Appendix I: Previous Iterations of the Selection Process

For

Chicago Area Waterway Systems (CAWS)

Dredged Material Management Plan (DMMP)

March 2020
Contents

1.0 Introduction .............................................................................................................................................. 1

2.0 Original Site Identification Process ........................................................................................................ 1
  2.1 Site Identification ...................................................................................................................................... 1
  2.2 Site Screening ........................................................................................................................................... 4
  2.3 Site Evaluation ......................................................................................................................................... 6
  2.4 Comparison of 2015 Final Array of Alternatives .................................................................................. 8

3.0 Lake Calumet Sites Analysis ..................................................................................................................... 16
  3.1 LRC presentation of 2015 site selection process, proposed to be re-run in 2017-18 ..................... 16
  3.2 Submission of proposed sites by CDOT and IIPD ................................................................................. 16
  3.3 Lake Calumet Site Screening Workshop and Preliminary Investigation ............................................ 17

4.0 Re-examination of original site identification process ................................................................................ 18

5.0 Land and Lakes Site Evaluation .............................................................................................................. 19

6.0 Current Site Selection Process .................................................................................................................. 19

Figures:

Figure 1: Potential DMDF site identification overview .................................................................................. 2

Figure 2: Inset Map "a": Potential DMDF site identification. ......................................................................... 2

Figure 3: Insert Map "b": Potential DMDF site identification. ........................................................................ 2

Figure 4: Insert Map "c": Potential DMDF site identification. ........................................................................ 3

Figure 5: Proposed Lake Calumet sites submitted by IIPD on 02 November 2017. ................................. 16

Figure 6: Lake Calumet sites screening workshop with PDT members, held on 08 November 2017. .... 17
Previous Iterations of the Selection Process

Tables:
Table 1: Site screening summary. .................................................................................................................. 5
Table 2: Summary of retained sites. .................................................................................................................. 6
Table 3: Site proximity to residential areas. ..................................................................................................... 7
Table 4: Plan evaluation summary................................................................................................................ 9
Table 5: 2015 Final Array of Alternatives construction costs. ....................................................................... 14
Table 6: Average annual cost of 2015 Final Array of Alternatives. ................................................................. 15

Attachments:
1. 30 October site selection presentation given to the nonfederal sponsor
2. 20 November 2017 (rev 08 Dec 2018) screening level analysis of two proposed project sites in Lake Calumet - presentation given to the nonfederal sponsor
3. Site selection process poster (differences between 2015 and 2018) developed for 2018 public outreach effort
4. Supporting material provided by Land and Lakes Co for a proposed dredged material disposal facility in the study area
Appendix I: Previous Iterations of the Selection Process

For

Chicago Area Waterway Systems (CAWS)
Dredged Material Management Plan (DMMP)

1.0 Introduction

The process of identifying potential sites for a dredged material disposal facility (DMDF) has gone through multiple iterations over the life of this study based on technical analyses, policy changes, availability of property, public and stakeholder input, and coordination with the nonfederal sponsor(s) and natural resource agencies. The purpose of this appendix is to document the iterative nature of the planning process as it relates to identifying, analyzing, and selecting a potential site for a DMDF that will allow the US Army Corps of Engineers (USACE) to continue maintaining the CAWS for at least the next 20 years.

2.0 Original Site Identification Process

Originally, 61 sites were located along the Calumet River and Cal-Sag Channel, using aerial imagery to locate open and undeveloped sites and through coordination with the Illinois International Port District (IIPD) and the Metropolitan Water Reclamation District (MWRD) of Greater Chicago. The process of identifying and screening site resulted in the identification of three potential sites that were included in the 2015 Final Array of Alternatives.

The Tentatively Selected Plan (TSP) for this iteration of the site identification process was called the Former Republic Steel Site and was located on the east side of the Calumet River at Turning Basin #3 near South Carondolet Avenue and 122nd Street. The nonfederal sponsor at the time was ultimately not financially viable and had to drop out of the project. By the time that the current nonfederal sponsor, the Chicago Department of Transportation (CDOT), came on board in 2017, the Former Republic Steel Site was no longer available due to development plans that supported a significant new employment source in the study area.

2.1 Site Identification

Potential DMDF sites were identified using aerial imagery to locate open and undeveloped sites and through coordination with IIPD and MWRD. Sites were limited to those along the Calumet River and Cal-Sag Channel and no more than a half-mile inland from the waterway. The limits to the geographic extents were placed to avoid high costs associated with transporting dredged material along the waterway or transferring the material from the channel to the placement site. The 61 identified sites are shown in Figure 1 through Figure 4. Each site was assigned an ID. Site IDs represent the approximate RM of the site and bank, (“L” indicates left descending bank and “R” indicates right descending bank.) Sites not along a river channel are designated by the water body (“CH” indicates Calumet Harbor and “LC” indicates Lake Calumet).
Previous Iterations of the Selection Process

Figure 1: Potential DMDF site identification overview.

Figure 2: Inset Map "a": Potential DMDF site identification.

Figure 3: Insert Map "b": Potential DMDF site identification.
Previous Iterations of the Selection Process

Figure 4: Insert Map "c": Potential DMDF site identification.
2.2 Site Screening

This initial search identified 61 sites that could potentially have been suitable for a new DMDF. The majority of the sites were located on land, but several aquatic sites were also identified. To focus detailed analyses on viable sites that could provide a minimum reasonable capacity and that would avoid significant impacts to existing resources, the sites were compared to the screening criteria presented below. Sites that did not meet one or more of the criteria were eliminated from consideration.

A summary of the screening process and results is presented in Table 1. Five sites were retained for additional detailed analysis. Three sites, 313R, 329L-B, and 330L, were former industrial lands along the waterway and two (CH02 and CH03) were aquatic sites at Calumet Harbor.

**Size**
Sites smaller than 30 acres were eliminated. This footprint area was estimated to be the minimum acreage that would allow for the storage of 500,000 cy of contaminated material. 500,000 cy was selected as a reasonable minimum size for a facility. To provide a complete plan, a larger site could be used for a single facility or multiple sites could be combined to provide the required capacity.

**Natural Resources**
Primarily forested or natural sites and those that include wetlands were designated as natural resources that should be avoided. Where a small portion of the site was forested or a designated wetland, that area was subtracted from the total footprint used to determine the site size (determined by referencing Illinois Natural Areas Inventory, Forest Preserves, and National Wetlands Inventory).

**In Use/Under Development**
Sites that were in heavy use or actively under development were eliminated. This included residential, commercial, industrial, recreational, ecological development/site use (determined through review of existing site infrastructure such as buildings, pavement, and access roads as well as current and planned uses).

**Recognized Environmental Conditions**
Sites with active clean-up actions were eliminated. Former industrial sites and other properties that may have been likely to contain RECs were retained, but with the assumption that these conditions would be considered in development of design and cost (determined through review of IEPA and USEPA online databases).

**Cultural Resources**
Sites with known archeological or historic properties (determined through coordination with the Illinois State Historic Preservation Office (SHPO), using the database of known sites) were eliminated.

**Site Configuration/Operational Feasibility**
The Project Delivery Team (PDT) considered how potential sites would be accessed, where and how material would be offloaded, and how the facility would be operated and maintained (determined using professional judgment of team members from Operations with decades of experience dredging on the CAWS).
### Table 1: Site screening summary.

<table>
<thead>
<tr>
<th>ID</th>
<th>Size/ Footprint Area (ac)</th>
<th>Natural Resources Adjusted Site Size (ac)¹</th>
<th>In Use²</th>
<th>Recognized Environ-mental Conditions³</th>
<th>Cultural Resources⁴</th>
<th>Operational Feasibility⁵</th>
<th>Elimination Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>301L</td>
<td>30.6</td>
<td>30.6</td>
<td>X</td>
<td></td>
<td>In Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>301R</td>
<td>26.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>303L</td>
<td>30.2</td>
<td>27.2</td>
<td></td>
<td></td>
<td>Natural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>303R</td>
<td>229.1</td>
<td>0.0</td>
<td></td>
<td></td>
<td>Natural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>304L-A</td>
<td>17.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>304L-B</td>
<td>20.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>305R-A</td>
<td>2.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>305R-B</td>
<td>8.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>306L</td>
<td>544.6</td>
<td>6.0</td>
<td></td>
<td></td>
<td>Natural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>308R</td>
<td>497.3</td>
<td>0.0</td>
<td></td>
<td></td>
<td>Natural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>310L</td>
<td>11.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>311R-A</td>
<td>84.3</td>
<td>78.8</td>
<td>X</td>
<td>Site Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>311R-B</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>313L</td>
<td>59.9</td>
<td>52.3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>313R</td>
<td>55.9</td>
<td>53.6</td>
<td></td>
<td></td>
<td></td>
<td>Retained</td>
<td></td>
</tr>
<tr>
<td>314R</td>
<td>19.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>315L</td>
<td>29.0</td>
<td>29.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>315R</td>
<td>34.7</td>
<td>34.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316L-A</td>
<td>52.7</td>
<td>52.7</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316L-B</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316L-C</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>316R</td>
<td>21.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>317L</td>
<td>20.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>317R</td>
<td>27.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318L-A</td>
<td>11.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318L-B</td>
<td>6.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318L-C</td>
<td>7.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318R-A</td>
<td>23.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318R-B</td>
<td>16.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318R-C</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>318R-D</td>
<td>8.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>319L-A</td>
<td>16.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>319L-B</td>
<td>8.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>320L-A</td>
<td>86.0</td>
<td>49.2</td>
<td>X</td>
<td>Site Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>320L-B</td>
<td>42.7</td>
<td>42.7</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>320R</td>
<td>15.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>321R</td>
<td>30.1</td>
<td>18.2</td>
<td></td>
<td></td>
<td>Natural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>324L</td>
<td>12.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>326R-A</td>
<td>130.3</td>
<td>129.3</td>
<td>X</td>
<td>Site Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>326R-B</td>
<td>135.4</td>
<td>91.8</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>327L</td>
<td>134.2</td>
<td>99.3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>327R</td>
<td>160.4</td>
<td>152.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>328R</td>
<td>115.2</td>
<td>111.2</td>
<td>X</td>
<td>Site Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>329R</td>
<td>74.1</td>
<td>73.7</td>
<td>X</td>
<td></td>
<td>HTRW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>329L-A</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>329L-B</td>
<td>43.1</td>
<td>43.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>329L-C</td>
<td>67.0</td>
<td>66.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Site Configuration</td>
</tr>
<tr>
<td>330L</td>
<td>40.6</td>
<td>40.6</td>
<td></td>
<td></td>
<td></td>
<td>Retained</td>
<td></td>
</tr>
</tbody>
</table>
### Previous Iterations of the Selection Process

<table>
<thead>
<tr>
<th>ID</th>
<th>Size/ Footprint</th>
<th>Natural Resources Adjusted Site Size (ac)¹</th>
<th>In Use²</th>
<th>Recognized Environmental Conditions³</th>
<th>Cultural Resources⁴</th>
<th>Operational Feasibility⁵</th>
<th>Elimination Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>331R</td>
<td>107.1</td>
<td>106.8</td>
<td>X</td>
<td>X</td>
<td>In Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>333L-A</td>
<td>7.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>333L-B</td>
<td>183.0</td>
<td>183.0</td>
<td>X</td>
<td></td>
<td>In Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>333R-A</td>
<td>146.4</td>
<td>146.4</td>
<td>X</td>
<td></td>
<td>In Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>333R-B</td>
<td>359.4</td>
<td>354.6</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH01</td>
<td>12.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>CH02</td>
<td>62.0</td>
<td>62.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Retained</td>
</tr>
<tr>
<td>CH03</td>
<td>72.5</td>
<td>72.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Retained</td>
</tr>
<tr>
<td>LC01</td>
<td>15.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>LC02</td>
<td>16.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>LC03</td>
<td>16.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>LC04</td>
<td>19.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td>LC05</td>
<td>19.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Size</td>
</tr>
</tbody>
</table>

¹ Adjusted site size excludes forested areas and wetlands to avoid natural resources.
² Site status determined through review of existing infrastructure and current and planned development.
³ Sites with active clean up actions cataloged by USEPA or IEPA were eliminated.
⁴ Determined through review of existing data as coordinated with State Historic Preservation Office.

### 2.3 Site Evaluation

Each of the retained sites was evaluated further.

**Table 2: Summary of retained sites.**

<table>
<thead>
<tr>
<th>ID</th>
<th>Site Name</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>313R</td>
<td>Ridgeland</td>
<td>MWRDGC</td>
</tr>
<tr>
<td>329L-B</td>
<td>Republic</td>
<td>Private</td>
</tr>
<tr>
<td>330-L</td>
<td>LTV</td>
<td>Private</td>
</tr>
<tr>
<td>CH02</td>
<td>In-Lake North of Breakwater</td>
<td>State of Illinois</td>
</tr>
<tr>
<td>CH03</td>
<td>In-Lake South of Breakwater</td>
<td>State of Illinois</td>
</tr>
</tbody>
</table>

These preliminary investigations used the following available data to identify conditions that would impact the design and implementation:

**Geotechnical.** A review of available geotechnical information was conducted to identify any conditions that may impact the design and cost. For sites 329L-B (Republic) and 330L (LTV), the subsurface is predominantly coarse-grained and seepage control would be necessary. For site 313R (Ridgeland), an existing liner installed for use of the site as sludge drying beds may have provided an appropriate seepage barrier, although additional investigations would have been needed to confirm the liner characteristics. At the two in-lake sites, nearby borings show a surface layer of fill with an underlying sand layer, followed by a thick layer of silty clay. Cut-off walls would have been required to isolate the contaminated sediment from the surrounding environment.

**Recognized Environmental Conditions.** Phase I Environmental Site Assessments (ESAs) were conducted for the upland sites to identify RECs, needs for further investigation, and potential impacts to design and
Previous Iterations of the Selection Process

cost. All of the upland sites had former industrial uses. All conceptual designs minimized excavation and managed fill on site.

**Cultural Resources.** The potential for presence of archeological or historic properties on site was assessed through a review of historical maps and aerial photographs as well as site visits. Based on this review, disturbances from previous land uses make it unlikely that any significant historic or archaeological properties would be found at any of the upland sites retained for further consideration.

**Natural Resources.** Evaluation of existing natural resources on each site was conducted through a review of aerial photography and site visits. At site 313R (Ridgeland), the majority of the site is paved and this area contains no natural resources that would be impacted. Site 330L (LTV) was in use as a storage area and did not appear to have any significant natural resources. Site 329L-B (Republic) was vacant at the time, with some vegetated areas on the site.

**Social Impacts/Environmental Justice Concerns.** To evaluate potential impacts to surrounding areas and residents, the distance from each site to nearby residential areas was investigated using aerial photography. While the study area is highly industrialized, there are residential areas within 1-mile of all retained sites. However, as shown in Table 3, there are existing industrial or natural areas that provide a buffer between each site and the nearby residential areas.

Table 3: Site proximity to residential areas.

<table>
<thead>
<tr>
<th>Site</th>
<th>Distance to Residential Area</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>313R</td>
<td>Under 1/4 mile</td>
<td>Site was previously used as a sludge drying bed and is separated by a forested buffer zone.</td>
</tr>
<tr>
<td>329L-B</td>
<td>1/2 to 1 mile</td>
<td>While the nearest residential area is about 1/2 mile from site, surrounding sites are all either active industrial or vacant brownfield sites.</td>
</tr>
<tr>
<td>330L</td>
<td>1/4 to 1/2 mile</td>
<td>Site is separated from nearby residential area by a vacant brownfield.</td>
</tr>
<tr>
<td>CH02/CH03</td>
<td>1/2 to 1 mile</td>
<td>In-lake sites are about 1/2 mile from existing nearby residential areas. Residential and commercial development is planned for adjacent sites.</td>
</tr>
</tbody>
</table>

**Land Values/Real Estate.** Based on available information for the sites and surrounding area, an initial estimate of real estate costs was developed. Considerations in developing the real estate estimate included location, typical area land uses, site configuration, and opportunities for future use. There would have been no real estate cost for the in-lake sites as the land would be subject to navigation servitude.

**Existing Site Infrastructure.** For sites with existing liners and decant structures, the designs considered use of these structures for management of effluent and stormwater, to the extent possible.

**Beneficial Use Compatibility.** Site designs also evaluated potential opportunities to facilitate beneficial use activities. Use of Calumet Harbor material in site construction or closure would reduce the required capacity or extend the life of the facility. Sediment from Calumet Harbor was determined to be suitable...
Previous Iterations of the Selection Process

for berm construction, and would be used as the primary cap layer with an additional layer of topsoil placed as cover.

In addition to being used for closure of the existing CDF and construction of a new DMDF, stakeholders and other agencies, such as IIPD, Illinois Tollway, Chicago Park District (CPD), and MWRD, had expressed interest in potentially using the Calumet Harbor dredged material as clean fill material in construction projects. There have been several past projects where other suitable dredged materials have been placed at upland unconfined sites or have been otherwise used beneficially.

**Capacity.** Preliminary site designs considered a range of capacities. All sites were able to provide at least 500,000 cy of confined placement capacity. With a facility height of approximately 20 feet, all sites were able to provide a greater confined capacity of 700,000 cy. Due to their depth, the in-lake sites could also provide larger capacities. Confined capacities were determined based on an even top contour elevation. Total capacity allows for mounding and grading clean dredged material above the top of the berm.

Based on these analyses and available site specific information, preliminary designs and costs were developed for each site. Based on available sub-surface information, upland sites would require controls to prevent seepage of effluent from the sediment. This control would be provided by an impermeable clay liner. If the site had existing cover or paving, it was assumed that the existing cover could be used as part of the liner, to the extent possible. The existing liner would have had to be inspected, repaired as necessary, and sealed prior to placement of material. For the in-lake site designs, no bottom liner was included because the depth of the sheet pile wall needed for stability would also key in to the existing subsurface clay layer, which could serve as an impervious liner.

For upland sites, the design used one of two construction methods: a berm around the site or, if there were site limitations due to the size or configuration, a concrete t-wall. In-lake site designs included walls constructed from steel sheet pile with armor stone around the exterior to protect the structure from wave action.

**2.3.1 Additional Design Features**

**A docking and offloading area to allow for sediment offloading operations.** When possible, existing bank walls and paved areas were used for these features.

**A system for collecting and treating effluent and runoff.** Water was proposed to be collected through decant structures and pass through filter cells to remove suspended solids before being discharged to an existing sewer system. Where there was no existing sewer connection on site, designs included a lift station and piped connection to a nearby sewer.

**Closure and capping after the site has been filled to capacity.** A 3-foot final cover consisting of 2.5 feet of clean fill and 0.5 foot of topsoil would have been placed on top of the contaminated dredged material. Material dredged from Calumet Harbor would be suitable for the primary 2.5-foot clean cover.

**2.4 Comparison of 2015 Final Array of Alternatives**

Alternative plans were compared to one another according to their ability to meet the planning objectives and avoid constraints. The screening process provided successive steps to ensure that formulated plans would not violate any constraints. The ability of the formulated plans to meet the planning objectives is evaluated below and summarized in Table 4Error! Reference source not found.
### Previous Iterations of the Selection Process

Table 4: Plan evaluation summary.

<table>
<thead>
<tr>
<th>Plan ID</th>
<th>Plan</th>
<th>Sustainability and Long-term Planning</th>
<th>Operational Efficiency</th>
<th>Beneficial Use</th>
<th>Existing Infrastructure</th>
<th>RECs</th>
<th>Impacts to Site and Surrounding Area</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>No Action</td>
<td>Poor: No placement capacity provided</td>
<td>None: No site</td>
<td>None: No opportunity for placement of clean material</td>
<td>Poor: No reuse opportunity</td>
<td>Good: No environmental issues</td>
<td>None: No changes to any sites</td>
<td>Good: No land required, no cost to sponsor</td>
</tr>
<tr>
<td>313R</td>
<td>Ridgeland</td>
<td>Ok: Room to expand vertically, limited space for horizontal expansion</td>
<td>Ok: Site management would be challenging due to the long, narrow site configuration</td>
<td>Ok: Over 300,000 cy of clean material could be used in construction</td>
<td>Good: Reuse existing bottom liner</td>
<td>Ok: Some unresolved issues associated with Nike Control Area</td>
<td>Ok: Project would limit future site use opportunities. Site is located less than ¼ mile from residential area.</td>
<td>Ok: Land is in public ownership and available to sponsor</td>
</tr>
<tr>
<td>329L-B</td>
<td>Republic</td>
<td>Good: Room to expand vertically and horizontally</td>
<td>Good: No expected issues with site management</td>
<td>Ok: Over 200,000 cy of clean material could be used in construction</td>
<td>Poor: No reuse opportunity</td>
<td>Good: Minimal unresolved issues associated with site and surrounding area</td>
<td>Good: Project would not change future site use opportunities. Site is approximately ½ mile from residential area.</td>
<td>Ok: Land is privately owned but currently vacant; land costs exceed allowable credit</td>
</tr>
<tr>
<td>330L</td>
<td>LTV</td>
<td>Ok: Room to expand vertically; limited room to expand horizontally</td>
<td>Good: No expected issues with site management</td>
<td>Ok: Over 200,000 cy of clean material could be used in construction</td>
<td>Ok: Existing sheetpile wall could be used for docking area</td>
<td>Good: Minimal unresolved issues associated with site and surrounding area</td>
<td>Good: Project would expand future site use opportunities. Site is located less than ½ mile from residential area.</td>
<td>Poor: Land is privately owned and in use; land costs exceed allowable credit</td>
</tr>
</tbody>
</table>
Previous Iterations of the Selection Process

**Sustainability and Long-term Planning**
With the exception of the No Action Plan, all plans had sufficient projected capacity to manage the projected maintenance dredging volumes from all CAWS federal channels and minimize impacts to users for at least 20 years. Each site also had the potential for future expansion that was not included in the formulated plans. All designs could have potentially provided additional capacity by increasing the height of the berms or constructing a third stage. Limited opportunities for horizontal expansion also existed.

**Ridgeland.** Designs for the Ridgeland site used the previously developed portion of the site. The eastern area was avoided because a large amount of fill would have needed to be moved; it was separated from the paved area by an open drainage ditch and there was increased risk of encountering RECs. However, if this site was selected, the eastern area could have been considered for future expansion.

**Republic.** There were expansion opportunities both east and west of the Republic site. There was an additional vacant site to the east that could have been considered for future expansion. However, this area was separated from the proposed site by active railroad tracks, raising logistical concerns. West of the site, the adjacent turning basin was considered as an opportunity for additional capacity based on its light use.

**LTV.** As with the Republic site, there was an additional vacant site to the east of the LTV site at the time that could have been considered for future expansion. However, this area was also separated from the proposed site by active railroad tracks.

**Operational Efficiency**
With the exception of the No Action Plan, all plans considered dredging practices and schedules. Construction phasing accounted for placement needs and was timed to allow for uninterrupted channel maintenance. Site operations would have been similar at each site, with sediment management activities occurring between dredging events. Ridgeland would have been the most challenging site to manage due to its shape and configuration. Management of the remaining sites would have been easier as they were not constrained to a long, narrow shape.

**Beneficial Use Compatibility**
With the exception of the No Action Plan, all plans beneficially used clean dredged material from Calumet Harbor as part of the plan implementation. The plan that maximized beneficial use was the Ridgeland Plan. However, with all sites, the design and phasing could be further optimized to allow for additional beneficial use of Calumet Harbor material.

**Formerly Used Sites**
Use of a previously developed site would have had both advantages and disadvantages. Where existing infrastructure could be reused, excavation and construction costs would be minimized. However, previous industrial activities increase the risk of encountering RECs.

**Existing Infrastructure**
The liner and sewer connections created for sludge drying operations at the Ridgeland site could have been used as part of a DMDF at this site. At LTV, the channel bank had been reinforced with sheetpiles, resulting in minimal requirements for construction of a docking area for dredge scows.
Previous Iterations of the Selection Process

Recognized Environmental Conditions
For all plans there was some risk of encountering environmental conditions that would require remediation actions by the nonfederal sponsor. The unresolved issues at Ridgeland were associated with the previous activities at the site while it was used by Department of the Army as a Nike C-51 Control Area. The Republic and LTV sites were both part of the former Republic Steel manufacturing complex. However, site investigations and remediation activities have been conducted at both sites and, through participation in the IEPA Site Remediation Program, the owners have received letters from IEPA stating that no further remediation is needed. Both of these no further remediation (NFR) letters are “focused” NFR letters that are subject to different conditions and terms of approval, rather than comprehensive NFR letters that address all environmental conditions. Focused NFR letters are issued for remedial applicants that want to limit their remedial actions for a specific chemical or set of chemicals at a site. Although the NFR letter for the LTV site indicates the remediation site consists of 48.7 acres, the site base map included with the NFR letter shows that the remedial applicant used an engineered barrier to address polychlorinated biphenyl (PCB) contamination in a comparatively small spill area on the site. The NFR letter issued for the former Republic Steel site indicated that the remediation site consists of 204 acres and the remediation boundary appears to include the entire footprint for the proposed DMDF. It also addressed a long list of regulated substances of concern.

End Use Compatibility
Additional investigation of planned site uses was conducted to determine whether constructing a new DMDF would impact future use of the site.

Ridgeland. For Ridgeland, potential site uses are limited by the shape and location of the site, and an increased ground elevation would likely have further limited those uses. Nearby properties include a boat launch, an expressway, and a residential area. The residential area is located less than a quarter-mile from the site but would have been separated from the site by a forested buffer zone.

Republic. Republic was a vacant site at the time, cleared of structures and infrastructure. The eventual closed DMDF would have provided similar conditions. Surrounding properties were either active or vacant industrial sites. A residential area is approximately a half-mile northeast of the site, separated by a large vacant industrial site.

LTV. LTV operates as a recycling facility. Construction of a DMDF would have provided a new, clean cover for the site and would create opportunities for new end uses. Adjacent sites were either active or vacant industrial sites. However, a residential area is located less than a half-mile east of the site and implementation would have required careful consideration of potential impacts to residents compared to the further removed sites.

Implementability
In addition to the planning objectives, the ability of both USACE and the nonfederal sponsor to implement each plan was assessed. Factors included availability of real estate and opportunities for LERR crediting to minimize cash requirements for the nonfederal sponsor. Each plan would have required a cash contribution and acquisition of real estate by the nonfederal sponsor. However, LTV, which is currently in active use, would present the greatest challenge based on its active use at the time.
Previous Iterations of the Selection Process

Each plan was assessed relative to these criteria, as summarized in Table 4. Each plan had positive and negative aspects and, where possible, site limitations and benefits were considered in the design and cost. No issues were identified that would eliminate any of the sites form further consideration and all plans were considered in the Final Array of Alternatives.

2.4.1 Implementation and Cost-Comparison of 2015 Final Array of Alternatives

All plans except the No Action Plan met the planning objectives to varying degrees. The three remaining plans were, therefore, compared against one another to identify the TSP. To ensure that all life-cycle costs were considered, an economic analysis was conducted to determine the average annual cost of each plan over the period of analysis. For the formulated plans, the period of analysis was 25 years. Construction, dredging, closure, and O&M costs were annualized over the project life at the FY15 Federal Discount Rate of 3.375%.

Each plan assumed that construction would occur in phases.

Phase I: Surface Preparation. The initial surface preparation phase would have included installation or rehabilitation of an impermeable bottom liner, construction of drainage structures, a dock, and a crane pad for offloading sediment at the site.

Phase II: Stage 1 Berm Construction. Once the surface preparation was completed, material dredged from Calumet Harbor would have been placed at the site and allowed to dewater. Once the volume of material needed for construction of the berms was accumulated, the second construction phase would have commenced. In the second phase, berms would have been constructed around the perimeter of the facility with an impermeable liner on the inside face. Upon completion of the Stage 1 Berm construction, the facility would have started accepting contaminated sediment.

Phase III: Stage 2 Berm Construction. Once the facility was filled to the height of the Stage 1 Berms, the third construction phase would have been initiated. Clean dredged material, dewatered and stockpiled while contaminated material is being placed in the facility, would have been used to construct a second of berms around the perimeter of the facility. The facility would have then continued to accept contaminated sediment until the final capacity was reached.

Phase IV: Site Closure. The facility would then have been closed using a 3-foot cover layer consisting of 2.5 feet of clean dredged material and 0.5 foot of topsoil.

Using Calumet Harbor material to build the berms for the facility instead of purchasing fill provided a significant cost savings. However, the time needed to accumulate the necessary volume of material could have led to delayed dredging in contaminated portions of the federal project. To allow for continued maintenance of Calumet River and the Cal-Sag Channel, contaminated material would have been placed in the existing Chicago Area CDF until construction of the Stage 1 Berm was complete. Based on estimates at the time, there was enough room to place this material in the CDF followed by placement of clean material as final cover. Once the new facility was online to accept contaminated sediment, the Chicago Area CDF would have stopped accepting contaminated material and, as dredging occurred at Calumet Harbor, beneficial use material would have been placed as cover on the site prior to final grading, placement of topsoil, and seeding.

For each phase, Engineering and Design (E&D) was estimated as 15% of construction costs. Construction Management was estimated as 10% of construction costs. Construction and closure costs also included
Previous Iterations of the Selection Process

cost contingencies. Contingencies were developed according to uncertainties associated with each major construction feature and were applied according to the quantities associated with that feature. The resulting overall contingencies for each plan were 29.2% for Ridgeland, 29.9% for Republic, and 29.0% for LTV. The estimated construction costs for each plan are shown in Table 5.

Implementation costs also included estimated real estate costs. The costs presented here were based on an investigation of available data for each site including current and former site uses and environmental investigations.

Plan costs also included O&M costs and dredging costs. Operation and maintenance costs were based on costs for managing sediment at the Chicago Area CDF. Operation and maintenance would have occurred in years after dredging events, and the estimated cost included a 9.2% contingency. Dredging costs were based on historic dredging costs for Calumet Harbor and River and, based on these historic costs, include E&D costs of $88,000 per contract and construction management costs of 7.5% of the dredging costs. These costs also include a 9.2% contingency. For the Ridgeland site, an additional cost of $7.5 per cubic yard is included in the dredging cost for Calumet Harbor and River to account for the additional 15-mile haul distance. Similarly, at Republic and LTV this additional cost for the haul distance is associated with Cal-Sag Channel dredging costs.

Construction, dredging, and O&M costs were discounted according to the year in which they would occur in the period of analysis. The resulting average annual costs are shown in Table 5.
Table 5: 2015 Final Array of Alternatives construction costs.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Real Estate</th>
<th>Construction Phase</th>
<th>Construction 3</th>
<th>Engineering &amp; Design 4</th>
<th>Construction Management 5</th>
<th>Subtotal</th>
<th>Total Construction Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridgeland (313R)</td>
<td>$2,657,000</td>
<td>Surface Prep</td>
<td>$5,364,000</td>
<td>$805,000</td>
<td>$536,000</td>
<td>$6,705,000</td>
<td>$23,605,000</td>
<td>$26,262,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 1</td>
<td>$5,920,000</td>
<td>$888,000</td>
<td>$592,000</td>
<td>$7,400,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 2</td>
<td>$5,774,000</td>
<td>$866,000</td>
<td>$577,000</td>
<td>$7,217,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closure</td>
<td>$1,826,000</td>
<td>$274,000</td>
<td>$183,000</td>
<td>$2,283,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Republic (329L-B)</td>
<td>$3,275,000</td>
<td>Surface Prep</td>
<td>$7,456,000</td>
<td>$1,118,000</td>
<td>$746,000</td>
<td>$9,320,000</td>
<td>$19,252,000</td>
<td>$22,527,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 1</td>
<td>$3,116,000</td>
<td>$467,000</td>
<td>$312,000</td>
<td>$3,895,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 2</td>
<td>$3,050,000</td>
<td>$458,000</td>
<td>$305,000</td>
<td>$3,813,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closure</td>
<td>$1,779,000</td>
<td>$267,000</td>
<td>$178,000</td>
<td>$2,224,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTV (330L)</td>
<td>$4,550,000</td>
<td>Surface Prep</td>
<td>$8,871,000</td>
<td>$1,331,000</td>
<td>$887,000</td>
<td>$11,089,000</td>
<td>$19,833,000</td>
<td>$24,383,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 1</td>
<td>$2,541,000</td>
<td>$381,000</td>
<td>$254,000</td>
<td>$3,176,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berm 2</td>
<td>$2,066,000</td>
<td>$310,000</td>
<td>$207,000</td>
<td>$2,583,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closure</td>
<td>$2,388,000</td>
<td>$358,000</td>
<td>$239,000</td>
<td>$2,985,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

October 2014 Price Level

1 Real Estate costs occur in the year before construction starts.

2 Project phases are: Surface Prep (site clearing and construction of impermeable bottom liner, drainage features, dock, and crane pad); Berms 1 and 2 (lifts providing partial capacity, constructed from clean dredged material and impermeable inner liner); and Closure (final grading and topsoil placement over cap constructed from clean dredged material).

3 Construction costs include contingencies specific to each design. The weighted average contingency for each plan are: 29.2% for Ridgeland; 29.9% for Republic; and 29.0% for LTV.

4 Engineering and Design costs occur in the year before construction starts and are estimated as 15% of construction costs.

5 Construction Management costs occur during construction and are estimated as 10% of construction costs.
Previous Iterations of the Selection Process

Table 6: Average annual cost of 2015 Final Array of Alternatives.

<table>
<thead>
<tr>
<th>Cost Rank</th>
<th>Plan ID</th>
<th>Plan</th>
<th>Average Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NA</td>
<td>No Action</td>
<td>$0</td>
</tr>
<tr>
<td>2</td>
<td>329L-B</td>
<td>Republic</td>
<td>$2,793,000</td>
</tr>
<tr>
<td>3</td>
<td>330L</td>
<td>LTV</td>
<td>$2,811,000</td>
</tr>
<tr>
<td>4</td>
<td>313R</td>
<td>Ridgeland</td>
<td>$3,412,000</td>
</tr>
</tbody>
</table>

As discussed in the preceding sections, all three of the retained plans met the minimum plan selection criteria. As shown in Table 6, the least-cost plan that provided the required dredged material management capacity was the Republic Plan, but the LTV Plan cost is nearly identical. However, there were differences in the abilities of the plans to meet all planning objectives. Of particular concern were the impacts to the existing business at the LTV site and the proximity of that site to a residential neighborhood and a community high school. Therefore, the Republic Plan (site 329L-B) was selected as the TSP.

The nonfederal sponsor at the time of this iteration of the site identification and selection process was ultimately unable to provide the financial self-certification that would be required to move ahead with the TSP that came out of this analysis. As such, the nonfederal sponsor had to drop out of the project. Without a nonfederal sponsor and cost-sharing partner, the study was unable to move forward and was put on hold pending the identification of a new sponsor that would be able to meet the cost-sharing requirements of the proposed project. The study was paused in the fall/winter of 2015. Then, in the summer of 2017, the current nonfederal sponsor, the Chicago Department of Transportation (CDOT), came on board and the study was resumed. However, the Former Republic Steel site was no longer available due to development plans that supported a significant new employment source in the study area, resulting in the need to identify a new TSP.
3.0 Lake Calumet Sites Analysis

In 2017, while the current nonfederal sponsor was getting familiar with the study, the PDT was asked by CDOT and IIPD to evaluate or re-evaluate a number of potential sites for a DMDF in and around Lake Calumet. The PDT undertook a preliminary analysis of these sites and determined that each of them had significant technical and/or environmental challenges, and that none of them would be likely to represent the least-cost alternative, per USACE guidance. The major takeaway from this process was that in-water DMDFs would not represent the least-cost alternative or the least environmentally damaging practicable alternative under Section 404(b)(1) of the Clean Water Act (40 CFR Part 230).

The process for completing the preliminary analysis of these sites is outlined in the following sections.

3.1 LRC presentation of 2015 site selection process, proposed to be re-run in 2017-18

In an effort to bring the new nonfederal sponsor up to speed on the study history and process, the PDT made a presentation to CDOT on 30 October 2017 that outlined the site selection process that was carried out in 2015 and was being recommended to be re-run in the study area based on lessons learned and possible changes to existing conditions in the study area. This presentation is included as Attachment 1.

3.2 Submission of proposed sites by CDOT and IIPD

Following the 30 October presentation, the nonfederal sponsor, in coordination with IIPD, requested that the PDT evaluate 2 specific sites in Lake Calumet for the development of a DMDF. These sites are shown in a drawing provided to the PDT by IIPD in

Figure 5: Proposed Lake Calumet sites submitted by IIPD on 02 November 2017.

The Slips site is composed of three individual slips in Lake Calumet that were each considered separately in 2015 but screened out due to size. Combination of multiple slips would have potentially increased
Previous Iterations of the Selection Process

the overall volume enough to meet the 20 year planning horizon of the DMMP. The West Lake Calumet site extends eastward from the outlet of Pullman Creek/Doty Ditch to the end of a slip where St Mary’s Cement Co is located (to the south).

After receiving the request to add these sites to the site identification process, the PDT committed to 1.) hold an internal preliminary site screening workshop, 2.) prepare rough-order-of-magnitude (ROM) cost estimates, and 3.) present the preliminary findings back to the nonfederal sponsor.

3.3 Lake Calumet Site Screening Workshop and Preliminary Investigation

The PDT convened a screening level workshop on 08 November 2017 to efficiently identify the potential risk and benefits of the proposed Lake Calumet sites. The outcome of the workshop was to identify preliminary cost and design assumptions that would allow the team to quickly provide a ROM cost estimate to determine whether these potential sites appeared to be cost-competitive with previously analyzed sites, and thus warrant further consideration. The workshop was attended by PDT members representing the following disciplines: real estate, operations, planning, and legal.

The PDT then conducted site research and a field visit in order to get a better handle on the existing conditions at the proposed sites. All of the analysis above led to the following design assumptions for the Lake Calumet sites that the PDT felt would maximize safe operability and cost-effectiveness:

- Use ~4-foot depth for Lake Calumet in the proposed site locations (based off best available data)
- Use steel sheet pile cutoff walls across areas of open water
- Utilize dredged material from Calumet Harbor in berm construction above the water line
- Clay liner on shoreline and upland portions of the sites
- Existing Lake Calumet clay provides impervious bottom; no liner necessary
- Slips site- bring slips to grade and then consolidate facility into a more regular, consolidated geometric layout
Previous Iterations of the Selection Process

The results of this analysis showed that these sites would both have potentially significant adverse impacts on natural resources, require costly mitigation measures to replace displaced habitat, and be unlikely to align with the IL Department of Natural Resources (IDNR) Coastal Management Program (CMP), per the Coastal Zone Management Act of 1972 (16 U.S.C. ch. 33 § 1451 et seq). Additionally, the Slips site was discovered to be under active litigation related to environmental cleanup activities related to previous industrial use of the site. Lastly, and perhaps most importantly, ROM cost estimates showed that the proposed Lake Calumet sites would be anticipated to cost approximately twice as much as a comparable upland site, based on the 2015 estimate for a DMDF at the former Republic Steel site. USACE policy directs the PDT to identify the least cost, technically feasible, and environmentally acceptable method for managing dredged material. The Lake Calumet sites would not fit this guidance. The full presentation updating the nonfederal sponsor on the results of this analysis are shown in Attachment 2.

4.0 Re-examination of original site identification process

Next, the PDT re-ran the original site identification process that was carried out leading up to the 2015 Draft DMMP during 2017-2018. After the passing of two years, the team felt that this effort was worthwhile because properties may have more recently become available or unavailable and it would allow for the application of lessons learned during preliminary design and cost analyses from previous site identification processes. The applied lessons learned included:

Restrict potential sites to location along the Calumet River. The PDT learned from previous analysis that transportation costs were one of the few differences by which to evaluate potential alternatives against one another. Since essentially all of the anticipated dredging in the CAWS is forecasted to occur in Calumet Harbor and River (97%), transporting material over large distances would be inconsistent with the Base Plan.

Restrict potential sites to locations directly adjacent to the Calumet River. The PDT learned from previous analysis that sites not located directly adjacent to the river would require additional transportation costs (and associated environmental risks). This would include additional costs and potential environmental impacts related to either hydraulic unloading (pumping) or truck transport (cost from double handling material and spill/leakage risks).

Exclude in-water sites from consideration. The PDT has learned, from multiple iterations of the site identification process that in-water sites are more costly to build, have greater potential for significant adverse environmental impacts, would require mitigation (additional project cost), and are likely inconsistent with the IDNR CMP.

Additionally, as part of this renewed site identification process, the PDT recognized an opportunity and a need to re-involve the public and key stakeholders in the site identification process, based on feedback received and concerns heard during the public review period in 2015. The PDT convened a series of Stakeholder Roundtable Meetings, public workshops, updated NEPA scoping and, a pilot application of a web-based crowdsourcing tool to disseminate key information about the study and solicit feedback about potential sites. Specifically, the team sought to determine whether it was overlooking any potentially viable sites or key information about the sites under consideration (detailed documentation of the materials used in this public outreach campaign are included in Appendix A: Coordination and Public
Previous Iterations of the Selection Process

Involvement). A poster that was developed for public outreach explaining how the site identification process evolved between 2015 and 2018 is included as Attachment 3.

5.0 Land and Lakes Site Evaluation

In August 2018, LRC received a proposal from Land and Lakes Environmental Construction Services for development of a DMDF at a previously unconsidered site. The proposal was to create a DMDF that would fill the “wedge” between two existing landfills. Once the PDT and the nonfederal sponsor determined that the site would potentially satisfy all of the preliminary screening criteria, they requested the appropriate technical information to inform the decision about whether or not to retain this alternative moving forward, including information about the existing caps and liners on the site, quality of the material in the landfill, regulatory status and history of the facilities, and details of the existing facilities’ closure plans and responsibilities. Documentation of the information exchanged by Land and Lakes Co. and LRC is included in Attachment 4 and includes:

- Opening letter requesting the USACE consider this site (dated 21 August 2018)
- Site area maps
- Site plan
- Site summary sheet
- Cross section liner design
- Cross section cap design
- Gas system plans
- Groundwater monitoring (*not included in attachment due to file size, available upon request*)
- Topographic maps
- Cross section preliminary plan

Following review of the materials provided, a face-to-face conference was held at the Chicago District in September 2018 with the PDT, the nonfederal sponsor, and representatives from Land and Lakes. Following this meeting, the PDT and the nonfederal sponsor made the risk-informed decision not to pursue this alternative based on such concerns as potential HTRW liability, technical risks related to landfill gas and leachate management, and ongoing responsibilities related to the sites’ closure and monitoring requirements. In sum, the study team believes these factors make it unlikely that this alternative would represent the least cost, environmentally acceptable, and technically feasible alternative.

6.0 Current Site Selection Process

The primary differences between the final study alternatives are the location, layout, and existing infrastructure at the sites identified for the implementation of a new DMDF. Over the life of this study, the PDT has evaluated more than 60 potential sites in the study area for a new DMDF. Through the processes described above, a list of nine screening criteria was ultimately developed to help the team identify the location for a facility that would be the least-cost, technically feasible, and environmentally acceptable option. The current site selection process is documented in the CAWS DMMP/EIS.
Attachment #1
CHICAGO AREA WATERWAY SYSTEM (CAWS) DREDGED MATERIAL MANAGEMENT PLAN

Plan Formulation and Site Selection Briefing

Presentation by
U.S. Army Corps of Engineers,
Chicago District

October 30, 2017
City of Chicago

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

BUILDING STRONG®
and Taking Care of People!
CALUMET HARBOR & RIVER DMMP PROJECT - BLUF

• Chicago Area CDF will reach capacity in 2022 based on current dredging rates
  • Calumet River sediment needs confinement
  • Calumet Harbor material may be beneficially used

• A new Dredged Material Disposal Facility (DMDF) requires a lead time of approximately 6 years
  • Navigation in Calumet River and Harbor would be impacted
  • Current Path: No dredging of Calumet River for 2 years (2022-2024)
  • Deviation from Current Path: Increases duration of navigation impacts (>2 years)

• Necessary non-federal items of cooperation:
  • Lands for new facility
  • Funding for design and construction
  • Liaison with local community

• Sensitive to community concerns
AUTHORIZED NAVIGATION CHANNELS AND PROJECTED DREDGING NEEDS

The Chicago Area Waterway System (CAWS) is composed of:
1. Chicago River
2. Chicago Harbor
3. South Branch of the Chicago River
4. Chicago Sanitary and Ship Canal (CSSC)
5. Calumet-Saganashkee (Cal-Sag) Channel
6. Calumet River
7. Calumet Harbor

Only Calumet Harbor, Calumet River, and the Cal-Sag Channel are anticipated to require dredging in the next 25 years.

- 98% of the sediment will be dredged from Calumet Harbor & Calumet River

Calumet Harbor Sediment
- Suitable for beneficial use

Calumet River Sediment
- Requires confinement

Cal-Sag Channel Sediment
- Requires confinement
Existing CDF was designed to provide 10 years of capacity

Chicago District has successfully extended operational life to 35 years using:
- block walls
- sediment management and handling strategies
- selective dredging of only highest priority areas
WHY IS CALUMET RIVER & HARBOR DREDGING NEEDED?

- Major Great Lakes Port
  - ~11.8 million tons/year (2011-2015 average)
- Regional Economic Benefits
  - Cargo handling, transportation, and other support industries contribute to Illinois economy
    - 4,300 jobs
    - $608 million in annual revenues
- Environmental and Social Benefits
  - Waterborne transportation safety and efficiency – Maintained since 1870
  - Remove legacy contaminated sediment from waterway

Commodity Movements (2011-2015)

- Coal 24%
- Petroleum Products 18%
- Non-Metallic Ores and Minerals 14%
- Iron Ore and Iron and Steel Products 13%
- Grain and Grain Products 3%
- Others 15%
- Chemicals 5%
- Aggregates 4%
- Crude Petroleum 0%

Calumet Harbor & River
(annual average, 11.8M tons)

Calumet Sag-Channel
(annual average, 5.4M tons)
POTENTIAL IMPACTS TO NAVIGATION

- Dredging locations selected annually based on areas of greatest sediment accumulation
- Calumet River accumulates between 0.5 and 0.7 feet of sediment annually

Without dredging...
- Navigation channels continue to fill with sediment.
- More shippers impacted; higher transportation costs would be incurred.

**Best case scenario:** if we continue on current path, already a projected 2-year gap in dredging
PROJECTED TIMELINE OF DREDGING IMPACTS

Chicago Area CDF stops accepting Calumet River material after 2022

Complete DMMP in FY 18:
- Preconstruction engineering and design (PED)
- Site Preparation
- Dredge, dry, and stockpile Calumet Harbor material
- Construct Stage 1 berms
- Gap in dredging

Complete DMMP in FY 19:

Complete DMMP in FY 20:

Assumptions:
- Capability funding (federal & non-federal)
- Timely real estate acquisition
- Sufficient “clean” harbor material for Stage 1 berms

- $188K increase in transportation costs over 2 years
- $619K increase in transportation costs over 3 years
- $1.383M increase in transportation costs over 4 years
SITE SELECTION AND SCREENING PROCESS

USACE evaluated 61 sites to determine whether the proposed project would be environmentally responsible, technically sound, and economically justified.

- **Size** – Must be at least 30 acres
- **Natural Resources** – Avoid quality habitat
- **In-Use** – Vacant land only
- **Environmental Conditions** – No unresolved contamination issues
- **Cultural resources** – No historic landmarks, etc.
- **Operational Feasibility** – Practical to build and operate (adjacent to waterway, flat, etc.)
- **Retained Sites** – USACE identified 5 potentially suitable sites during this screening process

The selected site is Republic Steel.
TENTATIVELY SELECTED PLAN: FORMER REPUBLIC STEEL SITE

Proposed Site: Western portion of the Former Republic Steel Complex

Why this site?

- **Size** - larger than 30 acres
- **Natural Resources** - Overrun with weeds; no endangered species
- **Not-in-use** - Vacant property

**Environmental Conditions** - IL EPA restricts this land to industrial use

**Cultural Resources** - No cultural resources would be impacted

**Operational Feasibility** - accessible by river; mostly flat; close to dredging areas

Of the 5 potentially suitable sites identified during the site selection and screening process, the former Republic Steel site represents the **least cost** alternative, based on lowest complete life-cycle costs:

- Dredging and dredged material handling
- Construction of the DMDF
- Operations and maintenance

The Republic Steel site is estimated to provide capacity for 25 years of dredged material disposal:

<table>
<thead>
<tr>
<th></th>
<th>Confined (Cal River)</th>
<th>Used in facility construction (Cal Harbor)</th>
<th>Mounded excess for other beneficial use (Cal Harbor)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>680,000cy</td>
<td>240,000cy</td>
<td>140,000cy</td>
<td>1,060,000cy</td>
</tr>
</tbody>
</table>
PRELIMINARY DMDF SITE LAYOUT

- Site is located in a heavily industrial corridor, separated from residential areas.
- Located out of the way on a dead street; low traffic area.
- Beneficial use of Calumet Harbor material in facility construction extends the life of the DMDF.
- The existing No Further Remediation Letter (NFR) restricts the site to industrial/commercial land use.
PRELIMINARY DMDF SITE LAYOUT

- Furthest from residential areas of the 5 potential sites identified
- Does not require filling in waters of the United States (additional permitting actions required, extending duration of project implementation)
- Closed DMDF would be approx. 25-foot high grass-covered hill when turned over to the sponsor.

**PHASE I**
Step 1: Berms constructed Calumet Harbor sediment and a waterproof liner. Vegetation planted for erosion control
Step 2: Sediment not suitable for beneficial use would be confined

**PHASE II**
A second level of berms would increase the facility's capacity.

**CAPPED AND CLOSED**
Once full, the facility would be capped, closed, and turned over to the non-federal sponsor.
<table>
<thead>
<tr>
<th>Year</th>
<th>Activity</th>
<th>Non-Federal</th>
<th>Federal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Design</td>
<td>$150,000</td>
<td>$450,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>2020</td>
<td>Design</td>
<td>$200,000</td>
<td>$600,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>2021</td>
<td>Real Estate (2)</td>
<td>$3,397,000</td>
<td>$0</td>
<td>$3,397,000</td>
</tr>
<tr>
<td>2021</td>
<td>Site Prep</td>
<td>$3,131,000</td>
<td>$9,392,000</td>
<td>$12,523,000</td>
</tr>
<tr>
<td>2023</td>
<td>Stage 1 Berm</td>
<td>$720,000</td>
<td>$2,160,000</td>
<td>$2,880,000</td>
</tr>
<tr>
<td>2035</td>
<td>Stage 2 Berm</td>
<td>$1,168,000</td>
<td>$3,503,000</td>
<td>$4,671,000</td>
</tr>
<tr>
<td>2044</td>
<td>Closure</td>
<td>$1,306,000</td>
<td>$3,919,000</td>
<td>$5,225,000</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>$10,072,000</td>
<td>$20,024,000</td>
<td>$30,096,000</td>
</tr>
</tbody>
</table>

(1) Includes escalation; also includes design & construction management costs. 75% Fed, 25% of construction and additional 10% of construction over a period not to exceed 30 years non-Fed; Real estate can be credited toward the additional 10%.

(2) Estimate based on limited analysis of local market. Does not represent appraised value of property.
QUESTIONS?

Existing Chicago Area CDF

Proposed DMDF: Republic Steel Site
Attachment #2
Screening Level Analysis of Proposed Lake Calumet Sites

Presentation by
U.S. Army Corps of Engineers,
Chicago District

November 20, 2017
Revised December 8, 2017
City of Chicago

---

"The views, opinions and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

BUILDING STRONG®
and Taking Care of People!
PROPOSED SITES IN LAKE CALUMET

Sponsor inquired about 2 new alternative sites in Lake Calumet for a DMDF

• **Combined Slips Site:**
  Slips 4, 6, and 8
  Outfall of drainage ditch in NE Corner

• **West Lake Calumet Site:**
  Outfall of Doty/Pullman Ditch east of Bishop Ford (I-94)

USACE to provide a screening level analysis to determine if these sites warrant further consideration

Provided by Illinois International Port District
PREVIOUS SITE CONSIDERATION

1 Combined Slips Site:
   - Considered slips separately in draft DMMP
   - Screened out due to size

2 West Lake Calumet Site:
   - Newly proposed site since formulation of draft DMMP
   - 2 other in-water Lake Michigan sites previously considered; screened out based on estimated cost (~4x the cost of Republic Steel Site)

Sites screened out based on:

- Size
- Natural Resources
- In-Use
- Environmental Conditions
- Cultural Resources
- Operational Feasibility

Does not violate screening criteria:

Retained Site

Tentatively Selected Site: Republic Steel
TEAM SITE VISIT – TUESDAY NOVEMBER 7, 2017

1. SE of West Lake Calumet Site
2. Center of Lake Calumet; cross-lake views of both proposed sites
3. NE corner of Combined Slips Site
SCREENING LEVEL WORKSHOP 2 STEP PROCESS

• STEP 1: 6 Screening Criteria in DMMP
  • **Size** - >30 acres
  • **Natural Resources** – Avoid high quality habitat
  • **Not In-Use**
  • **Environmental Conditions** – No unresolved environmental issues
  • **Cultural Resources**
  • **Operational Feasibility** – practical to build and fill

• STEP 2: DMDF Design and Cost Expectations
  • Site opportunities and constraints
  • Design assumptions
  • Cost assumptions
  • Order of magnitude comparison to Republic Steel site
6 SCREENING CRITERIA IN THE DRAFT DMMP

1. **Size**
   - West Lake Calumet Site: ~75ac.
   - Combined Slips Site: ~70ac.

2. **Natural Resources**
   - Must be consistent with IL DNR Coastal Zone Mgmt. (CZM) Plan
   - Quality spawning & nursery habitat
   - State-listed threatened species
   - Wetland mitigation

3. **In-Use**
   - Port properties; not in active use

4. **Environmental Conditions**
   - Limited data; contaminated area

5. **Cultural Resources**
   - Hunting, fishing, birding (rec.)
   - Existing city/state open space plans

6. **Operational Feasibility**
   - Construct in-water DMDF
   - Mound additional capacity above existing grade if necessary

<table>
<thead>
<tr>
<th></th>
<th>West Lake Calumet Site</th>
<th>Combined Slips Site</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>✓ &gt; 30ac</td>
<td>✓ &gt; 30ac</td>
</tr>
<tr>
<td><strong>Natural Resources</strong></td>
<td>? CZM, T&amp;E, Wetlands</td>
<td>? CZM, T&amp;E, Wetlands</td>
</tr>
<tr>
<td><strong>In-use</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Environmental Conditions</strong></td>
<td>✓</td>
<td>❌ Ongoing litigation at the site</td>
</tr>
<tr>
<td><strong>Cultural Resources</strong></td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td><strong>Operational Feasibility</strong></td>
<td>✓</td>
<td>❌ Timing of site remediation and NFR</td>
</tr>
</tbody>
</table>
### Opportunities:
- IIPD owns shoreline
- Further from residential areas than Republic Steel Site
- Lake Calumet clay possible for use as bottom ‘liner’

### Constraints:
- Need to construct and maintain access channel
- In-water construction
- Additional permitting
- 404(b)(1) mitigation likely

#### STEP 2: DESIGN & COST CONSIDERATIONS

<table>
<thead>
<tr>
<th>Mitigation Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected minimum mitigation acreage ratio</strong></td>
</tr>
</tbody>
</table>

#### Mitigation would require hundreds of acres & millions of dollars
- No mitigation banks at this scale
- Separate mitigation project required

#### Broadly comparable Army Corps ecosystem project examples:
- Orland Perimeter ~ $3.8M; 275 ac
- Ft Sheridan Coastal ~ $10.2M; 200 ac
- Jackson Park ~ $8.2M; 150 ac
- Wolf Lake (IN) ~ $7.1M; 385 ac

**Avg:** ~$35K/ac
SCREENING DESIGN AND COST ASSUMPTIONS

Capacity
- Need 1M cy of storage capacity
- ~ 4 feet to surface of water (conservative)
- ~ 4 feet to existing grade

Design
- Steel sheet pile cutoff walls
- Use existing clay bottom as ‘liner’
- Clay liner around perimeter
  - Truck in clay
  - Dewatering necessary
  - Cap of clean harbor material

Operations
- Require upland area for staging & drying
- Need to dredge and maintain access channel
- Decant water to sewer
- Use harbor material beneficially when possible

Assumes no show-stopping HTRW issues
FIRST GLANCE CAPACITY DETERMINATION & ASSUMPTIONS

Project requires approximately 1M cy of storage over 25 years

West Lake Calumet Site:
- ~ 996,000 cy to existing grade
- Additional upland area for staging, storage, etc.

\[ \text{~75 ac} \times \left( \frac{4 \text{ ft}}{} + rac{4 \text{ ft}}{} \right) = 996,000 \text{ cy} \]

Combined Slips Site:
- ~ 874,000 cy to existing grade
- Use upland between slips for staging, storage, etc.

\[ \text{~70 ac} \times \left( \frac{4 \text{ ft}}{} + rac{4 \text{ ft}}{} \right) = 874,000 \text{ cy} \]

Both proposed sites would require mounding above existing grade to meet required 1M cy capacity
DESIGN AND COST ESTIMATE - WEST LAKE CALUMET SITE

Highlights:
• Optimized footprint to reduce cost
• Sheet pile (1800’)
• Mitigation (56 acres)
• Operations
• ~6 ft minimum mounding above grade
• Conservative based on 5’ water height assumption
• Dredge access channel
• Reroute existing Doty/Pullman Ditch

Order of magnitude cost estimate:
• Real estate – Port owns shoreline, need ICMP consistency determination
• Mitigation ~$5.87M
• PED – $6.14M
• Construction Mgmt – $4.10M
• Stage 1 - $24.97M
• Stage 2 Berm – $6.79M
• Closure – $9.20M
• Estimated total project cost - $57.07M
DESIGN AND COST ESTIMATE – COMBINED SLIPS SITE

Highlights:
• Optimized footprint to reduce cost
  • Sheet pile (800’)
  • Mitigation (41 acres)
  • Operations
• ~7 ft minimum of mounding above grade
• Conservative based on 4’ water height assumption
• Dredge access channel

Order of magnitude cost estimate (does not include RCRA closure costs):
• Real estate – Port owns shoreline, need ICMP consistency determination
• Mitigation ~$4.34M
• PED – $6.27M
• Construction Mgmt – $4.18M
• Stage 1 - $23.33M
• Stage 2 Berm – $7.18M
• Closure – $11.26M
• Estimated total project cost - $58.09M
DESIGN AND COST ESTIMATE - REPUBLIC STEEL SITE

Design features:
- Upland DMDF (43 ac)
- 2-stage berm design (11 ft each)
- Clay bottom liner
- Beneficial use in berm construction & cap
- ~25 ft grass mound when complete
- Decant water to sewer

Order of magnitude cost estimate:
- Real estate ~$3.4M
- Mitigation – N/A
- Preconstruction engineering & design – $1.4M
- Site Prep – $12.5M
- Stage 1 Berm – $2.9M
- Stage 2 Berm – $4.7M
- Closure – $5.2M
- Total project cost ~$30.1M
<table>
<thead>
<tr>
<th>QUESTIONS?</th>
<th>Republic Steel Site</th>
<th>West Lake Calumet Site</th>
<th>Combined Slips Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint</td>
<td>• 43 acres (Stage 2: 20 acres)</td>
<td>• 56 acres (Stage 2: 48 acres)</td>
<td>• 77 acres (Stage 2: 62 acres)</td>
</tr>
</tbody>
</table>
| Capacity   | • 1,060,000 cy (Hbr & Rvr)  
• 0 cy (access channel)  | • 1,085,057 cy (Hbr & Rvr)  
• 94,500 cy (access channel) | • 1,132,138 cy (Hbr & Rvr)  
• 86,4000 cy (access channel) |
| Real Estate | • Need to acquire;  
~$3.4M counted towards cost share | • IIPD to sell land to City or join as NFS  
• Value of staging area credited towards cost share  
~$500K* (10 ac**) | • IIPD to sell land to City or join as NFS  
• Value of land b/n slips credited towards cost share  
~$1.8M* (35.73 ac) |
| Mitigation | • N/A | • ~ $5.87M | • ~ $4.34M |
| Schedule   | • Begin accepting Calumet River material in 2025  
• ~ 2 yr delay for formulation/NEPA  
• 404(b)(1), 401 cert., Coastal Zone Consistency, mitigation | • Ongoing litigation  
• Delay for RCRA actions  
• ~ 2 yr addt'l delay for formulation/NEPA  
• 404(b)(1), 401 cert., Coastal Zone Consistency, mitigation | |
| Questions/Concerns | • Community/public concerns  
• Conflicts with Lake Calumet open space plans  
• Rerouting of Pullman Ditch | • Community/public concerns  
• Conflicts with Lake Calumet open space plans  
• Rerouting of Pullman Ditch | • CERCLA liability  
• Community/public concerns  
• Conflicts with Lake Calumet open space plans  
• Clean Harbors (HTRW) |
| Estimated Project Costs | • $30.1M**** | • $57.07M | • $58.09M*** |

* estimate; not based on appraisal  
** land used only temporarily may receive less credit  
*** does not include RCRA closure action  
**** cost estimate is older than 2 years  

The cost estimates shown are used for a rough screening analysis and have not undergone the regular level of USACE quality checks.
How are sites for a new facility being evaluated?

In 2015, USACE evaluated 61 sites to determine whether a proposed project was environmentally responsible, technically sound, and economically justified, as required by law (the Federal Standard).

**LESSONS LEARNED:** Upland sites near the areas where dredge allow for beneficial use of clean material, reduce impacts to natural resources, and promote responsible use of taxpayer dollars.

**2018**

In 2015, USACE recommended construction of a new dredged material storage facility at the Former Republic Steel site. Since that time, site conditions have changed such that it would no longer satisfy the screening criteria described above.

USACE is now in the process of re-examining potential sites in the study area in order to recommend a new facility site. This evaluation will use the screening criteria from 2015 and also incorporate LESSONS LEARNED from USACE’s previous analyses.

**ORIGINAL SCREENING CRITERIA FROM 2015:**
- **Size:** Must be at least 30 acres
- **Natural Resources:** Avoid high quality habitat
- **Not In-Use:** Vacant land only
- **Environmental Conditions:** No unresolved contamination issues
- **Cultural Resources:** No historic landmarks
- **Operational Feasibility:** Practical to build and fill

**NEW CRITERIA BASED ON LESSONS LEARNED:**
- **Direct Waterway Access:** Safer and efficient handling of material
- **Located on the Calumet River:** Virtually all dredging occurs here
- **Upland Site:** Beneficial use of clean Harbor material

This map depicts all of the identified potential sites along the Calumet River. It includes sites USACE evaluated in 2015 as well as new potential sites based on feedback from the technical team, project stakeholders, and the public.

This map depicts the potential sites from the previous map that do not violate the preliminary screening criteria. These sites will be further analyzed to determine whether they satisfy the Federal Standard (technically feasible, environmentally responsible, and economically justified).
Attachment #4
August 21, 2018

Via Federal Express # 7730 2773 5303

Mr. Alex Hoxsie
Planning Branch
US Army Corps of Engineers
Chicago District
231 S. LaSalle Street, Suite 1500
Chicago, IL 60504

Re: Potential Site for Dredged Material Disposal Facility

Dear Mr. Hoxsie,

As discussed in our recent phone call, Land & Lakes Company ("LALC") and its affiliated companies own several parcels of land located along the Little Calumet River at 138th Street that may be suitable for use as a Dredged Material Disposal Facility (DMDF) by the U.S. Army Corps of Engineers ("USACE"). You mentioned that in recent review by the USACE, our 30-acre Rio Vista Clean Construction and Demolition site at 700-750 E. 138th Street is possibly too small, therefore, LALC encourages the USACE to consider use of the combined sites at 800 E. 138th Street and 801 E. 138th Street which encompass approximately 150 acres. The site offers multiple options for placement of dredged material: on vacant land on the eastern edge of the Site, on the tops and slopes of the landfills, and in the space between the two landfills. The property is located in a highly industrialized area and offers transportation of materials by truck or barge.

Site Description:

The LALC site is 150 acres located at 800-801 E 138th Street, (the “Site”). The Site straddles 138th Street. All property north of the centerline of 138th Street is located in unincorporated Cook County, Illinois. All property south of the centerline of 138th Street is located in the Village of Dolton, Illinois. The right-of-way for 138th Street was vacated from its respective municipalities. It is now a private access road to the Site.

The Site is bounded by the Little Calumet River to the North, Illinois Harbor Belt Railway to the South, the Marine Services Corporation basin of the Little Calumet River to the East; and Cottage Grove Avenue to the West.

The northern portion of the Site is approximately 90 acres. It consists of a 67-acre former non-hazardous landfill known as Land & Lakes #1 and 2; a non-hazardous waste transfer station, and vacant land.

The southern portion of the Site is approximately 60 acres. It consists of a 55-acre non-hazardous landfill that is in the process of being capped for closure known as River Bend Prairie, various settlement ponds,
a flare for destruction of landfill gas, a maintenance shop, a 1500 linear foot (LF) barge dock, and vacant land.

**Regulatory Framework**

The property contains three regulated facilities: Land & Lakes #1 & 2 landfill; the River Bend Prairie landfill; and the River Bend Prairie Transfer Station. The Transfer Station is currently leased to a third party and is not discussed in this summary.

**Land & Lakes #1 and 2**

This former landfill accepted non-hazardous municipal solid waste for disposal from 1973 to 1993. It was closed and capped in 1995. Although not required of older landfills developed under 35 IAC §807, Land & Lakes #1 and 2 was closed with active gas and leachate extraction systems. The landfill has an in-situ clay bottom with a minimum hydraulic conductivity of $10^{-7}\text{ cm/s}$. The cap of the landfill consists of 2' of compacted clay and a 6' vegetative layer. Groundwater is monitored quarterly at 12 points. The landfill has completed its regulatory post-closure care period of 15 years, which commenced after certified closure. The next step is to request Certification of Completion of the post closure care period (the “Certification”). This is anticipated to occur in the next twelve months.

Certification is confirmation from the Illinois Environmental Protection Agency (“IEPA”) that the landfill has achieved its slope stability, proper vegetative growth, and has been determined to have no adverse impact on groundwater or the environment. The Certification is based upon the body of documentation over the entire post closure care period, including quarterly analysis of groundwater monitoring parameters. The amount of documentation and periodic inspections are at least equal to, but generally far greater than, that required to receive a letter of No Further Remediation (“NFR”) from the IEPA.

A NFR is limited to use of a site in accordance with the terms of the NFR letter, such as installation of institutional controls or engineered barriers prior to construction of a specific type of development upon a property. A NFR must be filed with the recorder of deeds of the county in which the remediation site is located and is a part of the chain of title. In contrast to a NFR, the Certification removes the property from the environmental regulatory framework and it is once again treated as any industrial zoned property. There are no deed restrictions placed on the Site when the Certification is received.

**River Bend Prairie**

River Bend Prairie is a more modern landfill developed under 35 IAC §811 regulations. Daily receipts of non-hazardous waste ceased in 2015. It has a bottom liner constructed of a geomembrane layer both drainage and clay layers. The cap of the landfill consists of 1 foot of clay, covered by geotextile and geomembrane layers, 2.5 feet of protective soil, and 6” of vegetative layer. This landfill is currently in the final stages of a multi-year closure process. It is anticipated that it will be certified closed in 2020, and then a 30-year post closure care period will commence.

River Bend Prairie has active gas and leachate extraction systems. The combined landfill gas from Land & Lakes #1 and 2 and River Bend Prairie is collected and destroyed at a flare on the east side of the landfill. The gas system is monitored monthly by a third party engineering firm that tunes the gas field for maximum efficiency and maintains the gas collection equipment. Groundwater is monitored quarterly at 24 points. In a highly regulated environment, River Bend Prairie is not now and has never been in assessment or corrective action for groundwater quality.
Potential DMDF use

Upon its release from post closure care, Land & Lakes #1 and 2 may be redeveloped. It is zoned in Cook County as heavy industrial with special use for a landfill. River Bend Prairie will soon commence its post-closure care period. Any change in its current post closure plan would require a supplemental permit from the EPA.

A. Screening Criteria

The Site meets the site screening criterion set forth in the 2015 Draft Dredged Material Management Plan as described below.

1. Size.

The Site is larger than 30 (subsequently revised to 40 acres) and provides more than the minimum 1,060,000 cy of storage capacity, with expansion available. The site is privately owned by a single owner, Land & Lakes Company and/or its affiliates.

2. Natural Resources

The Site is not forested and contains no wetlands. The Site is a former brickyard featuring in-situ clay. A slurry wall separates much of the site from the Little Calumet River.

3. In Use/Under Development.

The Site's existing use as closed and nearly closed landfills meets the criterion for no active development. Without development for a use like the DMDF, the site would likely remain dormant and underused for decades. There are no deed restrictions preventing future development of the Site.

4. Recognized Environmental Conditions.

The Site use as landfills would qualify as a Recognized Environmental Condition ("REC"), however, the site is in compliance with all regulations as verified by periodic inspections and data submissions to the EPA. The data base of information concerning the Site is extensive and allows for engineering best practices to control any RECs. In addition, the Site's monitoring well network, surface water sampling and air monitoring provide near immediate feedback on any changes in environmental quality at the Site.

5. Cultural Resources.

The Site does not have any known archeological or historic properties as was determined by the Illinois State Historic Preservation Office prior to development of its current use.

6. Operational Feasibility.

Site access is from a ½ mile private access road coming off of non-signalized, T-intersection in an industrial neighborhood. The eastern side of the Site contains a barge dock opening onto the Marine Service Corporation's basin. The site offers multiple options for placement of dredged material: on vacant land on the eastern edge of the Site, on the tops and slopes of the landfills, and in the space between the two landfills. A preliminary calculation indicates approximately 2.6 million CY of airspace is available. Each of these possibilities can be reviewed in detail with the USACE project team.
B. Site Evaluation Criteria

The Site also satisfies the site evaluation criteria for sites retained from the site screening process.

1. Geotechnical.

Both Land & Lakes # 1 and 2 and River Bend Prairie have liner systems. The entire Site is constructed on a former brickyard which is underlined with clay with a natural hydraulic conductivity of at least $10^{-7}$ cm/s. A slurry wall separates much of the North side of the Site from the Little Calumet River.

2. Recognized Environmental Conditions.

The Site contains two non-hazardous waste landfills. The landfill regulatory framework provides decades of data showing compliance with environmental laws. The Site is zoned heavy industrial with special use for a landfill.

3. Cultural Resources.

There are no historical or archaeological resources on the Site.

4. Natural Resources.

There are no forests or wetlands on the Site.

5. Social Impacts.

The Site is separated from residential neighborhoods by the Little Calumet River and the closed Site itself. Working on the eastern side or interior of the Site provides a minimum $\frac{1}{2}$ mile buffer from non-industrial property. The filing of the areas between the landfills would create a contiguous 150-acre parcel along the Little Calumet River which could reclaim the former landfills as open lands, wildlife habitat, hiking trails and similar public uses.


The landfills are difficult to redevelop for future uses due to settlement issues with new construction. The highest and best economic uses are for such activities as composting or solar energy farms, which are uses that are compatible with the planned DMDF.

7. Existing Site Infrastructure.

The Site has existing liners and environmental control structures. Leachate is discharged directly to the Metropolitan Water Reclamation District of Greater Chicago ("MWRD") via a force main. The Site has an established NPDES permit for stormwater discharge. The Site also has a Title V Clean Air Act permit.


As determined for previously considered sites, Calumet Harbor sediments should be suitable for berm construction, the primary cap layer.


Capacity of the Site exceeds the 1,060,000 cy design capacity specified by USACE for the DMDF. The Site includes an existing barge docking facility for sediment offloading operations.
The Site includes existing structure for collecting and treating leachate. The Site is served by an existing sewer system via a lift station.

The Site has been a known destination for clean fill disposal materials which can assist in the closure and capping of the filled DMDF.

This preliminary review of the Site shows that it meets the screening and evaluation criteria set forth in the 2015 Dredged Material Facility Plan. Further evaluation of physical and economic feasibility of the Site would require analysis of a chosen disposal area(s) on the Site.

Land & Lakes welcomes the opportunity to meet with the DMDF Program Manager and the planning staff to discuss the Site and its attributes. To assist you with preliminary review, we have enclosed as Attachments several documents to provide an overview of the Site.

As a privately-owned, family-run business, Land & Lakes is excited by this opportunity to work with the USACE. This project would represent a return to our roots. When incorporated in 1966, our name was chosen to reflect our excavating expertise in land reclamation and man-made lake developments. Early work included harbor dredging and park development. The Cowhey family has made land donations to Open Lands and similar groups, and is committed to finding permanent public uses of these parcels.

We look forward to meeting with you soon,

Sincerely,

Mary Margaret Cowhey
President

Attachments:

1. Site Area Maps
2. Site Plan
3. Site Summary Sheet
4. Cross Section Liner Design
   a. Land & Lakes #1 and 2
   b. Older Section River Bend Prairie
   c. New Section of River Bend Prairie
5. Cross Section Cap Design
   a. Land & Lakes #1 and 2
   b. Old and New Sections of River Bend Prairie
6. Gas System Plans
7. Groundwater Monitoring
   a. Land & Lakes #1 and 2 Well Locations
   b. River Bend Prairie Well Locations
   c. 2013-2018 well data for both sites
8. Topographic Maps
9. Cross Section Preliminary Fill Plan
ATTACHMENT 1:

Site Area Maps
Attachment 1A: River Bend Prairie Environmental Campus Location
Attachment 1B: Aerial View of River Bend Prairie Environmental Campus
ATTACHMENT 2:

Site Plan
# USACE 138th St Landfills Summary Sheet

<table>
<thead>
<tr>
<th>Size/Location</th>
<th>North Landfill</th>
<th>South Landfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Name</td>
<td>Land &amp; Lakes # 1 &amp; 2</td>
<td>River Bend Prairie</td>
</tr>
<tr>
<td>Address</td>
<td>800 E 138th Street</td>
<td>801 E 138th Street</td>
</tr>
<tr>
<td>Municipality</td>
<td>Uninc. Cook County</td>
<td>Village of Dolton</td>
</tr>
<tr>
<td>Landfill Size</td>
<td>67 acres</td>
<td>55 acres</td>
</tr>
<tr>
<td>Additional land</td>
<td>23 acres</td>
<td>5 acres</td>
</tr>
<tr>
<td>Total Size</td>
<td>90 acres</td>
<td>60 acres</td>
</tr>
<tr>
<td>Regulatory Framework</td>
<td>35 IAC §807</td>
<td>35 IAC §811</td>
</tr>
<tr>
<td>Type</td>
<td>Non-hazardous</td>
<td>Non-hazardous</td>
</tr>
<tr>
<td>Last waste received</td>
<td>Sep-92</td>
<td>Sep-15</td>
</tr>
<tr>
<td>Post Closure Period</td>
<td>15 yrs</td>
<td>30 yrs</td>
</tr>
<tr>
<td>Estimated End</td>
<td>2019</td>
<td>2050</td>
</tr>
<tr>
<td>Inspection Reports</td>
<td>Clear</td>
<td>Clear</td>
</tr>
<tr>
<td>Construction Details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liner</td>
<td>Clay</td>
<td>Clay/Geomembrane</td>
</tr>
<tr>
<td>Cap</td>
<td>Clay</td>
<td>Clay/Geomembrane</td>
</tr>
<tr>
<td>Gas Extraction System</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Gas Production</td>
<td>Minimal</td>
<td>700 CFM</td>
</tr>
<tr>
<td>Groundwater Wells</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Leachate Monitoring Pts</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Deed Restrictions</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Maximum final elevation</td>
<td>670 MSL</td>
<td>690 MSL</td>
</tr>
</tbody>
</table>
ATTACHMENT 4:

Cross Section Liner Design
Attachment 4A:

Land & Lakes #1 &2 Liner Design
TYPICAL FILL SECTION
(LOOKING WEST)
FOR: Land and Lakes, Inc.
PROJECT: Solid Waste Disposal Site
LOCATION: 138th & Cottage Grove
Chicago, Illinois

SOIL BORING LOG NO.
WALTER H. FLOOD & COMPANY INC.
Engineers
CHICAGO, ILLINOIS – PORTAGE, MICHIGAN

<table>
<thead>
<tr>
<th>ELEV.</th>
<th>DEPTH</th>
<th>S</th>
<th>T</th>
<th>N</th>
<th>LR</th>
<th>DD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ground Surface</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stiff black to dark gray clay with brick, fill</td>
</tr>
<tr>
<td>12.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Black to dark gray silty clay, organic and stiff</td>
</tr>
<tr>
<td>16.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Black to dark gray organic silty sand, loose</td>
</tr>
<tr>
<td>25.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tough gray clay trace small gravel</td>
</tr>
<tr>
<td>42.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very tough gray clay trace small to medium gravel and boulders</td>
</tr>
<tr>
<td>45.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Soft gray silty clay</td>
</tr>
<tr>
<td>47.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dense gray sandy silt trace small gravel</td>
</tr>
<tr>
<td>52.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hard gray silty clay trace small gravel and boulders</td>
</tr>
<tr>
<td>57.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very dense stone fragments with limestone, shale, and clay</td>
</tr>
</tbody>
</table>

End of Boring - Auger Refusal

<table>
<thead>
<tr>
<th>ELEV.</th>
<th>DEPTH</th>
<th>S</th>
<th>T</th>
<th>N</th>
<th>LR</th>
<th>DD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LEGEND: A - AUGER
ACR - AFTER CASING REMOVAL
AD - AFTER DRILLING
BCR - BEFORE CASING REMOVAL
C - CORE
DCI - DRY CAVE IN
DD - DRY DENSITY, L.B. PER CU. FT.

DEPT - FEET BELOW GROUND SURFACE
FT - FISH TAIL
HS - HOLLOW STEM AUGER
L - SAMPLE LENGTH
N - PENETRATION, BLOWS PER FOOT
OU - UNCONFINED COMPRESSIVE STRENGTH
P - POUNDS PER SQUARE FOOT
R - LENGTH OF SAMPLE RECOVERED
S - SAMPLE NUMBER
SS - SPLIT SPOON
ST - SHELBY TUBE
T - TYPE OF SAMPLE
WC - WATER, %
WCI - WET CAVE IN
WD - WHILE DRILLING
WO - WASHOUT
### Soil Boring Log No. 1

**FOR:** Land and Lakes, Inc.

**PROJECT:** Solid Waste Disposal Site

**LOCATION:** 138th & Cottage Grove, Chicago, Illinois

**SOIL BORING LOG NO.**

**WALTER H. FLOOD & COMPANY INC.**

Engineers

CHICAGO, ILLINOIS – PORTAGE, MICHIGAN

---

**METHOD OF BORING:** HS

**SPLIT SPOON SIZE:** 2 IN.

**WT. OF HAMMER:** 140 LBS.

**INCH DROP:** 30

**SHELBY TUBE SIZE:** CASING USED 37.5' - 2 1/2'' IDHS 4.1' @ 24

**WATER LEVEL READINGS**

- 7.5' W.D.
- 20.5' B.C.R.
- 24.0' A.C.R.

**DATE:** 2/20/74

**BACKFILLING DATA**

**FOREMAN:** DL: JE: pb

**JOB NO.:** 7405-0044

**METHOD:**

**GROUT:**

**VERT. SCALE:**

1" = 10.0'

---

### Drilling Data

<table>
<thead>
<tr>
<th>ELEV. DEPTH</th>
<th>S</th>
<th>T</th>
<th>N</th>
<th>LR</th>
<th>DD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ground Surface</td>
</tr>
<tr>
<td>35.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hard gray silty clay trace small gravel</td>
</tr>
<tr>
<td>37.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dense medium to coarse clayey limestone</td>
</tr>
</tbody>
</table>

**Legend:**

- A: AUGER
- AD: AFTER CASING REMOVAL
- BCR: BEFORE CASING REMOVAL
- C: CORE
- DICI: DRY CAVE IN
- DD: DRYDENSITY, LB. PER CU. FT.
- FT: FEET BELOW GROUND SURFACE
- SS: SPLIT SPOON
- ST: SHELBY TUBE
- WC: WET CAVE IN
- WD: WHILE DRILLING
- WO: WASHOUT

---

**Example Entries:**

- 2 ss 6: Loose gray and brown sandy silt trace small gravel
- 4 ss 16: Tough gray clay trace small to large gravel
- 8 ss 14: Very tough gray clay trace small gravel
- 12 ss 24: Medium dense gray clayey silt trace sand
- 14 ss 109: Dense medium to coarse clayey limestone

---

**Signature:**

- **FOREMAN:** DL: JE: pb

---

**Notes:**

- **LABORATORY:**
- **PENETROMETER:**
Attachment 4B:

Older Section of River Bend Prairie Liner Design
Attachment 4C:

New Section of River Bend Prairie Liner Design
2. DESCRIPTION OF THE LINERS AND LEACHATE CONTROL SYSTEMS

2.1 General Description

The existing landfill has a natural or recompacted clay liner a minimum of 10-ft (3-m) thick with a hydraulic conductivity no greater than \(1 \times 10^{-7}\) cm/s.

As shown in Drawings 3 and 6, the development of River Bend Prairie includes a vertical expansion on top of the approximately 46-acre (19-hectare) existing landfill footprint, and a 9-acre (4-hectare) lateral expansion to the east of the existing landfill. The landfill footprint after expansion occupies a plan area of approximately 55 acres (22 hectares).

The lateral expansion area will include a lining system that exceeds the minimum requirements of §811.306. As final waste grades are achieved, both the lateral and vertical expansion areas will be capped with a cover system upon closure in accordance with Part VIII: Closure and Post-Closure Care Plans.

As shown in Drawing 6, the lining system over the relatively flat base portions of the lateral expansion area is graded in a sawtooth configuration with minimum 2 percent grades sloping towards leachate collection swales. The leachate collection swales are located at the valley between the high point of the sawtooth and at the toe of side slopes. The leachate collection swale includes a high density polyethylene (HDPE) perforated pipe embedded in gravel. The swales discharge to a single sump located at the toe of the northwest side slope in the lateral expansion area. The lining system over the excavated and subsequently lined side slopes of the lateral expansion areas is sloped at 2 horizontal to 1 vertical (2H:1V).

2.2 Detailed Description of the Lining System

The lining system at the base of the lateral expansion area includes a composite liner, as shown in Drawing 9, and exceeds the requirements of §811.306, §811.307, and §811.308. This lining system, from top to bottom, consists of:
• a 1-ft (0.3-m) thick LCS drainage sand layer;

• an LCS geotextile filter;

• an LCS geonet drainage layer; and

• a composite liner composed of a 60-mil (1.5-mm) thick HDPE geomembrane placed on top of a 3-ft (0.9-m) thick layer of low-permeability compacted clay.

In addition, at the LCS collector swale and LCS sump there is:

• an LCS geotextile cushion located between the pipe bedding/drainage gravel and the HDPE geomembrane; and

• an LCS geotextile filter located between the LCS drainage sand layer and the pipe bedding/drainage gravel.

The lining system on the side slopes of the lateral expansion area also includes a composite liner, as shown in Drawing 9, and exceeds the requirements of §811.306, §811.307, and §811.308. This lining system, from top to bottom, consists of:

• a 1-ft (0.3-m) thick LCS drainage sand layer; and

• a composite liner composed of a 60-mil (1.5-mm) thick textured HDPE geomembrane placed on top of a 3-ft (0.9-m) thick layer of low-permeability compacted clay.
DETAIL

Penetration of Leachate Collection Riser Pipe and LCS Pipe Cleanout Riser through Cover Geomembrane (Typical)

Scale: 1" = 1'

Geosynthetics Legend

NOTE:
1. Scales pipe shown to scale as noted. Except for the geosynthetics which are shown at exaggerated scale for clarity.

SECTION

12 LEACHATE COLLECTION SUMP AND RISER PIPE

Scale: 1" = 1'

LEACHATE COLLECTION RISER PIPE (1½") perforated on side slope
LEACHATE COLLECTION CLEANOUT PIPE (6") perforated on side slope

Geosynthetics Legend

NOTE:
1. Scales pipe shown to scale as noted. Except for the geosynthetics which are shown at exaggerated scale for clarity.

LEACHATE COLLECTION RISER PIPE (1½") perforated on side slope
LEACHATE COLLECTION CLEANOUT PIPE (6") perforated on side slope

SECTION

12 LEACHATE COLLECTION RISER PIPE AND LCS PIPE CLEANOUT RISERS ON SIDE SLOPE

Scale: 1" = 1'

LEACHATE COLLECTION RISER PIPE (1½") perforated on side slope
LEACHATE COLLECTION CLEANOUT PIPE (6") perforated on side slope

Geosynthetics Legend

NOTE:
1. Scales pipe shown to scale as noted. Except for the geosynthetics which are shown at exaggerated scale for clarity.
Attachment 5:

Cross Section Cap Design
Attachment 5A:

Land & Lakes #1 & 2 Cap Design
Attachment 5B:

River Bend Prairie Cap Design
DETAIL 8: TERMINATION OF GEOCOMPOSITE DRAINAGE LAYER ON FINAL COVER SIDE SLOPE

DETAIL 9: FINAL COVER SYSTEM OVER SIDE SLOPES

DETAIL 10: FINAL COVER SYSTEM OVER TOP SLOPES

DETAIL 11: FINAL COVER ACCESS ROAD WITH ADJACENT DRAINAGE SWALE

DETAIL 12: FINAL COVER DRAINAGE SWALE ON SIDE SLOPE

GEOSYNTHETICS LEGEND:
- GEOGRID
- GEOCOMPOSITE
- GEOFABRIC

NOTE:
- SIZES ARE SHOWN TO SCALE AS NEEDED FOR THE GEOSYNTHETIC LAYERS WHICH ARE SHOWN AT EXAGGERATED SCALE FOR QUALITY.
Attachment 6:

Gas System Plans
Note: Since 12/31/17, there have been no composting operations at L&L #1 and #2.
Attachment 8:

Topographic Maps
FIG. 2
Attachment 9:

Cross Section Preliminary Fill Plan