

Anderson Reservoir Feasibility Study

An aerial photograph of a region in North Carolina, showing a large area highlighted in blue to represent the proposed reservoir. The highlighted area includes a significant portion of a town, with residential streets and commercial buildings visible. To the north of the town, there is an airport with a runway and taxiway. The surrounding landscape consists of a mix of green fields, wooded areas, and some industrial or commercial structures. A semi-transparent white box is overlaid on the map, containing the text "Anderson Corporation for Economic Development" and the date "December 8, 2011".

Anderson Corporation
for Economic Development
December 8, 2011

Draft Confidential



Executive Summary

The Anderson Corporation for Economic Development (ACED) and its partners has commissioned DLZ Indiana, LLC (DLZ) to complete a preliminary planning-level study to evaluate the feasibility of constructing a dam on the West Fork of the White River in Anderson, Indiana for the primary purpose of economic development.

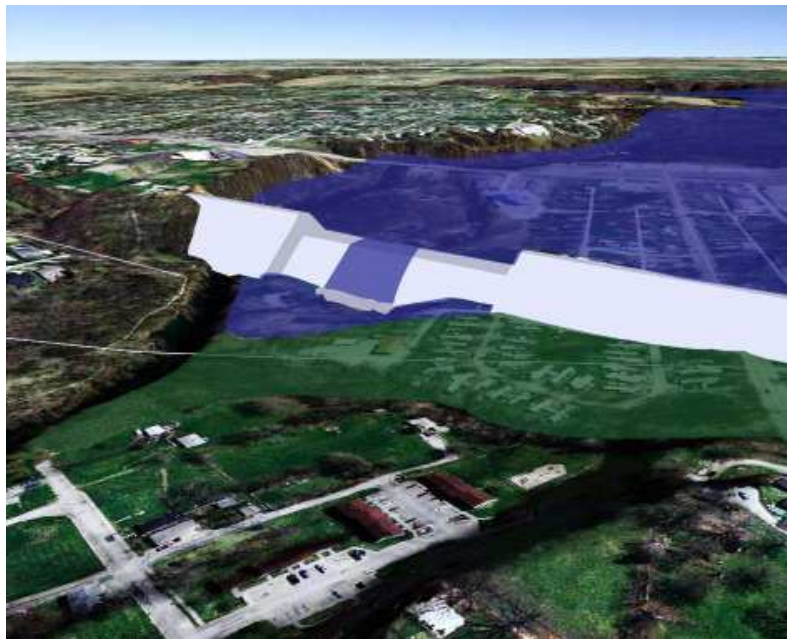
Many issues and elements were investigated as part of this report. They included environmental issues, stakeholder impacts/outreach, potential for flood control, potable water supply/yield, geotechnical issues, and existing bridge impacts.

Three alternatives were derived from this study and are presented as options for completing the proposed dam. The options are as follows:

Option 1: Uncontrolled Spillway; Pool Elevation 870 feet

Option 2: Uncontrolled Spillway; Pool Elevation 875 feet

Option 3: Controlled/Gated Spillway; Pool Elevation 870 or 875 feet



The estimated hard costs for the construction of these three options falls in the \$175M to \$200M range with additional land prep/permitting/mitigation costs ranging from \$125M to \$150M. Therefore, as a planning level tool, the total costs for the project are believed to lie in the \$300M to \$350M range.

Each of these options presents its own set of features, and challenges; however the information investigated in this report did not find any “fatal flaws” that would stop the project at this phase. Therefore, the next phase of this project appears to be warranted from the analysis within the scope of this study.

Any continued phase of this project would require the investigations associated with an Environmental Impact Statement (EIS) in order to obtain National Environmental Policy Act (NEPA) Clearance. This Clearance would include coordination with all relevant agencies and stakeholders to verify the initial findings and confirm permitting and other regulatory issues that might be of concern. There are many other items that would be a part of this next phase, but the EIS is by far the most time consuming and expensive portion.

It is also recommended that as an interim step, that the “optional” borings along the centerline of the dam be completed prior to kick off of next phase. This information would be invaluable to augment the marginal data collected from the well logs in this study, and this would address the proposed dam foundation concerns cited in this report.

Introduction

The Anderson Corporation for Economic Development (ACED) and its partners commissioned DLZ Indiana, LLC (DLZ) to complete a preliminary planning-level study to evaluate the feasibility of constructing a dam on the West Fork of the White River in Anderson, Indiana. The impetus for a proposed dam is the potential to increase economic development and investment in the area. The conceptual idea for this study came from the 2010 Class of the Leadership Academy of Madison County as a way to potentially increase economic development within the City of Anderson and Madison County. The purpose of this study is to review available material and complete a preliminary-level conceptual design plan to ascertain if there are any roadblocks that may be encountered that would prevent the project from moving to the next level. In order to ascertain the potential feasibility of constructing a dam and the impacts from the various elements associated with the dam, this study includes the review of geotechnical, environmental, hydrologic and hydraulic modeling, and a public relations overview.

In addition to evaluating the feasibility and prospects of constructing the dam, other positive elements of incorporating a dam along this segment of the White River were evaluated. These elements include flood control, potable water supply, recreation and enhancement of water quality. Though there may be more potential positive elements from the project, the scope of this study is to address and evaluate issues associated with the dam itself, as well as other elements mentioned above.

Three dam configuration options were presented in this report. Each option presents its own set of issues for and against. Phase II of the project will allow for more detailed information gathering to determine which, if any, of the options should be pursued.

DLZ was chosen as a partner in this study because of past experiences with other dams of this magnitude in the area, such as Geist Reservoir, Eagle Creek Reservoir, and Morse Reservoir. DLZ is also recognized as a leader in the industry, and has the in-house capabilities to provide full service expertise to ACED.

LOCATION

Anderson, Indiana is located on S.R. 32 northwest of Interstate 69 (I-69) in Madison County. The dam is proposed to be located on the eastern side of Anderson approximately 2,000 feet west of S.R. 9. This location was chosen for a variety of reasons that will be discussed throughout this report. The immediate reasoning to study this area was the topography of the area is cut with a deep (incised) valley suitable for this endeavor, and the sparse population where the permanent pool would lie requires a relatively small relocation of people/properties. The preferred location will create a pool depth of approximately 50 feet at the dam, and 30 feet at the midpoint of the reservoir. The dimensions of the lake will vary throughout, but it will be approximately 7 miles in length and will have an overall surface area of approximately 2,000 acres. This location will control the drainage from approximately 400 square miles of land. This dam would increase the total drainage controlled by Central Indiana reservoirs (Geist, Eagle Creek, and Morse inclusive) by about 67%.

BACKGROUND

As stated above, the main purpose of the reservoir is to provide economic development opportunities for the City of Anderson. However, the ancillary benefits/risks of the reservoir are the focus of this report. The first ancillary benefit that is anticipated from the reservoir is the potential to provide a source of potable water. This potable water yield can be used by Anderson or sold to surrounding agencies and/or communities in Central Indiana. It is widely known that a potential shortage of potable water exists throughout the United States and in Central Indiana. The City of Indianapolis Service Advisory Board (SAB) commissioned a study by Black and Veatch in 2010 to determine anticipated future water shortages for the City of Indianapolis/Marion County in 2020. The tables on the following page summarize the projected water yields (current facilities), and projected deficits for a dry summer, moderate drought, and severe drought. This report as presented had several solutions to alleviate the shortages at costs ranging from \$500 to \$750 million. The proposed Anderson reservoir is projected to cost between \$300 million and \$350 million.

Approximately 80% of residents in central Indiana receive their water from an identified municipal water system.



Introduction (continued)

Of these systems within the area of the reservoir, a majority are supplied by ground water. However, one of the largest water systems in central Indiana is Citizens Water Authority (part of Citizens Energy Group, CEG) comes from surface water. CEG purchased the utility/system from the City of Indianapolis in August 2011. With the purchase of the water utility, CEG is now the owner of Morse and Geist Reservoirs, and has water rights to the Eagle Creek Reservoir. CEG was approached in a meeting on October 11, 2011 to discuss the potential of becoming a stakeholder in the Anderson project. CEG is waiting for additional information such as is being supplied by this report before making any indication as to their intent.

Table 1: Projected Demands for Drought Conditions

Year	Average Day Demand (mgd)	Maximum Day Demand (mgd)
2010	164	246
2020	172	258

1. Water production and metered consumption data for 2001 through 2007 obtained from Veolia Water Indianapolis (VWI).
2. Future population data obtained from Indianapolis Metropolitan Planning Organization and Indiana STATS website.

Table 2: Projected System Yields

Climate	Average Day Yield (mgd)
Dry Summer (2007)	237
Moderate Drought (1988)	161
Severe Drought (1941)	118

Table 3: Indianapolis Projected Water Deficits (mgd)

	2010	2020
Dry Summer (2007)	9	21
Moderate Drought (1988)	85	97
Severe Drought (1941)	128	140

Reservoirs in Central Indiana have a proven record for being successful long term water supplies. Eagle Creek, Geist, and Morse Reservoirs have been successfully supporting regional growth for over 50 years. However, the growth boom associated with these Reservoirs has reached a peak and the Anderson Reservoir would supply the next growth boom that has come to be associated with such reservoirs.

Introduction (continued)

The analysis and subject matter sections of the report refer to pool elevations of 870 and 875. These elevations were determined in a preliminary investigation by ACED. They were determined by looking at contour mapping and trying to limit potential impacts while maximizing the size of the reservoir. During Phase II of the study a more exact elevation of the pool level will be determined.

The remainder of the report includes the Analysis and Subject Matter regarding the issues of concern for the project. These issues include environmental concerns, stakeholder impacts/outreach, potential for flood control, potable water supply/yield, geotechnical issues, and existing bridge impacts.

Each section of the report contains a Goal, Summary and Next Step status. All of the sections were then analyzed in combination to prepare the conclusions and recommendations for this report.

Analysis/Subject Matter

1. Environmental Review/Permit Requirements

- Goal:** The intent of this section of the study is to address any outstanding items associated with environmental and permitting issues that need to be investigated and to determine if there are any issues that will prevent this project from continuing or issues that cannot be mitigated during the course of this project.
- Summary:** At this stage of the investigations there appears to be no issues that should prevent this project from continuing to the next stage. However, many areas of concern exist most notably the environmental stakeholders, and potential impacts to the Native American Mounds area.
- Next Steps:** The initial investigation findings have indicated that the next phase of the project should be to begin an Environmental Impact Statement (EIS) to obtain NEPA Clearance, and begin coordination with all relevant agencies and stakeholders to verify the initial findings and confirm permitting and other regulatory issues that might be an issue.

ENVIRONMENTAL CONDITIONS OF REGION

For the purposes of assessing the environmental conditions, the project area was defined as that area that encompasses the flood pool basin at the 875 foot contour with a 200 foot buffer along the perimeter (see Figure 1). The project area is in an area of low topographic relief. Topography in this part of the West Fork White River watershed is a result of continental glaciation during the most recent ice age. Average monthly temperatures for the area range from 26 °F to 74 °F. Average monthly precipitation ranges from 2.0 inches in the winter to 4.28 inches in the summer. Average annual precipitation is about 40 inches and is generally distributed evenly throughout the year.

The project area is within the ecoregion of the Eastern Corn Belt Plains, more specifically the Loamy, High Lime Till Plains. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; including abiotic and biotic factors such as geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (United States Environmental Protection Agency [USEPA]). The White River Basin can be divided into six regions that have similar characteristics on the basis of geologic, geomorphologic, and hydrologic factors (USGS 2001). Three of the regions, the till plain, glacial lowland, and fluvial deposits, are defined primarily by glacial deposits while the remaining three, the bedrock upland, bedrock lowland and plain, and karst plain, are defined primarily by bedrock geology (USGS). The most intensively farmed regions in the White River Basin are the till plain, glacial lowland, and fluvial deposits.



*Figure 1.1 Environmental Inventory Map
(see Appendix A for full size copy)*

The White River Basin is part of the Mississippi River system and drains 11,350 square miles of central and southern Indiana. Major streams of the basin include the White River, WF White River, Eel River, and an extensive network of tributary streams and ditches. Streamflow leaving the basin enters the Wabash River, then the Ohio and Mississippi Rivers, and eventually reaches the Gulf of Mexico. Long-term average streamflow is about 12,300 cubic feet

Analysis/Subject Matter (continued)

per second near the White River's confluence with the Wabash River in southwestern Indiana (USGS 2001). Streamflow variation is seasonal (highest in April and May and lowest in late summer and fall) and moderate.

DEMOGRAPHICS

The median income for a household in Madison County in 2010 was \$38,772, and the median income for a family was \$52,319. About 13% of families and 18.5% of the population were below the poverty line in 2010, including 31.5% of those under age 18 and 9.4% for those aged 65 or over (U.S. Census Bureau). No detailed study of potential environmental justice populations was made and will likely be required during future studies. The median income for a household in Delaware County in 2009 was \$35,935.

The population within Madison County is 131,642 and within Delaware County is 117,671 (2010 data; U.S. Census Bureau). The two population centers within the project area in Madison County are the city of Anderson and the town of Chesterfield. Anderson is the county seat of Madison County, Indiana. The population of Anderson in 2010 was 56,129. Chesterfield is in Union Township and the population was 2,547 at the 2010 census. The town of Daleville is located in Salem Township, Delaware County, Indiana and had a population of 1,647 in 2010.

LAND USE/REAL ESTATE

Land use types within the project area include low, medium and high density development, developed open space, water, woody and emergent herbaceous wetlands, deciduous forest, shrub/scrub, pasture/hay, grassland and cultivated crops (Figure 2.2). Habitat types present in or nearby the project area include agriculture, aquatic systems, urban grasslands, barren lands, developed lands, forest lands and wetlands. Forest lands and wetlands are primarily concentrated along the West Fork White River throughout the project area.

Interstate 69 runs through the middle to eastern portion of the project area (Figure 1.1) just east of the Madison County/Delaware County boundary. A Conrail line runs at the southern portion of the project area south of Anderson. State Route (SR) 32 (Main St.) crosses the West Fork White River west of Chesterfield and continues east through Daleville. The Anderson Municipal Airport is located off SR 32 east of the West Fork White River between Anderson and Chesterfield.

Relocations are always a concern with the magnitude of a reservoir project; please refer to the section regarding relocation costs. At this time it is unknown whether the project would have a disproportionately high impact on low income or minority populations. The NEPA documentation phase will seek to identify potential environmental justice populations and determine the proportionality of the impacts.

As indicated above, a pool elevation of 875.0 is estimated to impact 628 parcels for a total of \$86,500,000. See Table 1.1. Out of the estimated 628 parcels, 552 parcels (400 residential/agricultural parcels and 152 business parcels) are located in Madison County. An additional 76 parcels (74 residential/agricultural parcels and 2 business parcels) are located in Delaware County. A 15% contingency was added to the assessed values to account for possible discrepancies between assessed values and actual market values. The 2011 median sales prices for resi-

Dam and Reservoir Feasibility Study					
Real Estate Analysis					
County	Parcel Quantity (Resid/Agricult)	Parcel Quantity (Business/ Industrial)	Parcel Quantity (Total)	County Assessed Values	Contingency (15%)
Madison	400	152	552	\$68,000,000.00	\$78,200,000.00
Delaware	74	2	76	\$7,200,000.00	\$8,300,000.00
TOTALS	474	154	628	\$75,200,000.00	\$86,500,000.00

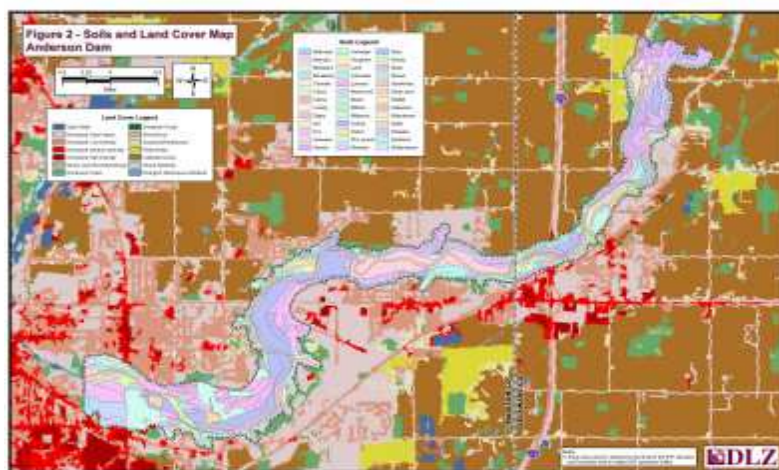
Table 1.1 Real Estate Analysis

Analysis/Subject Matter (continued)

dential properties in Madison and Delaware Counties were approximately \$75,000+/- . As commercial/industrial properties would typically be relatively higher in cost than residential, the attached numbers having average values of \$142,000 (Madison) and \$109,000 (Delaware) appear consistent to cover the additional costs for commercial/industrial, etc. Please note, as Madison County has substantially more commercial than Delaware County, it's consistent that the average price for Madison would be higher than Delaware.

SOILS

Soil survey information was obtained from the USDA Natural Resources Conservation Service Web Soil Survey. The soils that are predominant in the project area include: Brookston, Wawaka, Celina, Crosby, Genesee, Fox, Hennepin, Sloan and Miami silt loams, Ross loam and urban land on the Wawaka-Miami complex (Figure 1.2). Slopes are primarily 0 to 2 percent. The till plains are typically covered by 100 to 200 feet of silty-clay till interspersed with thin (5 to 10 feet) layers of sand and gravel. The relatively impervious till limits infiltration and promotes surface runoff. Tile drains are common in the till plain (USGS). Please refer to the Geotechnical Section of this report for more detailed summary of the soils.



*Figure 1.2 Soils and Land Cover Map
(see Appendix A for full size copy)*

STREAMS

The West Fork White River Drainage area at Anderson (USGS gage station #03348000; RM 293.27) is 406 square miles. Within the project area, 10 tributaries enter into the river – East Anderson Drain, Mary A. Cromer Ditch, Chesterfield Drain, James M. Donnelly Ditch, Ollie Pittsford Drain, Henry Bronnenberg Ditch, Turkey Creek, Laura Heath Drain, Pate Shoemaker Drain and Dona Van Ditch (Figure 1.1), with numerous unnamed watercourses also being present. Flows in the West Fork White River are typically the greatest in March and April during spring rains and snowmelt and lowest in the late summer and early fall. Flood stage is 10 feet at the Anderson gage; the highest recorded peak stage was 26.3 feet in March 1913 (USGS 2011).

The Clean Water Act and U.S. Environmental Protection Agency (USEPA) regulations require that states develop Total Maximum Daily Loads (TMDL) for all waters on the Section 303(d) lists. A TMDL is the sum of the allowable amount of a single pollutant that a waterbody can receive from all contributing point and nonpoint sources and still support its designated uses. The stretch of the West Fork White River that flows through the project area does appear on Indiana's section 303(d) list of impaired waters for failing to fully support the state's recreation use. Violations of the *Escherichia coli* standard were identified during surveys collected by IDEM in 1996 and 2001. *E. coli* is a bacterium that indicates the presence of human sewage and/or animal manure. It can enter rivers through direct permitted discharges, combined sewer overflows (CSOs), illicit and failing septic systems, and storm runoff carrying wastes from wildlife, domestic, and agricultural animals. *E. coli* is also an indication of the possible presence of other disease causing organisms or pathogens. Bacteria monitoring data is available for two locations in the WF White River within the project area. The stations and the monitoring data are available from the USEPA Storage and Retrieval of US Waters Parametric Data (STORET).

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Active NPDES permit near the project area includes Anderson Municipal Sewage Treatment Plant (downstream of site). Under Phase II of the NPDES storm water program, rules have been developed to regulate most Municipal Separate Storm Sewer Systems (MS4s) entities (cities, towns, universities, colleges, correctional facilities, hospitals,

Analysis/Subject Matter (continued)

conservancy districts, homeowner's associations and military bases) located within mapped urbanized areas or for those areas serving an urban population greater than 7,000 people. The following entities within the West Fork White River watershed located near the project area fall under the Phase II guidelines:

- Anderson
- Muncie
- Madison County
- Delaware County

The West Fork White River is not a federally designated scenic river but is classified as an outstanding river within the reach of the project area (segment from farmland to Wabash river confluence). In 1993, the Natural Resources Commission adopted its "Outstanding Rivers List for Indiana" and the listing was published in the Indiana Register as Information Bulletin #4 (16 IR 1677). Except where incorporated into a statute or rule (e.g., utility line crossings within floodways and general permits for logjam removals), the listing is intended to provide guidance rather than to have regulatory application (Indiana General Assembly). The West Fork White River qualified because it is a state designated canoe trail, the river has been identified by natural heritage program as having outstanding ecological importance and the segment was identified in the Nationwide Rivers Inventory (1982) by the National Park Service as being qualified for inclusion in the National Wild and Scenic Rivers System. Although the West Fork of the White River is designated as described above, at this time the project poses primarily secondary impacts, and mitigation if required should not be an issue but this will need to be verified in future phases.

WETLANDS

The wetlands within the project area are located primarily adjacent to the West Fork White River. Lacustrine, palustrine emergent, farmed, scrub-shrub and unconsolidated bottoms, and riverine wetland types are present. Wetland information was obtained from U.S. Fish & Wildlife Service National Wetland Inventory maps and are not considered to be completely accurate and should not be relied upon to make determinations of wetland locations, presence, size, or type without field verification.

As shown on Figure 1.1, the initial investigation has identified numerous areas of identifiable wetland areas. As stated above these too would be considered secondary impacts, mitigation on some of these areas will most surely be required, but should not be an issue, and would most likely follow the procedures and coordination as any other project of smaller size. Phase II should include wetland delineations, and coordination with the Army Corps of Engineers (ACOE) and IDEM on mitigation requirements for impacts to waters of the U.S.

GROUNDWATER

In this part of the state, surficial and buried sand and gravel, limestone, and dolomite bedrock aquifers are present. These zones are porous and allow free movement of groundwater. Most drinking water wells target these types of substrate. The major groundwater source is the basin of the West Fork White River. The highest estimated rate of recharge to aquifers in the West Fork White River basin is approximately 700,000 gallons per day per square mile and occurs in the White River and Tributaries Outwash Aquifer system (IDNR/DW). Infiltration due to direct precipitation is high because of the thinly developed soils that lie on thick, surficial sand and gravel. Groundwater quality ranges from fair to good.

IDEM confirmed that the project area is located within a Wellhead Protection Area (see letter). Numerous groundwater wells are present within project area (Figure 1.1). The City of Anderson obtains its public water supply from groundwater wells. The project area is not located within a Sole Source Aquifer (SSA); currently the only SSA present in Indiana is the St. Joseph system in the northern part of the state.

Groundwater does not appear to be an issue with this project. As stated above, the project area is located in Well Head Protection Area, but other reservoirs in Central Indiana have been built within these protection areas.

Analysis/Subject Matter (continued)

PARKS

Four parks were found to be located within the study area:

- Mounds State Park - located on the southern shore of the West Fork White River at 4306 Mounds Road. The park established in 1930, contains the mound building from the Adena-Hopewell people (see Historic Properties below) and the homestead of the Bronnenberg family, circa 1840. Mounds Fen Nature Preserve, managed by the Indiana State Parks and Reservoirs, is located within the Mounds State Park.
- Walbridge Acres Park - In 1890, the State Spiritualist Association purchased 30 acres of land north of Chesterfield for a campground. This park is now named the Walbridge Acres Park and is located off SR 32 in Chesterfield.
- Bicentennial Park - located north of Daleville off of West Hilltop Circle adjacent to a residential neighborhood.
- Rangeline Preserve - is located at the former Vulcan Materials gravel pit on the northern shore of the West Fork White River at 1200 S. Rangeline Road. The 180 acre nature area includes a range of vegetation, topography, and water amenities and has several mountain bike trails.

The park areas may present a unique challenge as these areas are usually set aside to be protected, and in most cases have clubs or organizations that are sensitive to disturbing or impacting the areas. Mounds State Park presents a separate set of issues as Native American artifacts and possible burial grounds exist throughout the area. Impacts to this park may be able to be minimized depending on the proposed water elevation of the reservoir. Archaeological exploration may be required, and extensive coordination with the tribes and State Historic Preservation Officer would be anticipated during the NEPA phase.

ENDANGERED, THREATENED AND RARE SPECIES AND HIGH QUALITY NATURAL COMMUNITIES/AREAS

A request was made to the Indiana Natural Heritage Data Center (IDEM) for information on the endangered, threatened, or rare species documented within the project area. Results of the request can be found in Appendix A. Two Federally listed mollusks have been documented within the project area; the clubshell (*Pleurobema clava*) and the northern riffleshell (*Epioblasma torulosa rangiana*). Mussel surveys would need to be performed prior to any project work taking place to determine their live presence within the river segment of the proposed project. The Federally endangered Indiana bat (*Myotis sodalis*) is also listed in Madison County. Likely habitat occurs within the project area (wooded stream corridors and bottomland and upland forests and woods) and would need to be confirmed prior to initiation of the project.

Of the state listed species, three dragonflies are documented near the project area. Because these species are mobile as adults they would not likely be impacted. The remaining state listed species are plant species and a plant survey would need to be performed to confirm their presence.

The presence of potential high quality natural communities and natural areas within the project area was also requested from IDEM. A wetland fen is documented in the Mounds Fen Nature Preserve and mesic upland forest is present at Mounds State Park.

After reviewing the protected species list, it is almost certain that there will be impacted species in a project area this size. At this stage of the investigation nothing is present that would appear to prevent the next phase of this project from going forward. It is anticipated that a survey would need to be completed and some species may be required to be relocated as mitigation.

HISTORIC PROPERTIES AND ARCHAEOLOGICAL RESOURCES

Mounds State Park features 10 unique earthworks built by prehistoric Indians. The Adena first inhabited the site around 1,000 B.C. and built several of the mounds. Later cultures, such as the Hopewell, used the earthworks for burial purposes in addition to using them for gathering places for religious ceremonies, from where astronomical

Analysis/Subject Matter (continued)

observations could be made. The largest earthwork, the Great Mound, is believed to have been constructed around 160 B.C. (IDNR). As noted in the preceding paragraphs it is unlikely that any direct impact to known Native American burial sites will be permitted. However, other areas typically can be permitted to be inundated after an archaeological investigation, and possible excavation, if warranted, of artifacts. An archaeological survey may be required for the next phase if the extent of burial ground is not fully verified. In the next phase it will also be imperative that outreach include the tribes referenced above as their official approval may be required.



Mounds State Park

Bronnenberg Cemetery, located north of the airport off of SR 32, was established in 1836 and sits on about 4 acres adjacent to the White River. There are no historic bridges known within the project area; two are located downstream in Anderson. No other historic landmarks appear to be within the project area; however any structure older than 50 years may be eligible for the National Register of Historic Places as long as it fulfills the criteria for evaluation (including age, integrity and significance).

ENVIRONMENTAL

Potential environmental concerns include an old landfill, an industrial waste site, construction demolition waste and a Brownfield site that are present within the project area boundaries (Figure 1.1). Specific requests for an area this large would be difficult without potentially divulging the project location, therefore information related to underground or aboveground storage tanks is unknown. It is reasonable to assume that a number of both could be present and would need to be removed and remediated, if necessary, prior to the project moving forward.

Herbicides dominate pesticide use in the White River Basin. Herbicides are applied during spring planting to virtually all of the corn and soybean crop and its use on corn accounts for about 70 percent of the total agricultural use of pesticides in the basin (USGS). Insecticides are applied during the summer to about 25 percent of the corn crop but typically are not applied to soybeans. About 96 percent of the total agricultural pesticide use is herbicide and insecticide use on corn and soybeans. Fungicide and insecticide use on apples, tomatoes, and watermelons (2.2 percent of use) and herbicide use on wheat, pasture, and hay (1.0 percent of use) accounts for most of the remaining agricultural pesticide use (USGS). Nonagricultural use of pesticides in the White River Basin is not as well documented but typically insecticides account for a larger percentage of the total amount of pesticides used in urban areas than in agricultural areas.

Further review on environmental concerns should be made during an Initial Site Assessment (ISA) which will be performed to identify known and potentially contaminated sites within the project area. The ISA will include a review of aerial photographs, field visits, and a search of several regulatory databases. As part of the ISA, all known and potentially contaminated sites will be identified.

PERMITTING AND AGENCY COORDINATION

Due to the confidential nature of the project, the inventory of existing information and potential permitting issues was limited. Typically once issues are identified we are able to contact regulatory agencies to discuss specific permit requirements. Since this is a unique project with impacts that will require discussion with numerous regulatory agencies and those discussions could not be held, the list of potential permits and approvals below is provided based on our past experiences and expectations and will need to be confirmed and possibly expanded as the project moves forward. At a minimum, we would expect the following approvals and/or coordination to occur:

Analysis/Subject Matter (continued)

- When a project is planned in Indiana that will impact a wetland, stream, river, lake, or other Water of the U.S., the Indiana Department of Environmental Management (IDEM) must issue a Section 401 Water Quality Certification (401 WQC). A Section 401 WQC is a required component of a federal permit and must be issued before a federal permit or license can be granted.
- For the scale of this project, the proposed impacts to the wetlands will require authorization under a federal 404 permit, issued by the United States Army Corps of Engineers (COE) following the 401 WQC by IDEM. The COE Individual Permit (IP) is used for projects proposing extensive impacts or impacts to rare or special aquatic types. Generally speaking, the COE IP is always used for projects that propose impacts equal to or greater than one (1) acre of wetland or stream. Individual Permits require the evaluation of COE applications under a public interest review and the environmental criteria set forth in the Clean Water Act Section 404(b)(1) Guidelines.
- If isolated wetlands exist (those wetlands not regulated under the federal Clean Water Act), then these wetlands are regulated under Indiana's State Isolated Wetlands law. Impacts to isolated wetlands require State Isolated Wetland Permits from IDEM.
- Construction/Land Disturbance Storm Water Permitting (327 IAC 15-5, Rule 5) from IDEM is required from all persons who are involved in a construction activity (which includes clearing, grading, excavation and other land disturbing activities) that results in the disturbance of one (1) acre or more of total land area. If an adverse environmental impact from a project site is evident, a Rule 5 permit or, in more significant situations, an individual storm water permit may be required. An individual storm water permit is typically required only if IDEM determines the discharge will significantly lower water quality.
- Coordination with IDNR- Division of Water for Construction in a Floodway permit; they review of all dam projects.
- Drinking water permits may be necessary from both IDEM and USEPA if the reservoir will be used for public drinking water supply.
- Endangered, Threatened and Rare species presence will need to be coordinated with Christie Stanifer, Environmental Coordinator, Division of Fish and Wildlife and consultation with U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act. Additional review may be necessary from the Environmental Review Coordinator at the Department of Natural Resources.
- Coordination with Indiana Division of Historic Preservation and Archaeology would be necessary once the project was initiated to determine potential impacts on historic and archaeological resources. This will also require a detailed inventory of potential historic properties and verification of the impact to known or suspected archaeological resources. Extensive coordination with the Native American community will be essential.
- We would anticipate clearance to be required under the National Environmental Policy Act (NEPA) given the potential number of Federal agency approvals required. Given the context and intensity of the impacts, it is likely that an Environmental Impact Statement (EIS) and Record of Decision (ROD) are the appropriate NEPA documentation. This will need to be verified once the agencies are contacted and discussions held regarding which agency will be the lead and which would be cooperating agencies. Information gathered during an EIS generally identifies all permits required for a project.
- Coordination with the U.S. Department of Agriculture to determine is prime and unique farmland would be impacted will be required.

LIMITATIONS STATEMENT

This initial ecological assessment has been prepared for the exclusive use of the Anderson Corporation for Economic Development for the Dam and Reservoir Feasibility Study Project. The report may not contain sufficient information for other parties or other uses. This evaluation is preliminary and continued progress towards construction of a dam and reservoir will require additional studies, reports, and coordination.

Analysis/Subject Matter (continued)

CONCLUSION

There are many obstacles and issues that present themselves from an environmental and permitting prospective, however, at this stage of the investigation there does not appear to be any fatal flaws to prevent the project from moving onto the next phase. This next phase would include the necessary coordination with regulatory and resource agencies and NEPA documentation.

REFERENCES

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