

**Chicago Area Waterways System (CAWS)
Dredged Material Management Plan (DMMP)
and Integrated Environmental Impact Statement
January 2020**

**U.S. Army Corps of Engineers Response to
Independent External Peer Review
December 2019**

Independent External Peer Review (IEPR) was conducted for the subject study in accordance with Section 2034 of WRDA 2007, EC 1165-2-214, and the Office of Management and Budget's *Final Information Quality Bulletin for Peer Review* (2004). The goal of the U.S. Army Corps of Engineers (USACE) Civil Works program is to always provide scientifically sound, sustainable water resources solutions for the nation. The USACE review processes are essential to ensuring project safety and quality of the products USACE provides to the American people. Battelle Memorial Institute (Battelle), a non-profit science and technology organization with experience in establishing and administering peer review panels for the USACE, was engaged to conduct the IEPR of the Chicago Area Waterway System (CAWS) Dredged Material Management Plan (DMMP) and Integrated Environmental Impact Statement.

The IEPR Panel consisted of subject matter experts in the following key technical areas: Economics, Environmental Law Compliance, Civil Design Engineering, and Geotechnical Engineering. The Final IEPR report from Battelle was issued on 05 December 2019.

Overall, 11 final panel comments were identified and documented. Of these, one was identified as having high significance, two had medium/high significance, two had medium significance, and six had low significance. The following discussions present the agency's final responses to the comments.

Comment 1 - High Significance: *The adequacy of the forecasting models used cannot be assessed because information on each model and the statistical results associated with each model is not included in the DMMP/EIS.*

This comment included five recommendations for resolution, four were adopted.

Recommendation 1: Explain the level of disaggregation for all forecast models (i.e., explain whether each commodity group has a single forecast model for the entire group or whether each commodity within a commodity group has its own forecast model).

USACE Response: Adopted.

Action Taken: *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* was amended to provide the following description of the approach to developing commodity-specific forecasts:

As described in Appendix B.1 (Calumet Harbor & River Traffic Demand Forecast), sections 3.1 through 3.9, each of the nine commodity groups comprise multiple specific commodities, each of which were forecasted in one of three ways: (1) if available, application of Criton Corporation indexes; (2) application of a commodity group-level index generated by the Microsoft Excel 2013 forecast function; or (3) was assumed to remain constant.

Recommendation 2: Include an equation representing the forecasting models estimated using the Microsoft Excel Forecast function.

USACE Response: Adopted.

Action Taken: *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* was amended to include the following equation representing the forecasting models estimated using the Microsoft Excel Forecast function and the corresponding narrative. The Excel forecast function returns the predicted value of the dependent variable for the specific value, x , of the independent variable by using a best fit (least squares) linear regression to predict y values from x values. In this case, the dependent variable is future tonnage and the independent variable is historical tonnage. This is a time series forecast that uses actual historical results to predict future results. The formula follows as:

The equation is $y = \alpha + \beta(x)$, where:

$$a = \bar{y} - b\bar{x} \quad \text{and} \quad b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

Where \bar{x} and \bar{y} are the sample means of the known x 's and known y 's.

Recommendation 3: Provide t-stats, F-stats, Mean Squared Error, and R-squared associated with each commodity forecast model.

USACE Response: Not Adopted.

Action Taken: The Corps further addressed the stated concerns with forecasts in the report commentary. It also addressed concerns in terms of statistical metrics and alternative forecast method growth rates, expanded upon methods utilized, and acknowledged risks. Additional commentary was added to *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* under Section 5.1 "Reasonability of

Forecasting Results” to address the potential conservative nature and relevance of the forecast for utilization in the study analysis.

Recommendation 4: Describe the data used for the growth projections of aggregates, grains, chemicals, and iron/steel commodities.

USACE Response: Adopted.

Action Taken: *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* was amended to include the following description of the Criton Corporation data used for the growth projections of aggregates, grains, chemicals, and iron/steel commodities:

Criton Corporation publishes a 5-year forecast each year for dry bulk commodities utilizing the Mississippi River System and its connecting waterways. The primary data source for their projections is U.S. Army Corps of Engineers (USACE) Waterborne Commerce data with supplemental data from the U.S. Geologic Survey for mineral commodity demand and use; the U.S. Department of Energy on electric power generation, plant capacity utilization, coal and competing fuel use and prices, and planned coal powered plant shutdowns; the U.S. Department of Agriculture for farm products and inputs data; the American Iron and Steel Institute; the International Institute for Iron and Steel; and the U.S. Department of Commerce for exports, imports, and Waterborne Commerce data validation. In addition, Criton Corporation makes use of independently collected data. Dry cargo forecasts are developed using macro variables that measure economic activity, growth and decline; global grain production, consumption, trade, and international competitiveness.

Recommendation 5: Explain why the data used for those projections are considered accurate.

USACE Response: Adopted.

Action Taken: As described in *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast*, there is inherent uncertainty surrounding forecasts of future traffic demand. However, the appendix was amended to include the following explanation of why the data used for the aggregates, grains, chemicals, and iron/steel projections are considered reasonable.

The Criton Corporation was established in 1992 with the sole focus of providing the inland barge industry with the most current and comprehensive information on developments which affect river commerce” (rivertransportnews.com). Their primary data source, USACE Waterborne Commerce data, is considered the most comprehensive source of inland waterway traffic flows and is a Corps product. The other data sources they implement are also considered to be reputable. Criton makes use of data sources from an array of federal and other applicable data sources, identifies markets and the rationale for their key drivers, and offers a thorough description of their forecasting methods.

Since the Criton data is thorough, defensible, and readily available for use in the study, the Corps believes that it is appropriate to move forward with commodity-specific forecasts when applicable.

Comment 2 – Medium/High Significance: *Projecting static demand for all commodities from 2022-2045 for the Calumet Harbor and River forecasts is inconsistent with using the GLMRIS forecast data for these same commodity groups to generate yearly forecasts out to 2040 for the Calumet-Sag Channel.*

This comment included two recommendations for resolution that were both adopted.

Recommendation 1: Generate yearly forecasts for the Calumet Harbor and River for each commodity group out to 2040.

USACE Response: Adopted.

Action Taken: *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* was amended to demonstrate that allowing annual changes in forecasted tonnage until year 2040 rather year 2021 is not expected to improve their accuracy; rather, this approach would likely have reduced the accuracy of the forecasts.

Recommendation 2: Utilize the forecasted growth rates for each commodity group from the GLMRIS for the Calumet Harbor and River forecasts if new forecasting models cannot be developed.

USACE Response: Adopted.

Action Taken: *Appendix B.1 - Calumet Harbor & River Traffic Demand Forecast* was amended to include the following information to clarify that the Great Lakes and Mississippi River Interbasin Study (GLMRIS) (USACE, 2014) forecasts are not appropriate for use in the development of Calumet Harbor and River traffic demand forecasts.

The GLMRIS forecasts account for shallow draft tonnage movements (i.e., shipped on barges that draft less than 12 feet) within the Chicago Area Waterway System (CAWS). The Calumet Harbor and River tonnage of interest includes that which is shipped or received on deep draft vessels (those drafting greater than 12 feet below). A typical vessel moving deep draft tonnage into Calumet Harbor and River carries around 20k tons. This alone makes for differences in movements. Great lakes tonnage is largely driven by economic conditions and specific industries such as energy, steel production, agriculture and foreign demand whose nuances are considerably different from that of the shallow draft river system.

Note from Panel Reviewer’s BackCheck:

Concur. Recommendation 2 did not recommend that the GLMRIS forecasts be used for the Calumet H&R. Rather the recommendation was to use each commodity group’s forecasted growth rates from the GLMRIS and apply growth rates to Calumet H&R traffic.

Comment 3 – Medium/High Significance: *The risk analysis associated with project benefits does not adequately convey the expected range of future project benefits.*

This comment included one recommendation for resolution that was adopted.

Recommendation 1: Generate 90% confidence intervals for all commodity groups and use those confidence intervals to establish upper and lower bounds for the risk analysis. Do this for the Calumet Harbor and River benefits as well as the Calumet-Sag Channel benefits.

USACE Response: Adopted.

Action Taken: *Appendix B: Economic Analysis* was amended to clarify the purpose of the analysis described in Section 5.0 - *Uncertainties and Associated Risks*.

There is inherent uncertainty surrounding the expected forecast for Calumet Harbor and River (deep draft movements) as well as the Calumet-Saganashkee (Cal-Sag) Channel (shallow draft movements). An expected (most likely) forecast was developed for these channels. However, any significant changes in the forecasted markets for each commodity group pose a potential risk that project benefits are over- or underestimated. This risk of significantly over- or underestimating the traffic demand forecasts for Calumet Harbor and River was characterized independently of the risk for the Cal-Sag Channel traffic demand forecasts.

The USACE Planning Community Toolbox Risk Register Template was used to qualitatively characterize via a ‘risk rating’ which is a function of both ‘likelihood’ and ‘consequence’ ratings. These ratings are summarized in *Appendix B: Economic Analysis* and more fully described in *Appendix B.1 – Calumet Harbor and River Traffic Demand Forecast* and *Appendix B.2 – Calumet-Saganashkee Channel Traffic Demand Forecast*. For both Calumet Harbor and River and the Calumet-Sag, the medium consequence rating and medium likelihood rating resulted in an overall risk rating of medium for the expected forecast. To characterize this risk, alternate forecast scenarios were considered in light of the market drivers most likely to impact traffic demand for Calumet Harbor and River or the Cal- Sag. Given these alternate traffic scenarios, project benefit estimates were developed and are displayed in Table 22 of *Appendix B: Economic Analysis*.

Appendix B: Economic Analysis was amended to include the following information to clarify the purpose of the analysis described in Section 5.0 - *Uncertainties and Associated Risks*.

The risk characterization is not intended to demonstrate a comprehensive array of all potential traffic demand scenarios, but rather, demonstrate how uncertainty surrounding key market drivers could most substantively impact traffic demand and associated project benefits.

The approach to developing the alternate traffic scenarios was subject to available information and the key market drivers for Calumet Harbor and River traffic and Calumet-Sag traffic. The 90% confidence interval was determined to be an appropriate method to characterize the uncertainty associated with a subset of the Calumet Harbor and River commodity forecasts for which linear regressions were utilized to estimate future traffic levels, but not all due to their relatively lower tonnages and minimal uncertainty surrounding future market changes that would impact traffic. Meanwhile, based on best available information, alternate ‘high’ and ‘low’ scenarios for the Calumet-Sag traffic forecasts could be reasonably characterized by considering alternate lower or ‘no’ growth rates.

Comment 4 – Medium Significance: *Major uncertainties remain regarding the beneficial use plan, because an explicit plan for about 370,000 cubic yards of material that need to be dredged has not been fully developed.*

This comment included three recommendations for resolution which were all adopted.

Recommendation 1: Prepare a market analysis for supply and demand for dredged material from Calumet Harbor, ensuring that it is competitive with other sources of sediment for similar purposes.

USACE Response: Adopted.

Action Taken: The Corps is continuing to explore markets for beneficially used dredged material in coordination with the non-federal sponsor, resource agencies, and private entities. Specific steps being taken include:

- Additional sediment sampling of the Calumet Harbor material that is currently stockpiled at the Chicago Are CDF occurred in the summer of 2019.
- Meetings with Illinois Environmental Protection Agency (IEPA) and Indiana Department of Environmental Management (IDEM) were held in August and October to discuss sampling results and a path forward for beneficial use of Calumet Harbor material in Illinois and Indiana.
- The Corps will undergo a “Sources Sought” effort to determine potential users in the Chicagoland area – similar to the market analysis for supply and demand suggested in the original comment.
- Corp staff attended a beneficial use of dredged material conference in Peoria, IL from 4-5 September 2019 to learn from other beneficial use case studies in the state/region and develop relationships with experts who may be able to assist in the generation of a complete beneficial use plan for the CAWS DMMP.
- Corps staff are currently coordinating development of a proof-of-concept study to explore creation of marketable engineered soils using dredged material and compost. This is based on a similar model that is working successfully in Minnesota.

Once complete, the Corps anticipates preparation of a supplemental NEPA document to describe any potential adverse impacts related to beneficial use that may not be fully described in the DMMP.

Recommendation 2: Conduct further analyses of the environmental quality of the Calumet Harbor sediments to ensure that the end uses specified (e.g., brownfields and roadbeds) are available.

USACE Response: Adopted.

Action Taken: In coordination with the non-federal sponsor, Corps staff continues to undergo additional effort to develop the details for a more complete beneficial use plan. Additional sediment sampling results show that the material is below the Maximum Allowable Concentration (MAC) table levels for most listed substances, with certain metals (notably iron) being higher.

IEPA has advised that the Corps either pursue a Beneficial Use Determination with the state to use the material in the short term for specified purposes or wait 1.5-2.5 years while the MAC standards are updated (currently ongoing). Once updated, tentatively anticipated by the spring of 2022, IEPA representatives expect the allowable concentrations of some of these metals to increase. If the material is below the levels described in the updated MAC tables, IEPA stated that it would be considered suitable for unregulated use from the state’s perspective.

Recommendation 3: Determine whether Calumet Harbor sediments meet regulatory criteria for use on recreational parkland such as athletic fields.

USACE Response: Adopted.

Action Taken: (See ‘Action Taken’ from Recommendation #2 above). The Corps’ beneficial use plan will not allow unregulated beneficial use of the material unless it meets the contaminant concentration levels described in the MAC table and/or the Tiered Approach to Corrective Action Objectives (TACO) residential standards.

The material may be used for certain other specified purposes pending an approved Beneficial Use Determination from the state. These applications would likely be restricted to redevelopment and fill rather than recreational parkland uses if the material does not meet the MAC table and/or TACO standards.

Comment 5 - Medium Significance: *The DMMP/EIS does not assess risks and impacts from climate change on the future project or from project activities on the climate.*

This comment included two recommendations for resolution that were both adopted.

Recommendation 1: Explicitly assess and estimate possible effects on the TSP from climate change, including the effects of lake levels, waves, and increases in rainfall events and their intensity upon the CDF or new berm walls, as well as the effects of lower water levels on dredging quantities.

USACE Response: Adopted.

Action Taken: Additional discussion was added to the inventory of existing conditions in the main report under *Section 2.6 – Climate and Climate Change* to address the range of potential future conditions in the study area related to greenhouse gas emissions. The major takeaway from this discussion is that

A majority of scientists are certain the world’s climate is changing, and it is evidently driven by increasing concentrations of greenhouse gases in the atmosphere (Kling et al. 2003). The primary greenhouse gas (GHG) is carbon dioxide (CO₂), but other gases also contribute to climate change, such as methane (CH₄) and nitrogen oxides (NO_x). The increase of greenhouse gases in the atmosphere is mainly attributed to the burning of fossil fuels, particularly human activities related to transportation and the burning of natural gas or coal to generate electricity... In 2015, the Chicago Region (population of approximately 8.5 million people in 2015) reportedly produced 119 MMTCO₂e (ICF 2018). For the Chicago Region study, these emissions were divided into stationary energy emissions (69 percent), transportation emissions (29 percent), and waste emissions (3 percent). Stationary emissions were emissions from buildings and facilities, manufacturing and energy industries, and fugitive emissions from oil and natural gas systems; transportation emissions were emissions from road, railway, and waterborne navigation, aviation, and off-road construction equipment; and waste emissions were emissions from waste generated within the region, including the emissions from the disposal of solid waste, biological treatment of waste, and wastewater. The emissions from waterborne navigation were estimated to less than one percent of the transportation emissions (ICF 2018).

Additionally, the following discussion was added to the potential effects analysis in the draft report under *Section 4.5 - Climate and Climate Change*. The major takeaways that are stressed in this additional discussion are:

1. Acknowledgement that all of the proposed action alternatives would increase GHG emissions to some extent due to operation of equipment and vehicles during facility construction (short term) and during operation and maintenance of the waterways (long term), and
2. Implementation of any of the action alternatives would represent a decrease in GHG emissions compared to the no action plan. This is due to the fact that without a sediment management facility, maintenance of the waterways would not be viable, causing waterborne commerce to be replaced by trucks and rail. These modes of bulk transportation are much less efficient than waterborne commerce.

Recommendation 2: Provide a detailed analysis regarding the possible impacts resulting from the generation of greenhouse gases under the TSP and the alternatives, including the no action alternative.

USACE Response: Adopted.

Action Taken: Additional language was added to the potential effects analysis in the draft report under *Section 4.4 - Air Quality*. A summary of the major points is included below.

For the no action alternative, no construction will occur and air quality will not be impacted. All of the proposed action alternatives would cause localized, temporary increases in exhaust emissions from equipment and vehicles during construction and placement activities. These impacts would be limited through emissions controls during activities, in compliance with USACE, USEPA, IEPA, and local laws and regulations. Construction and operation of the proposed conceptual DMDF facility design will not result in significant or long-term adverse impacts to air quality.

Section 176(c) of CAA has a “general conformity” requirement to ensure that any activity funded by or approved by a federal agency conforms to the State Implementation Plan (SIP) for a nonattainment area (or for a “maintenance area,” which is a former nonattainment area re-designated to attainment).

The proposed emissions would be limited to mobile source (equipment and vehicle) emissions during construction of the new facility and general dust emissions, since the facility would not include any processes or operations that are stationary source emissions. Because of the attainment status and the possibility for emissions from mobile sources, the general conformity analysis is potentially applicable.

Mobile source emissions from construction equipment are regulated; construction equipment must use appropriate fuel and technology to minimize diesel exhaust emissions. Based on extensive modeling for a much larger construction project (large flood risk management and ecosystem restoration study), the small footprint of the proposed constructed facility, and the short duration of the construction work, the emissions associated with the proposed confined disposal facility will be much less than the threshold (de minimis) emissions levels. The future operation will be similar to the current operation, except that the footprint of the facility will be smaller. Dust from the current facility has not been an issue during the past 30 years of operation. It is assumed that future operations will continue to incorporate dust management practices as needed, including the use of vegetation, watering as needed, silt fencing or foams if necessary.

Because the CAWS DMMP construction is expected to have a minimal impact on air quality in the study area, it was determined to be unnecessary to conduct a detailed analysis using air quality models. Diesel exhaust emissions are not expected to be a long-term issue, and USACE requires that all construction operations meet current environmental and safety laws and regulations. Particulate emissions are not expected to be a concern as long as the

DMDF operation incorporates proper controls to reduce the potential dust emissions that may occur under certain weather conditions. Total emissions are anticipated to be well below threshold levels for all criteria pollutants.

Implementation of any of the action alternatives would represent a decrease in GHG emissions compared to the no action plan. This is due to the fact that without a sediment management facility, maintenance of the waterways would not be viable, causing waterborne commerce to be replaced by trucks and rail. These modes of bulk transportation are much less efficient than waterborne commerce.

Comment 6 - Low Significance: *The DMMP/EIS does not document the benefits of the TSP on environmental and social justice.*

The comment had five recommendations for resolution which were all adopted.

Recommendation 1: Expand the environmental justice evaluation to provide a detailed analysis of potential pathways of exposure and possible impacts of the four upland sites and the TSP.

USACE Response: Adopted.

Action Taken: A *Potential Pathways of Exposure* discussion was added to *Section 4.9 – Socioeconomic/Environmental Justice*. Human exposure to contaminated dredged material could result from physical interaction with (touching), ingesting (eating or drinking), or breathing it. The potential for disproportionate risk of human exposure in environmental justice communities is broken down into the categories of physical contact, ingestion, and inhalation. Control mechanisms included in the proposed project are discussed for each category.

Recommendation 2: Provide details of potential impacts to the local communities under the no action alternative, including such impacts as increased barge traffic and emissions, added truck traffic, and safety issues.

USACE Response: Adopted.

Action Taken: USACE concurs with the reviewer's comment. This comment is addressed by the language added to satisfy Recommendation 1 above.

Recommendation 3: Edit the misleading statement on page 109 to clarify that these impacts would be the same regardless of race or income.

USACE Response: Adopted.

Action Taken: The misleading language was revised in *Section 4.9 – Socioeconomic/Environmental Justice* to increase clarity. The passage now reads as follows:

The potential action alternatives are all located on industrial land and construction of the facility will not displace any existing community facilities or disrupt existing social patterns or activities. No significant adverse impacts to the human and natural environment are anticipated as a result of constructing a DMDF at any of the alternative sites....

Recommendation 4: Discuss the environmental risks avoided by selection of the TSP instead of selecting one of the four upland sites, showing the relative positive contributions of the selection of the TSP.

USACE Response: Adopted.

Action Taken: In an effort to be more explicit about the benefits of the Recommended Plan, additional language was added to *Section 4.9 – Socioeconomic/Environmental Justice* in a new sub-header titled ‘Avoided Environmental Risks’. This discussion covers reducing GHG emissions, reducing truck traffic in the study area, supporting local/regional economies (jobs), and removing a portion of the legacy pollutants that exist unconfined in the ecosystem as a result of the study area’s industrial history.

Recommendation 5: Explain the methodology in Tables 5 and 6 of Appendix K such that the reader understands how household income is related to the percent of individuals below the poverty line.

USACE Response: Adopted.

Action Taken: There is not a universal standard for applying EJ to potential low-income communities. The PDT considered 3 different metrics to arrive at its decision in this case. Tables 5 and 6 address two of these.

1. Apply USEPA’s EJscreen webtool. This is the fastest and easiest method that Corps staff used as a screening level analysis.
2. The Council on Environmental Quality (CEQ) criteria defines poverty based on household income. While it is challenging to get an accurate breakdown of household poverty (changes based on number of family members), Corps staff analyzed household income data from the American Community Survey (ACS). Per this guidance, Corps staff sought to determine instead whether the percent of low-earning households was “meaningfully greater than the percentage in the general population”... In this case Chicago and Cook County were considered the general population.
3. The US Census Bureau defines a poverty area by the percentage of individuals living in poverty. Based on ACS 2013-2017 data, the study area meets this criteria and would be considered a poverty area. The description of the Census Bureau definition and a summary of the Corps’ findings were added to better document this third and final consideration in the low-income decision methodology.

Comment 7 - Low Significance: *It is unclear how reduction/expansion and site settlement were included in determining the volume estimates for CDF berm construction and confined disposal.*

The comment had two recommendations for resolution, both of which were adopted.

Recommendation 1: Provide additional details regarding how reduction/expansion and settlement were accounted for in the volume estimates in Appendix E and Appendix F.

USACE Response: Adopted.

Action Taken: For the volume computation for the Stage I and Stage II berm volumes, a 15% contingency was used to account for shrinkage during drying and an assumption was made that material used to build the berm is dry dredged material. Additionally, site settlement is considered to be negligible (no settlement included in preliminary volume estimate) since the site will be preloaded under the footprint of the berms and wick drains will be installed.

The Corps believes that these are suitable assumptions for the development of a feasibility level design and cost estimate. Reduction and expansion factors are outlined below and can be found in *Appendix D – Geotechnical Engineering* under Section 3.2 “Dredged Material Properties”:

CAWS DMMP
IEPR Agency Response Documentation

Source	Destination	Reduction/Expansion Factor
Dredging Scow	Compacted and Dried Berm	0.68*
Dredging Scow	Dried on Drying Pad	0.8*
Dried on Drying Pad	Dried Material in Truck	1.25+
Dried on Drying Pad	Compacted and Dried Berm	0.85~
Dried Material in Truck	Compacted and Dried Berm	0.68~

Recommendation 2: Discuss the possible impacts on project cost effectiveness associated with the uncertainty of the volume of beneficial use material for berm construction and available volume for confined disposal.

USACE Response: Adopted.

Action Taken: The Corps acknowledges and concurs with the commenter that there is some uncertainty surrounding the exact amount of dredged material necessary to construct the containment dikes and the availability of that material at the time of implementation. However, there is a very low risk of this uncertainty affecting the selection of the Recommended Plan or its future implementation:

1. The Chicago District currently maintains a ~25,000 CY stockpile of Calumet Harbor material on the southern portion of the existing CDF that can be used in future berm construction.
2. The Chicago District currently only maintains the center half-width of the maintenance channel in order to extend the life of the existing CDF. Therefore, there is ample additional Calumet Harbor material available for future dredging events in order to gather the necessary material for vertical expansion of the existing CDF.
3. It is possible that once the new drying pads are implemented, they could potentially both be used for the first year of operation (before being contaminated by first cycle of River Dredging) if necessary to acquire the remaining amount of material necessary to construct the Stage I berms.
4. The Chicago District is considering options under its current O&M activities at the existing CDF to expand the stockpile of beneficial use material that currently exists on the southern portion of the site prior to, and in addition to, the implementation schedule outlined in the Draft DMMP.

Comment 8 – Low Significance: *Relying on the properties of previously dredged material within the CDF to characterize sediment that will be dredged may not appropriately represent the future dredged material density and moisture content.*

The comment had one recommendation for resolution that was not adopted.

Recommendation 1: Modify the description of the dredged material physical properties to address grain size, plasticity, and organic content, separate from in-situ channel and existing CDF moisture content/density.

USACE Response: Not Adopted.

Action Taken: There is not a notable difference in the characteristics between the material underwater and material in the CDF, as it is all from the same source. Therefore, differentiating between the two is unnecessary.

Additional information on the reduction and expansion factors is included on Page 14 of the Geotechnical Appendix and summarized below:

The intermediate Reduction/Expansion Factors are as follows and have been considered in the cost estimate for this study:

- Scow to drying pad = 0.8
- drying pad to truck = 1.25
- *this brings us back up to the scow volume, only now dry*truck to compacted berm = 0.68
- Therefore, scow to compacted berm = 0.68

The IEPR team concurs that the properties of the dried/rehandled river/harbor materials will be very similar to those already in the CDF. As a result, the team concurs the properties of the dried/rehandled dredge material is adequately described relative to construction of the facility.

Comment 9 - Low Significance: *Uncertainty remains regarding the in-situ physical properties of the material to be dredged relative to the anticipated dredged volume due to the limited data that exists.*

This comment had two recommendations for resolution that were both adopted.

Recommendation 1: Provide additional data regarding the physical properties of the in-situ materials within the channel to be dredged, if available.

USACE Response: Adopted.

Action Taken: Additional testing has been completed but is not referenced in the main report. For additional testing, refer to Appendix D which includes sediment testing which generally agrees with testing displayed in Section 2.2.4 of the Main Report.

Recommendation 2: Summarize any additional investigations of the physical properties of the dredged material that will be conducted prior to disposal.

USACE Response: Adopted.

Action Taken: Dredged material properties are fairly consistent. Testing will be conducted once material is dredged and in the CDF. The following clarification has been added to the end of Section 2.2.4:

During design and construction, the material dredged will be continually tested to ensure the properties remain within the assumed characteristics. If the material becomes softer, weaker, etc., design modifications may be necessary.

Comment 10 - Low Significance: *It is unclear whether there is enough space to rehandle/dry and store beneficial use material for Phase 1 berm construction.*

The comment had one recommendation for resolution that was adopted.

Recommendation 1: Provide a more detailed discussion of rehandling/drying and stockpiling operations for Phase 1 berm construction.

USACE Response: Adopted.

Action Taken: The assumption that the commenter makes is correct. It is anticipated that the material required for Stage I berm construction will be stockpiled and available on site. The current estimate of material required for the Stage I berms is 51,724 CY. There are currently ~25,000 CY stored on the southern tip of the site. The remainder of the beneficial use material required would be dredged from Calumet Harbor at least 1 year prior to Stage I berm construction and stored on the drying pad. The drying pads were sized to adequately meet the expected dredging schedule of ~50,000 CY every other year.

The PDT has previously discussed increasing the existing stockpile area. If a need for additional beneficial use material storage is identified prior to implementation, this option will be examined in greater detail.

Another option would be to utilize both drying pads for Calumet Harbor material for a one-time material sourcing operation. Asphalt grindings or some other material would need to be placed on the Calumet River material drying pad first to separate the beneficial use material from the material that requires confinement.

In *Section - 6.9 Project Schedule and Implementation* the discussion of Year 2 of construction was amended to read as follows:

Year 2 (2024) – Dredge, dry, and stockpile Calumet Harbor material to be used in berm construction for the new DMDF, using both drying pads if necessary. No maintenance dredging of Calumet River would occur during Year 2.

The current estimate of material required for the Stage I berms is 51,724 CY. There is currently ~25,000 CY already stockpiled on the southern tip of the site. The remainder of the beneficial use material required would be dredged from Calumet Harbor at least 1 year prior to Stage I berm construction and placed/stored on the drying pad. The drying pads were sized to adequately meet the expected dredging schedule of ~50,000 CY every other year. Therefore, it is anticipated that acquiring and stockpiling a sufficient quantity of beneficial use material will not be an issue.

Comment 11 - Low Significance: *The relatively low safety factor for the waterfront CDF slope stability at the end of construction may indicate a risk of excessive deformation given the uncertainties regarding geotechnical parameters and the stability model.*

The comment had one recommendation for resolution that was not adopted.

Recommendation 1: Include the scope and cost of a slope monitoring program to be implemented during construction in the final design and cost estimate.

USACE Response: Not Adopted.

Action Taken: The referenced analysis with a safety factor of 1.2 was determined to be unacceptable. It was reworked with a larger offset from the edge of the existing CDF, resulting in a FS of 1.3. This meets the minimum 1.3 FS as required in the EM 1110-2-1902. This is documented in *Appendix D – Geotechnical Engineering* in the “Conglomerated Soil Laboratory Results” attachment (paragraphs 36 and 37 on pages 20 and 21 of 28):

As shown above, the short-term factors of safety for low and high lake levels are 1.200 and 1.268, respectively while long term are 1.556 and 1.555, respectively. The long-term conditions exceed the recommended FS of 1.5, but the end of construction does not. Therefore, the berm is pushed back from the edge of the site to 20 ft.

As shown above, by having the toe of the Stage 1 berm 20 ft away from the inside toe of the concrete block, the factors of safety for high and low water are 1.405 and 1.308, respectively. These are greater than the recommended 1.3 FS. Therefore the risk of constructing the berms with this configuration is acceptable.

The current cost estimate for the Recommended Plan does not include a line item for instrumentation on the berm (slope monitoring). If necessary in the future, this would represent a minor cost that would be covered under O&M and/or contingency.