

Project Technical Memorandum

Project Name:	City of Springfield, Springfield Supplemental Water Supply Project
Project Number:	325216041.02.01
Date:	September 2016
To:	Ted Meckes, City of Springfield, CWLP Jim Kelley, USACE Rock Island District
Subject:	Data Gap Review

Prepared by:	W. Elzinga
Checked by:	K. Boulware

1.0 Introduction

The United States Army Corps of Engineers (Corps) intends to prepare a Supplemental Environmental Impact Statement (SEIS) to address the proposed Springfield Supplemental Water Supply Project in Sangamon County, IL. The Corps, working in conjunction with the City of Springfield, Office of Public Utilities, also known as the City Water, Light & Power (City), is preparing a supplement to the previously prepared Environmental Impact Statement (EIS) in accord with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et. seq.). This Supplemental EIS (SEIS) is intended to evaluate environmental impacts associated with a range of alternatives considered to provide a supplemental water supply to meet a projected deficit in water availability. In conjunction with the SEIS, the City has undertaken an update to the water demand analysis, threatened and endangered species bat surveys, wetland delineations, programmatic agreement related to cultural resources, water quality anti-degradation analysis, and mitigation plans.

This memorandum is a summary of the review of previously collected information, prior reports and available data and its sufficiency for use in preparing the SEIS. Notably, this memorandum does not fully reflect the content of scoping comments that may be issued by regulatory and resource agencies, as this process is on-going.

This review is one task in the larger effort to prepare a SEIS for the above-referenced project. Its purpose is to support the NEPA analysis in conjunction with the project and identify other outstanding gaps that may need to be addressed to provide a complete analysis of the potential environmental impacts of the proposed alternatives under consideration.

2.0 Methods

This data gap analysis is based upon a review of available information, an understanding of the proposed action and the alternatives and assumed expectations regarding the outcome of supplemental studies currently being undertaken. This assessment is also predicated upon the availability of typical data sources obtained from internet sources and from unpublished data readily obtainable from other resource agency files.

The level of detail of data for use by the team in preparation of the SEIS is expected to be consistent with that required in accordance with standard impact assessment methodologies.

Such data are required to adequately characterize the affected environment and arrive at a defensible and logical conclusion as to the basis of environmental impact for each of the alternatives under consideration.

In support of this data gap analysis, numerous previously prepared documents pertaining to the alternatives under consideration were compiled and reviewed (Table 1). Reports consisted of those originally used in support of the FEIS and those that had been prepared subsequently. General topics covered by these documents included the following:

- Water yield of existing sources and water demand.
- Water resource information (surface water and groundwater).
- Preliminary plans, concepts and evaluations related to supplemental water supply alternatives (Illinois River well systems, Havana Lowlands well systems, Sangamon Valley well systems, Gravel Pit water supply systems, Hunter Lake, Lick Creek).
- Preliminary plans, concepts and evaluations related to the Joint Sewer Pipeline Project (Pawnee-Divernon-Virden).
- Evaluations of environmental impacts related to supplemental water supply alternatives (Illinois River well systems, Havana Lowlands well systems, Sangamon Valley well systems, Gravel Pit water supply systems, Hunter Lake, Lick Creek).
- Wetland delineation survey of the Hunter Lake project area.
- Cost evaluations and associated cost updates.
- Mineral resources impact evaluations for Hunter Lake.
- Socioeconomic impact evaluations of Hunter Lake.
- Cultural resource assessments of the Hunter Lake area.

In addition to the reports previously prepared in support of the Springfield Supplemental Water Supply Project, Amec Foster Wheeler will incorporate data obtained from resource agency files and from internet sources. Resource agency file information to be obtained includes the following:

- Records of historic properties and cultural resource sites on the Historic and Architectural Resources Geographic Information System (HARGIS) to supplement those included in the FEIS.
- Records of state-listed endangered species available from EcoCAT and from direct consultation with the Illinois Department of Natural Resources.
- Records of federally listed endangered or threatened species or of recorded occurrences of bald eagle available from the Information for Planning and Conservation (<http://ecos.fws.gov/ipac/>) (IPaC) and from direct consultation with the U.S. Fish and Wildlife Service.

Internet sources of data and information to support the characterization of the affected environment and the assessment of environmental impacts are also available for use in preparing the SEIS. Table 2 represents a list of typical internet reference web sites and their

associated data that Amec Foster Wheeler will consult as appropriate to obtain up to date resource data for use in preparation of the SEIS.

3.0 Results and Recommendations

Table 3 provides a summary of the review of available reports and data and their sufficiency for use in completing the SEIS. In general much of the required information is available and can be readily used to describe the alternatives under consideration and assess their potential effects on the environment. However, several important issues and resources are noted below to require additional development and analysis:

- *Water Demand.* Water demand is a key element of development of the overall project need and a technical review of the prior water demand study has identified a number of key inputs that must be addressed to establish a defensible project Purpose and Need. Additional input is required to support the following:
 - -Basis for 5% growth rate in demographic based demand
 - -Basis for future water demands by Dallman Station (Coal Combustion Residuals Rule (CCR Rule) and Effluent Limitations Guidelines (ELG) related reductions as well as unit retirement)
 - -Basis for additional wholesale water use growth in future
 - -Additional calculations/estimations of water demand by future medical facilities and other industrial/commercial growth in future
- *Recreational Need.* Information is currently sparse regarding the basis for and intensity of the need for additional regional outdoor recreation. Additional information will be developed by working with the City and IDNR.
- *Water Yield.* Water yield is another key element in the development of the project need. The 1998 Knapp study provides an analysis of the overall yield of the Springfield water supply system under different operational scenarios. The study factors in effects of Lake Springfield sedimentation rates. Information from Knapp can be used and projected to a common design year (2065, 50-year design life). However, information concerning current and projected forced evaporation as well as use of the pump station on South Fork of the Sangamon River will be developed by working with the City.
- *Development of the Sangamon Valley Well System Alternative.* This alternative has been subject to an evolution of configurations beginning with the original configuration of multiple clusters in the original FEIS to the revised configuration of 3 clusters coupled with gravel pit development in the 2008 CMT study. Subsequent to the 2008 CMT study, a review of gravel pit yield and associated impacts on adjacent well systems has demonstrated that gravel pits are limited in their ability to produce water for supplemental use. Use of the 1998 configuration is further complicated by the establishment of new wells by the South Sangamon County Water Commission to provide water for the community of Chatham. The Sangamon Valley well system configuration has the potential for scalability and application either alone or in combination with other alternatives. As

such, the Team needs to make decisions regarding well configuration and environmental impacts based upon the varying configurations between the 1998 CMT configuration and the revised 2008 CMT configuration.

- *Development of the Hunter Lake Alternative.* Abundant information exists in support of the description and analysis of the Hunter Lake alternative. However, several key issues have been identified:
 - Recent analyses have been performed using detailed topographic mapping that have resulted in a change in the estimated volume of Hunter Lake. An extension of that analysis should be performed to provide a revised estimate of water yield for use in the SEIS.
 - Some discussions and concepts have been developed conceptually to modify the Hunter Lake alternative to consist of a smaller lake with increased BMPs in tributaries, and in-watershed wetland creation. Such a configuration must be detailed to clarify a range of factors including operational pool level, cost, type and extent of BMPs in tributaries and surrounding watershed, changes in the need for bridge reconstruction, and other changes as appropriate.
- *Groundwater Withdrawal System Impact Assessment: Havana Lowlands and Illinois River.* Assessment of potential lateral effects of Havana Lowlands and Illinois River Well systems must be undertaken to evaluate impacts on other groundwater users as part of the SEIS.
- *Groundwater Quality: Havana Lowlands Well System.* Although database searches regarding water quality in the Havana Lowlands has not identified water quality issues, recent discussions with Rick Cobb of IEPA have suggested that nitrates may be an issue in some areas within the region. Follow on discussions and a meeting with Rick Cobb are recommended to further understand water quality in the vicinity of the Havana Lowlands Well System.
- *Water Quality Impact Analysis of Hunter Lake.* Supplemental studies/analyses are expected to be required to develop a model to evaluate the effect of Northwater loading projection both WITH and WITHOUT BMPs in Hunter Lake.
- *Sensitive Species.* Note: It is expected that resource agencies will provide comments regarding sensitive species and their habitats. Other than the bat netting survey no additional field studies are expected. However, some agency concerns may require specialized habitat assessment surveys. Such additional needs are the subject of on-going agency consultation.
- *Lick Creek Alternative.* As detailed topographic mapping resulted in the change in the estimated volume of Hunter Lake, the Team needs to decide if this analysis would also impact the estimated volume in the Lick Creek Reservoir, and if the estimate of water yield should be revised.

Table 1. List of Prior Reports and Studies

Author	Year	Title
Ahler, S.R., J.E. Clifton, E.R. Hajic, F. Mansberger, R. Mazrim, T. Sculle	1994	Cultural Inventory of the Hunter Lake Area, A Proposed Reservoir Impoundment in Sangamon County, Illinois. Illinois State Museum Technical Report Number 92-609-7. 30 pp. plus Appendices.
Anliker, Mark A.	1996	Report on the Impacts on Local Ground-Water Levels at Two Locations by the Proposed Hunter Lake. ISWS Letter Report.
Anliker, Mark A.	1996	Phase I: Study of Potential Ground-Water Resources For Springfield, Task 2: Sangamon River Valley. Illinois State Water Survey.
Anliker, Mark A. and Dorothy M. Wollner	1997	Phase I: Study of Potential Ground-Water Resources For Springfield, Task 4: Havana Lowlands. Illinois State Water Survey.
Anliker, Mark A. and Dorothy M. Wollner	1998	Potential Ground-Water Resources for Springfield, Illinois. Illinois State Water Survey.
Anliker, Mark A., Ellis W. Sanderson and Dorothy M. Wollner	1997	Phase I: Study of Potential Ground-Water Resources For Springfield, Task 3: Illinois River Valley West of Jacksonville. Illinois State Water Survey.
Borah, Deva K., Raman K. Raman, Shun Dar Lin, H. Vernon Knapp, and T.W. David Soong	1997	Water Quality Evaluations for Lake Springfield and Proposed Hunter Lake and Proposed Lick Creek Reservoir. Illinois State Water Survey, Contract Report 621.
Broeren, Sally M. and Krishan P. Singh	1989	Adequacy of Illinois Surface Water Supply Systems to Meet Future Demands. Illinois State Water Survey
CDM Smith	2015	CWLP Water Demand Analysis
Crawford, Murphy & Tilly, Inc.	1980	City of Springfield Report on Study of Sangamon River as Auxiliary Water Supply Source.
Crawford, Murphy & Tilly, Inc.	1994	Engineering Study for John H. Hunter Lake Hunter Lake Reservoir Area Roadway Network Plan.
Crawford, Murphy & Tilly, Inc.	1998	City of Springfield, Illinois, City Water, Light and Power Water Supply Alternatives Feasibility Study-Gravel Pit Withdrawal System.CMT89026-09
Crawford, Murphy & Tilly, Inc.	1998	City of Springfield, Illinois, City Water, Light and Power Water Supply Alternatives Feasibility Study-Illinois River Well System.
Crawford, Murphy & Tilly, Inc.	1998	DRAFT: City of Springfield, Illinois, City Water, Light and Power Water Supply Alternatives Feasibility Study-Havana Lowlands Well System.
Crawford, Murphy & Tilly, Inc.	1998	City of Springfield, Illinois, City Water, Light and Power Water Supply Alternatives Feasibility Study-Sangamon River Valley Wells.
Crawford, Murphy & Tilly, Inc.	2004	Preliminary Investigation of the Feasibility of Pumping Virden, Divernon and Pawnee Wastewater to the Springfield Metro Sanitary District.
Crawford, Murphy & Tilly, Inc.	2008	Preliminary Plan to Develop a Sangamon River Valley Backup Water Supply.

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Author	Year	Title
Crawford, Murphy & Tilly, Inc.	2015	Water Supply Alternatives Feasibility Study, Illinois River Well System. Cost Update of April 1998 Study. CMT 14026-01
Crawford, Murphy & Tilly, Inc.	2015	Water Supply Alternatives Feasibility Study, Havana Lowlands Well System. Cost Update of April 1998 Study. CMT 14026-01
Fitzpatrick, W.P. and H. V. Knapp	1991	Drought Yields of Lake Springfield and Hunter Lake. Illinois State Water Survey, SWS Contract Report 515.
Hanson Engineers Incorporated	1993	Hunter Lake Dam. Upstream and Downstream Flood Studies. Prepared for City Water, Light and Power, Springfield, IL. 175 pp.
Hanson Engineers Incorporated	1993	Hunter Lake Dam. Hunter Lake -South Fork Model. Downstream Reach Flood Study. Prepared for City Water, Light and Power, Springfield, IL.
Hanson Engineers Incorporated	1997	Wetlands Survey of the Hunter Lake Project Area. Project No. 89S3040C
Hanson Engineers Incorporated	1998	Evaluation of Significant Environmental Impacts Associated with Alternative Water Supply Sources & Pipelines.
Hanson Engineers Incorporated	1998	Springfield Supplemental Water Supply Project, Raise Lake Springfield Normal Pool Alternative.
Hanson Engineers Incorporated	1998	Evaluation of Significant Environmental Impacts Associated with Lick Creek Reservoir.
Hanson Engineers Incorporated	2005	Evaluation of Environmental Impacts Associated with Joint Sewer Pipeline and Horse Creek Channel Modifications at Pawnee.
Hanson Engineers Incorporated	2014	Hunter Lake Construction Cost Estimate- Updated to 2014 Dollars
Hanson Engineers Incorporated	2016	Revised Volume Analysis for Hunter Lake
Illinois Natural History Survey	1992	Hunter Lake Environmental Studies. Illinois Natural History Survey, Champaign, IL. 6 Sections.
Illinois Natural History Survey, U.S. Fish and Wildlife Service, and Illinois Department of Conservation	1992	Habitat Evaluation Procedures Applied to the Proposed Hunter Lake (Lake II) Sangamon County, Illinois. 43 pp. plus Appendices.
Knapp, H. Vernon	1998	Operation Alternatives for the Springfield Water Supply System and Impacts on Drought Yield. Illinois State Water Survey, Contract Report.
Layne Hydro	2012, 2013	Potential Yield of Gravel Pits in the Sangamon River Valley, 2012 Refinement of 2012 Estimates, August 2, 2013
Nonini, L.G. and J.J. Stevenson	1990	Mineral Resource Impacts Study for Hunter Lake Reservoir Site, Sangamon County, Springfield, Illinois. U.S. Bureau of Mines, Minerals Environmental Document. 15 pp.

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Author	Year	Title
PB Booker Associates	1998	Regional Recreational Potential of the Proposed Hunter Lake Sangamon County, Illinois.
Springfield-Sangamon County Regional Planning Commission	1992	Socio-Economic Impact Evaluation of Hunter Lake.

Table 2. List of Internet Data Sources and Agency File Information

<p>General Map Information</p> <p>http://www.epa.gov/oecaerth/nepa/nepassist-mapping.html NEPAssist</p> <p>http://www.mrlc.gov/nlcd2011.php GIS Land Use/Land Cover</p> <p>http://gis1.usgs.gov/csas/gap/viewer/land_cover/Map.aspx The National Map Land Cover</p> <p>http://www.fws.gov/wetlands/ NWI wetlands, interactive mapping tool</p> <p>http://www.epa.gov/emefdata/em4ef.home USEPA enviomapper site—hazardous waste sites, air, water, land, and more</p> <p>http://soils.usda.gov/survey/printed_surveys/ USDA NRCS soil surveys on line</p> <p>https://www.npms.phmsa.dot.gov/PublicViewer/ National Pipeline map viewer</p>	<p>Waste Databases (Air/Water/Waste)</p> <p>http://www.epa.gov/enviro/index.html Envirofacts</p> <p>http://www.epa-echo.gov/echo/ USEPA Environmental Enforcement and Compliance History Online</p> <p>http://www.epa.gov/enviro/html/rcris/rcris_query_java.html RCRA Site Search</p> <p>http://www.epa.gov/enviro/html/cerclis/cerclis_query.html CERCLIS Site Search</p> <p>http://www.epa.gov/tri/ Toxic Release Inventory System database</p> <p>http://www.epa.gov/enviro/html/pes/pes_query_java.html NPDES permit database</p> <p>http://www.epa.gov/superfund/sites/rods/ Record of Decision database</p>
<p>Biology/Endangered Species</p> <p>http://www.fws.gov/endangered/ USFWS Endangered Species</p> <p>http://www.nmfs.noaa.gov/pr/species/ NMFS Endangered Species, Commercial fisheries info, etc.</p> <p>http://www.fws.gov/endangered/species/recovery-plans.html Recovery Plans</p> <p>http://dnr.state.il.us/espb/ Illinois Endangered Species</p> <p>http://www.dnrecocat.state.il.us/ecopublic/ Illinois EcoCat Ecological Compliance Assessment Tool</p> <p>https://www.dnr.illinois.gov/conservation/BiologicalStreamratings/Pages/default.aspx Illinois Stream Classification System</p> <p>http://www.mvr.usace.army.mil/Missions/Regulatory/Stream-Mitigation/ Illinois Stream Mitigation Method</p>	<p>Water Resources and Floodplains</p> <p>https://msc.fema.gov/portal FEMA FIRM maps</p> <p>http://maps.isgs.illinois.edu/ilwater/ Illinois groundwater mapper</p> <p>http://www.illinoisfloodmaps.org/ FEMA Flood Insurance Rate maps</p> <p>http://nld.usace.army.mil/egis/f?p=471:32:12723574719334:LOAD_SEARCH:NO:32 Federal Levees</p> <p>http://www.nps.gov/ncrc/programs/rtca/nri/index.html Nationwide Rivers Inventory (NRI)</p> <p>http://www.rivers.gov/index.php National Wild and Scenic Rivers</p>

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<p>Geologic Data http://www.isgs.illinois.edu/?q=ilmines Illinois Coal Mines</p> <p>http://maps.isgs.illinois.edu/iloil/ Illinois Oil and Gas mapper</p> <p>http://iledi.org/ppa/index/AUTHOR_Illinois_Illinois_State_Geological_Survey_1.html ISGS Electronic Documents, various</p>	<p>Air http://www.epa.state.il.us/air/air-quality-report/ Illinois Air Quality Report</p>
<p>Economic/Census Data http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml US Census Data</p> <p>http://quickfacts.census.gov/qfd/states/17/17119.html US Census Quick Facts</p> <p>http://www.bls.gov/bls/proghome.htm Bureau of Labor Statistics</p> <p>http://www.bls.gov/data/#unemployment Local Area Unemployment Statistics, Bureau of Labor Statistics</p> <p>http://www.census.gov/econ/ US Census Bureau Economic Census</p> <p>http://www3.epa.gov/environmentaljustice/ Environmental Justice</p>	<p>Noise http://sengpielaudio.com/calculator-distance.htm Simple noise attenuation calculator</p> <p>http://www.masenv.co.uk/noisecalculator2 Noise barrier_attenuation calculator</p> <p>http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm Noise emission levels</p>
<p>Other Socioeconomic http://co.sangamon.il.us/departments/m-r/regional-planning-commission/program-areas/zoning-land-use-planning Sangamon County Zoning and Land Use Planning</p>	<p>Cultural Resources http://gis.hpa.state.il.us/hargis/ Illinois Historic Preservation Agency</p> <p>http://www.nps.gov/nr/research/ National Register database</p>



Table 3. Summary of Data Sufficiency for Use in Preparation of SEIS

Chapter/Section	Key Data Inputs (beyond FEIS 2000 and supporting documents)	Source Documents/Data	Data Sufficient (Y/N)	Description of Gap
Chapter 1: Purpose and Need				
Need for water	Water yield and demand analyses	Fitzpatrick and Knapp_1991_Drought Yields Knapp_1998_Operational Alternatives for the Springfield Water Supply System and Impacts on Drought Yield CDM Smith 2015 Springfield Water Demand Study Additional municipal contract agreements; ISWS_1997_CR-621 ISWS_1998_CR-626 Operational Alternatives	N	Additional input required to support the following: -Basis for 5% growth rate in demographic based demand -Basis for future water demands by Dallman Station (CCR and ELG related reductions as well as unit retirement) -Basis for additional wholesale water use growth in future -Additional calculations/estimations of water demand by future industrial use (medical facilities, etc.)
Supplemental need for recreation	Recreation	Booker_1998_Regional Recreational Potential of The Proposed Hunter Lake IDNR_2015_ILStatewide Recreational Plan	N	Need update of regional recreational needs
Chapter II: Alternatives				
No Action Alternative	Base condition characteristics regarding water yield and demand in consideration of conservation measures.	Incorporation of base reports and estimates of yield and demand from Purpose and Need analysis above Include characterization of water conservation measures and incentives from CWLP.	Y	
Gravel Pit Alternative	Updated hydrogeological assessment of gravel pit yield and potential effects on municipal well fields	CMT_1998_Water Supply Alts-FS-Gravel Pit Water Withdrawal System Layne Study_2013 --Pump Test and Model/Gravel Pit Analysis	Y	AmecFW review completed.
Sangamon Valley River Wells Alternative	Yield potential and configuration	CMT_1998_Water Supply Alternatives FS_Sangamon River Valley Wells CMT_2008_Preliminary Plan to Develop a Sangamon River Valley Backup Water Supply	N	This alternative has potential for scalability and application either alone or in combination with other alternatives. As such, the Team needs to make decisions regarding well configuration and environmental impacts based upon varying configurations between the 1998 CMT configuration and the revised 2008 CMT configuration.



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Havana Lowlands Well Field –design details	Well field location, pumping schematic, transmission main pipeline location Groundwater water quality	CMT_1998_Water Supply Alternatives FS_Havana CMT_2014_Havana figures CMT_2015_Havana Lowlands 14026-01	N	Has schematic of well placement and drawdown, but does not have horizontal impact zone of well operation on groundwater Water quality issues related to nitrates need to be resolved
Illinois River Well Field - design details	Well field location, pumping schematic, transmission main pipeline location	CMT_2014_Illinois River Well Figures CMT_1998_Water Supply Alts - IL River Well System CMT_2015_Cost Update of 1998 FS_Illinois River Wells 14026-01	N	No impact analysis of water drawdown on Illinois River Inadequate impact analysis of effect on other Illinois valley production wells
Lick Creek Reservoir Alternative	Lake configuration, size, cost	Hanson_1998_Eval of Significant Env Impacts Assoc with Lick Creek Reservoir	N	Potential for change in water yield based upon updated topographic information.
Hunter Lake Alternative	Lake configuration, size, cost	CMT_1994_Eng Study-Hunter Lake Area Roadway Network Plan Hansen_2014_FINAL Cost Estimate	Undetermined	Note: potential modification of proposed plan for smaller lake, increased BMPs in tributaries, wetland creation, etc. needs to be understood to fully assess project cost, yield and impacts
	Water quality and capacity to meet P standard	Northwater_2017_Watershed Loading Analysis	Undetermined	Need to consider scope of analysis and potential effects on reconfiguration of Hunter Lake alternative
	Joint Sewer Pipeline Project elements	CMT_2004_Feasibility of Pumping Virden-Divernon-Pawnee WW to Springfield District Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline	Y	
Springfield Lake Dredging Alternative	Volume of sediment to be dredged from Lake Springfield, estimated cost, and sedimentation detention area; Description of previous dredging efforts, volume, sediment detention area, and cost for comparison purposes	CWLP will provide information on Dredging Alternative	Y	Alternative expected to be eliminated in preliminary screening based on cost. CWLP to provide further information to describe alternative, size and availability of existing disposal area. Env. Impacts expected to be addressed in high-level narrative form only



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All Alternatives:	Cost Estimates of Alternatives Water conservation	Cost Analysis CMT_2015_Cost Update of 1998 FS_14026-01 (IL River well fields only) CMT_2015_Havana Lowlands 14026-01 Hunter Lake Cost Estimate - Updated to 2014 Dollars	N	See recommendations in technical memorandum regarding cost estimates Work with City to quantify potential water savings from conservation measures and leak detection program to reduce unaccounted water losses.
Phase III /IV- Draft SEIS and Supporting Documents				
Chapter 3 & 4: Affected Environment / Environmental Consequences				
Socioeconomic/Human Resources <i>Any more current information below? Current Reports are all 1992, 1998, or 2005</i>				
Demographics	Population statistics, low income/minority populations	Internet sources: USCB; Regional Planning Comm_1992_Socio-Economic Impact Eval.pdf	Y	
Land Use	Land use/ land cover	NLCD/ GIS; Pedestrian survey by Northwater and AmecFW;	Y	
Community Facilities and Services	Community facilities/services related to emergency services (police, fire, ambulatory), educational facilities, etc.	Internet sources Regional Planning Comm_1992_Socio-Economic Impact Eval.pdf	Y	
Transportation	Impact on transportation network	IDOT traffic count data	Y	
Recreation	Recreational needs and opportunities	1998 PB Booker Associates Recreational Potential Study; Statewide Recreational Plan; Sangamon County Comprehensive Plan Regional Planning Comm_1992_Socio-Economic Impact Eval.pdf	Y	
Agricultural Lands	Prime farmland, farmland of statewide importance, farm operations, leasing	NRCS soil survey (internet sources: NLCD, USDA-NRCS/ GIS), farm leasing operations from CWLP Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline	Y	Additional discussions needed with CWLP regarding leasing terms



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Cultural Resources	Update archival information on cultural resources; Update Programmatic Agreement	IHPA HARGIS; 1994 Cultural Inventory of the Hunter Lake Area; 1999 Programmatic Agreement Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline	Y	
Natural Resources <i>Any more current information below? Current Reports are all 1992, 1998, or 2005</i>				
Natural Divisions	ISGS Physiographic Regions, INHS Natural Divisions	INHS Editor_1992_EA of Hunter Lake Area Internet sources (ISGS/INHS)	Y	
Geology	Geologic conditions, mineral resources, aquifer characteristics, etc.	Anliker and Woller_1998_Potential GW Resources Nonini and Stevenson_1990_Minerals Environmental Report-Hunter Lake	Y	
Prime Farmland	Prime farmland, farmland of statewide importance, farm operations, leasing	NRCS soil survey (internet sources: USDA-NRCS/ GIS) INHS Editor_1992_EA of Hunter Lake Area	Y	
Vegetation	Plant community characteristics and composition, natural areas, important plant community associations	INHS Editor_1992_EA of Hunter Lake Area; AmecFW field review	Y	
Wildlife	General wildlife composition and characteristics.	INHS Editor_1992_EA of Hunter Lake Area, AmecFW field review	Y	
Sensitive Species	Federal and state listed species of concern. Bald eagle occurrences.	Consultation with IDNR/USFWS AmecFW_2016_Bat Surveys Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline AmecFW desktop analysis and field reconnaissance of habitats	Y	Note: It is expected that resource agencies will provide comments regarding sensitive species and their habitats. Other than the bat netting survey no additional field studies are expected. However, some agency concerns may require specialized habitat assessment surveys. Subject to consultation.
Aquatic Ecology	Fish and benthic invert	INHS Editor_1992_EA of Hunter Lake Area	Y	



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Water Quality	Nutrient loading; average and seasonal hydraulic residence time; sediment load / turbidity; hydrologic inputs / reservoir fluctuation; final plan for lake depth	Northwater_2017_Pollutant Loading Analysis--Hunter Lake HECRAS Modeling	N	<p>It is assumed, without knowing what Northwater's scope, approach, etc., that their report will provide the information needed to address the primary water quality concerns, which are assumed to include nutrient loading.</p> <p>However, supplemental studies/analyses are expected to be required to develop a model to evaluate the effect of Northwater loading projection both WITH and WITHOUT BMPs</p> <p>Obtain current information regarding potential nitrate issue in groundwater at Havana Lowlands</p> <p>Reference to HEC-RAS presumed to be a reference to downstream channel sediment transport (not other intended use for HEC-RAS related to floodplain impacts)</p>
Wetlands	Jurisdictional limits of waters of the US	Updated Hunter Lake Delineation--AmecFW Windshield confirmatory survey of alternatives—AmecFW Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline	Y	
Floodplains	100-year floodplain; structures or facilities potentially impacted by change; flood discharge frequency data with and without Hunter Lake, Effective FEMA Model with flows for the South Fork of the Sangamon River.	FEMA 100-year floodplain maps, HECRAS Analysis Hanson_2005_Eval of Env Impacts-Joint Sewer Pipeline	Y	<p>Information to assess structures / facilities potentially affected by change</p> <p>Note: AmecFW understands that dam safety analysis is being conducted by "Others" for use in the SEIS.</p>



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Visual Resources	Field reconnaissance	AmecFW windshield survey	Y	
Air Quality/Climate Change	Air quality status	US EPA Green Book; IEPA	Y	
Noise	Noise emissions and impacts on sensitive receptors	Internet sources, Noise attenuation calculations	Y	No Modeling to be performed
Cumulative Impacts	Assessment of potential cumulative effects from past, present, and reasonably foreseeable future actions	Internet sources, input from City Planning input from CWLP lake/land management	Y	
Unavoidable Adverse Effects	Unavoidable impacts of alternatives	Input from Env Consequences sections	Y	
Irreversible and Irretrievable Commitments of Resources	Commitment of resources discussion of alternatives	Input from Alternatives	Y	
Relationship of Short-Term Uses to Long-Term Productivity	Discuss productivity of land from implementation of alternatives	Input from Alternatives	Y	