

Appendix O

Geotechnical Engineering

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1 EXISTING CONDITIONS

1.1 Project Location and History

The Oakwood Bottoms, consisting of approximately 13,500 acres bottomland forest and wetlands, is located within the Shawnee National Forest in the Mississippi River floodplain on the left descending bank of the Mississippi River between River Miles (RM) 73-84 in Jackson County, Illinois. The Oakwood Bottoms HREP focuses on the 4,700-acre Greentree Reservoir portion of Oakwood Bottoms (Oakwood Bottoms Greentree Reservoir, or OBGTR). Refer to Appendix B – *Civil Engineering* for additional details on existing features.

This appendix provides information on the geotechnical engineering aspects of the project features.

2 MEASURES

2.1 Subsurface Data

Subsurface data available for review was from Grand Tower Drainage and Levee District adjacent to Oakwood Bottoms dated January 1953. The logs show a general stratigraphy of this specific area, but do not include any test results. No subsurface data was available for review within the project site.

Additional subsurface exploration will need to be obtained during preconstruction engineering and design (PED). The additional exploration should consist of Standard Penetration Test (SPT), auger borings with undisturbed samplings, and laboratory testing to characterize the subsurface conditions within Oakwood Bottoms. The subsurface investigation is needed for the design of proposed water control features to be constructed.

The locations of the borings will be finalized when water control structure locations are finalized. It is assumed that a minimum of one boring will be needed for the pump station, gate structure(s), and other structures with significant loading. Testing will vary for each structure, but at a minimum testing will include soil classifications (sieve and atterberg limits), moisture contents, as well as UU triaxial strength testing and consolidation testing under the pump station. All testing will follow the appropriate ASTMs.

2.2 Surveying

Post-exploration surveying will need to be completed at each boring location.

2.3 General Design Information

Geotechnical will coordinate with and provide soil material properties to the structural engineer for water control structure shallow or deep foundation design. Analyses will also include settlement, seepage, and stability as appropriate per each structure.

3 BORROW

All borrow is anticipated to come from onsite material. Excavated material from berm degradations, ditches, and other excavations will be used for embankment material.

Material classification of borrow material could influence the design and slopes of the berm modifications.