APPENDIX L

UMCES IMPACT ASSESSMENT

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Report

UMCES Contributions to Masonville Dredged Material Containment Facility
Feasibility Study and Environmental Impact Statement

Report on Impacts: Noise, Light, Socioeconomics, Aesthetics and Recreational Resources

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Noise

Regulatory Setting

The Baltimore City Revised Code bases its noise standards on zoning. The table below describes noise limits for various types of zoning (Table 1). In addition to maximum noise levels, the Baltimore City Revised Code stipulates that between the hours of 9 PM and 7 AM, the maximum permissible sound from any use that borders on a residential zone must be reduced by 5 dBA. The Code defines a noise as "any steady-state or impulse sound that occurs on either a continuous or intermittent basis."

Table 1. Maximum permissible noise levels for different types of zoning. Source: Baltimore City Revised Code

	Maximum permissible noise at property line when boundary shared with:		
Zone	**Manufacturing Zone**	**Commercial Zone**	**Residential Zone**
Manufacturing[1]	75 dBA	70 dBA	70 dBA
Commercial	64 dBA	61 dBA	58 dBA
Residential	61 dBA	58 dBA	55 dBA

[1]Maximum noise limits are defined in the Health section of the Baltimore City Revised Code which refers to limits set for "Manufacturing zones". The Zoning section of the Code refers to these zones as "Industrial districts". These terms are used interchangeably below.

Methods

Sounds associated with project construction and operations were evaluated to determine likely sound levels experienced by people in the vicinity of the project. To conduct the analysis, the types of equipment likely to be used during different phases of the project were characterized, and it was determined whether that equipment was likely to be used at night. Nighttime noise, in addition to being regulated in residential zones in Baltimore City, is generally perceived as more bothersome than daytime noise and therefore is of particular concern. The likely noise levels that would be associated with the equipment were evaluated, and the equipment that would tend to generate the loudest sounds or be perceived as the noisiest was identified. Sensitive noise receptors including residential, recreational and commercial areas in the vicinity of the proposed project were identified using the most recent tax assessment database (Maryland Department of Planning) and other sources described in the evaluation of existing conditions. All data were incorporated in a GIS analysis to estimate the impacts of project noise to nearby residents and boaters.

Although sound transmission is a function of specific conditions between the sound source and receptor, for purposes of this analysis, techniques to model sound transmission were used that assumed typical or average conditions. Commonly accepted rules of thumb were used to calculate the perceived sound levels after transmission of sound over land and water. Standard assumptions were used regarding the additive effects of multiple sound sources. These assumptions would misrepresent sound transmission under atypical conditions, which may occur

frequently. For example, temperature inversions would occur on most calm clear nights and would have the effect of amplifying sound levels heard around dawn.

Sound level attenuation between noise-generating activities and receptors was calculated by assuming that sounds originating from the project and traveling primarily over water attenuated 5 dBA with each doubling of distance, and sounds originating from the project and traveling over land attenuated 6 dBA with each doubling of distance (Blomberg 2004). Additional attenuation associated with molecular absorption and analogous excess absorption was also factored in. Molecular absorption refers to the linear attenuation of sound intensity as a result of its passage through air, and results in a 0.7 dBA decrease per 1,000 feet. Analogous excess attenuation is also linear, and is associated with other factors that reduce sound intensity such as humidity or ground cover, and was assumed to be a 1.0 dBA decrease per 1,000 feet.

When considering several sources producing sound simultaneously, sound levels cannot be added arithmetically because decibels are a logarithmic measure. Instead, the additive nature of sounds is such that the sound pressure level from two sources generating the same decibel level is approximately three dBA greater than the sound pressure level of just one source (Table 2). Such rules of thumb were used in the analysis to calculate total sound levels associated with typical project conditions, such as the simultaneous, proximate operation of several pieces of heavy machinery.

Table 2. Addition of multiple sound sources. Source: Federal Highway Administration

Difference between sound level of 2 sources	Amount added to higher value
0 to 1 dBA	3
2 to 3 dBA	2
4 to 9 dBA	1
10 or more dBA	0

To quantify sound levels generated by the proposed project, project phases were identified. For each phase, the most recent information on type and quantity of equipment that is likely to be used was identified, the duration and timing of activities was estimated, and all available information was combined to calculate potential project-related noise levels (Table 3).

Table 3. Estimated duration and timing of project-related noise at proposed Masonville DMCF based on current designs (subject to change)

	Construction – pre-dredging[1]	Construction – cofferdam	Construction – dikes[2]	Inflow	Crust Management
Duration	4 months	1 year	1 year	Post-construction to project life (~16 years)	Post-construction to project life (~16 years)
Time of Year	Summer/Fall	Year-round	Year-round	Fall through Spring	Summer
Time of Day	Day and night	Day	Day and night	Day and night	Day

[1]Pre-dredging activities and cofferdam construction would occur concurrently

[2]Dike construction would begin prior to the completion of cofferdam construction activities. Total time elapsed from start of cofferdam construction to end of dike construction estimated to be about 21 months.

Noise levels were evaluated from several perspectives. Information on zoning was used to determine whether noise levels generated by the project were within acceptable limits. The project is located in an area zoned Industrial/Manufacturing. The analysis first used the noise limit standards defined in the Baltimore City Revised Code to determine whether project-generated noise attenuates to acceptable levels, no more than 70 dBA, by the time it reaches the manufacturing/residential zone boundary (Table 4). In the second part of the analysis, the potential noise impacts at several sensitive receptors were considered. Likely noise levels at the nearest residence (approximately 4,400 ft away over land), Harbor Hospital (6,000 ft away across water), and Fort McHenry (3,100 ft away across water) were estimated. These noise levels were compared to standards set by the state of California for various land uses to determine if they were within acceptable limits (Table 4) (State of California 2003). These California standards were used because they identify suggested maximum noise levels for many land uses found in the Masonville area, and because they are likely conservative guidelines. Each of these calculations was made for several different types of sound, such as sustained, periodic, and nighttime.

Table 4. Suggested maximum allowable ambient noise levels for various land uses. Source: City of Grass Valley, CA.

Land Use	Suggested Maximum dBA
Residential – Low Density	60
Residential – High Density	65
Transient Lodging	65
Schools, libraries, churches, hospitals	70
Playgrounds, parks	70
Commercial	70
Industrial	75

Proposed Masonville DMCF Alternative

Sustained Daytime Noise

Sustained noise levels generated by typical daily operations associated with the proposed Masonville DMCF are expected to peak at around 94 dBA at 50 ft. This sound level represents several pieces of heavy equipment (e.g., dump trucks, dozers, compactors) working simultaneously in close proximity to one another. For any given observer, the sustained, elevated sound level experienced would depend on distance from the noise-generating machinery, atmospheric conditions, and proximity of multiple pieces of machinery to each other. Factoring attenuation with distance, molecular absorption, and analogous excess attenuation, a 94 dBA sound is estimated to decrease to 70 dBA within about 800 ft of the noise source when traveling over land. The entire area within this 800 ft zone is currently zoned Industrial/Manufacturing (Figure 1 and Table 5).

Therefore, under modeled conditions, sustained noise levels would be within acceptable limits for sensitive receptors. A 94 dBA sustained sound generated by the project would be expected to attenuate to about 49 dBA before it reaches the nearest residence. A 94 dBA sustained sound from the proposed site is estimated to decrease to about 50 dBA at Harbor Hospital and 59 dBA at Ft. McHenry.

Periodic Noise

Various construction activities associated with the proposed Masonville DMCF would produce loud, periodic sounds. Periodic sounds may be more noticeable to residents and visitors than sustained sounds because they are not consistent with steady, uniform background noise. Back-up beepers create loud, relatively high-pitched periodic sounds, and the associated sound level can vary from 85 to 110 dBA at 50 ft. The placement of rock during dike construction would also generate sound levels in this range, although these sounds would be lower pitched. A sound at the 110 dBA level would be expected to attenuate over land to daytime manufacturing/residential zone boundary levels within about 3,000 ft of the source. The entire area within this 3,000 foot zone is zoned Industrial/Manufacturing (see Figure 1).

The analysis indicates that periodic sounds may exceed acceptable noise levels at some sensitive receptors. Periodic sounds would be expected to attenuate to less than 65 dBA at the nearest residences, 4,400 ft away. At Harbor Hospital, the loudest project-related periodic sounds would be about 66 dBA. Visitors along the southern shore of Ft. McHenry may be subjected to periodic sounds of up to 75 dBA. While sounds reaching Ft. McHenry are expected to be slightly above the 70 dBA suggested maximum ambient noise level for parks, as set by the state of California, noises of this level are not inconsistent with an urban, industrial setting.

Nighttime Noise

Some sound-generating phases of project construction would occur day and night. Initial construction (including pre-dredging and dike construction) and material inflow are expected to be conducted day and night. Activities associated with inflow would persist on a seasonal basis for the duration of the project development. The area is accessible from land without using residential roads, so it is not expected that trucks would pass through residential areas at night. Also, much of the equipment traffic to and from the site during construction and inflow would be from the water.

The duration of noticeable nighttime noise increase would depend on the actual distance between equipment and receptors, duration of activities in areas proximate to the proposed site, and proximity of multiple pieces of noise-generating equipment to each other. Assuming equipment used for inflow would included a hydraulic unloader, trackhoe, bulldozer, and a few dump trucks, the maximum sound levels associated with these activities would be in the range of 93 dBA at 50 ft. That sound level would typically attenuate over land to an acceptable nighttime manufacturing/residential zone boundary level of 65 dBA within about 1,100 ft. The area within this 1,100 ft zone is zoned Industrial/Manufacturing (see Figure 1 and Table 5).

Nighttime noise is not expected to be disruptive at sensitive receptors. A 93 dBA sound originating from the proposed site would attenuate to about 47 dBA at the nearest residences. At the Harbor Hospital, nighttime noise is expected to be about 48 dBA, consistent with other nighttime noises in the area. Because Ft. McHenry is closed to visitors at night, nighttime noise is of not of great concern. However, a 93 dBA sound from the proposed site would attenuate to about 57 dBA at Ft. McHenry, and therefore would typically be within acceptable limits.

Conclusions

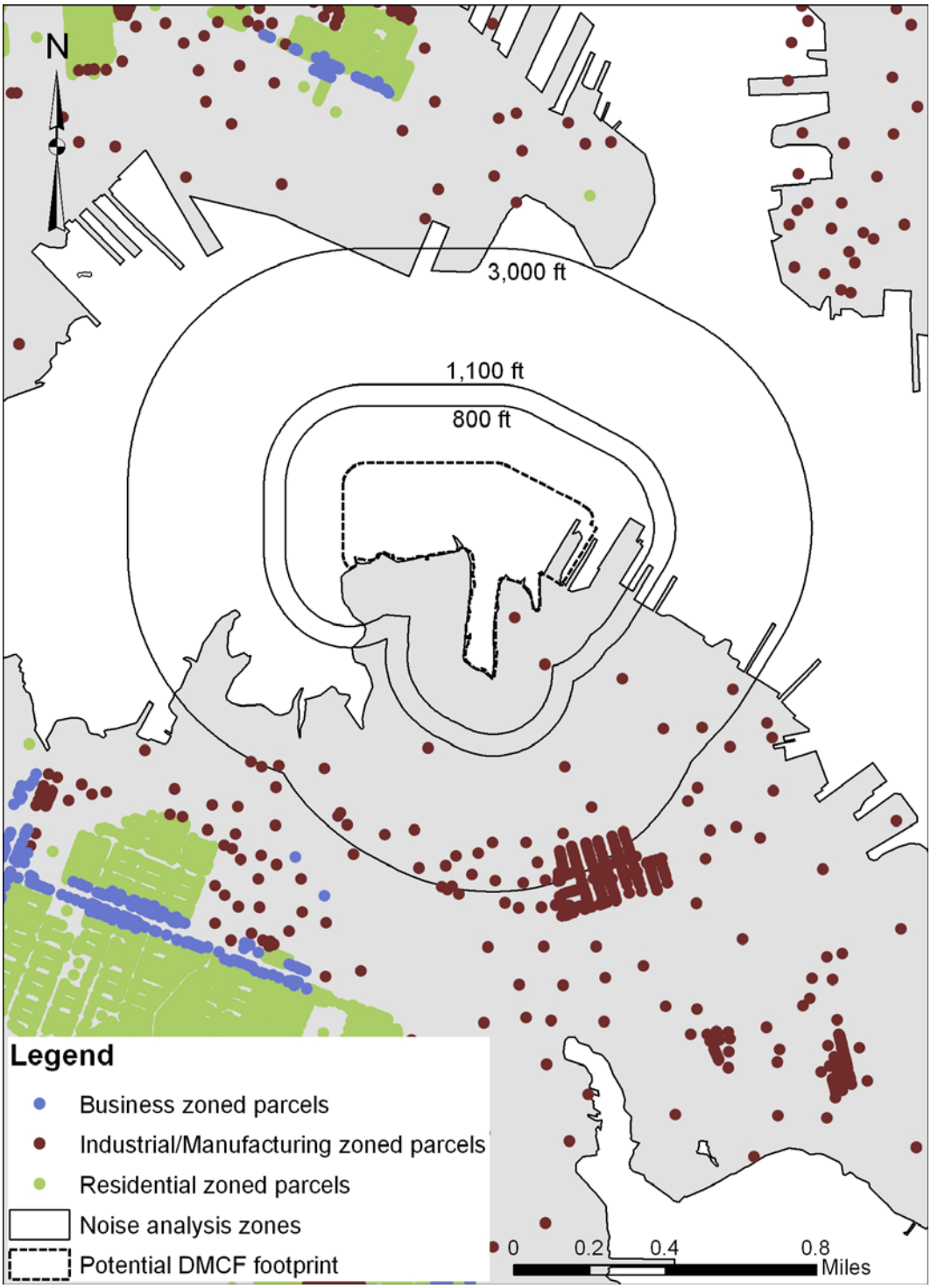
Generally, noise impacts associated with the proposed Masonville DMCF are not expected to interfere with residential or recreational activities. Pre-construction activities may begin as early as summer of 2006, and may persist for 20 years or more; however, the noise generated by the project is not expected to be inconsistent with the site's industrial setting. As activities shift location during project construction, sound levels associated with sustained activities (e.g., operation of vehicles, pumping of dredged material) would affect different areas and therefore would not affect the same group over the entire construction period. In addition to potential noise impacts on shore, recreational boaters traveling close to the site would be exposed to elevated sound levels.

No Action Alternative
Noise impacts associated with the no action alternative are not expected.

Table 5. Summary of noise analysis

Noise type	Estimated peak noise level	Distance to industrial/ residential boundary attenuation level	Estimated level at sensitive receptor:		
			Nearest residence	Harbor Hospital	Ft McHenry
Sustained/daytime	94 dBA	800 ft	49 dBA	50 dBA	59 dBA
Periodic	110 dBA	3,000 ft	65 dBA	66 dBA	**75 dBA**
Nighttime	93 dBA	1,100 ft	47 dBA	48 dBA	57 dBA

Note: boldface noise levels exceed suggested maximum levels



Note: parcel location dots represent the centroid of the land parcel, not necessarily the location of the house or building within the parcel. Zoning maps were not readily available, so parcel zoning data were used as a proxy to create this figure.

Figure 1. Zones used for noise analysis. Source data: Maryland Department of Planning

Light

Regulatory Setting
The Baltimore City Code does not set any specific limits on lighting. In the Off-Street Parking Regulations, it stipulates that lighting near residences must not reflect or direct rays of light into any adjacent lot or residence (Baltimore City Code Zoning Regulations Section 10-309).

Methods
At a coarse scale, the City of Baltimore has a high level of existing nighttime light. Impacts to the overall level of light in the city associated with the proposed project are not expected. At a finer scale, lighting is generally considered bothersome when it produces "excessive" illumination beyond the site boundary or creates glare that interferes with activities such as driving. A light analysis was conducted to determine whether construction of the proposed Masonville DMCF has the potential to generate light impacts such as these. To conduct the analysis of potential light impacts to residences and other sensitive viewpoints, the types of equipment and associated lighting likely to be used for different nighttime activities during different phases of the project were characterized. To judge potential impacts of light sources, potential light levels relative to existing light levels were evaluated.

Designs for the proposed Masonville DMCF are not complete, so the most current conception of the site was used to analyze potential light impacts associated with the project (Table 6). Many light levels are specified by Occupational Safety and Health Administration (OSHA) regulations and therefore, are not flexible. The brightest lights are those associated with inflow, and they are shielded to direct light downwards or toward operations, so glare does not typically reach nearby residences or affect boaters. Brightness of navigation lights are mandated by the U.S. Coast Guard and are typically designed to be visible for 2 miles. Lights on barges must be visible for 3-5 miles depending on size and mast lights should be visible from 360° when boats are at anchor (U.S. Coast Guard Navigation Rules and Regulations), such as when offloading dredged material.

Table 6. Potential types of lighting at Masonville DMCF

Light Source	# used	Wattage	# bulbs	Type	Height	Shielded
Light plants for inflow	2-3	1000 Watts	4	Mercury vapor	~12 ft	Yes
Navigation lights		2-4 candela		Incandescent	varies	No
On-site trailer	1	60 Watts	6	Incandescent	7-8 ft	Yes
Off-loader deck lights	7	150 Watts	1	High Pressure Sodium	varies	No
Off-loader flood lights	4	1000 Watts	1	High Pressure Sodium	varies	Yes

Proposed Masonville DMCF Alternative
The duration of nighttime activities varies by project phase (see Table 3). Pre-dredging and dike construction are nearly continuous over the first year and a half of the project, while inflow activities occur seasonally for the duration of the project after dike construction is complete. Therefore, potential light impacts associated with these phases of activity would be temporary and seasonal, respectively. The inflow activities use the highest power bulbs of any project activity and these lights may be raised as high as roughly 50 feet above sea level and have the potential to be seen over 10 miles away by an observer at 15 feet above sea level, under very clear atmospheric conditions. However, these operations use lights that are mobile and shielded,

so glare may reach areas along the Patapsco River, such as the Harbor Hospital, depending on the direction that the source is facing, but this would be a short-term effect.

Potential impacts during construction and inflow
During project construction and inflow, sensitive receptors along the Patapsco waterfront, such as Harbor Hospital, could experience increased light depending on the orientation and shielding of lights. Structures such as docks, piers, breakwaters, and channels, are required to be lit temporarily during construction either by floodlight and/or by federally maintained aids to navigation. These lights would be noticeable at the Hospital but would be generally in keeping with existing lights in the Patapsco.

Conclusions
In summary, existing light levels at this urban site are sufficiently high that the slight increase in light from the proposed project should not be noticeable from most locations. However, the intensity and direction of light plants during construction and inflow would determine whether light impacts may be experienced for periods at individual locations. The main area potentially affected by this increased lighting would be the Harbor Hospital, but impacts are expected to be of limited duration. Therefore, overall long-term lighting impacts are expected to be minimal.

No Action Alternative
Noise impacts associated with the no action alternative are not expected.

Socioeconomic Resources

Future Land and Water Use

The adjacent land use around the proposed Masonville DMCF is largely industrial, thus construction of the DMCF and its subsequent development as a port terminal would be in keeping with existing uses. The same relationship between proposed land use and existing land use holds true for the proposed Sparrows Point and BP-Fairfield DMCFs and the Cox Creek DMCF expansion. In each of these cases, any new land created by the project would ultimately be used for industrial purposes within a pre-existing industrial landscape. The HMI DMCF is located offshore but within view of a number of homes in Baltimore County, and this site's ultimate use as a park would provide recreational opportunities to nearby residents, as is currently the case with a portion of the island.

The cumulative impact of additional industrial lands created through these projects is expected to increase land supply for industrial activities. Development of industrial activities where a concentration already exists would allow compatible activities to be co-located and prevent spillovers into less compatible areas (e.g., residential areas).

Current water use in the Patapsco River is primarily associated with: domestic and international shipping, recreational boating to or from the Inner Harbor area, recreational angling, and commercial fishing. In the future, the development of the proposed DMCFs and the maintenance of Seagirt Marine Terminal would facilitate the use of these waters by shippers. Future water use by recreational boaters is not expected to be impacted by the implementation of these

projects. The mitigation projects associated with the proposed DMCFs and the Cox Creek renovation may improve aquatic habitats locally and improve conditions for recreational fishing.

Fishery-related Economic Impacts

Proposed Masonville DMCF Alternative
The existing level of commercial fishing effort in the waters around the proposed Masonville DMCF is low (see Land and Water Use section in Existing Conditions chapter). In addition, the proposed project is not expected to have a significant impact on commercial stocks of fish or crab. Therefore, impacts to commercial fishing associated with the project are not expected.

No Action Alternative
No economic impacts to commercial fisheries are expected with the no action alternative.

Employment and Industry

Background
The economic impacts of spending on any new project, such as a DMCF at Masonville, are typically measured in terms of the jobs, incomes, business sales, and tax revenues it generates. Spending on such projects creates direct impacts associated with the project itself. This direct project spending then generates "multiplier effects" which are measured in terms of indirect impacts associated with purchases and sales by businesses that supply inputs to the businesses involved with the project, and induced impacts associated with increased consumer spending associated with increased household incomes that result from direct and indirect economic impacts.

The analysis described in this section was designed to trace and measure direct, indirect, and induced economic impacts associated with the proposed Masonville DMCF in the local region, Baltimore City, and for the larger economic area of the state of Maryland. Analyses were also conducted at the regional scale, including Baltimore City, Baltimore County, and Anne Arundel County, but these results were not included here because the majority of regional impacts are in Baltimore City. Impacts in Anne Arundel and Baltimore counties are included in estimated statewide impacts.

Separate pathways of statewide and Baltimore City economic impacts were estimated for each stage of the proposed Masonville DMCF project, including first costs and initial studies, site development; dredging, transport, placement, and long-term site monitoring and maintenance. This section outlines how the analysis was performed and summarizes results.

Methods
Assessment of the economic impacts of each stage of project development involved five steps:

1. Estimate out-of-state, in-state, and regional spending associated with various phases of dredging, site development and construction, and material placement;
2. Develop an economic input-output model for the state of Maryland, for the nearby impact region and immediate impact region; and characterize spending on various activities in terms of input purchases from various industrial and household sectors in those regions.

3. Generate statewide and regional economic multipliers for each industrial sector expected to experience direct impacts;
4. Use spending estimates and sector-level state and regional economic multipliers to estimate direct, indirect, and induced impacts over the 20-year period of site construction and development; and
5. Estimate the average annual economic impacts and cumulative economic impacts over the project period and the approximate pattern of annual economic impacts over that period.

Estimates of direct spending on the tasks associated with the proposed Masonville DMCF project were developed at the State feasibility-level by GBA based on a 129-acre DMCF constructed over a 20-year period. Average annual spending on the project over the 20-year period was used to estimate annual direct economic impacts associated with each major task. These direct spending estimates were then used as the basis for generating estimates of state and regional indirect, and induced economic impacts using the IMPLAN (IMpact PLANning) regional economic modeling system (IMPLAN 2004).

Approach

Expected spending on each of the tasks listed in Table 6 was allocated to specific industrial sectors, (e.g., purchases of fuel, stone, equipment leasing) and to primary (household) sectors (e.g., employee compensation, proprietor income) to generate estimates of direct sector-specific impacts using various measures of economic performance including: job creation, employee compensation, other household income, business sales and tax revenues generated. Direct spending in each statewide and regional industrial sector was then used within state and regional IMPLAN models to generate total direct, indirect, and induced economic impact estimates for both economic areas. Impacts at the regional level are based on estimated regional spending and multiplier effects based on the existing (2004) economic structure (IMPLAN input-output model) of the region. Impacts estimated at the state level are based on statewide inter-industry linkages and patterns of in-state and out-of-state purchases and sales during 2002 (Table 6).

All impacts were developed based on estimates of average annual spending per activity over the life of the project. Because actual annual spending would differ from year to year over the life of the project, using average annual spending to reflect spending in each year would result in overestimates and underestimates of the economic impacts of some activities during some years. For some tasks, planning or site development for example, using average annual impacts to represent all years results is an underestimate of economic impacts during early years when most spending takes place, and an overestimate during later years. For other tasks, such as long-term site monitoring, using average impact estimates for all years results in overestimates during early years, when little spending takes place, and understates impacts during later years. The following sections present and interpret model results associated with estimates of average annual economic impacts, and also provide a general description of the pattern of these impacts over time by showing the years in which overall spending (on all tasks) is expected to be above or below the annual average.

Proposed Masonville DMCF Alternative

Maryland Statewide Economic Impacts

The Statewide economic impacts from constructing a DMCF at Masonville are summarized in Table 7. The total level of spending on the project over 20 years is approximately $179 million. This spending is estimated to create approximately 42 long-term direct jobs, measured as full time equivalents (FTEs), in Maryland, and the project is expected to generate about $8.9 million in direct business sales. After "multiplier effects", or indirect and induced impacts are considered, average annual spending on the project is expected to generate approximately 126 FTE jobs in Maryland and total (direct, indirect, and induced) Statewide business sales of approximately $16.2 million annually ($324 million total) over the course of the 20 year project.

Analytical results show that development of a DMCF at Masonville would generate economic impacts that would last up to 20 years from the period of initial site development and construction, through material placement and site finishing. Economic impacts would persist beyond 20 years as a result of long-term commitments to site monitoring and maintenance and subsequent commercial uses of the site.

Baltimore City Economic Impacts

Most of the direct economic impacts of developing and using a DMCF at Masonville would occur in Baltimore City. This is a heavily populated and industrially developed and diversified area which means that direct spending here would generate more substantial indirect and induced economic impacts than similar levels of spending in less developed parts of the state where more inputs would need to be imported from outside the region and outside the state. The overall regional impacts from developing and using a DMCF at Masonville are summarized in Table 8.

The analysis shows that the roughly $179 million in overall direct project spending over 20 years, or approximately $8.9 million in annual spending, is expected to generate approximately 42 direct annual jobs (FTEs) in Baltimore City. Factoring in indirect and induced impacts, approximately 112 total FTE jobs would be generated in the City over the 20-yr life of the project and annual City business sales would increase by approximately $14.9 million (see Table 8).

No Action Alternative

If no action is taken, no employment and industry impacts (positive or negative) related to the construction of the proposed action are expected.

Table 7. Summary of state economic impacts associated with the proposed Masonville DMCF

	Initial Study/Permitting/ Design Costs	Site Development	Dredging	Transport	Placement	Long-Term Site Maintenance & Monitoring	Total
I. Direct Impacts							
Total Spending[1]	$2,800,000	$59,307,126	$51,000,000	$14,400,000	$36,000,000	$15,150,000	$178,657,126
Average Annual Spending[2]	$140,000	$2,965,356	$2,550,000	$720,000	$1,800,000	$757,500	$8,932,856
Average Annual Employment[3]	2	18	4	4	2	12	42
II. Economic Impacts[4]							
Impact Category							
Total Jobs (FTEs)[5]	3.4	47.4	26.5	11.2	18.1	19.1	126
Labor Income	$134,120	$2,063,481	$1,578,319	$415,827	$1,112,615	$589,996	$5,894,358
Employee Compensation	$122,822	$1,796,590	$1,322,718	$370,279	$933,800	$522,611	$5,068,820
Proprietors Income	$11,298	$266,891	$255,601	$45,548	$178,815	$67,385	$825,538
Indirect Business Taxes	$8,134	$150,177	$138,598	$45,006	$97,829	$43,322	$483,066
Other Property Type Income	$23,649	$521,463	$367,220	$159,636	$259,217	$163,388	$1,494,573
Value Added	$165,903	$2,735,122	$2,084,137	$620,468	$1,469,661	$796,706	$7,871,997
Business Sales	$264,660	$5,369,669	$4,612,387	$1,387,844	$3,256,274	$1,354,430	$16,245,264

[1] Direct spending by task over the 20 year project life was drawn from current estimates by GBA. These are feasibility level estimates and are subject to change.

[2] Average annual cost per task over 20 year project life (not adjusted for annual fluctuations in spending per task)

[3] Direct employment per task was estimated by UMCES using phone interviews and IMPLAN regional economic modeling results

[4] Average annual economic impacts over 20 year project life
Includes direct, indirect and induced economic impacts of both state and federal spending in Maryland
Direct, indirect and induced impacts of spending were estimated using the IMPLAN regional economic modeling system

[5] These numbers represent the average number of full-time equivalent (FTE) jobs in each task over the 20 year project. The number of man-years associated with each task, therefore, is the value shown multiplied by 20. The jobs associated with some tasks will be primarily in early years and the jobs associated with some tasks will be in later years. (See text)

Table 8. Summary of local economic impacts associated with the proposed Masonville DMCF

	Initial Study/Permitting/ Design Costs	Site Development	Dredging	Transport	Placement	Long-Term Site Maintenance & Monitoring	Total
I. Direct Impacts[1]							
Total Spending[1]	$2,800,000	$59,307,126	$51,000,000	$14,400,000	$36,000,000	$15,150,000	$178,657,126
Average Annual Spending[2]	$140,000	$2,965,356	$2,550,000	$720,000	$1,800,000	$757,500	$8,932,856
Average Annual Employment[3]	2	18		3		12	35
II. Economic Impacts[4]			Currently Under Development		Currently Under Development		
Impact Category							
Total Jobs (FTEs)[5]	3.4	43.2		9.7		17.4	74
Labor Income	$ 121,173	$ 1,990,621		$ 375,450		$ 552,070	$3,039,314
Employee Compensation	$ 110,794	$ 1,731,253		$ 335,206		$ 490,544	$2,667,797
Proprietors Income	$ 10,379	$ 259,368		$ 40,244		$ 61,526	$371,517
Indirect Business Taxes	$ 7,018	$ 132,235		$ 41,847		$ 38,448	$219,548
Other Property Type Income	$ 20,573	$ 479,752		$ 149,988		$ 149,531	$799,844
Value Added	$ 148,764	$ 2,602,608		$ 567,285		$ 740,049	$4,058,706
Business Sales	$ 245,479	$ 5,072,918		$ 1,273,181		$ 1,262,348	$7,853,926

[1] Direct spending by task over the 20 year project life was drawn from current estimates by GBA. These are feasibility level estimates and are subject to change.

[2] Average annual cost per task over 20 year project life (not adjusted for annual fluctuations in spending per task)

[3] Direct employment per task was estimated by UMCES using phone interviews and IMPLAN regional economic modelling results

[4] Average annual economic impacts over 20 year project life
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[5] These numbers represent the average number of full-time equivalent (FTE) jobs in each task over the 20 year project. The number of man-years associated with each task, therefore, is the value shown multiplied by 20. The jobs associated with some tasks will be primarily in early years and the jobs associated with some tasks will be in later years. (See text)

Environmental Justice

The EPA Office of Environmental Justice defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that no group of people including a racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies (U.S. EPA 1996). Additionally, Maryland's definition, which builds on EPA's definition, specifically notes that all citizens of the State should expect (1) to be protected from public health hazards and (2) to have access to the socio-economic resources necessary to address concerns about their livelihood and health. (Commission on Environmental Justice & Sustainable Communities, *Annual Report 2002*).

Proposed Masonville DMCF Alternative
Environmental justice concerns arise if a project is expected to generate adverse environmental or economic consequences. The overall results of the air quality and water quality analyses suggest the action is not likely to generate health risks to people within the area, and the project has the potential to improve water quality in some of the adjacent waters. The economic effects of the project are expected to be largely positive, so adverse economic impacts are not a concern. However, temporary air quality, noise and light effects, visual impacts and recreational boater disruptions during the construction period could potentially be seen as undesirable impacts. For this reason, the presence of any vulnerable racial, ethnic, or socio-economic group in the vicinity of the project was reviewed.

The demographics of the area around the project were evaluated using data from the neighboring census tracts (see Demographics section in Existing Conditions chapter) from the 2000 US Census. Variables on race and household income were assessed to determine whether areas near the project contained a disproportionate share of any vulnerable group. Vulnerable groups were defined as:

- African-Americans
- Hispanics (non-white)
- All minorities (all non-white)
- Households below the federal poverty level

In addition, whether the median household and per capita income levels were below the county or state level was evaluated to further inform the evaluation of socio-economic groups.

The Census data suggest that the census tracts near the proposed Masonville DMCF do not contain a disproportionate minority population, but do have higher poverty levels than the City as a whole (Table 9). Median household income is 27% lower and per capita income is 33% lower in the neighboring census tracts than in Baltimore City. Additionally, a greater proportion of households in the neighboring census tracts report Supplemental Security Income and/or Public Assistance Income, and the census tracts have a greater proportion of persons below the poverty level.

Table 9. Demographic statistics for area near the proposed Masonville DMCF. Source: US Census 2000

	Neighboring Census Tracts	Baltimore City	Maryland
Total Population	210,006	651,154	5,296,486
% White, not of Hispanic/Latino origin	45.1%	31.6%	62.1%
% Black or African American, not of Hispanic/Latino origin	50.9%	64.3%	27.9%
% Persons of Hispanic or Latino origin	1.8%	1.7%	4.3%
Median household income	$24,729	$34,077	$52,868
Per capita income	$12,715	$18,929	$25,614
% Households With Supplemental Security Income (SSI)	11.7%	8.7%	3.4%
% Households with Public Assistance Income	12.0%	7.3%	2.4%
% Persons with income below poverty level	34.8%	22.9%	8.5%

Although a disproportionate number of low income persons and households exist in the area surrounding the proposed Masonville DMCF, there is scant evidence for unfair treatment or lack of opportunity for community involvement during the Harbor site selection and evaluation process. For example, from March to October 2003, an ad hoc committee, known as the Harbor Team, was convened by the Maryland Port Administration. The committee was made up of representatives from local governments, business interests, community groups, and environmental organizations, and considered many options for placement of Harbor dredged material. One of the recommendations that came out of that process was constructing a DMCF at Masonville along with a "community enhancement project" in the adjacent Masonville Cove (Harbor Team 2003). A number of potential environmental restoration and enhancement projects are being considered as compensatory mitigation as the plans for the proposed Masonville DMCF develop. Therefore, through citizen participation and community enhancement, disproportionate impacts to low-income persons and households associated with the proposed Masonville DMCF were avoided or mitigated.

No Action Alternative
The no action alternative would not result in environmental justice impacts.

Safety to Children

"A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks… Therefore, …each Federal agency: (a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." (Executive Order 13045, April 21, 1997).

Proposed Masonville DMCF Alternative
No health or safety risks to children associated with the project have been identified. The types of activities associated with construction of the proposed Masonville DMCF would not generate

chemical constituents that may pose health risks to children. Additionally, as this project is adjacent to an existing industrial facility, safety to children would not be an issue because children would not have access.

As part of the project, a variety of community and environmental enhancements have been proposed for Masonville Cove. Currently, conditions in Masonville Cove are unsafe for children. Large amounts of debris alongshore and in the water make this area treacherous. Additionally, environmental contaminants may be present, but their levels are currently unknown and testing is ongoing. The intent of the enhancement projects is to improve these conditions for the health and safety of the community. Precautions would be taken at Masonville Cove to minimize the risk of potential hazardous conditions presented by the water or beaches to users. At a minimum, the same safety measures would be implemented at Masonville Cove that are taken at State supervised parks and reservoirs where swimming is prohibited.

At the State Parks, the Department of Natural Resources follows the guidelines of the U.S. Lifesaving Association (USLA 2005). Specifically, Maryland DNR prepares a "beach management plan" for designated locations, including water bodies where swimming might appear attractive but is prohibited for health or safety reasons (attractive nuisances). The standard management practices to safeguard the public are signage, education, and surveillance conducted either by personnel or by remote cameras. At Masonville Cove, it would be important to convey the reasons why swimming is prohibited through signage and other means.

Currently, environmental education programs by the National Aquarium in Baltimore and the Living Classrooms Foundation are planned for the Cove (Chapter 6). Each of these organizations has standard operating procedures to ensure the safety of participants. It is intended that these operating procedures would be implemented for the activities and programs at Masonville Cove.

In the event that standards are not met Cove-wide, access would be allowed only in those areas deemed safe. Therefore, no additional health and safety risks to children are anticipated

No Action Alternative
The no action alternative would not impact safety to children.

Aesthetic and Recreational Resources

Aesthetics

Methods of Visual Impact Assessment
The approach for this visual assessment is an adaptation of the Visual Resources Assessment Procedure (VRAP) developed for the USACE (Smardon *et. al*. 1988) and the Forest Service Scenery Management System (USDA Forest Service 1995). Both procedures are intended to be used as general guidelines rather than rigid processes to inform analysis of visual effects of projects.

Although the two assessment procedures mentioned above were designed with natural areas in mind, their basic structure allows them to be adapted for use in urban settings. Evaluating project-related potential aesthetic impacts to a region begins with an inventory of the visual features of the landscape to establish a baseline of the region's visual character. This process includes assessing the quality of visual resources relative to the regional characteristics and identifying the area from which the project can be seen and the viewers affected. With this baseline, a proposed project can be systematically evaluated for its level of impact. The level of impact depends on the magnitude of change in the visual resource and the concern of viewers for those changes.

The steps followed for this analysis were:

1. Assess existing landscape character and visual resources
2. Assess scenic attractiveness of project location
3. Assess project visibility and visual sensitivity of observers
4. Simulate landscape with and without project
5. Evaluate change in view characteristics with project
6. Describe overall impact of project on visual resources

Visual resources were described by considering the following characteristics described by Smardon *et. al*. (1988) (VRAP):

1. Landform
2. Water Resources
3. Land use and use intensity
4. Vegetation distribution

Landform is typically described in terms of elevation, range of elevation and distinct land elements such as mountains, rivers or streams. Water resources are described in terms of the proportion of a landscape in water and how water elements are incorporated in views. Land use and use intensity includes a description of land cover types, particularly how much of the land is developed versus in a natural state, the density of development, types of buildings and other cultural features. Vegetation distribution is a description of the proportion of land in different types of vegetation and the pattern and fragmentation of elements. These characteristics combine to describe the regional character and the sensitivity of the existing landscape to change.

Elements of the landscape that contribute to quality of views can be described through a number of variables (Table 10). People's preferences can vary greatly, but some elements are fairly common to visual appeal (Smardon 1983, Zube *et. al*. 1975). Diversity of land uses, elevations, heights of dominant elements and patch sizes within views generally contribute to scenic attractiveness. Particular value is placed by viewers on water views and long views in most contexts. The amount of natural land overall, is strongly correlated with increased public preferences, although the amount of natural land vs. agricultural or developed land seen as desirable varies by dominant land use and characteristics of the natural area (Hunziker and Kienast 1999).

Table 10. Landscape characteristics contributing to aesthetic quality. Adapted from Craik 1975

Landform
Range of vertical elevation
Drainage density
Mean slope
Land use
Land use diversity
Percent tree cover
Proportion of natural land use
Edges
Land use edge density
Variety across edges
Land use compatibility across edges
Contrast
Height contrast between dominant elements
Proportion of elements in height classes
Grain contrast/evenness: difference in land use patch sizes and their distribution
Water
Water edge density
Percentage area water
View
Area of view
Length of view
Relative vertical position of the viewer to the view

Scenic attractiveness and impact on attractiveness may be assessed using measures of view characteristics and results of visual preference research. However, the final test of impact of a project is the public perception of any change in visual quality, which is subjective and may be specific to the population being affected. Public opinion on attractiveness may be judged by determining whether areas are designated scenic areas or by conducting surveys. Since surveys were not conducted for this EIS, scenic designations were combined with generally recognized preferences to evaluate scenic quality. The site and project was, however, was chosen by the Harbor team (which is comprised of community groups) and found to be acceptable.

To evaluate impacts on visual resources, the measure of change in quality of a view was combined with the visibility of the project and the sensitivity of viewers to changes. Visibility of the project was assessed through a combination of geographic information system (GIS) analysis and field reconnaissance. GIS viewshed analysis was used to delineate areas in Baltimore City that had views of the existing Masonville port terminal and the proposed project. Field surveys were then conducted to assess which of the areas had views of the proposed site.

Viewer sensitivity or level of concern was measured by considering the visibility of the project, the proximity of viewers, the number of viewers, the duration of views and the type of the viewer and associated expectations (e.g., recreationist, commuter, and resident). Distance zones were used to describe the relative importance of changes to the viewer. Specifically, the view was divided into foreground (up to ½ mile from viewer), middleground (up to 4 miles from the foreground) and background (4 miles from viewer to the horizon) (USDA Forest Service). Changes were given less weight with increasing distance zone, because changes that occur farther from the viewer are less apparent.

Views of the landscape with and without the project were simulated using GIS analysis. Both map views and 3-D visualizations of the viewer perspective of the projects were investigated. The with-project conditions were simulated using elevation, land cover and land use maps. The most recent conceptual diagram of the project footprint was used to evaluate with-project conditions.

The effect of a change in view was evaluated using the visual impact modifiers of *spatial dominance*, *scale contrast* and *compatibility*, as defined in the VRAP (Table 11). To provide input into this assessment, the GIS analysis was used to calculate the change in appropriate landscape characteristics from Table 10. Several viewpoints were used to assess quantitative changes in the views. Locations of roads, homes, commercial property, sightseeing areas and public lands were all evaluated for applicable viewer locations. Finally, these quantitative measures were used in a qualitative assessment of the impact of the project relative to existing visual resources.

Table 11. Rating system used to assess visual impact. From Smardon et al. 1988

Modifier	Definition	Rating
Spatial dominance	The prevalent occupation of a space in a landscape by an object(s) or landscape element. Spatial dominance can be described in terms of being Dominant, Co-dominant, or Subordinate.	Dominant – the modification is the major object or area in a confined setting and occupies a large part of the setting. Co-dominant – the modification is one of the major objects or areas in a confined setting, and its features are of equal visual importance. Subordinate – the modification is insignificant and occupies a minor part of the setting.
Scale contrast	The difference in absolute or relative scale in relation to other distance objects or areas in the landscape. Scale contrast can be described in terms of being Severe, Moderate, or Minimal.	Severe – the modification is much larger than the surrounding objects. Moderate – the modification is slightly larger than the surrounding objects. Minimal – the modification is much smaller than the surrounding objects.
Compatibility	The degree to which landscape elements and characteristics are still unified within their setting. Compatibility can be described in terms of being Compatible, Somewhat Compatible, or Not Compatible.	Compatible – the modification is harmonious within the setting. Somewhat Compatible – the modification is more or less harmonious within the setting. Not Compatible – the modification is not harmonious within the setting.

Analysis

Regional Landscape

The general character of the region's visual resources was discussed under the existing conditions section. Some important aspects of the landscape for evaluating visual impacts are the highly industrial, developed nature of the shoreline and the limited public access to the water. No residential land use exists along the shoreline of the Patapsco in the vicinity of the proposed project; therefore, those with a view of the proposed Masonville DMCF would primarily be those who visit the public access areas, including Fort McHenry and Middle Branch Park, and boaters.

Existing Aesthetic Quality

The Patapsco River is a dominant component of the views from shoreline in the vicinity of the proposed project, and it provides an attractive visual element to these views. The river creates areas of open space and allows long, unobstructed views amid the developed landscape. Viewers on the shoreline looking across the water can see to the horizon from some locations. Fort McHenry and the City-owned parks around Harbor Hospital provide open space in this otherwise industrial area, and the nearby Masonville Cove provides the only natural, forested shoreline in the vicinity of the proposed project.

Other dominant landscape elements are port and industrial facility structures including tank farms, container offloaders, factories, and warehouses which provide visual interest due to diverse heights, variety of industrial activities, and historic character of some buildings. The prevalence of industrial urban development and hardened shoreline creates limited expectations of natural land use in the vicinity of the project. However, isolated patches of vegetation and

unhardened shoreline provide some diversity amid the urban industrial expanse. The existing Masonville shoreline, although hardened, is vegetated with shrubs and trees which partially screen views of the existing parking facilities. In this industrial area, abandoned, deteriorating vessels and debris alongshore or under shallow water are likely to detract from the overall aesthetic quality.

Affected Area and Viewers
For purposes of the visual aesthetic analysis, the affected area includes 1) land areas where residents and transient visitors would be able to view the proposed project and 2) waterways where boaters would be able to view the proposed Masonville DMCF. Land areas including parks, such as Fort McHenry, and the Harbor Hospital would have extended periods of viewing and are therefore considered to have among the highest visual sensitivity. Winter visitors to Bay Brook Park, more than one mile inland from the site, may have a view of the proposed project to the north. Other business areas and commuters or non-recreational travelers on roads, are not thought to focus on views and therefore have low visual sensitivity. Water users can be considered to operate anywhere in the vicinity of either project. All boaters passing through the Middle Branch of the Patapsco would pass by and have a clear view of the proposed Masonville DMCF.

Expected Land Use of Proposed Project
After project construction, the DMCF is expected to be paved and used for automobile storage. This use is consistent with land use in the area. Eventually, the dikes will be vegetated with grass, shrubs, and trees.

Proposed Masonville DMCF Alternative
Geographic Information Systems (GIS) Analysis
Views were assessed from several points in the landscape that were chosen to represent concentrations of viewers most affected by the proposed project (Figure 2). Ft. McHenry was selected as a viewpoint because of its close proximity to the proposed project and because it draws tourists who would be considered highly sensitive to views. The Harbor Hospital was also chosen as a viewpoint because in addition to being in view of the proposed site, it is surrounded by City-owned parks that provide public access to the water (e.g., Middle Branch, Cherry Hill, Ferry Bar, and Reed Bird). To assess potential aesthetic impacts to water users, a viewpoint from the shipping channel at the Ft. McHenry Angle was also chosen. For each viewpoint, the changes in foreground, middleground, and long water views associated with the proposed project were evaluated to weight the impact of visual changes.

A variety of landscape features was compared for the proposed project and the adjacent shoreline. In this section, analyses of the variables that were quantified to judge spatial dominance of the project are presented. Other variables examined in the GIS are discussed in the summary of impacts below. The variables that best captured the changes in views in this waterfront environment were measures of the proportion of middleground view that was occupied by the project.

Initially, the total field of view from a particular point was characterized for each distance zone (foreground, middleground or long water view) by measuring the angular portion of the field of

view at a specified distance from the viewer. For example, the total view for the middleground represents the angle of the view over which an observer can see at least ½ mile and up to 4 miles. Next, the proportion of the field of view that the proposed project would occupy was measured for each distance zone. Using three different distances allows the effect of changes in length of view and changes in view character to be analyzed and weighted.

The proposed Masonville DMCF does not fall into the foreground view of the Harbor Hospital or channel viewpoints, but instead falls 0.6 miles, or just outside the foreground view, from Ft. McHenry. The existing Masonville shoreline lies about 0.8 miles from Ft. McHenry; thus, the proposed project would technically fall outside the foreground view, but it would appear markedly closer than the existing shoreline and would occupy a considerable portion of the view from this vantage point (see middleground analysis below). Because the foreground view from this viewpoint comes very close to being affected by the construction of the proposed project, a 3D simulation of the view from Ft. McHenry to the site before and after project construction was created (Figure 3).

For the middleground (1/2 – 4 miles), the view was assessed in terms of the total width of view (measured as an angle), and the width of view occupied by the proposed project (Figures 4 and 5) to assess potential visual effects during or after construction. The analysis shows that the middleground view at Ft. McHenry is more exposed to the proposed project than the view from the channel or Harbor Hospital (Table 12). The project would occupy approximately 19% of the middleground view at Ft. McHenry, compared to approximately 13% at the viewpoint in the channel and 10% at Harbor Hospital.

The analysis indicates that during construction, a relatively small proportion of most views by boaters and shoreline users would consist of construction activities. At Ft. McHenry, one-fifth of the middle-ground view would be dominated by activities on-site once the full perimeter of the project is constructed. Whether or not viewers at Ft. McHenry would find the view degraded during construction is not entirely clear. Some viewers may consider construction activities visually unappealing, but others would be interested to view the construction. The activities would not represent a strong visual contrast with existing land use, although exposed dirt would contrast with the current vegetated and weathered shoreline. Once completed, the project would include land cover similar to existing uses and thus is not expected to represent a major impact on middleground views.

The proposed Masonville DMCF does not affect the long water view (>6 miles) from any viewpoint. Tourists at Ft. McHenry and boaters in the mainstem of the Patapsco River enjoy a long waterview to the southeast, but the proposed site does not fall within this view. Looking due east from Harbor Hospital, the water view is <4 miles long. The Patapsco River is less than one mile wide in this area, and therefore, long, unobstructed views are generally not available here.

Table 12. Changes to middleground views associated with proposed Masonville DMCF

Description of View	Ft. McHenry	Harbor Hospital	View from channel
Distance to proposed project	0.6 miles	1.1 miles	0.7 miles
Total middleground view	236º	125º	251º
DMCF view	45º (19%)	12º (10%)	32º (13%)

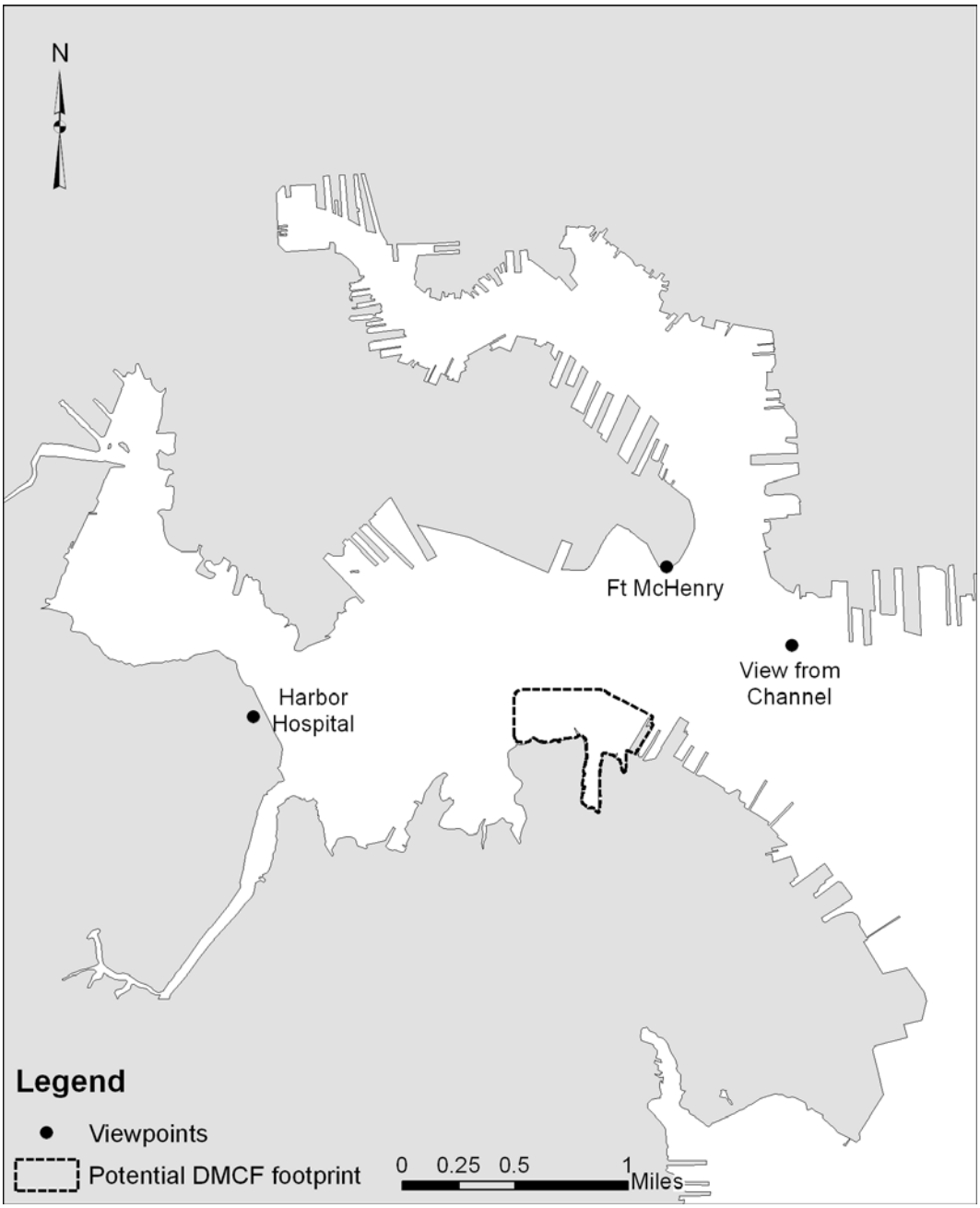

Figure 2. Viewpoints used in aesthetic analysis.

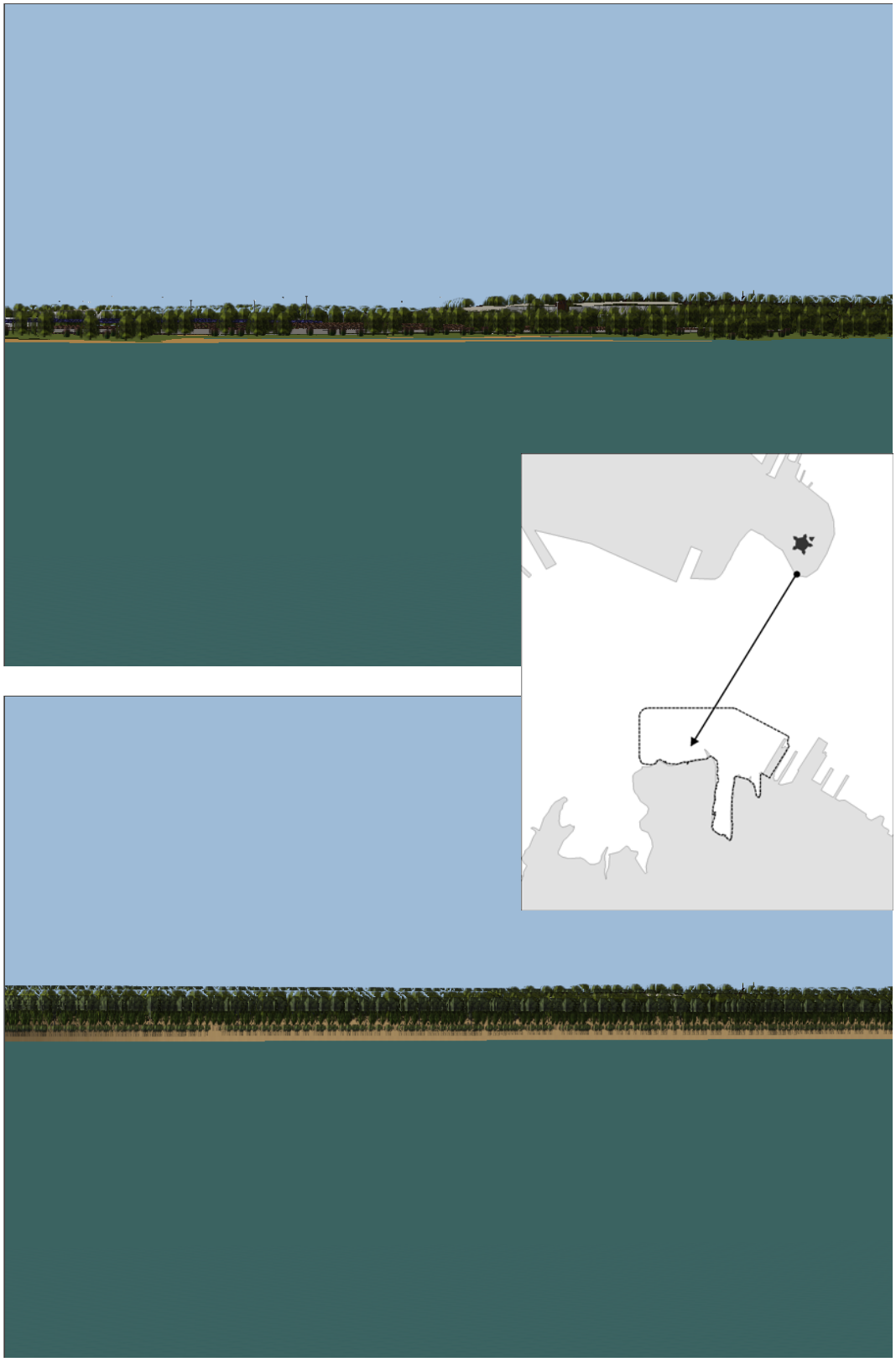

Figure 3. Simulated view from Ft. McHenry before and after project construction. Inset map shows location of observer at Ft. McHenry and direction of view.

Figure 4. Total middleground view from Ft. McHenry viewpoint

Figure 5. Portion of middleground view occupied by proposed Masonville DMCF

Spatial Dominance
From the results of the GIS analysis, it is evident that the proposed project has the potential to be a significant element in the landscape for a limited number of viewpoints. From most viewpoints, the project is not likely to adversely affect views because it is anticipated that the project, once completed, will blend into the existing landscape.

The proposed lateral expansion would be similar in appearance to the existing port terminal from the most common viewpoints. From nearby, the project would be a large feature in the landscape that would be noticeable during construction, but would not be inconsistent with the existing appearance of the area. From the north shore of the Middle Branch, represented by the Ft. McHenry viewpoint, views would be considerably changed by the project because it would fall close to the foreground and would occupy nearly 20% of the middleground view.

As currently envisioned, the proposed DMCF would extend approximately 1,200 ft into the Patapsco River from the existing shoreline. The river is approximately 4,000 ft wide in this area. While the height of the DMCF would be consistent with existing land, for viewers west of the project, represented by the Harbor Hospital viewpoint, the proposed DMCF would occupy a substantial portion of the middleground water view.

For recreational boaters venturing west from the Ft. McHenry Angle into the Middle Branch, the proposed project would be a dominant feature of the foreground and middleground view. However, the finished appearance of the project would be in keeping with existing conditions in terms of view and would not affect long water-views that are generally the most highly-valued views.

Scale Contrast
The scale of the proposed project is consistent with existing port facilities in the Middle Branch of the Patapsco River. The height of the proposed DMCF would be consistent with the existing site. However, the project's elevation is expected to be considerably higher than the natural shoreline in the adjacent Masonville Cove and have steeper slopes. Existing slopes at Masonville are around 15%, but the constructed project may have slopes closer to 30% in some areas during construction. The dikes on the north and northeast side of the proposed project would be about two-tenths of a mile closer to Ft. McHenry than what currently exists at Masonville, and given the expected slope differences, would represent a moderate scale contrast from Ft. McHenry. Overall, the scale contrast of the proposed DMCF would be minimal for most viewers given the existing land use and port facilities in the area, but visual changes would be apparent at Ft. McHenry and from the Cove.

Compatibility
Over the long-term, the project would be generally harmonious with the setting since it is an extension of an existing terminal. The projected use is consistent with the majority of the existing industrial uses in the area, and consistent with existing shoreline use at the site. The existing hardened shoreline of the project area is vegetated with grass, shrubs, and trees, creating a relatively smooth transition between the Cove and the existing shoreline. Initially, the new dikes will be barren and therefore less consistent with the natural shore of the Cove until similar

vegetation becomes established. During the material inflow phase, the dikes would likely be planted with grasses or shrubs, and once the proposed Masonville DMCF is closed, the dikes would be planted with trees. Debris removed as part of the project is likely to enhance the eventual compatibility of the new site with the natural areas and enhance the quality of visual aesthetics within the Cove.

No Action Alternative
Impacts to aesthetics associated with the no action alternative are not expected.

Recreation

Recreational Boating
Proposed Masonville DMCF Alternative
Based upon input from the local community, the current recreational boat use of the area around the proposed Masonville DMCF is presumed to be relatively low (see Recreational Fishing and Boating section in Existing Conditions chapter). The waters that would be filled by the project have depths from 0 to 15 feet indicating their potential use for small craft, but submerged debris may make navigation difficult. Any recreational boaters who currently use the water within the proposed footprint will be forced to travel closer to the shipping channel after construction of the proposed Masonville DMCF. The distance from shoreline to the Ferry Bar shipping channel will be reduced from about 1,500 feet to about 400 feet. There are currently low numbers of recreational boaters in this area so the reduced distance between the shoreline and the shipping channels is not anticipated to have a significant affect on recreational boating. Those few recreational boats using the area should be able to safely navigate in the 400 ft between the shoreline and the shipping channel.

No Action Alternative
The no action alternative would not affect recreational boating.

Recreational Fishing
Proposed Masonville DMCF Alternative
Adverse impacts to recreational fishing associated with the proposed Masonville DMCF are not expected and some minor improvements are possible. The data suggest that the level of recreational fishing from boats in this area is relatively low (see Recreational Fishing and Boating section in Existing Conditions chapter). Fishing from shore, such as that at Middle Branch Park, would not be affected by construction of the proposed project. However, any recreational fishermen fishing from boats in the Middle Branch have the potential to be displaced by the construction of the proposed Masonville DMCF. These impacts would be minor assuming alternative nearby fishing locations are available.

No Action Alternative
The no action alternative would not affect recreational boating.

Wildlife Viewing
Proposed Masonville DMCF Alternative

Construction of the proposed Masonville DMCF is not expected to impact wildlife viewing. Current use of Masonville Cove by wintering waterfowl and recreational birders was discussed in the Other Recreational Activities section of the Existing Conditions chapter. Wintering waterfowl are found inside the Cove until it ices over (Ringler 2005); therefore, construction of the proposed DMCF is not expected to spatially overlap with the area used the by overwintering birds.

No Action Alternative
The no action alternative would not result in impacts on wildlife viewing.

Other Uses
Proposed Masonville DMCF Alternative
The proposed DMCF is not expected to impact other recreational uses in the area.

No Action Alternative
The no action alternative would not have impacts on other recreational uses of the Masonville area.

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