffic</asp:ListItem>
                    <asp:ListItem>Weather</asp:ListItem>
                    <asp:ListItem>Survey</asp:ListItem>
                    <asp:ListItem>Scow Repair</asp:ListItem>
                    <asp:ListItem>Dredge Repair</asp:ListItem>
                    <asp:ListItem>Bucket Repair</asp:ListItem>
                    <asp:ListItem>Fuel XFR</asp:ListItem>
                    <asp:ListItem>Handling
Debris</asp:ListItem>
                    <asp:ListItem>Grease</asp:ListItem>
                    <asp:ListItem>Set
Ahead/back</asp:ListItem>
                    <asp:ListItem>Paint Marks</asp:ListItem>
                    <asp:ListItem>Positioning
System</asp:ListItem>
                    <asp:ListItem>Inspection</asp:ListItem>
                    <asp:ListItem>Micellaneous</asp:ListItem>
                    <asp:ListItem></asp:ListItem>
                </asp:DropDownList></td>
            <td>
                <asp:TextBox ID="delay4startTextBox" runat="server"
Text='<%# Bind("delay4start") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Width="70px"></asp:TextBox></td>
            <td>
                <asp:TextBox ID="delay4endTextBox" runat="server"
Text='<%# Bind("delay4end") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            <td>
                <td>
                    <asp:Label ID="Label61" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Barge Left"
Width="100px"></asp:Label></td>
                <td>
                    </td>
                <td>
                    </td>
            </td>
        </tr>

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                <asp:TextBox ID="bargyleftTextBox" runat="server"
Text='<%# Bind("bargyleft") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" ForeColor="Black"
Width="70px"></asp:TextBox></td>
            </tr>
        </table>
        <asp:Label ID="Label62" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
Text="Comments" Width="100px"></asp:Label>&nbsp;
&nbsp;<asp:TextBox ID="commentsTextBox" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" ForeColor="Black" Height="40px"
Width="400px"></asp:TextBox><br />
        <br />
        <asp:LinkButton ID="InsertButton" runat="server"
CausesValidation="True" CommandName="Insert"
Text="Insert" ForeColor="Yellow"></asp:LinkButton>
        &nbsp;&nbsp;<asp:LinkButton ID="InsertCancelButton"
runat="server" CausesValidation="False" CommandName="Cancel"
Text="Cancel" ForeColor="Yellow"></asp:LinkButton>
        <br />
        <br />
        <br />
    </InsertItemTemplate>
    <ItemTemplate>
        <table style="text-align: left;">
            <tr>
                <td>
                    &nbsp;<asp:Label ID="Label8" runat="server"
Font-Names="Verdana" Font-Size="9pt"
Forecolor="Black" Text="Load Number"
Width="100px"></asp:Label></td>
                <td>
                    <asp:Label ID="loadnumberLabel" runat="server" Text='<%#
Bind("loadnumber") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label>&nbsp;</td>
                <td>
                    &nbsp;</td>
                <td>
                    &nbsp;</td>
                <td>
                    &nbsp;</td>
                <td>
                    &nbsp;</td>
                <td>
                    &nbsp;</td>
            </tr>
            <tr>
                <td style="height: 30px">
                    <asp:Label ID="Label21" runat="server" Font-
Bold="True" Font-Names="Verdana" Font-Size="10pt"
Forecolor="Yellow" Text="DELAY"
Width="100px"></asp:Label></td>
                <td style="height: 30px">
                    <asp:Label ID="Label11" runat="server" Font-
Bold="True" Font-Names="Verdana" Font-Size="10pt"

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                                ForeColor="Yellow"
Text="START"></asp:Label></td>
                                <td style="height: 30px">
                                    <asp:Label ID="Label3" runat="server"
Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
                                <td style="height: 30px">
</td>
                                <td style="height: 30px">
</td>
                                <td style="height: 30px">
                                    <asp:Label ID="Label66" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
Text="Avg Dig Quantity"
Width="100px"></asp:Label></td>
                                <td style="height: 30px">
                                    <asp:TextBox ID="TextBox5" runat="server"
BackColor="White" BorderStyle="Inset" Font-Names="Verdana"
Font-Size="8pt" ForeColor="Black"
Text='<%# Bind("avgpayqty") %>' Width="70px"></asp:TextBox></td>
</tr>
<tr>
<td>
                                <asp:Label ID="Label9" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
Text="Move to New Cut"
Width="100px"></asp:Label></td>
<td>
                                <asp:Label ID="movetocutstartLabel" runat="server"
Text='<%# Bind("movetocutstart", "{0:t}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:Label></td>
<td>
                                <asp:Label ID="movetocutendLabel" runat="server" Text='<%#
Bind("movetocutend", "{0:t}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:Label></td>
<td>
</td>
</td>
</td>
</td>
                                <asp:Label ID="Label24" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
Text="Avg Dig Face"
Width="100px"></asp:Label></td>
<td>
                                <asp:Label ID="avgdigfaceLabel" runat="server" Text='<%#
Bind("avgdigface") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
</tr>
<tr>
<td>
                                <asp:Label ID="Label10" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
Text="Wait for Barge "
Width="100px"></asp:Label></td>

```

```

        <td>
            <asp:Label ID="waitforbargeLabel" runat="server" Text='<%#
Bind("waitforbarge", "{0:t}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:Label></td>
        <td>
            <asp:Label ID="bargearriveLabel" runat="server" Text='<%#
Bind("bargearrive", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
        <td>
        </td>
        <td>
        </td>
        <td>
            <asp:Label ID="Label25" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
                Text="Avg Dig Width"
Width="100px"></asp:Label></td>
        <td>
            <asp:Label ID="avgdigwidthLabel" runat="server" Text='<%#
Eval("avgdigwidth") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    </tr>
    <tr>
        <td>
            <asp:Label ID="Label63" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
                Text="Change Barge"></asp:Label></td>
        <td>
            <asp:TextBox ID="cangescowstartLabel"
runat="server" BackColor="White" BorderStyle="Inset"
                Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Text='<%# Bind("cangescowstart", "{0:t}") %>'
                Width="70px"></asp:TextBox></td>
        <td>
            <asp:TextBox ID="cangescowendLabel"
runat="server" BackColor="White" BorderStyle="Inset"
                Font-Names="Verdana" Font-Size="8pt"
ForeColor="Black" Text='<%# Bind("cangescowend", "{0:t}") %>'
                Width="70px"></asp:TextBox></td>
        <td>
        </td>
        <td>
        </td>
        <td>
            <asp:Label ID="Label26" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="Black"
                Text="Travel"></asp:Label></td>
        <td>
            <asp:Label ID="travelLabel" runat="server" Text='<%#
Bind("travel") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    </tr>
    <tr>
        <td>
            <asp:Label ID="Label11" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue"

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                Text='<%# Bind("pre1") %>' Width="100px"
BackColor="LightSteelBlue" BorderStyle="Inset"></asp:Label></td>
                <td>
                    <asp:Label ID="pre1startLabel" runat="server" Text='<%#
Bind("pre1start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td>
                    <asp:Label ID="pre1endLabel" runat="server" Text='<%#
Bind("pre1end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td>
                    <td>
                    <td>
                    <td>
                </td>
            </td>
        </tr>
        <tr>
            <td style="height: 24px">
                <asp:Label ID="Label12" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue"
                Text='<%# Bind("pre2") %>' Width="100px"
BackColor="LightSteelBlue" BorderStyle="Inset"></asp:Label></td>
                <td style="height: 24px">
                    <asp:Label ID="pre2startLabel" runat="server" Text='<%#
Bind("pre2start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td style="height: 24px">
                    <asp:Label ID="pre2endLabel" runat="server" Text='<%#
Bind("pre2end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td style="height: 24px">
                </td>
                <td style="height: 24px">
                </td>
                <td style="height: 24px">
                </td>
                <td style="height: 24px">
                </td>
            </tr>
        <tr>
            <td>
                <asp:Label ID="Label13" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("pre3") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
            <td>
                <asp:Label ID="pre3startLabel" runat="server" Text='<%#
Bind("pre3start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
            <td>
                <asp:Label ID="pre3endLabel" runat="server" Text='<%#
Bind("pre3end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
            <td>

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        </td>
        <td>
        </td>
        <td>
        </td>
        <td>
        </td>
    </tr>
    <tr>
        <td>
            <asp:Label ID="Label14" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("pre4") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
            <td>
                <asp:Label ID="pre4startLabel" runat="server" Text='<%#
Bind("pre4start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td>
                    <asp:Label ID="pre4endLabel" runat="server" Text='<%#
Bind("pre4end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                <td>
                </td>
                <td>
                    <asp:Label ID="Label2" runat="server" Font-
Bold="True" Font-Names="Verdana" Font-Size="10pt"
                    ForeColor="Yellow" Text="DELAY"
Width="100px"></asp:Label></td>
                <td>
                    <asp:Label ID="Label5" runat="server"
Text="START" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
                <td>
                    <asp:Label ID="Label6" runat="server"
Text="END" Font-Bold="True" Font-Names="Verdana" Font-Size="10pt"
ForeColor="Yellow"></asp:Label></td>
            </tr>
    <tr>
        <td>
            <asp:Label ID="Label15" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
            Text="Start Loading"
Width="100px"></asp:Label></td>
            <td>
                <asp:Label ID="startloadingLabel" runat="server" Text='<%#
Bind("startloading", "{0:t}") %>' BackColor="White"
BorderStyle="Inset" Font-Names="Verdana" Font-Size="8pt"
Width="70px"></asp:Label></td>
            <td>
            </td>
            <td>
            </td>
            <td>
                <asp:Label ID="Label4" runat="server"
Text="End Loading" Font-Names="Verdana" Font-Size="9pt"
ForeColor="White" Width="100px"></asp:Label></td>

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        <td>
            </td>
        </td>
        <td>
            <asp:Label ID="endloadingLabel" runat="server" Text='<%#
Bind("endloading", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
        </tr>
        <tr>
            <td>
                <asp:Label ID="Label16" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("dell") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
            <td>
                <asp:Label ID="delay1startLabel" runat="server" Text='<%#
Bind("delay1start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
            <td>
                <asp:Label ID="delay1endLabel" runat="server" Text='<%#
Bind("delay1end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
            <td>
                </td>
            </td>
            <td>
                <asp:Label ID="Label7" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("pos1") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
            <td>
                <asp:Label ID="post1startLabel" runat="server" Text='<%#
Bind("post1start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
            <td>
                <asp:Label ID="post1endLabel" runat="server" Text='<%#
Bind("post1end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
        </tr>
        <tr>
            <td>
                <td>
                    <asp:Label ID="Label17" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("del2") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
                    <td>
                        <asp:Label ID="delay2startLabel" runat="server" Text='<%#
Bind("delay2start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                    <td>
                        <asp:Label ID="delay2endLabel" runat="server" Text='<%#
Bind("delay2end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
                    <td>
                        </td>
                    </td>
                    <td>
                        <asp:Label ID="Label22" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"

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Text='<%# Bind("pos2") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
    <td>
        <asp:Label ID="post2startLabel" runat="server" Text='<%#
Bind("post2start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    <td>
        <asp:Label ID="post2endLabel" runat="server" Text='<%#
Bind("post2end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
</tr>
<tr>
    <td>
        <asp:Label ID="Label18" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("del3") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
    <td>
        <asp:Label ID="delay3startLabel" runat="server" Text='<%#
Bind("delay3start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    <td>
        <asp:Label ID="delay3endLabel" runat="server" Text='<%#
Bind("delay3end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
</td>
</td>
    <td>
        <asp:Label ID="Label23" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("pos3") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
    <td>
        <asp:Label ID="post3startLabel" runat="server" Text='<%#
Bind("post3start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    <td>
        <asp:Label ID="post3endLabel" runat="server" Text='<%#
Bind("post3end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
</tr>
<tr>
    <td>
        <asp:Label ID="Label19" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="MediumBlue" Width="100px"
Text='<%# Bind("del4") %>' BackColor="LightSteelBlue"
BorderStyle="Inset"></asp:Label></td>
    <td>
        <asp:Label ID="delay4startLabel" runat="server" Text='<%#
Bind("delay4start", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
    <td>
        <asp:Label ID="delay4endLabel" runat="server" Text='<%#
Bind("delay4end", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
</td>
</td>

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        <td>
            <asp:Label ID="Label20" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
                Text="Barge Left"
Width="100px"></asp:Label></td>
        <td>
        </td>
        <td>
            <asp:Label ID="bargelleftLabel" runat="server" Text='<%#
Bind("bargelleft", "{0:t}") %>' BackColor="White" BorderStyle="Inset"
Font-Names="Verdana" Font-Size="8pt" Width="70px"></asp:Label></td>
        </tr>
        <tr>
            <td style="height: 21px">
            </td>
            <td style="height: 21px">
            </td>
        </tr>

    </table>
    <asp:Label ID="Label27" runat="server" Font-
Names="Verdana" Font-Size="9pt" ForeColor="White"
        Text="Comments"></asp:Label>
    <asp:Label ID="commentsLabel" runat="server" Text='<%#
Bind("comments") %>' BackColor="White" BorderStyle="Inset" Font-
Names="Verdana" Font-Size="8pt" Height="40px"
Width="400px"></asp:Label><br />
    <asp:LinkButton ID="EditButton" runat="server"
CausesValidation="False" CommandName="Edit"
        Text="Edit" ForeColor="Yellow"></asp:LinkButton>
        &nbsp; &nbsp; <asp:LinkButton ID="DeleteButton"
runat="server" CausesValidation="False" CommandName="Delete"
        Text="Delete" ForeColor="Yellow"></asp:LinkButton>
        &nbsp; &nbsp; <asp:LinkButton ID="NewButton" runat="server"
CausesValidation="False" CommandName="New"
        Text="New" ForeColor="Yellow"></asp:LinkButton>
</ItemTemplate>
<FooterTemplate>

</FooterTemplate>
<HeaderTemplate>
    <span style="color: #ccffff">
    <span style="font-size: 14pt;">MECHANICAL DREDGE LOAD
INFORMATION</span>
    </span>
</HeaderTemplate>
</asp:FormView>

```



```

@delay3end, @del4, @delay4start, @delay4end, @endloading, @pos1,
@post1start, @post1end, @pos2, @post2start, @post2end, @pos3,
@post3start, @post3end, @bargeleft, @avgpayqty, @avgdigface,
@avgdigwidth, @travel, @comments)"
    SelectCommand="SELECT * FROM [MECHDREDGE_LOAD] WHERE
([reportid] = @reportid)" UpdateCommand="UPDATE [MECHDREDGE_LOAD] SET
[reportid] = @reportid, [cutid] = @cutid, [bargeid] = @bargeid,
[loadnumber] = @loadnumber, [movetocutstart] = @movetocutstart,
[movetocutend] = @movetocutend, [waitforbarge] = @waitforbarge,
[bargearrive] = @bargearrive, [changescowstart] = @changescowstart,
[changescowend] = @changescowend, [pre1] = @pre1, [pre1start] =
@pre1start, [pre1end] = @pre1end, [pre2] = @pre2, [pre2start] =
@pre2start, [pre2end] = @pre2end, [pre3] = @pre3, [pre3start] =
@pre3start, [pre3end] = @pre3end, [pre4] = @pre4, [pre4start] =
@pre4start, [pre4end] = @pre4end, [startloading] = @startloading,
[del1] = @del1, [delay1start] = @delay1start, [delay1end] =
@delay1end, [del2] = @del2, [delay2start] = @delay2start, [delay2end]
= @delay2end, [del3] = @del3, [delay3start] = @delay3start,
[delay3end] = @delay3end, [del4] = @del4, [delay4start] =
@delay4start, [delay4end] = @delay4end, [endloading] = @endloading,
[pos1] = @pos1, [post1start] = @post1start, [post1end] = @post1end,
[pos2] = @pos2, [post2start] = @post2start, [post2end] = @post2end,
[pos3] = @pos3, [post3start] = @post3start, [post3end] = @post3end,
[bargeleft] = @bargeleft, [avgpayqty] = @avgpayqty, [avgdigface] =
@avgdigface, [avgdigwidth] = @avgdigwidth, [travel] = @travel,
[comments] = @comments WHERE [loadid] = @loadid">
    <DeleteParameters>
        <asp:Parameter Name="loadid" Type="Int32" />
    </DeleteParameters>
    <UpdateParameters>
        <asp:Parameter Name="reportid" Type="Int32" />
        <asp:Parameter Name="cutid" Type="Int32" />
        <asp:Parameter Name="bargeid" Type="Int32" />
        <asp:Parameter Name="loadnumber" Type="String" />
        <asp:Parameter Name="movetocutstart" Type="DateTime" />
        <asp:Parameter Name="movetocutend" Type="DateTime" />
        <asp:Parameter Name="waitforbarge" Type="DateTime" />
        <asp:Parameter Name="bargearrive" Type="DateTime" />
        <asp:Parameter Name="changescowstart" Type="DateTime" />
        <asp:Parameter Name="changescowend" Type="DateTime" />
        <asp:Parameter Name="pre1" Type="String" />
        <asp:Parameter Name="pre1start" Type="DateTime" />
        <asp:Parameter Name="pre1end" Type="DateTime" />
        <asp:Parameter Name="pre2" Type="String" />
        <asp:Parameter Name="pre2start" Type="DateTime" />
        <asp:Parameter Name="pre2end" Type="DateTime" />
        <asp:Parameter Name="pre3" Type="String" />
        <asp:Parameter Name="pre3start" Type="DateTime" />
        <asp:Parameter Name="pre3end" Type="DateTime" />
        <asp:Parameter Name="pre4" Type="String" />
        <asp:Parameter Name="pre4start" Type="DateTime" />
        <asp:Parameter Name="pre4end" Type="DateTime" />
        <asp:Parameter Name="startloading" Type="DateTime" />
        <asp:Parameter Name="del1" Type="String" />
        <asp:Parameter Name="delay1start" Type="DateTime" />
        <asp:Parameter Name="delay1end" Type="DateTime" />
        <asp:Parameter Name="del2" Type="String" />

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<asp:Parameter Name="delay2start" Type="DateTime" />
<asp:Parameter Name="delay2end" Type="DateTime" />
<asp:Parameter Name="del3" Type="String" />
<asp:Parameter Name="delay3start" Type="DateTime" />
<asp:Parameter Name="delay3end" Type="DateTime" />
<asp:Parameter Name="del4" Type="String" />
<asp:Parameter Name="delay4start" Type="DateTime" />
<asp:Parameter Name="delay4end" Type="DateTime" />
<asp:Parameter Name="endloading" Type="DateTime" />
<asp:Parameter Name="pos1" Type="String" />
<asp:Parameter Name="post1start" Type="DateTime" />
<asp:Parameter Name="post1end" Type="DateTime" />
<asp:Parameter Name="pos2" Type="String" />
<asp:Parameter Name="post2start" Type="DateTime" />
<asp:Parameter Name="post2end" Type="DateTime" />
<asp:Parameter Name="pos3" Type="String" />
<asp:Parameter Name="post3start" Type="DateTime" />
<asp:Parameter Name="post3end" Type="DateTime" />
<asp:Parameter Name="bargelleft" Type="DateTime" />
<asp:Parameter Name="avgpayqty" Type="Decimal" />
<asp:Parameter Name="avgdigface" Type="Decimal" />
<asp:Parameter Name="avgdigwidth" Type="Decimal" />
<asp:Parameter Name="travel" Type="Decimal" />
<asp:Parameter Name="comments" Type="String" />
<asp:Parameter Name="loadid" Type="Int32" />
</UpdateParameters>
<InsertParameters>
  <asp:Parameter Name="reportid" Type="Int32" />
  <asp:Parameter Name="cutid" Type="Int32" />
  <asp:Parameter Name="bargeid" Type="Int32" />
  <asp:Parameter Name="loadnumber" Type="String" />
  <asp:Parameter Name="movetocutstart" Type="DateTime" />
  <asp:Parameter Name="movetocutend" Type="DateTime" />
  <asp:Parameter Name="waitforbarg" Type="DateTime" />
  <asp:Parameter Name="bargearrive" Type="DateTime" />
  <asp:Parameter Name="changescowstart" Type="DateTime" />
  <asp:Parameter Name="changescowend" Type="DateTime" />
  <asp:Parameter Name="pre1" Type="String" />
  <asp:Parameter Name="pre1start" Type="DateTime" />
  <asp:Parameter Name="pre1end" Type="DateTime" />
  <asp:Parameter Name="pre2" Type="String" />
  <asp:Parameter Name="pre2start" Type="DateTime" />
  <asp:Parameter Name="pre2end" Type="DateTime" />
  <asp:Parameter Name="pre3" Type="String" />
  <asp:Parameter Name="pre3start" Type="DateTime" />
  <asp:Parameter Name="pre3end" Type="DateTime" />
  <asp:Parameter Name="pre4" Type="String" />
  <asp:Parameter Name="pre4start" Type="DateTime" />
  <asp:Parameter Name="pre4end" Type="DateTime" />
  <asp:Parameter Name="startloading" Type="DateTime" />
  <asp:Parameter Name="del1" Type="String" />
  <asp:Parameter Name="delay1start" Type="DateTime" />
  <asp:Parameter Name="delay1end" Type="DateTime" />
  <asp:Parameter Name="del2" Type="String" />
  <asp:Parameter Name="delay2start" Type="DateTime" />
  <asp:Parameter Name="delay2end" Type="DateTime" />
  <asp:Parameter Name="del3" Type="String" />

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        <asp:Parameter Name="delay3start" Type="DateTime" />
        <asp:Parameter Name="delay3end" Type="DateTime" />
        <asp:Parameter Name="del4" Type="String" />
        <asp:Parameter Name="delay4start" Type="DateTime" />
        <asp:Parameter Name="delay4end" Type="DateTime" />
        <asp:Parameter Name="endloading" Type="DateTime" />
        <asp:Parameter Name="pos1" Type="String" />
        <asp:Parameter Name="post1start" Type="DateTime" />
        <asp:Parameter Name="post1end" Type="DateTime" />
        <asp:Parameter Name="pos2" Type="String" />
        <asp:Parameter Name="post2start" Type="DateTime" />
        <asp:Parameter Name="post2end" Type="DateTime" />
        <asp:Parameter Name="pos3" Type="String" />
        <asp:Parameter Name="post3start" Type="DateTime" />
        <asp:Parameter Name="post3end" Type="DateTime" />
        <asp:Parameter Name="bargelleft" Type="DateTime" />
        <asp:Parameter Name="avgpayqty" Type="Decimal" />
        <asp:Parameter Name="avgdigface" Type="Decimal" />
        <asp:Parameter Name="avgdigwidth" Type="Decimal" />
        <asp:Parameter Name="travel" Type="Decimal" />
        <asp:Parameter Name="comments" Type="String" />
    </InsertParameters>
    <SelectParameters>
        <asp:ControlParameter ControlID="GridView1"
        DefaultValue="1" Name="reportid" PropertyName="SelectedValue"
        Type="Int32" />
    </SelectParameters>
</asp:SqlDataSource>
    <asp:GridView ID="GridView2" runat="server" AllowPaging="True"
    AllowSorting="True"
        AutoGenerateColumns="False" CellPadding="4"
    DataKeyNames="loadid" DataSourceID="SqlDataSource6"
        ForeColor="#333333" GridLines="None">
        <FooterStyle BackColor="#5D7B9D" Font-Bold="True"
    ForeColor="White" />
        <Columns>
            <asp:CommandField ShowDeleteButton="True"
    ShowEditButton="True" />
            <asp:BoundField DataField="loadnumber" HeaderText="Load
    Nnumber" SortExpression="loadnumber" />
            <asp:BoundField DataField="movetocutstart"
    HeaderText="Move to Cut Start" SortExpression="movetocutstart" />
            <asp:BoundField DataField="movetocutend"
    HeaderText="movetocutend" SortExpression="movetocutend" />
            <asp:BoundField DataField="waitforbarge"
    HeaderText="waitforbarge" SortExpression="waitforbarge" />
            <asp:BoundField DataField="bargearrive"
    HeaderText="bargearrive" SortExpression="bargearrive" />
            <asp:BoundField DataField="changescowstart"
    HeaderText="changescowstart" SortExpression="changescowstart" />
            <asp:BoundField DataField="changescowend"
    HeaderText="changescowend" SortExpression="changescowend" />
            <asp:BoundField DataField="prel" HeaderText="prel"
    SortExpression="prel" />
            <asp:BoundField DataField="prelstart"
    HeaderText="prelstart" SortExpression="prelstart" />

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        <asp:BoundField DataField="prelend" HeaderText="prelend"
SortExpression="prelend" />
        <asp:BoundField DataField="pre2" HeaderText="pre2"
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HeaderText="pre2start" SortExpression="pre2start" />
        <asp:BoundField DataField="pre2end" HeaderText="pre2end"
SortExpression="pre2end" />
        <asp:BoundField DataField="pre3" HeaderText="pre3"
SortExpression="pre3" />
        <asp:BoundField DataField="pre3start"
HeaderText="pre3start" SortExpression="pre3start" />
        <asp:BoundField DataField="pre3end" HeaderText="pre3end"
SortExpression="pre3end" />
        <asp:BoundField DataField="pre4" HeaderText="pre4"
SortExpression="pre4" />
        <asp:BoundField DataField="pre4start"
HeaderText="pre4start" SortExpression="pre4start" />
        <asp:BoundField DataField="pre4end" HeaderText="pre4end"
SortExpression="pre4end" />
        <asp:BoundField DataField="startloading"
HeaderText="startloading" SortExpression="startloading" />
        <asp:BoundField DataField="del1" HeaderText="del1"
SortExpression="del1" />
        <asp:BoundField DataField="delay1start"
HeaderText="delay1start" SortExpression="delay1start" />
        <asp:BoundField DataField="delay1end"
HeaderText="delay1end" SortExpression="delay1end" />
        <asp:BoundField DataField="del2" HeaderText="del2"
SortExpression="del2" />
        <asp:BoundField DataField="delay2start"
HeaderText="delay2start" SortExpression="delay2start" />
        <asp:BoundField DataField="delay2end"
HeaderText="delay2end" SortExpression="delay2end" />
        <asp:BoundField DataField="del3" HeaderText="del3"
SortExpression="del3" />
        <asp:BoundField DataField="delay3start"
HeaderText="delay3start" SortExpression="delay3start" />
        <asp:BoundField DataField="delay3end"
HeaderText="delay3end" SortExpression="delay3end" />
        <asp:BoundField DataField="del4" HeaderText="del4"
SortExpression="del4" />
        <asp:BoundField DataField="delay4start"
HeaderText="delay4start" SortExpression="delay4start" />
        <asp:BoundField DataField="delay4end"
HeaderText="delay4end" SortExpression="delay4end" />
        <asp:BoundField DataField="endloading"
HeaderText="endloading" SortExpression="endloading" />
        <asp:BoundField DataField="pos1" HeaderText="pos1"
SortExpression="pos1" />
        <asp:BoundField DataField="post1start"
HeaderText="post1start" SortExpression="post1start" />
        <asp:BoundField DataField="post1end" HeaderText="post1end"
SortExpression="post1end" />
        <asp:BoundField DataField="pos2" HeaderText="pos2"
SortExpression="pos2" />

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        <asp:BoundField DataField="post2start"
HeaderText="post2start" SortExpression="post2start" />
        <asp:BoundField DataField="post2end" HeaderText="post2end"
SortExpression="post2end" />
        <asp:BoundField DataField="pos3" HeaderText="pos3"
SortExpression="pos3" />
        <asp:BoundField DataField="post3start"
HeaderText="post3start" SortExpression="post3start" />
        <asp:BoundField DataField="post3end" HeaderText="post3end"
SortExpression="post3end" />
        <asp:BoundField DataField="bargyleft"
HeaderText="bargyleft" SortExpression="bargyleft" />
        <asp:BoundField DataField="avgpayqty"
HeaderText="avgpayqty" SortExpression="avgpayqty" />
        <asp:BoundField DataField="avgdigface"
HeaderText="avgdigface" SortExpression="avgdigface" />
        <asp:BoundField DataField="avgdigwidth"
HeaderText="avgdigwidth" SortExpression="avgdigwidth" />
        <asp:BoundField DataField="travel" HeaderText="travel"
SortExpression="travel" />
        <asp:BoundField DataField="comments" HeaderText="comments"
SortExpression="comments" />
    </Columns>
    <RowStyle BackColor="#F7F6F3" ForeColor="#333333" />
    <EditRowStyle BackColor="#999999" />
    <SelectedRowStyle BackColor="#E2DED6" Font-Bold="True"
ForeColor="#333333" />
    <PagerStyle BackColor="#284775" ForeColor="White"
HorizontalAlign="Center" />
    <HeaderStyle BackColor="#5D7B9D" Font-Bold="True"
ForeColor="White" />
    <AlternatingRowStyle BackColor="White" ForeColor="#284775" />
</asp:GridView>

<asp:Panel ID="Panel5" runat="server" Height="50px" Width="1200px"
HorizontalAlign="Center" BackColor="Aquamarine">
    <table>
        <tr>
            <td>
                <asp:Button ID="Button4" runat="server" Text="Create a
New Report" OnClick="Button1_Click" />
            </td>
            <td>
                <asp:Button ID="Button5" runat="server" Text="Create a
New Load" OnClick="Button2_Click" />
            </td>
            <td>
                <asp:Button ID="Button6" runat="server" Text="Button" />
            </td>
        </tr>
    </table>
</asp:Panel>

```


Acronyms and Terminology

Acronyms

API	Application Programming Interface
PM	Project Manager
RPR	Resident Project Representative. Owner's representative on the job site.
WPMA	Web-Based Project Management Application
DMCF	Dredge Material Containment Facility.
ERD	Entity Relation Diagram

Terminology

Slurry	Mix of water and the material been transported throughout the hydraulic transport system.
In-situ	Material in its natural condition.
Hydraulic Unloading	Unloading Material Hydraulically to a Dredge Material Containment Facility (DMCF).
Unloader	Hydraulic equipment used to unload material from barges by means of hydraulic transport system.
New Work	The dredging of material that has been consolidated for long period of time. This material is generally obtained in areas that has not bee dredged before.
Maintenance Work	The dredging of newly sediment material accumulated in navigational channel.

Scow	A barge with a hopper to transport material.
Stakeholders	Stakeholders encompasses: Owner, potential contractors, contractor, owner's team, contractor's team, and public.
Earn Value	Is a project management technique that measures forward progress objectively.
Value Engineering	Is a systematic method to improve the "Value" of goods and services by using an examination of function

References

- Bellisano 2006 ASP.NET 2.0, Web Site Programming, Problem–Design–Solution. Marco Bellinaso. Wiley Publishing Inc. 2006.
- Herbich 2000 Handbook of Dredging Engineering, Second Edition. John B. Herbich. McGraw-Hill. 2000.
- (Kyling 1971) IV Proceedings of the World Dredging Conference, 1971. Article by Ivan C. Kling, Australia. "Is a Bad Contract Really Necessary?" Published by WODCON ASSN 1972, California.
- (Land 2006,19) Conference and Workshops on Contract Management for Dredging and Maritime Construction, summary by John Lan, London 2006. Published in "Terra et Aqua" Dredging and Marine Journal, No. 105, December 2006.
- (Marvel 2006, 40) Information is Power in the Decision-Making Process. Article by Dr. Orien E. Marvel. Sea-Technology Magazine, December 2006.
- (MTI Holland BV)
(Rolfes) Soil Properties and Classification with Reference to the Choice of Dredging Plant. MTI Dredging Technology Holland, Dredging Course. Virtual Project Management. A term paper for MSIS 489 by Mike Rolfes. www.umsl.edu/~suter/analysis/488_f01_papers/rolfes.htm
- (PMBOOK Guide)
(Hunt) Geotechnical Engineering Techniques and Practices, Roy E. Hunt. McGraw-Hill Book Company, 1986.
- (ENCE 662 Study Material)
(USACEMD) Courtesy of ENCE 662 Study Material and Readings "Master Builder Century 21"
US Army Corps of Engineers Memphis District. www.mvm.usace.army.mil/PPPM/assistance/two.htm
- (Safe Passage)
(Hoffer, 2006) http://www.mpasafepassage.org/dmmp_files/progstructure/progstructure.htm
Modern System Analysis and Design, Fifth Edition. Jeffrey A. Hoffer, Joey F. George, Joseph S. Valacich. Pearson Prentice Hall, 2006.
- (Turley 2006) SQL Server 2005, Reporting Services. Paul Turley, Todd Bryant, James Counihan, Dave DuVarney. Wiley Publishing, Inc. 2006.
- (Bleeker, 2007) Developer's Guide to Windows SharePoint Services 3.0. Tood C. Bleeker, Ph.D., Published by: Charles River Media, 2007)
- (Vieira,2006) SQL Server 2005, Programming. Robert Vieira, Wiley Publishing, Inc., 2006.)
- (Turner,1984) Fundamental of Hydraulic Dredging. Thomas M. Turner. Cornell Maritime Press, 1984.
- (Huston,1970) Hydraulic Dredging, Theoretical and Applied. John Huston, PE. Cornell Maritime Press, 1970.
- Kauffman,2006 ASP.NET 2.0 and Databases. John Kauffman, Braldley Millington. Wiley Publishing, Inc., 2006.