JH Campbell History of Construction
Bottom Ash Pond 3

Initial Compiled History Certification by Owner or Operator
# Contents

Certification Statement by Owner or Operator ................................................................. 3

1.0 Introduction .................................................................................................................. 4

2.0 40 CFR 257.73 (c)(1)(i) ................................................................................................. 4

3.0 40 CFR 257.73 (c)(1)(ii) ............................................................................................... 4

4.0 40 CFR 257.73 (c)(1)(iii) ............................................................................................. 4

5.0 40 CFR 257.73 (c)(1)(iv) .............................................................................................. 5

6.0 40 CFR 257.73 (c)(1)(v) .............................................................................................. 5

7.0 40 CFR 257.73 (c)(1)(vi) ............................................................................................. 6

7.1 Physical and Engineering Properties ............................................................................ 6

7.2 Site Preparation and Construction ............................................................................... 6

8.0 40 CFR 257.73 (c)(1)(vii) ........................................................................................... 6

9.0 40 CFR 257.73 (c)(1)(viii) .......................................................................................... 7

10.0 40 CFR 257.73 (c)(1)(ix) .......................................................................................... 7

11.0 40 CFR 257.73 (c)(1)(x) ............................................................................................ 8

11.1 Spillway and Diversion Description .......................................................................... 8

11.2 Capacities and Calculations ....................................................................................... 8

12.0 40 CFR 257.73 (c)(1)(xi) .......................................................................................... 8

12.1 Construction Specifications ....................................................................................... 8

12.2 Surveillance, Maintenance, and Repair ..................................................................... 8

13.0 40 CFR 257.73 (c)(1)(xii) ........................................................................................ 8

14.0 Attachments ............................................................................................................... 9

15.0 References .................................................................................................................. 9
CERTIFICATION

Certification Statement by Owner or Operator

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Consumers Energy Company

[Signature]

________________________________________________________________________

Signature

October 17, 2016
Date of Report Certification

Harold D. Register, Jr.
Name
1.0 INTRODUCTION
The United States Environmental Protection Agency (EPA) promulgated the Resource Conservation and Recovery Act (RCRA) Coal Combustion Residuals (CCR) Rule (“CCR RCRA Rule”) on April 17, 2015. The CCR RCRA Rule requires that owners or operators of existing CCR surface impoundments with a height of five feet or more and a storage volume of 20 acre-feet or more compile a history of construction, which shall contain, to the extent feasible, the information specified in 40 CFR 257.73 (c)(1)(i) through (xii). The history of construction, and any revisions of it, as required by 40 CFR 257.73(c) shall be placed in the operating record and shall be maintained until the CCR unit completes closure of the unit in accordance with 40 CFR 257.102 [40 CFR 257.105(f)(9)].

2.0 40 CFR 257.73 (C)(1)(I)
The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Consumers Energy Company (CEC)
Contact: Brad Runkel
1945 W. Parnall Road
Jackson, Michigan 49201

Name of CCR Surface Impoundment: JH Campbell Bottom Ash Pond 3
State Assigned Identification Number: None

3.0 40 CFR 257.73 (C)(1)(II)
The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.

Figure 1 – Site Location Map presents the 7 ½ minute USGS quadrangle map of Port Sheldon, Michigan dated June 2016. The location of the CCR unit is denoted on the map with the callout box – Site Location.

4.0 40 CFR 257.73 (C)(1)(III)
A statement of the purpose for which the CCR unit is being used.

According to the Potential Failure Mode Analysis (PFMA) Report prepared by AECOM (2009), the JH Campbell generating facility consists of three coal-fired electric generating units located on the western portion of the site. The ash disposal area of the facility is bounded by perimeter dikes and includes former Ponds B though K as well as the existing wet ash disposal area that includes three operational CCR surface impoundments: Bottom Ash Ponds 1-2, Bottom Ash Pond 3, and Pond A. Both Bottom Ash Ponds 1-2 and Bottom Ash Pond 3 contain an internal dike which separates a north and
south basin in each pond. The internal dike allows the owner/operator to direct flow to one portion of the unit so maintenance can be conducted on the adjacent portion of the unit. The three operational CCR surface impoundments are presented on Figure 2.

Bottom ash is sluiced into Bottom Ash Ponds 1-2 (which also receives coal pile run-off) and Bottom Ash Pond 3 where water is retained unless an overflow condition is reached. Under overflow conditions, the water is directed into a series of surface ditches, which ultimately discharge into the northwest corner of Pond A. Effluent from Pond A is directed through an outfall pipe that penetrates the perimeter dike into an open channel ditch leading to the recirculation pond, which ultimately discharges through the National Pollutant Discharge Elimination System (NPDES) permitted outfall into Pigeon River (AECOM 2009).

5.0 40 CFR 257.73 (C)(1)(IV)
The name and size in acres of the watershed within which the CCR unit is located.

According to the EPA MyWATERS Mapper website (USEPA 2016), the JH Campbell Ponds 1-2 CCR surface impoundment is located within the Pigeon River Subwatershed, which encompasses approximately 17,000 acres.

6.0 40 CFR 257.73 (C)(1)(V)
A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

As part of a subsurface investigation and sampling program conducted by Golder in May 2016, soil samples were collected from beneath Bottom Ash Ponds 1-2, Bottom Ash Pond 3, and Pond A. Sampling locations are visually depicted on Figure 2 – Existing Conditions Site Map. Physical properties of the soil samples are included in Appendix A – Soil Sample Data.

Engineering properties for the foundation and abutment materials were selected from Cone Penetrometer Test (CPT) correlations, field testing, and laboratory testing that supplemented the structural stability and factor of safety assessments for Bottom Ash Pond 3. A portion of the engineering properties of the foundation and abutment materials are presented in the “Structural Stability and Safety Factor Assessment Report” (Golder 2016c). Additional engineering properties of the foundation and abutment materials are presented in the “Summary of Monitoring Well Design, Installation, and Development – Bottom Ash Pond 3N/3S” (ARCADIS 2016).
7.0 40 CFR 257.73 (C)(1)(VI)
A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

7.1 Physical and Engineering Properties
Golder sampled and tested the soil and CCR that exists in the exterior berm of Bottom Ash Pond 3 to gather subsurface information to develop certifications for the structural stability and factor of safety assessment. A portion of the engineering properties of the foundation and abutment materials are presented in the “Structural Stability and Safety Factor Assessment Report” (Golder 2016c). Additional engineering properties of the foundation and abutment materials are presented in the “Summary of Monitoring Well Design, Installation, and Development – Bottom Ash Pond 3N/3S” (ARCADIS 2016).

7.2 Site Preparation and Construction
Construction drawings included in the PFMA Report (AECOM 2009) were reviewed, and the following sequence of construction was developed:

- Construction of the ash pond area began in the 1960s with several expansions, closures, and historic pond and dike configuration alterations continuing until 1997 (AECOM 2009).

- Bottom Ash Pond 3 is not present on the CEC Ash Disposal Area 1971 Addition – Pond D Plan and Sections drawing from 1971 (AECOM 2009). even though the area is not seen developed in the 1955 historical imagery but then appears in the 1962 and 1968 images and even more pronounced in the 1974 imagery (Appendix B – Historical Imagery).

- The CEC Boring Locations in Ash Pond Area drawing from 1977 (AECOM 2009) depicts Bottom Ash Pond 3 in similar configuration to present day.

Information regarding site preparation and construction of the CCR surface impoundment can be found on the CEC Ash Pond Plan pursuant to the June 22, 1978 solid waste permit application as well as the subsequent plan set drawings (AECOM 2009).

8.0 40 CFR 257.73 (C)(1)(VII)
At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation
improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Golder developed the following figures, which are attached hereto, for Bottom Ash Pond 3:

- Figure 2 – Existing Conditions Site Map
- Figure 3 – Ash Pond Characterization Bottom Ash Pond 3 Plan View
- Figure 3A – Ash Pond Characterization Bottom Ash Pond 3 Cross Section A-A’
- Figure 3B – Ash Pond Characterization Bottom Ash Pond 3 Cross Sections B-B’
- Figure 3C – Ash Pond Characterization Bottom Ash Pond 3 Cross Section C-C’

Cross sections were developed based on an EES Survey (September 2016) and subsurface data collected and interpreted by Golder in 2015 and 2016. These cross sections are not intended to illustrate a comprehensive conceptual site model representing all data that may be available for Bottom Ash Ponds 3.

9.0 40 CFR 257.73 (C)(1)(VIII)
A description of the type, purpose, and location of existing instrumentation.

The CCR RCRA Rule requires that a description of the type, purpose, and location of existing instrumentation be provided. Golder included the locations of the known instruments on Figure 2 – Existing Conditions Site Map.

CEC retained ARCADIS to install RCRA monitoring wells to characterize groundwater quality conditions in the vicinity of Bottom Ash Pond 3. The description and location of this existing instrumentation can be found in the “Summary of Monitoring Well Design, Installation, and Development –Bottom Ash Pond Unit 3N/3S” (ARCADIS 2016). In 2016, Golder installed five two-inch diameter standpipe piezometers that range in depth from 24 feet to 27 feet bgs. The piezometers were installed to accurately model the phreatic surface and subsequently the factor of safety for the external dike of Bottom Ash Pond 3. In 2016, EES installed four standpipe piezometers that range in depth from 27 feet to 33 feet bgs in the interior berm of Bottom Ash Pond 3. These piezometers are being used to develop construction dewatering methods for the Bottom Ash Pond 3 closure.

10.0 40 CFR 257.73 (C)(1)(IX)
Area-capacity curves for the CCR unit.
Area capacity curves for Bottom Ash Pond 3 were calculated by Golder using survey data collected by EES in May 2016. The area capacity curves are included in the “J.H. Campbell Generating Facility Bottom Ash Pond 3 Inflow Design Flood Control System Plan” (Golder 2016b).

11.0 40 CFR 257.73 (C)(1)(X)
A description of each spillway and diversion design features and capacities and calculations used in their determination.

11.1 Spillway and Diversion Description
Based on the “Annual RCRA CCR Surface Impoundment Inspection Report completed by Golder for Bottom Ash Pond 3” (Golder 2016), an elevated trestle and pipe system hydraulically conveys bottom ash to the pond system. Water is discharged from the unit via corrugated metal pipe (CMP) outflow pipes into a series of surface ditches that convey the flow to an internal pond system and ultimately to the NPDES outfall location.

Diversion is provided by the perimeter berm, minimum elevation of 631.75 (NGVD29) (Golder 2016b), which surrounds Bottom Ash Pond 3.

11.2 Capacities and Calculations
Capacities and calculations regarding the spillway and diversion features can be found in “J.H. Campbell Generating Facility Bottom Ash Pond 3 Inflow Design Flood Control System Plan” (2016b).

12.0 40 CFR 257.73 (C)(1)(XI)
The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

12.1 Construction Specifications
Construction specifications are detailed on drawings included in the PFMA Report (AECOM 2009).

12.2 Surveillance, Maintenance, and Repair
The December 2010 “Coal Ash Landfill Surveillance and Monitoring Program” (SMP) (CEC 2010) outlines CEC’s surveillance, maintenance, and repair program specific to each CCR surface impoundment at JH Campbell. Beginning in October 2015, Bottom Ash Pond 3 was inspected by a qualified individual at least weekly and by a qualified professional engineer (QPE) annually in accordance with the CCR RCRA Rule.

13.0 40 CFR 257.73 (C)(1)(XII)
Any record or knowledge of structural instability of the CCR unit.
Weekly inspections of the facility are performed by qualified individuals to detect potentially hazardous conditions or structural weakness per the CCR RCRA Rule and documented internally on CCR Weekly Inspection Observations Forms. Annual inspections at the facility have been performed by AECOM (2009a, 2012), Barr Engineering (2014), and Golder (2016, 2016a).

14.0 ATTACHMENTS

Figure 1 – Site Location Map

Figure 2 – Existing Conditions Site Map

Figure 3 – Ash Pond Characterization Bottom Ash Pond 3 Plan View

Figure 3A – Ash Pond Characterization Bottom Ash Pond 3 Cross Section A-A’

Figure 3B – Ash Pond Characterization Bottom Ash Pond 3 Cross Sections B-B’

Figure 3C – Ash Pond Characterization Bottom Ash Pond 3 Cross Section C-C’

Appendix A – Soil Sample Data

Appendix B – Historical Aerial Photography

15.0 REFERENCES


Rev.0_Signed  Page 9 of 10


1. BASE MAP TAKEN FROM 7.5 MINUTE U.S.G.S. QUADRANGLES OF PORT SHELDON MICHIGAN, DOWNLOADED FROM MICHIGAN DNR WEBSITE JUNE 2016.
ASH POND CHARACTERIZATION
BOTTOM ASH POND 3 PLAN VIEW

J.H. CAMPBELL ASH STORAGE FACILITY

NOTES
1. CONTOURS SHOWN ARE FROM MAY 2016 GROUND SURVEY.
2. ELECTRICAL TOWERS AND OVERHEAD LINES
   RIM = 633.70
   INV. (NW) = 622.08
   INV. (N) = 622.08
   INV. (S) = 621.98
3. APPROXIMATE LOCATION OF BURIED POWER LINE
   DRAWING 690-3273

LEGEND
1. PIEZOMETER
2. HISTORICAL SOIL BORING
3. SOIL BORING (2016)
4. MONITORING WELL
5. ELECTRICAL TOWERS AND OVERHEAD LINES

REFERENCES
6. BOTTOM ASH POND 3 SOUTH
7. BOTTOM ASH POND 3 NORTH
8. RIM = 632.02
9. INV. (NW) = 623.56
10. INV. (S) = 623.46

DESCRIPTION
1. CONTOURS SHOWN ARE FROM MAY 2016 GROUND SURVEY.

REFERENCES
1. JHC-BH-16003
2. JHC-BH-16004
3. JHC-BH-16002
4. JHC-BH-16001
5. SB-104
6. B-511
7. JHC-CPT-16001
8. JHC-CPT-16002
9. JHC-CPT-16003
10. SB-1504
11. POND 3-1
12. POND 3-C
13. POND 3-2
14. POND 3N-1
15. POND 3N-2
16. POND 3B-1
17. POND 3B-2
18. POND 3B-3
19. POND 3B-4
20. 18" HDPE PIPE OUTLET

DESCRIPTION
1. CONTOURS SHOWN ARE FROM MAY 2016 GROUND SURVEY.

REFERENCES
1. JHC-BH-16012
2. JHC-BH-16013
3. JHC-BH-16011
4. JHC-BH-16015
5. JHC-BH-16016
6. JHC BH-16014
7. JHC-CPT-16004
8. PERIMETER BERM
   ELEV. = 631.75

DESCRIPTION
1. CONTOURS SHOWN ARE FROM MAY 2016 GROUND SURVEY.
BOTTOM ASH POND 3 NORTH & SOUTH SECTION A-A'

BOTTOM ASH POND 3 SOUTH

BOTTOM ASH POND 3 NORTH

MAXIMUM POOL SURFACE ELEVATION = 625.42 (NAVD 88)
NORMAL OPERATING POOL SURFACE ELEVATION = 624.34 (NAVD 88)

NORMAL OPERATING POOL SURFACE ELEVATION = 625.34 (NAVD 88)
MAXIMUM POOL SURFACE ELEVATION = 626.43 (NAVD 88)

NOTES:
1. DRAWINGS CREATED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS, LLC.
2. EXISTING CONTOURS WERE GENERATED FROM A GROUND SURVEY PERFORMED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS LLC. IN MAY 2016.

LEGEND

CCM MATERIAL

NATIVE MATERIAL

REFERENCE DRAWINGS

REV DATE DESCRIPTION RV 126 APP REV DATE DESCRIPTION

SOUTH A

NORTH A

ELEVATION

ELEVATION

STATION

BOTTOM ASH POND CHARACTERIZATION

BOTTOM ASH POND 3 CROSS SECTION A-A'

J.R. CAMPBELL ASH STORAGE FACILITY

SCALE 1/" = 40'/1" = 4' DRAWING NO. DRAFTER 3A A

JHC-BH-16003
JHC-BH-16004
JHC-BH-16002
JHC-BH-16001

EL = 604.2
EL = 606.6
EL = 605.1
EL = 603.8

EL = 603.5
EL = 603.4
EL = 604.7
EL = 605.0
EL = 604.1
EL = 607.1

MAXIMUM POOL SURFACE ELEVATION = 626.43 (NAVD 88)
NORMAL OPERATING POOL SURFACE ELEVATION = 624.34 (NAVD 88)
MAXIMUM POOL SURFACE ELEVATION = 626.23 (NAVD 88)

POND 3B-1 EL = 631.93
POND 3B-2 EL = 632.16
POND 3B-3 EL = 633.29
POND 3B-4 EL = 631.6

POND 3-2 EL = 631.8
POND 3-C EL = 631.6
POND 3-1 EL = 631.8

JHC-BH-16015
JHC-BH-16016
JHC-BH-16014
JHC-BH-16013
JHC-BH-16012
JHC-BH-16011

EL = 603.5
EL = 603.4
EL = 604.7
EL = 605.0
EL = 604.1
EL = 607.1
BOTTOM ASH POND 3 NORTH  SECTION B-B'

NOTES:
1. DRAWINGS CREATED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS, LLC.
2. EXISTING CONTOURS WERE GENERATED FROM A GROUND SURVEY PERFORMED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS LLC. IN MAY 2016.

EL = 603.8
JHC-BH-16002
EL = 605.1
JHC-BH-16013
EL = 605.0
JHC-BH-16012
EL = 604.1
JHC-BH-16011
EL = 607.1

NORMAL OPERATING POOL SURFACE ELEVATION = 625.34 (NAVD 88)
MAXIMUM POOL SURFACE ELEVATION = 626.23 (NAVD 88)

POND 3N-1
EL = 632.81
POND 3N-1
EL = 632.81

BOTTOM ASH POND 3 NORTH SECTION B-B'
BOTTOM ASH POND 3 SOUTH SECTION C-C'

NOTES
1. DRAWINGS CREATED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS, LLC.
2. EXISTING CONTOURS WERE GENERATED FROM A GROUND SURVEY PERFORMED BY ENGINEERING AND ENVIRONMENTAL SOLUTIONS LLC IN MAY 2016.

BOTTOM ASH POND 3 SOUTH

REFERENCE DRAWINGS

SCALE: 1" = 40'/1" = 4'

NORMAL OPERATING POOL SURFACE ELEVATION = 624.66 (NAVD 88)
MAXIMUM POOL SURFACE ELEVATION = 626.43 (NAVD 88)

Bottom of CCR Surface Profile

Legend

CCS MATERIAL
NATIVE MATERIAL
## MOISTURE CONTENT DETERMINATIONS

<table>
<thead>
<tr>
<th>Borehole Number</th>
<th>Sample Depth (ft)</th>
<th>Sample Number</th>
<th>Wt. of Wet Soil &amp; Tare (g)</th>
<th>Wt. of Dry Soil &amp; Tare (g)</th>
<th>Weight of Tare (g)</th>
<th>Weight of Water (g)</th>
<th>Weight of Dry Soil (g)</th>
<th>Water Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB-1501</td>
<td>9.0-11.0</td>
<td>-</td>
<td>40.15</td>
<td>39.22</td>
<td>14.88</td>
<td>0.93</td>
<td>24.34</td>
<td>3.8</td>
</tr>
<tr>
<td>SB-1501</td>
<td>14.0-16.0</td>
<td>-</td>
<td>46.58</td>
<td>41.61</td>
<td>13.67</td>
<td>4.97</td>
<td>27.94</td>
<td>17.8</td>
</tr>
<tr>
<td>SB-1501</td>
<td>24.0-26.0</td>
<td>-</td>
<td>42.75</td>
<td>39.52</td>
<td>13.65</td>
<td>3.23</td>
<td>25.87</td>
<td>12.5</td>
</tr>
<tr>
<td>SB-1502</td>
<td>19.0-21.0</td>
<td>-</td>
<td>55.90</td>
<td>51.22</td>
<td>13.87</td>
<td>4.68</td>
<td>37.35</td>
<td>12.5</td>
</tr>
<tr>
<td>SB-1502</td>
<td>34.0-36.0</td>
<td>-</td>
<td>52.47</td>
<td>45.80</td>
<td>14.79</td>
<td>6.67</td>
<td>31.01</td>
<td>21.5</td>
</tr>
<tr>
<td>SB-1503</td>
<td>4.0-6.0</td>
<td>-</td>
<td>41.53</td>
<td>40.54</td>
<td>13.57</td>
<td>0.99</td>
<td>26.97</td>
<td>3.7</td>
</tr>
<tr>
<td>SB-1503</td>
<td>9.0-11.0</td>
<td>-</td>
<td>58.58</td>
<td>52.11</td>
<td>13.51</td>
<td>6.47</td>
<td>38.60</td>
<td>16.8</td>
</tr>
<tr>
<td>SB-1503</td>
<td>24.0-26.0</td>
<td>-</td>
<td>51.23</td>
<td>45.55</td>
<td>14.85</td>
<td>5.68</td>
<td>30.70</td>
<td>18.5</td>
</tr>
<tr>
<td>SB-1504</td>
<td>4.0-6.0</td>
<td>-</td>
<td>45.91</td>
<td>44.51</td>
<td>14.80</td>
<td>1.40</td>
<td>29.71</td>
<td>4.7</td>
</tr>
<tr>
<td>SB-1504</td>
<td>14.0-16.0</td>
<td>-</td>
<td>61.71</td>
<td>53.05</td>
<td>13.53</td>
<td>8.66</td>
<td>39.52</td>
<td>21.9</td>
</tr>
<tr>
<td>SB-1504</td>
<td>24.0-26.0</td>
<td>-</td>
<td>48.93</td>
<td>44.96</td>
<td>14.82</td>
<td>3.97</td>
<td>30.14</td>
<td>13.2</td>
</tr>
<tr>
<td>SB-1504</td>
<td>44.0-46.0</td>
<td>-</td>
<td>56.28</td>
<td>50.03</td>
<td>13.66</td>
<td>8.25</td>
<td>36.37</td>
<td>22.7</td>
</tr>
<tr>
<td>SB-1505</td>
<td>2.0-4.0</td>
<td>-</td>
<td>38.49</td>
<td>34.31</td>
<td>14.97</td>
<td>4.18</td>
<td>19.34</td>
<td>21.6</td>
</tr>
<tr>
<td>SB-1505</td>
<td>9.0-11.0</td>
<td>-</td>
<td>40.15</td>
<td>34.21</td>
<td>13.70</td>
<td>5.94</td>
<td>20.51</td>
<td>29.0</td>
</tr>
<tr>
<td>SB-1506</td>
<td>4.0-6.0</td>
<td>-</td>
<td>40.42</td>
<td>38.40</td>
<td>13.84</td>
<td>2.02</td>
<td>24.56</td>
<td>8.2</td>
</tr>
<tr>
<td>SB-1506</td>
<td>9.0-11.0</td>
<td>-</td>
<td>37.86</td>
<td>34.68</td>
<td>13.64</td>
<td>3.18</td>
<td>21.04</td>
<td>15.1</td>
</tr>
<tr>
<td>SB-1506</td>
<td>15.4</td>
<td>-</td>
<td>32.34</td>
<td>26.99</td>
<td>13.71</td>
<td>5.35</td>
<td>13.28</td>
<td>40.3</td>
</tr>
<tr>
<td>SB-1506</td>
<td>14.0-16.0</td>
<td>-</td>
<td>34.11</td>
<td>30.78</td>
<td>13.50</td>
<td>3.33</td>
<td>17.28</td>
<td>19.3</td>
</tr>
<tr>
<td>SB-1506</td>
<td>19.0-21.0</td>
<td>-</td>
<td>53.30</td>
<td>40.85</td>
<td>13.84</td>
<td>12.45</td>
<td>27.01</td>
<td>46.1</td>
</tr>
<tr>
<td>SB-1507</td>
<td>44.0-46.0</td>
<td>-</td>
<td>51.95</td>
<td>45.52</td>
<td>13.84</td>
<td>6.43</td>
<td>31.68</td>
<td>20.3</td>
</tr>
<tr>
<td>SB-1507</td>
<td>4.0-6.0</td>
<td>-</td>
<td>51.17</td>
<td>48.17</td>
<td>14.94</td>
<td>3.00</td>
<td>33.23</td>
<td>9.0</td>
</tr>
<tr>
<td>SB-1507</td>
<td>14.0-16.0</td>
<td>-</td>
<td>34.69</td>
<td>33.77</td>
<td>13.60</td>
<td>0.92</td>
<td>20.17</td>
<td>4.6</td>
</tr>
<tr>
<td>SB-1507</td>
<td>24.0-26.0</td>
<td>-</td>
<td>50.13</td>
<td>43.49</td>
<td>13.75</td>
<td>6.64</td>
<td>29.74</td>
<td>22.3</td>
</tr>
</tbody>
</table>

---

Golder Associates - Lansing Michigan
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS
ASTM D421, D422, D4318

PROJECT NAME:  J.H. Campbell Ash Pond Characterization
SAMPLE ID:  JHIC-BH-16001 S-2
TYPE:  Jar
DEPTH (ft):  2.5

<table>
<thead>
<tr>
<th>Particle Size (mm)</th>
<th>% Passing</th>
<th>Description</th>
<th>Percentage</th>
<th>7.59</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-inch</td>
<td>7.5</td>
<td>100.0</td>
<td>Cobble</td>
<td>0.00</td>
</tr>
<tr>
<td>1.5-inch</td>
<td>37.5</td>
<td>100.0</td>
<td>Coarse Gravel</td>
<td>0.00</td>
</tr>
<tr>
<td>1-inch</td>
<td>25.0</td>
<td>100.0</td>
<td>7.59</td>
<td></td>
</tr>
<tr>
<td>3/8-inch</td>
<td>19.0</td>
<td>100.0</td>
<td>Fine Gravel</td>
<td>7.59</td>
</tr>
<tr>
<td>1/2-inch</td>
<td>12.7</td>
<td>97.7</td>
<td>Coarse Sand</td>
<td>4.67</td>
</tr>
<tr>
<td>3/16-inch</td>
<td>9.5</td>
<td>95.1</td>
<td>Medium Sand</td>
<td>24.48</td>
</tr>
<tr>
<td>#4</td>
<td>4.75</td>
<td>92.4</td>
<td>72.17</td>
<td></td>
</tr>
<tr>
<td>#16</td>
<td>2.0</td>
<td>87.7</td>
<td>Fine Sand</td>
<td>43.01</td>
</tr>
<tr>
<td>#20</td>
<td>0.85</td>
<td>75.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#40</td>
<td>0.425</td>
<td>63.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#60</td>
<td>0.25</td>
<td>50.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#100</td>
<td>0.15</td>
<td>37.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#200</td>
<td>0.075</td>
<td>20.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.036</td>
<td>9.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.023</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.013</td>
<td>5.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.009</td>
<td>4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.007</td>
<td>4.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.003</td>
<td>3.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil or Clay</td>
<td>20.24</td>
</tr>
</tbody>
</table>

Visual Description:
Very dark gray, CCR

Notes:
(1) Particle size analysis sample Mechanically dispersed using Storing Apparatus A for about 1 Minute.
(2) Sample prepared for Atterberg Limits testing by the dry method. Material retained on No. 40 sieve removed from Atterberg Limits sample by dry sieving. Plastic Limit test performed by hand rolling. Method A Liquid Limit test performed using manual device.
**ASTM GRAIN SIZE ANALYSIS**

**ASTM D 421, D 2217, D 1140, C 117, D 422, C 136, C 142**

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>J.H. Campbell Ash Pond Characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT NO.</td>
<td>165-4923</td>
</tr>
<tr>
<td>REMARKS</td>
<td></td>
</tr>
</tbody>
</table>

| SAMPLE ID      | JHC-BH1-16002 S-4                     |
| SAMPLE TYPE    | Jar                                    |
| SAMPLE DEPTH (ft) | 6.0                                    |

**WATER CONTENT (Delivered Moisture)**

<table>
<thead>
<tr>
<th></th>
<th>Wet Soil &amp; Tare (gm)</th>
<th>Dry Soil &amp; Tare (gm)</th>
<th>Tare Weight (gm)</th>
<th>Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wt Wet Soil &amp; Tare (gm)</td>
<td>(w1) 33.12</td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Wt Dry Soil &amp; Tare (gm)</td>
<td>(w2) 33.30</td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Weight of Tare (gm)</td>
<td>(w3) 13.59</td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Weight of Water (gm)</td>
<td>(w4=w1-w2) 2.82</td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Weight of Dry Soil (gm)</td>
<td>(w5=w2-w3) 15.71</td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Moisture Content (%)</td>
<td>(w4/w5)*100 15.88</td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture**

| Weight Of Sample (gm)    | 592.88                        |
| Tare Weight (gm)         | 298.23                        |
| (W6) Total Dry Weight (gm) | 294.65                      |

**SIEVE ANALYSIS**

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>Wt Ret</th>
<th>(Wt-Tare)</th>
<th>Cumulative (Wt-Tare)</th>
<th>Cumulative % Retained</th>
<th>% PASS</th>
<th>SIEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>3.0&quot;</td>
<td>coarse gravel</td>
</tr>
<tr>
<td>2.5&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>2.5&quot;</td>
<td>coarse gravel</td>
</tr>
<tr>
<td>2.0&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>2.0&quot;</td>
<td>coarse gravel</td>
</tr>
<tr>
<td>1.5&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>1.5&quot;</td>
<td>coarse gravel</td>
</tr>
<tr>
<td>1.0&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>1.0&quot;</td>
<td>coarse gravel</td>
</tr>
<tr>
<td>0.75&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>0.75&quot;</td>
<td>fine gravel</td>
</tr>
<tr>
<td>0.50&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>0.50&quot;</td>
<td>fine gravel</td>
</tr>
<tr>
<td>0.375&quot;</td>
<td>298.23</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
<td>0.375&quot;</td>
<td>fine gravel</td>
</tr>
<tr>
<td>#4</td>
<td>298.90</td>
<td>0.67</td>
<td>0.23</td>
<td>99.77</td>
<td>#4</td>
<td>coarse sand</td>
</tr>
<tr>
<td>#10</td>
<td>300.40</td>
<td>2.17</td>
<td>0.74</td>
<td>99.26</td>
<td>#10</td>
<td>medium sand</td>
</tr>
<tr>
<td>#20</td>
<td>305.39</td>
<td>7.16</td>
<td>2.43</td>
<td>97.57</td>
<td>#20</td>
<td>medium sand</td>
</tr>
<tr>
<td>#40</td>
<td>399.12</td>
<td>100.89</td>
<td>34.24</td>
<td>65.76</td>
<td>#40</td>
<td>fine sand</td>
</tr>
<tr>
<td>#60</td>
<td>552.99</td>
<td>254.76</td>
<td>86.46</td>
<td>13.54</td>
<td>#60</td>
<td>fine sand</td>
</tr>
<tr>
<td>#100</td>
<td>582.03</td>
<td>283.80</td>
<td>96.32</td>
<td>3.68</td>
<td>#100</td>
<td>fine sand</td>
</tr>
<tr>
<td>#200</td>
<td>591.12</td>
<td>292.89</td>
<td>99.40</td>
<td>0.60</td>
<td>#200</td>
<td>fines</td>
</tr>
</tbody>
</table>

**% C GRAVEL**

| % C GRAVEL | 0.00 |

**% F GRAVEL**

| % F GRAVEL | 0.23 |

**% C SAND**

| % C SAND | 0.51 |

**% M SAND**

| % M SAND | 33.50 |

**% F SAND**

| % F SAND | 65.16 |

**% FINES**

| % FINES | 0.60 |

**% TOTAL**

| % TOTAL | 100.00 |

**DESCRIPTION**

Light brown, POORLY GRADED SAND, trace gravel, trace fines

**USCS**

| USCS | SP |

*material finer than #4 sieve corrected for hygroscopic moisture.*

---

**Golder Associates - Lansing, Michigan**

JHC-BH1-16002 S-4 6.16.xlsx
PARTICLE SIZE DISTRIBUTION ASTM D 421 AND D 422
US STANDARD SIEVE OPENING SIZES

% PASSING

Grain size in millimeters

<table>
<thead>
<tr>
<th>Boulders</th>
<th>Cobble</th>
<th>Coarse</th>
<th>Fine</th>
<th>Cor</th>
<th>Med</th>
<th>Fine</th>
<th>SILT OR CLAY</th>
<th>FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.23</td>
<td>0.51</td>
<td>33.50</td>
<td>65.16</td>
<td>0.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SAMPLE ID: JHC-BH-16002 S-4
SAMPLE TYPE: Jar
SAMPLE DEPTH (ft): 6

DESCRIPTION: Light brown, POORLY GRADED SAND, trace gravel, trace fines

USCS: SP

Golder Associates - Lansing, Michigan

JHC-BH-16002 S-4 6.0'.xlsx
PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

PROJECT NAME: J.H. Campbell Ash Pond Characterization
SAMPLE ID: JIC-BH-16003 S-2
TYPE: Jar
DEPTH (ft): 3.0

---

**Sieve Analysis**

<table>
<thead>
<tr>
<th>Particle Size (mm)</th>
<th>% Passing</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-inch</td>
<td>75.0</td>
<td>100.0</td>
<td>Cobble</td>
</tr>
<tr>
<td>2-inch</td>
<td>50.8</td>
<td>100.0</td>
<td>Coarse Gravel</td>
</tr>
<tr>
<td>1.5-inch</td>
<td>37.5</td>
<td>100.0</td>
<td>Coarse Gravel</td>
</tr>
<tr>
<td>1-inch</td>
<td>25.0</td>
<td>100.0</td>
<td>Coarse Gravel</td>
</tr>
<tr>
<td>3/4-inch</td>
<td>19.0</td>
<td>100.0</td>
<td>Fine Gravel</td>
</tr>
<tr>
<td>1/2-inch</td>
<td>12.7</td>
<td>100.0</td>
<td>Fine Gravel</td>
</tr>
<tr>
<td>3/8-inch</td>
<td>9.5</td>
<td>100.0</td>
<td>Fine Gravel</td>
</tr>
<tr>
<td>#4</td>
<td>4.75</td>
<td>99.9</td>
<td>Coarse Sand</td>
</tr>
<tr>
<td>#10</td>
<td>2.0</td>
<td>99.7</td>
<td>Coarse Sand</td>
</tr>
<tr>
<td>#20</td>
<td>0.85</td>
<td>99.3</td>
<td>Medium Sand</td>
</tr>
<tr>
<td>#40</td>
<td>0.425</td>
<td>98.7</td>
<td>Fine Sand</td>
</tr>
<tr>
<td>#50</td>
<td>0.25</td>
<td>97.5</td>
<td>Fine Sand</td>
</tr>
<tr>
<td>#100</td>
<td>0.15</td>
<td>92.0</td>
<td>Fine Sand</td>
</tr>
<tr>
<td>#200</td>
<td>0.075</td>
<td>68.7</td>
<td>Fine Sand</td>
</tr>
</tbody>
</table>

**Plasticity Index (PI)**

0 - 2

**Liquid Limit (LL)**

0 - 100

**Visual Description:**

Very dark gray, CCR

---

**Notes:**
1. Particle size analysis sample mechanically dispersed using Sieving Apparatus A for about 1 Minute.
2. Sample prepared for Atterberg Limits testing by the dry method. Material retained on No. 40 sieve removed from Atterberg Limits sample by dry sieving. Plastic Limit test performed by hand rolling. Method A Liquid Limit test performed using manual device.
## ASTM Grain Size Analysis

### Project Title
J.H. Campbell Ash Pond Characterization

### Sample ID
JHC-BH-16004 S-4

### Remarks

<table>
<thead>
<tr>
<th>Water Content (Delivered Moisture)</th>
<th>JHC-BH-16004 S-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Soil &amp; Tare (gm)</td>
<td>Hygroscopic Moisture For Sieve Sample</td>
</tr>
<tr>
<td>Wt Wet Soil &amp; Tare (gm)</td>
<td>Wet Soil &amp; Tare (gm)</td>
</tr>
<tr>
<td>Wt Dry Soil &amp; Tare (gm)</td>
<td>Dry Soil &amp; Tare (gm)</td>
</tr>
<tr>
<td>Weight of Tare (gm)</td>
<td>Tare Weight (gm)</td>
</tr>
<tr>
<td>Weight of Water (gm)</td>
<td>Moisture Content (%)</td>
</tr>
<tr>
<td>(w4-w1-w2)</td>
<td>0.00%</td>
</tr>
<tr>
<td>Weight of Dry Soil (gm)</td>
<td>Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture</td>
</tr>
<tr>
<td>(w5-w2-w3)</td>
<td>Weight Of Sample (gm)</td>
</tr>
<tr>
<td>Moisture Content (%)</td>
<td>Tare Weight (gm)</td>
</tr>
<tr>
<td>(w4/w5)*100</td>
<td>(W6) Total Dry Weight (gm)</td>
</tr>
</tbody>
</table>

### Sieve Analysis

<table>
<thead>
<tr>
<th>Tare Weight</th>
<th>Cum. Ret.</th>
<th>Cumulative</th>
<th>% Pass</th>
<th>Sieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>297.48</td>
<td>Wt Ret</td>
<td>(Wt-Tare)</td>
<td>(% Retained)</td>
<td>(100-% Ret)</td>
</tr>
<tr>
<td></td>
<td>+Tare (dry)</td>
<td>(w4/tare)*100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>2.5&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>2.0&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>1.5&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>1.0&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>0.75&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>0.50&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>0.375&quot;</td>
<td>297.48</td>
<td>0.00</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>#4</td>
<td>306.65</td>
<td>9.17</td>
<td>2.98</td>
<td>97.02</td>
</tr>
<tr>
<td>#10</td>
<td>319.55</td>
<td>22.07</td>
<td>7.17</td>
<td>92.83</td>
</tr>
<tr>
<td>#20</td>
<td>329.30</td>
<td>31.82</td>
<td>10.34</td>
<td>89.66</td>
</tr>
<tr>
<td>#40</td>
<td>340.11</td>
<td>42.63</td>
<td>13.85</td>
<td>86.15</td>
</tr>
<tr>
<td>#60</td>
<td>453.05</td>
<td>155.57</td>
<td>50.55</td>
<td>49.45</td>
</tr>
<tr>
<td>#100</td>
<td>572.88</td>
<td>275.40</td>
<td>89.48</td>
<td>10.52</td>
</tr>
<tr>
<td>#200</td>
<td>599.37</td>
<td>301.89</td>
<td>98.09</td>
<td>1.91</td>
</tr>
</tbody>
</table>

### Description
Brown, POORLY GRADED SAND, trace gravel, trace fines

### USCS
SP

---

*material finer than #4 sieve corrected for hygroscopic moisture.*

---

Golder Associates - Lansing, Michigan

JHC-BH-16004 S-4 6.0.xlsx
PARTICLE SIZE DISTRIBUTION ASTM D 421 AND D 422
US STANDARD SIEVE OPENING SIZES

Grain size in millimeters

<table>
<thead>
<tr>
<th>% Passing</th>
<th>100</th>
<th>90</th>
<th>80</th>
<th>70</th>
<th>60</th>
<th>50</th>
<th>40</th>
<th>30</th>
<th>20</th>
<th>10</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>100</td>
<td>10</td>
<td>1</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coarse</th>
<th>Fine</th>
<th>Cor</th>
<th>Med</th>
<th>Fine</th>
<th>SILT OR CLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAVEL</td>
<td>2.98</td>
<td>4.19</td>
<td>6.68</td>
<td>84.24</td>
<td>1.91</td>
</tr>
<tr>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SAMPLE ID: JHC-BH-16004 S-4
SAMPLE TYPE: Jar
SAMPLE DEPTH (ft): 6
DESCRIPTION: Brown, POORLY GRADED SAND, trace gravel, trace fines
USCS: SP

Golder Associates - Lansing, Michigan
JHC-BH-16004 S-4 6.0'.xlsx
APPENDIX B
HISTORICAL AERIAL PHOTOGRAPHY
The EDR Aerial Photo Decade Package

J.H. Campbell Solid Waste Disposal Area
LAKESHORE DR
West Olive, MI 49460

Inquiry Number: 3324207.2
May 21, 2012
EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050 with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report AS IS. Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2012 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.
Date EDR Searched Historical Sources:
Aerial Photography May 21, 2012

Target Property:
LAKESHORE DR
West Olive, MI 49460

<table>
<thead>
<tr>
<th>Year</th>
<th>Scale</th>
<th>Details</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1938</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1938</td>
<td>AAA</td>
</tr>
<tr>
<td>1950</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1950</td>
<td>PMA</td>
</tr>
<tr>
<td>1955</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1955</td>
<td>CSS</td>
</tr>
<tr>
<td>1962</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1962</td>
<td>CSS</td>
</tr>
<tr>
<td>1968</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1968</td>
<td>ASCS</td>
</tr>
<tr>
<td>1974</td>
<td>Aerial Photograph. Scale: 1&quot;=600'</td>
<td>Flight Year: 1974</td>
<td>ASCS</td>
</tr>
</tbody>
</table>
| 1992 | Aerial Photograph. Scale: unknown | Flight Year: 1992
Best Copy Available from original source | FSA           |
| 1997 | Aerial Photograph. Scale: 1"=500' | /Composite DOQQ - acquisition dates: 1997    | EDR           |
| 2005 | Aerial Photograph. Scale: 1"=500' | Flight Year: 2005                           | EDR           |
| 2006 | Aerial Photograph. Scale: 1"=500' | Flight Year: 2006                           | EDR           |