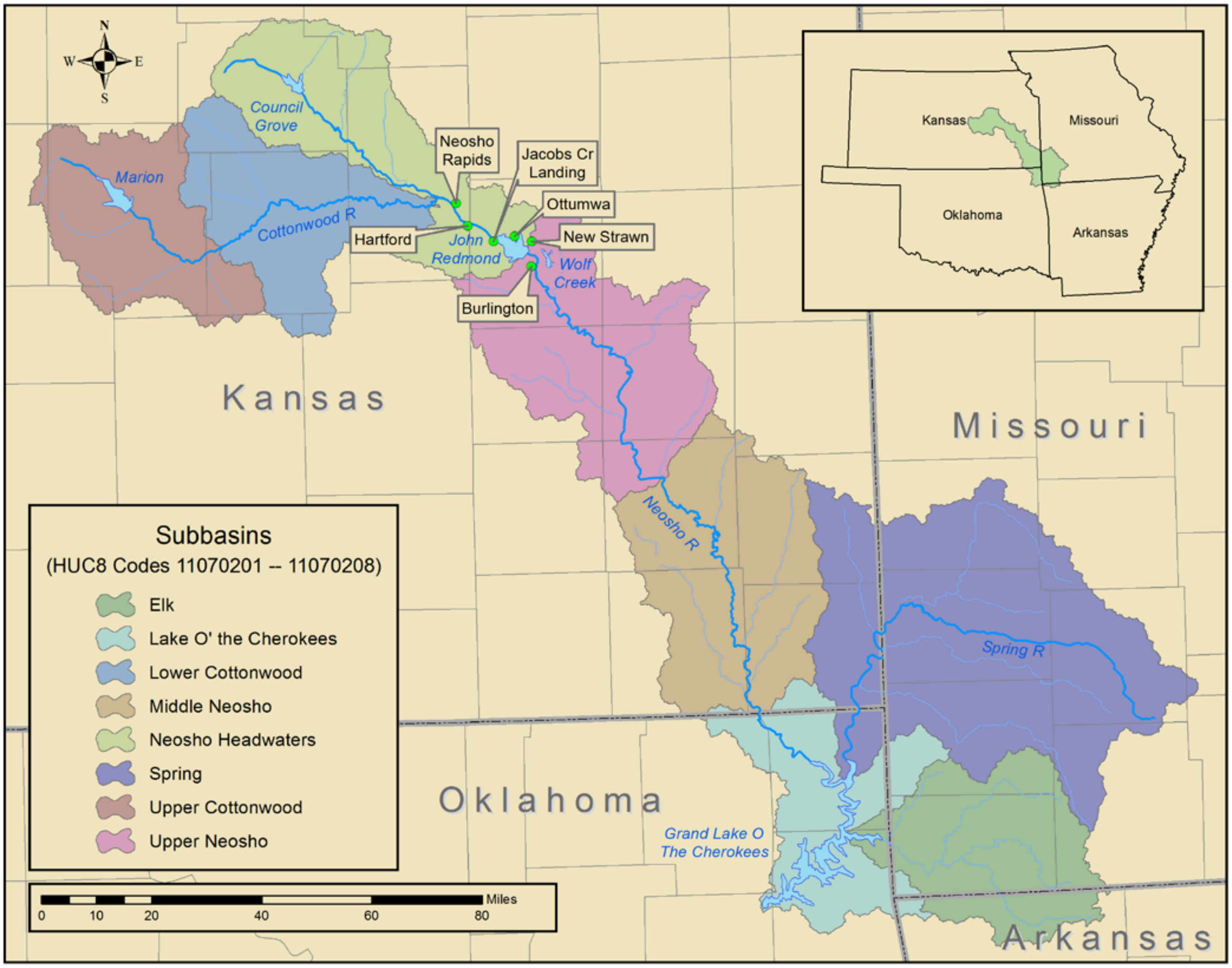

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (FPEIS)

Prepared for the:

REMOVAL AND DISPOSAL OF SEDIMENT AND RESTORATION OF WATER STORAGE AT JOHN REDMOND RESERVOIR, KANSAS
September 2014

Project Proponent:

Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612
www.kwo.org

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT REMOVAL AND DISPOSAL OF SEDIMENT AND RESTORATION OF WATER STORAGE AT JOHN REDMOND RESERVOIR, KANSAS

ABSTRACT

Lead Federal Agency: U.S. Army Corps of Engineers

Project Proponent: State of Kansas, Kansas Water Office

Title: Final Programmatic Environmental Impact Statement – Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas

Designation: Final Programmatic Environmental Impact Statement

Proposed Action: Remove sediment deposited in the conservation pool of John Redmond Reservoir at a quantity sufficient to ensure water supply is available to meet the contractual obligations of the Kansas Water Office to customers of the lower Neosho basin.

Affected Jurisdiction: The John Redmond Reservoir and approximately 190 miles downstream of the dam, as well as, land within a four-mile buffer of the dam at John Redmond Reservoir.

USACE Point of Contact: David Gade; Limnologist; U.S. Army Corps of Engineers, Environmental Technical Services Branch, Regional Planning & Environmental Center; 1645 S. 101st East Ave., Tulsa, OK 74128; Telephone: (918) 669-7579; Email: David.Gade@usace.army.mil

State of Kansas Point of Contact: Susan Metzger, Chief of Planning and Policy, Kansas Water Office, 901 S. Kansas Avenue, Topeka, KS 66612; Telephone: (785) 296-3185; Email: Susan.Metzger@kwo.ks.gov

Abstract: This FPEIS addresses alternatives and environmental impacts associated with the removal and disposal of sediment from the conservation pool at John Redmond Reservoir. This proposed action would restore water storage capacity lost to sedimentation since the construction of the reservoir in 1964. A range of alternatives was developed and screened to determine viable alternatives to carry forward for analysis. The three alternatives that are evaluated in this FPEIS are: no action, dredge and dispose of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for authorized project purposes; and dredge and dispose of sediments to restore the conservation pool to near original capacity. Disposal areas will initially include three locations on federal government fee lands and later move to privately-owned locations. Assessment topics include downstream changes to water quality and habitat resulting from the re-suspension and release of sediments from the reservoir and impacts to surrounding land use from the deposition of dredged sediment.

The Kansas Water Office (KWO), a state of Kansas agency, is the project proponent. The Kansas Water Office is responsible for development of a state plan of water resource management, conservation and development. In addition, KWO administers the state's Water Marketing and Water Assurance programs which provide water supply from the storage owned with thirteen of the Kansas' federal reservoirs. As the project proponent, KWO is seeking all required permits and permissions necessary to modify a federal project through dredging and construction of sediment disposal locations. The KWO will be responsible for the preparation of future NEPA documents. The actions described and evaluated in this FPEIS will be funded entirely with non-federal funds.

The USACE, acting as the lead agency, will use the FPEIS in its consideration of dredging John Redmond Reservoir. For the proposed action, the USACE responsibility as the lead federal agency authorizes the proposed action to occur on fee lands through the use of appropriate real estate instrument, issuing the NEPA document prepared by the project proponent and executing the Record of Decision (ROD), issuing the 33 U.S.C. Section 408 permit authorizing the project proponent to modify a federal project, and, if necessary, issuing the Department of the Army permit to authorize the placement of fill into Waters of the United States (WOUS), which includes wetlands. A mitigation monitoring and reporting program will be required for reporting or monitoring mitigation measures that are adopted and will become a condition of project approval. This FPEIS is intended to provide decision makers, responsible agencies and citizens with enough information on the potential range of environmental impacts to make decisions on the alternatives analyzed in the document.

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
REMOVAL AND DISPOSAL OF SEDIMENT AND RESTORATION OF WATER STORAGE AT JOHN REDMOND RESERVOIR, KANSAS

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EXECUTIVE SUMMARY

John Redmond Dam was initially authorized as the Strawn Dam and Reservoir under the Flood Control Act of May 17, 1950. The intent of design and construction was to provide flood control, water conservation, recreation and water supply storage for communities along the Neosho River in southeastern Kansas. The John Redmond Project is also operated for wildlife purposes. Before construction the Neosho River had flooded 57 times in 34 years of recorded history. The project was renamed John Redmond Dam and Reservoir by an act of Congress in 1958, to posthumously honor John Redmond, publisher of the *Burlington Daily Republican* newspaper and one of the first to champion the need for flood control and water conservation along the Neosho River.

Dam construction by the U.S. Army Corps of Engineers (USACE) was undertaken between 1959 and 1964, at a site west of Burlington, KS. Water storage began during September 1964, collecting drainage from a basin approximately 3,015 square miles. John Redmond Dam lies below Marion Dam, constructed on the Cottonwood River (a tributary to the Neosho River), and Council Grove Dam, also constructed on the Neosho River and is the integral component of this flood control system. Uncontrolled drainage to the John Redmond Dam includes approximately 2,569 square miles below the upper two dams. Below John Redmond Dam to the Grand Lake O' the Cherokees in Oklahoma, an additional 3,285 square miles of uncontrolled drainage releases water to the Neosho River.

To perform the functions described above, John Redmond Reservoir contains two types of water storage: flood control pool and conservation pool. The upper zone provides 574,918 acre-feet of flood control storage and is reserved to contain floodwaters; it otherwise remains empty and is managed for agriculture, wildlife habitat and recreation under the Otter Creek Wildlife Area (OCWA), Flint Hills National Wildlife Refuge (FHNWR) and USACE authorities. The conservation pool provides 67,302 acre-feet of storage at elevation 1041.0 for water supply, water quality and space to contain sediment. The pools, dam structure, agricultural land, wildlife habitat and recreation sites are contained within approximately 29,801 acres.

The state of Kansas and the federal government entered into a water supply storage agreement in 1975, for 34,900 acre-feet of water storage annually and at the design life of the project (CY 2014). The water is provided to the Cottonwood and Neosho River Basins Water Assurance District Number 3 (CNRWAD) and the Wolf Creek Nuclear Generating Station (WCGS). The CNRWAD includes 19 municipal and industrial water users. Water supply storage was to occur within the conservation pool when maintained at the surface elevation of 1,039.0 feet.

When completed in 1964, the design life of the reservoir was 50 years. At construction, the reservoir had a surface area of about 9,800 acres and a conservation pool storage capacity of 82,700 acre-feet. In 2007, the Kansas Biological Survey (KBS) completed a bathymetric survey of the reservoir and concluded the surface area had reduced to about 8,800 acres with a water storage capacity of 50,200 acre-feet. Decreases in surface area and volume are attributed to sedimentation. Since 1964, John Redmond has lost an estimated 42 percent of its conservation-pool storage capacity as of 2010. The estimated sedimentation rate of 739 acre-feet per year is about 80 percent more than the sedimentation rate (404 acre-feet/year) that was originally projected for the conservation pool by the USACE at the time the reservoir was completed.

In 2013, the storage reallocation was approved, permitting the reallocation from the flood control to the conservation pool by raising the conservation pool elevation two (2) feet, in a single permanent pool raise, from an elevation of 1039 ft to 1041 ft. This action will provide a more equitable redistribution of the remaining storage capacity, depleted as a result of greater influx of sediment than originally expected and the uneven sediment accumulation and distribution within the conservation pool.

This Final Programmatic Environmental Impact Statement (FPEIS) addresses the *Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas,* and the proposed alternatives. The FPEIS has been prepared by the Kansas Water Office, Topeka, KS, in accordance with the National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. § 4332 (1994).

Purpose and Need for the Action

The purpose and need of the proposed federal action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem that has been lost due to sedimentation. Sediment has been collecting mainly in the conservation pool, thereby reducing the conservation pool faster than was designed, reducing storage capacities. The project area is defined as the John Redmond Reservoir site and the Neosho River to near the Oklahoma border or approximately 190 river miles of the approximately 350 mile extent of the Neosho River. The actions described and evaluated in this FPEIS will be funded entirely with non-federal funds.

As addressed under the Council on Environmental Quality (CEQ) regulations, an environmentally preferred alternative is identified in Chapter 2.0. For purposes of the NEPA analysis, direct and indirect environmental consequences or impacts are those associated with the two dredging alternatives and the No Action Alternative and cumulative environmental impacts are associated with other activities in the drainage basin. The USACE will consider all environmental impacts identified in the FPEIS in its decision process before issuing a Record of Decision.

The Kansas Water Office (KWO), a state of Kansas agency, is the project proponent. The Kansas Water Office is responsible for development of a state plan of water resource management, conservation and development. In addition, KWO administers the state's Water Marketing and Water Assurance programs which provide water supply from the storage owned with thirteen of the Kansas' federal reservoirs. As the project proponent, KWO is seeking all required permits and permissions necessary to modify a federal project through dredging and construction of sediment disposal locations. The KWO will be responsible for the preparation of future NEPA documents. The actions described and evaluated in this FPEIS will be funded entirely with non-federal funds.

The USACE, acting as the lead agency, will use the FPEIS in its consideration of dredging John Redmond Reservoir. For the proposed action, the USACE responsibility as the lead federal agency authorizes the proposed action to occur on fee lands through the use of appropriate real estate instrument, issuing the NEPA document prepared by the project proponent and executing the Record of Decision (ROD), issuing the 33 U.S.C. Section 408 permit authorizing the project proponent to modify a federal project, and, if necessary, issuing the Department of the Army permit to authorize the placement of fill into Waters of the United States (WOUS), which includes wetlands. A mitigation monitoring and reporting program will be required for reporting or monitoring mitigation measures that are adopted and will become a condition of project approval. This FPEIS is intended to provide decision makers, responsible agencies and citizens with enough information on the potential range of environmental impacts to make decisions on the alternatives analyzed in the document.

Other project-related studies have been or are being undertaken, including the preparation of the Flint Hills National Wildlife Refuge Comprehensive Conservation Plan, SUPER modeling performed for the John Redmond Reallocation Study; United States Geological Survey (USGS) studies of channel widening, low-volume dams and sediment quality; a Biological Assessment of the reallocation to threatened or endangered species identified as occurring in the project area; annual census for waterfowl and raptor populations; and research performed to study the distribution, abundance and life history of threatened fish and mussel species, Bathymetry Survey conducted by the Kansas Biological Survey (KBS) and Streambank Erosion Assessments conducted by the Kansas Water Office (KWO).

This FPEIS provides a comprehensive, programmatic evaluation that is broad enough in scope to assist in the evaluation of future sediment removal and disposal actions for water supply storage restoration at John Redmond. This FPEIS was prepared as a programmatic National Environmental Policy Act (NEPA) review applicable to future projects, or for use as a base from which NEPA analyses or decision documents could tier. That tiering approach could help minimize the need for repeated analyses for future dredging activities. USACE would use the NEPA process to evaluate any future changes to sediment removal and disposal actions. If it were determined that a need for additional analysis and documentation exists, the NEPA process would serve as a base document to reduce the level of effort required to prepare future decision documents.

This FPEIS documents the anticipated environmental effects at a basic level, because the dredging activities at John Redmond would be subject to continuous evaluation and adaptive change as dredging equipment and technologies, available land for disposal, and water supply needs of the basin were identified in the future. This document cannot provide a quantitative analysis of the potential site-specific effects for all sediment removal and disposal activities. USACE staff and partners with the state of Kansas would consider site-specific effect at a second level of decision making.

Scoping Process

The NEPA process is designed to involve citizens in federal and local decision making. As required by the Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500–1508), the USACE provided an early and open scoping process to determine issues to be addressed and those considered significant to concerned citizens, organizations and agencies. The NEPA process is designed to involve the public in federal and state decision making. Opportunities to comment on, and participate in, the process were provided during preparation of the Final PEIS. Comments from citizens and agencies were solicited to help identify the primary issues associated with the reservoir dredging project. Public meetings were held as part of the reservoir dredging process to obtain comments on the alternatives under consideration and to identify favorable elements or offer differing opinions.

Public involvement opportunities to date include the NEPA notification process, the Notice of Intent and the opportunity to comment on the Notice of Intent, and interagency and public scoping meetings. On Feb. 5, 2013, the KWO held a public scoping meeting in Burlington, KS. Approximately 85 individuals representing the public, county state and federal agencies attended the meeting. No written comments were received at the meeting, but attendees could also obtain comment forms to fill out later and return by mail. Two written comments were provided via mail following the public meeting (Appendix A). The public input, as well as feedback from resource and permitting agencies, will be used to evaluate the alternatives and environmental impacts prior to making final decisions. Section 1.4.1 provides more information on the public coordination process. Additionally, public hearings will be held on the FPEIS following the requisite comment period.

The purpose of scoping is to identify potential environmental issues and concerns regarding water storage restoration through the dredging project. The scoping process for the FPEIS included public notification via the *Kansas Register*, *Federal Register*, newspaper press releases, direct mail and one public meeting. USACE and the state considered comments received during the scoping process in determining the range of issues to be evaluated in the FPEIS.

In conformance with the requirements of NEPA (40 CFR 1501.7), a Notice of Intent (NOI) to prepare the FPEIS for the John Redmond Reservoir Dredging project, KS, was published in the *Kansas Register and Federal Register* on 29 January 2013 (Appendix A). Alternatives to be evaluated were identified in the NOI as the No Action and various alternatives to remove sediment through dredging.

A project website is maintained at www.kwo.org to provide information on project activities and upcoming meetings.

Proposed Alternatives

A range of alternatives was developed and screened to determine viable alternatives to carry forward for analysis. The three alternatives that are evaluated in this FPEIS are: no action; dredge and dispose of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for municipal and industrial demand; and dredge and dispose of sediments to restore the conservation pool to near original capacity.

Under the No Action Alternative, no sediment removal through dredging would occur. Sediment will continue to accumulate in the reservoir, reducing the water supply storage capacity at design life by approximately 25 percent. Storage available for water supply purposes in John Redmond Reservoir will continue to be depleted by the distribution of sediment such that the water supply storage agreement obligations with the KWO and its water supply customers cannot be met. This alternative provides the baseline to assess the environmental effects of other alternatives.

Another alternative would allow for the dredging and disposal of sediments from the conservation pool to restore the pool to near original capacity. Restoration of the pool would require removal of approximately 45 million cubic yards of sediment. This alternative seeks to remove sediment from areas of heaviest deposition with the greatest likelihood of benefiting water supply storage. This alternative would achieve the project goal of restoring water supply storage for the benefit of the regional water users and to restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem, but is not preferred by the state and USACE due to cost.

The alternative preferred by the project proponent (Preferred Alternative) would allow for the dredging and disposal of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for authorized project purposes. In the first five years of the dredging activity, approximately 3 million cubic yards of sediment will be removed. Phasing of removal will continue through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Project methodology and impacts will be assessed after the first five years and periodically throughout the full project period.

The Dredge John Redmond Reservoir Alternative would achieve the project goal to restore water supply storage for the benefit of the regional water users and to restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem, and is preferred by the state and USACE.

Section 3.0 of the FPEIS provides a description of the existing environmental conditions in the Neosho River Basin, including John Redmond Reservoir. Existing conditions are described in the following resources categories: geology and soils; hydrology and water resources; biological resources; air quality; aesthetics; prime or unique farmlands; socioeconomic resources; cultural resources; and hazardous, toxic or radioactive wastes. Potential cumulative impacts are also described in this section.

Period of Analysis

For purposes of this PEIS, the period of analysis for the Preferred Alternative is described for three general phases or temporal stages: (1) initial period of detailed, site-specific analysis for known conditions at this stage of project development, (2) additional dredging to be conducted during the first five years of dredging activity but involving yet-to-be-identified disposal locations, and (3) full sustainment of the preferred alternative through the year 2045. The initial period of analysis addressed by this PEIS encompasses the first 12 to 17 months of activity to include the deployment of equipment to the staging area, placement of the slurry pipelines, construction of the first three CDF sites (CDF Sites A, B and E), removal of approximately 600,000 cubic yards of sediment, and sediment disposal in CDF Sites A, B, and E. Related activities to follow within approximately 5 years of initial dredging include dewatering and remediation of CDF Sites A, B and E once materials have sufficiently dried. Future activities as project planning progresses are anticipated to include identification and construction of additional CDF sites on private property and the removal and disposal of 2.4 million cubic yards of additional sediment. These additional activities outside of the initial round of analysis will likely be accomplished within the first five years of dredging activity and will be reviewed in future tiered NEPA documents. Phasing of sediment removal through dredging would be expected to continue at appropriate intervals and frequency through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Additional NEPA documentation will be prepared and distributed for review at intervals appropriate for corresponding future proposals.

Project methodology and impacts will be assessed initially for the first 12 to 17 months, again after the first five years of dredging is completed, and periodically throughout the full project period. This will ensure that the project incorporates lessons learned during initial phases, minimizes environmental impacts, and stays current with developing dredging and dredge disposal technology.

To the extent possible at this stage of project planning, environmental impacts associated with the entire long-term dredging proposal are assessed in this PEIS. However, given the long-term and phased approach to dredging, many site-specific details regarding future dredge disposal sites and other details remain unknown. Consistent with the programmatic approach, this PEIS addresses specific impacts associated with initial dredging and dredge material disposal at currently-identified CDF Sites A, B, and E. All additional activities outside this initial review of known project specifics will be evaluated through the NEPA process by additional tiered NEPA documents (EAs or EISs) off this PEIS as future project details become available.

Environmental Impacts

The FPEIS evaluates potential environmental impacts of the dredging alternatives. The report compares potential environmental impacts with NEPA and the Council on Environmental Quality impact significance thresholds for each of the environmental resource categories described under Section 3.0 “Description of the Affected Environment.” To satisfy the stated Purpose and Need for the proposed project, NEPA requires the FPEIS include a presentation of the alternatives in comparative form to define the issues and to provide a clear basis for choice among options by decision makers and citizens. The environmental impacts of the alternatives described above are summarized in Table ES-1.

Table ES-1. Summary of Potential Environmental Impacts and Mitigation Measures

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
Geology and Soils	No short, medium or long-term, insignificant or significant, beneficial or adverse effects. No mitigation measures would be required.	Long-term, localized, adverse effects, the magnitude of which would be dependent upon the geology or soil resource and upon mitigation measures.	Long-term, localized, adverse effects, the magnitude of which would be dependent upon the geology or soil resource and upon mitigation measures.
Hydrology and Water Resources	Long-term, regional, major adverse effect. Mitigation measures would be required.	Long-term and major, regional beneficial effects on storage capacity. Short term and minor effects related to discharge of sediments downstream. No	Long-term, regional, and major beneficial effects on storage capacity. Short term and minor effects related to discharge of sediments downstream. No

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
		effects to reservoir releases in terms of inflows or reservoir discharge operations. Mitigation measures may be required.	effects to reservoir releases in terms of inflows or reservoir discharge operations. Mitigation measures may be required.
Biological Resources	No short-term, beneficial or adverse effects. Long-term, moderate to major adverse effects. No mitigation measures would be required.	Long-term, major and beneficial effects to fisheries and aquatic wildlife from long-term improved water quality. Short-term, minor, adverse effects from increased sediment load. Mitigation measures may be required.	Long-term, major and beneficial effects to fisheries and aquatic wildlife from long-term improved water quality. Short-term and long-term, minor, adverse effects from increased sediment load. Mitigation measures may be required.
Wetland Resources	No short-term, beneficial or adverse effects. No mitigation measures would be required.	Due to avoidance, no long-term, major adverse impacts to Waters of the United States.	If CDF Sites impact wetlands, long-term, major and adverse impacts to Waters of the United States. Mitigation will be required.
Threatened and Endangered Species	No short-term, beneficial or adverse effects. Long-term, moderate to major, adverse effects as trapping efficiency of reservoir decreases. No mitigation measures would be required.	May affect but not likely to adversely affect listed species.	May affect but not likely to adversely affect listed species.
Noise	No short or long-term, beneficial or adverse effects.	Effects of this alternative on noise conditions could occur both within and outside of federal lands, and would be short-term, localized, minor and adverse.	Medium term, localized, minor and adverse effects.
Transportation	No short or long-term, beneficial or adverse effects.	Short-term, localized, minor and adverse.	Short-term, localized, minor and adverse.
Air Quality	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term localized minor, adverse effects. No long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term, localized, minor, adverse effects. No long-term, beneficial or adverse effects. No mitigation measures would be required.
Aesthetics	No short-term, insignificant or significant, beneficial or adverse effects. Long-term, moderate, adverse impacts. No mitigation measures would be required.	Short-term, localized, moderate, adverse effects. Long-term moderate, beneficial effects. No mitigation measures would be required.	Short-term, localized, minor, adverse effects. Long-term moderate, beneficial effects. No mitigation measures would be required.
Prime or Unique Farmlands	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Long-term, minor, adverse effect because of the abundance of additional prime and unique farmlands in the area. No mitigation measures would be required.	Long-term, minor, adverse effect or long-term, moderate, beneficial effect depending on the selection of sites for dredge material. No mitigation measures would be required.

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
Socioeconomic Resources	Long-term, major adverse effects on economic and demographic conditions. Mitigation measures would be required.	Short-term, moderate to major, beneficial effects on economic and demographic conditions. No mitigation measures would be required.	Short-term, moderate to major, beneficial effects on economic and demographic conditions. No mitigation measures would be required.
Land Use	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term and long-term, localized, minor, adverse or beneficial depending on the reclamation activity. No mitigation measures would be required.	Short-term and long-term, minor, adverse or beneficial depending on the reclamation activity. No mitigation measures would be required.
Recreation	Long-term, major and adverse.	Short-term, localized, minor, adverse effect.	Short-term, localized, minor, adverse effect.
Cultural Resources	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long term, beneficial or adverse effects. Efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources. Site specific investigations and further literature review may be needed. Mitigation measures may be required. The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).	No short or long-term, beneficial or adverse effects. Efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources. Site specific investigations and further literature review may be needed. Mitigation measures may be required. The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).
Hazardous, Toxic, or Radioactive Wastes	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.
Cumulative Impacts	No cumulative impacts. No mitigation measures would be required.	Positive, long-term cumulative impacts experienced in the increased ability to meet water supply demands in the basin. No cumulative adverse impacts on resources. No mitigation measures would be required.	Positive, long-term cumulative impacts experienced in the increased ability to meet water supply demands in the basin. No cumulative adverse impacts on resources. No mitigation measures would be required.

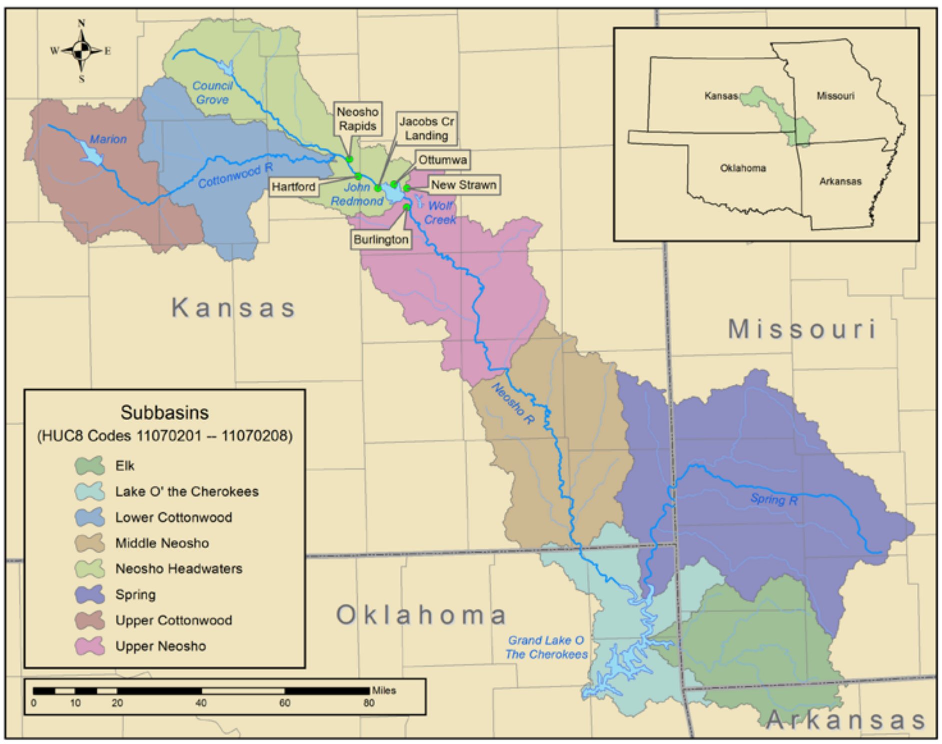
1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

This Final Programmatic Environmental Impact Statement (FPEIS) addresses the *Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas*, and the proposed alternatives. The FPEIS has been prepared by the Kansas Water Office, Topeka, KS, in accordance with the National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. § 4332 (1994). The actions described and evaluated in this FPEIS will be funded entirely with non-federal funds. The state of Kansas is the project proponent, but the action is occurring on federal property and will require federal permits.

The USACE project manager operates the John Redmond Dam and Reservoir under the direction of the Operations Division, Tulsa District. It is a multi-purpose dam project filled in 1964 and authorized for flood control, water supply, water quality, recreation and fish and wildlife habitat. In addition to site management by the USACE, leases have been signed with other federal (United States Fish and Wildlife Service (USFWS) and state (Kansas Department of Wildlife, Parks, & Tourism) agencies to provide land management for the Flint Hills National Wildlife Refuge (FHNWR) and the Otter Creek Wildlife Area (OCWA) (USACE 2013).

Figure 1-1. John Redmond Reservoir and the Neosho River to the Grand Lake O' the Cherokees

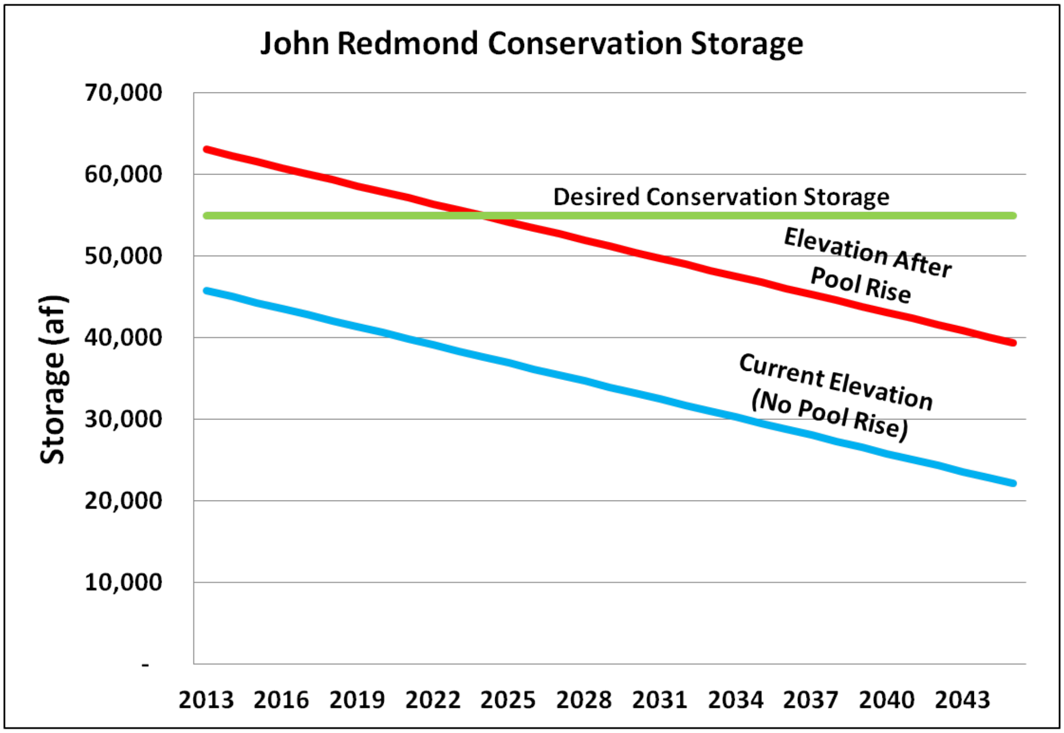


John Redmond Dam is located on the Neosho River, about three miles north and one mile west of Burlington, KS (Figure 1-1). Other communities in the vicinity of the dam and reservoir include New Strawn, Hartford, Neosho Rapids, Jacob's Landing, and Ottumwa, KS. Downriver effects on the Neosho River to the vicinity of Grand (Pensacola) Lake (Lake O' the Cherokees) are also examined in the FPEIS. The Neosho and Spring Rivers join near Miami, Oklahoma (OK) to form the Grand River, approximately ten miles upriver of Grand (Pensacola) Lake (USACE 2013) (Figure 1-1).

The state of Kansas and the federal government entered into a water supply storage agreement at John Redmond Reservoir to provide water for the Cottonwood and Neosho River Basins Water Assurance District Number 3

(CNRWAD) and the Wolf Creek Generating Station (WCGS). The CNRWAD includes 13 cities, one wholesale water supplier, and five industrial water users (Wendt, B. KWO personal communication, Biery (WAD) November 28, 2012). An estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation (design life = Calendar Year [CY] 2014) forms the basis of the 1975 agreement (USACE 2013). Even with a pool rise occurring at John Redmond from elevation 1039.0 feet to 1041.0 feet, the conservation pool is losing capacity, due to the accumulating sediment (Figure 1-2). With the loss of capacity the Kansas Water Office (KWO) cannot meet its water supply contractual agreements.

Figure 1-2. John Redmond Conservation Storage



1.2 Scope of the Analysis

This FPEIS provides a comprehensive, programmatic evaluation that is broad enough in scope to assist in the evaluation of future sediment removal and disposal actions for water storage capacity at John Redmond. This FPEIS was prepared as a programmatic National Environmental Policy Act (NEPA) review applicable to future projects, or for use as a base from which future NEPA analyses or decision documents could tier. That tiering approach could help minimize the need for repeated analyses for future dredging activities. USACE would use the NEPA process to evaluate any future changes to sediment removal and disposal actions. If it were determined that a need for additional analysis and documentation exists, the NEPA process would serve as a base document to reduce the level of effort required to prepare future decision documents.

This FPEIS documents the anticipated environmental effects at a basic level, because the dredging activities at John Redmond would be subject to continuous evaluation and adaptive change as dredging equipment and technologies, available land for disposal, and water supply storage needs of the basin were identified in the future. This FPEIS provides a process that the USACE can use to guide future decisions.

This FPEIS does evaluate and document anticipated effects of initial, first-phase dredging activities, but cannot provide a quantitative analysis of the potential site-specific effects for all sediment removal and disposal activities far into the future. USACE staff and partners, such as U.S. Fish and Wildlife Service (USFWS) and

U.S. Environmental Protection Agency (EPA), with the state of Kansas would consider site-specific effects at a second level of decision making. Consistent with the NEPA and other applicable statutes and regulations, USACE would make an independent determination of the scope and level of additional documentation, if any that may be necessary. Under the Programmatic approach of this EIS, future disposal sites selection will be coordinated with relevant local, state and federal agencies, including, but not limited to, the U.S. Army Corps of Engineers, Tulsa District Regulatory Office, USFWS Kansas Ecological Services Field Office, Kansas Department of Wildlife Parks and Tourism, Kansas Department of Health and Environment and U.S. Environmental Protection Agency. Future sites will be evaluated through the NEPA process or permit process, or both, whichever is appropriate.

1.3 Period of Analysis

For purposes of this PEIS, the period of analysis for the Preferred Alternative is described for three general phases or temporal stages: (1) initial period of detailed, site-specific analysis for known conditions at this stage of project development, (2) additional dredging to be conducted during the first five years of dredging activity but involving yet-to-be-identified disposal locations, and (3) full sustainment of the preferred alternative through the year 2045. The initial period of analysis addressed by this PEIS encompasses the first 12 to 17 months of activity to include the deployment of equipment to the staging area, placement of the slurry pipelines, construction of the first three CDF sites (CDF Sites A, B and E), removal of approximately 600,000 cubic yards of sediment, and sediment disposal in CDF Sites A, B, and E. Related activities to follow within approximately 5 years of initial dredging include dewatering and remediation of CDF Sites A, B and E once materials have sufficiently dried. Future activities as project planning progresses are anticipated to include identification and construction of additional CDF sites on private property and the removal and disposal of 2.4 million cubic yards of additional sediment. These additional activities outside of the initial round of analysis will likely be accomplished within the first five years of dredging activity and will be reviewed in future tiered NEPA documents. Phasing of sediment removal through dredging would be expected to continue at appropriate intervals and frequency through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Additional NEPA documentation will be prepared and distributed for review at intervals appropriate for corresponding future proposals.

Project methodology and impacts will be assessed initially for the first 12 to 17 months, again after the first five years of dredging is completed, and periodically throughout the full project period. This will ensure that the project incorporates lessons learned during initial phases, minimizes environmental impacts, and stays current with developing dredging and dredge disposal technology.

To the extent possible at this stage of project planning, environmental impacts associated with the entire long-term dredging proposal are assessed in this PEIS. However, given the long-term and phased approach to dredging, many site-specific details regarding future dredge disposal sites and other details remain unknown. Consistent with the programmatic approach, this PEIS addresses specific impacts associated with initial dredging and dredge material disposal at currently-identified CDF Sites A, B, and E. All additional activities outside this initial review of known project specifics will be evaluated through the NEPA process by additional tiered NEPA documents (EAs or EISs) off this PEIS as future project details become available.

A summary of project phasing and associated periods of analyses is provided in Table 1-1.

Table 1-1. Summary of project phasing and associated periods of analyses.

Phase	Components	Acreage	Duration	Comments
1	- Design, construct 3 CDFs consisting of Sites A (Federal property), B (Federal property), and E (Federal and non-Federal property) - Dredge 600,000 cubic yards - Dispose of materials into CDFs - Let materials settle in CDFs - Discharge effluent into river or back into lake	180 acres	0 – 17 months	Impacts assessed in this PEIS.
	- Monitor CDFs to ensure return to prior condition or better - CDFs restoration complete		17-60 months	Impacts assessed in this PEIS.
2	- Identify, design and construct additional CDFs to handle remaining 2.4 million cubic yards (non-Federal property) - Dredge remaining 2.4 million cubic yards of material - Dispose of materials into CDFs - Monitor CDFs to ensure return to prior condition or better - CDFs restoration complete	320 acres	17-60 months	Identification, design, construction of remaining CDFs, dredging, disposal, discharge, monitoring and restoration of sites will occur concurrently/ overlapping with each other to be completed within 5 years from initiation of project. Impacts to be assessed in future, tiered NEPA documents.
3	- Identify, design and construct additional CDFs to handle any maintenance dredging requirements (non-Fed prop) - Dredge, dispose of materials into CDFs, discharge, monitor, and restore	2,000 acres	60-372 months	Impacts to be assessed in future, tiered NEPA documents.

1.4 Purpose and Need for Action

The purpose and need of the proposed action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem that has been lost due to sedimentation. Sediment has been collecting mainly in the conservation pool, thereby reducing the conservation pool faster than was designed, reducing storage capacities. The project area is defined as the John Redmond Reservoir site and the Neosho River to near the Oklahoma border or approximately 190 river miles of the approximately 350 mile extent of the Neosho River.

The state of Kansas, as the project proponent, is seeking to modify a federal project to restore water supply storage. The federal action includes the authorization of the project on fee lands through the issuance of 33 U.S.C. Section 408 and Clean Water Act Section 404 permits; issuance of the FPEIS and executing the Record of Decision (ROD); and exercising a real estate instrument to allow for access to and use of fee lands.

As addressed under the Council on Environmental Quality (CEQ) regulations, an environmentally preferred alternative is identified in Chapter 2.0. For purposes of the NEPA analysis, direct and indirect environmental consequences or impacts are those associated with the two dredging alternatives and the No Action Alternative and cumulative environmental impacts are associated with other activities in the drainage basin. The USACE will consider all environmental impacts identified in the FPEIS in its decision process before issuing a Record of Decision.

The USACE, acting as the lead federal agency, will use the FPEIS in its consideration of dredging John Redmond Reservoir. A mitigation monitoring and reporting program will be required for reporting or monitoring mitigation measures that are adopted and will become a condition of project approval. This FPEIS is intended to provide decision makers, responsible agencies and citizens with enough information on the potential range of environmental impacts to make decisions on the alternatives analyzed in the document.

Other project-related studies have been or are being undertaken, including the preparation of the Flint Hills National Wildlife Refuge Comprehensive Conservation Plan, SUPER modeling performed for the John Redmond Reallocation Study; United States Geological Survey (USGS) studies of channel widening, low-volume dams and sediment quality; a Biological Assessment of the reallocation to threatened or endangered species identified as occurring in the project area; annual census for waterfowl and raptor populations; and research performed to study the distribution, abundance and life history of threatened fish and mussel species, Bathymetry Survey conducted by the KBS and Streambank Erosion Assessments conducted by the KWO.

1.5 Public Information and Involvement

The NEPA process is designed to involve citizens in federal and local decision making. As required by the Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500–1508), the State of Kansas and USACE provided an early and open scoping process to determine issues to be addressed and those considered significant to concerned citizens, organizations and agencies. Opportunities to comment on, and participate in, the process were provided during preparation of this Final PEIS. Comments from citizens and agencies were solicited to help identify the primary issues associated with the reservoir dredging project. Public meetings were held as part of the reservoir dredging process to obtain comments on the alternatives under consideration and to identify favorable elements or offer differing opinions.

Public involvement opportunities to date include the Notice of Intent (NOI) and the opportunity to comment on the NOI, and interagency and public scoping meetings. The public input, as well as feedback from resource and permitting agencies, was used to evaluate the alternatives and environmental impacts prior to making final decisions. Section 1.5.1 provides more information on the public coordination process.

The purpose of scoping is to identify potential environmental issues and concerns regarding water storage restoration through the dredging project. The scoping process for the FPEIS included public notification via the *Kansas Register*, *Federal Register*, newspaper press releases, direct mail and one public meeting. USACE and the state considered comments received during the scoping process in determining the range of issues to be evaluated in the FPEIS.

In conformance with the requirements of NEPA (40 CFR 1501.7), a NOI to prepare the FPEIS for the John Redmond Reservoir Dredging project, KS, was published in the *Kansas Register and Federal Register* on 29

January 2013 (Appendix A). Alternatives to be evaluated were identified in the NOI as the No Action and various alternatives to remove sediment through dredging.

The scoping period ended on March 12, 2013.

The purpose of these meetings was to inform the public of the condition of the reservoir and to allow citizens an opportunity to comment on the proposed alternatives. A notice for the Feb. 5, 2013 public scoping meeting was submitted to the Coffey County Republican newspaper the week of Jan. 21, 2013. A press release was also distributed across the state to newspapers, radio and television stations for the hearing notice (Appendix A). The meeting announcement was also distributed through the KWO social media outlets. Copies of the presentation and handout materials are also included in Appendix A.

In addition to the public scoping meeting, the KWO met with representatives from the following agencies and organizations to discuss the project purpose and need as well as receive feedback on alternatives and issues to address in the FPEIS:

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Kansas Department of Wildlife, Parks and Tourism
- Kansas Department of Health and Environment
- Westar Energy

On Jan. 22, 2013, the USACE provided letters formally inviting the following to act as cooperating agencies:

- U.S. Fish and Wildlife Service
- Kansas Department of Wildlife, Parks and Tourism
- Kansas Department of Health and Environment
- U.S. Environmental Protection Agency, Region VII
- Oklahoma Water Resources Board
- U.S. Department of Agriculture, Natural Resources Conservation Service
- Kansas Historical Society

Only the Kansas Department of Health and Environment accepted (KDHE) (Appendix A). KDHE assisted the Kansas Water Office with the evaluation of laboratory results of sediment samples, provided KWO with references to Risk Based Standards for constituents, and conducted preliminary review of proposed CDF designs and offered recommendations related to ensuring sufficient quality of water from the effluent discharge from the CDFs.

A project website is maintained at www.kwo.org to provide information on project activities and upcoming meetings.

1.5.1 Summary of Public Involvement

On Feb. 5, 2013, the KWO held a public scoping meeting in Burlington, KS. Approximately 85 individuals representing the public, county state and federal agencies attended the meeting. No written comments were received at the meeting, but attendees could also obtain comment forms to fill out later and return by mail. Two written comments were provided via mail following the public meeting (Appendix A).

Oral comments provided during the public scoping meeting can be summarized as support for initiatives to restore storage that benefits water supply in the basin.

1.5.2 Public Comment Period on Draft PEIS

Publication of the Draft PEIS was announced in the Federal Register on April 11, 2014 and the Draft PEIS was circulated for agency and public review comments from April 11, 2014 to May 27, 2014. Section 7.0 contains the list of agencies, organizations and persons who received copies of the Draft PEIS. The Draft PEIS was also made available through the City of Burlington library and posted to the Kansas Water Office website. Comments received and a summary of how the comments were completed or addressed are included in Table 1-2. Comments and correspondence received during the public review are provided in Appendix I. Comment numbers shown in Table 1-2 correspond to a numbered comment within the correspondence in Appendix I.

Table 1-2. Comments Received on Draft PEIS and Associated Responses

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
1	USFWS	We recommend that the final PEIS contain a list of the agencies that will receive the opportunity to participate in the second level of decision making and review of the additional assessments and changes to the project. We request the opportunity to review potential disposal sites for their impacts to these resources. Federally listed species are subject to change, and as new information becomes available on these and other issues of concern, it is important that the USFWS be kept apprised of the most current information regarding potential sediment disposal sites in order to determine their effects on natural resources.	Clarification added to Section 1.2 to address comment by adding statement, "Under the Programmatic approach of this EIS, future disposal sites selection will be coordinated with relevant local, state and federal agencies, including, but not limited to, the U.S. Army Corps of Engineers, Tulsa District Regulatory Office, USFWS Kansas Ecological Services Field Office, Kansas Department of Wildlife Parks and Tourism, Kansas Department of Health and Environment and U.S. Environmental Protection Agency. Future sites will be evaluated through the NEPA process or permit process, or both, whichever is appropriate." In addition, Section 1.3 has been added to clarify the Period of Analysis. CDF Site E has been added throughout the analysis in the Final PEIS. KWO notified USFWS Manhattan Office via email of the addition of CDF Site E on 31 July 2014. Receipt of the email was acknowledged on 8 Aug 2014. Communication and coordination will continue as additional information is available.
2	USFWS	Table 1-3, page 23 is missing the Executive Order on Invasive Species (Executive Order 13112), the Migratory Bird Treaty Act, and the Water Resources Development Act (WRDA) - 1986,'90,'92, '96, & 2013 which address long-term disposal of dredged material and promotes decontamination technologies for the manufacturing of material for beneficial uses. These should be included in the final PEIS.	Relevant laws and Regulations added to Table 1-5

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
3	USFWS	Page 26 states that "Project methodology and impacts will be assessed after the first five years and periodically throughout the full project period and that "Under the Programmatic approach of this EIS, future disposal sites will be coordinated with relevant local, state and federal agencies…". We reiterate our request that the USFWS be kept apprised of the most current information regarding potential sediment disposal sites.	Clarification added to Section 1.2 to address comment. KWO acknowledges the comment and will ensure USFWS in engaged and informed of project developments and potential future disposal sites.
4	USFWS	The final PEIS should discuss alternatives to Confined Disposal Facilities (CDF), including beneficial uses.	Consideration for beneficial uses has been added to Section 2.2.1
5	USFWS	The document needs to add the following information on three additional species: Sprague's pipit is a candidate species for which the USFWS has on file substantial information on biological vulnerability and threats to support proposals to list as endangered or threatened species. Northern long-eared bat is proposed for listing under the ESA, and Mead's milkweed is federally listed as threatened.	Information about Sprague's pipit, Northern long-eared bat and Mead's milkweed has been added to Section 3.4.5 to address comment
6	USFWS	The PEIS should list the specific criteria that will be used to guide the placement/selection of basin sites and identify all impacts of drainage runoff to down slope aquatic and terrestrial systems.	Selection criteria provided in Section 4.4. Criteria for the placement of dredged materials has been expanded and described throughout document including in Section 4.4. Additional selection criteria related to biological resources include minimization or avoidance of impacts to local wildlife and other high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2. Discussion of the direct impacts to fish, submerged aquatic vegetation and the benthic community near the dredging activity has been added to Section 4.4. In addition, an explanation of the effects to aquatic communities from slurry

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
			pipeline route has been added to this section. Discussion of impacts to downslope systems is described in Section 4.4 as "The ability to release better quality water and for a longer duration would substantially aid in the preservation of the fisheries and aquatic wildlife below John Redmond Dam, particularly the riverine mussels."
7	USFWS	The PEIS gives a list of criteria to guide the selection of sites (page 26) and states that wetland and streams will be avoided where possible (page 98). However, there are other habitats that are high value, provide essential habitat to Federal trust resources, as well as local wildlife, and should also be avoided and added to the list of criteria. Unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, bottomland hardwood forests, wetlands, and streams are among the highest valued wildlife habitats.	Information on USFWS Mitigation Policy and selection criteria to avoid high quality natural areas has been added (Sections 2.2.1, 3.4, 4.9.2, and 5.1)
8	USFWS	The DPEIS does not adequately evaluate direct effects to fish and wildlife from dredging related activities, nor does it thoroughly evaluate indirect/cumulative effects from this long term project with its many disposal sites. Overhead lines associated with the dredges can impact wildlife through collisions and electrocution. The noise from the dredges could impacts wildlife and affect breeding, feeding and nesting behaviors. The dredging activity can impact fish and other aquatic organisms by altering behavior, destroying habitat, being injured by cutters, or sucked into the pipeline. Running the pipeline through culverts could impact aquatic organism passage. Laying the pipeline passively on the floor of the river (and possibly other streams) could also affect aquatic organism passage by creating a barrier. Releasing effluent from the disposal basins into rivers and streams could result in thermal pollution in the receiving streams or change the temporal flow regimes, impacting aquatic organisms.	Information on effects to fish and wildlife, including a discussion of collisions and electrocution risks, noise impacts, dredging activities on in-lake aquatic organisms and their habitat, and the effects of the slurry pipeline crossing the Neosho River and through road culverts has been added to Sections 4.4 and 5.4.
9	USFWS	Page 98 states, "If construction of CDFs impacts the hydrology of adjacent wetlands, the State of Kansas will ensure that measures are in place to avoid impacts to other aquatic resources." This statement is ambiguous. The DPEIS should explain this further and give examples.	Brief description of potential mitigation measures described in Section 4.4.

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
10	USFWS	In a September 16, 2013 letter, the USFWS delivered concurrence to the USACE pertaining to their determination of “may affect, not likely to adversely affect” for federally listed species that may be impacted by the dredge project, including the Neosho madtom, Neosho mucket mussel, rabbitsfoot mussel, interior least tern, and western prairie fringed orchid.	A copy of the September 16, 2013 letter is included in Appendix G – Agency Correspondence. KWO notes that the interior least tern was not included in the request for concurrence. The species is not known to occur within the project area.
11	USFWS	If effects are identified, reinitiation of the section 7 consultation, and/or new consultation may be required, dependent on the action, site location, and severity of possible effects.	Acknowledgement of the comment and the requirement for initiation with Section 7 consultation has been added to document (Section 4.5).
12	USFWS	We recommend the USFWS Kansas Ecological Services Field Office and KDWPT be included in that list due to continuing Section 7 obligations and potential changes in threatened and endangered species lists and habitat concerns.	USFWS and KDWPT have been added to the text as included on the list for continued coordination.
13	USFWS	Additional criteria should be added, including the avoidance of areas with high value natural areas (i.e., Resource categories 1 & 2).	Information on USFWS Resource Categories and additional criteria has been added (Section 5.4).
14	USFWS	A plant list for restoration of areas should additionally be included. This could be a list of potential plants with an acknowledgment that site specific plant lists will be developed for each site with review from relevant agencies.	Plant list has been provided by USACE and added to Appendix H and reference to appendix has been added to the text in Section 4.9.2
15	USFWS	Page 114 states that land will be reverted back to the use of the landowner, most likely the pre-dredging purpose. The DPEIS claims that cumulative impacts will be negligible. We believe that it is highly likely that natural areas would be converted to agriculture following the dredge disposal, resulting in loss of wildlife.	KWO acknowledges the comment. Most land identified for non-federal disposal facilities is currently agricultural and will likely return to agriculture post-dredging. Adherence to the selection criteria and implementation of best management practices in the watershed above John Redmond, as well as in the land near the reservoir will ensure natural areas are not converted to agriculture following dredge disposal. Additional information to support the

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
			cumulative impacts discussion has been added to Section 4.12.
16	USFWS	The PEIS should list specific steps and Best Management Practices (BMPs) that will be required to ensure that equipment used is not infested with zebra mussels and include the management plan for contractors to ensure no transportation of zebra mussels. Also need to expand the discussion to include all exotic/invasive species.	Recommended information has been added to Section 5.4. Specific BMPs, as provided by KDWPT, have been included in Section 5.4. Discussion has been expanded to include additional exotic/invasive species.
17	USFWS	The interactions of migratory birds may create operational risks, health and safety concerns, and avian injuries or mortalities. The frequency of electrocution and collisions and the associated outages has been dramatically reduced in areas where efforts have been made to retrofit or replace hazardous poles and mark lines. The design and placement of transmission lines and towers can increase or decrease the exposure for bird collisions. Early evaluation of risk factors for bird electrocution and collision can reduce the risk potential that may reduce the need for costly modifications later.	Information on migratory bird impacts has been added to Sections 4.4 and 5.4.
18	USFWS	Table 6-1, page 126 is missing the Executive Order on Invasive Species (Executive Order 13112), the Water Resources Development Act (see previous comments under 1.5.3 Project Development History), the Migratory Bird Treaty Act, and the Rivers and Harbors Act of 1899. These should be added to the final PEIS.	Relevant laws and Regulations added to Table 6-1
19	SHPO	Our office finds the DPEIS to be acceptable, as it incorporates all project elements previously presented to us. Our office has already commented on a draft version of the Memorandum of Agreement (MOA) that will guide cultural resource investigations and we have no additional concerns at this time.	Receipt of the comment is acknowledged.
20	EPA	The PEIS should more completely characterize the sources and causes of increased sedimentation into JRR. This characterization would then support the inclusion of land management practices in the watershed, which could reduce the amount of sediment delivered to JRR, as a component of any or all alternatives addressing reduced water storage.	Streambank stabilization and watershed practices will continue to be a priority as the dredging initiative is implemented to reduce future loss of storage to sedimentation. Information on these practices and the sources of sediment in the watershed above John Redmond Reservoir has been added to the Affected Environment in Section

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
			3.2.2.
21	EPA	The PEIS should characterize water quality conditions in both JRR and the Neosho River downstream from JRR in the context of Kansas water quality standards.	Information on water quality conditions in the Neosho basin with respect to Total Maximum Daily Loads and Kansas Water Quality Standards has been added to Section 3.3.3
22	EPA	The PDEIS does not attempt to characterize either the content of these CDF dewatering effluents or potential impacts resulting from these discharges. The PDEIS does not state whether an NPDES permit will be required for discharges (if effluent is returned to reservoir) nor does it characterize any potential impacts to JRR water quality resulting from the discharge of polluted CDF effluent back to JRR. JRR is currently listed as impaired by siltation and nutrients which would be concentrated in these CDF discharges already expected to exceed NPDES permit limits governing discharge to the Neosho River. This approach raises concerns about important restrictions to planned management of dredged materials in both the short-term and over the planned 30 year span of potential dredging operations.	Information on typical CDF effluent quality from similar types and scale of dredging projects has been added (Section 4.3). In addition, letter from KDHE regarding the process and potential permit limits has been added to Appendix G – Agency Correspondence.
23	EPA	Section 2.2 Proposed (Preferred Action) states that no parent material (non-deposited sediment) will be removed under this alternative, but does not offer an indication of how this will be ensured. Please consider including this information in the final.	Description of the dredging quality control process has been added to Section 2.2.2
24	EPA	Section 4.3 Hydrology and Water Resources states that resuspension rates and sediment concentrations increasing over ambient conditions during dredging operations were found to be minimized by hydraulic dredges but does not provide specifics or quantitative information. Inclusion of supplementary information on these conditions would be beneficial.	Clarification and Figure 4-1 showing the probability distribution of dredging resuspension rates for hydraulic and mechanical dredging equipment by Anchor Environmental has been added to Section 4.3
25	EPA	While the 2013 Final Supplement to the Final Environmental Impact Statement for the Storage Reallocation is cited and referenced throughout this document, a full review of the cumulative impacts of both the reallocation and this proposed action is lacking.	Cumulative impacts section has been revised to address comment by adding additional consideration for the reallocation and other related activities that may results in cumulative impacts (Section 4.12).

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
26	EPA	Section 5.0 Mitigation addresses the various actions that allow project-related impacts to a range of environmental resource areas, but fails to adequately identify what entity/entities will be responsible for ensuring that mitigation measures are applied and completed for each resource and at what intervals monitoring activities will take place.	Clarification has been added to Section 5.0 that KWO and their contractors will be responsible for mitigation. Throughout Section 5.0 information on monitoring activities and the intervals at which the monitoring will take place has been added. In addition, Section 5.11 has been added to describe the restoration of the CDF Sites.
27	EPA	Identify a course of action or additional mitigation if impacts to Prime or Unique Farmlands cannot be avoided.	Consulted with NRCS and mitigation described in FPEIS sufficient. However, to address comment, additional information has been added to Section 5.7 to note other mitigation alternatives and NRCS-provided information has been added to Appendix E.
28	EPA	Discrepancy in Section 4.9.3 Recreation on the effects of the preferred and Alternative #2.	Discrepancy/Error has been corrected in Section 4.9.3 as well as affects summary tables.
29	EPA	This PEIS lacks a thorough consideration of what impacts the continuation of dredging activities will have on environmental resources beyond the first five years.	Additional description added to Section 4.12. In addition, a description of the Period of Analysis has been added to Section 1.3. All additional activities outside this initial review of known project specifics will be evaluated through the NEPA process by additional tiered NEPA documents (EAs or EISs) off this PEIS as future project details become available.
30	EPA	CEQ issued draft guidance for public comment on when and how federal agencies must consider GHG emissions and climate change in their proposed action. While this guidance is not yet final, EPA recommends that the EIS reference the draft guidance, describe elements of the draft guidance, and to the relevant extant, provide the assessments suggested by the guidance.	Reference to the draft guidance and technical support document have been added to Sections 3.5 and 4.6

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
31	EPA	As the primary purpose and need for the proposed action is to restore water supply storage for the benefit of regional water users, EPA recommends that the project team thoroughly consider the need for measures to manage potential climate-related impacts, such as potential increases in storm frequency and intensity resulting in increased floodwater flows, and conversely, the potential for increased drought events.	Information on the potential for climate-related impacts to flood control and water supply has been added to Section 4.6.
32	EPA	We would like to request clarification on a discrepancy in section 4.9.3 Recreation. The effects on recreation from the Preferred Alternative are said to be short-term, localized, minor, and adverse. The effect on recreation from Alternative #2 is said to be the same as the Preferred Alternative, but conversely states that "Alternative #2 would result in medium-term, minor, adverse effects on recreation.	Correction has been made to reflect that effects of both the Preferred Alternative and Alternative #2 on recreation would be short-term, localized, minor and adverse.
33	EPA	We would like to point out that owners or operators of any project or combination of projects who engage in construction activities which will disturb one of more acres must have authorization to discharge stormwater under the Stormwater Runoff from Construction Activities General Permit.	KWO acknowledges receipt of the comment and is coordinating with KDHE for application for the General Permit when appropriate.
34	KDHE	We do have a concern regarding the discharge of any project water to the Neosho River below the dam. The Clean Water Act and its implementing regulations require new and expanding point source discharges satisfy the State's antidegradation policy regarding protection and maintenance of existing uses and current water quality.	Information has been added to the PEIS related to Kansas Surface Water Quality Standards and antidegradation. Coordination is actively underway between the project proponent and KDHE to address concerns related to discharge of project water to the Neosho River below the dam (Sections 3.3.3 and 4.3).
35	KDHE	Regardless of the location of any discharge, the construction of the staging area, the pipeline route(s) and the sediment basins will disturb sufficient acres as to require a NPDES Construction Stormwater General Permit in addition to the NPDES discharge permit. We suggest the Office develop and submit the necessary applications as soon as possible to minimize delays to the dredging activity because of the timeframe of the permitting process.	Project proponent acknowledges the comment and has initiated coordination to develop and submit the necessary applications. Letter from KDHE (commenting agency) regarding the process and potential permit limits has been added to Appendix G – Agency Correspondence.
36	KDHE	The Bureau notes that CDF A is located adjacent to the reservoir and could discharge its effluent back to the reservoir without need of a NPDES permit or consideration of any antidegradation considerations.	Letter from KDHE (commenting agency) regarding the process and potential permit limits has

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
		Therefore, during the early stages of this project, the Bureau suggests foregoing any discharge to CDF B, returning the CDF A effluent back to the reservoir and monitoring its turbidity and suspended solid content. Meanwhile, the Office's plan for using the USGS gages and sensors to monitor downstream changes can build a baseline of conditions at various flows prior to any subsequent discharge into the Neosho River. This suggestion allows the Office to support its proposal and permit application to discharge from CDF B eventually with data on both the effluent quality as well as conditions throughout the lower reaches of the Neosho River. While Kansas' antidegradation policy allows for temporary sources of pollution producing ephemeral surface water quality degradation, the Bureau is quite sure the project's continual discharge over a five year period does not qualify as a short term impact to the existing uses of the Neosho River.	been added to Appendix G – Agency Correspondence. In addition, description of impacts and alternatives analysis process with respect to returning effluent water to the reservoir has been added to Section 4.3.
37	KDHE	While the settling basins are not considered wastewater treatment systems subject to minimum design standards or lagoon regulations, we would suggest the design of their outfalls accommodate a release rate that minimizes downstream bank stability issues and erosion control at the outfall. Finally, after the CDF areas are stable and dewatered, another NPDES Construction Stormwater General Permit will be required for any soil disturbing activities occurring on areas over one acre in size.	Project proponent acknowledges the comment and has initiated coordination to develop and submit the necessary applications and will adhere to the design recommendation to minimize bank stability issues. Letter from KDHE (commenting agency) regarding the process and potential permit limits has been added to Appendix G – Agency Correspondence.
38	Mary Sheridan	Questions and comments regarding soil quality, farmland production, pumping noise, standing water odor, standing water insect infestation, flooding and drainage.	Addressed in Sections 2.2.1, 3.2.2, 4.7 and 4.9.5 and Appendix K
39	Chauncey Shepard	Expressed concern of increase sediment passing through dam during runoff events. Also expressed concerns about the design and locations of CDFs and their ability to hold contents during extreme rain events.	Addressed in Sections 2.2, 3.2, 3.3, 4.2, 4.3 and 4.5
40	Danny Hawkins	With respect to the water treatment operations at Burlington, the PDEIS included all the information with respect to sediment quality and downstream turbidity needed. Clarification sought on the elimination for consideration of CDF Site C.	KWO acknowledges receipt of comment. Avoidance of impacts to wetlands, streams and fish rearing habitat is the purpose for eliminating CDF Site C as described in Section 2.2.1

Comment #	Agency/ Organization/ Individuals	Agency or Public Comment	Completed or Addressed by KWO
41	Mark Peterson, Mayor – City of New Strawn	We, as the City of New Strawn, have concerns regarding how the state will adequately address the impact odor and noise pollution will have on our city and residents. Upon review of the "Draft Programmatic Environmental Impact Statement (DPEIS) - April 2014," it is unclear as to what analysis, measure, or comparison has been given regarding odor from dredged material and the impacts to our community.	Addressed in Sections 3.8.5, 4.7, 4.9.6 and 5.6. On 7 Aug 2014, KWO and Great Lakes Dredge and Dock, LLC attended the New Strawn City Council meeting to discuss concerns presented in comment letter.
42	USFWS	Page 123 bullet states, “Dispose sediments on land that does not fit the criteria for prime or unique farmland.” This will significantly limit the number of potential CDF sites and potentially could promote the selection of sites containing native vegetation.	KWO has coordinated with NRCS to evaluate the potential impacts to Prime and Unique Farmlands from the Preferred Alternative. Correspondences between KWO and NRCS, as well as associated evaluation forms are included in Appendix E. Disposing of sediments on land that does not fit the criteria for prime and unique farmland can be a mitigation measure that will reduce impacts; however, because of the abundance of additional prime and unique farmlands in the area KWO does not feel that this will limit potential CDF sites. Adherence to the selection criteria for CDF Sites as described in Section 2.2.1 will also reduce or negate impacts to high value natural areas.
43	USFWS	The document should discuss the Migratory Bird Treaty Act (MBTA) and associated legal responsibilities under it.	Information on the Migratory Bird Treaty Act, associated legal responsibilities, potential migratory bird impacts and potential mitigation measures have been added to Sections 4.4 and 5.4 and referenced in Table 6-1.

1.6 Environmental Setting

1.6.1 Climate and Topography

The John Redmond Reservoir project area is influenced by a continental climate with average annual precipitation of approximately 35 inches in the vicinity of Emporia, KS to the north, 40 inches at Chanute, KS to the south and 43 inches at Miami, OK (to the south) (USACE 2013). Historically, most precipitation occurs from late spring through early summer, with about 75 percent falling during the growing season. Temperatures range from below zero (-30F was recorded historically at Chetopa, KS) to above 100F (117F was recorded historically at Columbus, KS) and the winds are predominantly from the south averaging approximately 12 mph. Evaporation rates ranged from approximately 73 inches during normal years to approximately 111 inches during drought years in the vicinity of Emporia, KS (USACE 2013).

The topography is that of a broad floodplain within low, rounded hills. The hills result from generally westerly to northwesterly dipping strata that create resistant bend and irregular cuesta-like ridges (USACE 2013). The broad, shallow Neosho River Valley is the most prominent topographical feature on the landscape. The maximum relief is about 225 feet in the dam and reservoir area, with most of the site ranging from approximately 1,020 foot elevation near the south recreation area below the dam to approximately the 1,100-foot elevation west of Neosho Rapids, KS, within the northwestern-most flood pool boundary. The lowest elevations are downriver near the Grand Lake O' the Cherokees (Pensacola Lake) where the Grand (Pensacola) Lake surface elevation lies at approximately 742 feet (USACE 2013).

The Neosho and Spring Rivers join to form the Grand River, approximately 10 miles southeast of Miami, OK. The Grand River receives drainage from tributaries on the western slopes of the Ozark Mountains. The river channel varies from one to two miles in width and flows through rolling hills topography (USACE 2013).

Recent Drought Conditions

Severe drought conditions were experienced in 2012. Municipal water utilities implemented mandatory conservation measures and releases for Wolf Creek were limited to only about 69 percent of their annual contract. The year started with full conservation storage but inflows diminished to well below the statistical one (1) percent chance of inflow by June. Reservoir projections of similar inflows showed that storage would be insufficient to supply the full Wolf Creek contract and also warranted continuation of conservation measures by the municipalities. Water quality releases were used sparingly and downstream flows were below Minimum Desirable Streamflow levels for the majority of the year, resulting in water right administration.

Table 1-3. Calculated inflow probabilities (1952-2012) and 2012 observed flow, June – December (acre-feet)

	1%	2%	5%	2012
June	14298	22265	39704	8876
July	4673	7625	14696	3898
August	3751	5595	9531	5445
September	1547	2856	6189	5574
October	615	1722	4919	4056
November	3094	4998	9402	3560
December	1476	2460	4981	2936

1.6.2 Land Ownership and Land Management in the Planning Area

Most of the lands of the Neosho River floodplain downstream of John Redmond Dam are privately owned. Approximately 29,801 acres of land are owned by the USACE; this land is upriver from and includes John

Redmond Dam and outlet structures. The USACE project manager operates the dam and reservoir under the direction of the Operations Division, Tulsa District. The principal regulation/management issue identified historically was riverbank erosion which occurs after periods of high flows in the Neosho River below the dam. To minimize any riverbank erosion, reservoir releases are decreased as slowly as possible to slow the rate of fall in the river stage, since this erosion has been attributed to the fast rate of fall from natural and regulated flows (USACE 2013). However, recent research determined aside from localized channel widening, there was little post-dam construction change in bank-full channel width on the Neosho River below John Redmond Dam (USACE 2013).

The USACE maintains six public-use areas, five of which have recreation parks providing camping, picnic areas, drinking water and sanitary facilities (USACE 2013). Additional recreation facilities present on USACE managed lands include five boat ramps, an overlook and a swimming beach. In addition to site management by the USACE, leases have been signed with the USFWS and Kansas Department of Wildlife, Parks and Tourism (KDWP&T) to provide land management for the FHNWR and OCWA.

Flint Hills National Wildlife Refuge (FHNWR) was established in 1966 and consists of approximately 18,545 acres located on the upriver portion of John Redmond Reservoir (USACE 2013). The refuge is managed primarily for migratory waterfowl and shorebirds. OCWA was established in 1966 and consists of approximately 1,472 acres adjacent to FHNWR and the southeast portion of John Redmond Dam. This wildlife area is managed primarily for big game and upland species: white-tailed deer, wild turkey, mourning dove, bobwhite quail, cottontail rabbit and squirrel.

Permitted activities on the FHNWR include wildlife observation, hiking and sightseeing, photography, boating, picnicking, camping, fishing, hunting, wild food gathering, and fish bait collection. Interpretive trails are present and include Dove Roost Trail and the Headquarters Trails. OCWA provides wildlife observation, sightseeing, photography, boating, fishing, and hunting opportunities.

1.6.3 Project Development History

The project was authorized as the Strawn Dam and Reservoir under the Flood Control Act of 17 May 1950 (Public Law 516, 81st Congress, Chptr 188, 2nd Session) (USACE 2013). It was to provide flood control, water conservation, recreation and water supply. The project was renamed John Redmond Dam and Reservoir by an Act of Congress (Public Law 85-327, 85th Congress, HD 3770, 15 February 1958). Construction of John Redmond Dam began in June 1959, and final water storage began during Sept. 1964 (USACE 2013).

John Redmond Dam is an integral component of a three-dam and reservoir system that includes Council Grove Reservoir, also on the Neosho River, and Marion Reservoir on the Cottonwood River (USACE 2013). The drainage area occupied by all three dams is 3,015 square miles, of which 2,569 square miles below Council Grove and Marion Reservoirs is uncontrolled and drains directly to John Redmond Reservoir. The following data and Table 1-4 presents the post-construction John Redmond Reservoir baseline. Specific physical data describing the dam (USACE 2013) include:

- Earthfill Dam Structure: 20,740 feet long (not including spillway); dam top = 1,081.5 feet National Geodetic Vertical Datum (NGVD); maximum height = 86.5 feet above the Neosho River bed; crest width = 35 feet 7 inches.
- Spillway: located near left abutment; concrete chute, gated ogee weir; crest elevation = 1,033.0 feet NGVD; length = 560 feet; control = 14 (40 ft. x 35 in.) tainter gates; hoists are individual electric motors.

- Outlet Works: two 24 inch circular pipes for low flow; one 30 inch circular pipe for water supply; invert elevation = 1,015.5 feet NGVD; invert placed through left abutment of spillway; control = motor-operated butterfly valves for low flows and manually operated gate valves.
- Land Acquisition: taking line is semi-blocked to elevation 1,063.0 feet; easement is elevation 1,073.0 feet or limits of backwater envelope curve.

Table 1-4. Project Elevations, Surface Areas and Storage Volumes (Source: KWO)

Project Feature	Elevation (ft)	Surface Area (Acres)	Storage Volume (AF)	Spillway Capacity (cfs)
Top of Dam	1081.5	52,957	1,140,775	732,000
Maximum Pool	1074.5	41,773	816,795	575,000
Surcharge Pool	1073.0	39,984	755,330	542,000
Flood Control Pool	1068.0	31,606	573,157	430,000
Conservation Pool	1041.0	9,181	67,302	38,000
Spillway Crest	1033.0	4,951	8,639	0
Inactive Pool	1020.0	0	0	-
Streambed – Dam	995.0	-	-	-
Flood Control Storage	1041.0 – 1068.0		505,855	
Conservation Storage	1020.0 – 1041.0		67,302	

1.7 Relevant Federal, State and Local Statutes, Regulations and Guidelines

The FPEIS has been written in compliance with recognized federal and state guidelines, regulations and statutes presented as Table 1-5. Further identification and descriptions of applicable environmental laws and regulations are presented in Section 6.0. Permits, licenses and other entitlements which must be obtained by the state of Kansas before implementing the proposed project and modification of the federal project are included in Table 1-6.

Table 1-5. Relevant Laws and Regulations

Environmental Law or Regulation	General Description
National Environmental Policy Act of 1969, as amended (NEPA)	Requires the disclosure of the environmental impacts of any major federal action.
Council on Environmental Quality Regulations, Implementing NEPA	The Council on Environmental Quality was established by NEPA and consists of three members appointed by the president to 1) analyze and interpret environmental trends and information, 2) appraise programs and activities of the federal government under NEPA, 3) be aware of and responsive to the scientific, economic, social, aesthetic, and cultural needs and interests of the nation, and 4) formulate and recommend national policies to promote the improvement of the quality of the environment.
Clean Water Act of 1977, as amended	Provides the principle framework for national, state and local efforts to protect water quality, including protection of wetlands.
Executive Order 11988 of 1977, Flood Plain Management	Federal agencies are directed to consider the proximity of their actions to or within floodplains, to 1) reduce the risk of flood damage, 2) minimize the impacts of floods on human safety, health and welfare, and 3) restore and preserve the natural and beneficial values served by floodplains.
Kansas Administrative Regulations 28-16-28c, Surface Water Quality Standards	General provisions state that no degradation of water quality by artificial sources shall be allowed that would have harmful effects on threatened or endangered aquatic life in a critical habitat.
Executive Order 11990 of 1977, Protection of Wetlands	Requires federal agencies to minimize or avoid wetland destruction, loss, or degradation and to preserve and enhance natural and beneficial

Environmental Law or Regulation	General Description
	wetland values.
Endangered Species Act of 1973, as amended	Requires federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed, threatened, or endangered species, or destroying or adversely affecting their critical habitat.
Fish and Wildlife Coordination Act	Requires consultation with the Fish and Wildlife Service and the fish and wildlife agencies of the States where waters of any stream or other water body are proposed or authorized, permitted or licensed to be impounded, diverted or otherwise controlled or modified by any agency under a Federal permit or license. Consultation is to be undertaken for the purposes of preventing loss of and damage to wildlife resources.
Clean Air Act of 1970, as amended	Provides the principle framework for national, state and local efforts to protect air quality.
Kansas Administrative Regulations 28-19-17, Prevention of Significant Deterioration of Air Quality	Applies to the construction of major stationary sources and major modifications of stationary sources in areas of the state designated as attainment areas or unclassified areas for any pollutant under the procedures prescribed under the federal Clean Air Act of 1970, as amended.
Antiquities Act of 1906	Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.
National Historic Preservation Act of 1966, as Amended	Establishes as policy that federal agencies are to provide preservation of the nation's prehistoric and historic resources, and establishes the National Register of Historic Places.
Archaeological Resources Protection Act of 1979, as amended	Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate them.
Rivers and Harbors Act	States that appropriate Federal and State agencies are to ensure that possible adverse economic, social and environmental effects relating to any proposed action have been fully considered in the development of the project, and that the final decisions on the project are made in the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes, and the cost of eliminating or minimizing such adverse effects to biological and human resources.
Migratory Bird Treaty Act	Prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Takings could result from projects in lakes, prairies, wetlands, stream and woodland habitats, and those that occur on bridges and their structures.
Noise Control Act	Initiated a federal program of regulating noise pollution with the intent of protecting human health and minimizing annoyance of noise to the general public. Noise is defined as unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Response to noise varies according to its type, perceived importance, appropriateness in the setting and time of day, and the sensitivity of the individual receptor.
Executive Order on Invasive Species (EO 13112)	Established the National Invasive Species Council to ensure that Federal programs and activities to prevent and control invasive species are coordinated, effective and efficient.
Water Resources Development Act (WRDA) – 1986, '90, '92, '96 and 2013	Addresses long-term disposal of dredge material and promotes decontamination technologies for the manufacturing of material for beneficial uses.

Table 1-6. Permits, Licenses and other Entitlements.

Permit or License	General Description
U.S.C. Section 408	Permission from the Secretary of the Army for non-federal entity to alter or modify existing USACE projects. As the project proponent, the state of Kansas will prepare and submit a Section 408 request to modify the federal project (John Redmond Reservoir) to dredge sediment and for use of federal lands to construct sediment disposal facilities.
Real Estate Instruments	The Kansas Water Office will also coordinate with USACE to secure the appropriate real estate instruments to allow the state of Kansas, as the project proponent, to access and utilize federal lands for dredging, construction of sediment disposal locations, and pipeline right of ways, staging areas, and other activities associated with the dredging project. Depending on the phase of the project appropriate real estate instruments may include leases, easements, consents to easement, early rights to entry, and licenses. The State of Kansas will not retain permanent occupancy of any of the sites.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

The proposed *Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas,* and proposed alternatives to the proposed action are described in this section. NEPA requires an EIS objectively evaluate a reasonable range of alternatives that are practical or feasible from a technical and economic perspective, and based on common sense (46 FR 18026, as amended, 51 FR 15618). All of the action alternatives evaluated herein meets the basic project goal of increasing the water storage capacity in the conservation pool of John Redmond Reservoir.

In 1975, the state of Kansas and the federal government entered into a water storage agreement at John Redmond Reservoir to provide water for the CNRWAD and the WCGS. The CNRWAD includes 19 municipal and industrial water users (Wendt, B. KWO personal communication, Biery (WAD) November 28, 2012). Construction of John Redmond Dam began in June 1959, and final water storage began during September 1964 (USACE 2013). John Redmond Dam is an integral component of a three-dam and reservoir system that includes Council Grove and Marion Reservoirs. The three structures provide flood control, water supply, water quality, recreation and other benefits to the Neosho River Basin. The conservation pool of John Redmond Reservoir was filled to its initial elevation of 1,036.0 feet during November 1964 and was raised to the 1,039.0 foot elevation during April 1976. In 2013, the reallocation request was approved and the conservation pool elevation was authorized to increase to 1041.0. The CNRWAD and Western Resources, the operators of WCGS, have contracted with the State of Kansas for all the water supply storage in the reservoir (USACE 2013). The WCGS pumps water from the Neosho River below the dam structure to store in Coffey County Fishing Lake, approximately three miles east of John Redmond Dam. The remaining water users divert flows using low-elevation dams and/or pump the water from the river.

A recent Tulsa District water supply yield analysis indicated a 25 percent reduction in the water supply capacity at design life (CY 2014) because of sediment deposition. Most of the sediment deposition has been below the top of the conservation pool. The USACE was directed by Congress to study an equitable redistribution (reallocation) of water storage between the flood control and conservation pools, and therefore, the USACE evaluated an alternative to raise the conservation storage pool to an elevation of 1041.0 feet. A Record of Decision was approved in June 2013 on the Supplement to the Final Environment Statement for the pool raise and reallocation. Even with the authorization of the pool rise, John Redmond Reservoir will still accumulate sediment and its conservation storage will be depleted. Therefore the KWO is evaluating the alternative actions described in this section to resolve the depleting water storage situation, due to accumulating sediment. The actions proposed to resolve the loss of water storage due to sedimentation at John Redmond Reservoir are:

- Proposed (Preferred) Action: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.
- Alternative #2 - Dredge and dispose of sediments to restore the conservation pool to near original capacity
- No Action

2.2 Proposed (Preferred) Action: Dredge and Dispose of Sediments to Ensure 55,000 Acre-Feet of Conservation Storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

This alternative would allow for the dredging and disposal of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for authorized project purposes. In the first 12 to 17 months, equipment will be deployed to the staging area, the first three Confined Disposal Facilities (CFDs) (CDF Sites A, B and E) will be constructed, and approximately 600,000 cubic yards of sediment will be removed. Within the first five years of the dredging activity, approximately 3 million cubic yards of sediment will be removed (Figure 2-1). No parent material (non-deposited sediment) would be removed under this alternative. Phasing of removal will continue through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Project methodology and impacts will be assessed initially for the first 12 to 17 months and then again after the first five years and periodically throughout the full project period.

Under this alternative sediment removal would be conducted with a barge-mounted, portable hydraulic dredge with a cutter head ranging from 16” to 20”. Only sediment deposited since lake construction will be removed; there will be no excavation of the original, pre-impoundment, surface. Staging for equipment assembly and mobilization will be conducted at the Dam Site Area, but if needed, the Hickory Creek, Otter Creek or Ottumwa public use areas may be used (Figures 2-1 and 2-2). If alternative or additional staging areas are needed, they will be evaluated through the NEPA process by additional tiered NEPA documents (EAs or EISs) off this Final PEIS. The staging area will be two to three acres in size with a portion of the area graveled to provide a stable working surface. Activities at the staging area will include the loading and unloading of trucks, assembly of dredge equipment, storage of parts, and will serve as a support area during dredging for crew change and parts delivery.

2.2.1 Determination of CDF Sites

Confined Disposal Areas (CDFs) will initially include three locations on federal government fee lands and later move to privately-owned locations. Initially four parcels were identified on federal property as potential disposal sites, each of which are located below the dam (Figure 2-4). To avoid fill and impact to wetlands and other Waters of the United States (CDF Site C), only three of the sites (CDF Sites A, B and E) will be used. CDF Sites A, B and E will likely be sufficient for disposal of approximately 600,000 cubic yards of sediment disposal. Identification of additional suitable disposal sites on private property, approximately 320 additional acres, will be focused in the first five years below the dam. If the dredging action were to continue beyond the initial five years and remove a quantity greater than three million cubic yards, approximately 2,000 additional acres, for a total of about 2,500 acres, may be needed for CDF sites over the next 30 years to maintain the 55,000 acre feet of storage in John Redmond Reservoir. Identification of suitable disposal sites on non-federal land beyond the removal and disposal of the first three million cubic yards will be focused within an area four miles east and west of the reservoir.

Potential sites for sediment disposal on private property will be evaluated for feasibility based on the following criteria: (1) proximity to dredging location in John Redmond Reservoir, (2) avoidance of impacts to gas and utility lines, (3) a topography that minimizes CDF cell wall height, (4) avoidance of Waters of the U.S. (5) minimization or avoidance of impacts to local wildlife and other high valued natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2 (defined in Section 5.4) (6) sufficient distance (outside 2-mile buffer) of Coffey County airport and (7) cost for compensation. Sites meeting the criteria will be evaluated for historical and cultural resources and potential impacts to threatened and endangered species and habitat. Under the Programmatic approach of this EIS, future disposal sites selection will be coordinated with relevant local, state and federal agencies, including the U.S. Army Corps of Engineers, Tulsa District Regulatory Office. Future sites will be evaluated through the NEPA process or permit process, or both, whichever is appropriate.

CDFs will be constructed with multi-cell designs with berms and weirs to slowly dry deposited sediment (Figures 2-5, 2-6, 2-7 and 2-8). All materials required for berm construction will be collected on-site from within the containment area. Materials will be excavated using hydraulic excavators or tractor pulled scrapers. Once excavated, the material will be transported using off-road trucks or scrapers to the berm area being built. The material will be deposited within the footprint of the berm and spread using a D6 class bulldozer. Compaction of each lift will be achieved by either using a sheeps-foot roller or using tires from the scraper to compact the soil. As each lift progresses upward the side slopes will be graded using the same D6 dozer into the final design template.

Excavation to create berms for CDF A will be from soil on site with an average depth of 0-12 feet, more or less, graded to drain as shown in Figure 2-5. Berms and excavated soil will have more cut than fill with 117,000 cubic yards of soil being removed from site. Total elevation change across the site is approximately 34 feet with an average grade of 1.5% with the high point near the northern line and low point near the south end. Excavation to create berms for CDF B will be from soil on site with an average depth of one to three feet, more or less, graded to drain as shown in Figure 2-6. Berms and excavation soil for CDF Site B will be equal cut and fill with no additional soil being added or removed from site. Total elevation change across the site is approximately 6 feet with an average grade of 0.5% with the high point near the center and low point near the southwest corner. Excavation to create berms for CDF E will be from soil on site with an average depth of 12-24 inches, more or less, graded to drain as shown in Figure 2-7. Berms and excavated soil will be equal cut and fill with no additional soil being added or removed from site. Total elevation change across the site is approximately 10 feet with an average grade of 1.5% with the high point near the northern line and low point near the south end.

Effluent water will be piped and discharged into the nearest river or stream surrounding the CDFs unless analysis determines this approach would adversely impact the quality of downstream waters in which case the effluent will be piped back to the reservoir. CDF areas will be reclaimed or repurposed after the sediment has dewatered.

For CDF Site A (Figure 2-5), approximately 33,000 cubic yards of soil is needed to construct the berms and cells. As described above, all material for construction of the CDFs will be collected on-site from within the containment area. CDF Site A is 24 acres and the total holding capacity is approximately 125,000 cubic yards. For CDF Site B, approximately 47,000 cubic yards of soil is needed to construct the berms and cells. CDF Site B is approximately 33 acres with a holding capacity of approximately 133,000. CDF Site E is 123 acres and the total holding capacity is approximately 335,000 cubic yards. For CDF Site E, approximately 98,000 cubic yards of soil is needed to construct the berms and cells.

A mix of dredged material and water would be transported from the reservoir to CDFs via 24” high-density polyethylene (HDPE) pipe. Piping routes from the reservoir to the federal-government owned sites are shown in Figure 2-4. Pipes will remain above ground. Road crossings for sites on non-federal property will either be placed through culverts or over the road surface (Figure 2-10). Where the pipe crosses Embankment Road between the dredging site within the reservoir and the CDF, the roadway will be bored and jacked with a 24” casing. The remaining road crossings will be cut and covered whenever possible with the road surface returned to original condition. If placed over the road surface, the pipe will be covered to allow vehicle passage. The pipeline route was selected to avoid contact with and impact to the dam and tainter gates.

Each 50’ section will be fused together using a model 500 McElroy fusing machine and pushed into the lake. At 75’ intervals, the pipeline will be attached to steel floating pontoon tanks. Pontoon pipeline will be fused into 1,000’ sections and secured in the lake until dredging begins. Two different wall thickness of pipe will be used on the project based on internal pressure at any given location. The pipe near the stern of the dredge and the discharge of the booster will be exposed to the highest pressure therefore 20” Standard Dimensional Ration (SDR) 13 pipeline will be used. The SDR 13 pipeline has a working pressure of 160 psi and nearly a 2” wall thickness. The remaining pipeline in the system will be 18” SDR 17 with a working pressure of 100 psi and a wall thickness of 1”. Both the 20” SDR 13 and the 18” SDR 17 have the same basic inner diameter of 16”. The pipe will cross the Neosho River approximately 3,000 feet below the dam. No materials will be excavated from the Neosho River and the pipe will lay passively on the floor of the river. Because the slope of the streambanks at the point where the pipe crosses the Neosho River is too steep, trenches will be cut into the bank to lay the pipe at a more gradual slope. These trenches will be covered with the excavated materials and reinforced with riprap (Figures 2-10 and 2-11).

Pipelines throughout the project will be inspected multiple times each day. Should a leak develop in the pipeline, dredging activities will be shut down immediately and the pipeline will be repaired. Any material which may have leaked will be cleaned up and transported to the nearest CDF site. Where the pipe crosses the Neosho River, new, thicker walled pipe will be used to minimize the possibility of any leaks occurring in the river.

Effluent from the CDF sites A, B and E will be released into the Neosho River or piped between each CDF for additional water clarification. The CDFs will be designed to retain suspended materials and provide adequate long-term storage capacity. The quality of effluent discharged from these sites will meet the conditions and standards established by the Section 401 State water quality certification, as well as, the wastewater permitting limits established in a National Pollutant Discharge Elimination System (NPDES) permit.

For the purpose of this FPEIS, the initial period of analysis encompasses the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment. Construction of the first three CDF sites (CDF Sites A, B and E) will take approximately three months. Dredging will commence at the completion of the construction of these three sites. Removal of 600,000 cubic yards of sediment (capacity of CDF Sites A, B and E) will take approximately 12 to 17 months depending on weather conditions. Upon fill of CDF Sites A and B, the sites will be allowed to dewater sufficiently to allow the sites to be remediated to native grass habitat. Upon fill of CDF Site E, the site will be also be allowed to dewater sufficiently to allow a portion of the site (on USACE property) to be remediated to grasses and the remainder of the site (on private property) to return to a mix of pasture and row crop production. Dewatering may take up to two to three years. After the sites are dewatered, berm walls will be collapsed to cover the dredge materials and the sites will recontoured to the elevation and gradient necessary to support the native grasses and crops. Approximately 320 additional acres will be identified and evaluated through the NEPA process within the first five years of the project, following the initial period of analysis. Additional activities outside of the initial period of analysis include dewatering and remediation of CDF Sites A, B and E and the removal of 2.4 million cubic yards of additional sediment. All additional activities outside of the initial period of analysis will be evaluated through the NEPA process.

Analysis of the material to be removed from the reservoir shows that it is within normal background range of typical watershed soils in content, nutrients and trace chemicals. Placement of the material will not adversely affect the soil profile that will be utilized by the expected plant population root zone. In addition, to maintain land productivity after placement of dredged material, existing topsoil will be removed to a depth of 1–2 feet based on individual site conditions. A portion of this topsoil will be used to construct CDF levees where soils are suitable. The remaining topsoil will be stockpiled on site for the duration of the dredge material placement and dry down. After the placed dredge material has dried to a point where mechanized equipment can work the material, the stockpiled topsoil and levees will be placed on top of the dredged material and contoured to a shape that supports the expected use of the landowner and allows for appropriate drainage. Both removal of existing topsoil before dredged material placement and reapplication during site remediation will be accomplished with standard earth moving equipment.

Every effort is being made on private property to avoid jurisdictional drainage. Each potential private property site is being evaluated, and CDF's designed, with surrounding properties in mind. Precipitation that falls directly on the CDF site will be captured within the levee system and controlled throughout its' course to the river. Drainage which currently crosses potential CDF sites, upstream to downstream, will be routed around the constructed CDF through existing, enhanced or constructed drainage ditches such that no additional property will be inundated during runoff events greater than would have been seen without the CDF in place. Existing drainage that currently meets downstream landowners needs agricultural or stockwater supply will be also be maintained either through avoidance of natural drainages or by rerouting of flow around constructed CDF's with existing or constructed drainage ditches.

The Dredge John Redmond Reservoir Alternative would achieve the project goal to restore water supply storage for the benefit of the regional water users and to restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem, and is preferred by the state and USACE.

Beneficial Uses of Dredge Material

As described by the USACE Engineer Research and Development Center (ERDC), dredge material is a potentially valuable resource if properly applied in a beneficial use. Dredged materials can be used for engineering applications such as land creation; for agricultural and product applications such as topsoil; and for environmental enhancement such as wetlands and other habitats. For example, dredge material on CDFs A and B will allow for remediation to upland grass habitat. As additional CDF sites are identified, opportunities for the beneficial use of the dredge material will be considered.

Dredge material may be beneficial for agricultural use, as well. CDF Site E will be returned to agricultural production post-dredging. The definition of agricultural use as it applies to dredging is the beneficial use of dredged material by the application of dewatered or slurry dredged material to farmland, for the purpose of improving the soil for farming. Agricultural use of dredged material can be a method of amending poor agricultural soils. The processed dredged material can be used to supply organic content and nutrients to deficient soils to increase productivity. Dredged material with the proper amount of fine material can also be beneficial in reducing the percolation rate of rainwater, thus promoting the retention of soil moisture needed by the crops.

Dredged material can be incorporated as a land amendment to improve the productivity of low organic soils. The material may need to be conditioned prior to use as a land amendment. Alkalinity (generally agricultural lime) can be incorporated in the soil mixture to buffer acid production. Frequently, the limiting process in dredging operations is the rate of dewatering of the dredged materials. If certain admixtures of soil amendments (calcium carbonate, calcium sulfate, etc.) can be used to improve dewatering properties, then using dredged material to reclaim agricultural soils can be optimized.

Studies from the Midwest and Mid-Atlantic regions have shown that measured yields of wheat and corn planted in dredged materials remained at or above county averages. Overall, the chemical and physical properties of these materials are comparable to the topsoils in the region. Based upon the study with the documented chemical, physical and morphological properties of the material, and the combined yield data, the newly deposited "dredge soils" can be said to be as productive as natural soils (Daniels 2007, Lembke 1983, Innovative Reuse Committee 2007). While these studies were not conducted in Kansas, it is anticipated that similar results would apply from Kansas agricultural land productivity.

2.2.2 Dredging Quality Control Process

The quality control process for the dredging of John Redmond reservoir will utilize a combination of electronic and physical instrumentation.

Horizontal Control: The dredge LP will be equipped with Trimble DGPS. This DGPS system has an accuracy of plus or minus one meter. The latitude and longitude received from the Trimble GPS unit will be communicated to an onboard laptop computer. The computer will convert the latitude and longitude to state plane coordinates based on a local Kansas grid. The computer will display this information both graphically and numerically to the dredge operator along with longing the data for post dredging record keeping. The dredge operator will have a computer display showing the edge of the dredging area and a graphical representation of the dredge moving within the dredge area. The cutterhead location will be shown on the screen as well as the limits of dredging. The dredge operator can limit the width of dredge cut by stopping the dredge movement as the cutter nears the edge of the cut. As a visual back up to the DGPS system, buoys will be placed along the dredge limit line to verify cutter location.

Vertical Control: The dredge cutterhead elevation is controlled from the dredge operators control station. The elevation of the cutterhead will be monitored with both electronic and physical systems. The electronic system will consist of an inclinometer installed on the dredge ladder. This inclinometer senses the angle of the dredge ladder and transmits it to the dredge laptop computer. The computer calculates the cutterhead location utilizing both the angle and length of the ladder. Once this calculation has been completed the information is integrated into the horizontal position and displayed as an X, Y, Z for the operator. The target elevation is used as a reference and both are displayed for the operator to monitor his digging depth verses target elevation. Along with the inclinometer a physical gauge will be installed on the ladder to indicate the digging depth of the cutterhead. This gauge will consist of a cable and pulley system attached to the ladder which moves a pointer across a graduated board representing the cutterhead depth.

As verification of the horizontal and vertical controls hydrographic surveys will be conducted to verify the actual dredging results.

Additionally, in the case of John Redmond where the goal is to remove only silt/clay sediments, the cutterhead hydraulic pressure will be monitored. The cutterhead hydraulic pressure is an indication of the stiffness of the material being dredged. Silt/clay sediment requires much less pressure to excavate than virgin soils. The operator will monitor his pressures constantly to insure he is not dredging any virgin material. If higher hydraulic pressures are encountered, the operator will raise the cutterhead until the pressures return to normal for silts/clays. Using all of these control measures we can insure that only the sediment is removed and it is removed only from the areas intended.

Figure 2-1. Proposed dredge location for removal of initial 600,000 cubic yards and up to 3 million cubic yards of sediment, Preferred Alternative.

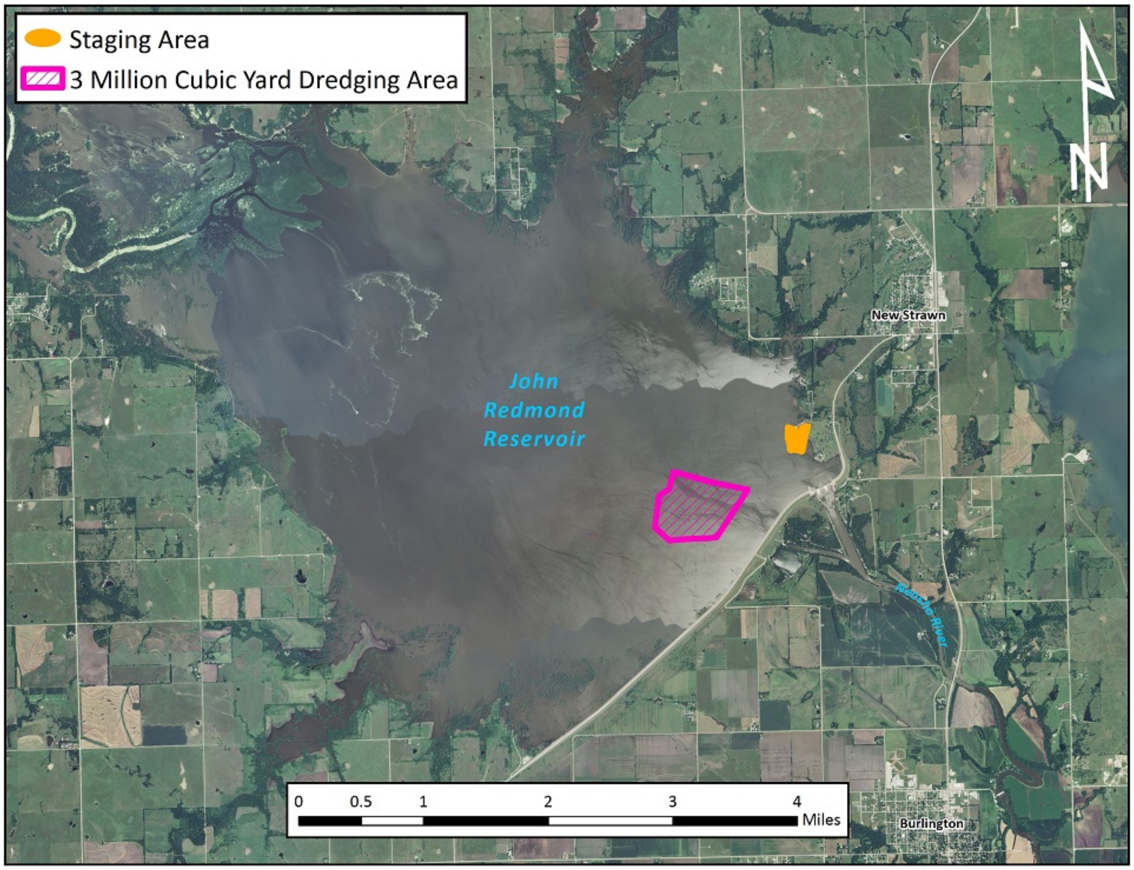


Figure 2-2. John Redmond Reservoir Public Use Areas.

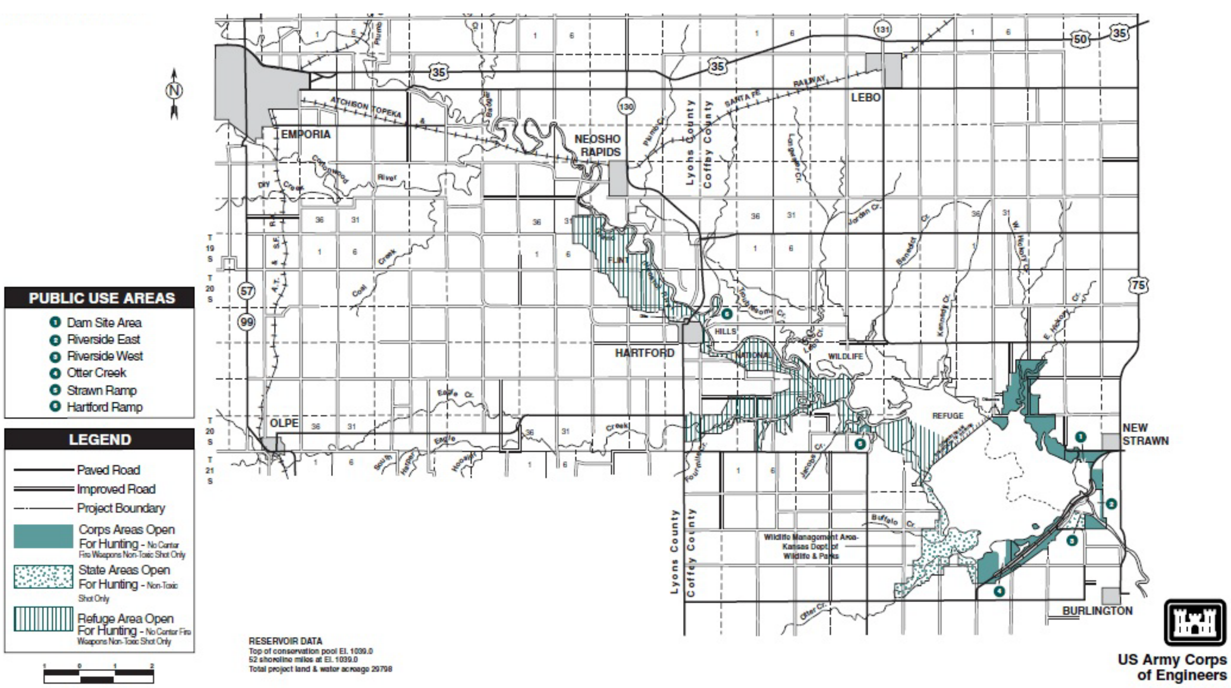


Figure 2-3. Draft Schematic of Confined Disposal Facility (CDF) Typical Dike Profile.

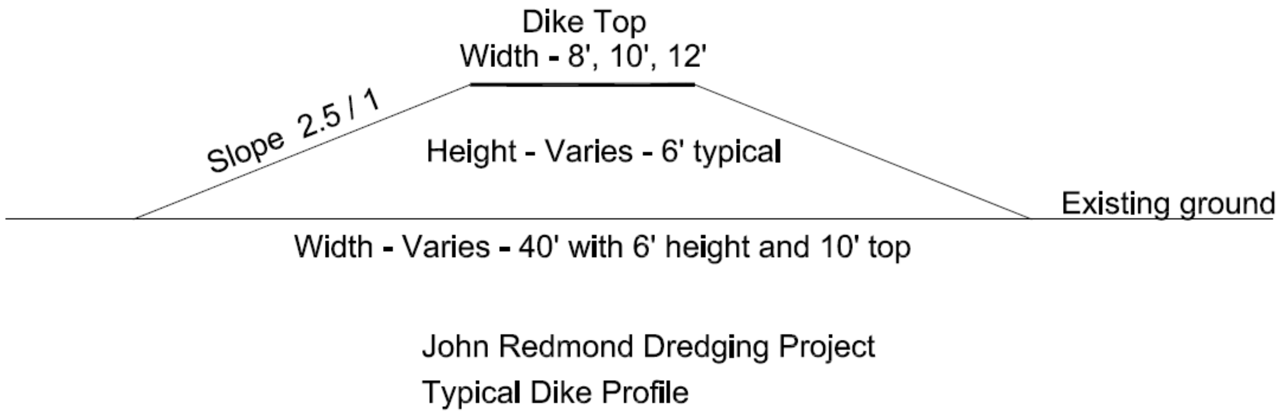


Figure 2-4. Potential sediment disposal locations on federal property.

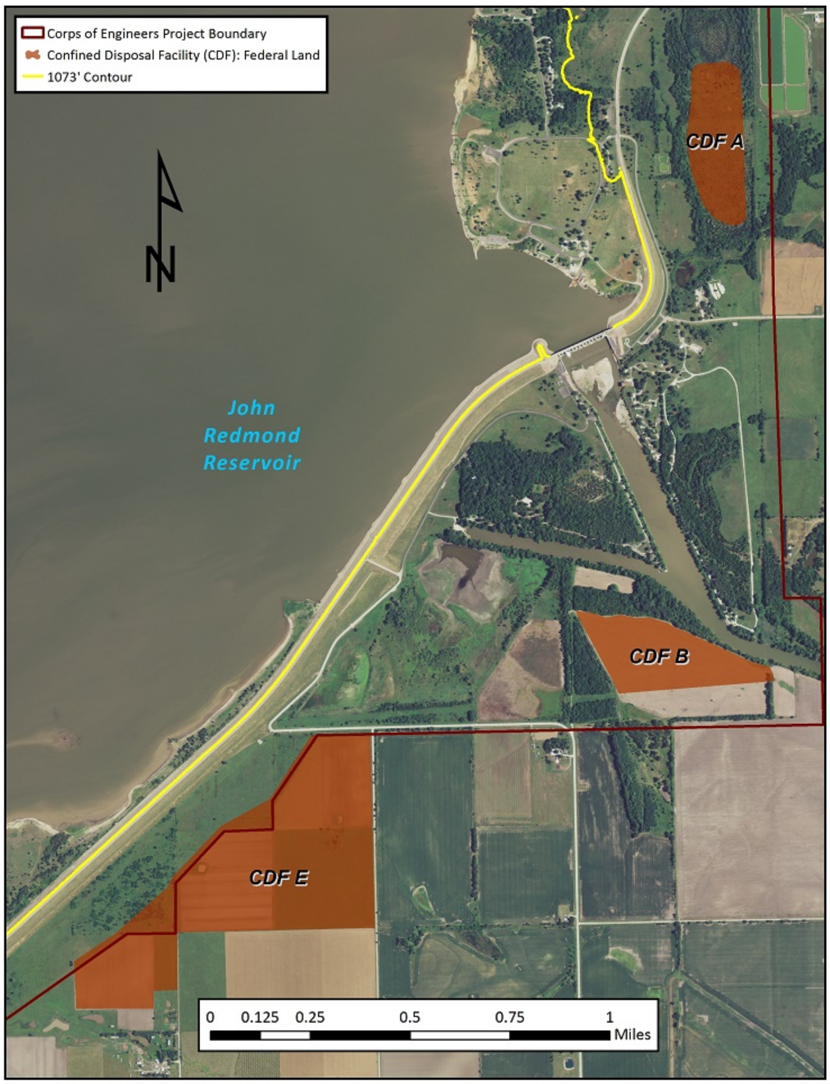


Figure 2-5. Draft Design Drawings for CDF Site A.

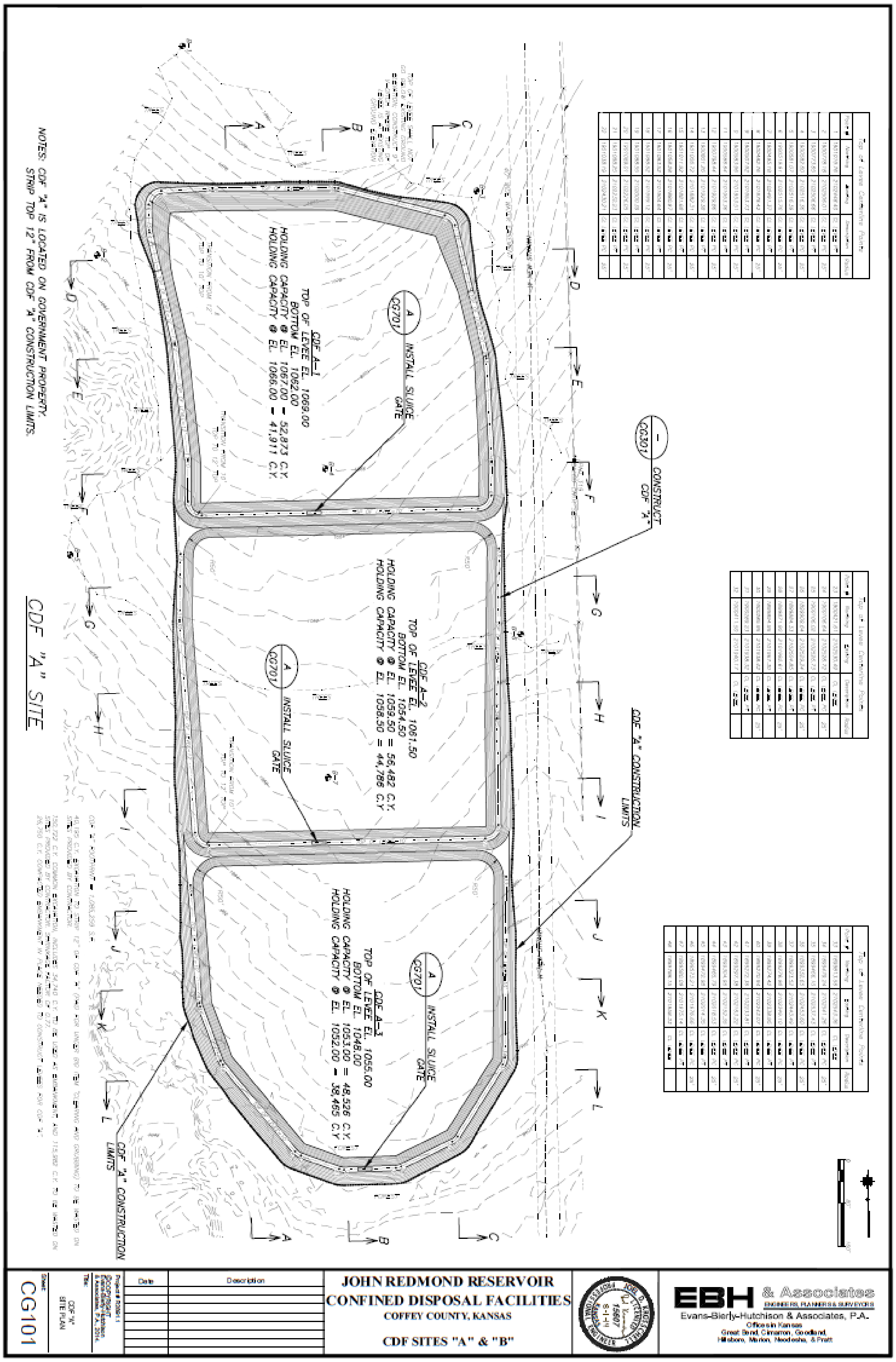


Figure 2-6. Draft Design of CDF Site B.

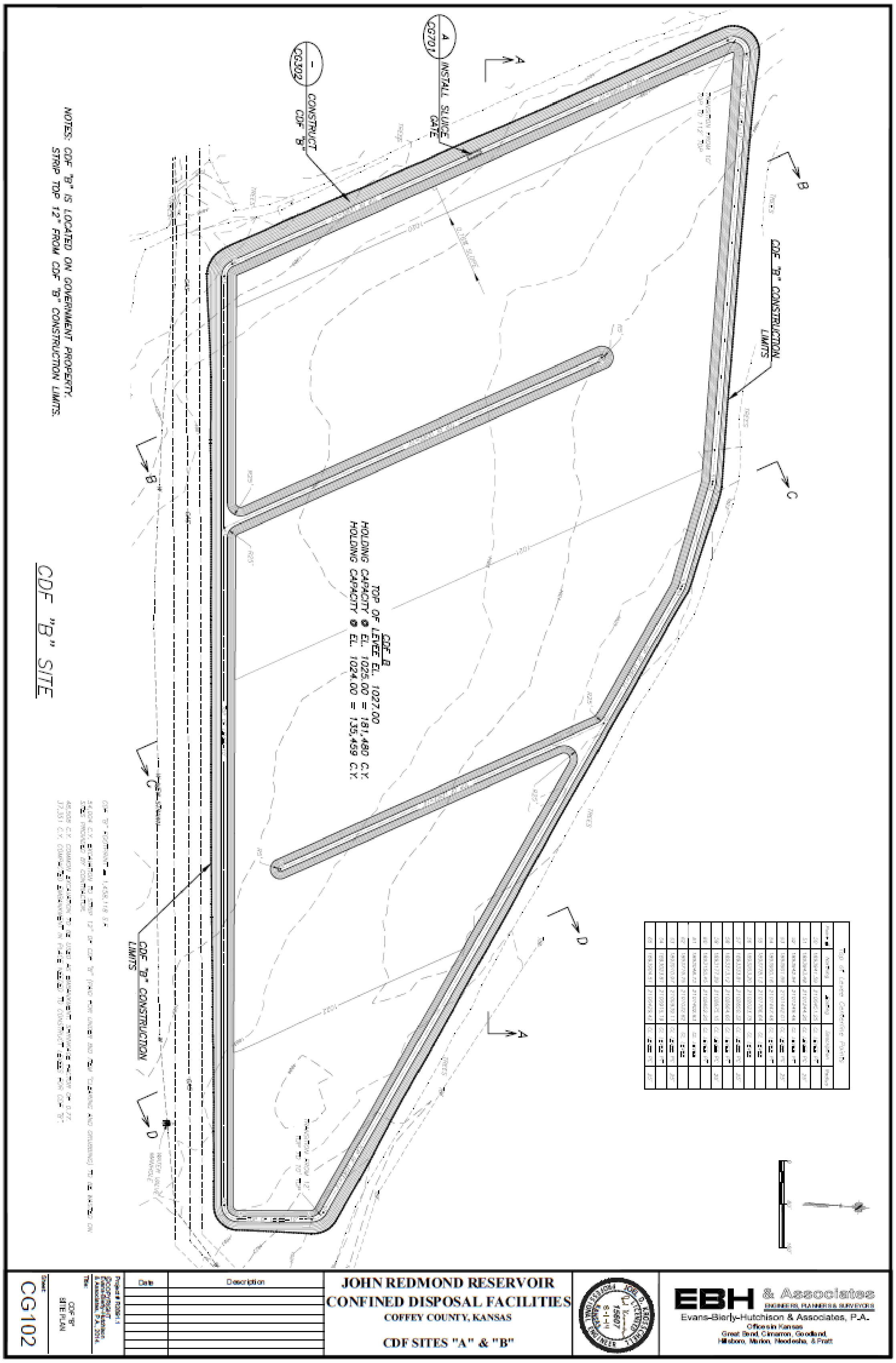


Figure 2-7. Draft Design of CDF Site E.

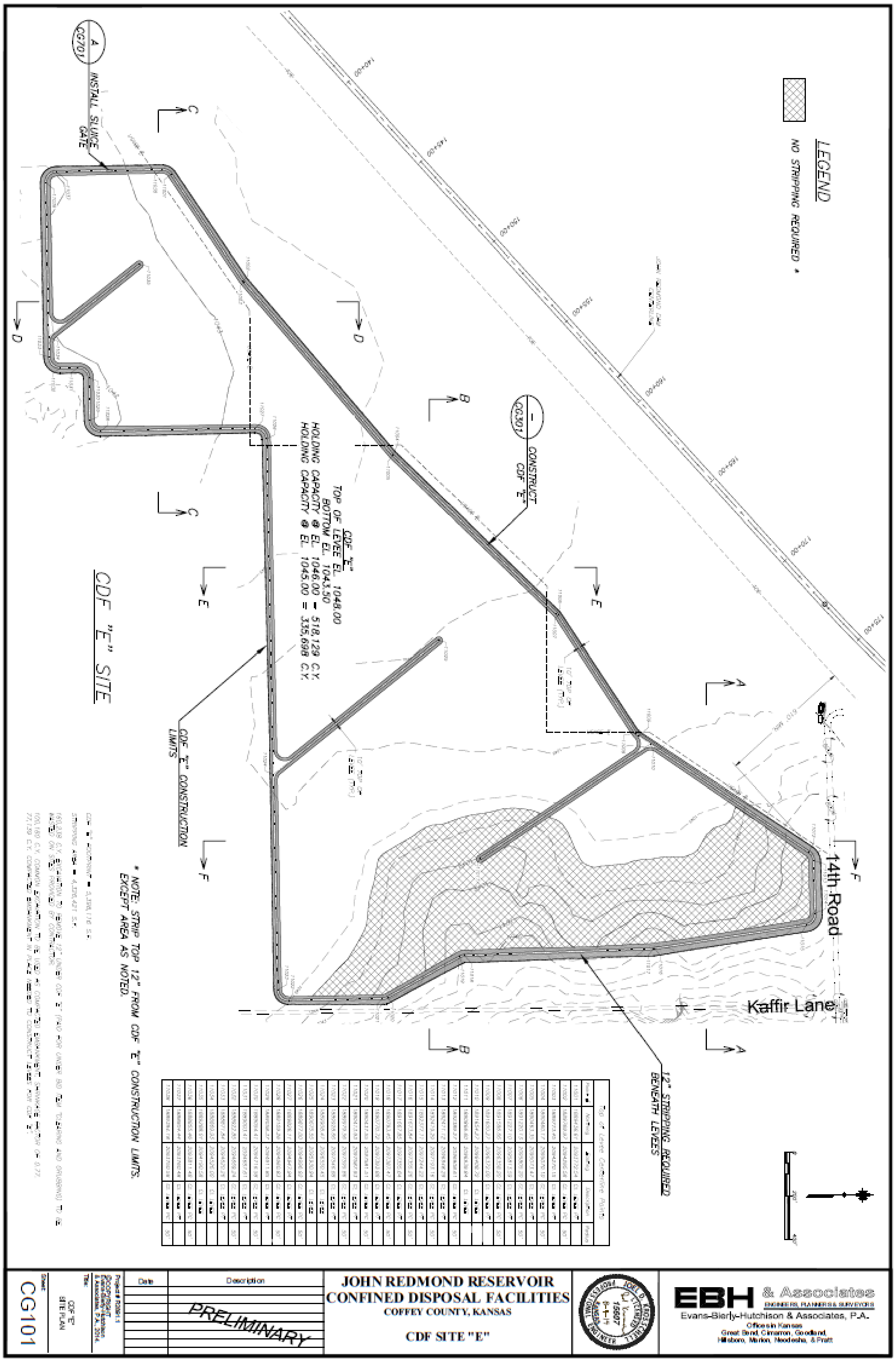


Figure 2-8. Focus area for identification of suitable non-federal land for sediment disposal for first three million cubic yards of sediment removal.

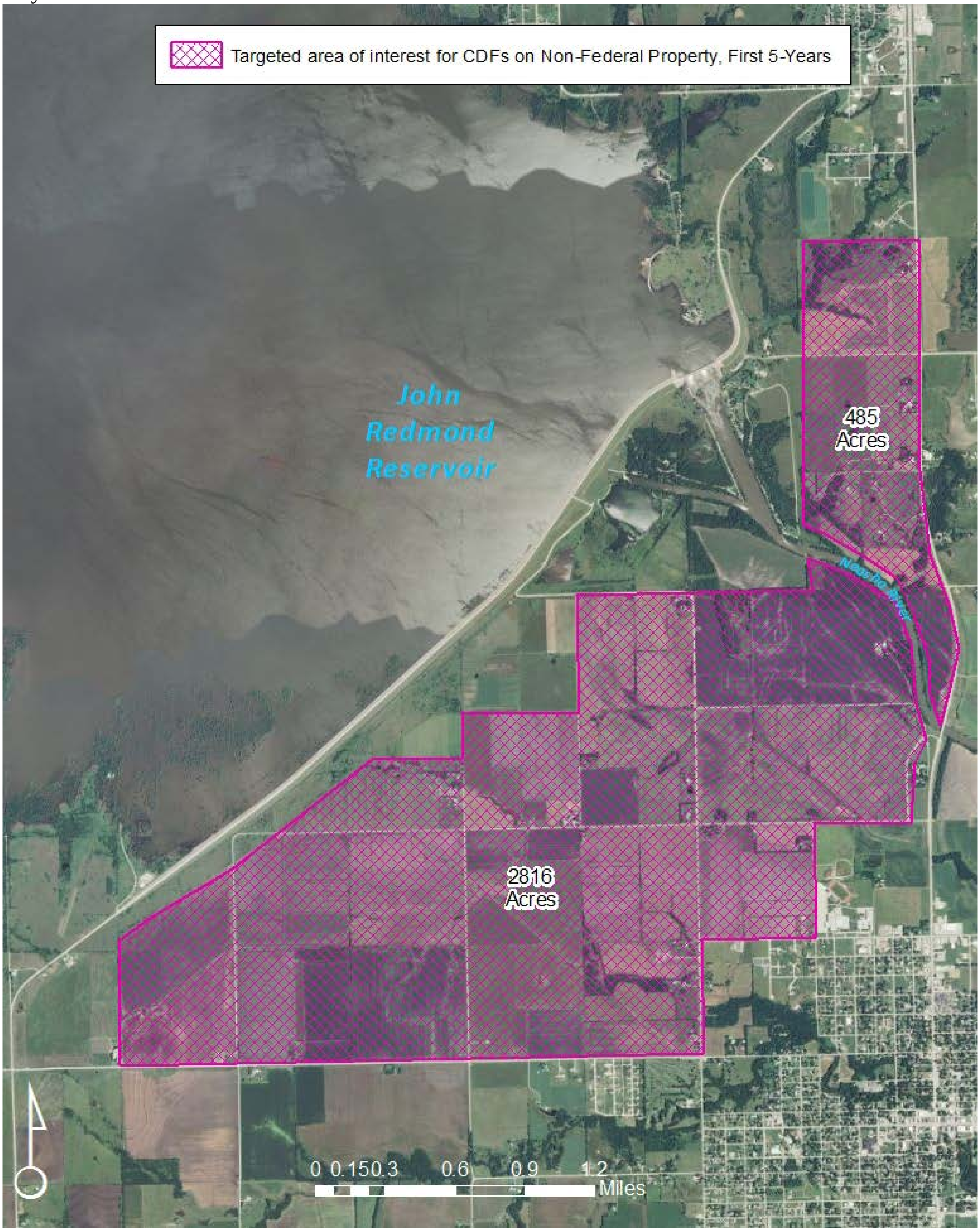


Figure 2-9. Focus area for identification of suitable non-federal land for sediment disposal beyond first three million cubic yards of sediment removal.

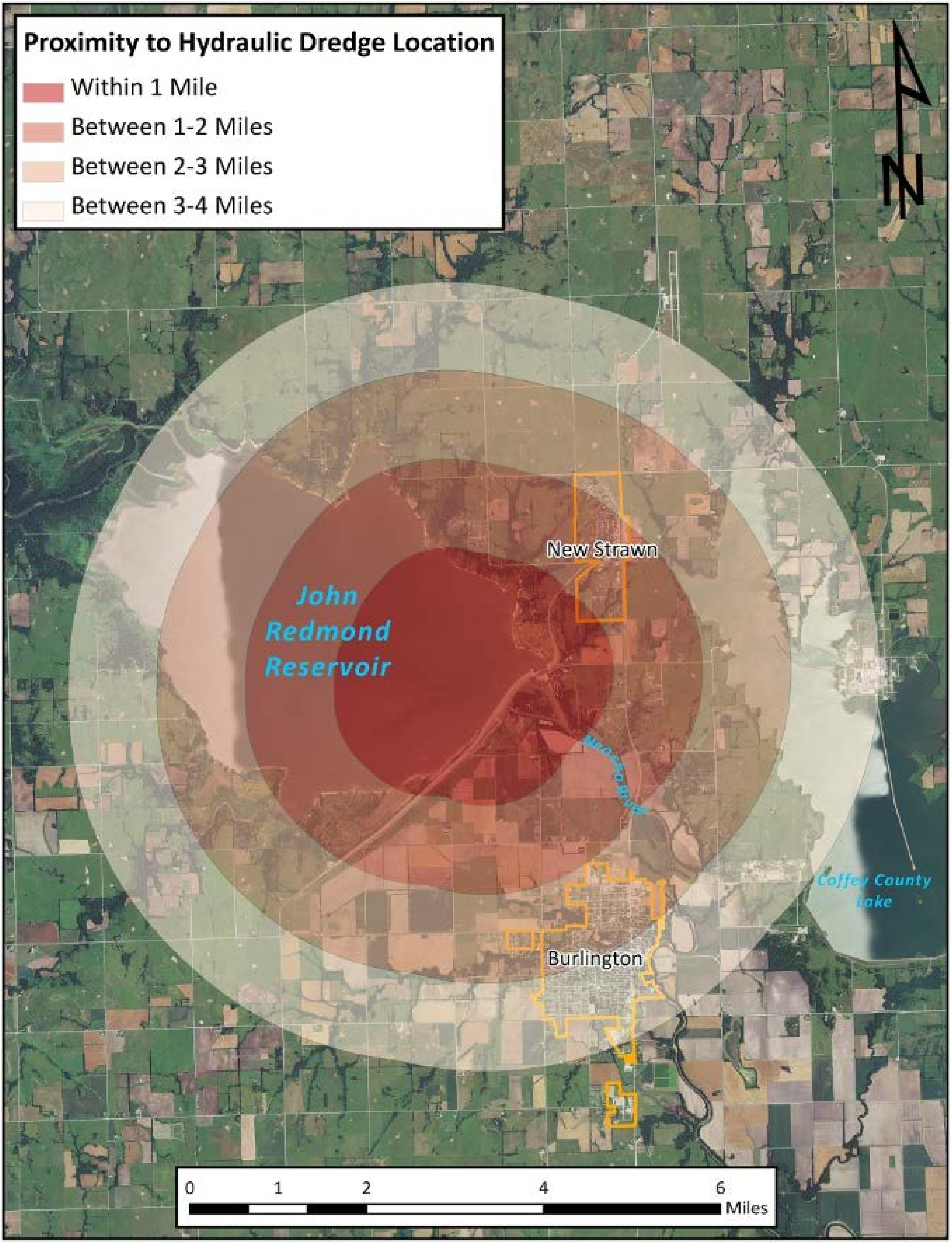


Figure 2-10. Pipeline Road Crossings

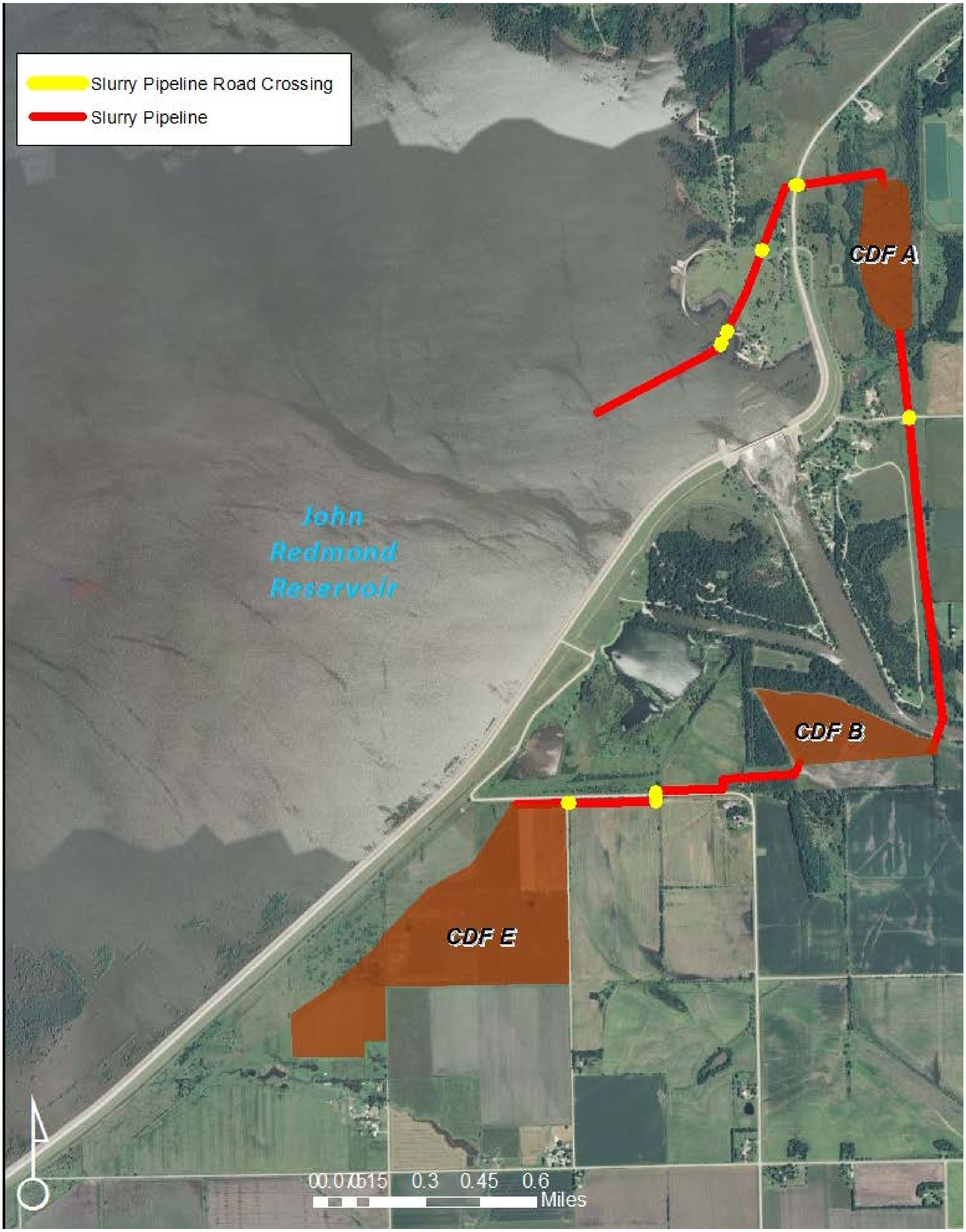


Figure 2-11. Slurry pipeline crossing Neosho River, cross section of existing elevations.

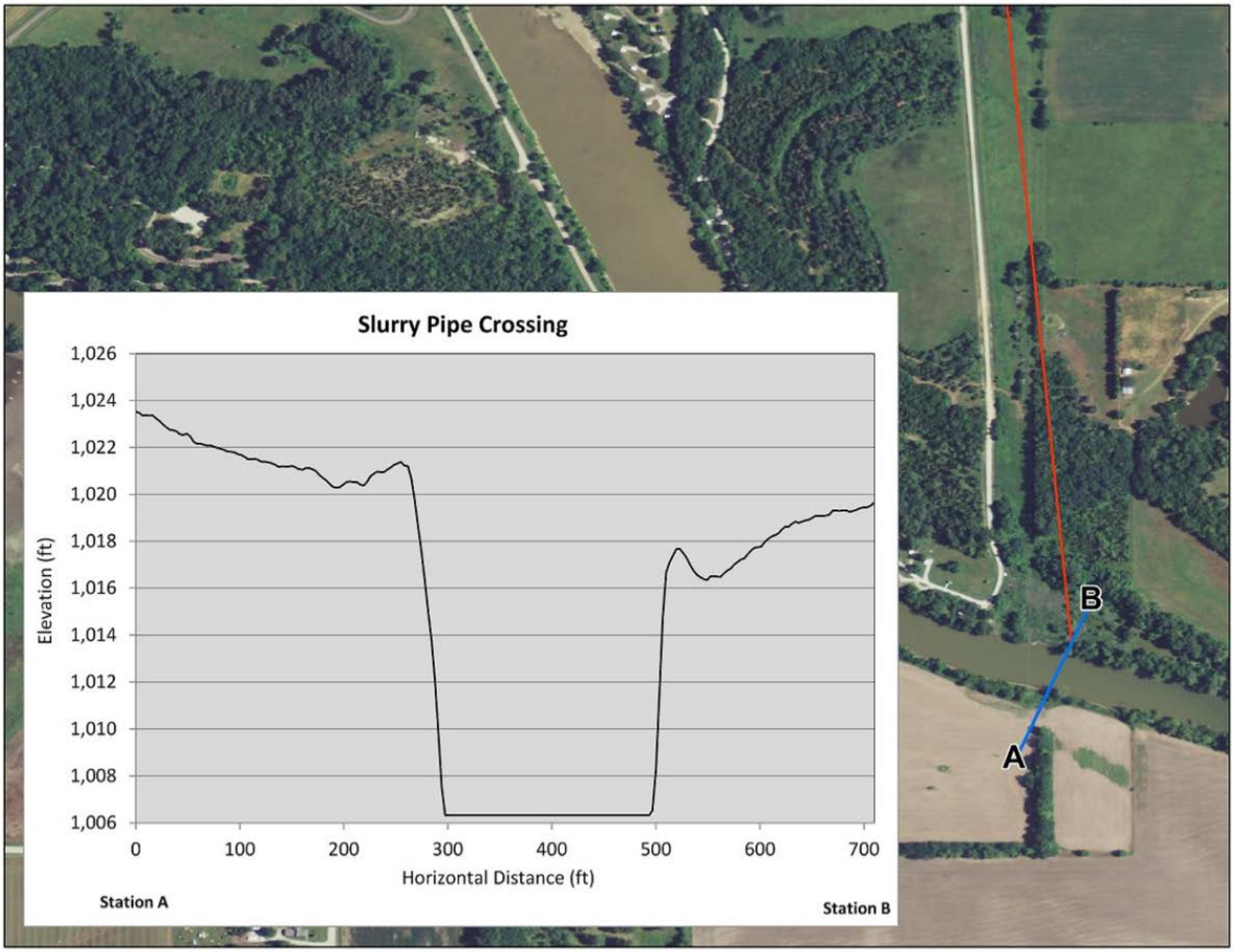
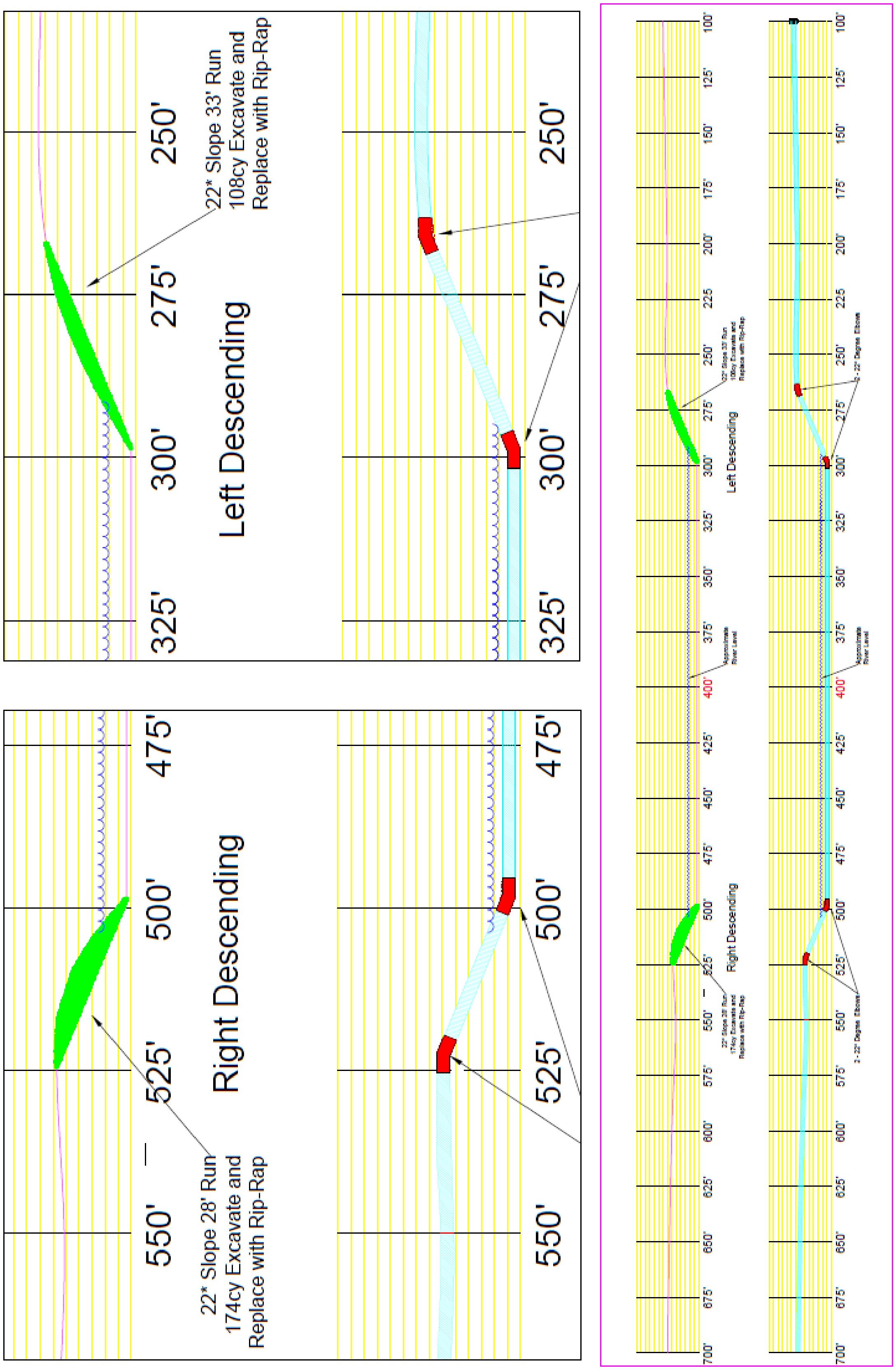


Figure 2-12. Slurry pipeline crossing Neosho River, plans for excavation and replacement rip-rap.



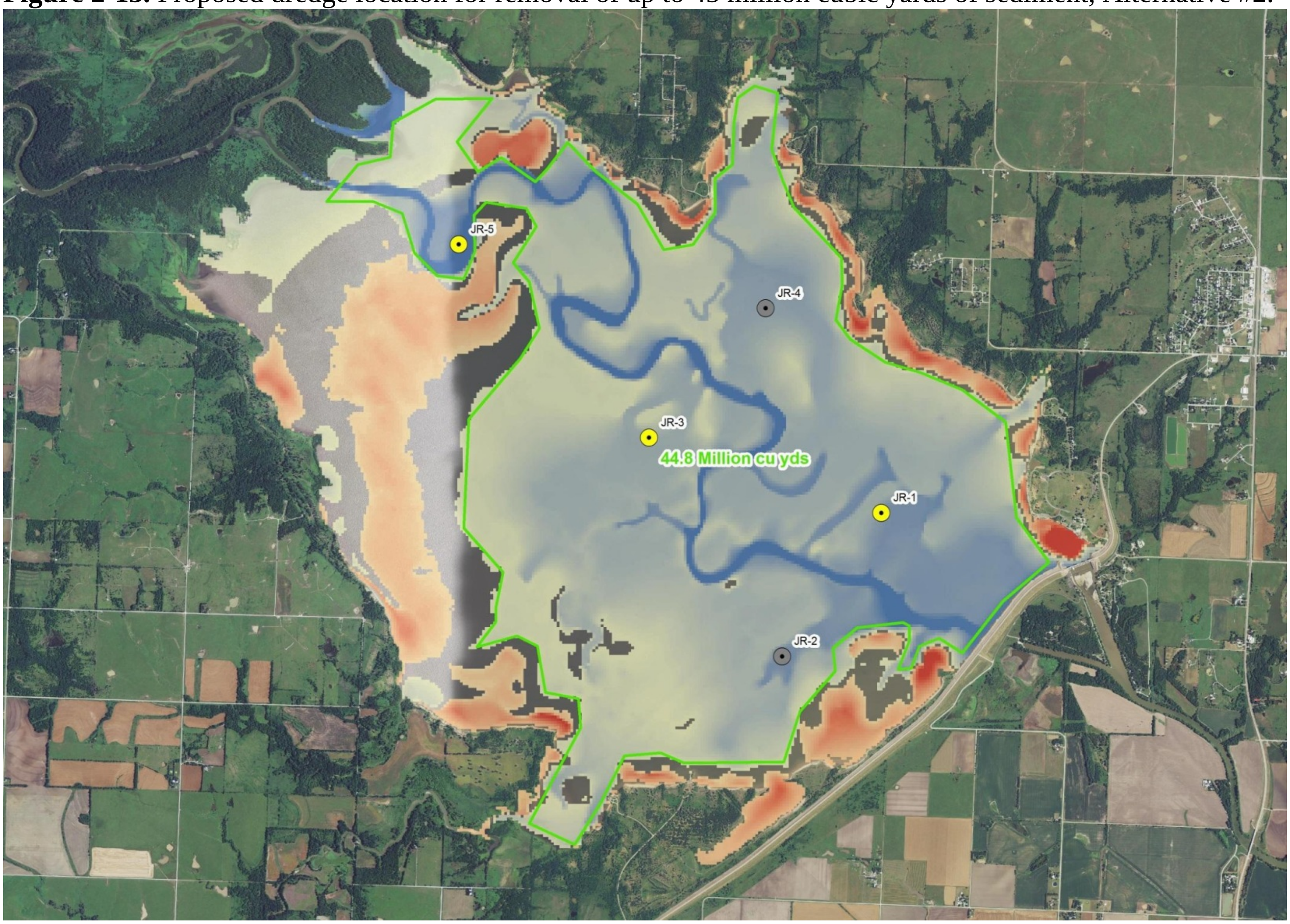
2.3 Alternative #2: Dredge and Dispose of Sediments to Restore the Conservation Pool to Near Original Capacity

This alternative would allow for the dredging and disposal of sediments from the conservation pool to restore the pool to near original capacity and approximate configuration. No parent material (non-deposited sediment) would be removed under this alternative. Restoration of the pool would require removal of approximately 42 million cubic yards of sediment. Although 30,000 acre-feet (48 million cubic yards) of storage has been lost to sedimentation since construction, accretion and deposition has occurred variably throughout the reservoir. This alternative seeks to remove sediment from areas of heaviest deposition with the greatest likelihood of benefiting water supply storage.

Under this alternative sediment removal and disposal would be conducted with similar equipment and methodology as described in the preferred alternative; however, additional land would be required for disposal sites. Over time, approximately 38 100-acre disposal sites may be needed to store the quantity of sediment described in this alternative.

Alternative #2 would achieve the project goal of restoring water storage capacity for the benefit of the regional water users and to restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem, but is not preferred by the state due to cost.

Figure 2-13. Proposed dredge location for removal of up to 45 million cubic yards of sediment, Alternative #2.



2.4 No Action Alternative

The No Action Alternative evaluated in the FPEIS is in compliance with NEPA (40 CFR § 1502.14(d)). No Action may be defined as the continuation of an existing plan, policy or procedure, or as failure to implement an action. The No Action Alternative also provides a benchmark to compare the magnitude of the environmental effects of the various alternatives.

Under the No Action Alternative, no sediment removal through dredging would occur. Sediment will continue to accumulate in the reservoir, reducing the water supply storage capacity at design life by approximately 25 percent. Storage available for water supply purposes in John Redmond Reservoir will continue to be depleted by the distribution of sediment such that the water supply agreement obligations with the KWO cannot be met.

The No Action Alternative could have adverse ecological effects. Kansas reservoirs have lower flow velocities, greater depth of flow, and longer water residence times than streams and rivers supplying them and therefore act as deposition zones (sinks) for sediments. Over time, sediment deposition in reservoirs reduces reservoir depth which can increase the frequency, magnitude and duration of suspended sediment concentrations in the water column. The resulting impact to the organisms, including invertebrates and fish communities in those areas can lead to a change from desirable sediment-sensitive organisms being replaced by less-desirable, sediment-tolerant organisms. These population changes would reduce the size of recreational sport harvest, in the case of fish, by lowering both the total abundance of organisms and their individual size. These changes negatively affect recreational anglers and subsistence anglers (USEPA 2009).

In addition, increased sediments and turbidity reduce the aesthetics of a waterbody, which can reduce recreational users enjoyment of their experience and their choices of how often and where to recreate. Sediment and turbidity may also affect recreational anglers by reducing the distance over which fish can see lures, resulting in lower catch rates (Clark et al. 1985).

Birds, mammals, reptiles, and amphibians that consume aquatic plants, invertebrates, fish, and other aquatic organisms or otherwise utilize aquatic habitats for shelter and reproduction can also be affected by elevated sediment and turbidity levels in surface waters. Some species are sufficiently mobile that they can avoid impacted aquatic communities and seek substitutes, if available and accessible (Berry et al. 2003).

2.5 Alternatives Considered but Eliminated

Pursuant to the NEPA, KWO had one public scoping period, extending from Feb. 5, 2013 through March 12, 2013 to solicit comments for the purpose of determining the scope of the FPEIS. Comments received through scoping were used to identify issues to be addressed in this FPEIS. No comments were received during the public scoping period that identified alternatives to consider. Alternatives evaluated in this FPEIS were developed by KWO. The USACE and KWO, prior to issuing the Notice of Intent to prepare the FPEIS, had identified four alternatives that may meet the project purpose and need, but have been eliminated from further consideration in this FPEIS for a variety of reasons.

1. Sediment removal through less extensive dredging to only manage the accumulation of sediment, but not increase capacity.
2. Sediment removal through flushing of John Redmond Reservoir.
3. Construction of a new water supply reservoir in the Neosho River basin.
4. Construction of a pipeline transferring water supply from the Missouri River to the Neosho River basin.
5. Disposal of dredged sediment through direct application and reuse of Confined Disposal Facilities (CDFs)

These alternatives were considered but eliminated from further evaluation in this FPEIS for a variety of reasons and each alternative is discussed separately below.

2.5.1 Evaluating the feasibility of sediment removal through less extensive dredging to only manage the accumulation of sediment, but not increase capacity

KWO maintains that if dredging action is to occur it is more efficient to remove incoming sediment as well as remove sediment that has already accumulated to increase conservation storage capacity to ensure water for current and future needs. Simply removing the sediment at a pace to manage the future accumulation of sediment would not provide the water storage capacity long-term to meet downstream needs.

2.5.2 Evaluating the feasibility of sediment removal through flushing of John Redmond Reservoir

KWO maintains that if flushing were to occur extensive research on this method would be needed to understand the full benefits of this process to ensure this change in operation could efficiently remove an adequate quantity of incoming sediment as well as remove sediment that has already accumulated to increase conservation storage capacity to ensure water for current and future needs. The ramifications on downstream users and biological resources of moving the accumulated and incoming sediment through the reservoir would also need to be considered.

2.5.3 Construction of a new water supply reservoir in the Neosho River basin

Potential site selection and the requisite costs associated with this alternative to identify an appropriate site, acquire property, relocate infrastructure, as well as the impacts to the environment while maintaining the contractual commitments to customers of the state’s Water Marketing and Water Assurance District Program preclude further consideration of this alternative.

In 2011, CDM Federal Programs Corporation (CDM) prepared a *Neosho River Water Supply Analysis* for the Kansas Water Office, under a Planning Assistance to States (PAS) agreement with the Tulsa District, U.S. Army Corps of Engineers (Contract No. W912BV-09-D-1001, Task Order 0004). The analysis included a planning-level construction cost estimate for four proposed reservoir locations in the Neosho River basin. Total planning level costs for the four sites ranged from $250 million to $560 million. KWO conducted a desktop review of the four proposed reservoir locations to estimate the cost of compensatory mitigation. Costs for mitigation of these four sites ranged from $316 million to $1.1 billion.

2.5.4 Construction of a pipeline transferring water supply from the Kansas River to the Neosho River basin

Transferring water from the Kansas River to the Neosho basin would require more than 60 miles of approximately 36” pipeline, as well as at least one raw water intake facility constructed on the Kansas River and multiple booster stations to lift the water. Projected capital costs for this pipeline may exceed $288 million and may require annual operation and maintenance investments greater than $3 million. In addition to the cost, transferring water from the Kansas River may impact water supply availability for municipalities and industries in the Kansas River basin.

2.5.5 Disposal of dredged sediment through direct application and reuse of Confined Disposal Facilities (CDFs)

Direct application of dredged materials to farmland or the disposal of dredge slurry behind crop terraces would require either mechanical removal of sediment or the repeated transfer and movement of the slurry pipeline – both of which are inefficient for the quantities of sediment to be removed. Construction of CDFs but with higher levee walls would allow for the construction of fewer CDFs and the reuse of each disposal area. However, the increase in dredged sediment thickness on a reused CDF would limit reclamation opportunities and would likely reduce the participation from private landowners.

2.6 Environmentally Preferable Alternative

The No Action Alternative would have no significant unmitigatible impacts and, for the purposes of NEPA, would be the environmentally preferable alternative. However, the No Action Alternative would not increase available water storage or address the stated purpose and need.

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Introduction

This chapter sets forth the Affected Environment of the proposed action and describes the present physical conditions within the area of the proposed action. The area, or region of influence, is defined for each environmental issue based upon the extent of physical resources that may be affected directly or indirectly by the proposed action and appropriate guidelines of regulatory agencies or common professional practice. Table 3-1 summarizes the environmental issues and associated region of influence described in the Affected Environment sections of the FPEIS.

Table 3-1. Environmental Issues and Region of Influence

Environmental Issue	Region of Influence
Geology and Soils	Reservoir, Surrounding Federal lands, Staging Area, Pipeline and Disposal Areas
Hydrology and Water Resources	John Redmond Reservoir and downriver effects
Biological Resources	Sediment disposal areas, Staging Area, Pipeline, Upriver, John Redmond Reservoir, and downriver effects
Air Quality	John Redmond Reservoir vicinity
Aesthetics	Sediment disposal area, Staging Area, Pipeline, John Redmond Reservoir, and downriver effects
Prime or Unique Farmlands	Pipeline, and Disposal Areas
Socioeconomic Resources	John Redmond Reservoir and surrounding counties
Cultural Resources	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir and downriver effects
Hazardous, Toxic or Radioactive Waste	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir, and downriver effects

Section 3.0 of the FPEIS describes the baseline conditions for each environmental resource against which the potential impacts of the proposed action will be compared. Generally, the baseline used for the analysis of environmental impacts under NEPA reflects the conditions present during the year 2010. The original sediment analysis conducted to determine rates and location of accumulation in John Redmond Reservoir was performed during 1963 and resurveys were completed in 1974, 1983, 1991, 1993, and 2007 (USACE 2013 and KBS 2007).

3.2 Geology and Soils

3.2.1 Geology

John Redmond Reservoir lies among low, rounded hills. The topography is a result of generally westerly to northwesterly dipping strata that create resistant bend and irregular cuesta like ridges (USACE 2013). The Neosho River Valley and most of the John Redmond Reservoir site is composed of Holocene, Post-Kansan alluvium and is bordered by the Pennsylvanian – Virgilian, Wabaunsee Group on the western end and the Shawnee Group on the eastern end of the site. Both the Wabaunsee and Shawnee Groups are sedimentary exposures, which were deposited in shallow seas and swamps approximately 300 million years ago. Some very small exposures of tertiary terrace deposits are present at the western end of the conservation pool of the reservoir, above the northern floodplain boundary of the Neosho River (USACE 2013).

To the west of John Redmond Reservoir in the Flint Hills Region are formations of the Permian Period, deposited approximately 250 million years ago (USACE 2013). A portion of the sediments deposited as

Holocene alluvium along the Neosho River within the John Redmond Reservoir project area were eroded from these Permian Formations. The alluvial deposits have been further described as cherty gravel, cobble, and sand with small amounts of boulders and mud present (USACE 2013). Gravel-sized alluvium was most commonly observed along the Neosho River above and below John Redmond Dam and Lake.

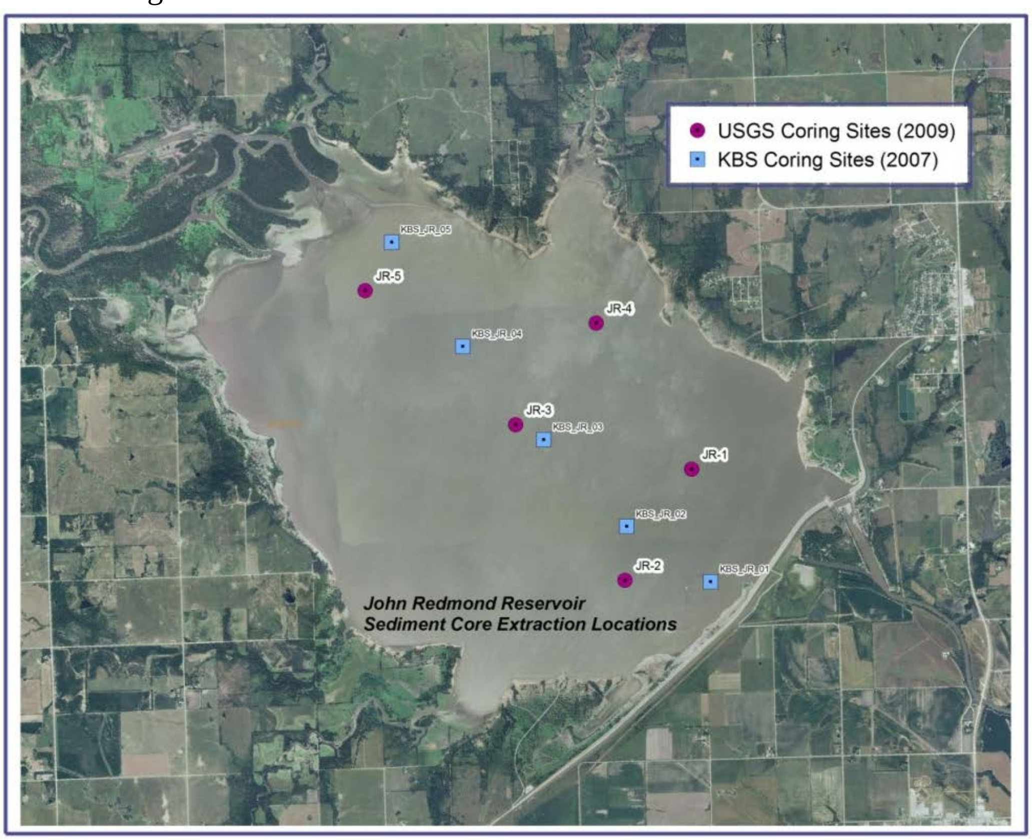
3.2.2 Lake Sediment

Soils formed within the John Redmond Reservoir site and the project area are relatively shallow, silty loam and silty, clay loams that are fertile, but low in organic matter and phosphoric acid. Soils form through the physical and chemical weathering of parent material (USACE 2013), and the characteristics of soil thus formed are determined by the:

- physical and mineral composition of the parent material
- climate under which the soil material has accumulated and existed since accumulation
- plant and animal life on the soil
- relief, or topography
- length of time the soil forces have acted upon the soil material

In the 2007 bathymetric survey conducted by the KBS, five sediment core samples and one replicate sediment core sample from the Neosho River thalweg, now covered by the reservoir, were taken. The top six inches of each core sample was analyzed for particle size. With the exception of site KBS_JR_01 nearest the dam, silts and clays dominate the sediment of John Redmond Reservoir. The exception near the dam was sandier with 5-10 percent of the core being sand. No explanation was provided for this. The thicknesses (lengths) of the six cores taken ranged from three to nine feet.

Figure 3-1. John Redmond Coring Sites.



The USGS also collected five cores from John Redmond Reservoir (Figure 3-1 in 2009). The USGS devoted much of their report to the chemical and nutrient analysis of the cores they pulled from John Redmond Reservoir. The core thicknesses ranged from 5.5 to seven feet and the average bulk density was approximately 39 lbs/ft^3. The sediment quality was compared to EPA non-enforceable sediment quality guidelines for trace elements (mostly metals). Both the probable and threshold effect levels were used for this assessment (threshold values are lower than probable effect levels). The guidelines are shown in Table 3-2.

The chemical analysis of sediment from John Redmond Reservoir showed no issue at the probable effects level, but exceed the threshold values for arsenic, chromium and nickel. At site JR-3, zinc was also higher than the threshold effects guideline. When compared to other eastern Kansas reservoirs in which the USGS has analyzed sediment, the arsenic, chromium and nickel levels at John Redmond are similar to and generally slightly lower than the levels at Perry, Clinton, Fall River and Toronto. The similarity between lakes for arsenic, chromium and nickel indicates the source of those elements is likely natural (from eastern Kansas soils and/or bedrock). No organochlorine compounds (PCBs and DDT) were above the probable effects level and typically were not even detected in the sediment. Particle size analysis of the cores showed silts and clays composed nearly all of the sediment at all the USGS core sites. John Redmond Reservoir has as good or better sediment quality in terms of nutrients, metals and/or organochlorine concentrations than any other eastern Kansas lake the USGS has studied to date (USGS 2010).

Table 3-2. Sediment-quality guidelines for selected trace elements and organochlorine compounds, and associated bioaccumulation index.

	USEPA (1997)		MacDonald and others (2000)		
Constituent	**TEL**	**PEL**	**TEC**	**PEC**	**Bio-accumulation index[1]**
Trace elements					
Arsenic	7.24	41.6	9.79	33.0	moderate
Cadmium	.676	4.21	.99	4.98	moderate
Chromium	52.3	160	43.4	111	moderate
Copper	18.7	108	31.6	149	high
Lead	30.2	112	35.8	128	moderate
Nickel	15.9	42.8	22.7	48.6	moderate
Silver	.733	1.77	--	--	moderate
Zinc	124	271	121	459	high
Organochlorine compounds[2]					
Chlordane	2.26	4.79	--	--	--
p,p'-DDD	1.22	7.81	--	--	--
p,p'-DDE	2.07	374	--	--	--
p,p'-DDT	1.19	4.77	--	--	--
Dieldrin	.715	4.3	--	--	--
Gross PCBs	21.6	189	--	--	--

[1]Bioaccumulation index information for trace elements.
[2]TEL & PEL values for organochlorine compounds converted from milligrams per kilogram to micrograms per kilogram.

[Values in milligrams per kilogram for trace elements and micrograms per kilogram for organochlorine compounds. Shading represents guidelines to which sediment concentrations were compared in this report. USEPA, U.S. Environmental Protection Agency; TEL, threshold-effects level; PEL, probable-effects level; TEC, threshold-effects concentration; PEC, probable-effects concentration; --, not available; PCBs, polychlorinated biphenyls]

Comparing the samples collected by USGS to the Risk-Based Standards for Kansas, levels of arsenic, chromium and nickel fall well below Tier 2 levels for non-residential scenarios (Table 3-3). The Risk-Based Standards for Kansas Manual is a guidance document which describes the process for establishing chemical-specific and site-specific cleanup goals for soil, ground water, and indoor air that are protective of human health and the environment (KDHE BER 2010). The cleanup values, based on current EPA toxicity values for the contaminants and default exposure factors, represent the concentrations at which the contaminants pose an acceptable human health risk to receptors, including sensitive groups (children or the elderly), over a lifetime. Comparing the chemical analysis results to the Risk-Based Standards for non-residential scenarios is relevant because the areas identified for sediment disposal are in agricultural settings with low home densities.

Table 3-3. Comparison of USGS Chemical Analysis Results from John Redmond with the Risk-Based Standards for Kansas Manual.

Contaminant	Non-Residential Scenario Soil Pathway (mg/kg)	USGS Chemical Analysis Results All Intervals (2010 Analysis), All Samples Median (mg/kg)	USGS Chemical Analysis Results All Intervals (2013 Analysis), Composite Sample (mg/kg)
Arsenic	38	11	6.1
Chromium	111	80	28.6
Nickel	32400	39	20.6
Zinc	61300	120	62.2

In April 2013, USGS collected five additional samples within the preferred dredge location (Figure 3-1) for a composite analysis using both total sediment quality analysis and the Toxicity Characteristic Leaching Procedure (TCLP). Results from the analysis are included in Appendix F. TCLP is a soil extraction method for chemical analysis employed as an analytical method to similar leaching through soils and is used to characterize if a waste is characteristically hazardous. Analytical results for the total sediment quality analysis of the composite sample were below the results for the 2009 samples. All parameters evaluated in the TCLP analysis were non-detectable.

Sources of Lake Sediment

In 2009 the Kansas Water Office (KWO), in response to requests to update previous mean annual sediment yield estimates in the state, reevaluated the Neosho basin suspended sediment yields. The primary data sources used in the 2009 reevaluation for the Neosho basin are Kansas Department of Health and Environment (KDHE) stream chemistry sampling network's total suspended solids data (1990-2008), the unique contributing areas (watersheds) formed by the ambient surface water quality monitoring network and United States Geological Survey (USGS) stream statistics for the registered surface waters of Kansas. In addition, when available, USGS instantaneous flow gage data and USGS suspended sediment concentration data were used to calculate mean annual sediment yields. Mean annual sediment yields in the Neosho basin were created based upon the method described in Sediment Engineering for estimating long-term sediment yields by flow duration-sediment rating curves.

Due to a number of factors outlined within the 2009 yield assessment report (available online at www.kwo.org), the uncertainty and potential sources of error for many of the updated mean annual sediment yield estimates remain high. The assessment found the sediment yields of the Neosho and Cottonwood Rivers are significantly higher than that of the tributaries feeding into them. This finding reinforces other recent studies performed in the John Redmond drainage area which have pointed to streambank sources along those main stems as being the primary sources of the sediment in the basin.

Kansas State University (KSU) recently produced a report for the Soil and Water Assessment Tool (SWAT) model developed as part of the John Redmond Feasibility Study (Sheshukov 2010, available online at www.kwo.org). The SWAT model, whose domain was the John Redmond drainage area below Marion and Council Grove reservoirs, was calibrated to high flow events recorded at the USGS stream gages on the Cottonwood River near Plymouth and the Neosho River at Americus.

The calibration to high flow events is significant in this study. Most SWAT modeling efforts are directed toward calibration of average flows. Since almost all annualized sediment loads are produced by flow events exceeded 10% of the time or less, KSU spent a considerable amount of time developing their model to be calibrated to those higher flows that transport sediment in the watershed.

In addition to flow data collected at gages on the Cottonwood and Neosho Rivers, USGS collected two years of continuous suspended sediment data at the gage sites. When KSU compared their high flow calibrated SWAT model to the USGS suspended data they found a very large discrepancy (under prediction) between the SWAT model's predicted sediment concentrations and the concentrations observed at the USGS gage monitoring locations. The SWAT model for the watershed above John Redmond Reservoir only accounts for sources of sediment generated from the land surface at this time, such as croplands or grasslands. KSU made numerous adjustments to the land surface model factors within their SWAT model to try and simulate the observed sediment concentrations of high flow events. All attempts simply could not use the land surface sources to even begin to account for the observed sediment concentrations of high flow events. A recommendation from the KSU SWAT model report was to rely on on-the-ground sediment survey data such as the USGS gage monitoring and the riparian and streambank condition assessments described below.

Detailed riparian and streambank condition assessments have been done in the watersheds above John Redmond reservoirs. Assessments consistently indicate that in areas in which a stable riparian border exists along the stream, streambanks are in good condition. In areas where the riparian area has been reduced or degraded, the streambanks are typically in poor condition.

Detailed fluvial geomorphology surveys were conducted by The Watershed Institute (TWI) at ten locations and aerial photographs were interpreted to determine the condition of streambanks and riparian areas. KWO chose the locations or target areas from KDHE stream sediment monitoring data. Survey locations included reaches on the Neosho and Cottonwood rivers, and Allen, Dow, and Plumb Creeks. For each survey, data were compiled on the bankfull dimension, pattern, and profile to classify each reach using the Rosgen stream classification system for natural rivers. Bank erosion potential using the Bank Erodibility Hazard Index (BEHI) and channel health using the Pfankuch stream stability evaluation was estimated. General riparian corridor conditions within the survey reach as well as adjacent reaches upstream and downstream were documented.

Most streams have a low bankfull width to depth ratio indicating a narrow and deep channel. In comparing study reaches with equivalent stable reference reaches, similar ratios were found. Deep silt loams are found consistently throughout all reaches. Erosion rates for 27 bank conditions within the ten sites were developed. Based on BEHI scores and near bank stress calculations, an erosion average of 0.20 tons/year/foot was estimated. The Pfankuch stream stability evaluations ranged from fair to poor. In comparison to healthy riparian corridors, survey reaches suffer from excessive cutting, mass wasting, and debris jam potential. Excessive cattle grazing in riparian corridors were also observed. In some locations, the herbaceous understory was in poor condition or missing from grazing and hoof action. As a result, the sediment loading potential is greater from within these riparian corridors.

To address observed instability problems, implementing streambank stabilization— using rock vanes—and riparian fencing BMPs is recommended. Rock vanes slow down water velocities and redirect flow away from the near bank region. Riparian corridor restoration should be implemented in conjunction with the rock vanes. Riparian restoration will require bank shaping, riparian tree and shrub planting, native grass seeding, and proper maintenance. For cattle disturbances, riparian fencing BMPs to restrict or limit cattle access to the riparian corridor are recommended. Alternative water BMPs may also be needed to supplement water requirements. Based on the identified hotspots, a cost of nearly seven million dollars to implement BMPs is estimated.

TWI and KWO used 1991 rectified aerial photography and 2006 or 2008 National Agriculture Imagery Program (NAIP) aerial photography to identify areas of actively eroding streambanks (hotspots) in the John

Redmond drainage area. The TWI photographic assessment covered the Neosho River from the Morris/Lyon County line to John Redmond Reservoir; the Cottonwood River from Middle Creek confluence to Neosho River confluence; Allen Creek from Neosho River confluence upstream; Dow Creek from the Neosho River confluence upstream; and Plumb Creek from Neosho River confluence upstream. For the upstream extent on primary tributaries to the Neosho or Cottonwood River main stems, photographs were reviewed until the resolution made it difficult to discern the channel location. KWO covered the balance of the John Redmond drainage area using the same methodology as TWI. TWI provided a qualitative assessment of the riparian condition along the streambank hotspots using the most recent aerial photography available. KWO did the same qualitative assessment for the hotspots they identified.

As expected, poor riparian conditions are typical for actively eroding streambanks. Eighty-four percent of the total actively eroding banks identified in the assessment had poor riparian conditions. Those reaches with the higher yield loss/bank length scores tended to have the highest percentages of poor riparian conditions. Overall the Cottonwood River had a slightly higher percent of poor riparian condition by unstable streambank than did the Neosho River (88 % vs. 81%).

In estimating soil volume losses from streambank erosion, TWI's field surveys of the Cottonwood, Neosho and primary tributaries were used to assign typical bank heights on the main stem and tributary streams. The surficial change between the streambank location in 1991 to the 2006 or 2008 location multiplied by the estimated bank heights provided an estimate of the soil volume loss from streambanks for the period. Assuming a typical soil weight of 89 lbs/cubic foot of soil for the predominate soil types in the John Redmond drainage area created the estimate for mass of soil loss per year by main stem reach. If the entire average annual streambank loss from erosion was deposited in John Redmond reservoir, and assuming an average bulk density of 45 lbs/cubic foot, streambank hotspot sources of sedimentation would account for just over half of the average annual sediment deposited at the reservoir.

Although streambank stabilization and riparian restoration of all the hotspots identified in this assessment would not be expected to be 100% efficient (there will always be a baseline sediment load from streambank sources in Kansas stream systems), such an effort would substantially reduce the excessive sediment loading to John Redmond from this source and significantly reduce the average annual sedimentation rate of the reservoir.

KWO and the local Watershed Restoration and Protection Strategies (WRAPS) Stakeholder Leadership Teams (SLTs) have been actively implementing Best Management Practices (BMPs) with an emphasis on streambank stabilization. By 2015, nearly 40 of the highest eroding streambanks on the Neosho and Cottonwood Rivers will be stabilized and a minimum vegetated buffer restored. Streambank stabilization and watershed practices will continue to be a priority as the dredging initiative is implemented to reduce future loss of storage to sedimentation.

3.2.3 Surface Soils

A slurry pipeline will connect the dredging activity in the reservoir with each of the sediment disposal locations. The soils along the slurry pipeline route include Dennis silt loam (1 to 3 percent slopes), Kenoma silt loam (1 to 3 percent slopes), Eram silt loam (1 to 3 percent slopes), Eram silt loam (3 to 7 percent), Kenoma - Olpe complex (3 to 15 percent slopes) and Verdigris silt loam, occasionally flooded.

The soils mapped at CDF Site A are Eram silt loam (1 to 3 percent slopes) and Kenoma silt loam (1 to 3 percent slopes). The Eram series consists of moderately deep, moderately well drained soils that formed from the shale interbedded with thin layers of sandstone of Pennsylvanian age. The Kenoma series consists of deep, moderately well drained, very slowly permeable soils that formed in old alluvial sediments. These soils are on uplands and terraces. The soils mapped at CDF Site B are Verdigris silt loam, occasionally flooded; Osage silty clay loam, occasionally flooded; and Osage silty clay, occasionally flooded. The Verdigris series consists of very deep well drained soils that formed in silty alluvium on floodplains. According to the National Cooperative Soil Survey, most of the Verdigris soils are cultivated as is the condition at CDF Site B. The Osage series consists of very deep, poorly drained, very slowly permeable soils that formed in thick clayey alluvium. These soils are on floodplains along major streams. As with the Verdigris series, Osage series soils are cropped to wheat, soybeans and corn. The soils mapped at CDF Site B are classified as hydric, however, both the soils and slope have been modified to allow for productive row crop agriculture and do not currently support the hydrology or vegetation necessary to be classified as wetlands. The soils mapped at CDF Site E are Dennis silt loam (1 to 3 percent slopes) and Woodson silt loam (0 to 1 percent slopes)The Dennis series consists of very deep, somewhat poorly drained soils that formed in material weathered from shale. The Woodson series consists of deep, somewhat poorly drained soils that formed in silty and clayey sediments. As with the Verdigris and Osage series, the Dennis and Woodson series soils are often cropped to wheat, soybeans and corn (NRCS Web Soil Survey). A wetland assessment and jurisdictional determination were conducted on CDF Sites A, B and E by USACE Regulatory Personnel.

No geotechnical analysis has been conducted to date at the proposed CDF sites; however, prior to final design of the CDFs, split spoon samples will be taken and sieve analysis performed along with visual classification to assess unconfined compressive strength, Atterburg limits and other soil features needed to complete the final CDF design. All materials required for berm construction for the CDFs will be collected on-site from within the containment area and will not be transported off site.

3.3 Hydrology and Water Resources

3.3.1 Introduction

The Neosho River is one of the many alluvial rivers draining the semiarid western United States. Approximately 200 tributary streams and creeks deliver water to the Neosho River as it traverses the Neosho Basin in Kansas (USACE 2013). From its source in the Flint Hills region of east-central Kansas, the Neosho River flows southeasterly for 314 miles to the Kansas border with Oklahoma and drains about 5,973 square miles. Approximately 34 miles south of the border, the Neosho and Spring Rivers join at Grand Lake O' the Cherokees, then flows as the Grand River an additional 130 miles to the confluence with the Arkansas River (Figure 1-1).

Annual precipitation across the Neosho Basin ranges from approximately 30 inches in the northwestern portion (Flint Hills) to approximately 43 inches in the southeastern portion (Miami, OK). The average annual precipitation in the region above John Redmond Dam is approximately 32.5 inches per year. A majority, 71.4 percent of the precipitation falls from April through September, including the major storms of record (USACE 2013). Major storm duration averages are approximately six days in the vicinity of John Redmond Dam.

Prior to 1964, the Neosho River flooded 57 times over a period of 34 years, which prompted many public requests to the USACE for flood protection. The largest of the floods occurred in 1951 and had physical effects on the Neosho River channel that remain observable today. The result of petitions for flood protection was the planning of four dams and the design and construction of three dams, e.g., Marion (Cottonwood River) and Council Grove and John Redmond (Neosho River) (Figure 1-1). The Cottonwood River is a major tributary to the Neosho River and the fourth dam, at Cedar Point, was authorized on the Cottonwood River but never constructed. The project is a part of the authorized seven-reservoir system in the Neosho and Grand Rivers Basin in Kansas and Oklahoma. The associated dam projects in Oklahoma include Pensacola (Grand Lake O' the Cherokees), Fort Gibson and Markham Ferry (USACE 2013).

Marion Lake has a total storage capacity of 145,500 acre-feet; 59,900 acre-feet and is available for storage of floodwater from approximately a 200-square mile drainage basin. Council Grove Lake has a total storage capacity of 114,300 acre-feet; 76,000 acre-feet is available for storage of floodwater from an approximate 246 square mile drainage basin. John Redmond Reservoir has a total storage capacity of 807,941 acre-feet; 574,918 acre-feet are available for storage of floodwater from an approximate 3,015-square mile drainage basin, with 2,569-square miles uncontrolled below the Marion and Council Grove dams. Downriver from John Redmond Dam to the Kansas border are 2,958-square miles of uncontrolled drainage, with additional uncontrolled drainage from the border to Pensacola Reservoir (Grand Lake O' the Cherokees). All of the lakes provide flood control, maintenance of downstream water quality, water supply storage, recreation, and fish and wildlife habitat.

John Redmond Dam and Reservoir is the integral component of the upper Neosho River system, lying approximately 180 miles downriver from its source, and located at river mile 343.7. This site is approximately three miles northwest of Burlington, KS. The dam structure is 20,740 feet long with an average height above the Neosho Valley floor of 60 feet. The lake at the top of the conservation pool is approximately three miles wide at its maximum width. It then extends northwesterly, upriver from the dam, approximately 11 miles for the entire length of the flood control pool.

Water management systems, of which storage and flood control reservoirs form an important part, greatly change the natural flow regime of rivers as well as the properties of the water. The extent of these changes is determined by: 1) the relative size and function of a reservoir, 2) the hydrologic regime of the inflows, 3) the release condition, 4) the geomorphological condition of the reservoir, and 5) the quality of the inflow water.

3.3.2 Precipitation Data Collection and Monitoring

As part of the effort to operate John Redmond Dam, the USACE maintains a system of data collection (hydrometeorological stations) and reliable communications networks with the USGS and the National Weather Service (NWS). The important river gaging stations on the Cottonwood and Neosho Rivers are equipped with automated gages with Data Collection Platforms (DCP) (USACE 2013). Data recorded at the DCPs are transmitted to the Hydrology-Hydraulics branch computer through a system of satellites and downlinks. River gages are a source of data used to forecast inflows into John Redmond Reservoir and are located near Florence and Plymouth, KS on the Cottonwood River and near Dunlap and Americus, KS on the Neosho River. River gages used to regulate flows downriver from the dam are located near Burlington, Iola, Chanute and Parsons, KS as well as and Commerce, OK. All of the automated river gages are maintained by the USGS, who periodically record stream flow measurements to develop accurate rating curves.

In accordance with the primary objectives of John Redmond Dam, flood releases are made with the predicted inflow volume, the predicted runoff from the uncontrolled basin drainage area downriver and the downriver regulating stage/flow restraints at the gaging stations seen in Table 3-4. Automated precipitation gages, are located at the entire automated river gaging stations along the Cottonwood and Neosho Rivers (USACE 2013). In addition, automated precipitation stations are located above John Redmond Reservoir near Durham, Diamond Springs, Cassoday, Matfield Green, Cottonwood Falls and Neosho Rapids; they are also located on the dams at Marion, Council Grove and John Redmond.

Table 3-4. Regulating Stages and Discharges (Source USACE 2013)

Station	River	Regulating Reservoir	Regulating State (ft)	Discharge (cfs)
Burlington	Neosho	John Redmond	23	14,000
Iola	Neosho	John Redmond	19	18,000
Chanute	Neosho	John Redmond	22	18,000
Parsons	Neosho	John Redmond	19	17,000
Commerce	Neosho	John Redmond	15	22,000

The NWS maintains a network of local rainfall observers throughout the Neosho River Basin, who report on a daily basis as well as weather stations at the Marion, Council Grove and John Redmond project offices monitor precipitation, evaporation, wind speed and direction and temperature (USACE 2013). The local reports are entered into the Automated Field Observing Station (AFOS) computer network by the NWS. John Redmond Reservoir pool elevations are monitored by an automated gage and a recording chart located on the dam structure.

The AFOS data (precipitation, river and pool gage readings) are available for direct access by the USACE District Office, Hydrology-Hydraulics Branch via the Data Output Message Satellite (DOMSAT) downlink. Reporting criteria for pertinent precipitation and river gaging stations are used to place these data into the District Office database (USACE 2013). Site-specific data from John Redmond Reservoir (precipitation, evaporation, wind speed and direction, and sky conditions) are collected, recorded and reported to the District Office daily.

3.3.3 Surface Water

The average yearly runoff or inflow into John Redmond Reservoir is 1,082,000 acre-feet, calculated from the period of record from 1922-2012, which includes 42 years of pre-operation data and 48 years of post-operation data. The upriver dams at Marion and Council Grove regulate slightly less than 15 percent of the total inflow into John Redmond Reservoir.

John Redmond Reservoir is a relatively shallow body averaging 5.5 feet in depth with a relatively short hydraulic residence time (0.5 months) (KBS 2010). Those conditions are likely the reason the reservoir has never been reported to thermally stratify during summer (KBS 2000, ESU 1966). The lake is light limited rather than exhibiting a phosphorous or nitrogen limit to algae growth (KDHE 2000).

Prior to 1964, the Neosho River flooded 57 times and subsequent flooding has occurred to the present year. Upriver from John Redmond Reservoir are the gaging stations along the Cottonwood River, the Neosho River at Council Grove Reservoir, and the Neosho River at Americus, KS. Downriver gaging stations are located on the Neosho River at Burlington, Iola, and Parsons, KS as well as Commerce, OK.

John Redmond Reservoir water elevation level is maintained based on the entire reservoir system needs, the immediate upriver and downriver conditions and the effort to manage the water level for all entities at the reservoir.

Surface Water Quality

The state of Kansas established a stream chemistry monitoring program that currently operates 320 monitoring sites spanning all the major river basins and physiographic regions of Kansas. About 165 core sites are sampled on a bimonthly basis every year, whereas the remaining 155 sites are monitored using a four-year rotational approach (KDHE 2013). Placement of many sampling stations on smaller order streams in 1990 facilitated a more thorough analysis of rural and agricultural effects to surface water quality.

The USGS also monitors water quality in real-time. Real-time computed concentrations of water-quality constituents such as suspended sediment, total nitrogen and total phosphorus are calculated using ordinary least squares regression models. The results of these models, along with direct water-quality measurements, can be viewed as time series graphs, or downloaded as tabular data. Ordinary least squares regression models on this site use conventional sensor measurements (for example, discharge, temperature, pH, specific conductance, turbidity and dissolved oxygen) to compute concentrations and loads of other water-quality constituents in real time. This makes it possible to compute instantaneous values of many constituents in real time for public safety without the lengthy time delay of collecting a sample and waiting for a sample analysis at a laboratory. In the Cottonwood-Neosho River basin five sites are monitored (USGS 2013).

Water quality measurements obtained in the Neosho River above John Redmond Reservoir and below the dam found that water temperature was cooler by approximately 3C above the dam than below. Turbidity was also higher above the dam than downriver of the dam, but the pH was nearly the same. Dissolved oxygen increased downriver of the dam; however, conductivity, alkalinity and hardness were all higher above the dam structure. In addition, species of catfish were more common above John Redmond Reservoir than below the dam (USACE 2013).

USGS has collected baseline real-time turbidity information below John Redmond Reservoir dam on the Neosho River at Burlington, Kansas from February 2007 – April 2011 (USGS 2011a). Statistically discernible differences from the magnitude, frequency and duration of the baseline turbidity concentrations can be monitored during the dredge operation. Above John Redmond Reservoir, USGS has collected baseline real-time turbidity data at three gage locations from August 2009 through present (USGS 2011b, USGS 2011c, and USGS 2011d). Statistically discernible differences from the magnitude, frequency and duration of the baseline turbidity concentrations entering John Redmond Reservoir can be monitored during the dredge operation.

John Redmond Reservoir traps over 90 percent of the suspended sediment transported in inflows. The sediment load discharged from John Redmond Reservoir is primarily related to the magnitude of release flows. The suspended sediment concentrations vary relatively little in releases, as compared to inflows (USGS 2008) and observed turbidity ranges immediately downstream are similar to those collected in the water column of John Redmond Reservoir (KDHE 2000). Higher releases generally have higher sediment loads and higher releases are associated with larger flood pool storage evacuations.

In 2013, USGS, under a cooperative agreement with KWO, will install and operate water quality monitors and collect sediment samples on the Neosho River at Burlington, Iola, and Parsons. Data from the monitors and samples will be baseline sediment data on the Neosho River below John Redmond to compare with changes to water quality that may result from dredging or other sediment management practices.

Water quality concerns have been documented for most of the surface water entering John Redmond Reservoir, including contaminants (USACE 2013). Consumption advisories are issued most years for the Neosho River due to chlordane compound concentrations in fish. During the 1970s, several fish kills were related to runoff from confined livestock feedlots. Investigations by the USFWS, Kansas Field Office, identified PCB, atrazine, and heavy metals, including lead, mercury and arsenic in biota samples, along with lead in sediment samples (USACE 2013).

Total Maximum Daily Loads

Water bodies not meeting water quality standards for their designated uses are identified on the Clean Water Act Section 303(d) list. The state's 303(d) list is used to identify those waters targeted for the development of Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a water body can receive without exceeding water quality standards. There are 77 approved TMDLs within the Neosho basin that describe the strategies and goals to reduce pollution to achieve water quality standards. Of these, 17 are high priority for implementation, including Eagle Creek near Olpe and Hartford (atrazine and dissolved oxygen). A medium priority TMDL has been developed for John Redmond Reservoir for eutrophication. Water quality data as reported in the two TMDLs for John Redmond Reservoir (eutrophication and silt) are reported below (KDHE 2003).

As described in the TMDL, because much of the phosphorous entering John Redmond Reservoir is attached to sediment, the reductions in total suspended solids will lead to total phosphorous reductions. Bioassays performed by the Kansas Biological Survey indicate that nitrogen and phosphorous are co-limiting. The chlorophyll a to total phosphorous yield is low; the algal production is reduced because light cannot penetrate through the turbid water.

Table 3-5. Average Concentrations of Samples Taken from Kansas Biological Survey (John Redmond Reservoir Eutrophication TMDL, KDHE 2003)

Location	Total Phosphorous (μg/L)	Total Nitrogen (μg/L)	Chlorophyll a (μg/L)
Station 1 – Lacustrine	208	1.52	28.49
Station 2 – Riverine	266	1.79	33.12
Station 3 – Transitional	265	1.67	35.95
Station 4 – Riverine	239	1.73	40.34
Station 5 – Transitional	241	1.71	37.94
Station 6 – Transitional	202	1.51	33.73
Station 7 – Transitional	271	1.55	29.38
Station 8 – Transitional	189	1.53	28.23
Station 9 – Lacustrine	191	1.55	27.11
Station 10 – Lacustrine	194	1.54	32.56

Loads were calculated for the Neosho River and Cottonwood River subwatersheds. From this analysis, it is evident that the Cottonwood River subwatershed is making the greatest contribution to the phosphorous and nitrogren load. This conclusion is consistent with the land use assessment, because the Cottonwood River subwatershed has a larger drainage area and a greater number of Livestock Waste Management System and NPDES sites than the Neosho River subwatershed (KDHE 2003).

Table 3-6. Average Concentrations and Load at Sediment Monitoring Stations (John Redmond Reservoir Eutrophication TMDL, KDHE 2003)

KDHE Station (USGS Station)	Total Phosphorous (mg/L)	Total Nitrogen (mg/L)	Median Flow (cfs)	Flow Weighted Total Phosphorus Load (lb/day)	Flow Weighted Total Nitrogen Load (lb/day)
275 – Cottonwood Rv near Plymouth (07182250)	0.210	1.32	286	2,482	5,636
581 – Neosho Rv near Americus (07179730)	0.173	1.01	70	887	1,752

Based on samples taken by KDHE (Table 3-7), the average transparency (Secchi Disc depth), average turbidity, and total suspended solid concentrations at John Redmond Reservoir fit the criteria for siltation problems (KDHE 2003).

Table 3-7. Average Concentrations of Samples Taken by the KDHE Lake Monitoring Program (John Redmond Reservoir Siltation TMDL, KDHE 2003)

Date	Average Total Suspended Solids (mg/L)	Average Turbidity (formazin turbidity units)	Secchi Depth (m)	Lake Elevation
9/1/1987	73			
6/20/1990	52	56.5	0.20	
06/14/1993	12	13.8	0.40	
06/11/1996	48	88.3	0.10	1040.41
07/13/1999	39	43.0	0.23	1038.53

From June of 1999 to November 2000, the Kansas Biological Survey collected at ten stations in John Redmond Reservoir. A summary of those results is included in the table below.

Table 3-8. Average Concentrations of Samples Taken by the Kansas Biological Survey (John Redmond Reservoir Siltation TMDL, KDHE 2003)

Location	Average Total Suspended Solids (mg/L)	Average Turbidity (formazin turbidity units)	Secchi Depth (m)
Station 1 – Lacustrine	497.4	144.1	0.19
Station 2 – Riverine	114.9	190.4	0.16
Station 3 – Transitional	204.9	191.6	0.16
Station 4 – Riverine	100.8	179.0	0.17
Station 5 – Transitional	81.3	169.5	0.21
Station 6 – Transitional	297.2	135.4	0.21
Station 7 – Transitional	551.8	145.6	0.21
Station 8 – Transitional	1107.9	128.5	0.21
Station 9 – Lacustrine	198.9	145.6	0.20
Station 10 – Lacustrine	181.9	133.9	0.21

Kansas Water Quality Standards

The Kansas Department of Health and Environment (KDHE) has classified segments of the Cottonwood and Neosho Rivers as follows:

Outstanding National Resource Water, K.A.R 28-16-28b (pp), "means any of the surface waters or surface water segments of extraordinary recreational or ecological significance identified in the surface water register, as defined K.A.R. 28-16-28b (zz), and afforded the highest level of water quality protection under the anti-degradation provisions of K.A.R. 28-16-28c(a) and the mixing zone provisions of K.A.R. 28-16-28c(b)."

> K.A.R. 28-16-28c(a)B(3) -"Wherever state surface waters constitute outstanding national resource waters existing water quality shall be maintained and protected. New or expanded discharges shall not be allowed into outstanding national resource waters."
>
> Exceptional state waters, K.A.R. 28-16-28b(y), "means any of the surface waters or surface water segments that are of remarkable quality or of significant recreational or ecological value, are listed in the surface water register as defined in K.A.R. 28-16-28b(zz), and afforded the highest level of water quality protection under the antidegradation provisions of K.A.R. 28-16-28c(a) and the mixing zone provisions of K.A.R. 28-16-28c(b)."

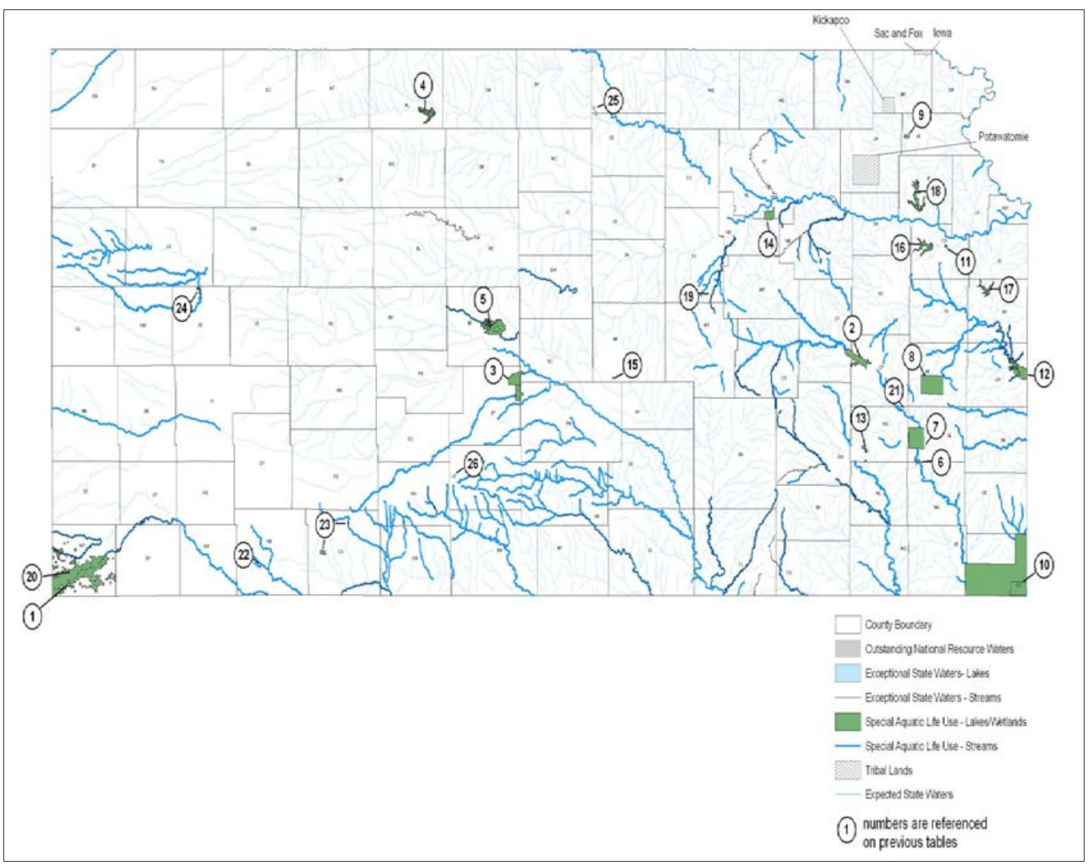
K.A.R. 28-16-28c(a)B(2)-"Wherever state surface waters constitute exceptional state waters, discharges shall be allowed only if existing uses and existing water quality are maintained and protected."

Special Aquatic Life Use, K.A.R. 28-16-28d (b)(2)(A), "means surface waters that contain combinations of habitat types and indigenous biota not found commonly in the state, or surface waters that contain representative populations of threatened or endangered species."

Table 3-9. Exceptional State Waters, Special Aquatic Life Use Waters and Outstanding National Resource Waters by County.

County	Exceptional State Waters	Special Aquatic Life Use Waters	Outstanding National Resource Waters
Allen		Neosho River	
Chase	Cottonwood River	Cottonwood River	
Cherokee	Neosho River	Neosho River	
Coffey		Neosho River	Flint Hills National Wildlife Refuge
Labette	Neosho River		
Lyon		Cottonwood River & Neosho River	Flint Hills National Wildlife Refuge
Neosho		Neosho River	

Figure 3-2. Exceptional State Waters, Special Aquatic Life Use Waters and Outstanding National Resource Waters.



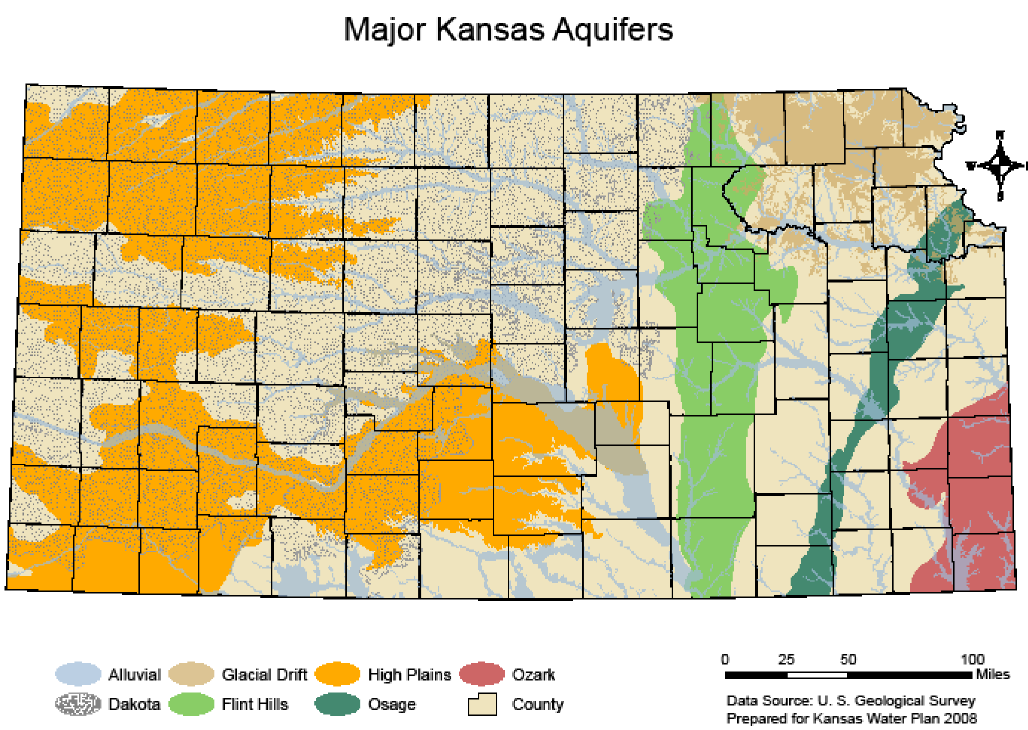
The Clean Water Act and its implementing regulations require new and expanding point source discharges satisfy the State's antidegradation policy regarding protection and maintenance of existing uses and current water quality. Kansas Surface Water Quality Standards, codified in K.A.R. 28-16-28b through 28-16-28g, contain an antidegradation policy at K.A.R. 28-16-28c(a). Expectations for so called "Tier 2 waters" are "*For all surface waters of the state, existing water quality is better than applicable water quality criteria established in these regulations, that existing water quality shall be fully maintained and protected. Water quality may be lowered only if the department finds, after full satisfaction of the intergovernmental coordination and public participation requirements on antidegradation, …, that a lowering of water quality is needed to allow for important social or economic development in the geographical area in which the waters are located. In allowing the lowering of water quality, the maintenance and protection of existing uses shall be ensured by the Department and the highest statutory and regulatory requirements for all new and existing point sources of pollution and all cost-effective and reasonable best management practices for nonpoint sources of pollution shall be achieved.*" (K.A.R. 28-16-28c(a)(1)(B)).

Additionally, "*Wherever surface waters of the state constitute exceptional state waters, discharges shall be allowed only if existing uses and existing water quality are maintained and protected.*" (K.A.R. 28-16-28c(a)(2)). The reach of the Neosho River below John Redmond Reservoir has a designated use of Special Aquatic Life and is generally viewed as Tier 2 for most pollutants.

3.3.4 Ground Water

Ground water is a minimal resource along the Neosho River. One reason is the abundance of surface water and another is because the alluvium is shallow and lies on shale and limestone bedrock, which are not good aquifer materials (Figure 3-3). Floodplain alluvium near John Redmond Reservoir averages approximately 26 feet in thickness and the water table is typically 10–15 feet below the land surface (USACE 2013). Although a few wells have been drilled in the northwest area, most ground water use in the Neosho Basin occurs in Crawford and Cherokee counties, east of the Neosho River (Figure 3-3) where the western extremity of the Ozark aquifer protrudes out in the state.

Figure 3-3. Map of Major Aquifers



Ground Water Quality

The state of Kansas established a cooperative ground water monitoring program between the USGS and the KDHE in 1976. The program objectives are to provide reliable information on ground water quality for use in the identification of temporal and spatial trends in aquifer chemistry associated with: 1) alterations in land-use patterns 2) advances in land treatment methods and other resource management practices 3) changes in ground water availability or withdrawal rates 4) variations in regional climatic conditions.

Initially the USGS performed sample collection and data interpretation, while sample analyses were performed by KDHE. In 1990, KDHE assumed all operational and managerial aspects of the Kansas ground water quality monitoring program. The basic sampling network was left intact, but several improvements were made, as follows:

- Legal descriptions were reviewed for all network sites
- Wells were tagged with a unique site identification number
- The Kansas Water Database (electronic repository for ground water quality data) was updated to reflect changes and corrections to the list of monitoring well locations

Sampling frequency previously reflected a two year rotational sampling schedule in which half of the network was sampled each year. The sampling network is no longer actively sampled due to budget and staff reductions.

Groundwater from the Douglas aquifer was sampled five times during the period June 27, 1985 to June 11, 1996 at KDHE site number 31554 near Waverly KS, legal TRS 1916E14. All samples were collected from a depth of 253.3 ft. Parameters analyzed were inorganics, organics and volatiles included in the suite of contaminants related to drinking water quality. Not all parameters were measured every time. Only contaminants on the EPA list of regulated or recommended guidelines for contaminants in drinking water detected are summarized here.

Aluminum has a secondary maximum contaminant level (SMCL) of 0.05 to 0.2 mg/L. The mean of three samples was 0.06 mg/L. Barium has a maximum contaminant level guideline (MCLG) of 2 mg/L. The mean of three samples was 0.06 mg/L. Boron has a Longer Term Health Advisory (LTHA) of 5 mg/L. The mean of three samples was 0.52 mg/L. The recommended standard for chloride levels in drinking water is 250 mg/L. The mean of three samples was 17.4 mg/L. Copper has a MCLG of 1.3 mg/L. The mean of three samples was 0.0113 mg/L. Fluoride has a MCLG of 4.0 mg/L. The mean of three samples was 0.43 mg/L. Iron has a secondary MCL of 0.3 mg/L. The mean of three samples was 0.266 mg/L. Lead has an action level of 0.015 mg/L. Of three samples, lead was only detected once at 0.0583 mg/L. Sulfate has a SMCL of 250 mg/L. The mean of three samples was 194 mg/L. Total dissolved solids has a SMCL of 500 mg/L. The mean of three samples was 459 mg/L. Zinc has a SMCL of 5 mg/L. The mean of three samples was 0.23 mg/L.

3.3.5 Water Rights

Within the John Redmond Reservoir flood pool, above John Redmond Dam, the USFWS holds rights to 4,574 acre-feet of water under Approved Certificates of Appropriation (USACE 2013). These rights are of two types, e.g., natural flow diversion (3,102 acre-feet) and pumping (1,472 acre-feet) for recreational purposes, which include fish and wildlife. These water rights are used to provide water to constructed and naturally-occurring wetlands within the refuge. Water rights for natural flows in the Neosho River, downriver from John Redmond Dam, are issued by the Division of Water Resources, Kansas Department of Agriculture.

The breakdown of reported water used per beneficial use is shown in Figure 3-4. Industrial use is the highest quantity of water use reported in the basin. This is due largely to the water released from John Redmond and pumped from the Neosho River by WCGS into their cooling lake. Municipal use is the second highest use reported in the basin, used to satisfy the water rights of the 16 municipalities that pump surface water and the remaining 21 that use ground water, with one entity relying on both, but does not include those pumping water from the Spring River or the Ozark aquifer. The recreational use captures mainly the water pumped to fill duck marshes in the fall near St. Paul, including the Neosho Wildlife Area owned and operated by KDWP&T. The remaining use is scattered throughout the basin and represents producers operating farming operations.

Figure 3-4. 2011 Reported Water Use (excludes Spring River and Ozark aquifer use)

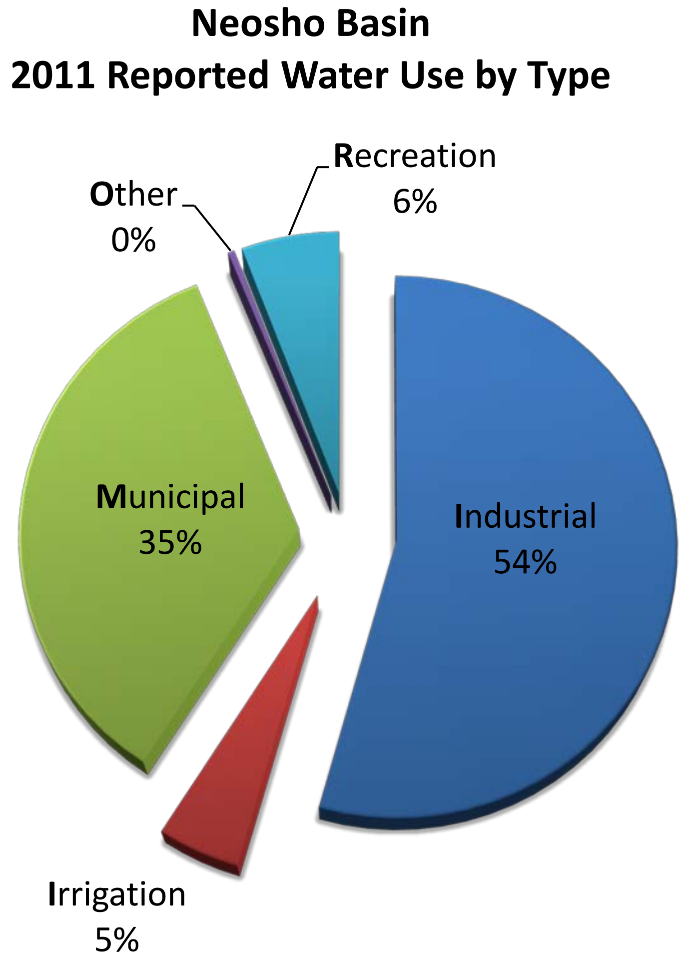
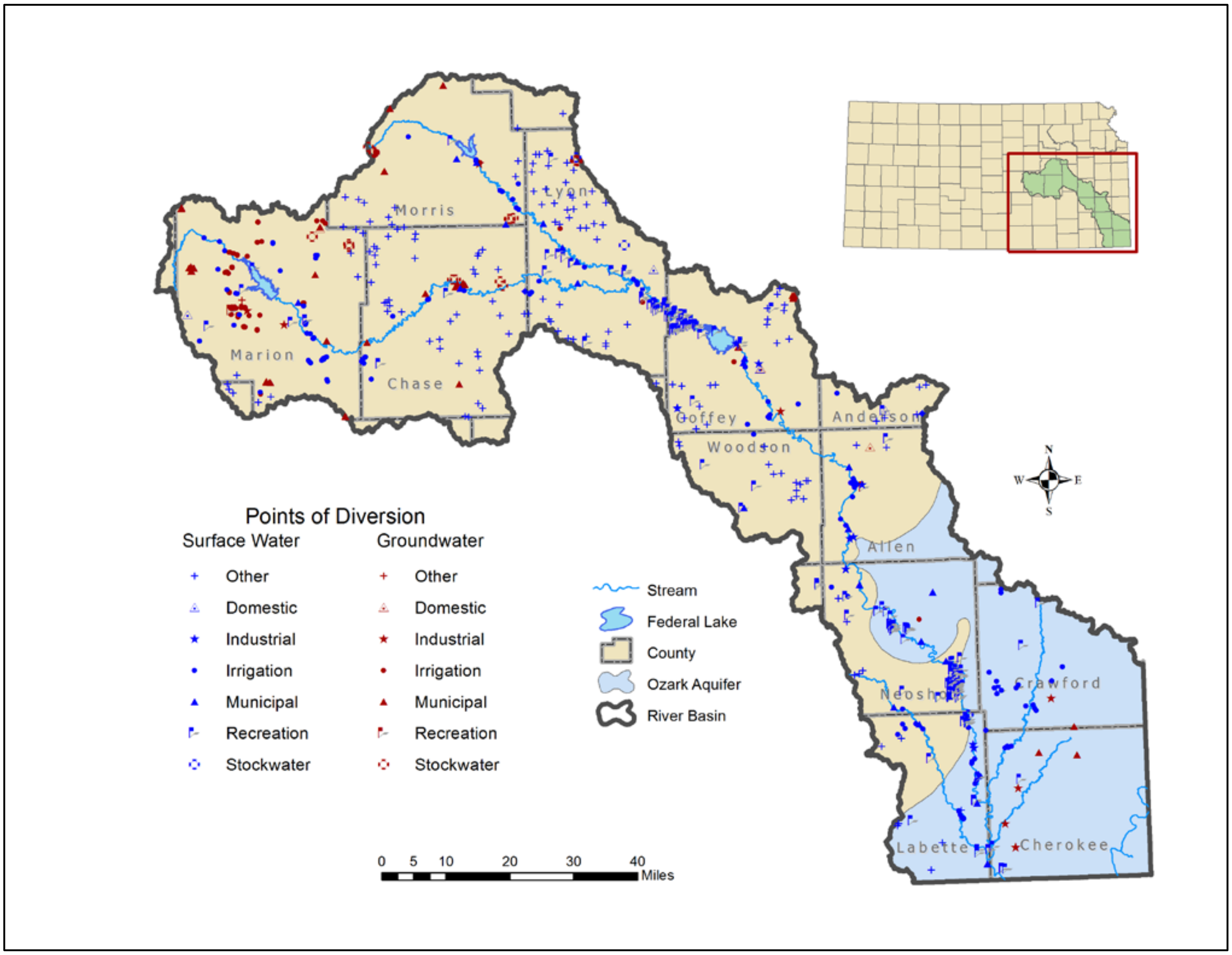


Figure 3-5 illustrates the distribution of water rights and their associated use throughout the basin. The map shows authorized water rights, not just reported use as shown in Figure 3-4. The largest number of water rights in the basin have a surface water source, as there is little alluvium in the basin to provide adequate water at sufficient rates. Of the authorized water rights, the foremost beneficial use in the basin is municipal use, for quantity authorized. However, there are more irrigation water rights, with recreation following third in number of rights behind municipal use. The municipal and industrial water rights below John Redmond Reservoir greatly depend on water stored and released for them in dry times to satisfy either their Water Marketing Contracts or Water Assurance District Contracts.

Figure 3-5. Water Right Distribution.



The state of Kansas has established a Water Marketing Program (WMP) to contract with water supply customers. Several significant events converged during the 1950s leading to the creation of the WMP:

- Floods of 1951, followed by the 1952–1957 drought
- Creation of the Kansas Water Resources Board (KWRB now KWO) (1955), with responsibility for water resources planning, water policy development and coordination of water-related activities at all levels of government
- Federal Water Supply Act (1958) passage with provisions allowing non- federal entities to add water supply storage space to planned flood control structures
- Kansas voter approval (1958) of a constitutional amendment allowing Kansas to financially participate in the development of flood control works or works for the conservation or development of the state's water resources

Under the KWRB, the 1961 Kansas legislature passed a House Concurrent Resolution (H.C.R. 5) allowing the state to provide assurances to the federal government for repayment of costs for add-on water supply storage in Council Grove (18,200 acre-feet), Marion (31,930 acre-feet) and John Redmond Reservoir (27,450 acre-feet), among others. The estimated yield capability of this storage space during periods of prolonged drought for these three reservoirs is 29.66 million gallons per day (mgd), with 19.9 mgd assigned to John Redmond Reservoir.

The quantity of water obligated to purchasers is based upon an estimate of the quantity of water that can be expected to be withdrawn from storage with a two percent chance of shortage during a drought, having a statistical chance of occurrence once every 50 years. A yield analysis was conducted on John Redmond Reservoir and the recalculation results were as follows:

- Sediment deposition differs significantly from that expected during project design
- Flood control pool has excess capacity and the conservation pool has diminished capacity
- The diminished storage capacity of the conservation pool can be recovered – a lower yield results until corrective measures are taken
- The two percent chance yield has been recalculated to be 19.9 mgd (formerly calculated to be 26.5 mgd) for the original water supply pool purchased from the USACE to serve the WMP
- The portion of the water supply pool purchased in 1985 (Memorandum of Understanding [MOU] with the USACE) was calculated to yield 7.3 mgd
- The USACE has been directed by Congress to conduct a study to determine the feasibility of a pool raise to restore storage lost to sedimentation

To date, withdrawals for water supply storage have not had a major effect on the operation of John Redmond Reservoir (USACE 2013). All of the water supply storage is contracted by the state of Kansas, and the WCGS has contracted from the state all of the water in the storage to use for cooling and other uses. The state has also formed water assurance districts with downriver communities in anticipation of purchasing additional water supply storage in the reservoir to release for downriver water supply during drought periods.

Westar Energy holds the only Water Marketing Contract supplied by John Redmond Reservoir through KWO to support operation of WCGS (53,916 acre-feet); the remainder of water rights holders are members of the CNRWAD (3,500 acre-feet).

Water Assurance Districts were formed under the Water Assurance Program Act of 1986 (K.S.A. 82A. 82a-1330 *et seq*.), which gives the KWO authority to enter into contracts with the federal government for storage space to be used for water assurance. It was under this act that the CNRWAD was formed. Ten thousand acre-feet of water were purchased under this act, 3,500 acre-feet were from John Redmond Reservoir.

3.4 Biological Resources

Biological resources include the vegetation, wetland, wildlife, fisheries and aquatic resources, and the endangered, threatened and candidate species present in the vicinity of John Redmond Reservoir. In addition, a national wildlife refuge and a Kansas wildlife management area are present within John Redmond Reservoir project lands and are summarized under this report section.

Several biological surveys have been completed at John Redmond Reservoir and in the project region. A countywide plant species list and description of plant communities was prepared for FHNWR during 1999 and published in 2000. Additionally, lists of avifauna, mammals, and herpetiles have been prepared by the refuge or by the Kansas Natural Heritage Inventory (KNHI) and were published for FHNWR during 2000. Waterfowl and raptor census data are taken at John Redmond Reservoir annually/bimonthly between the months of October and March by the KDWP&T. Fishery data for the Neosho madtom and other catfish were collected during the late 1990s for the Neosho River upstream and downstream of the dam and reservoir during a number of years and published during 2000. Similarly, data for freshwater mussels was collected during the mid-1990s for the Neosho River upstream and downstream of the dam and reservoir and published during 1997 (USACE 2013).

3.4.1 Vegetation Resources

Plant species have been inventoried for Coffey and Lyon Counties, and number 776 (USACE 2013). Many of these species grow in the variety of vegetation types that also serve as wildlife habitat within the John Redmond Reservoir project area, including woodland, shrubland and herbaceous terrestrial and aquatic plant communities. The terrestrial herbaceous communities are comprised of native and introduced grasslands in addition to agricultural crops and fallow cropland that supports weedy annual forbs and grasses. Forested, shrub scrub, and emergent wetland and aquatic plant communities are discussed in Section 3.4.2.

The John Redmond Reservoir project area lies within the Prairie Division–Forest-steppes and prairies ecoregion province (formerly the Prairie Parkland Province) Osage Plains section (USACE 2013). The lowest elevations support riparian woodlands along the Neosho River and its tributaries as well as the John Redmond Reservoir shoreline, upland woodlands on adjacent slopes and hills, and tall and mid-grasses on open sites of the higher elevations. Shrubs are invading some grasslands where land management practices are not sufficient to prevent their establishment. These sites will eventually support predominantly shrub and woodland species, unless stewardship practices such as hand grubbing, mowing, controlled burning, or herbicide application are employed.

Woodlands

Riparian woodlands are characterized as a bottomland hardwood type (Elm-Ash-Cottonwood Woodland). These stands are dominated by American elm, green ash, eastern cottonwood, black willow, black walnut, sycamore, silver maple, burr oak, boxelder, and hackberry. They are lowland sites, typically have heavy soils with poor surface drainage and are located along the Neosho River (both up and downstream of the dam and reservoir), on the shoreline of John Redmond Reservoir, and along Otter, Buffalo, Jacobs, Eagle, Plum, Troublesome, Lebo, Benedict, Kennedy and Hickory Creeks.

Downriver from John Redmond Dam, most of the floodplain vegetation that has become established along the Neosho River and its major tributaries can be described as the riparian woodland type. When observed during a site field visit and on black-and-white aerial photography of the countywide soil surveys (USACE 2013), it is a closed-canopy forest type extending the length of the Neosho River. The type occupies islands and point bars and first and second terraces along the river. Islands, point bars, and first terraces are dominated by eastern cottonwood, silver maple, boxelder, and black willow, while slightly higher elevation second terraces support eastern cottonwood, green ash, American elm, black walnut, hackberry and burr oak. It is common to observe seedlings and saplings of these trees in the forest understory, in addition to the eastern red cedar.

Between 2009 and 2012, in fulfilment of mitigation requirements for the pool raise at John Redmond Reservoir, KWO funded several habitat improvement projects at the USFWS Flint Hills Wildlife Refuge. Mitigation included the planting of 55,000 trees over 166 acres and the construction and planting of 203 acres of wetlands.

Shrublands

Downriver of the John Redmond Dam, shrublands occupy recently scoured islands, point bars and riverbanks. On these sites, which are disturbed during flood events, sandbar willow, rough dogwood, and buttonbush invade rapidly and form stands of shrubs up to 15 feet tall. On some sites, silver maple, eastern cottonwood and black willow seedlings make up a significant portion of the shrub canopy cover. As the shrubs mature, the stands are gradually replaced by black willow, silver maple and eastern cottonwood trees (USACE 2013).

Grasslands

Only small patches of grassland were observed along the Neosho River downriver of John Redmond Dam. These occurred on steep, southerly exposed banks and in canopy breaks, where disturbances for road and power line maintenance activities had occurred. Some pasture grasses had been planted to support grazing livestock on a few sites above the primary floodplain.

Agricultural Land

Downriver from John Redmond Dam, agricultural fields occupy the upland along nearly the entire 190 mile corridor. One parcel identified for sediment disposal is currently leased by the federal government for agricultural production. For much of the corridor, riparian forests form a narrow to broad belt along the river, intercepting runoff from adjacent agricultural land, but at a few sites fields are farmed to nearly the river's edge.

Exotic Plant Species

Several exotic plant species are present in the project area; two targeted for control and occurring within John Redmond Reservoir lands are Johnson grass and Sericea lespedeza. State and county law mandates control of exotic plant species. Typically, control efforts incorporate mowing and farming, although biological controls are being investigated. Pesticide and herbicide use are restricted in the Neosho River floodplain within the refuge and an integrated pest management approach is taken, using farm management practices, prescribed burning and chemical application where appropriate (USACE 2013).

Vegetation on Federal Disposal Sites

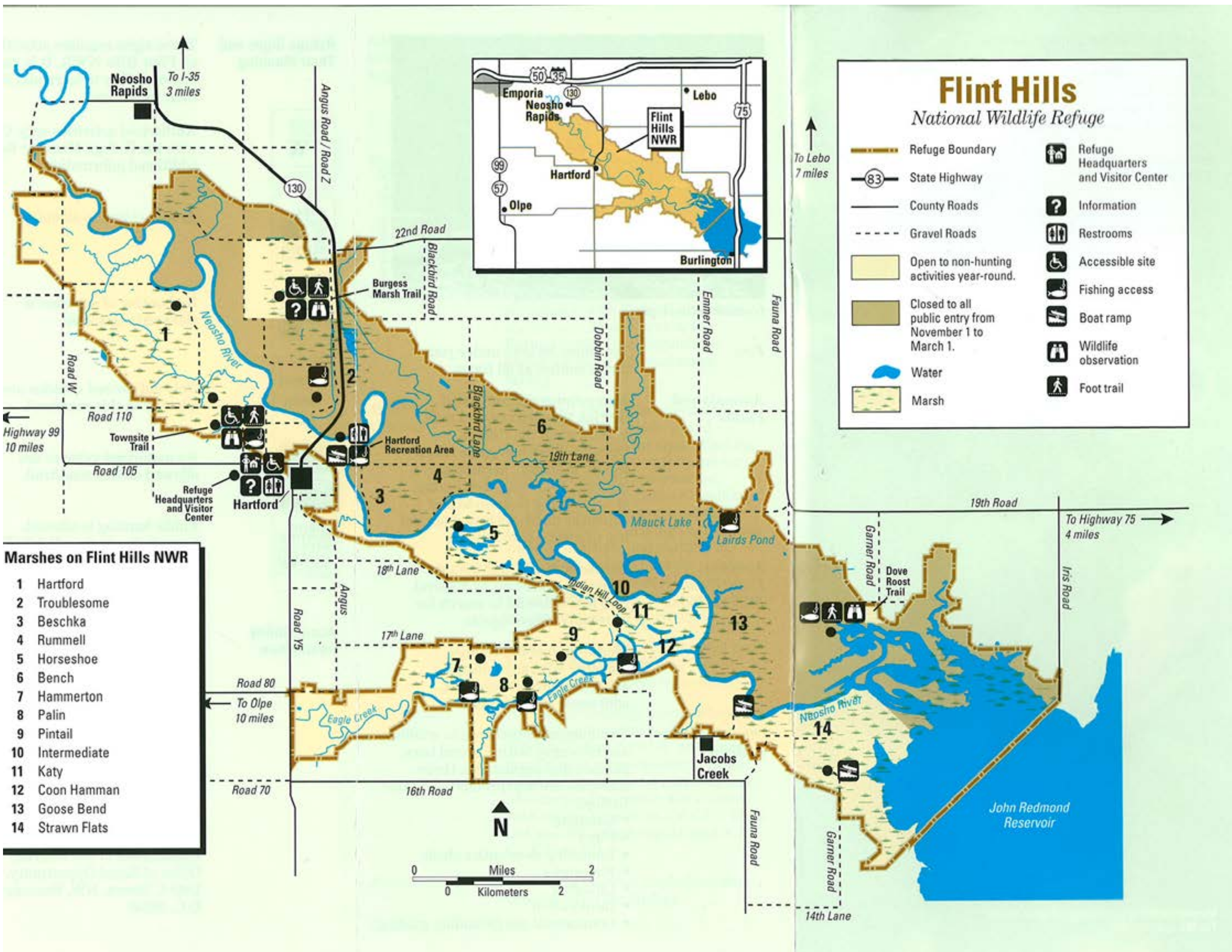
One property identified on federal property for sediment disposal, CDF Site B, is currently out-leased for agricultural production. The parcel is planted and maintained for row crops. Approximately 85% (28 acres) of CDF Site B is farm ground and 15% (5 acres) is mixed native grasses and forbs. The sediment disposal site on federal property, CDF Site A, is a mix of grasses and Eastern Red Cedar. Approximately 35% (9.1 acres) of CDF Site A is mixed timbers with a variety of species, 60% (15.6 acres) is grasses, and 5% (1.3 acres) is terraces. Grasses on site are dominated by Old World bluestem, an undesirable and invasive grass species in Kansas. Grasses on site also include brome. CDF Site E is a mix of grasses and forbs, Eastern Red Cedar, and a row crop rotation including soybeans, wheat and corn. Approximately 54% (67 acres) of CDF Site E is farm ground planted to row crops, 33% (40 acres) is managed pastureland, and 13% (16 acres) is mixed grasses, forbs and Eastern Red Cedar. Vegetation found within the Dam Site Recreation Area which will serve as the staging area is mainly invasive Sericea lespedeza, Johnson grass, mixed forbs, mixed warm season grasses and scattered trees. The Dam Site Recreation Area is highly prone to flooding and vegetation changes occur rapidly after flood events. Initial construction of the campground had mixed grasses planted throughout the entire area, with various deciduous and coniferous trees planted for landscaping. Detrimental flood events over the lifespan of the recreation area have drastically altered the vegetation of the area. Vegetation along the pipeline route includes representation of all the vegetation described for the staging area and CDF Sites A, B and E. Typical species associated with the habitat provided by CDF Sites A, B and E, the staging area and pipeline route include, but are not limited to white tailed deer, squirrel, rabbit, bob-white quail, turtle dove, variety of song birds, Bald Eagle, bobcat, beaver, opossum, red fox, raccoon, skunk, and coyote.

3.4.2 Wetland Resources

Wetlands of John Redmond Reservoir consist of natural wetlands (approximately 123 acres) that have become established upriver from the reservoir in abandoned oxbows of the Neosho River and deeper floodplain depressions (that are now known as lakes). Wetlands also persist along the shoreline of the reservoir and at the base of John Redmond Dam, where shallow water supports emergent and aquatic types, which have been introduced into FHNWR (USACE 2013).

Approximately 1,934 acres of wetland units have been created on the FHNWR using a dike and levee system and pumping or natural flow diversion water rights that equal 4,574 acre-feet. Two wetland units, Strawn and Goose Bend #4, lie in relatively close proximity to the upper shores of John Redmond Reservoir. The hydrology supporting wetlands within John Redmond Reservoir and along the Neosho River is predominantly surface water that inundates sites during high water periods or is pumped into constructed, shallow impoundments (USACE 2013). Figure 3-6 illustrates the location of the Strawn and Goose Bend #4 wetland units as well as the other wetland units at FHNWR.

Figure 3-6. Marshes on the Flint Hills National Wildlife Refuge



Natural wetland communities support species of sedge, flatsedge, spike-rush, bulrush, rush, and grasses such as prairie cordgrass, switchgrass, and rice cutgrass (USACE 2013). An aquatic component is typically present in wetlands of the John Redmond Reservoir project area and includes swamp smartweed, pondweed species, duckweed, bladderwort, arrowhead, water plantain and hornwort. A fringe of willow and buttonbush shrubs is typically present on upper wetland margins.

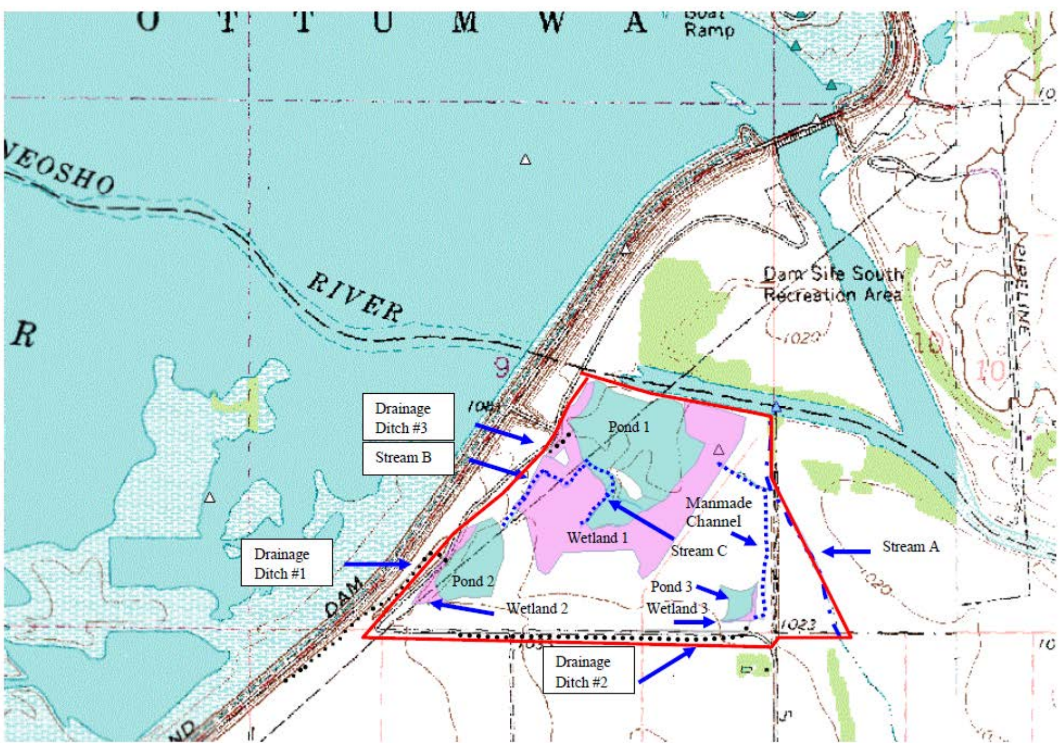
Wetlands established in the wetland units and in shallow coves of the reservoir are dominated by swamp smartweed, in addition to other smartweed species, bulrush, cattail, spike-rush and sedge. Some stands of seedling silver maple, eastern cottonwood and black willow were also present. On the reservoir drawdown zones, weedy annuals such as cocklebur, foxtail grass and barnyard grass are common species. Reservoir drawdown zones are sometimes aerially seeded with millet to provide waterfowl and fisheries forage (USACE 2013).

As compensatory mitigation for the reallocation and 2-foot pool raise at John Redmond Reservoir, from 1039 to 1041, the state of Kansas replaced 243 acres of wetlands, along with 166 acres of riparian forest, and some wetland infrastructure.

Downriver from the dam, wetlands on the Neosho River banks and on islands in the river are predominantly shrub-scrub and dominated by species of willow and buttonbush shrubs, and sapling black willow, silver maple, and eastern cottonwood trees. Herbaceous species, including bulrush, cattail and spikerush are commonly observed. In areas of ponded water such as oxbows, aquatic species including smartweed and duckweed are common (USACE 2013).

In November 2013, Regulatory Personnel from USACE Tulsa District performed a wetland delineation on the proposed CDF Site C (South ½ of Section 9, Township 21 South, Range 15 East; Figure 3-7; Appendix G). The delineation report identified 38.6 acres of ponds, 30.5 acres of wetlands, and 6,780 linear feet of stream channel over which USACE asserts jurisdiction. Due to the results of the wetland delineation, CDF Site C has been excluded from consideration as a viable sediment disposal location. A wetland delineation and jurisdictional determination was also conducted on CDF Sites A, B and E by USACE Regulatory Personnel and concluded that the identified properties do not indicate that a placement of dredged or fill material will be required, permanently or temporarily, into any "waters of the United States," including jurisdictional wetlands (Appendix G).

Figure 3-7. Wetland delineation of proposed CDF Site C. Jurisdictional streams are shown as blue dotted line; ponds are shown in blue; wetlands are shown in pink. Non-jurisdictional drainage ditches are shown as black broken dotted lines.



Clean Water Act Section 404 and Permits

Following is a brief description of the purpose of Section 404 of the Clean Water Act and the type of permits that could be required under the Clean Water Act. If waters of the United States and jurisdictional wetlands are impacted by the placement of dredge or fill materials that Kansas Water Office will adhere to the process and permits as described in this section. The USACE Regulatory Office will follow its procedures as required by the 10 April 2008, Final Compensatory Mitigation Rule, Department of the Army, Corps of Engineers 33 CFR Parts 325 and 332, and the Tulsa District Mitigation and Monitoring Guidelines.

The purpose of Section 404 of the Clean Water Act is to ensure that the nation's waterways are protected from irresponsible and unregulated discharge of dredged or fill material. Generally, if any action or proposed action is expected to result in the addition of any fill material to navigable waters, or result in the loss to an established threshold of acreage, then the action is subject to regulation under Section 404. A jurisdictional determination decides whether the specific body of water in question is subject to Section 404. If the water body is subject to Section 404, the proposed action then enters into the permitting process.

Determining whether a specific action is subject to Section 404 requires that the body of water be determined to be jurisdictional or non-jurisdictional. If the action is expected to impact wetlands, those wetlands must first meet the criteria of (1) being identified as a wetlands established by the U.S. Army Corps of Engineers and (2) being defined as "navigable waters of the United States" (33 CFR 329) or "waters of the United States" (33 CFR 328). "Navigable waters of the United States" are those waters that are subject to the ebb and flow of the tide or may be used for interstate or foreign commerce. "Waters of the United States" are those waters that may be used for foreign or interstate commerce; are interstate (including wetlands); are impoundments of waters otherwise defined as waters of the U.S.; or are wetlands adjacent to other waters of the U.S., except other wetlands. If the wetland meets any of these criteria, then a jurisdictional determination is made and the action must begin the permitting process.

Once it has been established that a wetland is jurisdictional, the applicant must enter into the permitting process. There are two types of permits that are issued for wetlands: (1) nationwide permits and (2) individual permits. Under Section 404, the USACE has authority to review and issue these permits.

Applying for a nationwide permit allows a proposed action with minimal impacts to proceed more quickly through the approval process. If a project site does not exceed one-half acre and falls into one of the broad categories of projects established by the USACE, it is eligible to enter into the nationwide permitting process. The proposed action must meet a number of mitigation and impact standards, such as having no impact to endangered species or historical properties, for the proposed action to be approved for a nationwide permit.

If a project is not eligible for a nationwide permit, it must apply for an individual permit. Individual permits are generally issued for those actions that are larger in scope and thought to have a more significant impact on the environment. As such, the process usually takes over six months and requires a very detailed analysis of the proposed action. After approval of the application, the proposed action is subject to a review period and the USACE considers all comments before issuing a final decision.

3.4.3 Wildlife Resources

The John Redmond Reservoir project area supports a wide variety of bird, herptile and mammal species. FHNWR lists 294 species of birds, including 90 species that are known to nest on the refuge. Species lists prepared for Coffey and Lyon Counties included 47 mammals and 58 herptiles that likely occur within the John Redmond Reservoir site (USACE 2013).

The project site and region provide habitat for a variety of avifauna that use the upland, grassland, agricultural land, hardwood riparian stands, marshes, and flooded sloughs and ponds present. The peak of migration is April–May for passerine species, July–August for shorebirds and November–December for waterfowl species. The John Redmond Reservoir area avifauna provides a destination for conduct of both naturalist activities such as bird watching and for hunting waterfowl, turkey, northern bobwhite quail and mourning dove.

One roost used by turkeys is known within the FHNWR adjacent to the Neosho River near Mauck Lake. There are likely to be additional turkey roosts within riparian habitats in the vicinity (USACE 2013).

Raptors common to the area include the American kestrel, prairie falcon, northern harrier, red-tailed hawk, great-horned owl, barred owl and wintering bald eagles. Although not strictly raptors, the turkey vulture and American crow are also common. Passerine birds common to and nesting within John Redmond Reservoir include the American goldfinch, eastern meadowlark, red-winged blackbird, northern cardinal, common yellowthroat, brown thrasher, northern thrasher, northern mockingbird, American robin, house wren, black-capped chickadee, barn swallow, horned lark, eastern kingbird and red-bellied woodpecker among many other species (USACE 2013). The introduced European starling and house sparrow are also considered abundant passerine birds for the area.

Shorebirds common to John Redmond Reservoir and vicinity include: killdeer, American avocet, herons, plovers, sandpipers, yellowlegs, dowitchers, gulls and terns. Common waterfowl species present during the fall migration include the mallard, teal (green-winged, cinnamon, and blue-winged), northern shoveler, common merganser, lesser scaup, redhead, wood duck and American coot (USACE 2013). Commonly observed goose species include the Canada, Ross, snow and white-fronted.

The numbers of waterfowl present through the season are variable, depending on habitat availability and quality. During the year 2000 migration, a total of approximately 48,600 geese and 48,000 ducks were counted on John Redmond Reservoir. During the year 1996 migration, approximately 103,000 geese and 236,000 ducks were counted. The primary use of John Redmond Reservoir and the FHNWR by waterfowl is for resting and foraging during migration; little waterfowl nesting activity occurs in the area (USACE 2013).

Herptiles common to John Redmond Reservoir and vicinity uplands include species such as Woodhouse's toad, box turtle, common garter snake and species of skink (USACE 2013).

A variety of game and non-game mammals are present in the John Redmond Reservoir site vicinity. The principal game mammals include the eastern cottontail, eastern fox squirrel and white-tailed deer. Common furbearers present include the muskrat, raccoon, a few beaver and the carnivores coyote, red and gray fox, mink and species of weasel. The river otter has been reintroduced to the region and a few have been observed using the Neosho River (USACE 2013).

Raccoon denning behavior and response to flooding has been studied along the Neosho River within the FHNWR. Eighty-three percent of dens used by raccoons in the FHNWR were tree cavities. Cavities in silver maple and sycamore trees were most commonly used by raccoons for den sites and suitable trees occurred at a density of 5.5 trees/ha in the FHNWR. Extensive flooding (69 and 78 days) of the Neosho River Valley above John Redmond Dam did not force raccoons out of the floodplain or contribute to raccoon mortality. Rather, the partly arboreal raccoons remained within floodwaters and swam from tree-top to tree-top during these two flooding events at John Redmond Reservoir (USACE 2013).

The Kansas Department of Transportation (KDOT) maintains records of total deer-related vehicle accidents (DVA) by county and has calculated the DVA per billion miles traveled for each county. The John Redmond

Dam and Reservoir lies in the western half of Coffey County and the eastern half of Lyon County. Data for these counties show a 15-year total of 1,317 and 1,759 DVAs for Coffey and Lyon Counties, respectively (USACE 2013).

3.4.4 Fisheries and Aquatic Resources

Fish species have been listed for Coffey and Lyon Counties and number 68. Those common to John Redmond Reservoir include the channel and flathead catfish, common carp, white bass, walleye, white crappie and several species of sunfish. Amphibians present in the aquatic system include the plains leopard frog, bullfrog and tiger salamander. Common aquatic reptiles include the snapping turtle, map turtles, softshell turtles and northern water snake (USACE 2013).

The lake environment supports both sport and rough fish species, with gizzard shad as the predominant forage base for the sport fish. The population of walleye is considered to be in fair condition and spawn among the rocks on the face of the dam. Typically, walleye spawn in one to four feet of water among riprap on the dam face. White crappie may spawn throughout the shallow portions of John Redmond Reservoir, but their preferred location is in coves protected from wave action. White bass and channel catfish populations tend to be insensitive to moderately fluctuating water levels in the reservoir and wipers are primarily an open water fish species. Bigmouth and smallmouth buffalo, common carp and the river carpsucker are rough fish present throughout John Redmond Reservoir (USACE 2013).

The John Redmond Reservoir was recently studied to determine its effect within the Neosho River on the associated ictalurid (catfish) populations. Comparative studies were conducted to determine differences in the Neosho River fishery above the reservoir and below the dam structure (USACE 2013). Generally, more catfish were present above John Redmond Reservoir than below the dam (Table 3-10).

Table 3-10. Mean Density of Ictalurid Fish Species Captured Above John Redmond Reservoir and Below John Redmond Dam, Kansas (Source: USACE 2013).

Fish Species	Mean Density Above John Redmond Reservoir	Mean Density Below Dam
Neosho Madtom	19.82/100m^2	5.64/100m^2
Channel Catfish	34.31/100m^2	18.73/100m^2
Stonecat	4.61/100m^2	2.82/100m^2
All catfish excluding Neosho Madtom	45.50/100m^2	25.66/100m^2
Note: Research was conducted at an average water depth - velocity of 0.33m - 0.34m/s above John Redmond Reservoir and 0.38m - 0.35m/s below the dam		

Several attributes of the Neosho River were compared above and below the reservoir and dam (USACE 2013), including:

- Water temperature was cooler by approximately 3^{o}C above the dam than below
- Turbidity was higher above the dam than downriver of the dam
- The pH was nearly the same
- Dissolved oxygen increased downriver of the dam
- Conductivity, alkalinity, and hardness were all higher above the dam structure, but it was unknown if these factors limit ictalurid populations.

An analysis of sediments indicated the Fredle Index (geometric mean adjusted for distribution of particle sizes) was lower above the dam than downriver from the dam (5.52 vs. 7.82). Although not significantly different, this index indicates that more evenly distributed substrate sizes occur upriver from the reservoir and a shift to the predominance of larger gravel below the dam may be occurring. This increased coarseness of the substrate is considered a common effect of reservoirs and could be a limiting factor for some fish populations (USACE 2013).

3.4.5 Endangered, Threatened, and Candidate Species, Species of Special Concern and Sensitive Communities

Ten (10) species, e.g., Western Prairie Fringed Orchid, Neosho Madtom, Neosho Mucket Mussel, Rabbitsfoot Mussel, Ouachita Kidneyshell Mussel, Butterfly Mussel, Flutedshell Mussel, and Western Fanshell Mussel, are listed as federal or Kansas endangered or threatened for the John Redmond Reservoir project area (Table 3-11) (KDWP&T 2013). Additionally, two species were discussed in the FHNWR Comprehensive Conservation Plan, the Peregrine Falcon and Flat Floater Mussel (Kansas-endangered). One additional species, Sprague's Pipet, is being reviewed but did not warrant listing in 2012.

The KDHE has classified the Neosho River (downstream from Council Grove Reservoir) and the Cottonwood River as special aquatic life-use waters (USACE 2013). These are waters that contain unique habitat types and biota, or species that are listed as threatened or endangered in Kansas.

Table 3-11. Federally and Kansas Listed Species for the John Redmond Reservoir Project Area (Sources: USFWS 2013, KDWP&T 2013, and USACE 2013) (Appendices B and C).

Species	Status/Rank	Comments
Common Name (Scientific Name)	**Federal/Kansas/Global**	**Source and Habitat**
Bald Eagle *(Haliaeetus leucocephalus)*	Delisted. Protected by The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) and Migratory Bird Treaty Act.	USFWS response letter. Transient use of larger trees in the vicinity of open water. Personal communication–Wendt (KWO) and Johnson and Luginbill (KDWP&T) on January 8, 2013.
Peregrine Falcon *(Falco peregrinus)*	Not listed as threatened or endangered. Protected by Migratory Bird Treaty Act.	FHNWR management plan. Migrates through the John Redmond Reservoir area, but does not nest. Personal communication – Wendt (KWO) and Johnson and Luginbill (KDWP&T) on Jan. 8, 2013.
Sprague's Pipit (*Anthus spragueii*)	Not yet listed, candidate species	Personal communication – Metzger (KWO) and USFWS Manhattan, KS. Federal Register / Vol 77, No. 225/ Nov. 21, 2012. North American grassland and tied to native prairie habitat.
Neosho Madtom (*Noturus placidus*)	US – Threatened KS – Threatened G2/S2	USFWS and KDWP&T response letters. Use shallow riffles with loose/uncompacted gravel bottoms.
Western Prairie Fringed Orchid (*Platanthera praeclara*)	US – Threatened KS – Does not list plants G2/S1	USFWS response letter. Grows in tallgrass silt loam soils, moist sand prairies or hay meadows with full sunlight.
Neosho Mucket Mussel (*Lampsilis rafinesqueana*)	US – Endangered KS– Endangered G2/S1	USFWS & KDWP&T response letter. Requires clean, in-stream gravel beds.
Rabbitsfoot Mussel (*Quadrula cylindrica cylindrica*)	US – Threatened KS– Endangered	USFWS & KDWP&T response letter. Requires clean, in-stream gravel beds.

Species Common Name (Scientific Name)	Status/Rank Federal/Kansas/Global	Comments Source and Habitat
	G3/S1	
Ouachita Kidneyshell Mussel (*Ptychobranchus occidentalis*)	KS – Threatened G3G4/S1	KDWP&T response letter. Requires clean, in-stream gravel beds.
Flat Floater Mussel *(Anodonta suborbiculata)*	KS – Endangered G5/S1	FHNWR management plan. Requires ponds, lakes or sluggish mud-bottomed pools of creeks and rivers.
Butterfly Mussel *(Ellipsaria lineolata)*	KS – Threatened	Personal communication – Wendt (KWO) and Luginbill (KDWP&T) on July 18, 2013. Requires clean, in-stream gravel beds.
Flutedshell Mussel *(Lasmigona costata)*	KS – Threatened	Personal communication – Wendt (KWO) and Luginbill (KDWP&T) on July 18, 2013. Requires clean, in-stream gravel beds.
Western Fanshell Mussel *(Cyprogenia aberti)*	KS - Endangered	Personal communication – Wendt (KWO) and Luginbill (KDWP&T) on July 18, 2013. Found in mud, sand, gravel and cobble substrate, generally associated with less than three feet of water.
Northern Long-Eared Bat *(Myotis septentrionalis)*	Proposed for listing	USFWS Comment letter dated May 21, 2014
Mead's Milkweed *(Asclepius meadii)*	US - Threatened	USFWS Comment letter dated May 21, 2014

Rank: G2: Globally imperiled because of rarity; typically 6-20 occurrences, G3: Globally vulnerable because it is very rare and local throughout its range; typically 21-100 occurrences, G4: Globally apparently secure, uncommon but not rare, widespread; typically 100 occurrences or more. G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. S1: State critically imperiled because of extreme rarity; typically five or fewer occurrences, S2: State imperiled because of rarity; typically 6-20 occurrences, SZN: Zero occurrences/non-breeding population, occurs during migration (USACE 2013).

Bald Eagle (Haliaeetus leucocephelus)

The Bald Eagle was delisted from the Endangered Species Act in 2007; however, it is protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

The Eagles are also protected under The Migratory Bird Treaty Act (MBTA). The MBTA is a Federal law that carries out the United States' commitment to four international conventions with Canada, Japan, Mexico and Russia. Those conventions protect birds that migrate across international borders.

The take of all migratory birds, including Bald Eagles, is governed by the MBTA's regulations. The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except as authorized under a valid permit (50 CFR 21.11). Additionally, the MBTA authorizes and directs the Secretary of the Interior to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take (for example, hunting seasons for ducks and geese).

The Bald Eagle is considered transient through the project area, but some nest initiation behavior has been observed on the FHNWR. Bald Eagles are listed as common during the winter months and counts occur every other week from the latter half of October through the end of March (USACE 2013).

The total season counts have ranged from as few as one bald eagle in 1974, to as many as 280 in 1988. On average, 10 to 20 individual bald eagles use the John Redmond Reservoir area at any one time. Bi-weekly counts over the past 30 years have yielded no bald eagles observed (several periods), and as many as 104 individuals present in the latter half of February 1987. During the year 2000, 65 bald eagle observations were recorded during the season: four in late December, zero in early January, eight in late January, seven in early February, 29 in late February, 15 in early March and two in late March (USACE 2013).

In approximately three of the last 10 years, a pair (or possibly different pairs) of Bald Eagles performed nest initiation but rapidly abandoned the behavior. It is possible these were young eagles as they did not complete nest construction or initiate breeding or egg laying activities. A successful nest site was reported from near the Coffey County Fishing Lake and the WCGS (USACE 2013).

Typically, Bald Eagles use trees around John Redmond Reservoir and along the Neosho River and its tributaries as perches for foraging, resting and as roosts. When ice formed on John Redmond Reservoir, Bald Eagles were observed resting directly on the ice where they consumed waterfowl and fish from an open portion of the lake (USACE 2013). Bald Eagles may take fish and waterfowl directly, in addition to foraging or scavenging for dead or wounded animals.

Peregrine Falcon (Falco peregrinus)

The Peregrine Falcon is not a federal or Kansas listed raptor. The Peregrine Falcons are also protected under MBTA, along with the eagles. They are recorded as passing through the project area during spring and fall migration but do not nest there.

Sprague’s Pipit (Anthus spragueii)

The Sprague’s Pipit is a relatively small passerine (about the size of a bluebird) endemic to the North American grasslands. It has a plain buff colored face with a large eye-ring. The Sprague’s Pipit is a ground nester that breeds and winters on open grasslands. It feeds mostly on insects, spiders and some seeds. Spring migration primarily occurs in April and May while fall migration occurs primarily from late September through early November. It is unlikely that they would be found in the project area.

The Sprague’s Pipit is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota and South Dakota as well as south-central Canada. Wintering occurs in the southern states of Arizona, Texas, Oklahoma, Arkansas, Mississippi, Louisiana and New Mexico.

The USFWS reviewed the conservation status of Sprague’s Pipit to determine whether the species warrants protection under the Endangered Species Act. The status review found that listing Sprague’s Pipit as threatened or endangered is warranted, but that listing the species at this time is precluded by the need to complete other listing actions of a higher priority. To ensure this review was comprehensive, the service solicited information from state and federal natural resource agencies and all interested parties regarding the Sprague’s Pipit and its habitat.

Western Prairie Fringed Orchid (Platanthera praeclara)

The Western Prairie Fringed Orchid (WPFO) is federally listed as threatened. The species may be found within unplowed mesic to wet mesic prairies and sedge meadows on unglaciated, level to hilly sites, and on Pennsylvanian-age sediments covered with a thin, discontinuous mantle of loess residuum. The Western Prairie Fringed Orchid distribution in Kansas is generally north John Redmond Reservoir (Douglas, Franklin, Jackson, Jefferson, Leavenworth, Lyon, Osage, and Shawnee Counties) and the project area; the nearest population was known in the vicinity of Reading, KS in northeastern Lyon County. One historical report of the western prairie fringed orchid in Waverly Prairie of Coffey County was reported during 1969, but the prairie was converted to cropland, destroying the former western prairie fringed orchid habitat (USACE 2013).

In eastern Kansas, Western Prairie Fringed Orchid habitat was described as mesic to wet mesic prairies, and in northeastern Kansas it was described as wet mesic to mesic tallgrass prairie. The populations of Western Prairie Fringed Orchid in Kansas are small and none support greater than 50 individual plants. Western Prairie Fringed Orchid decline is principally attributed to the conversion of habitat to cropland (USACE 2013).

The WPFO has not been documented within the John Redmond Reservoir project boundaries.

Mead's Milkweed (Asclepius meadii)

Mead's milkweed is a perennial broad-leaved plant of unbroken tallgrass prairie, generally occurring as small populations or scattered individuals, and is listed as federally threatened. Although it is not known in the currently identified CDF locations, affects to the Mead's milkweed will be considered as additional CDF locations are identified.

Northern Long-Eared Bat (Myotis septentrionalis)

The Northern long-eared bat (NLEB) is currently proposed for listing under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.). The final listing for the NLEB is expected in October 2014. At this time, no critical habitat has been proposed for the NLEB. During the summer, NLEB typically roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically $\geq$ 3 inches dbh). Males and non-productive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on presence of cavities or crevices or the presence of peeling bark. It has also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). They forage for insects in upland and lowland woodlots and tree lined corridors. During the winter, NLEBs predominately hibernate in caves and abandoned mine portals. Occurrences have been documented from Ellis, Graham, Leavenworth, Marshall, Osborne, Phillips, Rooks, Russell and Washington counties. However, the species could potentially occur in suitable habitat anywhere east of a line bounded by U.S. Highway 283 from Nebraska south to I-70, I-70 east to Russell, then U.S. Highway 281 south to Oklahoma. No survey has been conducted to document the presence or absence of the NLEB in the project area.

Neosho Madtom (Notorus placidus)

The Neosho Madtom is both a federal and State of Kansas listed threatened species of catfish that occupies gravel bars and smaller areas of gravel in rivers of the Neosho Basin. Neosho Madtoms are protected by the Kansas Nongame and Endangered Conservation Act, the Federal Endangered Species Act and state and federal regulations applicable to those acts (KDWP&T 2011).

Designated Critical Habitats as defined by Kansas Administrative Regulations, critical habitats include those areas documented as currently supporting self-sustaining population(s) of any threatened or endangered species of wildlife as well as those areas determined by the KDWP&T to be essential for the conservation of any threatened or endangered species of wildlife.

Currently, the following areas are designated critical for Neosho Madtom:

(1) The main stem Cottonwood River from the point it enters Chase County at Sec. 1, T21S, R5E to its confluence with the Neosho River at Sec. 23, T19S, R12E, Lyon County
(2) The main stem Neosho River from its point of discharge from Council Grove Reservoir in Sec. 10, T16S, R8E, Morris County to the point it leaves Lyon County in Sec. 15, T20S, R13E
(3) The main stem Neosho River from its point of discharge from John Redmond Reservoir at Sec. 10, T21S, R15E to Coffey County to the Kansas-Oklahoma border at Sec. 18, T35S, R22E, Cherokee County
(4) The main stem Spring River from the Kansas-Missouri border to a point where it crosses the west boundary of Sec. 36, T33S, R25E, Cherokee County
(5) The main stem of the South Fork of the Cottonwood River in Chase County where it enters Sec. 14, T20S, R8E, until its confluence with the Cottonwood River (Sec. 25, T19S, R8E). The U.S. Fish and Wildlife Service also has authority to designate areas of critical habitat for federally listed endangered species, but has not done so for Neosho Madtoms in Kansas (KDWP&T 2011)

Neosho Mucket Mussel (Lampsilis rafinesqueana)

The Neosho Mucket Mussel is both a federal and State of Kansas listed endangered species and is proposed for listing as a species by the USFWS, an action that may occur during the year 2013 (Wendt, B. KWO personal communication, Johnson and Luginbill (KDWP&T January 8, 2013). The Neosho Mucket Mussel occupies gravel bars in the Neosho, Spring, and Verdigris Rivers. The overall distribution of Neosho Mucket Mussel shows regional endemism to the Arkansas River system, including the Neosho, Spring, Elk, Illinois, and Verdigris basins of Kansas, Missouri, Oklahoma and Arkansas (USACE 2013).

The Neosho Mucket Mussel occupies shallow riffles and runs (mean depth 15.0-33.7 cm) across gravel bars, with stable and moderately compacted substratum, predominantly gravel with a minimum of silt. The mussels prefer riffles and runs with relatively clear, flowing water. Gravel bar stability is usually the result of some stabilizing force in the river, such as bedrock exposed along the river edge or bedrock on the river bottom. The Neosho Mucket Mussel is a bradytictic breeder; the females attract hosts with a mantle lure. Potential larval hosts for the Neosho Mucket Mussel include smallmouth and largemouth bass (USACE 2013).

The Neosho Mucket Mussel is probably extirpated from the Neosho River above John Redmond Reservoir (USACE 2013). Downriver from the John Redmond Dam, 32 living Neosho Mucket Mussel and some weathered dead shells were located. The living individuals occupied six of 21 sites surveyed and were greater than 20 years old based on counts of annular rings. In contrast, 1,192 individual Neosho Mucket Mussel were collected in the Spring River and 77 in the Verdigris River. In the Neosho River, the observed habitat used by NMMs had the following characteristics: depth = 39.6 cm; current speed = 16.0 cm/s and 27.0 cm/s (100 percent and 60 percent depths); substratum character = 41.3 percent gravel, 35.9 percent cobble, 14.9 percent sand, 4.4 percent boulder, and 3.3 percent mud; compaction rated 1.1 and siltation rated 1.4 (USACE 2013).

Rabbitsfoot Mussel (Quadrula cylindrica cylindrica)

The Rabbitsfoot Mussel is both a federal and State of Kansas listed endangered species that occupies gravel bars in the Neosho and Spring Rivers (Wendt, B. KWO personal communication, Johnson and Luginbill

(KDWP&T January 8, 2013). The overall distribution of Rabbitsfoot Mussel includes the Ozarkian and Cumberland faunal regions of 13 states, but it is most abundant in the Black River system of Arkansas (USACE 2013).

The Rabbitsfoot Mussel occupies shallow riffles and runs (mean depth 15.0–33.7 cm) across gravel bars, with stable and moderately compacted substratum, predominantly gravel with a minimum of silt. The mussels prefer riffles and runs with relatively clear, flowing water. Gravel bar stability is usually the result of some stabilizing force in the river, such as bedrock exposed along the river edge or bedrock on the river bottom. The Rabbitsfoot Mussel is a tachytictic breeder whose larval hosts may include species of shiner (USACE 2013).
The Rabbitsfoot Mussel is probably extirpated from the Neosho River above John Redmond Reservoir (USACE 2013). Downriver from John Redmond Dam, two living Rabbitsfoot Mussel and some weathered dead shells were located. A reproducing Rabbitsfoot Mussel population is known to occupy a gravel bar near Iola, KS. In the Neosho River, the observed habitat used by Rabbitsfoot Mussel had the following characteristics: depth = 12.5 cm; current speed = 27.5 cm/s and 38 cm/s (100 percent and 60 percent depth); substratum character = 60.0 percent gravel, 32.5 percent cobble, 7.0 percent sand, and 0.5 percent mud; compaction rated 1.0; and siltation rated 1.0 (USACE 2013).

Ouachita Kidneyshell Mussel (Ptychobranchus occidentalis)

The Ouachita Kidneyshell Mussel (OKM) is a Kansas listed threatened species that occupies gravel bars in the Spring, Verdigris, and Fall Rivers. The overall distribution of OKMs includes the Arkansas, Black, Red, St. Francis and White River systems in Arkansas, Kansas, Missouri, and Oklahoma (USACE 2013).

The Ouachita Kidneyshell Mussel occupies shallow riffles and runs (mean depth 15.0-33.7 cm) across gravel bars, with stable and moderately compacted substratum, predominantly gravel with a minimum of silt. The mussels prefer riffles and runs with relatively clear, flowing water. Gravel bar stability is usually the result of some stabilizing force in the river, such as bedrock exposed along the river edge or bedrock on the river bottom. The Ouachita Kidneyshell Mussel is a bradytictic breeder; the females attract potential hosts with a mantle lure. Potential larval hosts include orangethroat, greenside, and rainbow darters (USACE 2013).

Flat Floater Mussel (Anodonta suborbiculata)

The Flat Floater Mussel is a Kansas endangered species. The Flat Floater Mussel is considered locally abundant in the floodplain lakes, sloughs, and oxbows of the Mississippi and Ohio Rivers and their tributaries. Its habitat is described as ponds, lakes or sluggish mud-bottomed pools of creeks and rivers (USACE 2013). In Kansas, the Flat Floater seems to prefer shallow areas of relatively permanent oxbow lakes having organically rich mud bottoms. This preferred habitat is subject to water level changes due to fluctuations in runoff water and flood flows that recharge oxbow lakes. Flat Floaters appear, however, to be able to repopulate suitable areas when favorable habitat conditions return. The current probable range of the Flat Floater in Kansas is restricted to the lower reaches of the Neosho and Marais des Cygnes Rivers (KDWP&T 2013).

Butterfly Mussel (Ellipsaria lineolata)

The Butterfly Mussel is a Kansas threatened species. This species is an obligate riverine mussel preferring clean water with good current over gravel substrate. Its historic range included the Neosho, Spring, Fall and Verdigris Rivers. Although rare, the Butterfly Mussel has been found at some mussel survey sites in the Verdigris and Marais des Cygnes Rivers between 2000 - 2010 and the Neosho River in the mid 1990's (KDWP&T 2013).

Flutedshell Mussel (Lasmigona costata)

The Flutedshell Mussel is a Kansas threatened species. This species is an obligate riverine species preferring clear water riffles with moderate current on substrate of medium to small sized gravel. Historically occurred in the Fall, Elk, Verdigris, Cottonwood, Spring and Marais des Cygnes Rivers. It still occurs in the same watersheds, but at greatly reduced numbers and distribution (KDWP&T 2013).

Western Fanshell Mussel (Cyprogenia aberti)

The Western Fanshell Mussel is a Kansas listed endangered species. This species is an obligate riverine species found in mud, sand, gravel and cobble substrate, generally associated with less than three feet of water. Historically found in low densities in the Fall, Verdigris, Neosho, and Spring Rivers. Appears to be extirpated from the Neosho River. Surveys from 2000-2010 have documented populations in the Verdigris and Spring Rivers (KDWP&T 2013).

Sensitive Communities

The KDHE has classified the Neosho River downstream from Council Grove Reservoir and the Cottonwood River as special aquatic life-use waters. The general provisions of the Kansas surface water quality standards (K.A.R. 28-16-28c) state in part: "…no degradation of water quality by artificial sources shall be allowed that would result in harmful effects on populations of any threatened or endangered species of aquatic life in a critical habitat…" The KDHE could issue a variance, however, if "important social and economic development" is impaired.

In addition, according to KDWP&T: "The Neosho River immediately upstream from John Redmond Reservoir is Kansas-designated critical habitat for the Neosho Madtom and Ouachita Kidneyshell Mussel. The Neosho River immediately downstream from the John Redmond Dam is designated critical habitat for the Neosho Madtom, Ouachita Kidneyshell Mussel and Rabbitsfoot Mussel. The Cottonwood River immediately upstream of John Redmond Reservoir is designated critical habitat for the Neosho Madtom, Ouachita Kidneyshell Mussel, and the Neosho Mucket Mussel." (USACE 2013, Correspondence from KDWP&T)

3.4.6 Invasive Species

Zebra mussels were first confirmed to be present in John Redmond Reservoir in August, 2010. Since that time the larval stage, veligers, have moved downstream, and were confirmed to have infested Coffey County Lake in August, 2012. Additional downstream infestation is likely, however infestation can also occur in separate, or upstream water bodies through equipment that is not properly cleaned and movement of water and sediment infested with Zebra mussels.

Eurasian water milfoil forms dense mats on water surfaces and out-competes native aquatic vegetation. It has been found in 33 states including Kansas, but has not been identified in John Redmond Reservoir or any surface water bodies in Coffey County. Salt cedar forms dense monocultures and dramatically changes vegetation structure and animal species diversity. It is not known to occur within the project area (KDWP&T 2014). Johnsongrass is an upright perennial grass, reproducing by large rhizomes and seeds. It is listed as a Kansas noxious weed. New infestations of Johnsongrass may be reduced by planting Johnsongrass free seed and cleaning machinery before leaving infested fields. Sericea lespedeza is also on the Kansas noxious weed list. It is known to occur throughout the John Redmond Reservoir project area. Control of Sericea lespedeza is by preventing the production of viable seeds through grazing practices, mowing, prescribed burning and herbicide application. A state quarantine was enacted in 2002 for the prevention of commercial sales of purple loosestrife in Kansas. No infestations of purple loosestrife are known to exist in Coffey County (KDA Plant Protection and

Weed Control, 2014). Reed canary grass is not regulated in Kansas nor is it on the state watch list. It is not known to be a nuisance species in Coffey County (personal communication, Scott March, KDA, 2014).

3.4.7 Wildlife Refuges and Wildlife Management Areas

Approximately 29,801 acres of land along the Neosho River are owned by the USACE from below John Redmond Dam to near Neosho Rapids, KS. In addition to overall site management by the USACE and direct management of approximately 9,784 acres, leases have been signed with the USFWS and KDWP&T to provide land management for the FHNWR (18,545 acres) and OCWA (1,472 acres) (USACE 2013).

FHNWR was established in 1966 under the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. § 644) and is located on the upriver portion of John Redmond Reservoir, including the approximately upper one-third of the conservation pool (USACE 2013). The refuge is managed primarily for migratory waterfowl.

The breakdown of habitat types supported in the refuge is presented in Table 3-12.

Table 3-12. Acreage of Habitat Types within the Flint Hills National Wildlife Refuge.

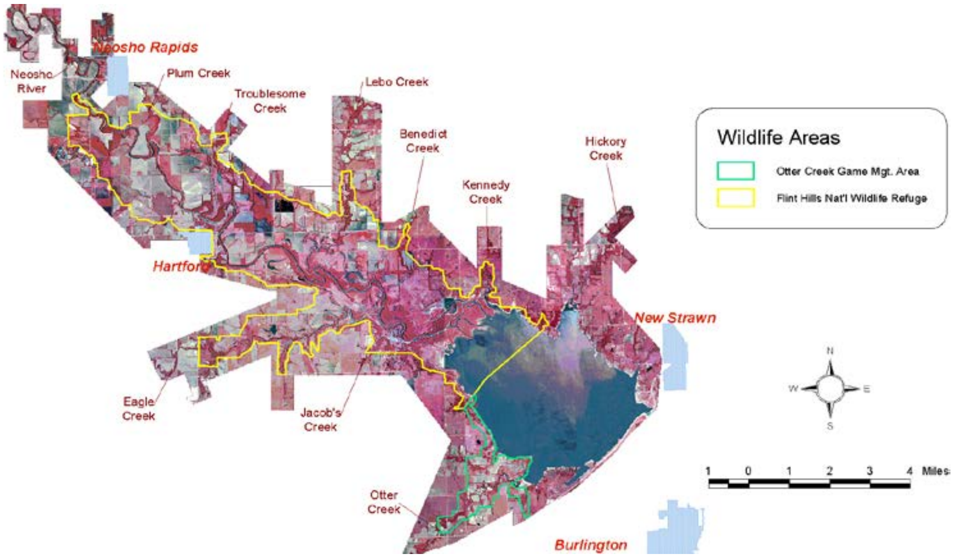
Habitat Type	Acreage
Wetland	4,572
Open Water	1,400
Riparian Wetlands	680
Cropland	3,917
Grassland	3,200
Woodland	2,400
Brushland	2,255
Administrative/Recreational	120
Total	**16,544**
Source: USFWS 2002. (USACE 2013)	

Further, the Refuge Recreation Act (16 U.S.C. § 460-1) states that a refuge may provide incidental fish and wildlife oriented recreational development, the protection of natural resources and the conservation of endangered or threatened species. A Comprehensive Conservation Plan (CCP) has been prepared and will guide management decisions at FHNWR for the next 15 years.

Otter Creek Wildlife Area (OCWA) was established in 1966 and is located on the southeastern boundary of FHNWR and the southeastern portion of John Redmond Dam (Figure 3-8). This state wildlife area is managed primarily for big game and upland species, e.g., white-tailed deer, wild turkey, mourning dove, bobwhite quail, cottontail rabbit and squirrel.

Permitted activities on the FHNWR include wildlife observation, hiking and sightseeing, photography, boating, picnicking, camping, fishing, hunting, wild food gathering and fish bait collection. Interpretive trails are present and include Dove Roost Trail and the Headquarters Trails. OCWA provides wildlife observation, sightseeing, photography, boating, fishing and hunting opportunities.

Figure 3-8. Approximate Boundaries of the Flint Hills National Wildlife Refuge and the Otter Creek Wildlife Management Areas.



3.5 Air Quality

Air pollution is generated from many different sources including stationary (factories, power plants, smelters, dry cleaners, degreasing operations, etc.), mobile (cars, trucks, trains, airplanes, etc.) and naturally occurring (windblown dust, volcanic eruptions, etc.) (USACE 2013). The Federal Clean Air Act of 1970 (CAA) (43 U.S.C. § 7401 *et seq*., as amended in 1977 and 1990) provides the principle framework for national and state efforts to protect air quality and requires the adoption of National Ambient Air Quality Standards (NAAQS) to protect the public health, safety and welfare from known or anticipated effects of air pollution. Amendments to the CAA require the U.S. Environmental Protection Agency (USEPA) to promulgate rules to ensure that federal actions conform to the appropriate state implementation plan. These requirements are known as the General Conformity Rule (40 C.F.R. § 51.100 *et seq*. and § 93.100 *et. seq*.).

Federal agencies responsible for an action must determine if the action conforms to pertinent guidelines and regulations that control or maintain air quality in the region. Certain actions are exempt from conformity determination, including those actions associated with transfers of land or facilities where the federal agency does not retain continuing authority to control emissions associated with the properties. Federal actions may also be exempt if the projected emission rates would be less than the specified emission rate threshold known as *de minimis* limits.

Guidance and technical support on federal Greenhouse Gas (GHG) accounting and reporting has been developed by the White House Council on Environmental Quality (CEQ) that establishes Government-wide requirements for measuring and reporting greenhouse gas (GHG) emissions associated with Federal agency operations. Elements of the guidance include consideration for when and how to evaluate GHG emissions. The guidance also proposes that agencies consider the current or projected effects of climate change on proposals for federal agency action.

National Ambient Air Quality Standards (NAAQS) have been established by the USEPA, Office of Air Quality Planning and Standards (OAQPS), for six criteria pollutants that are deemed to potentially impact human health and the environment. These include: 1) carbon monoxide (CO); 2) lead (Pb); 3) nitrogen dioxide (NO_2); 4) ozone (O_3); 5) particulate matter <10 microns (PM_{10}); and 6) sulfur dioxide (SO_2). Ground level or "bad" ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NOx and VOC (USEPA 2011).

The primary and secondary NAAQS concentrations are presented in Table 3-13. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation and buildings (USEPA 2011).

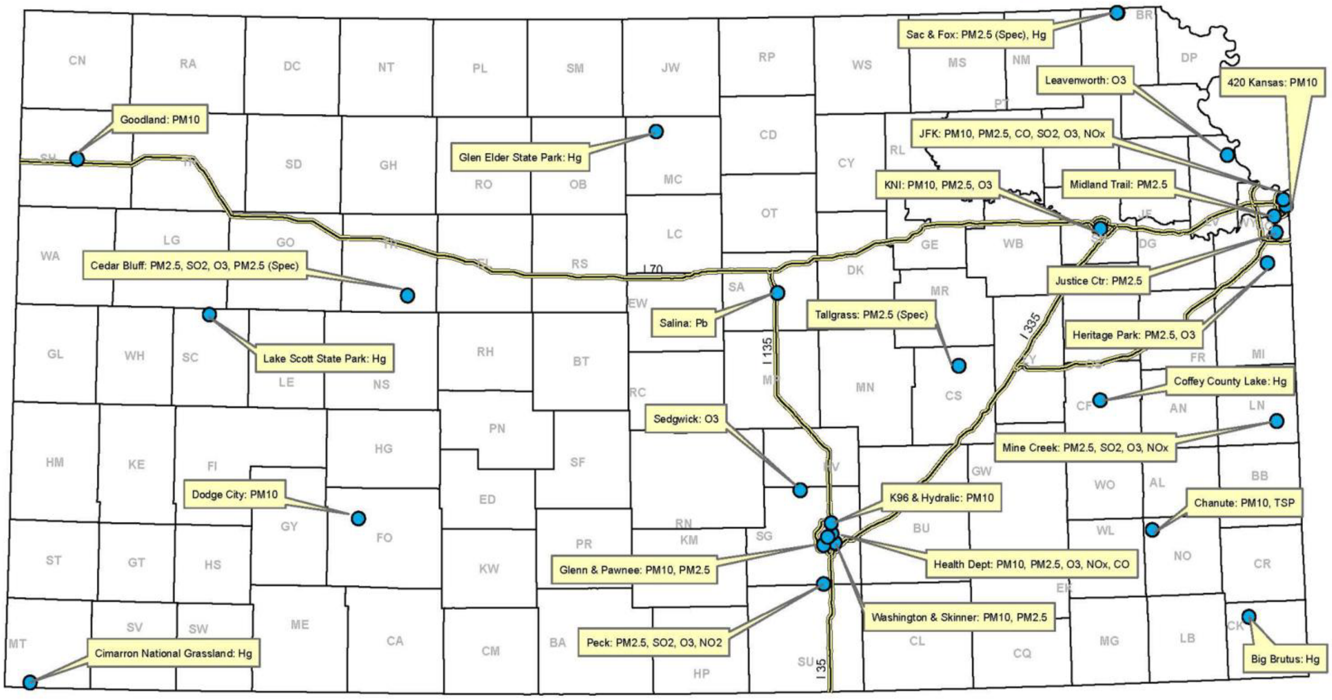
Table 3-13. National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 μg/m^3	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution Dec 14, 2012	PM	primary	Annual	12 μg/m^3	annual mean, averaged over 3 years
		secondary	Annual	15 μg/m^3	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 μg/m^3	98th percentile, averaged over 3 years
	PM	primary and secondary	24-hour	150 μg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year
Source: USEPA NAAQS http://www.epa.gov/air/criteria.html					

Since both short and long-term exposures are addressed, a single pollutant may have more than one primary standard.

The state of Kansas has adopted the federal standards under the Kansas Administrative Regulations (K.A.R.), Section 28-19-17a: Incorporation of Federal Regulations by Reference. Under K.A.R. Section 28-19-17b (d), “National ambient air quality standard, national primary ambient air quality standard, and national secondary ambient air quality standard mean those standards promulgated at 40 CFR Part 50, as in effect on July 1, 1989, which are adopted by reference.” Air monitoring is conducted at 26 sites within the state (Figure 3-9), which is considered somewhat more extensive than USEPA requirements (KDHE 2012-2012-2013 Ambient Air Monitoring Network Plan).

Figure 3-9. Kansas Air Monitoring Sites, May 2012



It is important to understand the terms exceedance and violation of a standard, as they are not interchangeable. An exceedance is any single value greater than the standard. A violation occurs when the limits for both concentration and frequency of occurrence, as established in the CAA and its amendments, are exceeded.

Air quality has not been monitored by KDHE in the Emporia, KS area since the early to mid-1970s; at that time particulate matter was monitored. The current statewide monitoring network is focused on metropolitan areas where fine particulate matter and ozone tend to be more of a problem. The WCGS is located adjacent to John Redmond Reservoir and regularly monitors selected radionuclide levels in the air (USACE 2013).

Radionuclides are monitored as part of the operation of the WCGS by weekly collection and laboratory analysis of continuous air samples taken at five locations on and in the vicinity of John Redmond Reservoir. The five sampling locations are: 1) Sharpe, 2) east of the Coffey County Lake dam, 3) Burlington, 4) New Strawn, and 5) Hartford. The site at Hartford serves as the control location for analysis and data interpretation. The major airborne isotope of concern is radioiodine (I^{131}) and it is tested using a flow rate of about 30 liters per minute (lpm) through 47 millimeter (mm)-diameter glass fiber particulate filters and 5 percent triethylene diamine impregnated carbon cartridges. In addition, gross beta and gamma isotopic analyses are performed on the same cartridges.

Airborne sample analyses indicated that no radionuclides attributable to WCGS operation were present above the lower limits of detection during State Fiscal Year (SFY) 2000. The highest gross beta activity observed was 0.092 picoCuries per cubic meter (pCi/m^3), due primarily to naturally occurring Radon-222 (Rn222) progeny, specifically the long- lived isotope Lead-210 (Pb^{210}). The range of gross beta activity was 0.010-0.092 pCi/m^3. For comparison, the range of gross beta activity recorded at the Hartford control site was 0.017–0.077 pCi/m^3. No gamma emitters attributable to WCGS operation were present above the lower limits of detection in any air particulate filters or charcoal cartridges evaluated (USACE 2013).

3.6 Aesthetics

The general viewscape of the John Redmond Reservoir project area is rural, consisting of wooded rolling hills, wooded drainages, open agricultural fields, farmsteads, towns, infrastructure elements (roads, parking lots, powerlines, property fencing, etc.), the Neosho River and John Redmond Dam and Lake. The most visibly dominant features include John Redmond Dam and Lake and the pump facility for the WCGS, below the dam.

3.6.1 Visual Characteristics of the John Redmond Reservoir Site and Surrounding Area

Features present within the John Redmond Reservoir site include the large dam and reservoir on the southeastern portion. The dam is an earthfill structure nearly four miles long and is 86.5 feet higher than the Neosho River at its crest. The reservoir covers approximately 9,490 surface acres under normal operation, but could cover as much as 40,220 surface acres or higher during a major flood. The reservoir shoreline is approximately 58 miles long under normal operation (USACE 2013).

The community of Burlington, KS lies approximately three miles downriver from the dam, and New Strawn, KS is located approximately one mile northeast of the reservoir. West of the reservoir are the towns of Hartford and Neosho Rapids, KS which lie approximately five and seven miles upriver, respectively. A few structures are also present at Ottumwa, KS and at Jacob's Creek Landing, KS, both within approximately one mile of the reservoir shoreline. There are no direct views of the lake from these communities, because of the relatively flat land surfaces and medium-tall woodland vegetation.

The visual impression of Burlington is a small community with predominantly red brick office buildings and stores, and modest, family-oriented residential areas. Most residences have ample yards with landscaping and mature trees and the yards become larger at the outskirts of town resembling small farms. Hartford, Neosho Rapids and New Strawn are smaller residential communities with a minimum of businesses. The overall visual impression is one of modest, family-oriented towns, with large lawns and numerous trees to accent the urban landscape. Existing utilities such as electricity and telephone are provided via aboveground poles, which results in some visual clutter.

Available views onto a site are affected by distance, viewing angle, as well as the number and type of visual obstacles, both natural and human made. Views can be from stationary areas such as campgrounds, or from mobile sources such as motor vehicles. Typically, views are analyzed as foreground (less than 0.25 miles), middle ground (0.25-3.0 miles) and background (more than 3.0 miles). Background views of John Redmond Dam and Lake would be very rare and may only be achieved from the corner of the dam structure.

Recreational facilities are scattered throughout the project site and include campgrounds, day use sites with boat ramps and hiking/walking trails. Most of these sites have large parking areas, access roads, large grassy fields, and/or open agricultural fields, providing an expansive experience in an otherwise wooded environment. Many acres are leased to grow agricultural crops and the fields provide breaks in the tree-covered landscape of the Neosho River Valley. Agricultural fields that are not under cultivation, or fallow, become rapidly invaded by tall, coarse annual herbs in contrast to the row crops and alfalfa hay grown in cultivated fields. These recreational facilities and agricultural fields provide for clear, relatively unobstructed middle ground views across portions of the project area.

3.6.2 Viewer Groups and Sensitivity

Visual sensitivity is dependent upon viewer attitudes, the types of activities in which people are engaged when viewing the site and the distance from which the site will be seen. Overall, higher degrees of visual sensitivity are correlated with areas where people live, are engaged in recreational outdoor pursuits, or participate in scenic or pleasure driving. Conversely, visual sensitivity is considered low to moderate in industrial or commercial areas where the scenic quality of the environment does not affect the value of the activity.

Site visibility may also be affected by air quality, the measure of which involves human perception and judgment and has been described as the maximum distance that an object can be perceived against the background sky. Visibility is of value by citizens, although the value of good visibility is inherently subjective and difficult to quantify. Visibility can vary from clear to regional haze. There is no qualitative visibility standard for pristine and scenic rural areas, however, Section 169A of the CAA (1970, as amended), created a qualitative standard of the prevention of any future and the remedying of any existing impairment of visibility in mandatory Class I federal areas which impairment results from human-caused air pollution.

The expectation of many visitors to John Redmond Reservoir is to fish in the lake, river, or nearby Coffey County Fishing Lake, or to seek hunting opportunities, particularly waterfowl. Therefore, these visitors are not considered to be sensitive viewers because of the nature of their recreational pursuits. There are views of the dam and reservoir from the surrounding area, particularly from the highway across the dam, the OCWA day use area, the dam site area (including Redmond Cove) and the Hickory Creek Area. Below the dam at Riverside East and Riverside West campgrounds, the view is of the dam structure, pumping station for WCGS and the Neosho River. Many of the views from below the dam are at least partially obstructed by landscape plantings and tall trees.

Most views from the north and south access roads are of the woodlands growing along the Neosho River and its tributary drainages, with occasional glimpses of the lake and/or the dam structure. A full view of the lake and dam structure only occurs from shoreline sites or while boating on the lake surface. The dam, but not the lake, can be viewed from recreational sites downstream. Views from bridges across the Neosho River result in only short distances before the river meanders and is hidden by riparian woodlands (USACE 2013).

3.7 Prime or Unique Farmlands

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture (USDA). It is of major importance in providing the national short and long range needs for food and fiber (USACE 2013). In Coffey and Lyons Counties, the principal crops grown on prime farmland are grain sorghum, wheat, soybeans and corn. Approximately 70 percent of the soils in Coffey County meet the requirements for prime farmland (USACE 2013).

Prime farmland is defined by the USDA as: “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and is available for these uses. Further, it could be cultivated land, pastureland, forestland, or other land, but it is not urban or built up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0-6 percent.”

Unique farmland is defined by USDA as: “land other than prime farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree-grown nuts, olives, cranberries, fruit, and vegetables." The soils supporting pecan orchards along the Neosho River would be an example of unique farmland.

The state of Kansas has further identified farmland of statewide importance and defined it as: "farmland, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage and oilseed crops. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable. Additional farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law."

The common soils within John Redmond Reservoir and along the Neosho River, fit the criteria for prime farmland, unique farmland and farmland of statewide importance, e.g., Woodson silt loam, Verdigris silt loam, Summit silty clay loam (1-4 percent slopes), Kenoma silt loam (1-3 percent slopes), Eram silt loam (1-3 percent slopes), and Dennis silt loam (1-4 percent slopes) are considered prime farmland. The Kenoma silty clay loam (1-3 percent slopes - eroded), and Dennis silty clay loam (2-5 percent slopes - eroded) soils are considered farmland of statewide importance (USACE 2013). In addition, Osage silty clay, Osage silty clay loam, Lanton silty clay loam, and Hepler silt loam soils meet the prime farmland designation if they are drained (NRCS 1993).

For compliance with the Farmland Protection Policy Act (FPPA),), a component of the Agriculture and Food Act of 1981, this project was coordinated with the NRCS using a Farmland Conservation Impact Rating Form (AD 1006, Appendix E). On May 3, 2013, KWO staff received a letter a copy of the AD 1006 form mentioned above with parts completed from Natural Resources Conservation Service (NRCS). In this letter KWO staff was instructed to complete parts VI and VII and return the completed copy of the form to the NRCS office in Emporia, Kansas. KWO staff completed and returned the AD 1006 form as previously instructed to the NRCS Assistant State Conservationist in Emporia, Kansas.

A majority of the lands designated as prime or unique farmlands within this area were in agricultural production prior to the passage of the FPPA. Because prime or unique farmland could be impacted as noted within the Preferred Alternative as well as Alternative #2 noted within Section 4.8, coordination has and will continue to be conducted to determine the effects of these alternatives on prime or unique farmlands, as defined by FPPA, for all potential off-site dredging disposal areas.

Soil types occurring on potential sediment disposal site areas were summarized by Farmland of Statewide Importance, Prime Farmland if drained, and Prime Farmland (Appendix E). Disposal of sediment on the federal property would impact approximately 193 acres of Prime Farmland if drained soils, 18 acres of Prime Farmland and five acres of farmland of statewide importance. Use of sites on non-federal property would impact approximately 81.2 acres of Farmland of statewide importance, 33.4 acres of Prime Farmland if drained soils and 329.7 acres of Prime Farmland.

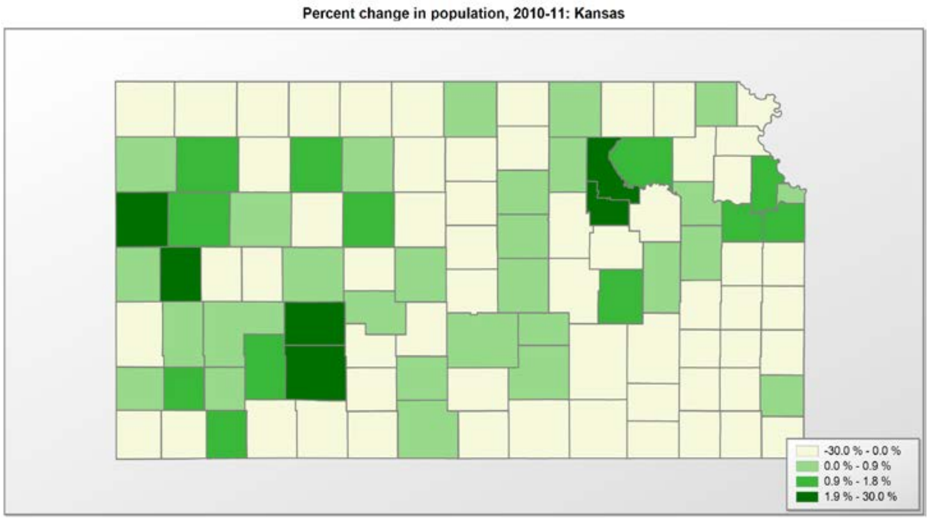
Within the John Redmond Reservoir site boundary, approximately 5,098 acres of land are available for lease to be farmed under cooperative farming agreements with the USACE, FHNWR and OCWA. Much of the land under farming agreements also meets prime farmland criteria. The number of acres potentially farmed under each management program, include 400 acres (USACE), 4,298 acres (FHNWR) and 400 acres (OCWA). Because of flooding events along the Neosho River during the 1990s, successful farming of lower land tracts in the flood storage pool has occurred only about two of every five years (USACE 2013).

3.8 Socioeconomic Resources

The assessment area for socioeconomic effects of the Proposed Action and alternatives includes Coffey and Lyon Counties in southeastern Kansas, and lands within the floodplain downriver from John Redmond Reservoir. Potentially affected socioeconomic conditions include area economic and population conditions, land use, recreation and transportation. Activities in the Neosho River floodplain between John Redmond Reservoir and Grand Lake could also be affected.

3.8.1 Economic and Demographic Trends and Conditions in Coffey and Lyon Counties

Figure 3-10. Percent Change in Population, 2010-11: Kansas.

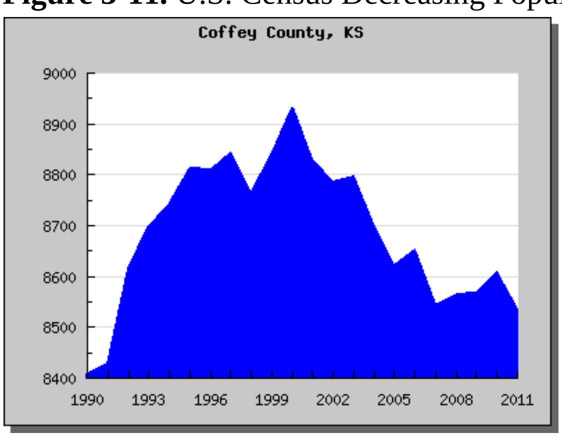


Population

County Level Data Sets, Percentage Change in Population 2010-2011 (USDA 2012)

The majority of counties in Kansas are following the trend of decreasing population as can be seen on Figure 3-10. Between 2000 and 2011, Coffey County population fell from 8,932 to 8,533, (Figure 3-11) a 4 percent decline. This decline is typical of many counties in Kansas that are not located in highly metropolitan areas. Burlington, the Coffey County seat, had a 2011 population of 2,790, about 33 percent of total county population (US Census Bureau 2010).

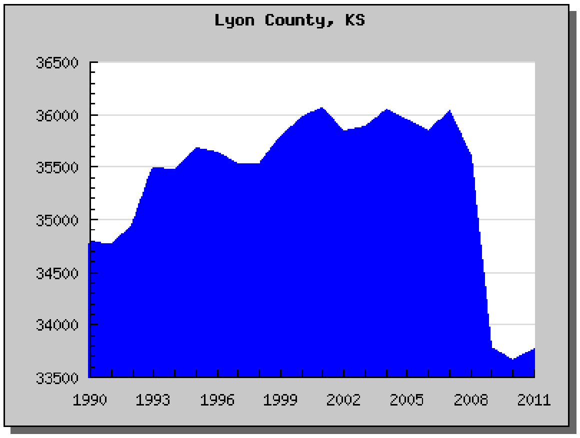
Figure 3-11. U.S. Census Decreasing Population Trends Coffey County



Source: U.S. Census Bureau, Population Estimates Division.

Figure 3-12 displays recent U.S. Census population counts for Lyon County. Between 2000 and 2011, Lyon County population decreased from 35,967 to 33,764, a 6 percent decline. This decline is typical of many counties in Kansas that are not located in highly metropolitan areas. However, from 2010 to 2011 the population in Lyon County did increase by 0.2 percent (USDA). Emporia, the Lyon County seat, had a 2011 population of 24,971, about 74 percent of total county population (US Census Bureau 2010).

Figure 3-12. U.S. Census Decreasing Population Trends Lyon County



Source: U.S. Census Bureau, Population Estimates Division.

Economy

Coffey County

The U.S. Bureau of Economic Analysis (BEA) publishes estimates of full and part-time employment by the North American Industry Classification System (NAICS). These statistics reflect employment by industry. A community's economic base includes those industries and businesses that bring income into the community from other areas of the state, nation and the world.

The Coffey County economy is based on electric power generation, agriculture and manufacturing. The tourism/recreation industry also brings income into the county; most is spent in the retail and service sectors which also serve local residents. The government sector is the largest employer in Coffey County, with 1,242 jobs in 2011. Almost 91 percent of government jobs were in local government, including school district employment (NAICS 2012 BEA US Dept. of Commerce). The retail and services sectors provided nine percent and five percent of total employment, respectively (BEA 2011).

The combined farming and agricultural services sectors comprised about five percent of total 2011 BEA employment in the county. Between 1990 and 2007, the total number of farms in the county increased from 610 to 681, but the total acres farmed decreased from 345,000 to 324,827 (NASS USDA 2011).

During 2011, Coffey County had a per capita personal income of $46,517, which was 14 percent above the statewide average (BEA 2011).

Wolf Creek Generating Station

Wolf Creek Generating Station is an integral part of Coffey County's local economy. The plant is owned by Kansas City Power & Light Co. (a Great Plains Energy Inc. company), Westar Energy and Kansas Electric Power Cooperative Inc. Wolf Creek Nuclear Operating Corp. operates the facility.

Operation of the Wolf Creek plant increased Coffey County's economic output by $7.9 million in 2003. Adding the direct value of the plant's electricity generation brings the county's economic output attributable to Wolf Creek to $607.9 million in Coffey County. The operation of Wolf Creek and the secondary effects of the plant account for 682 jobs in Coffey County and account for $57.7 million in earnings to workers in Coffey County. Wolf Creek employs 1,028 people, with 55 percent living in Coffey County. Economic activity generated by Wolf Creek creates another 121 jobs in the county.

Wolf Creek pays an estimated $24.8 million in state and local taxes annually. The economic activity generated by the plant contributes another $5 million in state and local taxes through increased business, corporate, payroll and personal taxes. By combining direct and indirect tax benefits, the Wolf Creek plant pays nearly $30 million in state and local taxes.

Besides the economic benefits Wolf Creek provided, the plant generated more than 10 million megawatthours of electricity in 2004, approximately 19 percent of Kansas' electricity needs. This low-cost electricity helped keep energy prices affordable in the Southwest Power Pool North Sub-Region, where the Wolf Creek plant resides. In 2004, Wolf Creek's production cost was 1.44 cents per kilowatt-hour, compared to an average production cost of 1.69 cents per kilowatt-hour for the rest of the regional market (NEI 2005).

Lyon County

Manufacturing is still considered the largest sector in the county and includes the Tyson plant, a Dolly Madison plant, and firms that manufacture automotive and industrial products, among others. However, in the past few years production has decreased at the Tyson plant and Dolly Madison has closed its plant in Emporia. The statistics for this are not available yet and do not reflect in the recorded 2,826 jobs provided in the 2011 Economic Analysis. The government sector, which employs 2,628 individuals, includes Emporia State College (BEA 2011)). The retail and service sectors provide slightly larger percentages of employment in Lyon County, reflecting its larger population and Emporia's position as a regional trade center. In 2011, Lyon County retail and services sectors provided 12 percent and seven percent of total employment, respectively (BEA 2011).

Farming and agricultural services provided about five percent of total Lyon County employment. In 2007, there were 930 farms in the county, 60 more than in 1990. The total acres farmed decreased, from 485,000 in 1990 to 473,679 in 2007 (NASS USDA 2011).

During 2011, Lyon County had a per capita personal income of $29,493, which was 28 percent below the statewide average for Kansas (BEA 2011).

3.8.2 Land Use

The assessment area for land use includes lands associated with the John Redmond Reservoir and surrounding areas.

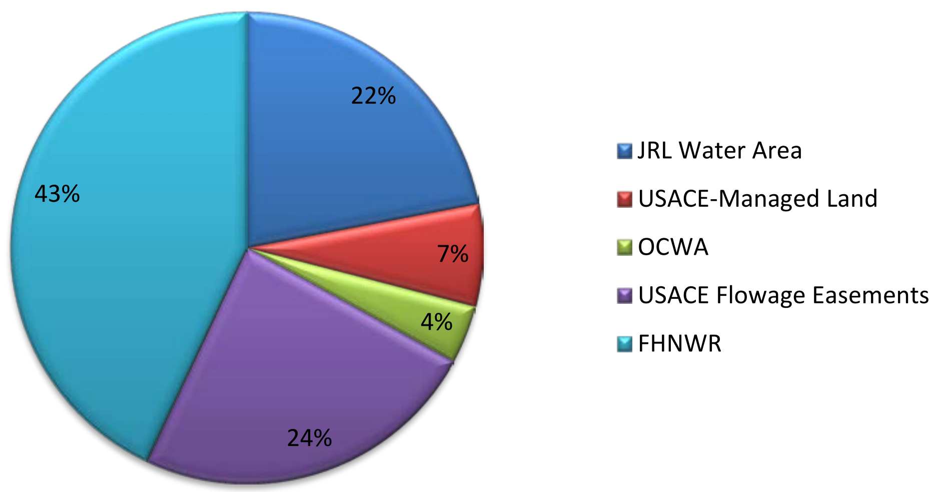
Lands Associated with John Redmond Reservoir

The John Redmond Reservoir complex includes the lake, dam, and associated lands and flowage easements, the FHNWR and the OCWA. The land area of each of these facilities is displayed in Table 3-14. The percentage of each of the total project area is shown in Figure 3-13.

Table 3-14. John Redmond Reservoir Land Area (Source: USACE 2013)

USACE			USFWS	KDWP&T
John Redmond Reservoir Water Area[1]	Flowage Easement	Land	Flint Hills NWR	Otter Creek
9,710 acres	10,505 acres	3,160 acres	18,545 acres	1,472 acres
[1]*Acreage at 1039 msl conservation pool level.*				

Figure 3-13. Land Percentages by Managing Agency or Category (Source: USACE 2013)



John Redmond Reservoir

The USACE holds fee title to approximately 29,801 acres of land associated with John Redmond Reservoir and has flowage easements on an additional 10,505 acres.

John Redmond Reservoir was developed for flood control, water supply, water quality and recreation purposes. The reservoir and associated lands are also managed for wildlife objectives. USACE lands associated with John Redmond Reservoir include lands designated for intensive and low-density recreation use and wildlife management. There are six developed public-use areas on USACE managed land, including five that have recreation parks providing camping (recreational vehicle, tent and trailer), picnic areas, drinking water and sanitary facilities. Additional recreation facilities present on USACE managed lands include an overlook facility, parking areas, trails, a swimming beach and five boat ramps.

USACE lands include approximately 400 acres of land that has been leased for agricultural purposes in the past. Currently, the land is not leased because of frequent flooding and the difficulty in removing the resultant wood debris (USACE 2013).

US Fish and Wildlife Flint Hills National Wildlife Refuge

The FHNWR, located on the upper portion of John Redmond Reservoir, consists of 18,545 acres owned by the USACE, which is leased and managed by the USFWS under a cooperative agreement. The total land area is 25 percent wetlands (4,572 acres), eight percent open water (1,400 acres), three percent riparian wetlands on the Neosho River and associated creeks (5,999 acres), 17 percent grasslands (3,200 acres), 13 percent woodlands (2,400 acres), 12 percent brushlands (2,255 acres), 21 percent croplands (3,917 acres) and 0.6 percent administrative and recreational roadways (120 acres) (USACE 2013).

The FHNWR is managed primarily to benefit migrating and wintering waterfowl in the Central Flyway. A variety of management practices are used to provide food and cover for waterfowl, shorebirds, neotropical migrants and native species. The refuge also provides habitat for white-tailed deer, wild turkey, bobwhite quail, and an assortment of other mammals, birds, reptiles and insects.

Public use activities currently permitted at FHNWR include wildlife observation, hiking, photography, sightseeing, boating, picnicking, camping, fishing, wild food gathering and hunting. Fish bait gathering is allowed for personal use and firewood gathering is allowed by permit. Public facilities on FHNWR include parking areas, boat ramps, hiking trails and an observation tower (USACE 2013).

Currently, the USFWS maintains 3,917 acres of croplands on FHNWR, which is leased to 14 cooperative farmers. The USFWS share of crops ranges from 10 percent in flood-prone areas to 45 percent on higher ground. The land is difficult to lease because it floods frequently in low lying areas, and removing the resulting wood debris is expensive and time consuming (USACE 2013).

<u>Otter Creek Wildlife Area</u>

The USACE has licensed the KDWP&T to manage the 1,472 acre OCWA. Otter Creek is managed primarily for upland game species, including bobwhite quail, mourning dove, wild turkey, cottontail rabbit, squirrel and white-tailed deer. The OCWA also provides fishing access and management, particularly for channel and flathead catfish, as well as wildlife observation, sightseeing, photography, boating and hunting opportunities. There are no developed facilities on OCWA. Interpretive trails are present and include the Dove Roost Trail and the Headquarters Trails.

Approximately 400 acres of the OCWA is available for agricultural leases, but these lands have been flooded about three out of every five years in recent times. During productive years, the KDWP&T leaves approximately 25 percent of the crop in the field to provide forage for wildlife. The cropland is becoming more difficult to lease and the KDWP&T may convert a portion of the cropland to natural grasses for wildlife cover and forage (USACE 2013).

<u>Federal Government Owned Sediment Disposal Areas</u>

Three parcels owned by the federal government below the dam have been identified as potential sediment disposal locations, CDF Sites A, B and E. CDF Site A is located north of the Neosho River and is owned by the federal government. CDF Site B is located along the Neosho River and is owned by the federal government, but is currently out-leased for agricultural production. CDF Site E is located southwest of the Neosho River and southeast of the dam embankment. A portion of CDF Site E is federally-owned.

Land Use on Adjacent Areas

Coffey County adopted the John Redmond Reservoir Plan for Land Use and Transportation about the time John Redmond Reservoir was first constructed. The land immediately outside the boundary of the USACE land is zoned agricultural, which allows for a wide variety of land use. Other nearby land use within Coffey County includes an airstrip and several small cemeteries. The Coffey County communities of New Strawn (2010 population 394) and Ottumwa (2010 population unknown) are all located within close proximity to John Redmond Reservoir.

A portion of the FHNWR lies within Lyon County. Most Lyon County land in the vicinity of FHNWR is zoned agricultural, except for a quarry and several parcels in conservation easements. The Lyon County communities of Hartford (2010 population 371) and Neosho Rapids (2010 population 265) are located adjacent to FHNWR.

Land use around John Redmond Reservoir has experienced little change in the past several years, remaining a predominantly rural agricultural setting. For Coffey County, Kansas, the total land within farms noted in the 2012 United States Department of Agriculture Census of Agriculture is 329,243 acres. This represents an increase of 4,416 acres (approximately 1%) from the 2007 Census. Of the total land in farms within Coffey County, approximately 55.7% of that was noted as cropland, 36.4% pastureland and 7.9% in other uses. While total land in crops within Coffey County grew by only 1% between the Census of 2007 and 2012, the market value of products sold grew by approximately 27%. The 2012 Census noted a market value of agricultural products sold from Coffey County of $61,695,000, an increase of $13,201,000 from the 2007 Census.

Recreation Activities

Recreation resources exist on John Redmond Reservoir, FHNWR and OCWA. In all areas, sightseeing and fishing, primarily for channel and flathead catfish, are the recreation activities that generate the greatest number of year-round visits. Although the KDWP&T has had recent success in maintaining a population of hybrid white bass/wiper, maintaining a sport fish population on John Redmond Reservoir has proven difficult, because young fish are flushed downstream on an annual basis (USACE 2013). Fishing visitation has declined in recent years because several more attractive (in terms of sport fish populations and water quality) fishing alternatives have been developed in the vicinity of John Redmond Reservoir. These include the Coffey County Fishing Lake and several municipal lakes. Although the presence of these lakes has generally reduced fishing activity on John Redmond Reservoir and adjacent lands, it has resulted in an increase in camping activity in John Redmond Reservoir campgrounds, because camping facilities are not available at these alternative lakes.

Seven recreation areas, 126 camping sites, two playgrounds, six trails, and two boat ramps are available at John Redmond Reservoir. In 2010, more than 110,000 visitors were recorded at the lake, including 8,471 picnickers, 1,480 campers, 6,342 swimmers, 101 water skiers, 1,510 boaters, 59, 446 sightseers, 31,977 fisherman and 4,242 hunters (USACE 2010).

Table 3-15 displays visitation statistics by management area for 1998 through 2000. Recreation visits have been increasing in all areas except OCWA. The decrease in OCWA use may be the result of increased fishing opportunities elsewhere in the area.

Table 3-15. Annual Visits, By Management Area 1998–2000 (Source: USACE 2013)

	1998	1999	2000	2011
USACE John Redmond Reservoir	17,012	21,507	32,372	148,447
USFWS FHNWR	35,030	37,000	52,000	N/A
KDWP&T OCWA	30,635	21,672	10,675	N/A
Total	82,677	80,127	95,047	148,447

The Kansas Department of Wildlife, Parks and Tourism (KDWPT) initiated the walk-in hunting access (WIHA) program in 1995 in an effort to enhance the strong Kansas hunting heritage by providing hunting access to private property. The program has grown into one of the most successful access programs in the country. Although the majority of the acreage provides good to excellent upland game bird hunting, some areas provide opportunities for deer, waterfowl and squirrel hunting as well. Landowners receive a modest payment in exchange for allowing public hunting access. Payments vary by the amount of acres enrolled and length of contract period. Contract dates can be established from September 1 or November 1 through January 31 of each year. In addition, other lands are leased for spring turkey hunting only (April 1- May 31). Land enrolled can be in CRP, native rangeland, wheat or milo stubble and riparian or wetland areas.

For the 2014 season there are more than 30 individual tracts of property with roughly 5,400 acres available for public access through the program in Coffey County. The KDWPT continues to seek additional leases from private landowners through their regional offices and private lands coordinator.

Recreation Activities on John Redmond Reservoir

Table 3-16 displays seasonal percentages of recreation use by major activity for John Redmond Reservoir. Totals for all activities are greater than 100 percent because some visitors engage in more than one recreation activity per visit. Sightseeing is the major recreation activity on John Redmond Reservoir during all seasons, ranging from 45 percent to 65 percent of total visits during the period. Fishing is the second most popular activity ranging from 23 percent to 39 percent of total visits, except during winter, when hunting is the second most popular activity, totaling 34 percent of all visits (USACE 2013).

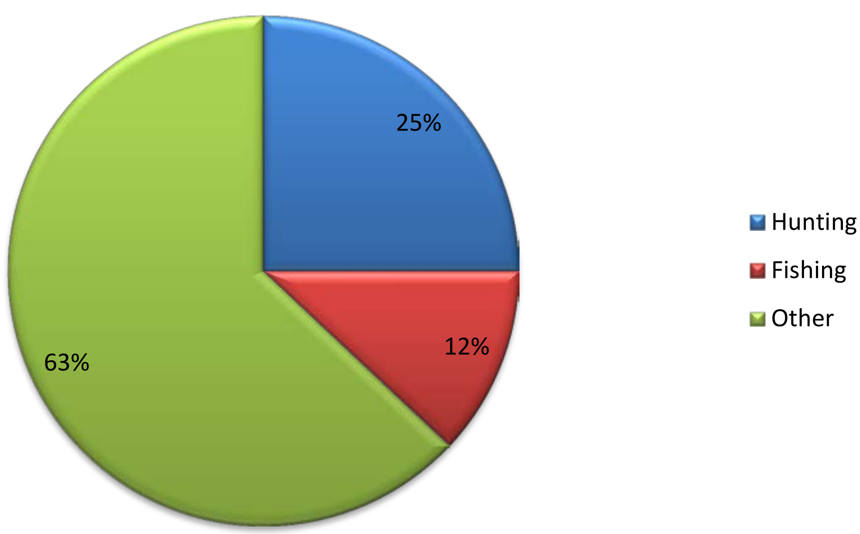
Table 3-16. Seasonal Percentage Recreation visits by Activity: Spring 1999 through Summer 2000. (Source: USACE 2013)

Recreation Activities on FHNWR

	Camp	Picnic	Boat	Fish	Hunt	Water Ski	Swim	Other	Sight-See
Spring 1999	2.49%	8.26%	0.08%	23.28%	7.03%	0%	0%	6.19%	63.87%
Summer 2000	17.28%	11.11%	2.24%	32.74%	0%	0.13%	9.12%	5.41%	46.66%
Fall 2000	0.0%	5.12%	0.96%	39.22%	8.63%	0.0%	0.0%	5%	45.32%
Winter 2000	0.0%	2.19%	0.02%	18.13%	35.28%	0.0%	0.0%	1.18%	49.68%

Recreation facilities are discussed in Section 3.8.2, Figure 3-14 displays the percentage of each of the major recreation uses on FHNWR for 2000. Other activities, which include wildlife viewing, generate the most recreation visits for FHNWR. Hunting and fishing are also major activities. In years when the water level plan has been implemented or in years when natural conditions allow for lowered water levels in the spring followed by raised water levels in the fall, both bird watching and waterfowl hunting visits increase dramatically (USACE 2013).

Figure 3-14. FHNWR Percentage of Recreation use by Type: 2000



(Source: USACE 2013) Other includes wildlife viewing, walking, driving, photography, visitor's center, etc.

Recreation Activities on OCWA

Most visitors to OCWA engage in wildlife viewing, hunting or fishing activities. Of those visitors who either fish or hunt, an estimated 60 percent of visitors hunt and the remaining 40 percent engage in fishing, primarily for channel catfish along Otter Creek. The white bass spring run also generates a number of fishing visits (USACE 2013).

Between 2009 and 2012, in fulfilment of mitigation requirements for the pool rise at John Redmond Reservoir, KWO funded the construction of the Indian Hill Loop boat ramp on the USFWS Flint Hills Wildlife Refuge.

3.8.3 Economic Effects of John Redmond Reservoir

The economic effects of John Redmond Reservoir include those associated with flood control, water storage and supply and recreation. Other economic effects include employment and the procurement of local goods and services for the operation and maintenance of the reservoir and associated facilities, which would not be affected by the Proposed Action or alternatives and are not considered in this assessment.

Flood Control

John Redmond Reservoir provides flood protection for lands along the Neosho/Grand River below the dam. While the dam does not prevent all flooding, it substantially reduces the amount of flooding downstream. The economic value of flood control is calculated as the dollar amount of damage prevented. In Fiscal Year 2010 (FY2010), $12,548,800 in flood damage protection was provided by the reservoir. Cumulative flood damage protection exceeds $739 million (Wendt, B. KWO personal communication, Goff (USACE), 2011).

Water Storage and Supply

John Redmond Reservoir provides water storage for two programs operated by the KWO: the Water Marketing Program and the Water Assurance Program. These programs are operated by the KWO to ensure that an adequate supply of water is developed, managed, and maintained to meet, as nearly as possible, the long range water supply needs of municipal and industrial water users within Kansas.

<u>Wolf Creek Nuclear Generating Station (WCGS)</u>

Under the Water Marketing Program, the KWO is contracted for an annual 9,672 million gallons per year (MGY) of water supply at John Redmond Reservoir, for use by Westar Energy in supplementing the cooling lake at the WCGS. This supplemental source of water is necessary because evaporation in most years is greater than inflow in the WCGS cooling lake (USACE 2013). Westar Energy pays $0.10 per thousand gallons of water, based on a formula that requires payment for 50 percent of the allotment at the beginning of the contract year and subsequent payment for water used over that amount on a per thousand gallon basis. Westar Energy has typically used less than half of their contract and paid the minimum annual amount of $483,600; however, in 2011 Westar Energy used about 65 percent of their contract maximum.

<u>Cottonwood and Neosho River Basins Water Assurance District Number 3</u>

The Water Assurance Program provides supplemental water to a number of municipal and industrial users. The Kansas Water Assurance Program was developed to meet the needs of municipal and industrial water supply users whose needs could not be economically and institutionally met by other means. During periods of drought, natural stream flow may be significantly reduced. Municipal and industrial water users along a stream who hold appropriation rights to the natural flow may find their ability to use the surface water is severely limited, at a time when their demand for water is at its highest. Many of these users are located below federal lakes.

The Cottonwood and Neosho River Basins Water Assurance District Number 3 (CNRWAD) was formed on August 31, 1993. The contract and operations agreement with this district were signed on August 28, 1996. The operations agreement is updated every five years or as needed. There are 19 municipal and industrial members of this district including:

Municipalities	Wholesale Water Suppliers	Industrial
Burlington	Public Wholesale Water Supply District #5 (Iola)	Ash Grove Cement Company
Chanute		Day & Zimmerman*
Chetopa		Great Plains Industrial Park*
Cottonwood Falls		Monarch Cement Company
Council Grove		Westar Energy
Emporia		
Erie		
Humboldt		
Iola		
Le Roy		
Oswego		
Parsons		
St. Paul		*Formerly Kansas Army Ammunition Plant

Each of these customers, except the cities of Council Grove, Cottonwood Falls, Emporia, and Hartford, are hydrologically below John Redmond Reservoir. There are no other major reservoirs in this reach of the river to supplement flows during periods of drought. In addition, ground water is only available in limited quantities within the alluvial valley. These 15 municipalities and industries located downriver from John Redmond Reservoir are directly dependent upon water provided from assurance storage during times of low streamflow.
Members receive water supply service through releases from storage in Marion, Council Grove Lakes and John Redmond Reservoir. The district pays the state for costs associated with the storage space for 10,000 acre- feet of water in these lakes and reservoirs. John Redmond Reservoir stores 3,500 acre-feet of the total, for which CNRWAD paid the state $291,370 in ten annual installments. The district continues to make annual payments for operation, maintenance, and repairs associated with the storage space dedicated to district use and an annual cost for administration and enforcement.

Recreation

The John Redmond Reservoir and associated facilities (OCWA and FHNWR) provide a variety of recreation opportunities including fishing, hunting, wildlife viewing, hiking, camping and boating. Each of these activities results in economic activity in the study area and elsewhere in the state. Over 29,100 angler days per year of angler use occurs on the river between Council Grove and John Redmond, and 63,900 angler days of use between the John Redmond Reservoir and the Kansas-Oklahoma State line. Both reaches are considered to have an excellent sport fishery, especially for catfish. The principal fishing areas are limited, and generally restricted to, adjacent towns, road crossings, low ware or overflow dams and reservoir tailwaters (USACE 2013).

The USFWS, KDWP&T and USACE prepared a study on the economic impact of water level management for John Redmond Reservoir. That study, based on previous studies of the economic contributions of bird and waterfowl recreation, estimated that each hunting trip contributed $162 to the economy. In 1996, this estimate yielded an economic value of $3,240,000 for wildlife-related recreation trips. Many shorebird watching and waterfowl hunting visits to John Redmond Reservoir are made by out-of-area and out-of-state visitors, particularly in years when natural conditions or implementation of the water level management plan results in large numbers of migrating birds (USACE 2013).

According the USACE Value to the Nation 2010 report, the visits to the reservoir resulted in $2,504,450 in visitor spending within 30 miles of the lake.

Coffey County Economic Development (CCED) estimates that overnight visitors to nearby Coffey County Fishing Lake spend $100 per day and day visitors spend $30 per day (CCED undated). Although fishing generates a substantial number of visits to John Redmond Reservoir, FHNWR, and OCWA, most fishing visits are believed to be associated with catfish and hybrid bass, and most are made primarily by local residents. The Coffey County Fishing Lake and several nearby municipal lakes are believed to attract the bulk of out-of-area visitors (USACE 2013).

3.8.4 Lands within the Floodplain Downriver from John Redmond Reservoir

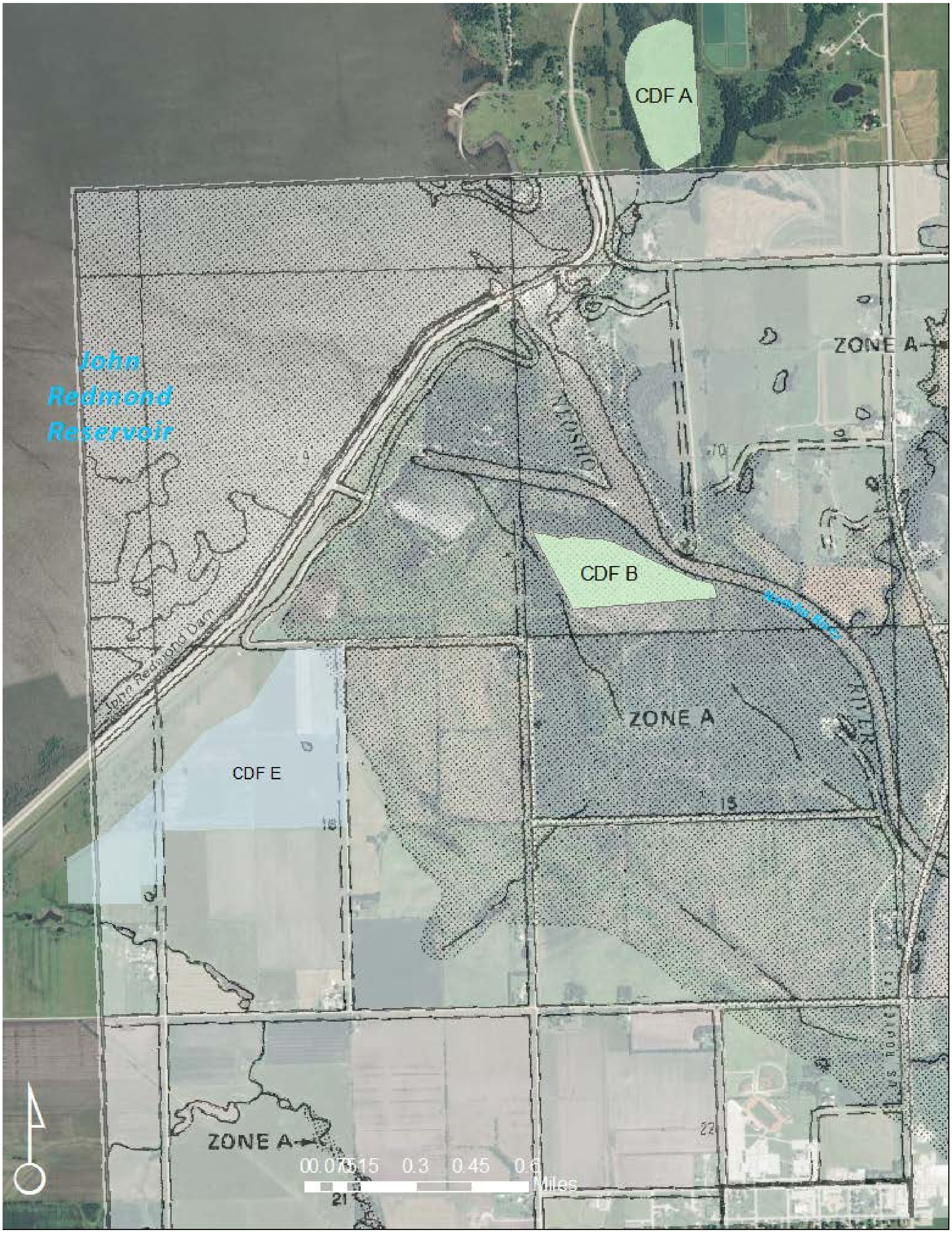
Lands within the floodplain along the Neosho River from John Redmond Reservoir to Grand (Pensacola) Lake are largely privately held and primarily in agricultural use. Agriculture is a major land use and economic activity throughout the Neosho/Grand River Basin. The alluvial soils within the floodplain, which support row crop production (primarily corn and soybeans), livestock grazing, timber production and pecan orchard cultivation, play a key role in area productivity.

Flooding in the Neosho River basin occurs primarily on agricultural lands and riparian woodlands within the floodplain. Flooding occurs during high rainfall/runoff events in the basin between John Redmond Reservoir and Grand (Pensacola) Lake, when high rainfall/runoff events are combined with channel capacity or lower releases from John Redmond Reservoir, or when greater than channel capacity releases are passed downstream from John Redmond Reservoir to avoid risk of project failure. In recent years, inundation of portions of the floodplain has occurred, on average, about once a year according to local estimates.

Flooding effects on crops have ranged from major to minimal, depending on the water depth, duration and time of year that the inundation occurred. Other effects of flooding include bank caving, channel degradation, loss of soil, and movement of nutrients, fertilizer and pesticides. Flooding affects agricultural lands, water quality, and aesthetic and recreational resources along the river (USACE 2013). There are no known studies of the effects of flooding on the agricultural economy in the Neosho River basin between John Redmond Reservoir and Grand (Pensacola) Lake (USACE 2013).

Federal Emergency Management Agency (FEMA) Special Flood Hazard Area (SFHA) Zone A areas in the vicinity of John Redmond Reservoir are shown as shaded gray areas in Figures 3-15. By definition, these areas are subject to inundation by the one (1)-percent-annual-chance flood event generally determined using approximate methodologies. Areas within the boundary of the Flint Hills National Wildlife Refuge are excluded from designation as SFHA Zone A.

Figure 3-15. Special Hazard Zone A areas – John Redmond Reservoir vicinity



3.8.5 Noise

Noise is defined as unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Response to noise varies according to its type, perceived importance, appropriateness in the setting and time of day, and the sensitivity of the individual receptor.

Much of the project area, including both the dredge site location within John Redmond Reservoir and CDF Sites A and B, are not near residential or commercial development. CDF Site E is not near commercial development but does have one single-family residence on the parcel. Recreational facilities such picnic areas and boat ramps are located immediately adjacent to the reservoir. The U.S. Army Corps of Engineers project office is located approximately 4,000 feet from the dredging site within the reservoir and approximately 1,500 feet from the nearest CDF site. Commercial development along Highway 75 is approximately 1.5 miles from the dredging site approximately 4,000 feet from the nearest CDF site. The nearest residential development is the City of Burlington which is approximately three miles from the dredging site and approximately two miles from the nearest CDF site.

The types of sources that contribute to existing ambient noise levels include street traffic such as cars and trucks, small aircraft overflights, noise from existing power lines, and rural environment sources (wildlife, etc.).

3.8.6 Transportation

John Redmond Reservoir and associated facilities are located about eight miles south of I-35. State Highway 75, located one mile east of John Redmond Reservoir, provides access to the area from the north and south. State Highway 130 provides access from I-35. A variety of Coffey and Lyon County roads provide access to John Redmond Reservoir, as well as, the proposed CDF Sites A, B and E (Figure 3-16). Average annual daily volumes on the county and major collector roads near John Redmond Reservoir are shown in Figure 3-17.

USACE, USFWS and KDWP&T maintained roads provide access within these facilities. Certain roads within these facilities are inundated during periods when the USACE is required to impound waters to prevent downstream flooding (USACE 2013).

Coffey County Airport provides aircraft access with a single 5,500 foot long, 75 foot wide runway. Currently there are 15 aircraft based at the field with more than 99 percent being general aviation. On average there are 55 aircraft operations per day.

In May 2010, the Kansas Legislature passed Transportation Works for Kansas (T-WORKS), an $8 billion 10-year transportation program. T-WORKS is designed to create jobs, preserve highway infrastructure, and provide multimodal economic development opportunities across the state. A portion of the T-WORKS plan required that the Kansas Department of Transportation coordinate with local units of government and insure that at least $8 million be spent in each Kansas county. T-WORKS projects identified 12 projects within Coffey County covering state highways, local roads and upgrades at the Coffey County Airport. Currently $5.1 million of projects have been completed with another $10.7 million scheduled.

Figure 3-16. Highways and Roads near John Redmond Reservoir.

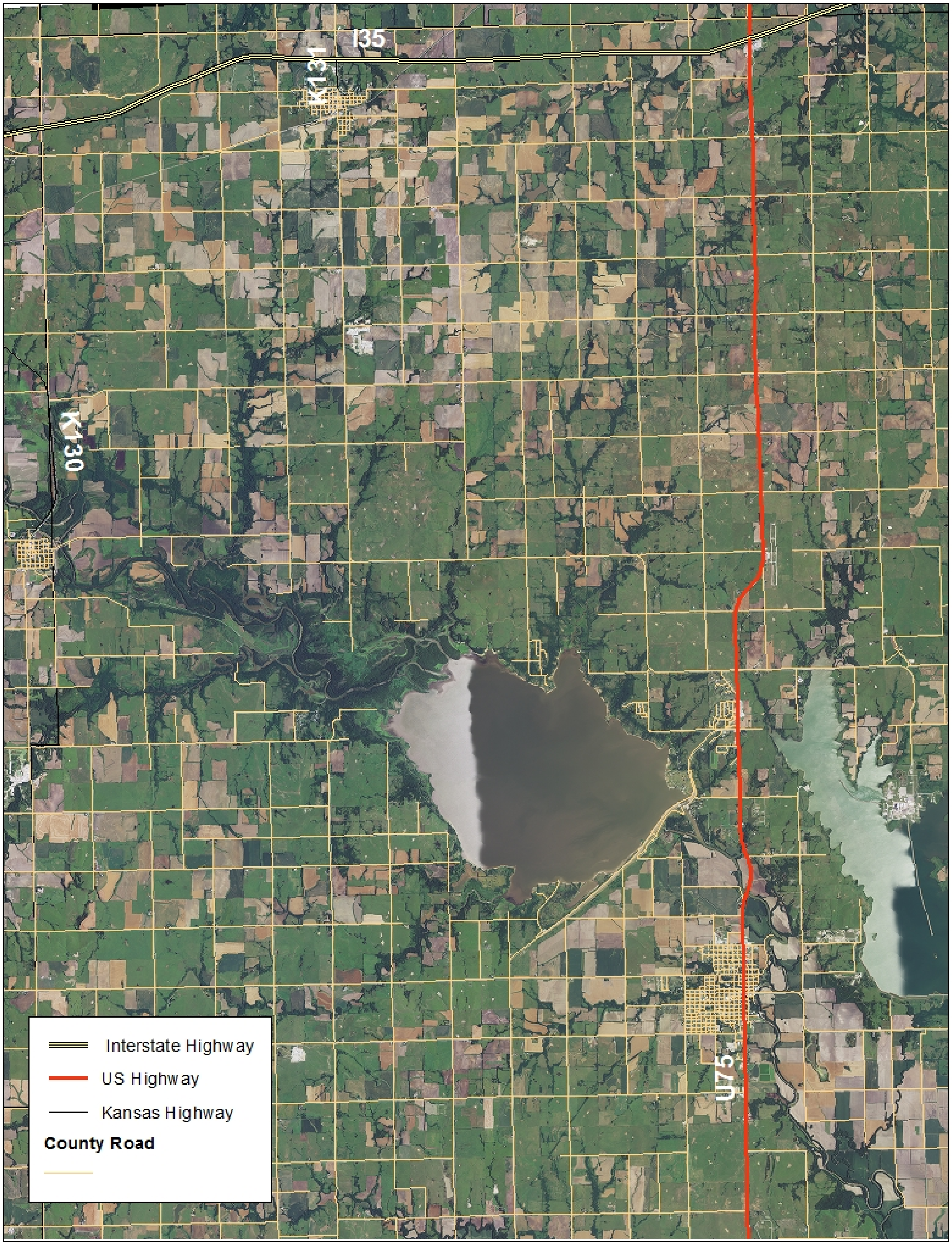
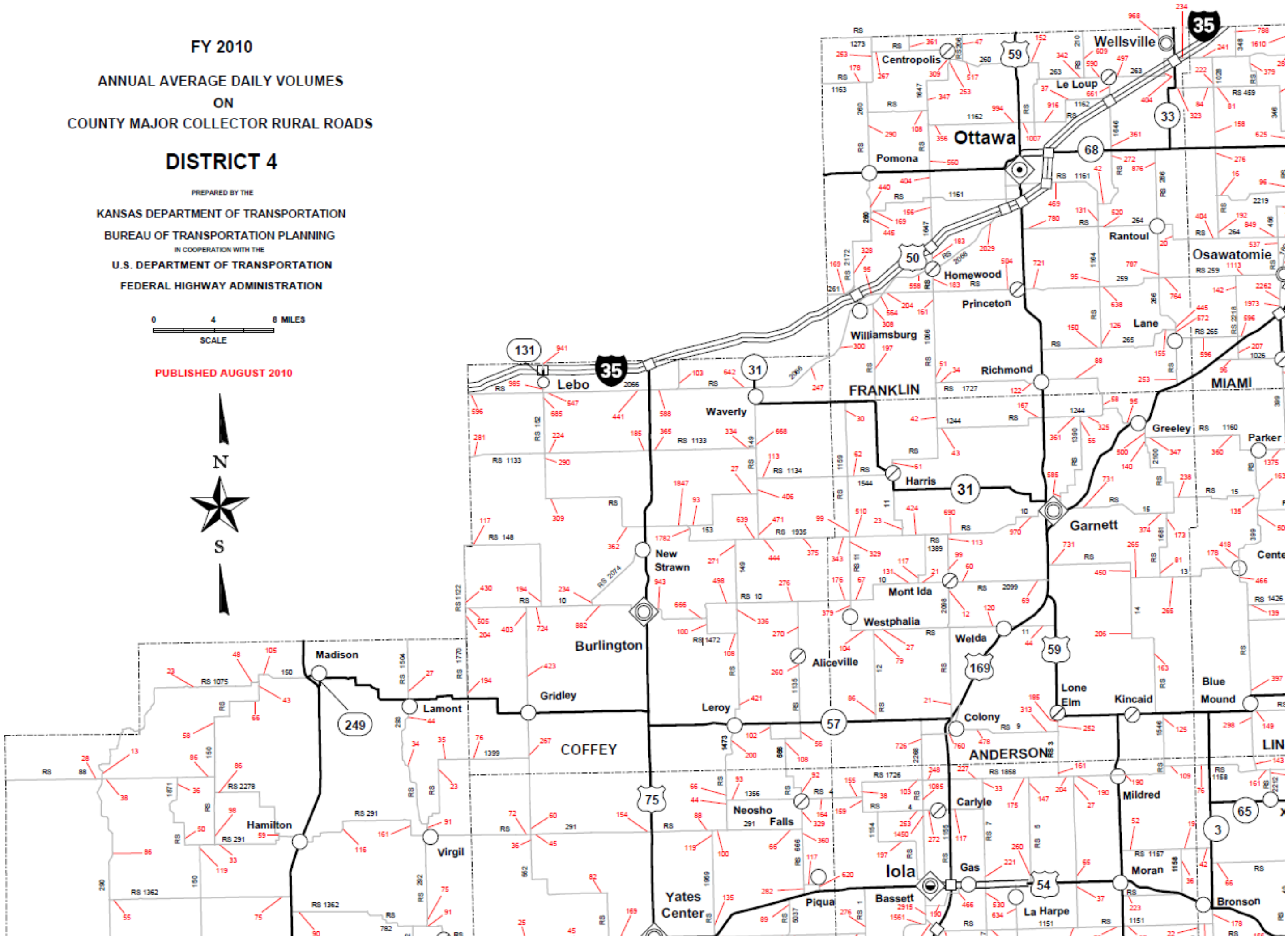


Figure 3-17. Annual Average Daily Volumes on County Major Collector Rural Roads.



3.9 Cultural Resources

Archaeological sites representative of the Paleo-Indian, Plains Archaic, Plains Woodland, Plains Village, Protohistoric (Contact), and Historic Periods are known in the larger vicinity of John Redmond Reservoir in southeastern Kansas. This culture-historical sequence falls generally within the overall sequence that has been established for eastern Kansas. Many archaeological sites in this area have undisturbed, deeply-buried deposits; many are comprised of multi-component prehistoric and/or historic occupations. Several cultural resources investigations, including archaeological survey and excavation, were conducted incident to the construction of John Redmond Reservoir. In the larger regional area there are hundreds of archaeological sites and historic standing structures on record with the Kansas State Historical Society (KSHS). Ultimately, as a major waterway in the Central Plains, the entire Neosho River Valley can be classified as an area of high sensitivity for the location of cultural resources (USACE 2013).

3.9.1 Cultural History Sequence

The following regional chronology is adopted in the FPEIS:

- Paleo-Indian 12,000 to 8500 BP
- Plains Archaic 8500 to 2500 BP
- Plains Woodland 2000 to 1000 BP (AD 1 to 1000)
- Plains Village AD 1000 to 1600
- Protohistoric AD 1500 to 1825
- Historic AD 1825 to present

To aid in comparing divergent cultures and sequences in the Central Plains, the following general adaptation types are used to characterize prehistoric cultural traditions.

Paleo-Indian

Specialized, large-game hunting by small bands of hunter-gatherers was the adaptation type associated with this period. Signature stone tools are unnotched projectile points of fluted or lanceolate type, often found in contexts where mammoth or bison remains also occur. Structural remains are poorly understood, the probable result of a mobile lifestyle and the use of perishable construction materials. Three main complexes identified within this period are Clovis, Folsom, and Late Paleo-Indian (Dalton). The extent of the Paleo-Indian period was approximately 12,000 BP to 10,000 BP (Hoard and Banks 2006).

Plains Archaic

Plant foraging was an important subsistence strategy of hunter gatherer groups in this period and was associated with increased seasonal variability of resources during the mid-Holocene Hypsithermal period. Repeated occupation of sites and features such as rock-lined hearths and roasting pits, and grinding tools reflect intensive plant processing and the cyclical exploitation of resources. Bison were hunted on a smaller scale than previously, with greater reliance on small mammals, mussels and fish. Stone tools were often thermally cured, and included distinctive stemmed and notched projectile points. The Plains Archaic period is traditionally divided into Early, Middle, and Late periods, the overall extent of which was approximately 8,000 BP to 2,500 BP (Hoard and Banks 2006).

Plains Woodland

Archaeologists in Kansas use the term Early Ceramic to describe Woodland cultural components. Incipient horticulture was the adaptation type associated with this period, marked by the introduction of cultigens in the Central Plains. Evidence for semi-permanent villages, increased reliance on wild and domestic plants, widespread use of ceramics and elaborate burials reflect the more sedentary lifestyle of Woodland cultures. Small game remained essential in subsistence. Tool assemblages are distinguished by small, corner-notched projectile points, which suggest invention of the bow and arrow (Hoard and Banks 2006).

Plains Village

Horticulture, supplemented by hunting and gathering, was the adaptation type associated with Village societies. Gardening tools were recognized in artifact assemblages, along with triangular arrowpoints for hunting and pottery types that in Kansas serve to denote this period as the Middle Ceramic. Villager cultures are often identified in lowland terraces of waterways where gardening was viable. The Pomona culture variant is associated with watersheds in southeastern Kansas. Distinguishing traits include shell tempered pottery and a scarcity of cultigen remains such as maize, possibly reflecting less dependence on farming than in other Villager cultures (Hoard and Banks 2006).

Protohistoric

This period was defined by transitory contacts of European explorers in the Central Plains, substantiated by little or no historical documentation. Lifeways were subsumed under the Plains Village adaptation type, but distinctive Late Ceramic archaeological complexes were identified, including the Great Bend aspect with sites in south-central Kansas. Great Bend manifestations likely represent the proto-Wichita villages encountered by Francisco Coronado in 1541. Proto-Wichita sites are also identified in north-central Oklahoma (Hoard and Banks 2006).

Historic

The Reservation Period (1825-1900) was marked by the displacement and resettling of Native American tribes throughout the greater study region. Between 1825 and 1835 reserves were established for the Osage and New York Indians in southeast Kansas. The Cherokee Nation was created in northeastern Oklahoma in 1828, soon thereafter incorporating the Quapaw and Seneca tribes. After the Civil War, the area was further divided into reserves for the Peoria, Ottawa, Wyandotte and others. From 1838 to 1871 the Neosho Agency held jurisdiction over all tribes but the Cherokee. Between the 1830s and 1850s Anglo-Americans legally occupied tribal lands to operate mission schools, trading posts, ferries, mills and blacksmith shops. The early part of the American Period (1850-present) is marked by increasing Anglo-American land speculation and enhanced military supply lines through the study region that connected Fort Gibson, Fort Scott and Fort Leavenworth during the Civil War. Pioneer settlement of homesteads and towns began in earnest in southeastern Kansas during the 1860s following the removal of Native American tribes to Oklahoma. This trend was somewhat delayed in northeastern Oklahoma where the Cherokee Nation maintained a loose hold on sovereignty. By the 1890s, however, towns such as Miami and Ottawa were firmly rooted.

3.9.2 Previous Investigations

Forty-eight archaeological sites have been recorded over the past 30 years in the conservation pool and flood pool at John Redmond Reservoir, which is comprised of land between 1035.0–1045.0 feet above mean sea level (amsl) in elevation. Comprehensive investigations have been published in several reports, including “Appraisal of the Archaeological Resources of the John Redmond Reservoir,” (Witty 1961); “Salvage Archaeology of the John Redmond Reservoir,” (Kansas State Historical Society 1980); “Archaeological Investigations in the John Redmond Reservoir Area,” (Rogers 2001); “Archaeological Investigations at John Redmond Reservoir, East-Central Kansas, 1979,” (Thies 1981); and “John Redmond Reservoir Historic Properties Management Plan,” U.S. Army Corps of Engineers, Tulsa District 1997). More recently, a Phase II shoreline survey was undertaken by e2M in 2000 with results presented in “An Archaeological Survey of John Redmond Reservoir,” (Rust 2001). The survey was followed by Phase III test excavation and evaluation of selected sites by e2M in 2001 (Rust 2005). A review of Historic Preservation Management Plan (HPMP) Database files prior to the e2M fieldwork indicated that 27 of the 47 sites had been destroyed, mitigated, or otherwise determined insignificant. Sites revisited during the Phase II survey determined that an additional 15 sites had been impacted by reservoir operations or lacked evidence of significance (not eligible for the National Register of Historic Places). Six sites, three of which were discovered in 2000, were the focus of Phase III investigations in 2001.

Four historic archaeological sites were recently investigated in the John Redmond Reservoir area of potential effects (Rust 2005). Sites 14CF101, 14CF102, 14CF103, and 14CF105 lie within close proximity to each other and are remnants of the historic Otter Creek community (Pleasant Township), which was first settled in 1858.

Phase III test excavations on the first three sites, all originally farmsteads, revealed *in situ* courses of stone foundation walls associated with deep deposits of artifacts. More than 2,000 artifacts were recovered from four excavated units. Preliminary analysis, combined with historical research and extensive oral interviewing of living descendants, suggest 14CF101 and 14CF102 may date to circa 1860 and 14CF103 to the 1880s. 14CF105 preserves substantial surface remains and an early phase probably also dates to the late 19th century (Rust 2005). Sites 14CF101, 14CF102, 14CF103, and 14CF105, and prehistoric sites 14CF311 and 14CF313 (these last two now defined together as one site) were determined not eligible for nomination to the National Register of Historic Places (NRHP). Site 14CF104 was tested and considered ineligible for listing.

Thirty-one sites have been recorded downstream of John Redmond Reservoir. These were inventoried during record searches at Kansas State Historical Society Center for Historical Research in Topeka, the Oklahoma Archaeological Survey in Norman and the State Historic Preservation Office in Oklahoma City. State archaeological site and survey forms were collected from these agencies, along with locations of properties indicated on historical General Land Office (GLO) maps of Kansas (1878) and Oklahoma (1898). Archival research was undertaken at the Kansas State Historical Society Archives, the Kansas Collection at the University of Kansas in Lawrence, and the Western History Collection at the University of Oklahoma in Norman. Only one comprehensive survey has yet been undertaken in this area, "An Assessment of Prehistoric Cultural Resources of the Neosho (Grand) River Valley." Unlike the John Redmond Reservoir sites, many of the downstream sites lack recent first-hand assessment. The sites are briefly described in Appendix D under the appropriate period. General location information for these sites may be found in Final Supplement to the Final Environmental Statement (USACE 2013).

3.9.3 Area of Potential Effect (APE)

Tulsa District has determined the Area of Potential Effect (APE) for the proposed action to include all federal property around the entire John Redmond Reservoir, including the conservation pool and flood pool. Additionally, the APE includes private property surrounding the reservoir where dredge disposal pits may be constructed. The APE will include access roads, utility lines, staging areas, borrow areas, and other connected features. While the APE will include dredge disposal pits and associated features that may be located on private property outside the reservoir footprint, the APE cannot be fully determined because the location of these elements has not been fully identified. Therefore, in order to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended), a set of alternate procedures must be implemented in the form of a Programmatic Agreement (PA). The PA will identify a set of procedures to be implemented as each dredge disposal pit and associated features is designed. Archaeological investigations will subsequently be carried out to identify historic properties in those locations.

3.10 Hazardous, Toxic, or Radioactive Wastes

This section describes existing conditions within the John Redmond Reservoir project area with regard to potential environmental contamination on the site, or that may enter the site, via surface water and the sources of releases to the environment. Contaminant pathways have been identified by the USFWS (USACE 2013) and radioactive analyses are conducted by WCGS (USACE 2013), using portions of the John Redmond Reservoir site as controls.

A Contaminant Assessment Process (CAP) was completed by the USFWS for FHNWR and radionuclides are monitored for the WCGS, including sites within and near John Redmond Reservoir (USACE 2013). The most likely pathways for contaminants to enter John Redmond Reservoir are through runoff water and the activities associated with agriculture, flood control and public recreation. Radionuclides could enter the John Redmond Reservoir environment via air or water pathways. The highways and roads, railroads, and oil and gas pipelines in the vicinity could also provide sources of contaminants to the project site.

Since establishment in 1966, the entire refuge (95 percent) has been flooded more frequently than one in 10 years, e.g., 1973, 1985, 1986, 1993, 1995, 1998, and 1999 (USACE 2013). Floodwater can bring contaminants to the project site and are a major contaminant pathway. Some sources of contaminants potentially carried in floodwater from the drainage basin include: 1) municipalities (Emporia, Neosho Rapids, Hartford, etc.,) which have sanitary sewage, automobile parts manufacturing, a slaughterhouse and meat packing plant, commercial bakery, dog food plant, and petroleum product storage facilities; 2) agricultural land where livestock feedlot runoff and chemicals used for fertilizer, weed control, and insect control are applied, and sediments are washed from fields, and 3) lead deposited historically through hunting and fishing activities.

A summary of contaminant issues identified in Blackford (1999 in USACE 2013) includes:

- Chlordane compound concentrations in fish sufficient to result in consumption advisories annually; Fish kills associated with livestock feedlot runoff during the 1970s
- Biota samples containing levels of PCB, atrazine, heavy metals (lead, mercury, and arsenic)
- Sediment samples containing lead
- Detection of strong chemical/pesticide odors by onsite personnel following precipitation events during the spring planting season
- Surface water analyses that identified triazines, 2,4-D, and alachlor
- All drainages are turbid
- Eagle Creek has documented heavy metal concentrations and a livestock feedlot is currently in operation on its banks, updrainage of John Redmond Reservoir

The KDHE Wolf Creek Environmental Radiation Surveillance (ERS) program began in 1979 in accordance with Kansas Administrative Regulation (K.A.R.) 28-19-81 with the initial selection of surface water sampling locations. The ERS program parallels (and partially overlaps) the WCNOC Radioactive Environmental Monitoring Program (REMP). The purpose of the ERS program is to detect, identify, and measure radioactive material and direct radiation released to the environment from the operation of WCGS. Data indicating the release of elevated levels of radioactive material will be used to determine the need for corrective and/or protective actions to protect the health and safety of the public. (KDHE 2011)

Environmental samples are collected within 90 miles of the Wolf Creek Nuclear Power Plant site. These samples include, but are not limited to, surface water, ground water, sediment/soil, vegetation, food (e.g. milk), fish and biota. While this routine and frequent measurement of radionuclide activity is primarily at environmental background levels and serves to establish baseline data, it would quickly detect any unplanned release from the power plant. Capabilities exist to detect low-level activities of actinides, fission products, and naturally occurring radionuclides (KDHE 2013).

The most significant radionuclide present in surface water samples collected in the Coffey County Lake is tritium (3H), a beta emitter. The highest 3H concentration measured in the Coffey County Lake during SFY 2011 was 16,890 pCi/l in March, 2011. This maximum Coffey County Lake 3H concentration is 84 percent of the National Primary Drinking Regulation maximum contaminant level (MCL) of 20,000 pCi/l. *The water from the Coffey County Lake is not used as a drinking water source*. The average CCL surface water 3H concentration for SFY 2011 was 12,457 pCi/l, or 62 percent of MCL. Coffey County Lake is not approved for any aquatic recreation other than fishing. All other non-CCL surface water and ground water samples collected in the environs of WCGS during SFY 2011 indicated no radionuclides present attributable to the operation of WCGS.

Aquatic vegetation samples are the best indicators for monitoring the seasonal fluctuations of fission and activation product levels in the Coffey County Lake. No aquatic vegetation sample showed any nuclides attributable to WCGS operation. Five trending samples and six random samples were analyzed.

Sediment samples have been excellent indicators for the long-term buildup of fission and activation product activity levels in the Coffey County Lake. The highest fission product activity in sediments during SFY 2011 was 326.3 pCi/kg-dry 137Cs found at the Environmental Education Area (WCBS-AR-1).

Airborne sample analysis indicated that no radionuclides attributable to the operation of WCGS were present above the lower limits of detection during SFY 2011. Sample analysis of terrestrial vegetation, soil, milk, grain, and vegetable samples collected in the environs of WCGS during SFY 2011 indicated no radionuclides present attributable to the operation of WCGS. Samples of nine species of fish were taken from the Coffey County Lake during SFY 2011. Sample analysis of edible fish portions collected in the environs of WCGS during SFY 2011 indicated that no gamma emitters attributable to WCGS operation were present.

Data from direct radiation monitoring sites revealed no significant changes from preoperational data. The lowest direct radiation levels are found closest to the WCGS. The direct radiation levels on the Coffey County Lake baffle dikes at the 1,200 m exclusion area boundary are the lowest of any monitored site. The limestone used to construct the baffle dikes has a lower natural background radioactivity than the original soil present before the construction of the Coffey County Lake. This effect of construction on the terrestrial component of natural background radiation was noted on radiation surveys conducted around the WCGS site before bringing the initial fuel load on the site. The water from the Coffey County Lake also acts as an effective shield from terrestrial radiation that was present before Coffey County Lake filling (KDHE 2011).

In April 2013, USGS collected five samples within the preferred dredge location (Figure 3-1) for a composite analysis using the Toxicity Characteristic Leaching Procedure (TCLP). TCLP is a soil extraction method for chemical analysis employed as an analytical method to similar leaching through soils and is used to characterize if a waste is characteristically hazardous. Results from the analysis are included in Appendix F. All parameters evaluated in the TCLP analysis, including pesticides, fungicides and herbicides, were non-detectable.

Table 3-17. TCLP Analysis Parameters on Composite Sample from Preferred Dredge Location, All parameters resulted in non-detect.

Arsenic	1,4- Dichlorobenzene	Nitrobenzene	Carbon tetrachloride
Barium	2,4-Dinitrotoluene	Pentachlorophenol	Chlorobenzene
Cadmium	Hexachloro-1,3-butadiene	Pyridine	Chloroform
Chromium	Hexachlorobenzene	2,4,5-Trichlorophenol	1,2-Dichloroethane
Lead	Hexachloroethane	2,4,6-Trichlorophenol	1,1-Dichloroethene
Selenium	2-Methylphenol(o-Cresol)	Benzene	Tetrachloroethene
Silver	3&4-Methylphenol(m&p Cresol)	2-Butanone (MEK)	Trichloroethene
			Vinyl chloride

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction

This section examines potential environmental impacts of the project proponent's preferred alternative: dredge and dispose to maintain 55,000 acre-feet of conservation storage; alternative #2: dredge and dispose of 45 million cubic yards of sediment; and the No Action alternative on the nine resource areas identified in the affected environment section of this document: geology and soils; hydrology and water resources; biological resources; air quality; aesthetics; prime or unique farmlands; socioeconomic resources; cultural resources; and hazardous, toxic and radioactive wastes. For each resource area, consideration is given to whether potential environmental consequences would result from the proposed action or alternatives. For each resource, potential effects are described with respect to the type, duration, extent, magnitude and the likelihood of impact Consideration of potential cumulative effects is also presented.

As defined by NEPA, significant impacts are those that have the potential to significantly affect the quality of the human environment. "Human environment" is a comprehensive phrase that includes the natural and physical environments and the relationship of people to those environments (40 CFR 1508.14). Whether or not a proposed action "significantly" affects the quality of the human environment is determined by considering the context in which it will occur and the intensity of the action. The context of the action is determined by studying the affected region, the affected locality, and the affected interests within both. Significance varies depending upon the setting of the proposed action (40 CFR 1508.27). The intensity of an action refers to the severity of the impacts, both regionally and locally. The level at which an impact is considered significant varies for each environmental resource area.

The area, or region of influence for an action, is defined for each environmental resource based upon the areal extent that would be affected directly or indirectly by the proposed action. The determination of the region of influence is based upon guidance provided by regulatory agencies or professional judgment (Table 4-1).

Table 4-1. Environmental Resources and Region of Influence

Environmental Resource	Region of Influence (No Action Alternative)	Region of Influence (Project Proponent Preferred Alternative)	Region of Influence (Alternative #2)
Geology and Soils	No region of influence	Reservoir, Surrounding Federal lands, Staging Area, Pipeline and Disposal Areas	Reservoir, Surrounding Federal lands, Staging Area, Pipeline and Disposal Areas
Hydrology & Water Resources	John Redmond Reservoir.	John Redmond Reservoir and downriver effects	John Redmond Reservoir and downriver effects
Biological Resources	John Redmond Reservoir	Sediment disposal areas, Staging Area, Pipeline, Upriver, John Redmond Reservoir, and downriver effects	Sediment disposal areas, Staging Area, Pipeline, Upriver, John Redmond Reservoir, and downriver effects
Air Quality	No region of influence	John Redmond Reservoir vicinity; staging area, construction of disposal areas	John Redmond Reservoir vicinity; staging area, construction of disposal areas
Aesthetics	No region of influence	Staging Area, Sediment disposal area, John Redmond Reservoir, and downriver effects	Staging Area, Sediment disposal area, John Redmond Reservoir, and downriver effects

Environmental Resource	Region of Influence (No Action Alternative)	Region of Influence (Project Proponent Preferred Alternative)	Region of Influence (Alternative #2)
Prime or Unique Farmlands	No region of influence	Sediment disposal areas and pipeline	Sediment disposal areas and pipeline
Socioeconomic Resources	Allen, Anderson, Bourbon, Cherokee, Coffey, Crawford, Labette, Lyon, Neosho, Wilson, and Woodson Counties, Kansas	John Redmond Reservoir vicinity, and Coffey and Lyon Counties, Kansas	John Redmond Reservoir vicinity, and Coffey and Lyon Counties, Kansas
Cultural Resources	John Redmond Reservoir	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir and downriver effects	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir and downriver effects
Hazardous, Toxic or Radioactive Wastes	No region of influence	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir, and downriver effects	Sediment disposal areas, Staging Area, Pipeline, John Redmond Reservoir, and downriver effects

4.2 Geology and Soils

Geology and soil resources for an area consist of the surface and subsurface soils and bedrock, and their respective physical characteristics. Concerns relating to geology and soil resources include the impacts of an action that would result in geologic or soil related hazards, i.e., subsidence, land sliding, erosion, expanding or collapsing soils and bedrock and seismic activity. The limiting of access to mineral resources, unique geologic features, or paleontological resources are also areas of concern.

Topography is the change in elevation over the surface of an area, and is generally the product of the geology and soil resources for a given area. Therefore, effects on topography are also included under this geology and soil resources section.

No Action Alternative

Potential effects on geology and soil resources through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing conditions. There would be no short, medium or long-term, beneficial or adverse effects on geology or soil resources as a result of implementing the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging would be accomplished through the use of a hydraulic dredge which would pump sediment from the lake to an offsite disposal facility. The Preferred Alternative would result in potential effects on geology and soil resources regarding the placement of dredge materials. The selected location for the dredge materials would potentially bury geology or soil resources resulting in long-term, localized, direct, adverse effects, the significance of which would be dependent upon the geology or soil resource.

No geotechnical analysis has been conducted to date at the proposed CDF sites; however, prior to final design of the CDFs, split spoon samples will be taken and sieve analysis performed along with visual classification to assess unconfined compressive strength, Atterburg limits and other soil features needed to complete the final CDF design. All materials required for berm construction for the CDFs will be collected on-site from within the containment area and will not be transported off site.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on geology and soils would be similar to the impacts described under the preferred alternative. However, because more land would be required for disposal of dredged sediments the potential to bury geology or soil resources would be greater, but still dependent upon the geology or soil source; resulting in long-term, localized, adverse effects, that magnitude of which would be dependent on the geology or soil resource

4.3 Hydrology and Water Resources

Hydrology and water resources for an area consist of the surface and ground water within a region. Environmental concerns pertaining to hydrology and water resources include the availability, quality, and quantity of surface and ground water and control of floodwaters.

No Action Alternative

The potential effect on hydrology and water resources through the implementation of the No Action Alternative is a decrease in availability of surface water resources for the state of Kansas. USACE has an agreement with the state of Kansas for water storage for industrial and municipal uses, and as the sediment continues to accumulate in the conservation pool at John Redmond Reservoir, the storage capacity is diminishing, thereby reducing the availability of water for the state of Kansas. At the current sedimentation rate, the conservation pool at John Redmond Reservoir will be unable to store enough water to meet the requirements of the state of Kansas. The inability of John Redmond Reservoir to store adequate water volume would result in a long-term, regional, major adverse effect on water resources for Kansas.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The Preferred Alternative would potentially result in both long-term, significant beneficial and short-term, insignificant adverse effects on hydrology and water resources for John Redmond Reservoir. The beneficial effects would be an increase in storage capacity of the reservoir thereby creating a greater availability of surface water resources for the state of Kansas. This alternative would also allow the state of Kansas to meet the needs of its water supply customers. The effects of implementing the Preferred Alternative on storage capacity would be considered long-term, major, regional and beneficial.

Another long-term and major benefit of restoring storage capacity to John Redmond Reservoir has to do with increasing reservoir trap efficiency. Reservoir trap efficiency is not a constant through time but is influenced by 1) reservoir operation, 2) inflowing sediment characteristics and 3) hydraulic detention time. No changes to reservoir operations in terms of the magnitude, duration, or timing of water releases are anticipated as a result of dredging. The state of Kansas is currently involved in implementing a number of sediment reduction activities upstream of the lake such as streambank restoration within the drainage of John Redmond Reservoir. A reservoir's trap efficiency declines through time due to sediment accumulation which reduces the capacity: inflow ratio (Sedimentation Engineering 2008). Improving capacity at John Redmond Reservoir as a result of dredging will improve the sediment rating curve below the reservoir. In other words, in terms of benefits, the Preferred Alternative will in the long-term, result in lower suspended sediment concentrations below the reservoir than the No Action Alternative, especially under low flow release conditions. A final beneficial short and long-term effect of the Preferred Alternative is a reduction to resuspension of in-reservoir sediment by wind induced waves. The magnitude of reservoir bottom sediment shear stress caused by wave action is a function of wave length and water depth (Laenen 1996). In dredged areas the water depth is increased reducing potential shear stress for a given wind speed and fetch over No Action Alternative. The result should be decreased concentrations of suspended sediments in low flow releases over time as dredging results in increased reservoir depth and decreased wind-induced sediment resuspension.

Because the effluent from CDF Sites A, B and E, located below the dam, will be released into the Neosho River the state will apply for and adhere to the conditions set forth in the National Pollutant Discharge Elimination System (NPDES) permit. Analysis of the material to be removed from the reservoir shows that it is within normal background range of typical watershed soils in content, nutrients and trace chemicals. The Neosho River below John Redmond is designated as Tier 2, meaning, in regard to antidegradation, it is a high quality waters where water quality exceeds the criteria associated with the assigned designated uses. Limited water quality degradation is allowed in high quality water where the degradation is necessary to accommodate important social or economic development, but only if designate uses are still maintained and the highest statutory and regulatory requirements for all point sources of pollution and all cost effective and reasonable best management practices for nonpoint sources of pollution are achieved. The CDFs will be designed to retain suspended sediment materials and provide adequate long-term storage capacity. The quality of effluent discharged from these sites will meet the conditions and standards established by the Section 401 State water quality certification, as well as, the wastewater permitting limits established in a National Pollutant Discharge Elimination System (NPDES) permit. Before an NPDES permit is issued for this discharge, the Kansas Water Office will demonstrate that any such discharge and the suspended solid load will not be detrimental to downstream uses, especially at low flow conditions. As part of the permitting process, the Kansas Water Office will identify any alternatives to discharge that may exist and evaluate the costs and implications of implementing those alternatives. A letter from KDHE describing the NPDES permitting process as it relates to the Preferred Alternative is provided in Appendix G.

The dredging contractor selected for the John Redmond Reservoir dredging project has extensive experience designing and construction CDFs capable of settling sediments and returning effluent water that meets state water quality permit conditions. In two examples of dredging projects of similar scale and scope, the contractor reported effluent quality between 15 mg/L to 300 mg/L total suspended solids (TSS) depending on the state permit requirements. CDFs designed for the disposal of sediment from John Redmond Reservoir will be capable of maintaining effluent quality sufficient to meet the discharge permit limit. KDHE has indicated that a discharge permit limit would be less than or equal to 50 mg/L TSS as a monthly average which is the same value utilized for inert solids in EPA's power plant effluent guidelines. The actual limit will be based on treatment technology determined through the antidegradation review.

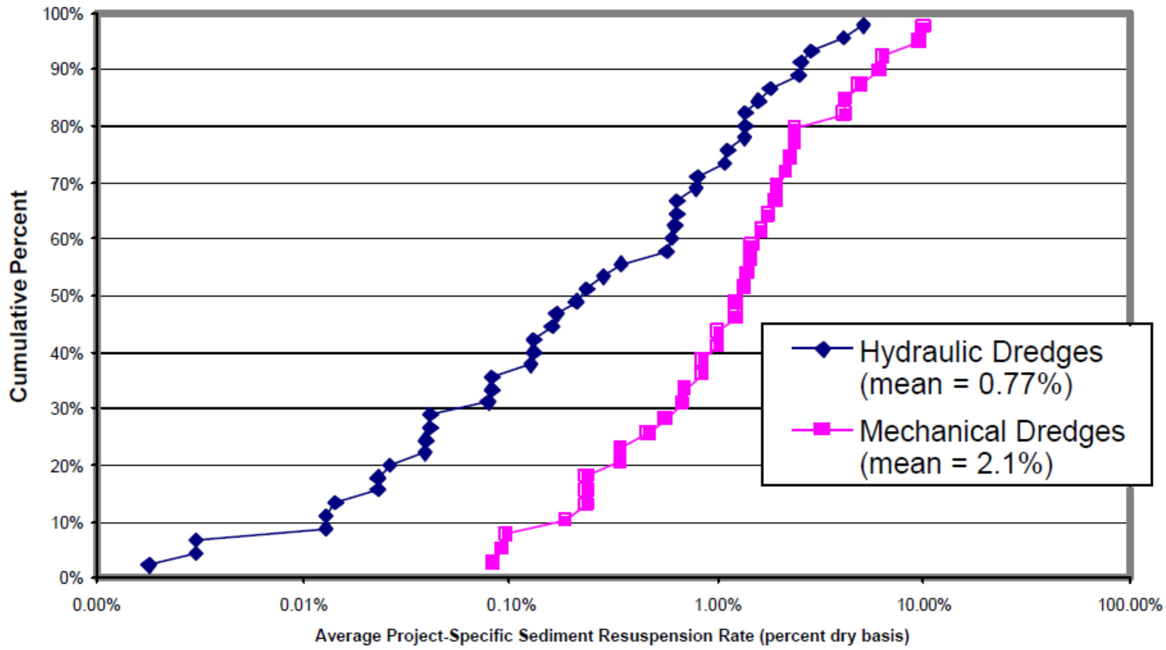
An alternative that may be evaluated during the permitting process is the return of effluent back to John Redmond Reservoir. If the effluent pipe were rerouted from the CDFs back to John Redmond Reservoir, an additional 15,000 feet of pipeline and a 500 HP 18" booster pump would be required. Approximately 500 gallons of fuel per day would be required to operate the booster pump. Infrastructure, mobilization and operation costs for this alternative would exceed $750,000. In addition, returning the effluent water to the reservoir would require an additional crossing of the Neosho River with the pipeline. Return water from CDFs is administratively defined as a discharge of dredged material by 33 CFR 323.3(d) and would require authorization from the USACE Operations Division if returned directly to the reservoir.

Proposed CDF Site B is within the 100-year floodplain for the Neosho River, in flood zone A. Soils mapped within CDF Site B, Osage and Verdigris Soils, are hydric and can have a high water table. Excavating on-site soils to use in the berm construction may affect the hydrologic regime of the site, which could affect the adjacent wetlands. The Kansas Water Office will ensure that measures are in place to avoid impacts to other aquatic resources. Such measures may include limiting excavation near the area; digging a dewatering trench and pumping the water back to the wetland; installing a cutoff wall; and limiting excavation to a time of year least likely to impact the wetland hydrology. These measures could be employed during the construction of the CDF. Once the berms are constructed and the placement of dredged slurry commences, a hydraulic boundary will be in place and the water will equalize.

Each potential private property site is being evaluated, and CDF's designed, with surrounding properties in mind. Precipitation that falls directly on the CDF site will be captured within the levee system and controlled throughout its' course to the river. Drainage which currently crosses potential CDF sites, upstream to downstream, will be routed around the constructed CDF through existing, enhanced or constructed drainage ditches such that no additional property will be inundated during runoff events greater than would have been seen without the CDF in place. Existing drainage that currently meets downstream landowners needs agricultural or stockwater supply will be also be maintained either through avoidance of natural drainages or by rerouting of flow around constructed CDF's with existing or constructed drainage ditches.

A potential direct adverse effect of the Preferred Alternative is the possibility of causing sediments to become suspended in the vicinity of hydraulic dredging activities. Although some resuspension of deposited sediment is anticipated during the dredging activities, the increase to the suspended sediment concentration in the water column is expected to be localized to areas immediately surrounding the dredge (VBKO 2003). According to a literature review summarizing the factors influencing resuspended sediment due to dredging operations (Anchor Environmental 2003) sediment concentrations: 1) are greater toward the bottom of the water column near the sediment/water interface, 2) rapidly decrease with distance from the active dredge site, 3) are greater when ambient water currents are sufficient to entrain mobilized sediment and 4) are greater when the particle size distribution of sediment is small (silts/clays). Removal of sediment from John Redmond Reservoir will be accomplished with a hydraulic dredge equipped with a dredging ladder which allows dredging at depths down to 38 feet. The *maximum* depth of John Redmond Reservoir is about 14 feet at 1,041 feet MSL (conservation pool elevation), therefore dredging will be maintained at the bottom of the water column. Resuspension rates and sediment concentrations increases over ambient conditions during dredging operations were found to be minimized by hydraulic dredges (rather than mechanical dredging) (Figure 4-1). For hydraulic dredges with pipeline disposal the vast majority of sediment resuspension occurs near the point of sediment removal. Because sediments are suctioned into the dredge and carried away via pipeline, they cannot directly enter the middle or upper water column.

Figure 4-1. Probability distribution of dredging resuspension rates for hydraulic and mechanical dredging equipment (Anchor Environmental 2003).



The same literature review also found that the shape and size of resuspended sediment plumes are predominately determined by hydrodynamic condition in the water body being dredged and the vast majority of resuspended sediments resettle close to the source within one hour. Water moves much more slowly in reservoirs than the streams that feed them (as evidenced by the sediment accumulation within them) and with proper low flow reservoir operations, there should be little opportunity for resuspended sediment to be discharged from the reservoir. Any impact of a release of nutrients to the water column from disturbed sediment due to dredge project on algal production would be minimized by the water body being light limited (KDHE 2003).

Given the above findings, the anticipated change to the annual, low flow sediment load discharged from John Redmond Reservoir due to the dredging project should be, at most, negligible. Some potential increase to suspended sediment concentrations downstream of John Redmond Reservoir could occur if dredging activities are conducted near a discharging John Redmond Reservoir gate. Current low-flow releases from John Redmond Dam are made through two 24-inch low flow conduits located near the left abutment. However, the dam is equipped with the capacity to make the same releases through any one of the fourteen tainter gates which discharge from a higher elevation in the water column. This provides a high degree of flexibility in both the lateral location (i.e., distance from dredging operations) and reservoir depth for low flow releases. Proper communications between dredge activities and reservoir operations will minimize the chance of occurrence of significant increases in suspended solids concentrations in low flow releases during dredging activities. Should such an issue arise, impacts are expected to be short-term in duration and low in magnitude and of substantially lower frequency, duration, and magnitude than normal fluctuations in ambient stream chemistry in the Neosho River downstream of John Redmond Reservoir owing to processes not related to reservoir releases.

In July 2013, the USGS in cooperation with the Kansas Water Office installed continuous water-quality monitors at Neosho River at Burlington, Neosho River at Iola, and Neosho River at Parsons. The monitors collect continuous turbidity, specific conductance, and water temperature. Real-time data for these sites is available at http://waterdata.usgs.gov/ks/nwis/current/?type=quality&group%20Key=basin%20cd. In addition to monitor operation, the USGS collects discrete suspended-sediment concentration (SSC) samples at each site throughout the range in stream stage. Turbidity data and discrete SSC samples will be used to develop models that can be used to compute continuous SSC. Streamflow from the three USGS streamgages located at these locations will be used to compute continuous SSC loads. These baseline data are important and can be used to compare with changes in SSC loads that may occur from lake dredging or other management practices.

USGS has shown (USGS 2008) in the Neosho basin above and below John Redmond Reservoir that sediment transport, in term of loads, occurs under higher flow events. Although John Redmond Reservoir tends to modestly mute the episodic nature of sediment transport in the Neosho basin through its control of flow, the difference between sediment loads associated with low flow releases and the sediment loads during medium or high flow releases is still over an order of magnitude to two orders of magnitude (USGS 2008; Figure 8 - comparing 90%, 50% and 95% suspended sediment load exceedances). Increasing the suspended sediment concentration in low flow releases would not substantially change the sediment load released from John Redmond Reservoir over the course of a normal precipitation year since the annual sediment load is driven by high flow releases. As previously noted, if the concentration of suspended sediments is of concern, rather than the sediment load, low flow reservoir releases can be coordinated with dredging activities to abate the downstream impact to suspended sediment concentrations. The first phase of dredging will be staged near the dam and outlet structures. Gate operations could be modified to select gates to open for reservoir releases that are not within an immediate vicinity of dredging operation. Future phases of dredging will be staged further and further away from the dam and outlet structures, therefore, any concerns related to unintentional release of suspended sediments will diminish as the distance of dredging from the dam increases.

A final concern with impacts to water resources could be the potential for release, as a result of dredging operations, of sediment-bound chemical contaminants to both reservoir and downstream aquatic systems. While minimal point-source discharges occur in the reservoir's watershed, the lake does drain a large agricultural area, thereby increasing the potential for accumulation of legacy agricultural chemicals (e.g., chlorinated pesticides) and other chemical constituents associated with past or current agricultural practices. In response, the KWO coordinated with the USGS to conduct sediment sampling on several occasions to quantify the extent, if any, of chemical contaminants in sediments. The USGS collected five cores from John Redmond Reservoir in 2009. The chemical analysis of sediment from John Redmond Reservoir showed no issue at the probable effects level, but exceed the threshold values for arsenic, chromium and nickel. When compared to other eastern Kansas reservoirs in which the USGS has analyzed sediment, the arsenic, chromium and nickel levels at John Redmond are similar to and generally slightly lower than the levels at Perry, Clinton, Fall River and Toronto. The similarity between lakes for arsenic, chromium and nickel indicates the source of those elements is likely natural (from eastern Kansas soils and/or bedrock). No organochlorine compounds (PCBs and DDT) were above the probable effects level and typically were not even detected in the sediment. John Redmond Reservoir has as good or better sediment quality in terms of nutrients, metals and/or organochlorine concentrations than any other eastern Kansas lake the USGS has studied to date (USGS 2010). In April 2013, USGS collected five additional samples within the preferred dredge location (Figure 3-1) for a composite analysis using both total sediment quality analysis and the Toxicity Characteristic Leaching Procedure (TCLP). Results from the analysis are included in Appendix F. Analytical results for the total sediment quality analysis of the composite sample were below the results for the 2009 samples. All parameters evaluated in the TCLP analysis were non-detectable. Because of a general lack of detected contamination there is a low potential for adverse effects of contaminant release.

No significant change to the current operations to John Redmond Reservoir is anticipated due to dredging project. As noted above, gate operations could be modified to select gates to open for reservoir releases that are not within an immediate vicinity of dredging operation. There should be no impact to John Redmond Reservoir releases in terms of inflow management or reservoir discharge operations. During significant flood control operations, dredging activities would cease and all dredging equipment would be relocated/disabled to allow for normal and unhindered flood control operations. Effluent discharges from the CDFs will be coordinated with reservoir releases so that there will be no impact to downstream hydrology.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on hydrology and water resources would be similar to the impacts described under the preferred alternative. The effects of implementing the Preferred Alternative on water supply storage capacity would be considered long-term, major and beneficial. Although more sediment would be removed from the reservoir and the potential to resuspend sediment with concentrations of trace elements increases, impacts would be localized to the dredge area. Such impacts are considered to be short-term and minor.

4.4 Biological Resources

Biological resources for the John Redmond Reservoir area include vegetation resources or land cover types, i.e.: woodlands, shrublands, grassland, wetland resources, wildlife resources, fisheries and aquatic resources, and wildlife refuges and wildlife management areas. Environmental concerns pertaining to biological resources include the disturbance, alteration, or destruction of wildlife and plant species and their habitat. Potential effects to endangered, threatened, and candidate species, species of special concern, and sensitive communities are described in Section 4.5.

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) and Executive Order 13186, including bald and golden eagles, which are also protected under the Bald and Golden Eagle Protection Act. Bald eagles are further discussed in Section 4.5. Migratory birds follow broad routes called flyways between breeding grounds in Canada and the United States and wintering grounds in Central and South America, and the Caribbean. The proposed project is in the Central Flyway.

No Action Alternative

Potential effects on biological resources through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing conditions. There would be no short-term, minor or major, beneficial or adverse effects on biological resources as a result of implementing the No Action Alternative. However, there would be long-term, moderate to major, adverse impacts with no removal of sediment, as John Redmond Reservoir would eventually fill with sediment and reduce areas of pooled water, changing the aquatic community.

The No Action Alternative could have adverse ecological effects. Kansas reservoirs have lower flow velocities, greater depth of flow, and longer water residence times than streams and rivers supplying them and therefore act as deposition zones (sinks) for sediments. Over time, sediment deposition in reservoirs reduces reservoir depth which can increase the frequency, magnitude and duration of suspended sediment concentrations in the water column. The resulting impact to the organisms, including invertebrates and fish communities in those areas can lead to a change from desirable sediment-sensitive organisms being replaced by less-desirable, sediment-tolerant organisms. These population changes would reduce the size of recreational sport harvest, in the case of fish, by lowering both the total abundance of organisms and their individual size. These changes negatively affect recreational anglers and subsistence anglers. (EPA 2008)

In addition, increased sediments and turbidity reduce the aesthetics of a waterbody, which can reduce recreational users enjoyment of their experience and their choices of how often and where to recreate. Sediment and turbidity may also affect recreational anglers by reducing the distance over which fish can see lures, resulting in lower catch rates (Clark et al. 1985).

Birds, mammals, reptiles, and amphibians that consume aquatic plants, invertebrates, fish, and other aquatic organisms or otherwise utilize aquatic habitats for shelter and reproduction can also be affected by elevated sediment and turbidity levels in surface waters. Some species are sufficiently mobile that they can avoid impacted aquatic communities and seek substitutes, if available and accessible (Berry et al. 2003).

> *Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.*

Potential effects on biological resources through implementation of the Preferred Alternative are both beneficial and adverse. The beneficial effect as a result of this alternative is the increased water storage capacity of John Redmond Reservoir, which in turn would result in the availability of improved water quality and quantity for downriver releases during drought conditions in the region of the Neosho River. The ability to release better quality water and for a longer duration would substantially aid in the preservation of the fisheries and aquatic wildlife below John Redmond Dam, particularly the riverine mussels. This effect is considered indirect long-term, major and beneficial.

Potential adverse effect for this alternative, depending on the time of year the dredge activities are performed and the distance from the source of the dredge or construction equipment may include the potential to disturb wildlife as a result of the presence and noises of human and heavy equipment activity. This is a short-term, direct, minor impact. Increases in turbidity and potential for direct removal of fish may occur, but will be very localized directly at the cutter head of the dredge. Mobile fish species are expected to avoid the dredging operations and will relocate to other areas of the reservoir until dredging operations cease. Less mobile species may be adversely impacted by the hydrologic dredge activities. Removal of deposited sediment will also remove submerged aquatic vegetation and the existing, localized benthic community. This impact is expected to be direct and temporary as vegetation and benthic organisms will re-colonize the dredged areas after operations cease in that area of the reservoir.

Selection of sites for construction of CDFs and disposal of sediments will seek to avoid fill of wetlands and other Waters of the United States when feasible. CDF Site C was initially selected for sediment disposal but has since been excluded as a viable CDF site because of the presence of jurisdictional Waters of the United States (WOUS).

Construction of a temporary sedimentation basin which does not include the placement of fill into WOUS is exempted from a Clean Water Act Section 404 permit. Efforts will be made to also avoid construction of additional CDFs and associated outlet features below the ordinary high water elevation. If construction of CDFs impacts the hydrology of adjacent wetlands, the state of Kansas will ensure that measures are in place to avoid impacts to other aquatic resources. Such measures may include limiting excavation near the area; digging a dewatering trench and pumping the water back to the wetland; installing a cutoff wall; and limiting excavation to a time of year least likely to impact the wetland hydrology. Additional selection criteria related to biological resources include minimization or avoidance of impacts to local wildlife and other high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2.

If the slope of the streambanks at the point where the pipe crosses the Neosho River is too steep, trenches will be cut into the bank to lay the pipe at a more gradual slope. These trenches will be covered with the excavated materials and reinforced with riprap. A Clean Water Act Section 404 permit will be completed to address the impacts associated with the pipeline crossing. These impacts include temporary excavation and trenching of the banks. The slurry pipeline will lay passively on the floor of the Neosho River. Typical river gage height below John Redmond Reservoir even during low flow conditions is more than five feet. The slurry pipeline is 24” and therefore is not expected to significantly impact movement of aquatic organisms or fish. Any exposed slopes and stream banks will be stabilized and seeded immediately, replanted or provided equivalent protection against subsequent erosion. Additional erosion control measures will be implemented as needed such as silt screen barriers. Erosion control measures will remain in place and effective until sufficient vegetation coverage on exposed areas is established upon completion of the pipeline crossing. The slurry pipeline will cross roads either by jack and boring through the roads or will be fed through existing culverts. Existing culverts within the proposed project area are designed to pass storm events and do not connect streams; therefore, the pipeline is not expected to disrupt fish passage or other aquatic organisms.

Construction of CDF Site B will temporarily replace approximately 31 acres of farm ground and 5.5 acres of mixed native grasses and forbs with a sediment disposal basin. Following remediation of the site, the parcel will be replaced with approximately 36 acres of native grasses. Construction of CDF Site A will temporarily replace approximately 13 acres of mixed timbers with a variety of species, 22 acres of grasses, and 2 acres of terraces with a sediment disposal basin. Following remediation of the site, the parcel will be replaced with approximately 37 acres of native grasses. Construction of CDF Site E will temporarily replace approximately 40 acres of pastureland, 67 acres of row crops, and 16 acres of mixed grasses, forbs and cedar trees. Following remediation of the site, the parcel will be replaced with grasses and row crops such as soybeans and wheat. Species associated with the original habitat provided by CDF Sites A, B and E will also make use of the native grass habitat and planted crops following the remediation of the sediment disposal basins.

Numerous migratory bird species, including waterfowl and Neotropical songbirds, could potentially occupy areas of the proposed project. Impacts on migratory birds and their habitat from the Preferred Alternative would be similar to impacts on general wildlife resources due to construction of the CDF sites and operation of the dredge. Application of the selection criteria for future CDFs as described above will avoid or minimize impacts to migratory birds resulting from the Preferred Alternative.

To minimize the use of diesel fuel, the Kansas Water Office is pursuing the opportunity to use an electric dredge. Use of an electric dredge may result in a minimal increase in above-ground, single-phase electric lines to deliver power to the staging area. According to the USFWS, the frequency of electrocution and collisions and the associated outages has been dramatically reduced in areas where efforts have been made to retrofit or replace hazardous poles and mark lines. Mitigation measures to reduce potential impacts to biological resources are described in Section 5.4.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on biological resources would be similar to the impacts described under the preferred alternative. More water supply storage capacity would be restored under this alternative. This effect is considered long-term, major and beneficial. Similar to the preferred alternative, potential adverse impacts may include the potential to disturb wildlife. This effect is considered short-term, localized, and minor. Alternative #2 would require the construction of a greater number of CDFs, increasing the possibility of fill of wetlands and other Waters of the United States. While every effort would be made to avoid fill of jurisdictional waters, if fill was unavoidable, the impact would be considered long-term, major and adverse.

4.5 Threatened and Endangered Species

No Action Alternative

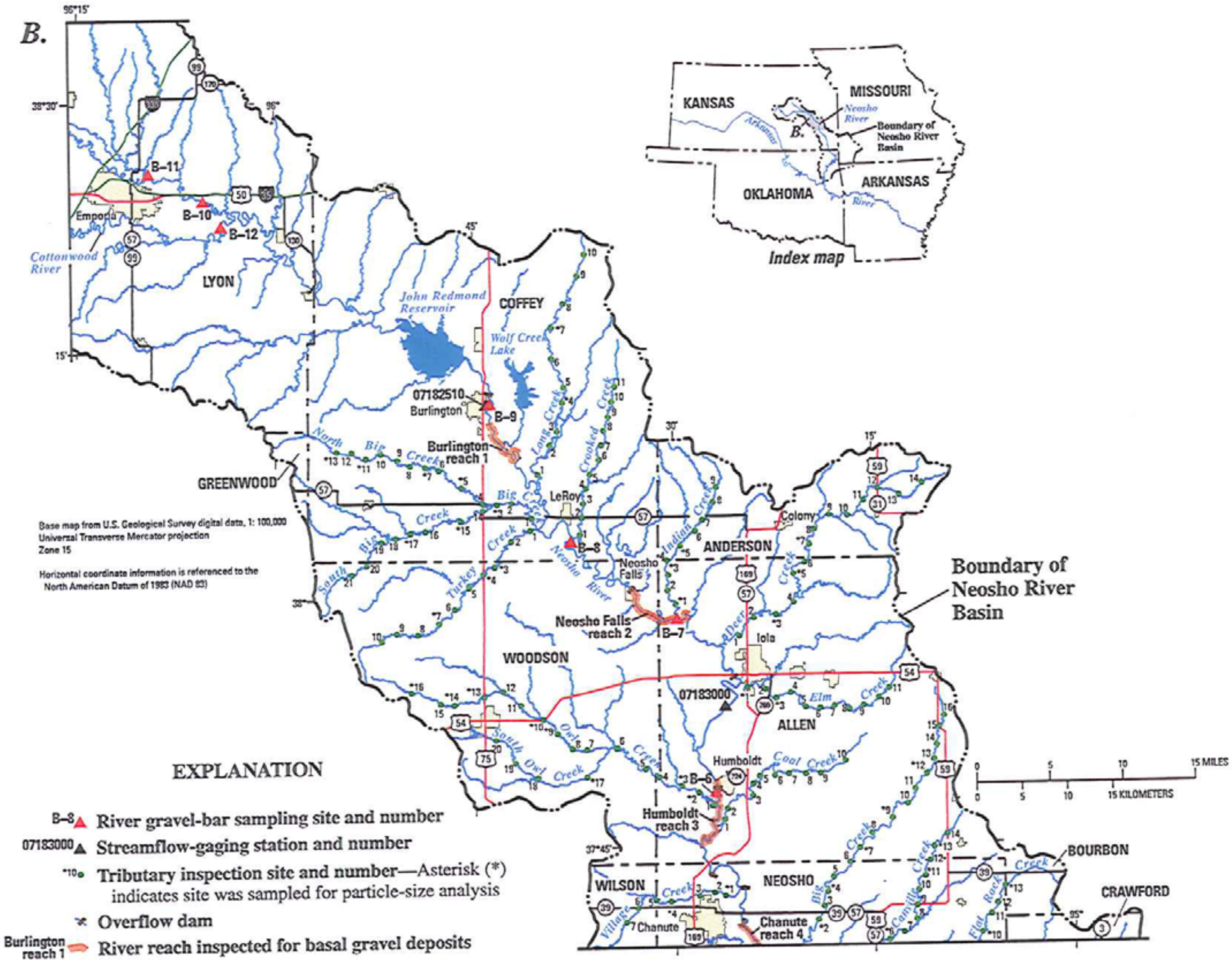
Potential effects on threatened and endangered species through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing conditions. There would be no short-term, insignificant or significant, beneficial or adverse effects on threatened and endangered species as a result of implementing the No Action Alternative. As the reservoir continues to accumulate sediment and the trapping efficiency of the reservoir decreases, more sediment will be passed through the reservoir (ASCE 2008). This could result in long-term, moderate to major and adverse effects on threatened and endangered species.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Federally Listed Species

The Neosho madtom, Neosho mucket mussel, and rabbitsfoot mussel occupy gravel beds below John Redmond Reservoir. The nearest gravel bed downstream of John Redmond Reservoir is approximately 5.3 miles from the dam, located near Streamflow-gaging station 07182510 (USGS 2004). Figure 4-2 shows the location of this gravel bed as denoted as B-9. Proposed dredging and disposal activities would not alter current operations of John Redmond Dam and Reservoir with regard to the magnitude, duration, or timing of water releases. Sediment quality sampling in the areas proposed for dredging indicate low or non-detectable levels of chemical constituents which could potentially be released to the reservoir water column or downstream through releases. Likewise, substantial increases in suspended sediments in the Neosho River downstream of John Redmond Dam are not anticipated owing to dredging-induced reservoir sediment re-suspension which should largely be confined to the immediate area of dredging, as well as operational flexibility regarding gates from which to make low flow releases.

Figure 4-2. Location of River Gravel Bar Sampling Sites in the Neosho River Basin.



Erosion and control measures will be employed at the staging area, as well as, during construction of the sediment disposal locations. A riparian corridor along the Neosho River at CDF Site B will remain intact to provide a set back from construction activities and the river. Pipelines throughout the project will be inspected multiple times each day. Should a leak develop in the pipeline, dredging activities will be shut down immediately and the pipeline will be repaired. Any material which may have leaked will be cleaned up and transported to the nearest CDF site. Where the pipe crosses the Neosho River, new, thicker walled pipe will be used to minimize the possibility of any leaks occurring in the river.

Based on analyses of potential impacts of dredging activities and coordination with the U.S. Fish and Wildlife Service (USFWS), proposed activities “may affect – not likely to adversely affect” the Neosho madtom, Neosho mucket mussel, and rabbitsfoot mussel. Proposed actions should have “no effect” on the western prairie fringed orchid. By letter dated September 16, 2013 (Appendix G), the USFWS concurred with these determinations, concluding coordination under Section 7 of the Endangered Species Act for the proposed action. All related correspondence is included in Appendix G. Coordination has been requested with the USFWS on the Fish and Wildlife Coordination Act. In August 2014, KWO informally shared information on CDF Site E with the Manhattan Area USFWS office. As additional areas are identified for sediment disposal, reinitiation of the

Section 7 consultation, and/or new consultation may be required, dependent on the action, site location, and severity of possible effects.

State Listed Species

Similar to the Neosho madtom, the Neosho Mucket Mussel, and the Rabbitsfoot Mussel occupy gravel beds below John Redmond Reservoir and prefer gravel bars with minimal silt, and riffles and runs with relatively clear flowing water. As described above for the Neosho madtom, no short-term or long-term major adverse effects are anticipated to state listed species and associated habitat as a result of the Preferred Alternative.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on threatened and endangered species would be similar to the impacts described under the preferred alternative.

4.6 Air Quality

Air quality for an area pertains to the condition of the ambient air whether the result of natural or manmade causes. Primary concerns regarding air quality are the impacts on ambient air quality conditions (NAAQS); impacts on attainment or non-attainment areas; and compliance with local, state and federal implementation plans, including air emission permits.

An emerging issue regarding water management strategies is climate change. There is continuing disagreement about the degree to which human activity has been responsible for change and how to best respond to change. Proposals to reduce greenhouse gas emissions have received most attention to mitigate climate change but adaptation is another strategy that is being considered. Widely agreed upon models forecast even more variability in weather and climate resulting in more extreme droughts and floods.

While none of the alternatives evaluated below may directly impact climate in Kansas, overall water management in the state recognizes the potential for greater introduction of sediment to the state's reservoirs if more frequent and extreme flood events were to occur and the value and importance of adequate reservoir storage if more extreme and prolonged droughts were to occur.

No Action Alternative

Potential effects on air quality that would result from the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing air emissions. There would be no short or long-term, major, beneficial or adverse effects on air quality as a result of the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The Preferred Alternative would result in potential short-term, direct, localized, minor, adverse effects on air quality owing to minor, temporary emissions from construction and dredging equipment. No long-term, major, moderate or minor, beneficial or adverse effects on air quality are anticipated as a result of implementing the Preferred Alternative.

Guidance and technical support on federal Greenhouse Gas (GHG) accounting and reporting has been developed by the White House Council on Environmental Quality (CEQ) that establishes Government-wide requirements for measuring and reporting greenhouse gas (GHG) emissions associated with Federal agency operations. Given the short-term, localized and minor adverse effects on air quality resulting from the Preferred Alternative, no significant contributions to GHG emissions are anticipated; however, the Guidance will be referred to throughout the project for appropriate reporting.

The primary sources of air emissions will be the various motors and equipment used to run the dredge, the dewatering equipment, and pumps to transport the sediment through the slurry pipeline. Diesel engines are common to the construction equipment that will be used during the construction and restoration of the CDF sites. Emission levels will vary according to make and model of engines, maintenance, equipment load and speed, and other vehicle conditions. The EPA publishes the AP-2, Compilation of Air Pollutant Emission Factors, as a compilation of emission factors and process information for more than 200 air pollution source categories (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf). Chapter 3.3 of the Compilation describes emission factors and the effect of various emission control technologies on gasoline and diesel industrial engines.

No air emissions inventory has been completed at John Redmond Reservoir.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

Alternative #2 would result in potential short-term, localized, minor, adverse effects on air quality. Given the extended duration of activities, the temporary impacts to air quality would be greater than the Preferred Alternative. No long-term, major, moderate or minor, beneficial or adverse effects on air quality are anticipated as a result of implementing Alternative #2.

4.7 Aesthetics

Aesthetics for a location is the product of the appearance of an area to an individual and is highly subjective. Aesthetics are often measured by the visual characteristics of a site or the visibility a location may offer on another site. Potential impacts pertaining to aesthetics include effects of an action on aesthetic character and visual resources within a site or surrounding area. The methodology for determining the significance of an action's impact was based on the identification of sensitive viewsheds, review of site photographs and evaluation of topographic alterations. Determination of the significance of an action is based on the extent of the alteration to landforms, vegetation, natural appearance and the project's increased visibility.

No Action Alternative

Potential effects on aesthetics through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing site conditions for the short-term. There would be no short-term, major, moderate or minor, beneficial or adverse effects on aesthetics as a result of implementing the No Action Alternative. However, there would be long-term, moderate, adverse impacts with no removal of sediment, as increased sediments and turbidity reduce the aesthetics of a waterbody, which can reduce recreational users enjoyment of their experience and their choices of how often and where to recreate. Sediment and turbidity may also affect recreational anglers by reducing the distance over which fish can see lures, resulting in lower catch rates.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The dredging methodology may result in potential effects on aesthetics, particularly in the area of staging and hydraulic dredge activities, as well as, placement of dredge materials. Depending on the selected location for the excavated sediments, there would be a potential for effects on aesthetic character and visual resources through the changing of the topography in the vicinity of John Redmond Reservoir. In addition, dredging activities would likely result in the presence of heavy construction equipment and trucks. Odor and the increase in water-born insects such as mosquitos was identified as an aesthetic concern during the PEIS public comment period; however any odor will be localized to the point of discharge into the CDF and will be separated by distance to any habitable structures. Based on experience from similar scale projects in the Midwest, no increase in water-born insects such as mosquitos is anticipated (Personal Conversation Great Lakes Dredge and Dock, LLC, June 2014).

Each potential private property site is being evaluated, and CDF's designed, with surrounding properties in mind. After the placed dredge material has dried adequately, the stockpiled topsoil and levees will be placed on top of the dredged material and contoured to a shape that supports the expected use of the landowner and allows for appropriate drainage.

Effects on aesthetics through the implementation of the Preferred Short-term, localized, moderate to major, adverse impacts to aesthetics are expected during the dredging process, but would dissipate as dredging was discontinued at the completion of the project. Long-term, direct, moderate, beneficial impacts to aesthetics are expected as a result of implementing the Preferred Alternative.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to original capacity

The effects of Alternative #2 on aesthetics would be identical to those of the Preferred Alternative. Therefore, Alternative #2 would result in long-term, moderate, beneficial impacts on aesthetics.

4.8 Prime or Unique Farmlands

The Kansas Water Office coordinated with the USDA NRCS Offices in Salina and Burlington, KS to evaluate farmland within the project area. The Kansas Water Office completed the USDA Farmland Conversion Impact Rating – Form AD 1006 (Appendix E). NRCS staff assisted KWO in the review of this information, assessment of the impacts the alternatives as described below and identification of mitigation alternatives as described in Section 5.7. Coordination between KWO and NRCS will be ongoing as future potential CDF Sites are identified.

No Action Alternative

Potential effects on prime or unique farmlands through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing conditions. There would be no short or long-term, major, moderate or minor, beneficial or adverse effects on prime or unique farmlands as a result of implementing the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The Preferred Alternative would result in potential effects on prime or unique farmlands; particularly in the area of the placement of dredge materials. Due to most of the Neosho River Valley being classified as prime or unique farmlands, the selected location for the dredge materials would likely bury prime or unique farmlands.

Soil types occurring on potential sediment disposal site areas were summarized by Farmland of Statewide Importance, Prime Farmland if drained, and Prime Farmland (Appendix E). Disposal of sediment on the federal property would impact approximately 29.6 acres of Prime Farmland if drained soils and 24.2 acres of Prime Farmland.

The excavation and piping of lake sediments could result in a long-term, direct, minor, adverse effect because of the abundance of additional prime and unique farmlands in the area. The excavation and piping of lake sediments could also result in a long-term, major, beneficial effect because of the improvement of soil quality from the placement of sediment on the farmland, such as occurs in a flooding event that would, when eventually dried out, increase crop production.

Placement of the material will not adversely affect the soil profile that will be utilized by the expected plant population root zone. In addition, to maintain land productivity after placement of dredged material, existing topsoil will be removed to a depth of 1 – 2 feet based on individual site conditions. A portion of this topsoil will be used to construct CDF levees where soils are suitable. The remaining topsoil will be stockpiled on site for the duration of the dredge material placement and dry down. After the placed dredge material has dried adequately, the stockpiled topsoil and levees will be placed on top of the dredged material and contoured to a shape that supports the expected use of the landowner and allows for appropriate drainage.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

Similar to the Preferred Alternative, the impact of Alternative #2 on prime or unique farmlands will depend on the selection of sites for dredge materials. For the purposes of quantifying potential impacts, soil types occurring in a four-mile buffer around John Redmond Reservoir were summarized by Farmland of Statewide Importance, Prime Farmland if drained, and Prime Farmland (Appendix E). Based on an estimate that an additional 450 acres may be needed on non-federal property for sediment disposal, it is estimated that use of sites on non-federal property would impact approximately 81.2 acres of Farmland of statewide importance, 33.4 acres of Prime Farmland if drained soils and 329.7 acres of Prime Farmland. Alternative #2 would either result in long-term, minor, adverse effect or long-term, moderate, beneficial effect.

4.9 Socioeconomic Resources

Potential socioeconomic impacts of the Proposed Action and alternatives include effects on economic and demographic conditions, recreation, land use, transportation and agricultural activities in the Neosho River basin below John Redmond Reservoir.

Socioeconomic issues identified during scoping and agency coordination include the following:

- Effects on recreation resources on John Redmond Reservoir, FHNWR, and OCWA
- Economic and land-use effects of dredging
- Effects on end users of water sold to the KWO under the No Action Alternative

4.9.1 Economic and Demographic Conditions

No Action Alternative

Under the No Action Alternative, the role played by John Redmond Reservoir in local economic and demographic conditions would remain unchanged during normal rainfall years. However, during severe drought years, direct effects of the No Action Alternative would include potential loss of a portion of the water supply for the CNRWAD and for Westar Energy's WCGS. Therefore, the long-term economic and demographic impact of the No Action Alternative would be major and adverse.

The approved reallocation of flood control storage to the conservation pool storage through a two foot rise in the conservation pool to 1041.0 recovered about 17,300 acre-feet of conservation pool storage. Continued siltation of John Redmond Reservoir is expected to reduce the conservation pool by about 800 acre-feet per year. CNRWAD contracts for storage of 10,000 acre-feet in Marion Lake, Council Grove Lake and John Redmond Reservoir. John Redmond Reservoir stores 3,500 acre-feet of the total. The reduction of 1.2 percent of John Redmond Reservoir storage capacity would represent a loss of about 60 acre-feet per year of CNRWAD storage from the reservoir. The 19 municipalities and industries in the district are directly dependent upon water provided from assurance storage during times of low stream flow. In severe drought years, this reduction in water storage could result in loss of water supply for communities, rural users, and industries in CNRWAD. Depending on the severity and duration of the drought, indirect impacts could include economic distress for commercial and industrial users, hardship for residential users, and a reduction in the amount of water available for fire suppression and other municipal purposes.

The conservation pool at John Redmond Reservoir serves to meet the annual demand of Westar Energy by supplementing the cooling lake at its WCGS with as much as 29,682 acre-feet of stored water. This supplemental source of water is necessary because evaporation in most years is greater than inflow in the WCGS cooling lake. The loss of 1.2 percent of conservation pool per year would reduce the amount available to meet the WCGS water supply contract by approximately 550 acre-feet per year. Although WCGS has not used its full water allotment since filling the cooling lake, it has used as much as 75 percent (2012). The reduction in water available for cooling purposes at WCGS could reduce Westar Energy’s ability to operate the plant during years when additional water capacity is needed.

Effects of the No Action Alternative on area economic and demographic conditions would be short or long-term, major, and adverse depending on the severity and duration of a drought.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

For this assessment, estimated costs for dredging vary widely depending on the project sponsor, location and scale of the activity. In 2010, the state of Kansas and the City of Horton in Brown County, KS removed 1,000,000 cubic yards of sediment using hydraulic dredging at a cost of about $6.60 per cubic yard. Estimates provided in a draft dredging assessment of John Redmond prepared by the Corps in 2009 are much higher, approximately $36 per cubic yard. Actual costs could vary depending on such factors as economies of scale, dredging methods, location of the disposal area for dredged material and composition of the sediment. In January 2013, the KWO posted a request for proposals for the design-dredge of the reservoir. Responses to the bid solicitation provided an estimated cost of less than $5.00 per cubic yard for the dredging at John Redmond reservoir. All financing for the dredging at John Redmond Reservoir would be with non-federal funds.

The Preferred Alternative would result in additional economic activity in Coffey and Lyon Counties, in terms of direct and indirect employment and income. A local contractor has been selected to eventually conduct the earthwork associated with the proposed construction of the CDFs and a Kanas-based company has been selected to provide the engineering, design and permitting. Direct employment and income will occur because local contractors and/or workers were selected to perform portions of the dredging work. Indirect employment and income would result from local expenditures by dredging contractors and employees for goods and services.

Depending on the location of the sediment disposal sites, the Dredge John Redmond Reservoir Alternative has the potential to affect land use and transportation conditions in Coffey and/or Lyon Counties. Landowners of sediment disposal sites will receive financial compensation for temporary use of their land, offsetting a portion of the potential economic loss while the property was out of production. Dredging activities could negatively affect recreation activities on John Redmond Reservoir, FHNWR, and OCWA by disturbing fish and wildlife and diminishing the quality of the recreation experience. A reduction in recreation visits would have a corresponding negative effect on the local tourism and recreation economy. These short-term impacts would be localized and cease upon completion of dredging activities. In the long term, impacts on recreation activities would be positive, as water depth to bottom of the lake would increase, providing additional boating access.

The effects of this alternative on area economic and population conditions would likely be beneficial although there could be some minor reduction in recreation-related spending in the county. If local contractors and employees were hired, this alternative would be significantly beneficial to the area economy in the short term. The Preferred Alternative would result in short-term, indirect, moderate to major, beneficial effects on economic and demographic conditions.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on economic and demographic conditions would be the same as the Preferred Alternative. Therefore, Alternative #2 would result in short-term, moderate to major, beneficial effects on economic and demographic conditions.

4.9.2 Land Use

No Action Alternative

The No Action Alternative would not affect land use conditions as described in Section 3.8.2. There would be no short or long-term, minor, moderate or major, beneficial or adverse effects on land use resources as a result of implementing the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Under the Preferred Alternative, land use associated with John Redmond Reservoir would remain similar to existing conditions with these possible exceptions. A relatively small portion of land would be required for a staging area during dredging operations. Staging operations would displace approximately two to three acres of existing land use for the duration of dredging operations, after which the land would be reclaimed.

Dredging would require land for disposal of sediment. Potential sites for sediment disposal on private property will be evaluated for feasibility based on the following criteria: (1) proximity to dredging location in John Redmond Reservoir, (2) avoidance of impacts to gas and utility lines, (3) a topography that minimizes CDF cell wall height, (4) avoidance of Waters of the U.S., (5) minimization or avoidance of impacts to local wildlife and other high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2, (6) sufficient distance (outside 2-mile buffer) of Coffey County airport and (7) cost for compensation. Sites meeting the criteria will be evaluated for historical and cultural resources and potential impacts to threatened and endangered species and habitat. Under the Programmatic approach of this EIS, future disposal sites selection will be coordinated with relevant local, state and federal agencies, including, but not limited to, the U.S. Army Corps of Engineers, Tulsa District Regulatory Office, USFWS Kansas Ecological Services Field Office, Kansas Department of Wildlife Parks and Tourism, Kansas Department of Health and Environment and U.S. Environmental Protection Agency. Future sites will be evaluated through the NEPA process or permit process, or both, whichever is appropriate.

Land use conditions of the CDF Sites A, B and E would change under the Preferred Alternative. Sediment disposal on both of these sites would result in vegetation removal and recontouring of the site. CDF Site A is currently a mix of grass, forbs, shrubs and cedar trees. CDF Site A is not currently under a fee agreement or in productive use. CDF Site B which is currently under a fee agreement between the federal government and a private landowner is in cropland. CDF Site E is currently a mix of grasses, forbs, cedar trees, row crops and pastureland. Use of these parcels would temporarily change to a dredge disposal facility. Following sediment disposal, plans for both CDF Sites A and B include restoration to native prairie grasses (see Appendix H for potential restoration plant list provided by USACE). CDF Site E will be returned to the mix of grasses, row crops and pastureland. Potential privately-owned properties for sediment disposal have been identified but no formal agreements with landowners have been negotiated. Sediment disposal would displace existing land use for the duration of dredging activities and perhaps permanently, depending on the reclamation plan for the site. Potential reclamation activities could include return to agricultural production, construction of wetlands, and restoration of native prairies.

In addition to the acres identified for CDF Sites A, B and E, approximately 320 additional acres will be needed for CDF sites in the first five years of dredging. This represents less than 1.5% of the land within a four-mile radius of the dredging project. If the dredging action were to continue beyond the initial five years and remove a quantity greater than three million cubic yards, approximately 2,000 additional acres, for a total of about 2,500 acres, may be needed for CDF sites over next 30 years to maintain the 55,000 acre feet of storage in John Redmond Reservoir. This represents approximately 7% of the total land available within a four-mile radius of the dredging project.

Land use effects of the Preferred Alternative would be localized, direct, short-term, minor, and adverse during the dredging activities. Reclamation of CDF Sites A and B to native prairie would have long-term beneficial impacts.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to original capacity

Similar to the Preferred Alternative, the effects of Alternative #2 on land use would be short-term and long-term, minor, adverse or beneficial depending on the reclamation activity.

4.9.3 Recreation

No Action Alternative

Potential effects on recreation resources associated with the No Action Alternative would be limited to a continued deterioration of boating conditions, as the depth to bottom in portions of the reservoir would continue to be reduced by siltation. Fish population changes would reduce the size of recreational sport harvest, in the case of fish, by lowering both the total abundance of organisms and their individual size. These changes negatively affect recreational anglers and subsistence anglers. Sediment and turbidity may also affect recreational anglers by reducing the distance over which fish can see lures, resulting in lower catch rates. The effect of the No Action Alternative on recreation resources would be long-term, major and adverse.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Impacts on recreation resources and activities would result from noise and activity in the vicinity of the dredge site, staging area, disposal site and along the haul route. The noise and associated activities may displace wildlife and result in a diminished recreation experience for some users. Some recreation facilities and wildlife habitat could be temporarily displaced by the staging area, haul route and sediment disposal sites. Staging operations would displace approximately two to three acres of existing land use and dredging operations would occupy about 10 reservoir surface acres for the duration of dredging operations. The Preferred Alternative would have a short-term, localized, minor, adverse effect on recreation resources.

Increased water depth resulting from the dredging will have long-term, indirect, localized, positive effects to lake recreation uses such as boating and water skiing.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to original capacity

The effect of Alternative #2 on recreation would be the same as the Preferred Alternative. Therefore, Alternative #2 would have a short-term, localized, minor, adverse effect on recreation resources.

4.9.4 Economic Effects of John Redmond Reservoir

No Action Alternative

Under the No Action Alternative the economic effects of John Redmond Reservoir would be similar to the descriptions in Section 3.8, with the exception of those associated with water storage and supply. The diminished capacity of the conservation pool would mean that the USACE could not guarantee the fulfillment of its water storage and supply contracts with the KWO. In severe drought years, when full water supply commitments are required, the member communities, rural water districts, and industrial users in the CNRWAD could experience economic losses from the 1.2 percent reduction in committed water supply. Westar Energy could also experience economic losses associated with the 25 percent reduction in water to supplement the cooling lake at WCGS. The effects of the No Action Alternative on John Redmond Reservoir would be short or long-term, major, and adverse depending on the severity and duration of a drought.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The Preferred Alternative would increase economic activity in Coffey and Lyon counties from the expenditures associated with project cost. The amount accruing to the local economy would depend on the number of local contractors and employees hired to perform portions of the project and on the amount of goods and services contractors and employees obtain from local vendors. These economic benefits could be offset by a reduction in recreation activities related to impacts of dredging activities on wildlife and on the recreation experience. However, in the aggregate, the effects of the Preferred Alternative would be short-term, indirect, major and beneficial.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The economic effect of Alternative #2 would be the same as the Preferred Alternative. Therefore, Alternative #2 would result in short-term, major and beneficial economic effects.

4.9.5 Land and Crops within the Floodplain Downriver from John Redmond Reservoir

According to the scoping record and subsequent interviews conducted for the Pool Raise EIS, the primary concern raised at that time by residents downriver of John Redmond is the loss of flood pool capacity, which would result from a raise in the conservation pool level. However, these concerns were not voiced during the scoping process of the Removal and Disposal of Sediment and Restoration of Water Storage PEIS. In fact it was noted that areas below the John Redmond Dam would be more at risk for flooding if the sediment was not removed from the Reservoir.

No Action Alternative

The potential for flooding of lands within the floodplain between John Redmond Reservoir and Grand (Pensacola) Lake would be unaffected by the No Action Alternative. There would be no short or long-term, minor, moderate or major, beneficial or adverse effects on land or crops within the floodplain downstream from John Redmond Reservoir as a result of the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Compliance with the laws and regulations as described below will ensure the effects of the Preferred Alternative on lands within the floodplain between John Redmond Reservoir and Grand (Pensacola) Lake would be negligible.

The proposed sediment removal project will require construction of several confined disposal facilities (CDF) to store and dewater dredge material. These facilities will be located partially in Zone A, Special Flood Hazard Areas (SFHA) identified by FEMA. By definition, these areas are subject to inundation by the one percent annual-chance flood event generally determined using approximate methodologies.

K.S.A. 12-766 authorizes cities and counties in Kansas to adopt floodplain zoning ordinances, to meet the requirements of the National Flood Insurance Program (NFIP.) At this time, Coffey County does not participate in the NFIP; therefore local floodplain permits are not required in unincorporated areas of the county. Local floodplain development permits will not be required for the proposed CDF sites.

K.S.A. 24-126 makes it unlawful to construct fills and levees without prior approval from the Kansas Department of Agriculture, Division of Water Resources (DWR). A DWR floodplain fill permit will be required for each CDF site located in the mapped floodplain. The permit application must include a geometric analysis to determine the impacts of the project on flood elevations. DWR regulations allow up to a one foot increase in the base flood elevation as a result of levees and fills. If the impact exceeds this standard, the applicant must demonstrate that the excess rise is contained within property or easements controlled by the applicant. If this standard cannot be met, the CDF design will be adjusted to reduce the impacts to flood elevations. Prior to construction, any CDFs located in the Zone A SFHA will be evaluated for impacts to downstream structures. A steady-state one dimensional hydraulic analysis was conducted to assess the potential impacts of dredge disposal, with a focus on CDF Sites B and E. The results of the model showed very minimal to no impacts to the floodplain in the vicinity of the proposed CDF structures.

The proposed sediment removal project will require construction of several confined disposal facilities (CDF) to store and dewater dredge material. K.S.A. 82a-301 makes it unlawful to construct dams or stream obstructions without prior approval from the Kansas Department of Agriculture, Division of Water Resources (DWR). Each CDF site will require a permit determination from DWR.

A dam is defined as an impoundment with a height of 25 feet or more, or a height of 6 feet or more with a stored volume of 50 acre-feet or more at the auxiliary spillway. An exemption may apply if the dam is classified as a low hazard dam based on downstream roadways and buildings. If a dam permit is required, DWR has identified a list of regulatory requirements that will be waived for these facilities. Each CDF site will be required to meet these standards:

- Structure would meet the classification of Hazard Class A (low hazard) dam
- CDF walls would be no steeper than 2.5:1, less than 20 feet in height, and with a minimum top width of 10 feet
- Outlet discharge channel will be designed and remain adequate and stable
- Storage would be adequate for 100-year rainfall over the area covered

- Storage sites will be reclaimed in less than 5 years

If a structure does not require a dam safety permit, a stream obstruction permit will be required if the upstream drainage area exceeds one square mile. None of the proposed CDF sites will obstruct streams of this size.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

Similar to the Preferred Alternative, compliance with the laws and regulations will ensure there would be no short or long-term, minor, moderate or major, beneficial or adverse effects on land or crops within the floodplain downstream from John Redmond Reservoir as a result of Alternative #2.

4.9.6 Noise

No Action Alternative

The No Action Alternative would not affect existing noise conditions. There would be no short or long-term, minor, moderate or major; beneficial or adverse effects on noise conditions as a result of the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Operation of the hydraulic dredge at John Redmond Reservoir would result in temporary increases in ambient noise levels for the duration of dredging operations. Typical dredge equipment set up and operations may include the following noise-generating equipment: tug boat, work barge, hydraulic dredge, support crews, and generators. Construction activities associated with the proposed CDF sites and pipeline construction would result in temporary increases in ambient noise levels for approximately eight (8) months while the sites are being constructed. Typical construction equipment for the CDF sites and pipeline construction may include backhoes, clam shovels, compactors, excavators, and boring hydraulic jacks. Default noise emission reference levels within 50 feet of the typical equipment associated with the preferred alternative are described in the table below.

Equipment Description	Reference Sound Level per Unit (dBA)[1]	Equipment Description	Actual Measured L_{max} @ 50 feet (dBA, slow)[2]
Tug Boat	87	Backhoe	78
Dredge	77	Clam Shovel	87
Support Crews	81	Compactor	83
Generators	63	Excavator	81
		Boring Hydraulic Jack	82

[1] Epsilon 2006; [2] USDOT 2006

For comparison noise levels are commonly compared to typical noise sources encountered and are shown in the table below.

Sound Source	Pressure Decibels dBA[1]
Normal conversation	55-65
Phone	66-75
Lawn mower	88-94
Vacuum cleaner	84-89

[1] Typical noise levels; Noise Pollution Clearinghouse Online Library

The effects of this alternative on noise conditions could occur both within and outside of federal lands, and would be short-term, localized, minor and adverse.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The effect of Alternative #2 on noise conditions would be similar to the Preferred Alternative, but would likely be longer in duration. Therefore, the effects of this alternative on noise conditions would be medium-term, localized, minor and adverse.

4.9.7 Transportation

No Action Alternative

The No Action Alternative would not affect existing area transportation conditions. Consequently, transportation conditions in and adjacent to John Redmond Reservoir, FHNWR and OCWA would remain essentially as they are today under this alternative. There would be no short or long-term, insignificant or significant, beneficial or adverse effects on transportation conditions as a result of the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The effects of the Preferred Alternative on area transportation conditions would be dependent on the dredging equipment and the selection of a sediment disposal site. Mobilization and assembly of the dredging equipment will require several truckloads to deliver the equipment to the staging site. During mobilization and construction of the disposal sites an increase in the number of vehicles on Embankment Road, US Highway 75 and the county roads below the dam to the disposal sites would be expected. In general, road crossings for the slurry pipeline will either be placed through culverts or over the road surface (Figure 2-10). Where the pipe crosses Embankment Road between the dredging site within the reservoir and the CDF, the roadway will be bored and jacked with a 24” casing. Jacking/boring pits will be located at a minimum distance from the centerline of Embankment Road and kept to the minimum size necessary. Boring or tunnel operations will be conducted in such a manner as not to be detrimental to the road. If excessive voids or too large a bore hole is produced during casing or pipeline installation, or if it is necessary to abandon a bored or tunneled hole, prompt remedial action will be taken by the construction contractor and USACE project staff will be notified immediately. All voids or abandoned holes caused by boring or jacking will be filled by pressure grouting. The hole diameter resulting from the bored installations will not exceed the outside diameter of the casing by more than two inches. The remaining road crossings will be cut and covered whenever possible with the road surface returned to original condition. If placed over the road surface, the pipe will be covered to allow vehicle passage. The proposed pipeline crosses seven roads between the dredging site within John Redmond Reservoir and CDF Sites A, B, and E. Kansas Water Office staff have and will continue to coordinate with the Coffey County Engineer and Zoning Administrator to discuss the pipeline route.

To minimize or avoid an increase in wildlife attraction near Coffey County airport, the selection criteria for future CDF Sites will include a sufficient distance (outside 2-mile buffer) of the airport. CDF Sites A, B and E are 4-5 miles away from the airport. Given the existing 8,000 acres of open water and adjacent Flint Hills Wildlife Refuge, it is unlikely that the construction of the CDFs will increase wildlife attraction near the airport; however, the selection criterion has been added as extra caution. Any future CDF Sites within a five mile radius of the airport will be coordinated with the Federal Aviation Administration (FAA) and Coffey County airport per Advisory Circular 150/500-33b.

The effects of this alternative on transportation conditions could occur both within and outside of federal lands, and would be short-term, direct, localized, minor and adverse.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

Similar to the effects of the Preferred Alternative, the effects of Alternative #2 on transportation conditions would be short-term, direct, localized, minor and adverse.

4.9.8 Environmental Justice (EO 12898)

Executive Order (EO) 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations" was published in the *Federal Register* (59 FR 7629) (1994). EO 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low- income populations (defined as those living below the poverty level).

The potentially affected areas for the Proposed Action and No Action Alternative include Coffey and Lyon Counties, and counties in the Neosho River drainage below John Redmond Reservoir, including Allen, Anderson, Bourbon, Cherokee, Crawford, Labette, Neosho, Wilson and Woodson.

Table 4-2 displays minority and poverty status for the state of Kansas and potentially affected counties. The percentage of racial minorities in every affected county except Lyon County is well below the statewide average for minority populations. In Lyon County, the minority population is concentrated in the City of Emporia. In contrast, the percentage of people living below the poverty level in every affected county, except Coffey County, is greater than the statewide percentage.

The conclusion of this assessment is that the No Action Alternative, Preferred Alternative and Alternative #2 would not result in significant adverse effect for human populations and therefore minority and low income persons would not be disproportionately affected by any of the alternatives.

Table 4-2. Minority and Persons Living Below Poverty Level: State of Kansas and Counties in the Neosho River Watershed

	Percent Minority (2010)	Percent Below Poverty Level (2010)
State of Kansas	16.2	13.5
Allen County	6.7	18.4
Anderson County	2.8	14.6
Bourbon County	7.0	15.7

	Percent Minority (2010)	Percent Below Poverty Level (2010)
Cherokee County	9.7	20.1
Coffey County	3.5	9.7
Crawford County	8.8	19.2
Labette County	12.0	17.1
Lyon County	16.5	19.6
Neosho County	5.9	16.4
Wilson County	4.4	16.0
Woodson County	4.5	17.2
(Source: US Bureau of the Census: 2010 Decennial Census and Small Area Income and Poverty Estimates Program, 2010)		

4.9.9 Protection of Children (EO 13045)

EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks," was signed during 1997. The policy of the EO states that each federal agency:

1. Shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.
2. Ensure that its policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks.

EO 13045 defines environmental health risks and safety risks as "… risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest, such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to."

No health and safety impacts resulting from exposure to environmental contamination or hazardous materials have been identified for the No Action Alternative. Potential disposal sites identified at this time are not located near residences, schools or other areas frequented by children. Therefore, it is not anticipated that the Preferred Alternative or Alternative #2 would have adverse effects on children.

4.10 Cultural Resources

No Action Alternative

The No Action Alternative would not affect existing cultural resources. There would be no short or long-term, insignificant or significant, beneficial or adverse effects on cultural resource conditions as a result of the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

The proposed John Redmond Reservoir dredging project has the potential to impact cultural resources. Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) requires agencies to evaluate the impacts of federal undertakings on historic properties, which include prehistoric and historic archaeological sites, and historic standing structures. Section 106 requires the identification of all historic properties, and emphasizes an evaluation of eligibility for listing on the National Register of Historic Places (NRHP).

Agencies must then determine which historic properties (those eligible for listing on the NRHP) will be adversely impacted. Section 106 requires that agencies resolve adverse effects to these properties. Plans for resolving adverse effects are determined through consultation with the Kansas State Historic Preservation Office (SHPO), potentially the Advisory Council on Historic Preservation (ACHP), and appropriate and interested Native American tribes and other interested parties.

In order to comply with Section 106 requirements, Tulsa District has entered into Section 106 consultation with the Advisory Council on Historic Preservation, Kansas State Historic Preservation Office, Kaw Nation of Oklahoma, Osage Nation of Oklahoma, and Wichita and Affiliated Tribes of Oklahoma. Tulsa District is in the process of drafting and executing a Programmatic Agreement (PA) with these signatories, which will guide compliance with Section 106. The PA will outline Tulsa District responsibilities in the identification and evaluation of historic properties, and the resolution of adverse effects to historic properties if necessary. Copies of cultural resources correspondence and a copy of the draft PA are included in Appendix D of this FPEIS.

An archeological survey will be conducted prior to the development of final designs for each CDF site. All criteria included in the PA will be met and will occur before any land disturbing activities occur.

No short or long term, beneficial or adverse effects are anticipated due to the preferred alternative because efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources. Site specific investigations and further literature review may be needed. The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

Similar to the effects of the Preferred Alternative, efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources under Alternative #2.

4.11 Hazardous, Toxic, or Radioactive Wastes

Environmental concerns pertaining to hazardous, toxic, or radioactive wastes consist of impacts to storage and disposal of these materials: spill contingency, waste management, pollution prevention; asbestos, radon, lead-based paint, PCBs, and radioisotopes; ordinance use and disposal; and storage tanks.

No Action Alternative

Potential effects on hazardous, toxic or radioactive wastes through the implementation of the No Action Alternative are precluded by the fact that the No Action Alternative for John Redmond Reservoir does not involve any activities that would contribute to changes in existing conditions. There would be no short or long term, minor, moderate or major, beneficial or adverse effects on hazardous, toxic or radioactive wastes as a result of implementing the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Potential effects on hazardous, toxic, or radioactive wastes through the implementation of the Preferred Alternative would be a result of the disturbance of lake sediments. Being located within an agricultural region, John Redmond Reservoir has the potential of having pesticide and fertilizer contamination of sediments; however, no pesticides, herbicides or fungicides were detected from a composite sample collected and analyzed from the first-phase dredging location within the reservoir (Figure 2-1, Appendix F) The two federal properties identified for sediment disposal and other areas near the reservoir suitable for sediment disposal are rural and have no history of industrial use of waste disposal. All potential disposal sites will be evaluated prior to construction to ensure no signs of industrial waste are present.

Staging for equipment assembly and mobilization will be conducted at the Dam Site Area and will include activities that involve the storage and use of petroleum products. Appropriate storage and adherence to an adequate plan of operations including a spill control plan will minimize any effects of potentially hazardous materials at the staging site.

Implementing the Preferred Alternative would have no short-term or long-term, minor, moderate or major, adverse or beneficial effects on hazardous, toxic, or radioactive wastes.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

As with the Preferred Alternative, implementing Alternative #2 would have no short-term or long-term, minor, moderate or major, adverse or beneficial effects on hazardous, toxic, or radioactive wastes.

4.12 Cumulative Impacts

Cumulative impacts on environmental resources result from incremental impacts of an action when combined with past, current and other reasonably foreseeable future actions. Cumulative impacts can result from individually insignificant, but collectively significant, actions undertaken over the same period of time by individuals or various agencies (federal, state, and local). In accordance with NEPA, consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed or anticipated to be implemented in the near future is required.

For purposes of this PEIS, the period of analysis for the Preferred Alternative is described for three general phases or temporal stages: (1) initial period of detailed, site-specific analysis for known conditions at this stage of project development, (2) additional dredging to be conducted during the first five years of dredging activity but involving yet-to-be-identified disposal locations, and (3) full sustainment of the preferred alternative through the year 2045. The initial period of analysis addressed by this PEIS encompasses the first 12 to 17 months of activity to include the deployment of equipment to the staging area, placement of the slurry pipelines, construction of the first three CDF sites (CDF Sites A, B and E), removal of approximately 600,000 cubic yards of sediment, and sediment disposal in CDF Sites A, B, and E. Related activities to follow within approximately 5 years of initial dredging include dewatering and remediation of CDF Sites A, B and E once materials have sufficiently dried. Future activities as project planning progresses are anticipated to include identification and construction of additional CDF sites on private property and the removal and disposal of 2.4 million cubic yards of additional sediment. These additional activities outside of the initial round of analysis will likely be accomplished within the first five years of dredging activity and will be reviewed in future tiered NEPA documents. Phasing of sediment removal through dredging would be expected to continue at appropriate intervals and frequency through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Additional NEPA documentation will be prepared and distributed for review at intervals appropriate for corresponding future proposals.

All additional activities outside this initial review of known project specifics will be evaluated through the NEPA process by additional tiered NEPA documents (EAs or EISs) off this PEIS as future project details become available. The state of Kansas will continue to coordinate the construction of the CDFs, utility lines, and other appurtenances associated with the CDFs to determine if additional Department of Army authorization is required. When considering the temporal scope of cumulative impacts, thirty years of maintenance and monitoring is considered within the period of analysis.

Cumulative impacts due to dredging and sediment disposal are anticipated to be minimal. Although minimal growth and development are expected to continue in the vicinity of John Redmond Reservoir, cumulative adverse impacts on resources would not be expected when added to the impacts of activities associated with the Preferred Alternative, Alternative #2 or No Action Alternative. The cumulative effects analysis has been evaluated on a resource-specific basis as described below. Unless described otherwise in the text below, activities that may contribute to the cumulative effects of each resource area are characterized within a 4-mile buffer of John Redmond Reservoir. Where deemed appropriate, the geographic area was extended to encompass the watershed above John Redmond Reservoir or the Neosho River downstream of the reservoir where the combined impacts of the project and other actions may result in cumulative impacts unique to the resource being described. Temporally, the cumulative effects analysis considered activities within the past 10 years, current activities, and activities that may occur within the next 30 years.

4.12.1 Air Quality

The Preferred Alternative would result in potential short-term, localized, minor, adverse effects on air quality owing to minor, temporary emissions from construction and dredging equipment. No long-term, major, moderate or minor, beneficial or adverse effects on air quality are anticipated as a result of implementing the Preferred Alternative. Vehicle traffic along area roadways, operation of Wolf Creek Nuclear Generating Station, and routine daily activities in the communities of New Strawn and Burlington contribute to current and future emission sources.

In the immediate vicinity of John Redmond Reservoir (4 mile radius) there is one Class II air operating permitted facility as well as three other facilities which are currently operating but fall below operating permit thresholds as determined by the Kansas Department of Health and Environment – Bureau of Air (Table 4-3). All four of the previously mentioned facilities are located within Burlington.

Table 4-3. KDHE – Bureau of Air permitted facilities within 4 miles of John Redmond Reservoir.

FACILITY NAME	PERMIT TYPE
BURLINGTON MUNICIPAL POWER PLANT	Class II
BURLINGTON COOP	Below Operating Permit Threshold
COFFEY CO. HOSPITAL	Below Operating Permit Threshold
SPRINT COMMUNICATIONS CO., LP	Below Operating Permit Threshold

Source: KDHE- Bureau of Air

The KDHE – Bureau of Air, in collaboration with numerous local, state, and federal agencies and organizations, has also developed a Flint Hills Smoke Management Plan (SMP). This SMP (available by download at (http://www.ksfire.org/doc4661.ashx) works to minimize the air quality impacts which can result from the seasonal prescribed burning of the Flint Hills region in Kansas. This prescribed burning has been shown to negatively impact air quality through elevated ground-level ozone and particulate matter concentrations downwind of source emission regions both within Kansas as well as other states.

A SMP support tool available to producers to see how their respective burn area(s) can impact ambient air quality monitoring stations within Kansas is the Kansas Fire Model. The Kansas Fire Model developed to support the Flint Hills SMP is a two part model; one part shows cumulative smoke impacts at the county-level to ambient air monitoring network sites within Kansas and the other part shows the direction and extent of a predicted smoke plume from a single burn site (source: http://ksfire.sonomatechdata.com/view/about/). Coffey County, in which John Redmond Reservoir is located, is included within the spatial domain of the Kansas Fire Model.

Minor improvements to the communities such as construction of new business buildings and highway improvement projects could contribute to minor future emissions. For the area surrounding John Redmond Reservoir, activities that could add to air emissions in the area are likely few and minor in nature.

4.12.2 Prime or Unique Farmlands

Dredging sediments may result in long-term loss of prime or unique farmland, dependent on the method used and the location of the sediment disposal site and the size required per the volume of sediment. Most of the area along the Neosho River valley is classified as prime or unique farmlands. Non-federal property in the valley used as sediment storage facilities will be returned to agricultural production after sufficient sediment drying. The slurry pipeline route is not anticipated to convert any land currently within agricultural production to non-agricultural uses. A condition of the agreements between KWO and the private landowners for use of their property for sediment disposal will include assurance that agricultural yield post-restoration will equal that prior to the use of the land for CDF Sites. During the period of time the private landowners' property is being used as a CDF and is not in active agricultural production, the landowner will be compensated by the state of Kansas for the loss of agricultural profit. While there may be temporary effects to these agricultural lands, the functional value of the farmland will be restored through the restoration described in Section 5.11, resulting in little, if any, long-term cumulative effects.

Land use around John Redmond Reservoir has experienced little change in the past several years, remaining a predominantly rural agricultural setting. Given the rural setting surrounding John Redmond Reservoir, no additional activities are anticipated to impact prime or unique farmlands.

4.12.3 Land Use

Approximately 180-acres will be needed for construction of CDF Sites A, B and E. Reclamation of CDF Sites A and B to native prairie would have long-term beneficial impacts. Identification of additional suitable sites on private property, approximately 320 additional acres, will be focused in the first five years below the dam. This represents 1.5% of the land within a four-mile radius of the dredging project. If the dredging action were to continue beyond the initial five years and remove a quantity greater than three million cubic yards, approximately 2,000 additional acres, for a total of about 2,500 acres, may be needed for CDF sites over next 30 years. This represents approximately 7% of the total land available within a four-mile radius of the dredging project. If all 2,500 acres are used for the dredging project, the annual rate of land conversion would be approximately 50-100 acres.

The Kansas Water Office use of private lands will be temporary, and after each disposal area has been filled, the land will be reverted back to the use of the landowner. Landowner use will most likely be for the original (pre-dredging) purpose, generally agriculture. The lands in the vicinity of John Redmond Reservoir are rural, and modifying lands temporarily used for disposal of dredged materials are not expected to change land use to municipal, commercial, industrial or other purposes. Adhering to the selection criteria defined in this PEIS for CDF selection, natural area will not be converted to agriculture post-dredging. Disposal areas on federal lands will also be temporary, and future land management will be by the USACE for project purposes and use by the public. No other activities within the watershed have been identified that may result in land use changes similar to the proposed action.

Land use around John Redmond Reservoir has experienced little change in the past several years, remaining a predominantly rural agricultural setting. For Coffey County, Kansas, the total land within farms noted in the 2012 United States Department of Agriculture Census of Agriculture is 329,243 acres. This represents an increase of 4,416 acres (approximately 1%) from the 2007 Census. Of the total land in farms within Coffey County, approximately 55.7% of that was noted as cropland, 36.4% pastureland and 7.9% in other uses. While total land in crops within Coffey County grew by only 1% between the Census of 2007 and 2012, the market value of products sold grew by approximately 27%. The 2012 Census noted a market value of agricultural products sold from Coffey County of $61,695,000, an increase of $13,201,000 from the 2007 Census.

According to USACE project staff at the reservoir, the John Redmond Reservoir USACE Project Master Plan will be updated in 2015. At that time, area zoning on project lands may change. Areas set within the existing Master Plan are zoned for four areas: operations, recreation intensive use, low density recreation and wildlife management.

No additional unrelated activities have been identified in the watershed which would lead to similar land use conversions. Cumulative impacts to land use within the area surrounding John Redmond Reservoir are anticipated to be minimal.

4.12.4 Recreation

The Preferred Alternative would have a short-term, indirect, localized, minor, adverse effect on recreation resources due to noise and activity of the dredge site, staging area, disposal site and along the haul route. Increased water depth resulting from the dredging will have long-term, localized, positive effects to lake recreation uses such as boating and water skiing. Long-term management plan activities at the Flint Hills Wildlife Refuge will contribute to cumulative effects on recreation from enhanced regional recreational opportunities.

In 2008, the Kansas Water Office contracted with The Watershed Institute (TWI) to complete a feasibility study for the restoration and maintenance of the access to the Neosho River at Jacobs Creek. Currently a large logjam extends approximately two and one-quarter miles upstream from the reservoir obstructing access to the river. As part of the feasibility study, TWI characterized the logjam conditions, identified and evaluated options for the logjam removal and disposal, and recommended remediation/restoration strategies. In the absence of implementing the larger scale remediation effort identified in the study, USACE staff at John Redmond Reservoir cooperates with the local community to maintain access to the boat ramp.

Between 2009 and 2012, in fulfilment of mitigation requirements for the pool rise at John Redmond Reservoir, KWO funded the construction of the Indian Hill Loop boat ramp on the USFWS Flint Hills Wildlife Refuge.

According to USACE project staff at John Redmond Reservoir, recreational enhancements may occur within the reservoir’s campgrounds (Riverside West, Dam Site, and Riverside East) in the reasonable foreseeable future to include utility upgrades, road improvements and campsite enhancements.

The Kansas Department of Wildlife, Parks and Tourism (KDWPT) initiated the walk-in hunting access (WIHA) program in 1995 in an effort to enhance the strong Kansas hunting heritage by providing hunting access to private property. The program has grown into one of the most successful access programs in the country. Although the majority of the acreage provides good to excellent upland game bird hunting, some areas provide opportunities for deer, waterfowl and squirrel hunting as well. Landowners receive a modest payment in exchange for allowing public hunting access. Payments vary by the amount of acres enrolled and length of contract period. Contract dates can be established from September 1 or November 1 through January 31 of each year. In addition, other lands are leased for spring turkey hunting only (April 1- May 31). Land enrolled can be in CRP, native rangeland, wheat or milo stubble and riparian or wetland areas.

For the 2014 season there are more than 30 individual tracts of property with roughly 5,400 acres available for public access through the program in Coffey County. The KDWPT continues to seek additional leases from private landowners through their regional offices and private lands coordinator.

Temporary, direct and minor impacts are anticipated to the Dam Site recreation area during dredging. Abundant enhancements to local recreational opportunities have occurred or are anticipated to occur in the foreseeable future surrounding John Redmond Reservoir. This will result in long-term, beneficial cumulative impacts to recreation.

4.12.5 Transportation

The effects of the Preferred Alternative on area transportation conditions would be dependent on the dredging equipment and the selection of a sediment disposal site. Mobilization and assembly of the dredging equipment will require several truckloads to deliver the equipment to the staging site. During mobilization and construction of the disposal sites an increase in the number of vehicles on Embankment Road, US Highway 75 and the county roads below the dam to the disposal sites would be expected. Road crossings for the slurry pipeline will either be placed through culverts, over the road surface, or cut and covered. The effects of this alternative on transportation conditions could occur both within and outside of federal lands, and would be short-term, localized, minor and adverse.

The majority of the transportation in John Redmond region is through the existing road network that is jointly shared by state, county and local units of government. Within Coffey County there are 1,246 roadway miles including 40 bridges within the state system. On average 442,885 miles are driven daily within Coffey County.

Coffey County Airport provides aircraft access with a single 5,500 foot long, 75 foot wide runway. Currently there are 15 aircraft based at the field with more than 99 percent being general aviation. On average there are 55 aircraft operations per day. To minimize or avoid an increase in wildlife attraction near Coffey County airport, the selection criteria for future CDF Sites will include a sufficient distance (outside 2-mile buffer) of the airport. CDF Sites A, B and E are 4-5 miles away from the airport. Given the existing 8,000 acres of open water and adjacent Flint Hills Wildlife Refuge, it is unlikely that the construction of the CDFs will increase wildlife attraction near the airport; however, the selection criterion has been added as extra caution. Any future CDF Sites within a five mile radius of the airport will be coordinated with the Federal Aviation Administration (FAA) and Coffey County airport per Advisory Circular 150/500-33b.

In May 2010, the Kansas Legislature passed Transportation Works for Kansas (T-WORKS), an $8 billion 10-year transportation program. T-WORKS is designed to create jobs, preserve highway infrastructure, and provide multimodal economic development opportunities across the state. A portion of the T-WORKS plan required that the Kansas Department of Transportation coordinate with local units of government and insure that at least $8 million be spent in each Kansas county. T-WORKS projects identified 12 projects within Coffey County covering state highways, local roads and upgrades at the Coffey County Airport. Currently $5.1 million of projects have been completed with another $10.7 million scheduled. The following table shows the general breakdown of projects.

Transportation Project Totals		
Completed:		$5.1 Million
Scheduled:		$10.7 Million
State Highways		
Completed:	42 Miles	$3.4 Million
Scheduled:	37 Miles	$9.7 Million
Local Roads		
Completed:		$1.7 Million
Scheduled:	1 mile	$834,000
Aviation		
Completed:		
Scheduled:		$236,000

As stated above, the Preferred Alternative will have short-term, direct, localized, minor and adverse impacts to transportation in the area immediately surrounding John Redmond Reservoir. When considering the planned T-WORKS improvement projects in the county, non-project related transportation activities will contribute to an overall cumulative impact that is beneficial and long-term.

4.12.6 Water Supply

In 2013, the Final Supplement to the Final Environmental Statement for Storage Reallocation: John Redmond Dam and Reservoir, Kansas was completed. The reallocation and associated pool rise by USACE was approved in 2013. In addition to the reallocation, the state of Kansas will continue to implement a number of sediment reduction activities upstream of the lake such as streambank restoration. These Best Management Practices (BMPs) within the drainage of John Redmond Reservoir will contribute positively to the cumulative impacts to water supply.

The operations agreement between the state of Kansas and the Cottonwood Neosho Water Assurance District was updated in 2014 to better manage water supply storage, municipal water use and water rights within the Neosho basin. The Kansas Water Office has coordinated with 33 public water suppliers in the Neosho River basin in the past 2.5 years to update their water conservation and drought emergency plans.

The Preferred Alternative and Alternative #2 evaluated in this FPEIS combined with the above describe activities would result in positive, long-term cumulative impacts. When considering the reallocation, watershed restoration activities, operations agreement, and updates to local conservation and drought emergency plans cumulative impacts will be experienced in the increased ability to meet water supply demands in the basin.

4.12.7 Reservoir Sedimentation

Improving capacity at John Redmond Reservoir as a result of dredging will improve the sediment rating curve below the reservoir. In other words, in terms of benefits, the Preferred Alternative will in the long-term result in lower suspended sediment concentrations below the reservoir, especially under low flow release conditions. Increasing the depth to sediment within the reservoir will also result in the reduction of resuspension of in-reservoir sediment by wind-induced waves. In addition to dredging, the state of Kansas will continue to implement a number of sediment reduction activities upstream of the lake such as streambank stabilization and riparian restoration. These Best Management Practices (BMPs) within the drainage of John Redmond Reservoir will contribute positively to the cumulative impacts to reservoir sedimentation.

Reservoir sedimentation impairs water supply at all public water supply reservoirs in Kansas. Bathymetric surveys have been conducted at all federal reservoirs in the state, as well as, at more than 50 non-federal water supply lakes. Projections for the storage in the federal reservoirs in Kansas indicates that if no action is taken in the next 50 years, collectively 40% of all federal water supply storage would be filled with sediment. Only one additional reservoir is located within a 4-mile radius of John Redmond Reservoir, Coffey County Lake. Due to its small drainage area, land use and age of the lake, the sedimentation rate at Coffey County Lake is very low; 27 acre-feet of storage loss per year compared to nearly 800 acre-feet per year at John Redmond Reservoir. Council Grove and Marion Reservoirs, located above John Redmond Reservoir, have lost 17% and 5% of their storage to sedimentation, respectively.

There are 10 watershed districts above John Redmond Reservoir. Watershed impoundments help control flooding and improve water quality in the watershed immediately downstream of the structure because they are designed to trap sediments. A total of 155 watershed structures were originally planned for the 10 watershed districts above John Redmond Reservoir. If all of the planned structures were built, 17% of the drainage area for John Redmond Reservoir would be regulated by watershed impoundments.

No other dredging projects are currently planned in the Neosho basin. The Preferred Alternative and Alternative #2 evaluated in this FPEIS combined with the implementation of BMPs are anticipated to result in positive, long-term cumulative impacts.

4.12.8 Vegetation

Construction of CDF Site A will temporarily replace approximately 13 acres of mixed timbers with a variety of species, 22 acres of grasses, and 2 acres of terraces with a sediment disposal basin. Following remediation of the site, the parcel will be replaced with approximately 37 acres of native grasses. Construction of CDF Site B will temporarily replace approximately 31 acres of farm ground and 5.5 acres of mixed native grasses and forbs with a sediment disposal basin. Vegetation along the pipeline route includes representation of all the vegetation described for the staging area and CDF Sites A, B and E. Following remediation of the site, the parcel will be replaced with approximately 36 acres of native grasses. Construction of CDF Site E will temporarily replace 40 acres of managed pastureland, 67 acres of cropland, and 16 acres of mixed grasses, forbs and Eastern Red Cedar. Following remediation of the site, the parcel will be replaced with 40 acres of managed pastureland, 67 acres of cropland, and 16 acres of grasses and forbs. Vegetation along the pipeline corridor will be restored, as necessary, to pre-dredging vegetation mixes. Selection criteria for future sediment disposal locations includes the minimization or avoidance to high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests. In addition, natural areas will not be converted to agriculture. Adherence to the selection criteria for CDF Sites will also reduce or negate impacts to area vegetation resulting from the Preferred Alternative.

Between 2009 and 2012, in fulfilment of mitigation requirements for the pool raise at John Redmond Reservoir, KWO funded several habitat improvement projects at the USFWS Flint Hills Wildlife Refuge. Mitigation included the planting of 55,000 trees over 166 acres and the construction and planting of 203 acres of wetlands.

Given the rural setting surrounding John Redmond Reservoir, no additional activities are anticipated to significantly contribute to the cumulative alteration of area vegetative communities.

4.12.9 Water Quality

The beneficial effect of the Preferred Alternative is the increased water storage capacity of John Redmond Reservoir, which in turn would result in the availability of improved water quality and quantity for downriver releases during drought conditions in the region of the Neosho River. The ability to release better quality water and for a longer duration would substantially aid in the preservation of the fisheries and aquatic wildlife below John Redmond Dam, particularly the riverine mussels.

Pipelines throughout the project will be inspected multiple times each day. Should a leak develop in the pipeline, dredging activities will be shut down immediately and the pipeline will be repaired. Any material which may have leaked will be cleaned up and transported to the nearest CDF site. Where the pipe crosses the Neosho River, new, thicker walled pipe will be used to minimize the possibility of any leaks occurring in the river.

Five active NPDES permits, of which three are industrial permits and two municipal permits, have been issued within a 4-mile buffer of John Redmond Reservoir. The industrial permits have been issued to Wolf Creek Nuclear Generating Station, the City of Burlington Water Treatment Facility, and Meier's Ready Mix in New Strawn. The municipal permits have been issued to the cities of Burlington and New Strawn. Of these permits, four discharge into the Neosho River and one into Wolf Creek.

In 2013, USGS, under a cooperative agreement with KWO, installed and operates water quality monitors and collects sediment samples on the Neosho River at Burlington, Iola, and Parsons. Data from the monitors and samples will be baseline sediment data on the Neosho River below John Redmond to compare with changes to water quality that may result from dredging or other sediment management practices.

Implementation of the Watershed Restoration and Protection Strategy (WRAPS) 9-Element Watershed Plans developed for the watersheds above John Redmond Reservoir, including the installation of Best Management Practices (BMPs) such as streambank stabilization and cover crops, will result in improved water quality of the Neosho River as it enters John Redmond Reservoir.

In 2014, the KWO and USACE entered into a cooperative cost share agreement to collect additional water quality data within John Redmond Reservoir and to develop and calibrate a three-dimensional hydrodynamic and sediment model. Collection of data will include additional sediment cores as well as deployment of sensors that will collect continuous water temperature, specific conductance and turbidity data. Data collected and scenarios modeled will provide additional information on the in-lake water quality conditions post-dredging.

Effluent water will be piped and discharged into the nearest river or stream surrounding the CDFs unless analysis determines this approach would adversely impact the quality of downstream waters in which case the effluent will be piped back to the reservoir. The dredging contractor selected for the John Redmond Reservoir dredging project has extensive experience designing and constructing CDFs capable of settling sediments and returning effluent water that meets state water quality permit conditions. In two examples of dredging projects of similar scale and scope, the contractor reported effluent quality between 15 mg/L to 300 mg/L total suspended solids (TSS) depending on the state permit requirements. CDFs designed for the disposal of sediment from John Redmond Reservoir will be capable of maintaining effluent quality sufficient to meet the discharge permit limit. KDHE has indicated that a discharge permit limit would be less than or equal to 50 mg/L TSS as a monthly average which is the same value utilized for inert solids in EPA's power plant effluent guidelines. The actual limit will be based on treatment technology determined through the antidegradation review. A description of the permitting process has been provided by KDHE as a letter in Appendix G – Agency Correspondence.

While no other activities surrounding John Redmond Reservoir have been identified as contributing to the cumulative impacts to water quality, water quality monitoring will be used to assess any changes in these conditions.

4.12.10 Invasive Species

Zebra mussels are present in John Redmond Reservoir. Potential adverse impacts include infestation of other water bodies through equipment that is not properly cleaned and movement of water and sediment infested with zebra mussels. Additional current and future activities such as recreational boating and other in-lake operation and maintenance activities could result in the transport of zebra mussels to other water bodies. Continued information and education as well as construction permit requirements will help reduce the potential transport of these invasive species.

Invasive species and noxious weeds such Eurasian water milfoil, Salt cedar, and purple loosestrife are not known to occur in the project area. The Preferred Alternative would not introduce or promote the transport of these species. New infestations of Johnsongrass and Sericea lespedeza will be reduced by planting Johnsongrass free seed on CDF berms, not hauling dirt to CDF sites and cleaning machinery before leaving the project sites.

According to USACE project staff at John Redmond Reservoir, invasive species control has and will continue to be conducted on various areas across the project lands. Control work has been focused on Sericea lespedeza, Johnsongrass, and Red cedar. Project staff has conducted grazing within the north end of the Dam Site campground for control of Sericea lespedeza and have conducted limited spraying as well. Herbicide application for the control of Johnsongrass has been implemented in various areas across the project land mainly focusing on the embankment and areas adjacent to ponds and campgrounds. Red cedar control efforts have been applied in the past to CDF Site A and areas adjacent to CDF Site E. Future plans for the control of invasive species may include grazing, tree removal and herbicide application specifically focused on the CDF Sites after they are restored to maintain the improved vegetation conditions.

According to Scott Marsh, KDA State Weed Specialist, all counties offer cost share chemicals to landowners for control of noxious weeds. Targeted efforts for control in Coffey County include Sericea lespedeza, field bindweed, musk thistle and Johnsongrass (Personal communication, KDA Scott Marsh 2014).

Implementing the best management practices described in Sections 5.1 and 5.4 will control the introduction and distribution of invasive species; ensuring the project will not contribute to the overall cumulative impacts related to invasive species.

4.12.11 Floodplains

The proposed sediment removal project will require construction of several confined disposal facilities (CDF) to store and dewater dredged material. These facilities will be located partially in Zone A, Special Flood Hazard Areas (SFHA) identified by FEMA. K.S.A. 24-126 makes it unlawful to construct fills and levees without prior approval from the Kansas Department of Agriculture, Division of Water Resources (DWR). A DWR floodplain fill permit will be required for each CDF site located in the mapped floodplain. The permit application must include a geometric analysis to determine the impacts of the project on flood elevations. DWR regulations allow up to a one foot increase in the base flood elevation as a result of levees and fills. If the impact exceeds this standard, the applicant must demonstrate that the excess rise is contained within property or easements controlled by the applicant. If this standard cannot be met, the CDF design will be adjusted to reduce the impacts to flood elevations. Prior to construction, CDFs located in the Zone A SFHA will be evaluated for impacts to downstream structures.

A steady-state one dimensional hydraulic analysis was conducted to study the potential floodplain impacts of dredged material disposal near John Redmond Reservoir. Appendix K provides a description of the data and methodology used to create and calibrate the hydraulic model for the Neosho River reach between John Redmond Reservoir and Burlington, Kansas.

HEC-RAS version 4.0 was used as the hydraulic model for the analysis. The tail water rating curve for the John Redmond dam was provided by the Tulsa District, USACE. The rating curve was used to select five profiles to model: 20,000; 40,000; 60,000; 80,000 and 100,000 cfs. The results of the model showed very minimal impacts to the floodplain in the vicinity of the proposed CDF structures. The model demonstrated less than a tenth of a foot change in water surface elevations for the profiles modeled. The results of the modeling analysis are shown in Appendix K.

Any future additional construction, even if not associated with the dredging activities, will be required to adhere to K.S.A. 24-126 and other floodplain regulations. Given the rural setting surrounding John Redmond Reservoir, no additional construction projects within the floodplain are anticipated and the overall cumulative impacts to floodplains are minimal.

4.12.12 Biological Resources

Potential effects on biological resources through implementation of the Preferred Alternative are both beneficial and adverse. The beneficial effect of this alternative is the increased water storage capacity of John Redmond Reservoir, which in turn would result in the availability of improved water quality and quantity for downriver releases during drought conditions in the region of the Neosho River. The ability to release better quality water for a longer duration would substantially aid in the preservation of the fisheries and aquatic wildlife below John Redmond Dam, particularly the riverine mussels. Potential adverse effect for this alternative, depending on the time of year the dredge activities are performed and the distance from the source of the dredge or construction equipment, may include the potential to disturb wildlife as a result of the presence and noises of human and heavy equipment activity. Increases in turbidity and potential for direct removal of fish may occur, but will be very localized directly at the cutter head of the dredge.

The slurry pipeline will lay passively on the floor of the Neosho River. Typical river gage height below John Redmond Reservoir even during low flow conditions is more than five feet. The slurry pipeline is 24” and therefore is not expected to significantly impact movement of aquatic organisms or fish.

Between 2009 and 2012, in fulfilment of mitigation requirements for the pool raise at John Redmond Reservoir, KWO funded several habitat improvement projects at the USFWS Flint Hills Wildlife Refuge. Mitigation included the planting of 55,000 trees over 166 acres, the construction and planting of 203 acres of wetlands, and the construction of dikes, outlet works and pumping facilities at Strawn Flats and Goose Bend.

The Kansas Department of Health and Environment (KDHE) administers a Watershed Restoration and Protection Strategy (WRAPS) program. WRAPS is a planning and management framework intended to engage stakeholders in a process to identify watershed restoration and protection needs, establish management goals, create a cost effective action plan to achieve goals and implement the action plan. WRAPS groups surround John Redmond Reservoir and include the Neosho Headwaters, Eagle Creek and Upper Neosho projects. KDHE provides limited funding to implement the plans. Most implementation consists of installation of best management practices (BMPs) to reduce pollution inputs into surface waters. Funding can also be used to improve habitat and many BMPs do both. KDHE funds are leveraged with other funding sources including NRCS, Conservation Districts and the Kansas Alliance for Wetlands and Streams.

The U.S. Fish and Wildlife Service (USFWS) manages 18,463 acres on the Flint Hills Wildlife Refuge. Established in 1966, the Refuge provides diverse habitat for an assortment of mammals, birds, reptiles, amphibians and insects, and is located at the upstream end of John Redmond Reservoir. Refuge habitats include wetlands, bottomland hardwood forests, grasslands, riparian areas and agricultural lands.

In the area surrounding the reservoir, numerous projects that improve biological resources have been and are being maintained, enhanced and established through these programs. A partial qualitative list of these projects includes: filter strips/riparian area buffers (Conservation Practice (CP-21)), shallow water areas for wildlife (CP-9), upland habitat buffers (CP-33), conservation reserve program (primarily native grass establishment), riparian area and woodland plantings, no-till and cover crop adoption, streambank stabilization including riparian enhancement, field terrace and waterway practices, safe areas for wildlife (CP-38e), stock pond restoration, Environmental Quality Incentive Program/ Conservation Security Program (EQIP/CSP) rangeland improvement including grazing plans, monitoring and brush/weed management, prescribed habitat burns for wildlife, fenced ponds for water quality, non-Conservation Reserve Program (CRP) native grass seeding, tile outlet terraces and nutrient management and soil testing.

As described above, potential effects on biological resources through implementation of the Preferred Alternative are both beneficial and adverse. Adherence to the selection criteria for CDF Sites will help reduce impacts to area biological resources resulting from the Preferred Alternative. When considering the planned and implemented conservation practices and mitigation activities, non-project related habitat conservation and improvement activities are anticipated to contribute to an overall cumulative impact to biological resources that is beneficial and long-term.

4.13 Comparison of Alternatives and Conclusion

Based upon the comparison of the Proposed Action: Dredge John Redmond Reservoir and the No Action Alternative (Table 4-4), the environmentally preferred action is the No Action Alternative, where there is the least amount of environmental impacts. Dredging of John Redmond Reservoir would primarily result in short and long-term, insignificant, adverse impacts depending upon the mitigation measures employed. Cumulative Impacts for the Proposed Action and No Action Alternative are also presented in Table 4-4 and indicate there are minimal cumulative impacts as a result of the proposed action or alternative.

Table 4-4. Summary of Potential Environmental Consequences and Mitigation Measures

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
Geology and Soils	No short, medium or long-term, insignificant or significant, beneficial or adverse effects. No mitigation measures would be required.	Long-term, localized, adverse effects, the magnitude of which would be dependent upon the geology or soil resource and upon mitigation measures.	Long-term, localized, adverse effects, the magnitude of which would be dependent upon the geology or soil resource and upon mitigation measures.
Hydrology and Water Resources	Long-term, regional, major adverse effect. Mitigation measures would be required.	Long-term and major, regional beneficial effects on storage capacity. Short term and minor effects related to discharge of sediments downstream. No effects to reservoir releases in terms of inflows or reservoir discharge operations. Mitigation measures may be required.	Long-term, regional, and major beneficial effects on storage capacity. Short term and minor effects related to discharge of sediments downstream. No effects to reservoir releases in terms of inflows or reservoir discharge operations. Mitigation measures may be required.
Biological Resources	No short-term, beneficial or adverse effects. Long-term, moderate to major adverse effects. No mitigation measures would be required.	Long-term, major and beneficial effects to fisheries and aquatic wildlife from long-term improved water quality. Short-term, minor, adverse effects from increased sediment	Long-term, major and beneficial effects to fisheries and aquatic wildlife from long-term improved water quality. Short-term and long-term, minor, adverse effects from increased

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
		load. Mitigation measures may be required.	sediment load. Mitigation measures may be required.
Wetland Resources	No short-term, beneficial or adverse effects. No mitigation measures would be required.	Due to avoidance, no long-term, major adverse impacts to Waters of the United States.	If CDF Sites impact wetlands, long-term, major and adverse impacts to Waters of the United States. Mitigation will be required.
Threatened and Endangered Species	No short-term, beneficial or adverse effects. Long-term, moderate to major, adverse effects as trapping efficiency of reservoir decreases. No mitigation measures would be required.	May affect but not likely to adversely affect listed species.	May affect but not likely to adversely affect listed species.
Noise	No short or long-term, beneficial or adverse effects.	Effects of this alternative on noise conditions could occur both within and outside of federal lands, and would be short-term, localized, minor and adverse.	Medium term, localized, minor and adverse effects.
Transportation	No short or long-term, beneficial or adverse effects.	Short-term, localized, minor and adverse.	Short-term, localized, minor and adverse.
Air Quality	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term localized minor, adverse effects. No long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term, localized, minor, adverse effects. No long-term, beneficial or adverse effects. No mitigation measures would be required.
Aesthetics	No short-term, insignificant or significant, beneficial or adverse effects. Long-term, moderate, adverse impacts. No mitigation measures would be required.	Short-term, localized, moderate, adverse effects. Long-term moderate, beneficial effects. No mitigation measures would be required.	Short-term, localized, minor, adverse effects. Long-term moderate, beneficial effects. No mitigation measures would be required.
Prime or Unique Farmlands	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Long-term, minor, adverse effect because of the abundance of additional prime and unique farmlands in the area. No mitigation measures would be required.	Long-term, minor, adverse effect or long-term, moderate, beneficial effect depending on the selection of sites for dredge material. No mitigation measures would be required.
Socioeconomic Resources	Long-term, major adverse effects on economic and demographic conditions. Mitigation measures would be required.	Short-term, moderate to major, beneficial effects on economic and demographic conditions. No mitigation measures would be required.	Short-term, moderate to major, beneficial effects on economic and demographic conditions. No mitigation measures would be required.
Land Use	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	Short-term and long-term, localized, minor, adverse or beneficial depending on the reclamation activity. No mitigation measures would be required.	Short-term and long-term, minor, adverse or beneficial depending on the reclamation activity. No mitigation measures would be required.
Recreation	Long-term, major and	Short-term, localized, minor,	Short-term, localized, minor,

Environmental Resource	No Action Alternative	Project Proponent Preferred Alternative	Alternative #2
	adverse.	adverse effect.	adverse effect.
Cultural Resources	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long term, beneficial or adverse effects. Efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources. Site specific investigations and further literature review may be needed. Mitigation measures may be required. The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).	No short or long-term, beneficial or adverse effects. Efforts will be made to avoid dredging or disposal in areas known to contain significant cultural resources. Site specific investigations and further literature review may be needed. Mitigation measures may be required. The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended).
Hazardous, Toxic, or Radioactive Wastes	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.	No short or long-term, beneficial or adverse effects. No mitigation measures would be required.
Cumulative Impacts	No cumulative impacts. No mitigation measures would be required.	Positive, long-term cumulative impacts experienced in the increased ability to meet water supply demands in the basin. No cumulative adverse impacts on resources. No mitigation measures would be required.	Positive, long-term cumulative impacts experienced in the increased ability to meet water supply demands in the basin. No cumulative adverse impacts on resources. No mitigation measures would be required.

5.0 MITIGATION REQUIREMENTS

5.1 Introduction

The John Redmond, Marion, and Council Grove Dams were constructed in the upper Neosho basin as mitigation for uncontrolled flooding along the Cottonwood and Neosho Rivers. The Neosho basin covers approximately 6,300 square miles, with 3,015 square miles draining through the reservoir system while 3,285 square miles are uncontrolled in Kansas and Oklahoma below John Redmond Dam. The dam structures were introduced to decrease the intensity of flood peak flows and provide a more controlled and less damaging release of floodwaters downriver. All three dams were constructed following the heaviest flooding of the Neosho River on record, which occurred during 1951 (USACE 2013).

In the FPEIS, mitigation refers to actions that allow project-related impacts, identified in Section 4.0, to be minimized or in some cases nullified. Mitigation is typically developed after all impacts have been identified; however, some mitigation measures may be identified earlier in the NEPA process. Unless otherwise specified, the Kansas Water Office and their contractors will be responsible for implementing and monitoring the appropriate mitigation measures. Mitigation measures must be feasible in order to receive consideration during the impact analysis process. Under Section 1508.20 of NEPA (1969), the description of mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree of magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments

Certain assumptions were considered relative to normal dam and reservoir operation by the USACE as well as attempting to manage the reduction of sediment entering the Reservoir and other purposes before mitigation measures were developed. These assumptions included:

- The Neosho basin covers and drains approximately 6,300 square miles, approximately 3,015 square miles drain through John Redmond Dam and Reservoir and approximately 3,285 square miles drain uncontrolled below John Redmond Dam.
- Sediments would continue to deposit in the reservoir, in approximately the same locations as currently, and would continue to reduce the storage capacity and flood control volume of the John Redmond Reservoir through the design life of the project (CY 2014).
- Debris and sediments would continue to deposit in the flood control pool upriver of the conservation pool in the area known as the logjam.
- Steambank erosion control projects above John Redmond Reservoir would continue to be implemented and/or completed.
- Best Management Practices would continue to be implemented to control overland erosion.
- Potential sites for sediment disposal on private property will be evaluated for feasibility based on the following criteria: (1) proximity to dredging location in John Redmond Reservoir, (2) avoidance of impacts to gas and utility lines, (3) a topography that minimizes CDF cell wall height, (4) avoidance of Waters of the U.S. (5) minimization or avoidance of impacts to local wildlife and other high valued natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2 (defined in Section 5.4), (6) sufficient distance (outside 2-mile buffer) of Coffey County airport and (7) cost for compensation.

The following sections present each resource area for which impacts were assessed.

5.2 Geology and Soils

No Action Alternative

Geology and soil resources in the project area would not receive additional impacts under the No Action Alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging would be accomplished through the use of a hydraulic dredge which would pump sediment from the lake to an offsite disposal facility. The Preferred Alternative would result in potential effects on geology and soil resources regarding the placement of dredge materials. The selected location for the dredge materials would potentially bury geology or soil resources. All materials required for berm construction for the CDFs will be collected on-site from within the containment area and will not be transported off site. Soils collected on-site for construction of the containment areas will be replaced over the dredge materials after the CDFs have sufficiently dried. Further, the soils may be classified as prime or unique farmland and are discussed under Section 5.7. Specific mitigation measures to be considered for the dredging alternative are:

- Conduct geotechnical analysis at the proposed CDF sites, including split spoon samples and sieve analysis along with visual classification to assess unconfined compressive strength, Atterburg limits and other soil features prior to the completion of the final CDF design.
- Survey potential disposal sites for important geologic and soils features and avoid using sites of high geologic and soils values.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for geology and soils for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.3 Hydrology and Water Resources

Hydrology and water resources would receive impacts related to all of the alternatives under consideration.

No Action Alternative

A decrease in water storage capacity due to sedimentation would result under the No Action Alternative. Under present conditions, this loss could not be mitigated and adequate water would not be available during drought years. The FPEIS evaluates two alternatives that mitigate this loss of water storage capacity under contract with the state of Kansas.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging *activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.*

Water storage sufficient to meet the needs of the state of Kansas would result from this alternative. Dredging from John Redmond Reservoir could disturb sediments that become waterborne, causing release downriver. Potential mitigation measures for this alternative could include the following:

- Baseline sediment data from the water quality monitors on the Neosho River at Burlington, Iola, and Parsons will be compared with changes to water quality that may result from dredging or other sediment management practices.
- Sediment sampling has been conducted within the area of the reservoir slating for the first phase of dredging, In future phases of the dredging project, additional sediment sampling could be conducted to determine the chemical composition and nature of any contaminants present
- Separate the work area from active reservoir storage to the extent possible

Monitoring for changes in downstream water quality conditions will occur for approximately six months prior to dredging and up to five years post-dredging with real-time data monitors.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for hydrology and water resources for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.4 Biological Resources

The site vegetation, wetlands, wildlife, fisheries, rare species and management areas are currently affected because of flood storage events and water level management for wildlife resources at John Redmond Reservoir.

No Action Alternative

No significant impacts to the biological resources would occur nor would mitigation be required for the No Action Alternative. Biological resources would receive project-related impacts from the Dredge John Redmond Reservoir alternative.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging sediments would result in additional water storage for the state of Kansas, which would result in improved water quality and quantity downriver, over the long term. This would benefit the downriver fishery and particularly the Neosho Madtom (Federally-listed threatened), Rabbitsfoot Mussel (state-listed), and Neosho Mucket Mussel (state-listed), species of concern that occupy gravel bar habitats. In addition, dredging would avoid drowning shoreline vegetation, particularly woodland and wetland habitats.

Potential adverse impacts for the dredge alternative include increased sediment load in the Neosho River below John Redmond Dam, and potential wildlife exposure to contaminants. Zebra mussels are present in John

Redmond Reservoir. Potential adverse impacts include infestation of other water bodies through equipment that is not properly cleaned and movement of water and sediment infested with Zebra mussels.

To minimize the use of diesel fuel, the Kansas Water Office is pursuing the opportunity to use an electric dredge. Use of an electric dredge may result in a minimal increase in above-ground, single-phase electric lines to deliver power to the staging area. According to the USFWS, the frequency of electrocution and collisions and the associated outages has been dramatically reduced in areas where efforts have been made to retrofit or replace hazardous poles and mark lines.

Specific mitigation measures to be considered for the dredging alternative are:

- Adherence to selection criteria for future sediment disposal locations which includes the minimization or avoidance to high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests.
- Avoid existing vegetation to the extent possible during dredging, hauling, and disposal operations, and revegetate disturbed sites with appropriate native vegetation following dredging activities
- Survey disposal sites for rare species of plants and wildlife
- Avoid existing wetlands during dredging and disposal operations
- Where avoidance of existing wetlands is determined not to be feasible, complete Clean Water Act Section 404 permit and compensatory mitigation
- Employ Best Management Practices (BMPs) to ensure no transport of Zebra mussels and other exotic/invasive species such as Eurasian watermilfoil (*Myriophyllum spicatum*), purple loosestrife (*Lytrhum salicaria*), Johnson grass (*Sorghum halepense*), Serecea lespedeza (*Lespedeza cuneata*), salt cedar (*Tamarix spp.*), and reed canary grass (*Phalaris arundinacea*).
- New infestations of Johnsongrass and Sericea lespedeza will be reduced by planting Johnsongrass free seed on CDF berms, not hauling dirt to CDF sites and cleaning machinery before leaving the project sites.
- Ensure that equipment used is not infested with Zebra mussels as it leaves John Redmond Reservoir. Equipment will be carefully checked and any mud and vegetation will be removed before equipment is used in another location. Equipment can be washed with hot water (~140° F), or if hot water is not available, a 10% bleach solution can be used. Special precautions will be taken to properly dispose of the bleach. If any equipment contains bilges or live wells those will be drained before leaving the reservoir. Water and sediment taken from John Redmond Reservoir is not placed in areas where Zebra mussels can infest other water bodies by direct contact or by water draining from the disposal area.
- Mandate that persons contracted to dredge, haul, and dispose of sediment work with the Kansas Department of Wildlife, Parks and Tourism to create and follow a management plan to ensure the Zebra mussels are not transported from John Redmond Reservoir and/or allowed to be disposed of in or near water bodies creating possible infestation.
- Provide resources and guidance documents posted to the Avian Power Line Interaction Committee to the Lyon-Coffey County Electric Cooperative for consideration in the delivery of power to the dredge.

Numerous migratory bird species, including waterfowl and Neotropical songbirds, could potentially occupy areas of the proposed project. Application of the selection criteria for future CDFs which includes the minimization or avoidance to high natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests will avoid or minimize impacts to migratory birds resulting from the Preferred Alternative. Prior to construction, laying of the pipeline and initiation of dredging activities, a reasonable search for active nests will be conducted.

The U.S. Fish and Wildlife Service (USFWS) Mitigation Policy uses four resource categories to determine that the level of mitigation recommended is consistent with the fish and wildlife resource values involved for individual project sites. The USFWS offered the following from the Mitigation Policy as guidance towards lower value sites for sediment disposal.

Resource category 1 is of high value for the evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section. Losses of existing habitat should be prevented. Native, unplowed prairie, riparian areas, riparian woodland, forested wetlands, shrub-scrub wetlands, bottomland hardwood forests, and streams are examples of resource category 1 habitat for the Federal Trust Resources in the project area.

Resource category 2 is of high value for the evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section. The goal is no net loss of this habitat type. Restored native prairie and Conservation Reserve Program lands using native grasses would be typical examples of this category in the project area.

Resource category 3 is high to medium value for the evaluation species and is relatively abundant on a national basis. The goal is no net loss of habitat value while minimizing the loss of in-kind habitat value. Farmed wetland would likely be an example resource category 3 for this project.

Resource category 4 is of medium to low value for the evaluation species. The goal is to minimize the loss of habitat value. Row cropland and domestic (tame) grasslands are examples of Resource category 4 habitat.

As noted above, adherence to the selection criteria for CDFs will include the minimization or avoidance of impacts to local wildlife and other high valued natural areas such as unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, and bottomland hardwood forests, as well as USFWS-defined Resource Categories 1 and 2.

Monitoring for biological resources will be conducted routinely during the active dredging and construction process and then yearly for the first five years of CDF restoration.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for biological resources for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.5 Air Quality

No Action Alternative

Air quality would not receive further impacts under the No Action Alternative. Because the John Redmond Reservoir area is in attainment for all criteria pollutants, mitigation is not required.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Under the dredging alternative, mitigation measures to abate emissions (dust) would be required, particularly in areas of excavation and sediment disposal sites and during periods of low precipitation. Airborne pollutants would also be generated from the exhaust of heavy dredging, excavating, and earth-moving equipment and vehicles driven to the site by workers. Potential mitigation measures that could be implemented include the following:

- Apply water as necessary to provide dust abatement from all actively disturbed sites, for all unpaved roads, parking lots, and staging areas, and sediment disposal area
- Use electricity from power lines/poles rather than temporary diesel or gasoline powered generators
- Reduce truck speeds to15 mph or less on all unpaved roads
- Encourage ride-sharing or other forms of shared transportation to reduce worker vehicle emissions to the site
- Continue monitoring airborne radionuclide concentrations at the WCGS and vicinity per KDHE sampling and emergency response protocols

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for air quality for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.6 Aesthetics

No Action Alternative

Aesthetics as a resource would not receive further impacts under the No Action Alternative and mitigation would not be required.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging would result in the short-term presence of dredge, excavation, and spreading equipment, private vehicles and construction workers. This equipment and activity would be visible in the conservation pool from the John Redmond Dam road, the reservoir shoreline, a few other access points at sufficient elevation above the intervening trees (observation tower south of Ottumwa, etc.), and at the disposal site. During the late fall and winter the visual effect would be greater because of leaf drop from the deciduous trees growing along the drainages and the reservoir shoreline.

Some visitor experiences during this time frame would be negatively affected, particularly those seeking to observe different species of wildlife. White-tailed deer, upland gamebird, turkey and waterfowl hunters would also experience a diminished visual perception of open space. Shorebirds could avoid the area during the summer migration. Dust generated from dredging activities could become noticeable to visitors and local citizens and would require abatement per the air quality sections of this report. Similar visual effects would result at any site selected for sediment disposal, storage or application. Specific mitigations to be considered for the dredging alternative are:

- Time dredging activities to avoid the peak site visitation by sensitive user groups, shorebirds, and waterfowl, including consideration of high quality viewing and hunting hours, e.g., early morning and late afternoon, to the extent possible
- Provide dust abatement as necessary, per the air quality section of the PEIS
- Stage, maintain, and service equipment on an upland site outside of lake viewscape
- Contour dredged spoil piles to reflect local topography
- Revegetate disposal areas using native vegetation to restore the viewscape

Odor and the increase in water-born insects such as mosquitos was identified as an aesthetic concern during the Draft PEIS public comment period; however any odor will be localized to the point of discharge into the CDF and will be separated by distance to any habitable structures. No increase in water-born insects such as mosquitos is anticipated. Therefore, no mitigation measures related to odor or water-born insects are provided.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for aesthetics for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.7 Prime or Unique Farmlands

No Action Alternative

Prime or unique farmlands would not receive further impacts under the No Action Alternative and mitigation would not be proposed.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging sediments may result in long-term loss of prime or unique farmland, dependent on the method used and the location of the sediment disposal site and the size required per the volume of sediment. Specific mitigations to be considered for the dredging alternative are:

- Dispose sediments on land that does not fit the criteria for prime or unique farmland.
- Conduct land evaluation and site assessment system (LESA) to establish a farmland conversion impact rating score and offer alternatives (relocation) for consideration.

The Kansas Water Office has coordinated with the state NRCS office for review of CDF Sites A, B and E, as well as the area surrounding John Redmond Reservoir where future CDF sites will be identified and constructed. NRCS provided the above mitigation measures. Future CDF sites will be coordinated with NRCS. Adhering to the selection criteria defined in this FPEIS for CDF selection, natural area will not be converted to agriculture post-dredging.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for prime or unique farmlands for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.8 Socioeconomic Resources

Socioeconomic resources may receive impacts relative to each alternative, as described below. Social and economic effects related to precipitation events and present managed flows from John Redmond Dam and uncontrolled flows below the dam would continue into the foreseeable future. No beneficial or adverse effects would occur regarding Environmental Justice or Protection of Children for any of the alternatives assessed.

No Action Alternative

The principal socioeconomic impact under this alternative would be the inability of the USACE to fulfill contractual obligations to the KWO for water supply storage. Under present conditions, this loss could not be mitigated and adequate water would not be available during drought years. The FPEIS evaluates one alternative to mitigate this loss of water supply storage capacity under contract with the state of Kansas.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Dredging sediments would result in additional water storage for the state of Kansas and increased economic activity in the vicinity, beneficial impacts requiring no mitigation. The principle adverse impacts of this alternative include transportation and land use effects associated with the staging area and sediment disposal sites. Affects to recreation activities, such as hunting, could also occur under the dredge alternative. Specific mitigation measures to be considered for the dredge alternative are:

- Implement standard transportation and waste disposal operating procedures, including road safety and control of dust, noise and vehicle emissions
- Limit hours and locations of operations during key recreation periods such as hunting season
- Contractors are to adhere to the following provisions while using land for staging equipment – (1) the area is within the flood pool. If high inflow events result in inundation of the ramp and staging area, the contractor may need to be prepared to move equipment to a higher ground; (2) the boat ramp access needs to be remain available for public boat access; and (3) the contractor is responsible for marking off a designated work area (“lay down area”) to restrict public access from dredging equipment.

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for socioeconomic resources for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.9 Cultural Resources

In compliance with Section 106 of the National Historic Preservation Act and regulations issued by the Advisory Council on Historic Preservation (36 CFR Part 800), Federal agencies are required to consult with the

Kansas State Historic Preservation Officer (SHPO) and the Advisory Council in the event that an undertaking may have an impact on historic or prehistoric sites.

The Programmatic Agreement (PA) will outline procedures to identify and evaluate historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended). If historic properties are identified in areas where dredge disposal pits and/or associated features are planned, those project features will be redesigned if possible. Avoidance of historic properties will therefore be the first goal in designing and constructing disposal pits for the reservoir dredging project. However, if historic properties cannot be avoided and if they will be adversely affected, the PA will provide procedures to resolve adverse effects as required by Section 106. Resolution of adverse effects is usually accomplished in the Section 106 process by means of a Memorandum of Agreement (MOA), which outlines specific mitigation measures used to offset the loss of historic properties. With the implementation of the PA, however, resolution of adverse effects will be accomplished through that existing process. A monitoring schedule for cultural resources will follow the recommendations of the resource agencies as described in the PA.

5.10 Hazardous, Toxic, or Radioactive Wastes

No significant impacts from hazardous, toxic, or radioactive wastes would occur, nor would mitigation be proposed for the No Action Alternative or proposed action of the Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir. Monitoring of the WCGS and environs for radioactive contamination would continue under the authority of the KDHE for sample methodology, laboratory analysis and response.

Preferred Alternative: Dredge and dispose of sediments to ensure 55,000 acre-feet of conservation storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity. Initial period of assessment will encompass the first 12 to 17 months of activity to include the deployment of equipment to the staging area, construction of the first CDF Sites (CDF Sites A, B and E), and the removal of approximately 600,000 cubic yards of sediment.

Potentially hazardous materials such as petroleum products, coolants, and heavy metals could be introduced by heavy equipment used in the dredging, hauling and disposal of sediments. Specific mitigations to be considered for the dredging alternative are:

- Store all fuel and lubricants out of the floodplain and service vehicles and equipment at a dedicated storage site
- Prepare an adequate plan of operations including a spill control plan and a hazardous waste management plan that outlines disposal procedures, under the regulations of 40 CFR, CERCLA 1980 (42 U.S.C. 6901), or RCRA (42 U.S.C. 6901), as appropriate

Alternative #2: Dredge and dispose of sediments to restore the conservation pool to near original capacity

The mitigation discussion for hazardous, toxic or radioactive wastes for Alternative #2 is the same as the Preferred Alternative and is presented above.

5.11 Restoration of CDF Sites

For the FPEIS, monitoring efforts, performed by KWO, will focus on evaluating and ensuring success of restoring the CDF sites after construction and utilization. It is intended that CDF sites will be reverted back to the use of the landowner; therefore, restoration objectives for the CDF sites will vary based upon its previous condition. Adhering to the selection criteria defined in the PEIS, natural areas will not be converted to agriculture or lesser valued uses based on the original resource. Monitoring will be carried out until the project has been determined to be successful, which may depend on the landowner specifications.

Baseline assessments of the CDF sites will be conducted prior to construction to help guide restoration efforts. As an example, restoration of herbaceous vegetation may be considered successful when the herbaceous canopy percent cover of the CDF site is at least 80-percent. Adaptive management could include remedial planting/seeding, modifying the species composition, and/or increased irrigation to ensure establishment of herbaceous canopy. Measures would be taken to reduce the establishment of non-native vegetation or noxious weeds as necessary. It is anticipated that evaluation of the CDF restoration efforts would occur bi-annually or annually until restoration of the site is determined to be successful.

A restoration plan will be developed for each CDF site. In general the restoration process will follow this methodology. Upon fill of each CDF site, pumping of dredged material into the site will cease and the site will be allowed to dewater. Dewatering will mostly be a passive process allowing sediments to fall out of the water column and effluent to discharge through the sluice gates and discharge point. Trenches will be dug within the deposited sediment to further encourage the drying of deposited materials. Dewatering may take up to two to three years. After the sites are dewatered, berm walls will be collapsed to cover the dredge materials and the sites will recontoured to the elevation and gradient necessary to support the desired vegetation.

The restoration plan for CDF Sites A and B include revegetation with native grasses and long-term management for native bird species. The restoration plan for CDF Site E includes replanting to row crops, pastureland and mixed grasses and forbs.

Monitoring will be an important component of the restoration plan to ensure the successful restoration of each CDF site. For CDF Sites A and B, maintenance of reconstructed prairie will be conducted to sustain and improve the site vegetation and wildlife communities. Monitoring will be set up to evaluate the elimination of exotic species from the restoration sites. For CDF Sites such as CDF Site E that will be returned to agricultural production, soil quality and yield production will be evaluated repeatedly throughout the first five years post-dredging to ensure the sites are returning to, at a minimum, the productivity experienced prior to sediment deposition. Assistance and advice will be sought from K-State Research and Extension, Natural Resource Conservation Service (NRCS) and the area cooperative agronomist.

6.0 APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

Laws and regulations in place and addressed in this FPEIS are presented in Table 6-1. In addition to those described in the table below, the Kansas Water Office will complete a Section 408 request (U.S.C. Section 408) seeking permission from the Secretary of the Army for a non-federal entity to alter or modify existing USACE projects. As the project proponent, the state of Kansas will prepare and submit a Section 408 request to modify the federal project (John Redmond Reservoir) to dredge sediment and for use of federal lands to construct sediment disposal facilities. The Kansas Water Office will also coordinate with USACE to secure the appropriate real estate instruments to allow the state of Kansas, as the project proponent, to access and utilize federal lands for dredging, construction of sediment disposal locations, and pipeline right of ways, staging areas, and other activities associated with the dredging project. Depending on the phase of the project appropriate real estate instruments may include leases, easements, consents to easement, early rights to entry, and licenses. The State of Kansas will not retain permanent occupancy of any of the sites.

Table 6-1. Applicable Environmental Laws and Regulations

Environmental Law or Regulation	Description
National Environmental Policy Act of 1969	Requires the disclosure of the environmental impacts of any major federal action significantly affecting the quality of the human environment.
AGRICULTURE	
Farmland Protection Policy Act of 1981	Minimizes the extent to which federal programs contribute to the unnecessary conversion of farmland to non-agricultural uses.
AIR QUALITY	
Clean Air Act (1970), as amended	Provides the principal framework for national, state, and local efforts to protect air quality.
AESTHETICS	
Noise Control Act	Initiated a federal program of regulating noise pollution with the intent of protecting human health and minimizing annoyance of noise to the general public. Noise is defined as unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Response to noise varies according to its type, perceived importance, appropriateness in the setting and time of day, and the sensitivity of the individual receptor.
BIOLOGICAL RESOURCES	
Clean Water Act of 1977	Requires consultation with the USACE for major wetland modifications under Section 404
Endangered Species Act of 1973	Requires federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally-listed threatened or endangered species, or destroying or adversely affecting their critical habitat.
Executive Order of 11990, Protection of Wetlands	Requires that federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural beneficial values of wetlands.
Federal Noxious Weed Act of 1990	Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other federal and state agencies.
Migratory Bird Treaty Act	Prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Takings could result from projects in lakes, prairies, wetlands, stream and woodland habitats, and those that occur on bridges and their structures.
Executive Order on Invasive Species (EO 13112)	Established the National Invasive Species Council to ensure that Federal programs and activities to prevent and control invasive species are coordinated, effective and efficient.

Environmental Law or Regulation	Description
CULTURAL RESOURCES	
Antiquities Act (1906)	Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.
American Indian Religious Freedom Act (1978)	Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.
Archaeological and Historic Preservation Act (1974)	Directs the preservation of historic and archaeological data in federal construction projects.
Archaeological Resources Protection Act of 1979, as amended	Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.
Executive Order 13007 Indian Sacred Sites (1996)	Directs federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.
Native American Graves Protection and Repatriation Act (1990)	Requires federal agencies and museums to inventory, determine ownership, and repatriate cultural items under their control of possession.
National Historic Preservation Act (1966), as amended	Establishes as policy that federal agencies are to provide preservation of the nation’s prehistoric and historic resources, and establishes the National Register of Historic Places.
Protection of Historic and Cultural Properties (1986)	Provides an explicit set of procedures for federal agencies to meet obligations under the National Historic Preservation Act (NHPA), including the inventory of resources and consultation with SHPOs.
Executive Order 13007, Indian Sacred Sites	Requires that federal agencies accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.
Executive Order 13084, Consultation and Coordination with Indian Tribal Governments (1998)	Requires that each federal agency have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.
Kansas Historic Preservation Act	Sets forth the policy for historic preservation and details procedures to be followed by state agencies in nominating properties to the Register and in dealing with undertakings affecting listed properties.
Kansas Antiquities Act	Prohibits unauthorized individuals, institutions, and corporations from excavating in, removing material from, vandalizing, or defacing any archaeological site or features on lands that are owned or controlled by the State, or any county or municipality.
Kansas Unmarked Burial Sites Preservation Act	Establishes procedures to be followed in dealing with discoveries of human remains and funerary objects associated with unmarked burial sites in Kansas.
HAZARDOUS WASTES	
Resource Conservation and Recovery Act	Principal source of regulatory control over the generation, storage, treatment, and disposal of hazardous wastes.
HYDROLOGY RESOURCES	
Clean Water Act of 1977	Requires consultation with the USACE for major wetland modifications under Section 404.
Water Quality Act of 1987, as amended	Establishes as policy restoration and maintenance of the chemical, physical and biological integrity of the nation’s waters and, where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water.

Environmental Law or Regulation	Description
Rivers and Harbors Act	States that appropriate Federal and State agencies are to ensure that possible adverse economic, social and environmental effects relating to any proposed action have been fully considered in the development of the project, and that the final decisions on the project are made in the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes, and the cost of eliminating or minimizing such adverse effects to biological and human resources.
SOCIOECONOMICS	
Executive Order 11988, Flood Plain Management	Requires federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains.
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income populations	Directs federal agencies to assess the effects of their actions on minority or low-income communities within their region of influence.
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	Directs federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children, and ensure that policies, programs, activities, and standards address disproportionately high environmental health and safety risks to children.
Farmland Protection Policy Act of 1981	Minimizes the extent to which federal programs contribute to the unnecessary conversion of farmland to non-agricultural uses.
Water Resources Development Act (WRDA) – 1986, ’90, ’92, ’96 and 2013	Addresses long-term disposal of dredge material and promotes decontamination technologies for the manufacturing of material for beneficial uses.
Federal Aviation Administration (FAA) Advisory Circular 150/5200-33b	Provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports.

7.0 ENVIRONMENTAL CONSULTATION AND COORDINATION

Federal, state and local agencies were consulted prior to and during the preparation of this FPEIS. Agencies were notified of plans for Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir by mail, scheduled public meetings, and publication of a Notice of Intent announcing preparation of a Final PEIS as required by NEPA and by one public scoping meeting. The agencies contacted are listed below.

7.1 Federal Agencies

U.S. Army Corps of Engineers
U.S. Department of Agriculture
    Natural Resources Conservation Service
Department of Energy
    Westar Energy: Wolf Creek Nuclear Generating Station
Department of the Interior
    U.S. Environmental Protection Agency
    U.S. Fish and Wildlife Service
    U.S. Geological Survey

7.2 State Agencies

Emporia State University
Kansas Biological Survey
Kansas Department of Health and Environment
Kansas Department of Transportation
Kansas Department of Wildlife, Parks, & Tourism
Kansas State Historic Preservation Office
Kansas State Historical Society
Kansas State University Agricultural Extension

7.3 Local Agencies

City of Burlington, Kansas
Neosho River Communities
Coffey County, Kansas
Lyon County, Kansas
Flint Hills RC&D

7.4 Project Mailing List

The notice of FPEIS availability is being sent to the following:

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USDA – Farm Services Agency
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Burlington, KS 66839-1190

USDA–Farm Services Agency
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Lyon County Commissioners
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9.0 ACRONYMS AND ABBREVIATIONS

3H	Tritium
AD	Ano Domani
AF	Acre Feet
AFOS	Automated Field Observing Station
BEA	U.S. Bureau of Economic Analysis
BP	Before Present
CAA	Clean Air Act
CAP	Contaminant Assessment Process
CCED	Coffey County Economic Development
CCL	Coffey County Lake
CCP	Comprehensive Conservation Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet Per Second
CNRWAD	Cottonwood and Neosho River Basins Water Assurance District Number 3
CO	Carbon Monoxide
CY	Calendar Year
Dbh	Diameter at Breast Height
DCP	Data Collection Platform
DOMSAT	Data Output Message Satellite
DVA	Deer-Related Vehicle Accidents
E^2M	Engineering-environmental Management, Inc.
EEMI	Engineering-Environmental Management, Inc.
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERS	Environmental Radiation Surveillance
FPPA	Farmland Protection Policy Act
FHNWR	Flint Hills National Wildlife Refuge
FR	Federal Register
GLO	General Land Office
H.C.R.	House Concurrent Resolution
HPMP	Historic Preservation Management Plan
I^{131}	Radioiodine
K.A.R.	Kansas Administrative Regulations
KBS	Kansas Biological Survey
KDHE	Kansas Department of Health & Environment
KDOT	Kansas Department of Transportation
KDWP&T	Kansas Department of Wildlife Parks & Tourism
KNHI	Kansas Natural Heritage Inventory
K.S.A.	Kansas Statutes, Annotated
KS	Kansas
KSHSSR	Kansas State History Society Site Report
KSU	Kansas State University
KWO	Kansas Water Office
KWRB	Kansas Water Resources Board

lpm	Liters Per Minute
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
MGD	Million Gallons Per Day
MGY	Million Gallons Per Year
mm	Millimeter
MO	Missouri
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NAICS	North America Industry Classification System
NEPA	National Environmental Policy Act of 1969, as amended
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NMM	Neosho Mucket Mussel
NO_2	Nitrogen Dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSRA	Natural Science Research Associates
NWR	National Wildlife Refuge
NWS	National Weather Service
O_3	Ozone
OAQPS	Office of Air Quality Planning and Standards
OCWA	Otter Creek Wildlife Area
OK	Oklahoma
OKM	Ouachita Kidneyshell Mussel
Pb	Lead
Pb^{210}	Lead-210
PCB	Polychlorinated Biphenyl
pCi/m^3	picoCuries per Cubic Meter
PEC	Probably Effects Concentration
PEL	Probably Effects Level
PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
PSSAh	Palustrine, Scrub-Shrub, Temporarily Flooded, Diked/Impounded
PM_{10}	Particulate Matter <10 microns
RCRA	Resource Conservation and Recovery Act
REMP	Radioactive Environmental Monitoring Program
RM	River Mile
Rn^{222}	Radon-222
SFY	State Fiscal Year
SH	State Highway
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SUPER	USACE Suite of Computer Programs
TEC	Threshold Effects Concentration
TEL	Threshold Effects Level
US	United States
USACE	United States Army Corps of Engineers, Tulsa District
U.S.C.	United States Code
USDA	United States Department of Agriculture

USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WCGS	Wolf Creek Nuclear Generating Station
WMP	Water Marketing Program
WPFO	Western Prairie Fringed Orchid

10.0 List of Preparers and Contributors

This section contains the list of personnel contributing to PEIS production and presents pertinent information concerning the organizations, project responsibilities, and experience level.

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APPENDIX A

Public Notification and Participation

NOTICE OF INTENT

To Prepare a Draft Programmatic Environmental Impact Statement for the Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas and to Announce Public Scoping Meeting

AGENCY: Kansas Water Office

ACTION: Notice

SUMMARY: Pursuant to Section (102)(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended (NEPA) (42 U.S.C. § 4332 (1994), the Kansas Water Office (KWO) announces its intent to prepare a Draft Programmatic Environmental Impact Statement (EIS) to evaluate the potential environmental consequences of removing sediment from John Redmond Reservoir to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation as well as lake ecosystem due to sedimentation. These activities include outdoor operations that require the use of dredge and sediment disposal sites.

DATES AND ADDRESSES: A public scoping meeting will be held February 5, 2013 at 9:30 a.m. at the Coffey County Courthouse, 110 S. 6th Street in Burlington, KS, to receive oral and written comments on environmental concerns which should be addressed in the EIS.

Anyone requiring special accommodations, such as a sign language interpreter, should contact: Kansas Water Office at 901 S. Kansas Ave., Topeka, KS 66612-1249 or call (785) 296-3185 at least five working days prior to the meeting.

SUPPLEMENTARY INFORMATION: The Action Proponent, KWO, entered into a water supply storage agreement with the U.S. Army Corps of Engineers (USACE) at John Redmond Reservoir to provide water for the Cottonwood and Neosho River Basins Water Assurance District Number 3 (consisting of 19 members) and the Wolf Creek Generating Station. An estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation forms the basis of the 1975 agreement. Sediment has been collecting mainly in the conservation pool, reducing the pool faster than designed, reducing storage capabilities.

The Proposed Action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation as well as the lake ecosystem due to sedimentation.

In addition to a no action alternative, reasonable alternatives to be considered could include varying combinations of the quantities, locations, and phasing of sediment removal from the reservoir. Alternatives could also consider varying locations, design, and methods of disposal for removed sediments, including potential beneficial use of dredged materials.

The USACE, acting as the lead agency, will use the EIS in its consideration of dredging John Redmond Reservoir. This EIS is intended to provide decision makers, responsible agencies and citizens with enough information on the potential range of environmental impacts to make decisions on the alternatives analyzed in the document.

Issues to be addressed in the EIS include but are not limited to: (1) geology and soils, including sediment composition; (2) hydrology and water resources to include both surface and groundwater; (3) air quality; (4) aesthetics; (5) biological resources to include wildlife, fisheries, vegetation, threatened and endangered species;

(6) prime and unique farmlands; (7) socioeconomic issues to include economic and population considerations, land use, recreation, transportation; (8) cultural resources; (9) issues related to potentially contaminated sediments and their disposal; (10) safety; (11) impacts to wetlands and permitting requirements under Section 404 of the Clean Water Act; and (11) cumulative impacts associated with past, current, and reasonably foreseeable future actions at John Redmond Reservoir.

The KWO is initiating the scoping process to identify community concerns and local issues that should be addressed in the EIS. Federal, state and local agencies as well as interested persons are encouraged to provide oral and/or written comments to the KWO to identify specific issues or topics of environmental concern. The KWO will consider these comments in determining the scope of the EIS.

Written comments on the scope of the EIS must be postmarked by March 12, 2013 and should be mailed to:

Kansas Water Office
c/o Bobbi Wendt
901 South Kansas Avenue
Topeka, KS 66612

Comments can also be submitted by phone: 785-296-3185, fax: 785-296-0878 or email: bobbi.wendt@kwo.ks.gov

Kansas Register

Kris W. Kobach, Secretary of State

Vol. 32, No. 4 | January 24, 2013 | Pages 75-110

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State of Kansas

Kansas Water Office

Notice of Intent

Pursuant to Section (102)(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended (NEPA) (42 U.S.C. § 4332 (1994), the Kansas Water Office (KWO) announces its intent to prepare a programmatic environmental impact statement (EIS) to evaluate the potential environmental consequences of removing sediment from John Redmond Reservoir to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation as well as lake ecosystem due to sedimentation. These activities include outdoor operations that require the use of dredge and sediment disposal sites.

A public scoping meeting will be held at 9:30 a.m. Tuesday, February 5, at the Coffey County Courthouse, 110 S. 6th St., Burlington, to receive oral and written comments on environmental concerns that should be addressed in the EIS. Anyone requiring special accommodations, such as a sign language interpreter, should contact the Kansas Water Office, 901 S. Kansas Ave., Topeka, 66612-1249, 785-296-3185, at least five working days prior to the meeting.

Supplementary Information

The action proponent, KWO, entered into a water supply agreement with the U.S. Army Corps of Engineers (USACE) at John Redmond Reservoir to provide water for the Cottonwood and Neosho River Basins Water Assurance District Number 3 (consisting of 19 members) and the Wolf Creek Generating Station. An estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation forms the basis of the 1975 agreement. Sediment has been collecting mainly in the conservation pool, reducing the pool faster than designed, reducing storage capabilities.

The proposed action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation as well as the lake ecosystem due to sedimentation. In addition to a no action alternative, reasonable alternatives to be considered could include varying combinations of the quantities, locations and phasing of sediment removal from the reservoir. Alternatives could also consider varying locations, design and methods of disposal for removed sediments, including potential beneficial use of dredged materials.

The KWO, acting as the lead agency, will use the EIS in its consideration of dredging John Redmond Reservoir. This EIS is intended to provide decision makers, responsible agencies and citizens with enough information on the potential range of environmental impacts to make decisions on the alternatives analyzed in the document.

Issues to be addressed in the EIS include but are not limited to: (1) geology and soils, including sediment composition; (2) hydrology and water resources to include both surface and groundwater; (3) air quality; (4) aesthetics; (5) biological resources to include wildlife, fisheries, vegetation, threatened and endangered species; (6) prime and unique farmlands; (7) socioeconomic issues to include economic and population considerations, land use, recreation and transportation; (8) cultural resources; (9) issues related to potentially contaminated sediments and their disposal; (10) safety; (11) impacts to wetlands and permitting requirements under Section 404 of the Clean Water Act; and (11) cumulative impacts associated with past, current and reasonably foreseeable future actions at John Redmond Reservoir.

The KWO is initiating the scoping process to identify community concerns and local issues that should be addressed in the EIS. Federal, state and local agencies as well as interested persons are encouraged to provide oral and/or written comments to the KWO to identify specific issues or topics of environmental concern. The KWO will consider these comments in determining the scope of the EIS.

Written comments on the scope of the EIS must be postmarked by March 12 and should be mailed to the Kansas Water Office, c/o Bobbi Wendt, 901 S. Kansas Ave., Topeka, 66612. Comments also can be submitted by phone at 785-296-3185, by fax at 785-296-0878 or by email at bobbi.wendt@kwo.ks.gov.

Tracy Streeter
Director

Doc. No. 041253

State of Kansas

Department of Revenue
Division of Vehicles

Notice of Intent to Establish a New Location for an Existing New Motor Vehicle Dealer

Scholfield Bros. Inc. Buick GMC has filed an intent to change dealership location. Scholfield Bros. Inc. Buick GMC currently conducts business as Scholfield Bros. Inc. Buick GMC at 7633 E. Kellogg, Wichita, Kansas. Scholfield Bros. Inc. Buick GMC seeks to relocate its location and line-make vehicles to 1333 N. Greenwich, Wichita, Kansas.

Pursuant to K.S.A. 8-2430(a)(5), any existing new motor vehicle dealer with standing may protest the proposed relocation of the new-line make vehicles by Scholfield Bros. Inc. Buick GMC. K.S.A. 8-2430(c) provides standing to any existing new motor vehicle dealer who has a franchise agreement for the same line-make vehicles as that which are to be sold or offered for sale by Scholfield Bros. Inc. Buick GMC, at 1333 N. Greenwich, Wichita, Kansas, and provided that the existing new motor vehicle dealer is physically located such that its relevant market area, as defined in K.S.A. 8-2430(e), includes the location where the Scholfield Bros. Inc. Buick GMC dealership will be relocated.

Pursuant to K.S.A. 8-2430(a), any petition or complaint by any dealer with standing to protest must be filed with the director of vehicles within 30 days of this notice. Such petition or complaint must be directed to the director of vehicles, Kansas Department of Revenue, Docking State Office Building, 915 S.W. Harrison, Topeka, 66612

Donna Shelite
Director of Vehicles

Doc. No. 041257

www.regulations.gov as they are received without change, including any personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT: Ms. Jody Sinkler, DLA FOIA/Privacy Act Office, Headquarters, Defense Logistics Agency, ATTN: DGA, 8725 John J. Kingman Road, Suite 1644, Fort Belvoir, VA 22060–6221, or by phone at (703) 767–5045.

SUPPLEMENTARY INFORMATION: The Defense Logistics Agency's systems of records notices subject to the Privacy Act of 1974 (5 U.S.C. 552a), as amended, have been published in the **Federal Register** and are available from the address in **FOR FURTHER INFORMATION CONTACT**. The proposed deletion is not within the purview of subsection (r) of the Privacy Act of 1974 (5 U.S.C. 552a), as amended, which requires the submission of a new or altered system report.

Dated: January 24, 2013.

Aaron Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

Deletion:
S900.20 CA

Workforce Composition, Workload, and Productivity Records (December 6, 1996, 61 FR 64709).

REASON:

Records are covered by an existing DoD-wide Privacy Act system of records identified as DMDC 02 DoD, entitled "Defense Enrollment Eligibility Reporting Systems (DEERS)." Therefore, S900.20 CA, Workforce Composition, Workload, and Productivity Records can be deleted.

[FR Doc. 2013–01791 Filed 1–28–13; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Army; Corps of Engineers

Intent To Prepare an Environmental Impact Statement for Sediment Dredging Activities at John Redmond Dam and Reservoir, KS

AGENCY: Department of the Army, U.S. Army Corps of Engineers, DoD.

ACTION: Notice of intent.

SUMMARY: The purpose of the Environmental Impact Statement (EIS) is to address alternatives and environmental impacts associated with proposed dredging (sediment removal and disposal) activities by the State of Kansas at John Redmond Dam and Reservoir, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform removal of excessive accumulated sediment from John Redmond Reservoir for the purpose of at least partially restoring conservation pool storage capacity. The proposed action would restore water supply storage for water users as well as regain lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Dredging activities are proposed by the State of Kansas in response to accumulation of excessive amounts of sediment at unanticipated in-lake settling locations and resulting adverse impacts to a critical water supply as well as an important recreational and biological resource.

ADDRESSES: Questions or comments concerning the proposed action should be addressed to Mr. Stephen L. Nolen, Chief, Planning and Environmental Division, Tulsa District, U.S. Army Corps of Engineers, CESWT–PE, 1645 S. 101st E. Ave., Tulsa, OK 74128–4629.

FOR FURTHER INFORMATION CONTACT: Mr. Stephen L. Nolen, (918) 669–7660, fax: (918) 669–7546, email: *Stephen.L.Nolen@usace.army.mil.*

SUPPLEMENTARY INFORMATION: The Tulsa District, U.S. Army Corps of Engineers manages John Redmond Dam and Reservoir, KS for the authorized purposes of flood control, water supply, water quality control, and recreation. John Redmond Dam is located on the Grand (Neosho) River at river mile 343.7, about 3 miles northwest of Burlington in Coffey County, KS. The project was completed for full flood control operation in September 1964 with all major construction completed in December 1965. The KWO is under contract with the U.S. Army Corps of Engineers for all water supply storage in John Redmond Reservoir and provides water for the Cottonwood and Neosho River Basins Water Assurance District Number 3 (CNRWAD) and the nearby Wolf Creek Generating Station, a nuclear power facility. The CNRWAD includes 13 cities, one wholesale water supplier, and five industrial water users. As such, the reservoir serves as a critical source of municipal and industrial water for the region. The reservoir also provides scarce and important recreational opportunities for the region in the form of fishing, hunting, boating, swimming, and related water-based activities. Water supply and recreational purposes are severely impacted owing to loss of lake capacity resulting from excessive sedimentation and deposition in unanticipated areas since reservoir construction. In addition to a potential increase in conservation pool elevation currently being considered in ongoing storage reallocation studies, dredging provides a means of restoring storage or at least slowing the rate of loss storage capacity at John Redmond Reservoir. Proposed dredging would be fully funded and performed by the State of Kansas. In addition to considerations under the National Environmental Policy Act (NEPA), the proposed action would also likely require review and approval of alterations/modifications of Corps of Engineers projects under 33 U.S.C. 408.

In addition to a no action alternative, reasonable alternatives to be considered could include varying combinations of the quantities, locations, and phasing of sediment removal from the reservoir. Alternatives could also consider varying locations, design, and methods of disposal for removed sediments, including potential beneficial use of dredged materials.

Issues to be addressed in the EIS include but are not limited to: (1) Geology and soils, including sediment composition; (2) hydrology and water resources to include both surface and groundwater; (3) air quality; (4) aesthetics; (5) biological resources to include wildlife, fisheries, vegetation, threatened and endangered species; (6) prime and unique farmlands; (7) socioeconomic issues to include economic and population considerations, land use, recreation, transportation; (8) cultural resources; (9) issues related to potentially contaminated sediments and their disposal; (10) safety; (11) impacts to wetlands and permitting requirements under Section 404 of the Clean Water Act; and (11) cumulative impacts associated with past, current, and reasonably foreseeable future actions at John Redmond Reservoir.

A public scoping meeting for the proposed action is currently planned for 9:30 a.m., Tuesday, February 5, 2013 at the Coffey County Courthouse, 110 S. 6th Street, Burlington, KS 66839. News releases and notices informing the public and local, state, and Federal agencies of the proposed action and date of this and any additional public scoping meeting(s) will be published in local newspapers. Comments received as a result of this notice, news releases, and the public scoping meeting will be used to assist the Tulsa District Corps of Engineers in identifying potential impacts to the quality of the human or natural environment. Affected Federal, state, or local agencies, affected Indian tribes, and other interested private organizations and parties are encouraged to participate in the scoping process by forwarding written comments to (see ADDRESSES) or attending the scoping meeting. Scoping comments must be postmarked by March 12, 2013.

The draft EIS will be available for public review and comment. While the specific date for release of the draft EIS has yet to be determined, all interested agencies, tribes, organizations and parties expressing an interest in this action will be placed on a mailing list for receipt of the draft EIS. In order to be considered, any comments and suggestions should be forwarded to (see ADDRESSES) in accordance with dates specified upon release of the draft EIS.

Dated: January 17, 2013.

Michael J. Teague,

Colonel, U.S. Army, District Commander.

[FR Doc. 2013–01723 Filed 1–28–13; 8:45 am]

BILLING CODE 3720–58–P

DEPARTMENT OF EDUCATION

[Docket No.: ED–2012–ICCD–0062]

Agency Information Collection Activities; Submission to the Office of Management and Budget for Review and Approval; Comment Request; Student Assistance General Provisions—Financial Assistance for Students With Intellectual Disabilities

AGENCY: Department of Education (ED), Federal Student Aid (FSA).

ACTION: Notice.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 3501 *et seq.*), ED is proposing an extension of an existing information collection.

DATES: Interested persons are invited to submit comments on or before February 28, 2013.

ADDRESSES: Comments submitted in response to this notice should be submitted electronically through the Federal eRulemaking Portal at *http://www.regulations.gov* by selecting Docket ID number ED–2012–ICCD–0062 or via postal mail, commercial delivery, or hand delivery. Please note that comments submitted by fax or email and those submitted after the comment period will not be accepted. Written requests for information or comments submitted by postal mail or delivery should be addressed to the Director of the Information Collection Clearance Division, U.S. Department of Education, 400 Maryland Avenue SW., LBJ, Room 2E117, Washington, DC 20202–4537.

FOR FURTHER INFORMATION CONTACT: Electronically mail *ICDocketMgr@ed.gov*. Please do not send comments here.

SUPPLEMENTARY INFORMATION: The Department of Education (ED), in accordance with the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3506(c)(2)(A)), provides the general public and Federal agencies with an opportunity to comment on proposed, revised, and continuing collections of information. This helps the Department assess the impact of its information collection requirements and minimize the public's reporting burden. It also helps the public understand the Department's information collection requirements and provide the requested data in the desired format. ED is soliciting comments on the proposed information collection request (ICR) that is described below. The Department of Education is especially interested in public comment addressing the following issues*:* (1) Is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology. Please note that written comments received in response to this notice will be considered public records.

Title of Collection: Student Assistance General Provisions—Financial Assistance for Students with Intellectual Disabilities.

OMB Control Number: 1845–0099.

Type of Review: Extension without change of an existing collection of information.

Respondents/Affected Public: State, Local, or Tribal Governments.

Total Estimated Number of Annual Responses: 60.

Total Estimated Number of Annual Burden Hours: 21.

Abstract: The Department of Education is requesting an extension of the approved collection for the regulations allowing students with intellectual disabilities who enrolled in an eligible comprehensive transition and postsecondary program to receive Title IV, HEA program assistance under the Federal Pell Grant, Federal Supplemental Educational Opportunity Grant, and Federal Work Study programs.

Dated: January 24, 2013.

Kate Mullan,

Acting Director, Information Collection Clearance Division, Privacy, Information and Records Management Services, Office of Management.

[FR Doc. 2013–01861 Filed 1–28–13; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF EDUCATION

[Docket No. Ed–2012–ICCD–0059]

Agency Information Collection Activities; Submission to the Office of Management and Budget for Review and Approval; Comment Request; Mathematics and Science Partnerships Program: Annual Performance Report

AGENCY: Office of Elementary and Secondary Education (OESE), Department of Education (ED).

ACTION: Notice.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 3501 *et seq.*), ED is proposing a revision of an existing information collection.

DATES: Interested persons are invited to submit comments on or before February 28, 2013.

ADDRESSES: Comments submitted in response to this notice should be submitted electronically through the Federal eRulemaking Portal at *http://www.regulations.gov* by selecting Docket ID number ED–2012–ICCD–0059 or via postal mail, commercial delivery, or hand delivery. *Please note that comments submitted by fax or email and those submitted after the comment period will not be accepted.* Written requests for information or comments submitted by postal mail or delivery should be addressed to the Director of the Information Collection Clearance Division, U.S. Department of Education, 400 Maryland Avenue SW, LBJ, Room 2E117, Washington, DC 20202–4537.

FOR FURTHER INFORMATION CONTACT: Electronically mail *ICDocketMgr@ed.gov*. Please do not send comments here.

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901 S. Kansas Avenue
Topeka, KS 66612

Kansas Water Office

Phone: (785)-296-3185
Fax: (785)-296-0878
www.kwo.org

Tracy Streeter, Director

Sam Brownback, Governor

FOR IMMEDIATE RELEASE:
January 23, 2013

Contact: Katie Patterson-Ingels, 785-296-3185
katie.ingels@kwo.ks.gov
www.kwo.org

Kansas Water Office to Hold Public Meeting in Burlington
John Redmond Reservoir Dredging Scoping Meeting on February 5

The Kansas Water Office (KWO) is proposing to dredge John Redmond Reservoir to restore water supply lost to sedimentation. KWO is initiating the scoping process to identify community concerns and local issues that should be addressed in the Programmatic Environmental Impact Statement (EIS) for the dredging project proposal.

A public scoping meeting will be held February 5, 2013 at 9:30 a.m. at the Coffey County Courthouse, 110 S. 6th Street in Burlington, KS, to receive oral and written comments on environmental concerns which should be addressed in the EIS dredging proposal.

KWO will be conducting several public meetings in 2013 to receive feedback on alternatives and impacts from the proposed dredging project. Additional information on John Redmond dredging planning and public outreach can be found on the KWO website at www.kwo.org/projects_programs/JohnRedmondDredging.htm.

Written comments on the scope of the EIS must be postmarked by March 12, 2013 and should be mailed to: Kansas Water Office, attention Bobbi Wendt, 901 South Kansas Avenue, Topeka, KS 66612 or comments can also be submitted by phone, 785-296-3185 or email: bobbi.wendt@kwo.ks.gov .

If accommodations are needed for persons with disabilities, please notify the KWO at least five working days prior to the meeting.

# # #

As the state's water office, KWO conducts water planning, policy coordination and water marketing as well as facilitates public input throughout the state.

The agency prepares the KANSAS WATER PLAN, a plan for water resources development, management and conservation. KWO also reviews all water laws and makes recommendations to the Governor and Legislature for needed legislation.

Public Scoping Meeting

Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

Coffey County Courthouse

February 5, 2013

Public Scoping Meeting Agenda

1. Introductions
2. Scoping Meeting Format
3. Project Purpose and Need
4. U.S. Army Corps of Engineers Partnership Role
5. Public Comments

Public Scoping Meeting

Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

INTRODUCTIONS

Public Scoping Meeting

Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

SCOPING MEETING FORMAT

Meeting Format

- Brief presentation from KWO and Corps describing project purpose and need
- Public comments provided first by those individuals who collected a number when arriving
- Following the numbered registrants, open comments accepted from those in attendance
- To ensure all who attend have the opportunity to speak, comments will be limited to **2 minutes**

Your comments and feedback about this activity are welcomed and important. Written comments can be provided to the following:

Katie Patterson-Ingels
Kansas Water Office
Communications Director
901 S. Kansas Avenue
Topeka, KS 66612
Katie.Ingels@kwo.ks.gov
(785) 296-3185

What is NEPA and an EIS?

- The National Environmental Policy Act (NEPA) is a national charter for the protection and restoration of the environment.
- NEPA includes a requirement to prepare a detailed statement of major Federal actions significantly affecting the quality of the human environment. In this case, the statement is an Environmental Impact Statement (EIS).

What is the purpose of public scoping?

- Early and open process for determining the scope of issues to be addressed.
- Based on your comments, KWO will refine the John Redmond EIS to focus on significant issues, as well as eliminate issues that are not significant from further detailed study.
- Pursuant to NEPA, KWO will ensure the EIS is available to the public before decisions are made and actions are taken.

Public Scoping Meeting

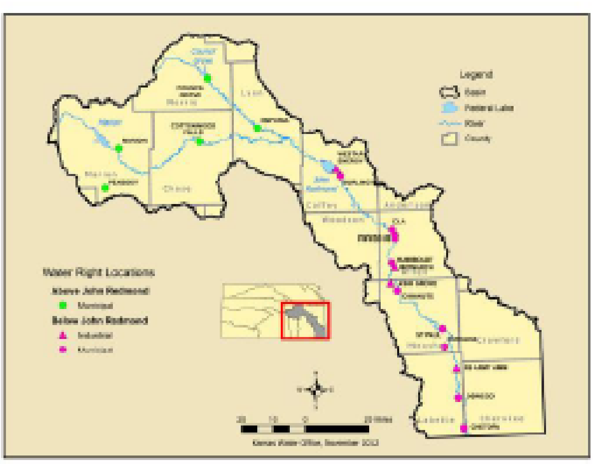
Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

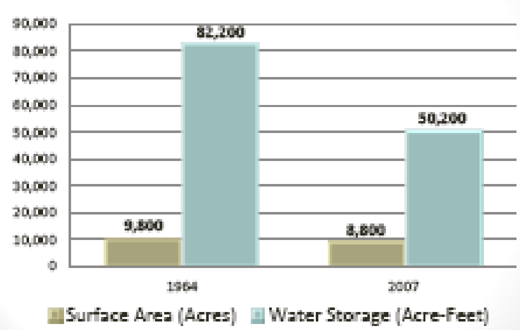
JOHN REDMOND RESERVOIR – BACKGROUND

John Redmond Reservoir

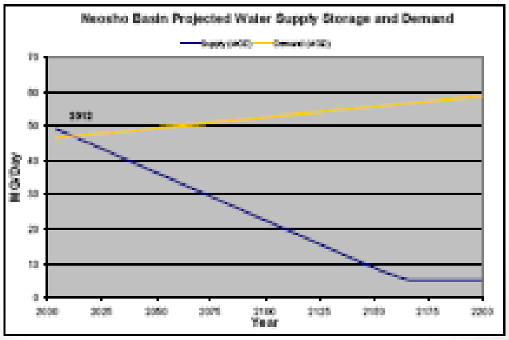
- Constructed in 1964
  - Design Life 50 years
- Bathymetric Survey in 2007
  - Has lost 42 % of Storage
  - Sedimentation rate is 739 AF/year
  - 80% more than projected



Lost Surface Area and Capacity



Neosho Basin Supply v. Demand



Current Initiatives to Reduce Sediment

- Streambank Stabilization and Other Watershed Restoration Practices
- Reallocation Request and Pool Rise

The purpose and need of the proposed federal action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem that has been lost due to sedimentation.

Purpose and Need

Environmental Impact Statement (EIS)

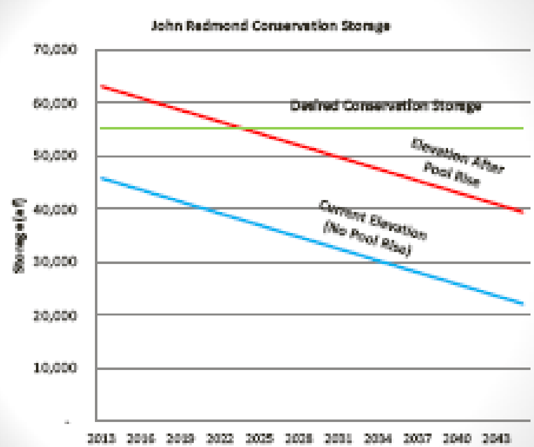
Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

Alternative – Restore Water Supply through Sediment Removal

- First – continue sediment reduction BMPs above John Redmond
- Remove sediment at a pace and purpose to maintain storage for current demands
- State seeking Request for Proposals to help provide better cost estimates and recommendations for project scope of work

How much sediment will be removed?

- KWO estimates that approximately 600,000 CY of sediment will need to be removed each year to maintain the volume necessary to meet customer demands during the 2% chance drought.



Where will the sediment be deposited?

- KWO is conducting preliminary reconnaissance to identify land near the reservoir suitable for disposal
- Disposal sites will likely involve construction of temporary impoundments to pump sediment/water mix
- After a period of a few years of draining, the walls can be removed and the land can return to a original or new purpose (agricultural production, recreational fields, etc)

Where will the sediment be deposited?

- Land use for disposal will only be acquired by donation or negotiated agreements between the state and landowner
- If you own land near the reservoir and are interested in learning more about the possibility of using the property for temporary sediment disposal, please contact KWO.

Who will pay for the project?

- Cost borne solely by State or other non-federal partners
- Costs include:
  - Planning
  - Permits & Studies
  - Land Acquisition
  - Disposal & Dewatering
  - Dredging

What other alternatives have been considered?

- KWO, in coordination with other state, federal and local partners, have evaluated other options to increase water supply storage in the Neosho basin. These alternatives, which have been eliminated from consideration in this EIS, include interbasin transfer using a pipeline and construction of a new reservoir.
- For the purpose of the EIS, KWO will also evaluate the "No Action" alternative.
- KWO may also consider alternatives provided during the scoping process.

Where can I find more information?

http://www.kwo.org/projects_programs/JohnRedmondDredging.html

Public Scoping Meeting

Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

U.S. ARMY CORPS OF ENGINEERS PARTNERSHIP ROLE

Public Scoping Meeting

Environmental Impact Statement (EIS)

Removal of Sediment and Restoration of Water Supply Storage at John Redmond Reservoir

PUBLIC COMMENT

Public Comment

What issues do you think the Kansas Water Office should address in the Environmental Impact Statement?

Public Comment Format

- Public comments provided first by those individuals who collected a number when arriving
- Following the numbered registrants, open comments accepted from those in attendance
- To ensure all who attend have the opportunity to speak, comments will be limited to **2 minutes**

Your comments and feedback about this activity are welcomed and important. Written comments can be provided to the following:

Katie Patterson-Ingels
Kansas Water Office
Communications Director
901 S. Kansas Avenue
Topeka, KS 66612
Katie.Ingels@kwo.ks.gov
(785) 296-3185

Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir
Environmental Impact Statement (EIS)
Public Scoping Meeting
February 5, 2013 at 9:30am
Coffey County Courthouse
Burlington, KS

The State of Kansas is proposing to dredge John Redmond Reservoir to restore water supply storage lost to sedimentation. Information on the project purpose and need, schedule, and additional upcoming meetings are available at:

http://www.kwo.org/projects_programs/JohnRedmondDredging.html

1. Introductions
2. Scoping Meeting Format
3. Project Purpose and Need
4. U.S. Army Corps of Engineers Partnership Role
5. Public Comments

Your comments and feedback about this activity are welcomed and important. Public comments can be offered verbally during the scoping meeting. If you prefer to provide comments following this meeting, they can be provided to:

Katie Patterson-Ingels
Kansas Water Office, Communications Director
901 S. Kansas Avenue
Topeka, KS 66612
(785) 296-3185
Katie.Ingels@kwo.ks.gov

Public comment period ends on March 12, 2013

John Redmon Dredging Meeting
2/5/2013 9:30

Name	Representing/Occupation	City
James Cowll	Oonouo Coust	Chicago, Il
Regina R Kewley	City Clerk	Burlington, Ks
Mark Petterson	Coffey County Republican	Burlington, Ks
Larry Davico	Johnson Const Co	Jacksonville, Fl
Warren Bell	Farmer	Burlington, Ks
Bob Culbertson	KDWPT	New Strawn, Ks
Darl Henson	CFG Exterson	Burlington, Ks
L. Sawesesg	Farm	LeRoy, Ks
Carolyn Smalley	D&Z	Parsons, Ks
J.D. Lester	City Manager	Chanute, Ks
Larry Gates	Utility Director	Chanute, Ks
Terry McCormick	Westar Energy	Topeka,Ks
Angie Kirchner	Coffey County Clerk	Burlington, Ks
Russel Stukey	Coffey County Emergency Mgmt	Burlington, Ks
Cortney Bartley	Coffey County Emergency Mgmt	Burlington, Ks
Bobbie Wendt	KWO	Topeka,Ks
Craig Seibert	Southwind Const	Evansville, In
Brian Meier	BMc D	Wichita, Ks
Kevin Kremkau	GBA	Tampa, Fl
Elmer Tatsch	PWWSD #5	Iola, Ks
John Johnson	KDWPT	Woodson, Co
Justin Morrison	KDWPT	Woodson, Co
Jason Deal	KDWPT	Woodson, Co
Bryan Taylor	USACE	Tulsa, Ok
Steve Nolen	USACE	Tulsa, Ok
Nate Herring	USACE	Tulsa, Ok
Eugene Goff	USACE	
Keith Francis	USACE	Tulsa,Ok
Paul Liechti	Ks Biological Survey	Lawrence, Ks
Jon Nieman	GLDD	Burlington, IA
Zack Monat	GLDD	Oak Brook, Il
Steve Pegg	GLDD	Burlington, IA
Doug Mays	GLDD	Topeka, Ks
Glenn Fischer	Oswego Mayor	Oswego, Ks
Nancy G. Billings		Burlington, Ks
Chuck W. Cordell	Retired	Burlington, Ks
Jim Stephens		Oswego, Ks
Cheri Peine		Oswego, Ks
Donnie Allison		Oswego, Ks
Daniel Williamson	citizen	Burlington, Ks
Bob Hammond	WCNOC	New Strawn, Ks
Ron Wood	Mayor	Chetopa, Ks
Scott Jones	Flint Hill ACLD	Emporia, Ks
Jim Putnam	USGS	Lawrence, Ks
Scott Satterthwaite	KDHE	Topeka, Ks

John Redmon Dredging Meeting
2/5/2013 9:30

Name	Representing/Occupation	City
Hakim Saadi	KDA/DOC	Topeka, Ks
Vince Adamrk		Tulsa,Ok
Nick Crawford		Tulsa,Ok
Larry Hastings	Great Plains Dev Auth	Parsons, Ks
Fred Rowley	Commissioner	Lebo, Ks
John Mitchell	KDHE	Topeka, Ks
Wayne Mudd	City of Chanute	Chanute, Ks
Derek Clevenger	City of Parsons	Parsons, Ks
Cassie Bailey	WCNOC	Burlington, Ks
Kyle Manwaring	USACE	
Gary Simmons	USACE	Burlington, Ks
Greg Lamberson	Genesis Water	Denver, Co
Art Freund	Farmer	Emporia, Ks
Dan Haines	WCNOC	Burlington, Ks
Alex Dick	Modum Dredging & Pump Co	Chester, Pa
Arlin Meats	CC Commissioner	Leroy, Ks
Sarah Reznicek	USACE	ElDorado, Ks
Eric Johnson	KDWPT	Pratt,Ks
Toby Ross	Iola Water Plant	Iola, Ks
Donna L Berland	Coffey County	Burlington, Ks
Kenneth L Combes	Coff ey County Commission	Burlington, Ks
Brett A. Skillman		New Strawn, Ks
Forrest T Rhodes		Burlington, Ks
John Schlageck	Kansas Farm Bureau	Manhattan, Ks
Gene Merry	City of Burlington	Burlington, Ks
Galen Biery	CNRBWAD #3	Topeka, Ks
Mike Skillman	Skillman Const	Burlington, Ks
Jim George		Hartford, Ks
Gary Romium		Hartford, Ks
Bob Saueressig	CC Commission	Burlington, Ks
Kimberly Robrahn	CC Commission	Burlington, Ks
Vic Elam	US Fish & Wildlife Service	Hartford, Ks
Aaron Hackman	ENVIRON	Overland Park, Ks
Steve McGinnis	ENVIRON	Overland Park, Ks
Art Pope	ENVIRON	Overland Park, Ks
Michael Eddings	EEC	New Strawn, Ks
Jeff Hodges	Hodges Farms & Dredging	Lebo, Ks
Brad Loveless	Westar Energy	Topeka, Ks
Paul Lambert	Denovo Properties	Chicago, Il
Loren Neanosky	BAS	ElDorado, Ks

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. Dan Mulhern, Acting Field Supervisor
U.S. Fish and Wildlife Service
Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, KS 66502

Dear Mr. Mulhern:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

A notice of intent (NOI) to prepare an Environmental Impact Statement is scheduled to be published in the Federal Register on or around January 29, 2013. A public scoping meeting for this action is scheduled for 9:30 AM, Tuesday, February 5, 2013, at the Coffey County Courthouse, 110 S. 6th Street, Burlington, Kansas 66839. We welcome your attendance at this meeting.

By this letter, we are also requesting your participation as a cooperating agency in the NEPA process in accordance with 40 CFR 1501.6. As a cooperating agency, you would be asked to participate in the scoping process, help identify issues and alternatives, and commit resources in your area(s) of expertise

to this study. In addition to your attendance at the public scoping meeting, we are requesting a response from your office regarding your willingness to participate as a cooperating agency for this study.

We appreciate your assistance with this matter. Written responses and any questions regarding this matter should be addressed to me at U.S. Army Corps of Engineers, CESWT-PE, 1645 S. 101st E. Ave, Tulsa, Oklahoma 74128-4629. I can also be reached by phone at 918-669-7660, fax 918-669-7546, or e-mail: Stephen.L.Nolen@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental
Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. Robin Jennison, Secretary
Kansas Department of Wildlife, Parks, and Tourism
512 SE 25th Avenue
Pratt, KS 67124-8174

Dear Mr. Jennison:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

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We appreciate your assistance with this matter. Written responses and any questions regarding this matter should be addressed to me at U.S. Army Corps of Engineers, CESWT-PE, 1645 S. 101st E. Ave, Tulsa, Oklahoma 74128-4629. I can also be reached by phone at 918-669-7660, fax 918-669-7546, or e-mail: Stephen.L.Nolen@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental
Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. John Mitchell, Director
Division of Environment
Kansas Department of Health and Environment
1000 SW Jackson, Suite 400
Topeka, KS 66612-1367

Dear Mr. Mitchell:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

A notice of intent (NOI) to prepare an Environmental Impact Statement is scheduled to be published in the Federal Register on or around January 29, 2013. A public scoping meeting for this action is scheduled for 9:30 AM, Tuesday, February 5, 2013, at the Coffey County Courthouse, 110 S. 6th Street, Burlington, Kansas 66839. We welcome your attendance at this meeting.

By this letter, we are also requesting your participation as a cooperating agency in the NEPA process in accordance with 40 CFR 1501.6. As a cooperating agency, you would be asked to participate in the scoping process, help identify issues and alternatives, and commit resources in your area(s) of expertise

to this study. In addition to your attendance at the public scoping meeting, we are requesting a response from your office regarding your willingness to participate as a cooperating agency for this study.

We appreciate your assistance with this matter. Written responses and any questions regarding this matter should be addressed to me at U.S. Army Corps of Engineers, CESWT-PE, 1645 S. 101st E. Ave, Tulsa, Oklahoma 74128-4629. I can also be reached by phone at 918-669-7660, fax 918-669-7546, or e-mail: Stephen.L.Nolen@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. Karl Brooks, Regional Administrator
USEPA Region VII
11201 Renner Blvd.
Lenexa, KS 66219

Dear Mr. Brooks:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

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Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental
Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. J.D. Strong, Executive Director
Oklahoma Water Resources Board
3800 North Classen Boulevard
Oklahoma City, OK 73118

Dear Mr. Strong:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

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Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Mr. Eric B. Banks, State Conservationist
USDA, NRCS
760 South Broadway
Salina, KS 67401

Dear Mr. Banks:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

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Sincerely,

Stephen L. Nolen

Stephen L. Nolen
Chief, Planning and Environmental
Division

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

January 22, 2013

Planning and Environmental Division

Ms. Jennie A. Chinn
Kansas Historical Society
6425 SW 6th Avenue
Topeka, KS 66615-1099

Dear Ms. Chinn:

This is to inform you that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, Coffey County, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fund and perform sediment removal and disposal actions at the reservoir in response to accumulation of excessive amounts of sediment at unanticipated locations in the reservoir. Purposes for the dredging activities would include restoring water supply storage for water users as well as regaining lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Presently, we are initiating preparation of an EIS for compliance with the National Environmental Policy Act of 1969 (NEPA) and would appreciate any initial information you might have regarding threatened and endangered species, fish and wildlife issues, water quality, important natural or cultural resources, or other matters pertaining to our analysis.

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We appreciate your assistance with this matter. Written responses and any questions regarding this matter should be addressed to me at U.S. Army Corps of Engineers, CESWT-PE, 1645 S. 101st E. Ave, Tulsa, Oklahoma 74128-4629. I can also be reached by phone at 918-669-7660, fax 918-669-7546, or e-mail: Stephen.L.Nolen@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental
Division

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Robert Moser, MD, Secretary

Kansas

Department of Health & Environment

Phone: 785-296-1535
Fax: 785-296-8464
www.kdheks.gov

Sam Brownback, Governor

January 29, 2013

Mr. Stephen L. Nolen
Chief, Planning and Environmental Division
U.S. Army Corps of Engineers, CESWT-PE
1645 S. 101st E. Ave.
Tulsa, Oklahoma 74128-4629

Dear Mr. Nolen,

This is in reply to your January 22, 2013 letter regarding preparation of an Environmental Impact Statement (EIS) for proposed dredging of sediments from John Redmond Dam and Reservoir, located in Coffey County, Kansas.

We look forward to attending the public scoping meeting for this project on February 5, 2013, in Burlington. We will also serve as a cooperating agency in the NEPA process, and are willing to participate in the scoping process, help identify issues and alternatives, and provide necessary resources to support this study.

We look forward to working with you on this project.

Sincerely yours,

John W. Mitchell

John W. Mitchell
Director, Division of Environment

C Mike Tate
Tracy Street – Kansas Water Office

JAN 29 2013

KSR&C No. 13-02-001

6425 SW 6th Avenue
Topeka, KS 66615

Kansas

phone: 785-272-8681
fax: 785-272-8682
cultural_resources@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

January 31, 2013

Stephen L. Nolen
Chief, Planning and Environmental Division
U.S. Army Corps of Engineers, CESWT-PE
1645 S. 101st E. Avenue
Tulsa, OK 74128-4629

RE: Sediment Dredging
John Redmond Reservoir
Coffey and Lyon Counties

Dear Mr. Nolen:

The Kansas State Historic Preservation Office has reviewed the description of proposed sediment dredging at John Redmond Reservoir as contained in your letter dated January 22, 2013. It is our understanding that the Tulsa District is initiating preparation of an Environmental Impact Statement (EIS). Sediment accumulation has become a serious problem in a number of the region's reservoirs, and we certainly understand the need for the dredging project.

John Redmond Reservoir was constructed at a time when cultural resource laws were very similar to those now in force. Extensive cultural resource investigations were therefore undertaken, including archeological survey, testing, and mitigation projects. Other investigations have followed in the years since as areas around the lake have been developed. As a result, the locations of large numbers of extant archeological sites throughout the reservoir area are well established. However, given what we understand to be the nature of sediment dredging, we believe that major cultural resource impacts are unlikely to result from the proposed project.

We appreciate the invitation to become involved in this project through the NEPA process. However, we do not have any major concerns at this time and so do not see the need to participate as a cooperating agency. We do look forward to reviewing specific dredging locations through the Section 106 process once they become available.

If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 (ext.225).

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer

Patrick Zollner

Patrick Zollner
Deputy SHPO

APPENDIX B

Federally Listed Species for the John Redmond Reservoir Project Area

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

KANSAS ECOLOGICAL SERVICES FIELD OFFICE
2609 ANDERSON AVENUE
MANHATTAN, KS 66502
(785) 539-3474

Project Name:
Dredge_SpeciesList

Project Counties:
Coffey, KS

Project Type:
Dredge / Excavation

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of 3 threatened, endangered, or candidate species, and/or designated critical habitat on your species list. Species on this list are the species that may be affected by your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Please contact the designated FWS office if you have questions.

Species that may be affected by your project:

Clams	Status	Species Profile	Contact

Natural Resources of Concern

Neosho Mucket (*Lampsilis rafinesqueana*)	Endangered	species info		Kansas Ecological Services Field Office
rabbitsfoot (*Quadrula cylindrica cylindrica*)	Threatened	species info		Kansas Ecological Services Field Office
Fishes				
Neosho madtom (*Noturus placidus*) Population: Entire	Threatened	species info		Kansas Ecological Services Field Office

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are 1 refuges in your refuge list

Flint Hills National Wildlife Refuge (620) 392-5553 P.O. BOX 128 HARTFORD, KS66854	refuge profile

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

APPENDIX C

Kansas Listed Species for the John Redmond Reservoir Project Area

KANSAS

Threatened & Endangered Species (T&E)

THREATENED:

INVERTEBRATES

Butterfly Mussel, *Ellipsaria lineolata*
Delta Hydrobe, *Probythinella emarginata*
Flutedshell Mussel, *Lasmigona costata*
Ouachita Kidneyshell Mussel, *Ptychobranchus occidentalis*
Rock Pocketbook Mussel, *Arcidens confragosus*
Sharp Hornsnail, *Pleurocera acuta*

FISH

Arkansas Darter, *Etheostoma cragini*
Blackside Darter, *Percina maculata*
Chestnut Lamprey, *Ichthyomyzon castaneus*
Flathead Chub, *Platygobio gracilis*
Hornyhead Chub, *Nocomis biguttatus*
Neosho Madtom, *Noturus placidus*
Plains Minnow, *Hybognathus placitus*
Redspot Chub, *Nocomis asper*
Shoal Chub, *Macrhybopsis hyostoma*
Silverband Shiner, *Notropis shumardi*
Sturgeon Chub, *Macrhybopsis gelida*
Topeka Shiner, *Notropis topeka*
Western Silvery Minnow, *Hybognathus argyritis*

AMPHIBIANS

Eastern Newt, *Notophthalmus viridescens*
Eastern Narrowmouth Toad, *Gastrophryne carolinensis*
Green Frog, *Rana clamitans*
Green Toad, *Bufo debilis*
Longtail Salamander, *Eurycea longicauda*
Spring Peeper, *Pseudacris crucifer*
Strecker's Chorus Frog, *Pseudacris streckeri*

REPTILES

Broadhead Skink, *Eumeces laticeps*
Checkered Garter Snake, *Thamnophis marcianus*
Common Map Turtle, *Graptemys geographica*
Longnose Snake, *Rhinocheilus lecontei*
Redbelly Snake, *Storeria occipitomaculata*
Smooth Earth Snake, *Virginia valeriae elegans*
Texas Blind Snake, *Leptotyphlops dulcis*

BIRDS

Piping Plover, *Charadrius melodus*
Snowy Plover, *Charadrius alexandrinus*

MAMMALS

Eastern Spotted Skunk, *Spilogale putorius*

ENDANGERED:

INVERTEBRATES

American Burying Beetle, *Nicrophorus americanus*
Ellipse Mussel, *Venustaconcha ellipsiformis*
Elktoe Mussel, *Alasmidonta marginata*
Flat Floater Mussel, *Anodonta suborbiculata*
Mucket Mussel, *Actinonaias ligamentina*
Neosho Mucket Mussel, *Lampsilis rafinesqueana*
Optioservus Riffle Beetle, *Optioservus phaeus*
Rabbitsfoot Mussel, *Quadrula cylindrica*
Slender Walker Snail, *Pomatiopsis lapidaria*
Western Fanshell Mussel, *Cyprogenia aberti*

FISH

Arkansas River Shiner, *Notropis girardi*
Arkansas River Speckled Chub, *Macrhybopis tetranema*
Pallid Sturgeon, *Scaphirhynchus albus*
Sicklefin Chub, *Macrhybopsis meeki*
Silver Chub, *Macrhybopsis storeriana*

AMPHIBIANS

Cave Salamander, *Eurycea lucifuga*
Many-ribbed Salamander, *Eurycea multiplicata*
Grotto Salamander, *Typhlotriton spelaeus*

BIRDS

Black-capped Vireo, *Vireo atricapilla*
Eskimo Curlew, *Numenius borealis*
Least Tern, *Sterna antillarum*
Whooping Crane, *Grus americana*

MAMMALS

Black-footed Ferret, *Mustela nigripes*
Gray Myotis, *Myotis grisescens*

KANSAS DEPARTMENT OF WILDLIFE & PARKS
Updated: August, 2009

Operations Office
512 SE 25th Ave.
Pratt, KS 67124-8174

Kansas
Department of Wildlife, Parks and Tourism

Phone: (620) 672-5911
Fax: 620-672-6020
www.kdwp.state.ks.us

Robin Jennison, Secretary

Sam Brownback, Governor

July 17, 2013

Bobbi Wendt
Kansas Water Office
901 S Kansas Avenue
Topeka, KS 66612

Track: 20121424-3
Ref.: D1.1103
CF

Dear Ms. Wendt:

This letter is a follow up response to comments sent out June 20, 2013, regarding the dredging project proposed for John Redmond Reservoir (JRR) and state listed threatened and endangered species and associated habitats. The JRR project entails dredging operations to insure 55,000 acre-feet of conservation storage is available annually for municipal and industrial demand. John Redmond Reservoir is located in Coffey County, Kansas.

Our initial review of the Kansas Water Office (KWO) draft Programmatic Environmental Impact Statement (PEIS) stated concerns with potential adverse impacts to many state listed species and associated habitats downstream of JRR dam. In a recent revision of the PEIS all concerns were addressed, such as sediment loads and concentrations, water quality, reservoir releases, floods, etc. and incorporated into project logistics and operations.

Therefore, we acknowledge that KWO has addressed all concerns of the Kansas Department of Wildlife, Parks and Tourism with the dredging operations that will take place within JRR. We are in agreement that the Preferred Alternative will not likely adversely affect state listed threatened and endangered species and habitats with implemented avoidance and minimization measures coupled with monitoring of the Neosho River.

In addition, we still advocate the timely releases of water from JRR, subsection 4.4 of PEIS, Biological Resources, to benefit state listed threatened and endangered fish and mussel species, associated habitats, and all other natural resources that are located in the Neosho River downstream of JRR.

If you have any questions or concerns please contact me at (620) 672-0795 or jason.luginbill@ksoutdoors.com

Sincerely,

Jason L Luginbill

Jason S. Luginbill, Aquatic Ecologist
Ecological Services Section

PRATT OPERATIONS OFFICE
512 SE 25th Ave., Pratt, KS 67124-8174
(620) 672-5911 • Fax: (620) 672-6020

APPENDIX D

Historical and Cultural Resources

Sites around John Redmond Reservoir

Site	Status	Reference
14CF027	Recommended Not NRHP Eligible	Rogers 1979
	Destroyed	HPMP 1997
14CR037	Recommended Not NRHP Eligible	Rogers 1979
	Destroyed	HPMP 1997
14CF041	Recommended Not NRHP Eligible	Rogers 1979
	Destroyed	HPMP 1997
14CF047	Recommended Not NRHP Eligible	Rogers 1979
	Destroyed	HPMP 1997
14CF101	Formerly Determined Not NRHP Eligible	Rust 2001b
14CF102	Formerly Determined Not NRHP Eligible	Rust 2001b
14CF103	Formerly Determined Not NRHP Eligible	Rust 2001b
14CF104	Formerly Determined Not NRHP Eligible	Rust 2001b
14CF105	Formerly Determined Not NRHP Eligible	Rust 2001b
14CF302	Destroyed	Rust 2001a
14CF303	Destroyed	Rust 2001a
14CF311	Formerly Determined Not NRHP Eligible	Rust 2001b (forthcoming)
14CF313	Formerly Determined Not NRHP Eligible	Rust 2001b
	South extension of current 14CF311	Wilmeth 1960 (KSHSSR)
14CF314	Recommended Not NRHP Not Eligible	Witty 1961
	Destroyed	HPMP 1997
14CF319	Recommended Not NRHP Eligible	Theis 1979 Wilmeth 1960 (KSHSSR) Rust 2001a
14CF320	Recommended Not NRHP Eligible	Wilmeth 1960 (KSHSSR)
	Destroyed	Theis 1979 HPMP 1997
14CR321	Recommended Not NRHP Eligible	Witty 1961
	Destroyed	HPMP 1997
14CF324	Destroyed	Rust 2001a
14CR325	Recommended Not NRHP Eligible	Witty 1961 HPMP 1997
	Destroyed	Rust 2001a
14CF326	Destroyed	Rust 2001a
14CF327	Recommended Not NRHP Eligible	Witty 1961 Theis 1983 (KSHSSR) HPMP 1997
14CF330	Mitigated	Witty 1980
	Destroyed	Rust 2001a
14CF331	Mitigated	Witty 1980 HPMP 1997
14CF333	Recommended Not NRHP Eligible	Witty 1961 Rust 2001a
14CF343	Destroyed	HPMP 1997
14CF350	Recommended Not NRHP Eligible	Theis 1979 HPMP 1997
14CF351	Recommended Not NRHP Eligible	Maul 1979 (KSHSSR) HPMP 1997 Rust 2001a
14CF352	Recommended Not NRHP Eligible	Theis 1981

Site	Status	Reference
		HPMP 1997
14CF353	Recommended Not NRHP Eligible	Theis 1981
	Destroyed	HPMP 1997
14CF354	Destroyed	HPMP 1997
14CF355	Destroyed	HPMP 1997
14CF356	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
14CF357	Recommended Not NRHP Eligible	Theis 1981 Rust 2001b
14CF360	Recommended Not NRHP Eligible	Theis 1981
	Destroyed	HPMP 1997
14CF361	Recommended Not NRHP Eligible	Theis 1981
	Destroyed	HPMP 1997
14CF362	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
14CF363	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
14CF364	Recommended Not NRHP Eligible	Theis 1979
	Destroyed	HPMP 1997
14CF365	Recommended Not NRHP Eligible	Theis 1981
	Destroyed	HPMP 1997
14CF369	Recommended Not NRHP Eligible	Rust 2001b
14CF389	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
14CF390	Recommended Not NRHP Eligible	Theis 1981
	Destroyed	HPMP 1997
14CF391	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
14CF1316	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
	Destroyed	Rust 2001a
14CF1318	Recommended Not NRHP Eligible	Theis 1981 HPMP 1997
	Destroyed	Rust 2001a
14CF1329	Recommended Not NRHP Eligible	Theis 1983 (KSHSSR)
	Destroyed	HPMP 1997
14CF1335	Destroyed	Rust 2001a
14CF1336	Destroyed	Rust 2001a
KSHSSR = Kansas State Historical Society Site Report		

Sites Downriver of John Redmond Dam

Site (N-S By County)	Reference	Summary Description
14CF8	Schmits 1973	Prehistoric: hearths in riverbank
14CF9	Schmits 1973	Prehistoric: lithic and burned stone deposit in riverbank
14CF10	Schmits 1973	Prehistoric: lithic and burned stone deposit in riverbank
14CF11	Schmits 1973	Prehistoric: mussel and charcoal deposit in riverbank
14CF12	Schmits 1973	Prehistoric: lithic and animal bone deposit in riverbank
14CF13	Schmits 1973	Prehistoric: lithic and burned earth deposit in riverbank
14AN6	Schmits 1973	Prehistoric: animal bone and lithic deposits in riverbank
14NO6	Schmits 1973	Prehistoric: hearths and lithic deposits in riverbank
14NO7	Schmits 1973	Prehistoric: pottery and animal bone deposits in riverbank
14NO8	Schmits 1973	Prehistoric: bone and burned earth deposit in riverbank
14NO9	Schmits 1973	Prehistoric: hearth in riverbank
14NO10	Schmits 1973	Prehistoric: mussel and charcoal deposits in riverbank
14NO11	Schmits 1973	Prehistoric: lithic scatter on top of riverbank Historic: nails, glass, china on top of riverbank
14NO376	KSHSSR 1976	Prehistoric: hearths and bison bone in riverbank
14NO398	KSHSSR 1994	Prehistoric: burials and lithics in riverbank
14LT9	Schmits 1973	Prehistoric: lithic deposit in riverbank
14LT10	Schmits 1973	Prehistoric: lithic and charcoal deposits in riverbank
14LT11	Schmits 1973	Prehistoric: hearth and burned earth deposit in riverbank
14LT12	Schmits 1973	Prehistoric: mussel and charcoal deposit in riverbank
14LT355	KSHSSR 1991	Prehistoric: hearth and lithic deposit in riverbank
14CH60	Schmits 1973	Prehistoric: lithic and charcoal deposit in riverbank
14CH61	Schmits 1973	Prehistoric: lithic and burned stone deposit in riverbank
14CH62	Schmits 1973	Prehistoric: described as thin occupation level in riverbank
GLO1	GLO Map 1898	Historic: sawmill
GLO2	GLO Map 1898	Historic: structure
Bridge 1	King 1993	Historic: Pratt-type bridge, 1901
Bridge 2	King 1993	Historic: mixed truss type bridge, 1916
OHSS-OT10	OK Historical Society 1958	Historic: Pooler Ferry
GLO 3	GLO Map 1898	Historic: Berry Ferry
GLO 4	GLO Map 1898	Historic: structure
GLO 5	GLO Map 1898	Historic: structure
KSHSSR = Kansas State Historical Society Site Report		

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

April 5, 2013

Planning and Environmental Division

Mr. Reid Nelson, Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
1100 Pennsylvania Ave., NW, Suite 803
Washington, DC 20004

Dear Mr. Nelson:

This letter is to invite the participation of the Advisory Council on Historic Preservation (ACHP) in the development of a Programmatic Agreement (PA). The proposed PA would address Section 106 procedures for the proposed dredging of portions of John Redmond Reservoir. The U.S. Army Corps of Engineers, Tulsa District, owns and operates John Redmond Reservoir, which is located in Coffey County, southeastern Kansas.

The Kansas Water Office (KWO) plans to conduct dredging in order to offset the effects of long-term sedimentation and associated loss of conservation pool storage in the reservoir. As proposed, KWO will conduct limited dredging within the John Redmond conservation pool over a number of years (see attached figure). Once removed from the reservoir bottom, the slurry material will be pumped to dredge disposal pits located outside the reservoir footprint.

Dredge disposal pits will each comprise up to 100 acres in area and will consist of excavated earth formed into berms approximately 10 feet in height (see attached figure). Each completed disposal pit will resemble a large bathtub, with a rim above ground and a bowl below the surface of the surrounding land. Ultimately, in order to accomplish a significant long-term reduction in sedimentation, construction of as many as 35-40 dredge disposal pits may be required around the perimeter of the reservoir. Some of the proposed dredge disposal pits will be located on government property, but most will probably be located on private property.

Tulsa District proposes to enter into a Programmatic Agreement (PA) in order to address the effects of the long-term effort to reduce sedimentation in John Redmond Reservoir. The PA would guide Tulsa District's compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and ensure procedures are in place throughout the life of this long-term effort.

John Redmond Reservoir is within the pre-contact range of the Wichita and Affiliated Tribes of Oklahoma and the Kaw Nation of Oklahoma, and is within lands adjudicated to the Osage Nation of Oklahoma under the Indian Claims Commission of 1978. Therefore, tribal consultation will be initiated with these Native American groups, and they may be invited as signatories to the PA.

At your earliest convenience, please advise Tulsa District on your willingness to participate in drafting the proposed PA. We look forward to working with you. If you have any questions, please contact Mr. Ken Shingleton at 918-669-7661.

Sincerely,

Jeff Knack
Chief, Planning and Environmental
Division

2 Encls

PROGRAMMATIC AGREEMENT

AMONG

THE U.S. ARMY CORPS OF ENGINEERS, TULSA DISTRICT,

THE KANSAS WATER OFFICE,

THE KANSAS STATE HISTORICAL SOCIETY,

THE WICHITA AND AFFILIATED TRIBES OF OKLAHOMA,

THE KAW NATION OF OKLAHOMA, AND

THE OSAGE NATION OF OKLAHOMA

REGARDING COMPLIANCE WITH SECTION 106 OF THE

NATIONAL HISTORIC PRESERVATION ACT OF 1966 (AS AMENDED)

FOR THE

JOHN REDMOND RESERVOIR DREDGING PROJECT,

COFFEY COUNTY, KANSAS

WHEREAS, the U.S. Army Corps of Engineers, Tulsa District (hereafter, Tulsa District) owns and operates John Redmond Reservoir, which is located on the Neosho River in Coffey County, southeastern Kansas; and

WHEREAS, construction on John Redmond Reservoir was completed in 1965, and the conservation pool was raised an additional three feet in 1976 to its current elevation of 1,041 ft. amsl; and

WHEREAS, conservation storage at elevation 1,041 ft. amsl was estimated in 2000 to be 50,501 acre-feet; and

WHEREAS, conservation storage is believed to be severely impacted by sedimentation from the upper Neosho River basin, with recent estimates being a 50% reduction; and

WHEREAS, the Kansas Water Office (KWO) proposes to conduct long-term dredging within the John Redmond Reservoir conservation pool to offset the effects of sedimentation and improve both conservation storage and water quality in the reservoir; and

WHEREAS, one reasonable alternative being considered is the “No Action” alternative, which would require the reservoir conservation pool volume to remain at less than authorized capacity as affected by sedimentation; and

WHEREAS, Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and its implementing regulation 36 CFR Part 800 require Tulsa District to ensure that historic properties are identified, and that adverse effects to those historic properties are identified and resolved; and

WHEREAS, Tulsa District has determined the Area of Potential Effect (APE) for this project to consist of several components, including (1) the reservoir conservation pool to elevation 1,041 ft. amsl; (2) the reservoir flood storage pool, elevation 1,041-1,068 ft. amsl.; (3) all government fee-owned property around the reservoir; and (4) all private, non-government owned, property adjacent to or in close proximity to government fee-owned property surrounding the reservoir; and

WHEREAS, each component of the APE shall additionally include the full horizontal and vertical extent of any identified cultural or historic resources intersected by or adjacent to any of the above listed project component boundaries and associated impact areas; and

WHEREAS, prior to and at contact with Europeans, the Neosho drainage in southeastern Kansas was occupied by ancestors of the Wichita and Affiliated Tribes of Oklahoma (hereafter, Wichita Tribe), the Kaw Nation of Oklahoma (hereafter, Kaw Nation), and the Osage Nation of Oklahoma, and thus may retain historic properties of importance to the Wichita Tribe, Kaw Nation, and Osage Nation; and

WHEREAS, as part of adjudicated lands identified by the United States Indian Claims Commission of 1978, the Neosho drainage in southeastern Kansas is historically a part of the Osage Nation of Oklahoma (hereafter, Osage Nation), and thus may retain historic properties of importance to the Osage Nation; and

WHEREAS, the effects of this undertaking on historic properties cannot be fully determined prior to commencement of the undertaking; and

WHEREAS, Tulsa District has consulted with the Kansas State Historical Society (SHPO) and the Advisory Council on Historic Preservation (ACHP) in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. 470 (NHPA), as amended, and its implementing regulations (36 CFR Part 800.6(b)(1)) to resolve potential adverse effects on these historic properties; and

WHEREAS, the ACHP has decided not to participate in consultation regarding this Project at this time, but may re-enter consultation at any time, particularly functioning to resolve potential disputes between Tulsa District , SHPO, and/or other Signatories to this PA; and

WHEREAS, Tulsa District and SHPO agree that it is advisable to accomplish compliance with Section 106 through the development and execution of this PA in accordance with 36 CFR 800.6 and 36 CFR 800.14(b)(3); and

NOW, THEREFORE, Tulsa District , Kansas Water Office, SHPO, the Osage Nation of Oklahoma, the Kaw Nation of Oklahoma, and the Wichita and Affiliated Tribes of Oklahoma agree that upon the Tulsa District and Kansas Water Office decision to proceed with the Undertaking, Tulsa District shall ensure that the following stipulations are implemented in order to take into account the effects of the John Redmond Reservoir Dredging Project on historic properties as required by Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended), and that these stipulations shall govern the Project and all of its parts until this PA expires or is terminated.

STIPULATIONS

Tulsa District and the Kansas Water Office shall ensure that the following measures will be carried out. All work conducted under this PA will be performed in a manner consistent with the Secretary of the Interior's "Standards and Guidelines for Archeology and Historic Preservation" (48 FR 44716-44740; September 23, 1983), as amended, or the Secretary of the Interior's "Standards for the Treatment of Historic Properties" (36 CFR 68), as appropriate.

I. IDENTIFICATION OF HISTORIC PROPERTIES.

A. ARCHAEOLOGICAL INVESTIGATIONS. Kansas Water Office will conduct a complete archaeological investigation, in multi-year phases if necessary because of funding, of proposed action areas within the Area of Potential Effect (APE). Technical guidance will be provided by Tulsa District as appropriate. Proposed action areas will consist primarily of, but not be limited to, the following types of project features, including dredging locations; dredge disposal structures and areas; borrow areas; access and transport routes; and equipment and materials staging areas. Proposed dredge locations within the conservation pool will be addressed as appropriate through review of site records and literature review, as it may be impractical to conduct further archaeological investigations in these areas. However, proposed dredge locations within the floodpool will be fully investigated.

Investigations and associated results will be coordinated as appropriate to the Section 106 process. Investigation methods will include, but not be limited to, pedestrian survey conducted at appropriate intervals and excavation of shovel tests at appropriate intervals, including screening of excavated material where appropriate. In certain instances subsurface testing will be conducted by 1X1 meter excavation units, soil coring, or backhoe trenching. Additionally, archival research may be necessary to establish chain of title or to establish historical significance to support National Register eligibility determinations for sites dating to the historic period.

B. NATIONAL REGISTER ELIGIBILITY EVALUATIONS AND DETERMINATIONS. When archeological or historic resources are identified within the APE, their eligibility for inclusion in the National Register of Historic Places (NRHP) will be assessed using the criteria outlined in 36 CFR Part 60. If in the event an archeological or historic resource is intersected by the limits of a project element or is immediately adjacent to the APE boundary, the entire property will be considered when determining National Register eligibility of that property. In some instances, information beyond that readily available from survey and archival research may be necessary to complete an eligibility determination. In these instances, additional work in the form of subsurface test excavations or further archival research may be necessary. If additional work is required to establish National Register eligibility, Kansas Water Office will ensure that the work is appropriately conducted, with technical guidance provided by Tulsa District. The actual amount of work conducted will vary from resource to resource, but it must obtain data sufficient to allow an independent assessment.

In addition to archeological and historic resources, non-archeological resources will be identified within the APE as well. Non-archeological resources may consist of, but not be limited to, historic standing structures, Traditional Cultural Properties (TCP's), Sacred Sites, and historic landscapes. TCP's and Sacred Sites will be identified through consultation with the Wichita and Affiliated Tribes of Oklahoma, Kaw Nation of Oklahoma, and the Osage Nation of Oklahoma. Historic standing structures should be documented in accordance with SHPO guidance.

Tulsa District will coordinate National Register eligibility determinations with all signatories, and each will have 30 calendar days in which to provide written comment. Should Tulsa District, SHPO, the Wichita and Affiliated Tribes of Oklahoma, the Kaw Nation of Oklahoma, and the Osage Nation of Oklahoma agree that a property is or is not eligible for the National Register such consensus shall be deemed conclusive for the purpose of this PA. Should Tulsa District or SHPO disagree regarding the eligibility of a property, Tulsa District shall obtain a determination of eligibility from the Keeper of the National Register pursuant to 36 CFR 63. Resources determined to be ineligible for inclusion in the NRHP shall require no further protection or evaluation. Archeological or historic resources that are eligible for listing on the NRHP are "historic properties," consistent with terminology defined in 36 CFR Part 800.16. Until resources have been conclusively determined to be eligible or not eligible for the NRHP, they will be treated as though they are eligible.

II. DETERMINATION OF ADVERSE EFFECT. Tulsa District shall make a reasonable and good faith effort to evaluate the effect of the undertaking on historic properties in the APE. Tulsa District and SHPO shall apply the criteria of adverse effect to historic properties within the APE in accordance with 36 CFR 800.5.

III. RESOLUTION OF ADVERSE EFFECT. Tulsa District shall consult with SHPO to resolve adverse effects in accordance with 36 CFR 800.6. Tulsa District will consult with all signatories to develop and evaluate alternatives or modifications to the undertaking that could avoid or minimize the adverse effects, with preference to avoidance if possible. Adverse effects to historic properties that cannot be avoided will be mitigated in order to offset the loss of those properties. Accordingly, mitigation will be accomplished by the Kansas Water Office with Tulsa District guidance. Tulsa District shall prepare a historic properties treatment plan (Plan) that describes the mitigation measures the District proposes to resolve the undertaking's adverse effects and shall provide this Plan for review and comment to SHPO and other consulting parties. All parties will have 30 calendar days in which to provide a written response to Tulsa District. The Plan shall include, as appropriate, excavation and recordation strategies; work and report schedules; and curation of artifacts and records. It shall specify at a minimum: a) the historic property or properties where data recovery is to be conducted; b) the excavation or recordation that will be performed; c) the methods to be used; and d) the methods to be used in analysis, data management, and dissemination of data, including a schedule of work and report submission.

If Tulsa District and SHPO fail to agree on how adverse effects will be resolved, the District shall request that the ACHP join the consultation and provide the Council and all consulting parties with documentation pursuant to 36 CFR 800.11(g).

IV. CURATION AND DISPOSITION OF RECOVERED MATERIALS, RECORDS, AND REPORTS.

A. CURATION. Tulsa District shall ensure that all archaeological materials and records that result from identification, evaluation, and treatment efforts conducted under this PA are ultimately accessioned into the University of Kansas, Museum of Anthropology in Lawrence and curated to 36 CFR Part 79 standards.

B. REPORTS. Tulsa District shall provide copies of final technical reports of investigations to the signatories and consulting parties. The signatories and consulting parties shall withhold from the public all site location information and other data that may be of a confidential or sensitive nature pursuant to 36 CFR 800.11(c).

C. ANNUAL REPORT. Tulsa District will provide an annual status report on implementation of the PA to SHPO and other Signatories.

V. TECHNICAL REPRESENTATIVES OF THE SIGNATORIES.

The parties to this PA will designate technical representatives which will communicate to fulfill the terms outlined in order to comply with the Section 106 process. Technical representatives will conduct consultation required to establish determinations of eligibility for the National Register, determinations of adverse effect, and the methods for resolving adverse effects to historic properties.

VI. EXECUTION AND APPLICABILITY OF THIS AGREEMENT.

This Agreement will go into effect when signed by Tulsa District and SHPO, and when an executed version is received by the Advisory Council on Historic Preservation (ACHP).

VII. TREATMENT OF HUMAN REMAINS.

A. PRIOR CONSULTATION. Tulsa District shall comply with the Native American Graves Protection and Repatriation Act (NAGPRA) and its associated regulation, 43 CFR Part 10. If investigations conducted on Federal land pursuant to Stipulation I of this PA indicate a high likelihood that human remains may be encountered, Tulsa District shall develop a treatment plan (e.g., NAGPRA Plan of Action) for these remains in consultation with the Wichita and Affiliated Tribes of Oklahoma, Kaw Nation of Oklahoma, and Osage Nation of Oklahoma. Tulsa District shall ensure that these Nations are afforded a reasonable opportunity to identify concerns, provide advice on identification and evaluation, and participate in the resolution of adverse effects in compliance with the terms of this PA and all related federal laws.

B. INADVERTENT DISCOVERY. Tulsa District shall comply with the Native American Graves Protection and Repatriation Act (NAGPRA) and its associated regulation, 43 CFR Part 10. Immediately upon the inadvertent discovery of human remains during historic properties investigations or construction activities conducted on Federal land pursuant to this PA, Tulsa District shall ensure that all ground disturbing activities cease in the vicinity of the human remains and any associated grave goods, and that the site is secured from further disturbance or vandalism. Within 48 hours of the discovery, Tulsa District shall initiate consultation with SHPO, the Wichita and Affiliated Tribes, the Kaw Nation, and the Osage Nation to resolve adverse effects. Because of the sensitivity of inadvertent discovery issues, no information about site locations or burial contents will be provided to the media.

VIII. INADVERTENT DISCOVERIES OF HISTORIC PROPERTIES.

If historic resources (aside from pre-contact burials or other human remains discussed in Stipulation VII) are inadvertently discovered during any activities directly related to this project, Tulsa District shall ensure that all construction activity ceases within a reasonable distance of the find, ensure the area is secured and the historic property is protected, and will notify SHPO within 48 hours of discovery. Tulsa District and SHPO will consult and formulate an appropriate course of action to address the effect on the discovery, consistent with a forthcoming, defendable determination of National Register eligibility.

IX. PROFESSIONAL QUALIFICATIONS.

All investigations specified in this PA shall be carried out by principal investigators meeting the pertinent professional qualifications of the Secretary of the Interior's (SOI) *Professional Qualification Standards* (36 CFR Part 61) in a discipline appropriate for the task and the nature of the historic properties.

X. DISPUTE RESOLUTION.

Should any signatory or concurring party to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the objector is encouraged to consult the other signatories in resolving the objection. If that objector determines that such objection cannot be resolved, Tulsa District shall perform the following tasks.

A. CONSULT ACHP. Forward all documentation relevant to the dispute, including proposed resolution, to the ACHP. The ACHP shall provide the agency with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the agency shall prepare a written response that takes into account advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The agency will then proceed according to its final decision.

B. FINAL DECISION. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the agency may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, Tulsa District shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the PA, and provide them and the ACHP with a copy of such written response.

XI. ANTI-DEFICIENCY ACT.

It is understood that the implementation of this Agreement is subject to Federal and State anti-deficiency statutes.

XII. DURATION, AMENDMENT, WITHDRAWAL, AND TERMINATION.

A. DURATION. Unless terminated or amended as outlined below, this PA shall remain in effect for a period of 10 years from the date that the PA goes into effect and may be extended for a second, five-year term with the written concurrence of all of the signatories. During the time in which this PA is in effect, relevant portions of this PA will be superseded, if appropriate, by future revisions to 36 CFR Part 800 or other federal historic preservation law or regulation.

B. AMENDMENT. If any signatory to the PA determines that the Agreement cannot be fulfilled or that modification of the Agreement is warranted, that signatory shall consult with the other signatories to seek amendment of the Agreement. The Agreement may be amended after consultation among the signatories and all parties agree in writing with such amendment.

C. WITHDRAWAL. Any signatory may withdraw their involvement in this Agreement by providing 30 days written notice to the other parties, provided that the parties will consult during this period to seek amendments or other actions that would prevent withdrawal. Withdrawal of Tulsa District or SHPO will invalidate the PA.

D. TERMINATION. This Agreement will be fully terminated if Tulsa District or SHPO provide notice of termination and after 30 days or more of unsuccessful consultations to amend the Agreement. This Agreement may also be terminated by the implementation of a subsequent Programmatic Agreement per 36 CFR Part 800 that explicitly supersedes this Agreement.

XIII. COMPLIANCE WITH 36 CFR PART 800.

Execution of this Programmatic Agreement and implementation of its terms is evidence that U.S. Army Corps of Engineers, Tulsa District and the Kansas Water Office have taken into account the effects of the agencies' undertakings on historic properties and has afforded the ACHP an opportunity to comment.

SIGNATORIES

____

COL Richard A. Pratt

Commander

U.S. Army Corps of Engineers, Tulsa District

____

Mr. Tracy Streeter, Director

Kansas Water Office

____

Ms. Jennie Chinn

Kansas State Historic Preservation Officer

INVITED SIGNATORIES

____

President Terri Parton

Wichita and Affiliated Tribes of Oklahoma

____

Chairman Guy Monroe

Kaw Nation of Oklahoma

____

Principal Chief John Red Eagle

Osage Nation of Oklahoma

PHASE II INTENSIVE ARCHAEOLOGICAL SURVEY OF THE KANSAS WATER OFFICE PROPOSED JOHN REDMOND RESERVOIR DREDGING PROJECT, COFFEY COUNTY, KANSAS

Prepared by
Don L. Dycus, RPA, LLC
Norman, Oklahoma

Prepared for
Kansas Water Office
Topeka, Kansas,
and
U. S. Army Corps of Engineers,
Tulsa District

Author and
Principal Investigator
Don L. Dycus, MA, RPA

March 25, 2014

ABSTRACT

During March 2014, Don L. Dycus, RPA, LLC, conducted a Phase II intensive archaeological survey on behalf of the Kansas Water Office and the Tulsa District U. S. Army Corps of Engineers to identify and evaluate archaeological resources that might be present on or near the John Redmond Reservoir Dredging project subject property on improved agricultural, recreational, and wildlife conservation host property north of Burlington in rural Coffey County in east-central Kansas. Archival research determined no archaeological site or historic property is recorded on or within ¼-mile of the subject property. A field investigation determined no archaeological material or feature is present on or near the subject property. It is recommended **no historic properties** will be affected by the project, which should proceed as proposed without further work. It must be noted, however, negative results do not guarantee cultural resources are absent. Project personnel should be aware buried cultural resources, such as chipped stone, pottery, bone, glass, brick, metal, etc., might be exposed by construction activities. Should such an event occur, it is recommended all ground disturbing activities near the discovery cease immediately and the Historic Preservation Office at the Kansas Historical Society in Topeka should be promptly notified of the discovery, in order to determine its significance prior to resuming construction activities.

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INTRODUCTION

This report summarizes the methodology and results of a Phase II intensive archaeological survey conducted by Don L. Dycus, RPA, LLC, for the Kansas Water Office and the Tulsa District U. S. Army Corps of Engineers of the John Redmond Reservoir Dredging project. According to 36 CFR 800, applicants for permission to engage in construction projects under federal jurisdiction are required to consider the potential effects on cultural resources.

Based on their review of the project, the Cultural Resources Division (CRD) of the Kansas Historical Society (KHS) recommended (Appendix) an archaeological survey of the subject property. Consequently, a Phase II intensive archaeological survey of this subject property was conducted to determine if significant archaeological resources are present. The investigation reported below was conducted in accordance with the procedures set forth by the State Historic Preservation Office (1999) and the National Park Service (1990).

Project Description and Location

Since completion of its dam 50 years ago, sedimentation is estimated to have reduced the original 82,200 acre-feet storage capacity of John Redmond Reservoir by 40 percent. Ongoing streambank conservation efforts on the Cottonwood and Neosho rivers should reduce upstream contributions of new sediment, but the removal of existing deposits is necessary to increase restore capacity. GLDD proposes dredging to remove this sedimentation, most of which is deposited in the area just above the dam, at an annual pace of up to 600,000 cubic yards per year for up to 25 years. The dredge operation will consist of pumping sediment slurry through a series of pipelines to be redeposited on upland disposal sites.

The proposed subject property consists of two separate Confined Disposal Facility (CDF) parcels supplied and connected by two Slurry Pipeline Corridor (SPC) segments located in central Coffey County in east-central Kansas (Figure 1). These CDF parcels and SPC segments are arrayed below (east of) John Redmond Dam, approximately 1½ miles north of the town of Burlington. The subject property is bounded on the west and north by Embankment Road, US 75 on the east, and by 13th Lane on the south. Specifically, the subject parcels are located in Sections 3, 4, & 10, Township 21 South, Range 15 East, 6th PM, as depicted on the Burlington 1978, John Redmond Dam 1966, New Strawn 1971, & Ottumwa 1970, Kans., 7.5' USGS topographic quadrangles (Figure 2). The Universal Transverse Mercator (UTM) coordinates (Zone 15; NAD83) of the CDF boundaries and SPC centerlines are provided in Table 1.

Table 1. John Redmond Reservoir Dredging project UTM coordinates.

PARCEL	EASTING	NORTHING		PARCEL	EASTING	NORTHING
CDF-A	259463	4236651		SPC-A	258589	4236655
	259388	4236675			258661	4236686
	259309	4237122			259012	4237376
	259341	4237290			259448	4237417
	259495	4237367			259446	4237346
	259576	4237342		SPC-B	259463	4236651
	259559	4236757			259487	4236542
CDF-B	259473	4234951			259513	4235042
	259114	4235146			259473	4234951
	258746	4235168				
	258884	4234893				
	259471	4234908				

PROJECT AREA

The subject property occupies generally open and level uplands on either side of the Neosho River below its confluence with the Cottonwood River, where it is impounded to create John Redmond Reservoir. This locale occupies the Osage Plains (or Osage Cuestas) region of the Central Lowlands province of the Interior Plains major physiographic division of North America. A succession of irregular, east-facing limestone escarpments underlies the flat to gently undulating uplands that characterize this region.

The native biotic regime of this area is a mosaic of tall bluestem grasses predominating the uplands and oak-hickory forest regimes along streams and valley floors, including oak, black walnut, elm, linden, sycamore, locust, hickory, and pecan, among other hardwoods. Typical understory species include chokecherry, wild grape, Osage orange, persimmon, papaw, elderberry, and serviceberry. Native forest species include elk, white-tailed and mule deer, black bear, cougar, wildcat, timber wolf, red and gray fox, raccoon, opossum, flying squirrels, beaver, otter, muskrat, and cottontail rabbit. Prairie species included bison, coyote, antelope, jackrabbit, badger, along with other small mammals. Wild turkey was plentiful and prairie chicken, ruffled grouse, quail, passenger pigeon, and Carolina parakeet were present, along with an abundance of edible fish and mollusks (O'Brien 1984).

CULTURAL BACKGROUND

Archaeological evidence from Kansas, including the project area, represents every major culture period of human occupation in North America, including some of the earliest recorded Amerindian occupations and European incursions. These periods are divided into regional cultural complexes that are recognized as certain localized manifestations.

The regions correspond to the physiographic regions of Kansas. Coffey County, including the subject property, is located in the Osage Plains region.

The generally accepted cultural sequence for Kansas consists of:

Paleoindian period	10,000 to 7,000 BC
Archaic period	7,000 BC to AD 1
Early Ceramic period	AD 1 to 1000
Middle Ceramic period	AD 1000 to 1500
Late Ceramic period	AD 1500 to 1800
Historic period	AD 1800 to present

Although some researchers argue for evidence of even earlier populations in North America, the earliest generally accepted Amerindian occupation of North America is the *Paleoindian* period (10,000 to 7000 BC). These early Americans, usually depicted as highly mobile big-game hunters, probably relied on a much wider variety of food resources than is popularly imagined. Consisting primarily of surface finds of fluted and nonfluted spear points, Paleoindian sites are reported in western Kansas (O'Brien 1984) and in Missouri (Chapman 1975), but have yet to be reported in the project area.

The *Archaic* period (7,000 BC to AD 1) represents an increasing diversification of a hunting and foraging strategy, including a reliance on smaller game species as the climate became both warmer and drier than during the preceding Pleistocene period. Additions to the Archaic tool kit include items for processing more plant food resources and more variety in projectile, including dart points. The Nebo Hill phase is a defined Archaic period complex recognized in the Kansas City area in the Dissected Till Plains region (Chapman 1975).

Economic strategies during the *Early Ceramic* (or Woodland) period (AD 1 to 1000) remain similar to those of the preceding period with the addition of limited horticulture. During this period, the use of pottery becomes widespread and social organization becomes increasingly complex. Toward the end of the period, the bow and arrow begin to replace darts and atlatls. The Early Ceramic period culture complex defined in the project area is the Kansas City Hopewell complex.

The *Middle Ceramic* (or Village Farmer) period (AD 1000 to 1500) in Kansas is notable for a well-developed agricultural economy, but lacks the temple mound architecture and complex social organization seen farther east at Mississippian centers like Cahokia. The corn/beans/squash triad appears during this period. Well-defined complexes include Steed-Kisker in the Kansas City area and Nebraska in the northeastern corner of Kansas.

The *Late Ceramic* (or Protohistoric) period (AD 1500 to 1800) in Kansas is remarkable for visits by the earliest European explorers, occupations by historically recognizable tribes, and the transfer of eastern tribes. The French expedition led by Claude Charles du Tisne is believed to have visited the vicinity north of study area in 1719. The first Europeans to visit east-central Kansas found it occupied by the Kansa tribe.

Early in the *Historic* period (AD 1800 to present), more than 10,000 Indians belonging to about 20 eastern tribes were forcibly removed onto reservations in eastern Kansas. The central portion of present-day Coffey County, including the subject property, is located on lands beyond those reserves. Explorations by Jacob Fowler in 1822 provide some of the earliest accounts of the study area. Military posts were the major Euroamerican presence in Kansas during this time, which after 1880 were primarily devoted to the settlement and creation of what became modern Kansas.

Named in honor of Col. A. M. Coffey, a member of the first Territorial Legislative Council, Coffey County was organized in 1859 with Burlington as its seat.

PREVIOUS INVESTIGATIONS

A review of records maintained by the CRD/KSHS indicates the subject property has not previously been subjected to professional scrutiny.

PRESENT INVESTIGATION

The present Phase II intensive archaeological survey consists of archival research and field investigation of the subject property. Archival research was conducted by the author March 9 & 10, 2014. Field inspection was conducted by the author March 10-12, 2014, under mostly sunny and clear conditions. Severe hardpan and/or frozen soils somewhat limited the present investigation.

Results of Archival Research

Research of the state site files maintained at the CRD/KHS determined no archaeological site is recorded on or within ¼-mile of the subject property.

Research of the National Register of Historic Places (NRHP) and Register of Historic Kansas Places (RHKP) online databases maintained by KHS (2014a) determined no Coffey County property listed or determined eligible for listing on either NRHP or RHKP is located on or within ¼-mile of the subject property (KHS 2014b).

Research of historic Kansas county atlases or plat books determined (KHS 2014c) structures are indicated between 1878 to 1919 in the SPC-A vicinity in W½ W½ W½ W½ Section 3 and SE¼ SE¼ SE¼ SE¼ Section 4, and on the western portion of the CDF-B location in S½ SW¼ Section 10.

Research of relevant USGS topographic quadrangles and historic General Land Office (GLO) maps determined no historic trail, roadway, cemetery, structure, or feature not otherwise recorded in the foregoing database inventories is indicated on or near the subject property.

The Osage Nation Tribal Historic Preservation Office in Pawhuska did not respond to a request for consultation regarding potentially sensitive areas of interest to the tribe.

Field Methodology

The present study intends to identify and record archaeological materials and features that might be present on or near the subject property, particularly upland and floodplain surfaces to the native Neosho channel. Systematic pedestrian survey relying on visual inspection along parallel transects at approximate 50' intervals was considered an adequate method for inspecting areas offering fair (26 – 50 percent) or better surface visibility. Surfaces offering generally poor (0 - 25 percent) visibility were subjected to subsurface tests consisting of a hand-excavated 18" diameter hole placed to a depth of 12" along survey transects at approximate 50' intervals. The fill is either trowel-sifted or screened to recover cultural materials, then the exposed opening is inspected for cultural features and soil characteristics are noted before backfilling.

The Area of Potential Effects (APE) for visual effect from the proposed project is considered to coincide with the subject property boundaries.

Results of Investigation

The subject property consists of two discrete upland CDF parcels and two connecting SPC corridors located on either side of the native Neosho River channel in the John Redmond Dam vicinity. The property occupies rural land in a traditionally agricultural area, much of which is presently either developed or conserved for recreational purposes.

The <u>CDF-A</u> parcel occupies approximately 37 acres of upland ridgetoe that declines slightly south toward an unnamed intermittent Neosho tributary (Figure 2). Located approximately one mile north of the native Neosho channel, it supports dormant grasses and dense thickets of invasive cedar trees offering surface visibility ranging from poor to good (51 – 75 percent). Attempted subsurface testing at approximate 50′ intervals of occasional areas offering poor visibility typically encountered solid resistance at depths of 2″ - 3″, but exposed fill consisting of mixtures of both silt loam A-horizon and silty clay B-horizon. No prehistoric or historic archaeological material or feature was observed or exposed on the proposed CDF-A property surface.

The <u>CDF-B</u> parcel occupies approximately 35 acres of cultivated floodplain near or adjacent to the right bank of the native Neosho channel (Figure 2). The generally level surface supports harvested corn crop stubble offering visibility ranging from fair to good, for which visual inspection was considered an adequate technique. No cultural indicators were observed on the CDF-B property surface, including evidence of former structures indicated (KHS 2014c) on the western half by historic maps.

The 50′ wide <u>SPC-A</u> corridor extends from an intake below pool level above the dam generally northeast to the northern CDF-A boundary. It emerges from pool level just east of the shoreline boat ramp in the Dam Site North Recreation Area, which it traverses from south-southwest to north-northeast for a distance of approximately 1700′ (Figure 2). The landscaped recreation area supports dormant and frequently sparse maintained lawn grasses and occasional trees offering surface visibility ranging from poor to good on eroded or disturbed areas. Attempted subsurface testing on this segment encountered solid resistance immediately. North of the recreation area, the corridor continues along the north-northeast bearing for a distance of approximately 900′ through an unlandscaped partially wooded area, which supports sparse understory offering fair surface visibility. North of the wooded area, the corridor proceeds for a distance of approximately 1600′ east-northeast across Embankment Road and down a shallow intermittent drainage that supports unmown dormant grasses offering fair surface visibility, then ascends a densely-wooded slope offering fair surface visibility to the ridgetop northern CDF-A boundary location. No prehistoric or early historic cultural indicators were observed in or near the 4200′ SPC-A corridor, including evidence of former structures indicated (KHS 2014c) in the vicinity by historic maps.

The SPC-B corridor extends south from the southern CDF-A boundary for a distance of approximately one mile to the eastern CDF-B boundary (Figure 2). Initially, it descends a densely-wooded slope offering fair surface visibility, across an intermittent drainage that appears to appears to have been extensively disturbed by borrowing or quarrying activity along its left bank, then emerges onto level ground supporting occasionally sparse unmown grasses and scrub growth offering surface visibility ranging from poor to fair for the remaining distance to the Neosho. Approximately 100′ north of 15th Road, the corridor adjoins an existing pipeline corridor adjacent west that it parallels the remaining distance to CDF-B. Attempted subsurface tests encountered solid resistance at shallow depths, but exposed mixed A and B horizons with frequent non-cultural rock fragment inclusions, in the top 2″ - 3″. Both banks of the Neosho encountered by the corridor are disturbed by channelization and previous pipeline construction. No prehistoric or early historic cultural indicators were observed on or near the 5500′ SPC-B corridor.

CONCLUSIONS AND RECOMMENDATIONS

A Phase II intensive archaeological survey of the Kansas Water Office proposed John Redmond Reservoir Dredging project property located below John Redmond Dam in rural central Coffey County north of Burlington identified no archaeological material or feature that would be affected by the proposed construction. The CDF-B location appears to offer both the highest archaeological potential and the most favorable survey conditions, so negative findings in this area are probably a reliable indication that local deposits are absent. Similarly, the SPC-B segment south of 15th Road appears to have good potential, so the dearth of cultural material identified by the present survey or exposed by previous pipeline construction suggests deposits are probably absent here. No property that is listed or considered eligible for listing on either the NRHP or RHKP was identified in the APE. Based on the results of this study, it is recommended **no historic**

properties will be affected by the project, which should proceed as proposed without additional work.

It must be noted, however, that negative results do not guarantee cultural resources are absent. Project personnel should be aware that buried cultural resources, such as chipped stone, pottery, bone, glass, brick, metal, etc., may be exposed by construction activities. Should that occur, all ground disturbing activities near the discovery should cease immediately and the Historic Preservation Office at the Kansas Historical Society in Topeka should be promptly notified of the discovery, in order to determine its significance prior to resuming construction activities.

REFERENCES CITED

Chapman, C. H.

1975 *Archaeology of Missouri, I.* University of Missouri Press. Columbia.

Kansas Historical Society

2014a National and State Register Database. Electronic document, http://www.kshs.org/p/register-database/14638, accessed 03/09/2014.

2014b Kansas Historic Resource Inventory. Electronic document, http://khri.kansasgis.org/, accessed 03/09/2014

2014c Kansas County Atlases or Plat Books. Electronic document, http://www.kshs.org/p/county-atlases-or-plat-books/13859#c, accessed 03/09/2014:
Historical Atlas of Coffey County. Philadelphia: Edwards Bros., 1878.
Plat Book of Coffey County. Minneapolis: Northwest Publishing Company, 1901.
Standard Atlas of Coffey County. Chicago: Geo. A. Ogle & Co., 1919.

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1990 *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin. U.S. Department of the Interior, National Park Service. U.S. Government Printing Office. Washington, D.C.

O'Brien, P. J.

2010 Archeology in Kansas. Public Education Series 9, University of Kansas Museum of Natural History. University of Kansas Printing Service.

State Historic Preservation Office

1999 "State Historic Preservation Officer's Guide for Archeological Survey, Assessment, and Reports." Kansas Historical Society. Topeka.

APPENDIX

6425 SW 6th Avenue
Topeka, KS 66615

Kansas

phone: 785-272-8681
fax: 785-272-8682
email@kshs.org

Kansas Historical Society

KSR&C No. 13-04-096

January 2, 2014

Joel Krosschell, PE
EBH & Associates
PO Box 427
Cimarron KS 67825

RE: Sediment Dredging
John Redmond Reservoir
Coffey County

Dear Mr. Krosschell:

In accordance with 36 CFR 800, the Kansas State Historic Preservation Office has reviewed your letter dated December 23, 2013, describing plans for the above-referenced project. According to our records, we have been reviewing this project for some time. It is a federal undertaking, with the U.S. Army Corps of Engineers Tulsa District (COE) as the lead agency, meaning that Section 106 of the National Historic Preservation Act applies. A draft Programmatic Agreement (PA) to guide the project is in preparation. One of its requirements is that all confined disposal facilities, whether situated on federal or private lands, receive archeological survey prior to construction. Our office therefore recommends that a professional archeologist should survey the project areas (situated just below the dam) as described in your letter.

Any archeologist meeting the Minimum Professional Qualifications of this office as outlined in *The State Historic Preservation Officer's Guide For Archeological Survey, Assessment, and Reports* (SHPO's Guide), is eligible to perform the requested work. A list of archeological contractors meeting these standards is available from our web site at: http://www.kshs.org/p/archeological-consultants/14593.

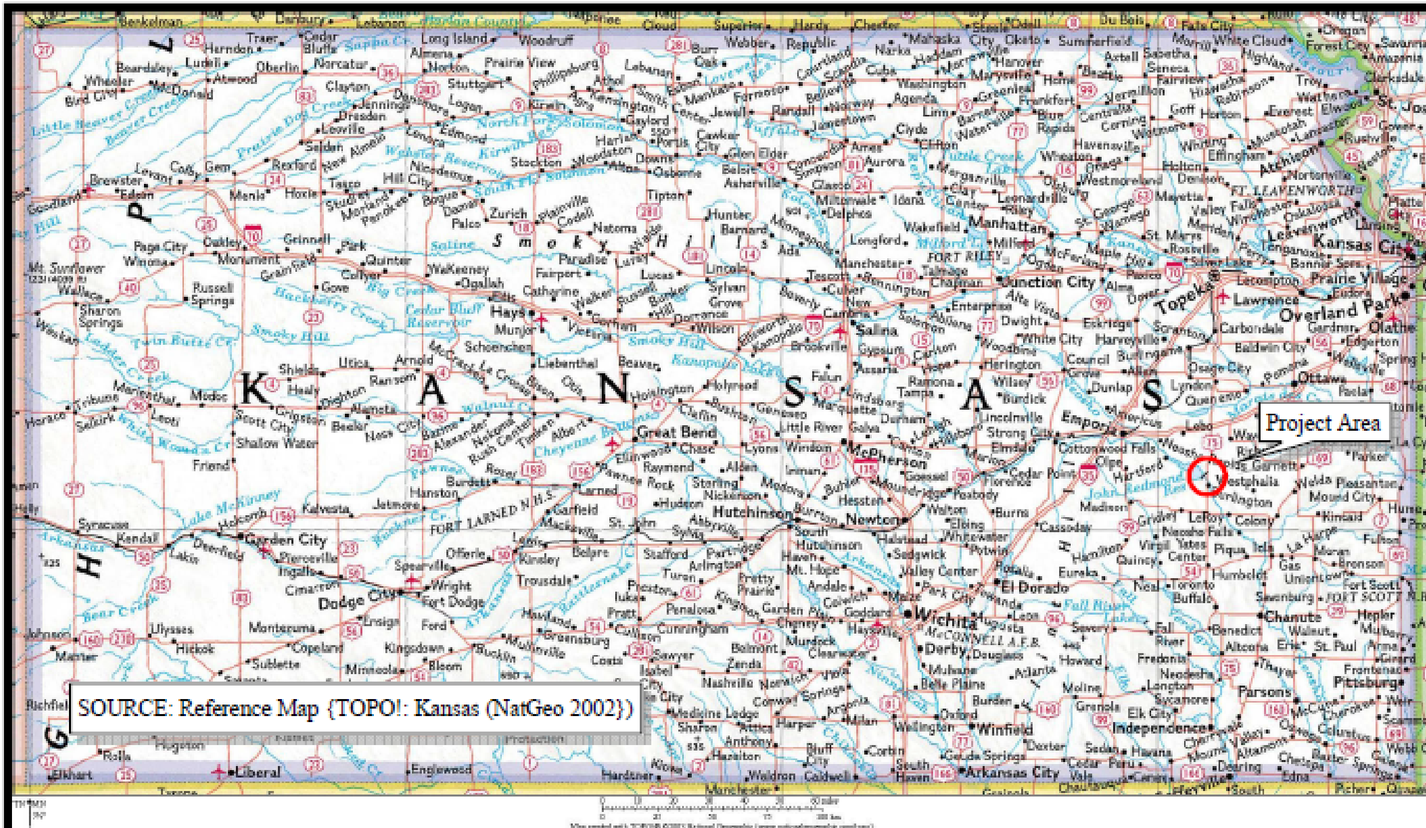
This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
Executive Director and
State Historic Preservation Officer

Timothy Weston
for

Patrick Zollner
Deputy State Historic Preservation Officer



DLD

DON L. DYCUS, RPA, LLC

CONSULTING ARCHAEOLOGIST

NORMAN, OKLAHOMA

PROJECT AREA MAP

PROPOSED JOHN REDMOND RESERVOIR DREDGING PROJECT

Kansas Water Office

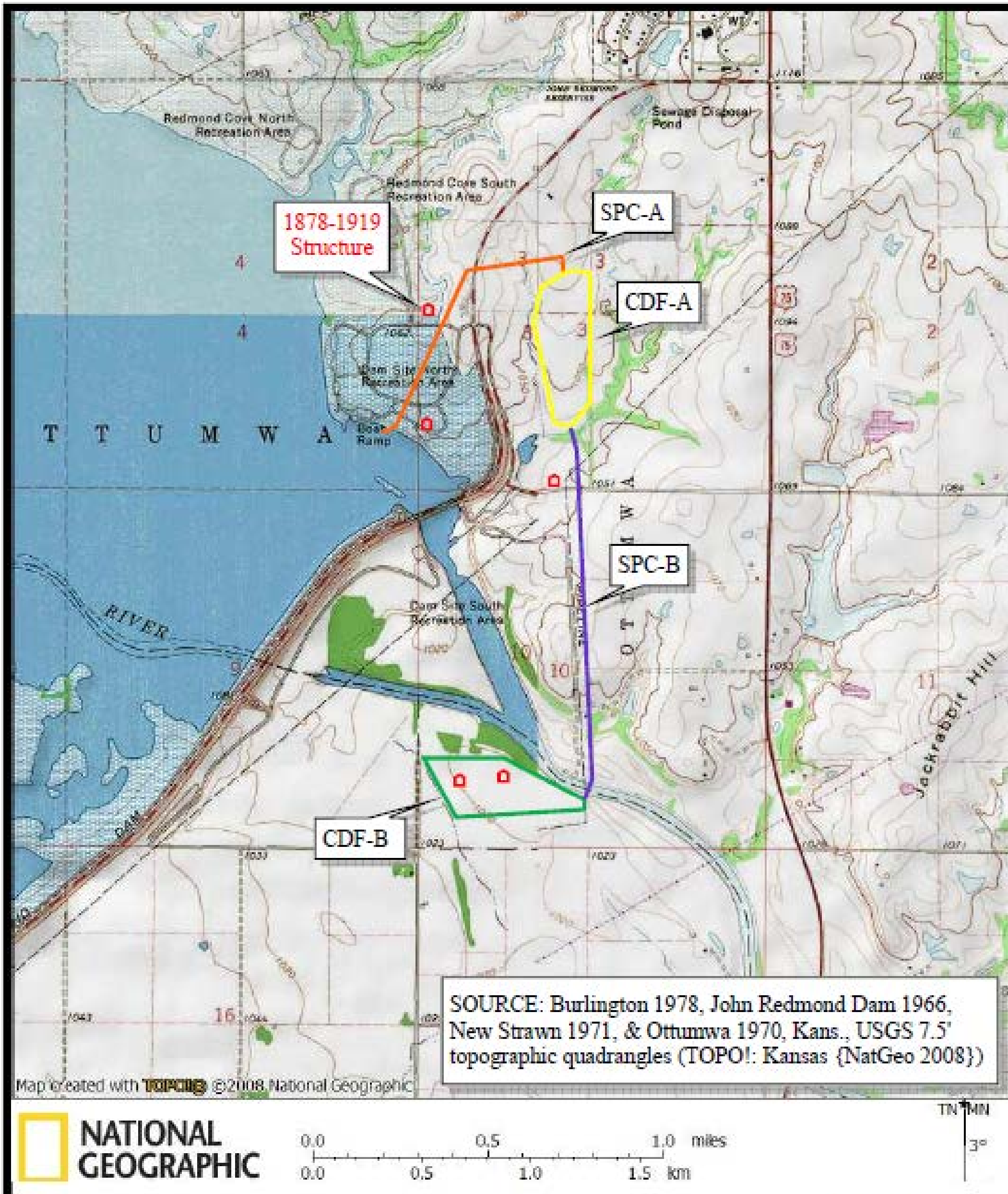
COFFEY COUNTY, KANSAS

DATE

March 25, 2014

FIGURE

1



DLD DON L. DYCUS, RPA, LLC CONSULTING ARCHAEOLOGIST NORMAN, OKLAHOMA	**PROJECT LOCATION MAP 1** **PROPOSED JOHN REDMOND RESERVOIR DREDGING PROJECT** **Kansas Water Office** **COFFEY COUNTY, KANSAS**	DATE: March 25, 2014 FIGURE: 2

Appendix E

Prime and Unique Farmlands

MEMO

DATE: April 11, 2013
TO: USACE and NRCS
FROM: Kansas Water Office
RE: Prime or Unique Farmlands

901 S. Kansas Avenue
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

Included with this memorandum is an information sheet for evaluators of farmland within the site boundaries of the *Removal and Disposal of Sediment at John Redmond Reservoir Final Programmatic Environmental Impact Statement (PEIS)* project.

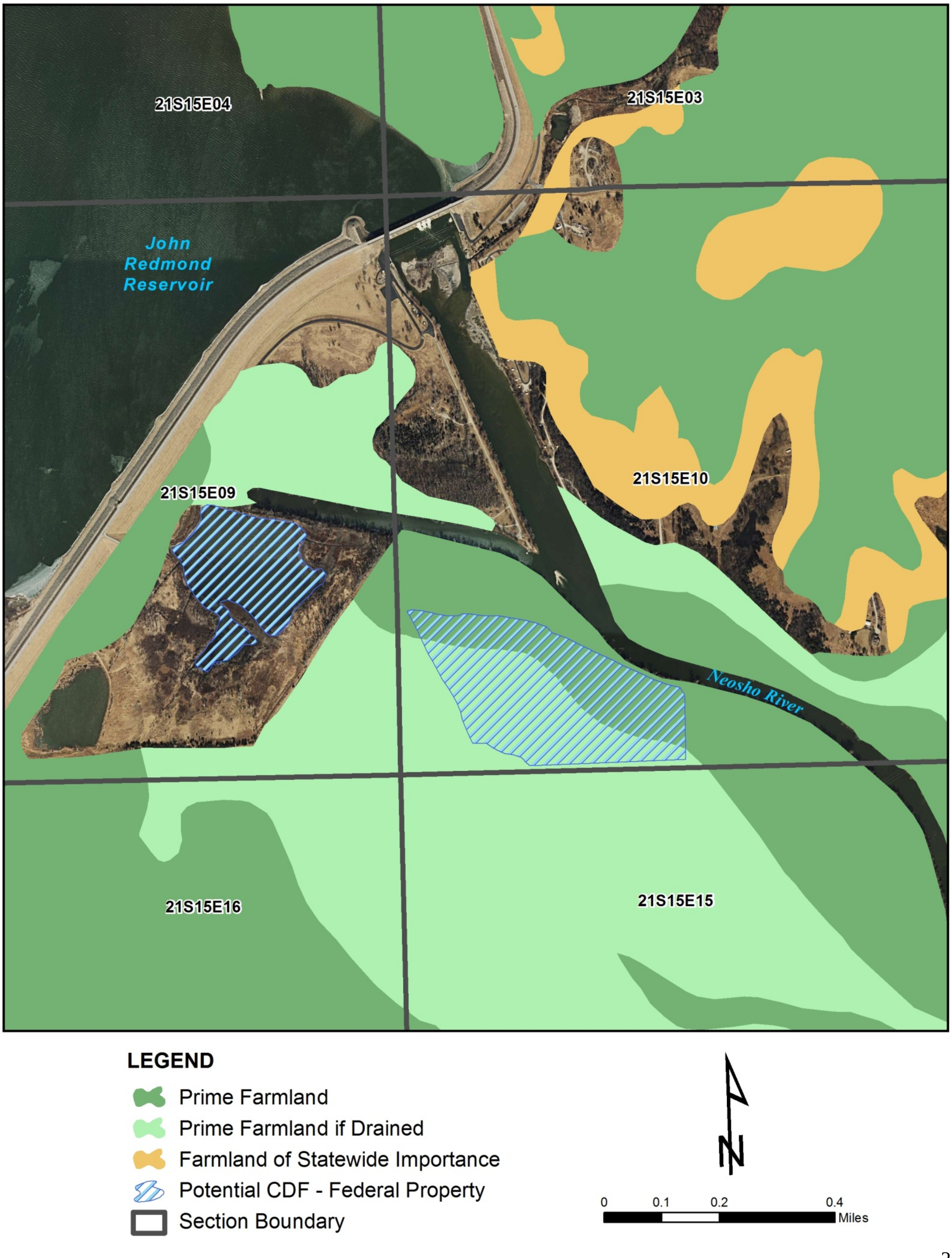
The preferred alternative evaluated in this PEIS would seek to dredge and dispose of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of water supply storage is available for municipal and industrial demand. In the first five years of the dredging activity, approximately 3 to 6 million cubic yards of sediment will be removed. Phasing of removal will continue through 2045 which corresponds to the expiration of the Federal Energy Regulation Committee (FERC) license for WCGS. Approximately five 100-acre sites may be needed for sediment disposal for the first five years of dredging activities. Two parcels have been identified on federal property below the dam as potential disposal sites (Alternative A in the table below). Identification of additional suitable disposal sites will be focused within an area four miles east and west of the reservoir (Alternative B in the table below).

Alternative Site	Alternative Site Description	Farmland of Statewide Importance (acres)	Prime Farmland if Drained (acres)	Prime Farmland (acres)	Total
A	4 Mile Buffer	10672.9	4284.6	42404.2	57361.7
		18.6%	7.5%	73.9%	100.0%
B	Federal Land Below Dam	0.0	29.6	24.2	53.8

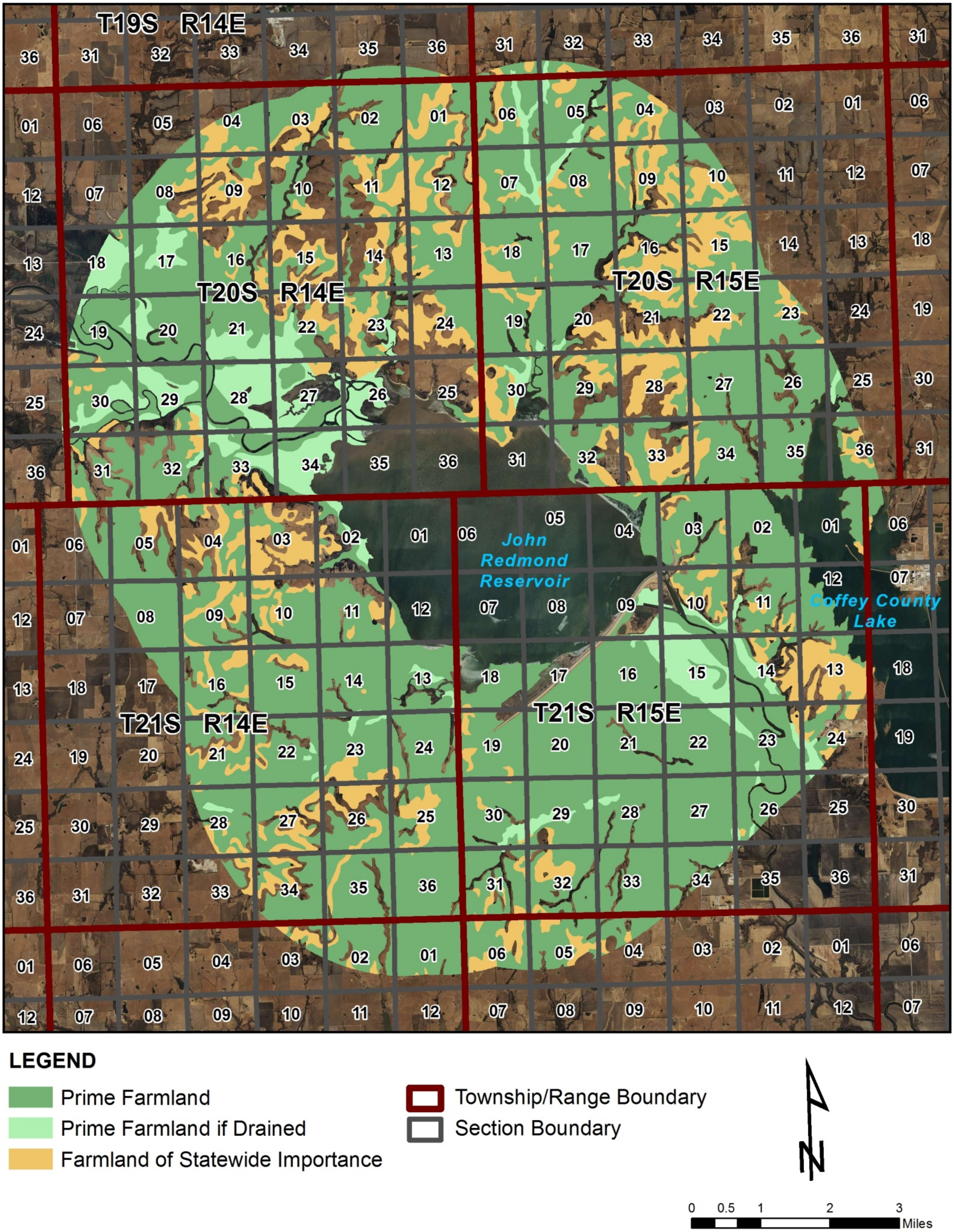
Soil types occurring within each alternative site areas were summarized by Farmland of Statewide Importance, Prime Farmland if drained, and Prime Farmland (see table above and associated maps). Disposal of sediment on the federal property (Alternative B, 53.8 acres total)) would impact approximately 29.6 acres of Prime Farmland if drained soils and 24.2 acres of Prime Farmland. Use of sites on non-federal property (Alternative A, 446.2 acres total) would impact approximately 81.2 acres of Farmland of statewide importance, 33.4 acres of Prime Farmland if drained soils and 329.7 acres of Prime Farmland.

Also attached with this memorandum is Form AD-1006, Farmland Conversion Impact Rating. This information has been provided for your consideration and evaluation of the farmland within the boundaries of the project described above.

Should you require additional information, please contact Susan Metzger, Kansas Water Office, at (785) 296-3185. Thank you for your cooperation with this PEIS project and Form AD-1006 evaluation.



21S15E04
21S15E03
John Redmond Reservoir
21S15E09
21S15E10
Neosho River
21S15E16
21S15E15
LEGEND
Prime Farmland
Prime Farmland if Drained
Farmland of Statewide Importance
Potential CDF - Federal Property
Section Boundary
N
0
0.1
0.2
0.4
Miles


T19S R14E
T20S R14E
T20S R15E
T21S R14E
T21S R15E
John Redmond Reservoir
Coffey County Lake
LEGEND
Prime Farmland
Prime Farmland if Drained
Farmland of Statewide Importance
Township/Range Boundary
Section Boundary
N
0 0.5 1 2 3 Miles

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
3020 West 18th, Suite B
Emporia, Kansas 66801

Phone: 620-343-7276
FAX: 620-343-7871
www.ks.nrcs.usda.gov

May 3, 2013

Susan Metzger
Kansas Water Office
901 S. Kansas Avenue
Topeka, Kansas 66612

Re: Removal and Disposal of Sediment at John Redmond Reservoir Programmatic Environmental Impact Statement (PEIS) project.

Dear Ms. Metzger:

The Farmland Protection Policy Act (FPPA) applies to projects where federal technical or financial assistance is being requested. FPPA provides a process for determining an impact rating when important farmlands are being considered for conversion to non-agricultural uses.

Enclosed is Form AD-1006, Farmland Conversion Impact Rating with the Natural Resources Conservation Service's (NRCS) parts completed. The originator should complete Parts VI and VII and return a completed copy to this office at the above address.

Sincerely,

John Conway acting for

CLIFFORD THORNTON
Assistance State Conservationist

Enclosure(s)

ec:
Susan M. Furgason, Soil Conservationist, NRCS, Salina, Kansas
Robert K. Harkrader, Supervisory District Conservationist, NRCS, Burlington, Kansas

Helping People Help the Land

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request April 12, 2013
Name of Project John Redmond Dredging Initiative	Federal Agency Involved KWO/USACE
Proposed Land Use CDF for dredge material	County and State county and state
PART II *(To be completed by NRCS)*	Date Request Received By NRCS April 26, 2013 / Person Completing Form: John Conway

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 0	Average Farm Size 553
Major Crop(s) Corn & Soybean	Farmable Land In Govt. Jurisdiction Acres: 177,357 % 42.3	Amount of Farmland As Defined in FPPA Acres: 270800 % 64.7	
Name of Land Evaluation System Used LESA	Name of State or Local Site Assessment System N/A	Date Land Evaluation Returned by NRCS May 01, 2013	

PART III *(To be completed by Federal Agency)*		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		~500	~79.5		
B. Total Acres To Be Converted Indirectly		--	--		
C. Total Acres In Site		~500	~79.5		
PART IV *(To be completed by NRCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		500	79.5		
B. Total Acres Statewide Important or Local Important Farmland		--	--		
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		<1	<1		
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		29	94		
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)		73	40		
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15	15		
2. Perimeter In Non-urban Use	(10)	10	10		
3. Percent Of Site Being Farmed	(20)	1	13		
4. Protection Provided By State and Local Government	(20)	0	0		
5. Distance From Urban Built-up Area	(15)	15	10		
6. Distance To Urban Support Services	(15)	0	0		
7. Size Of Present Farm Unit Compared To Average	(10)	8	0		
8. Creation Of Non-farmable Farmland	(10)	0	0		
9. Availability Of Farm Support Services	(5)	5	5		
10. On-Farm Investments	(20)	20	5		
11. Effects Of Conversion On Farm Support Services	(10)	0	0		
12. Compatibility With Existing Agricultural Use	(10)	0	0		
TOTAL SITE ASSESSMENT POINTS	160	74	58	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	73	40	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	74	58	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	147	98	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form: Bobbi Wendt | Date: May 8, 2013

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

901 S. Kansas Avenue
Topeka, KS 66612

Kansas Water Office

Phone: (785)-296-3185
Fax: (785)-296-0878
www.kwo.org

Tracy Streeter, Director

Sam Brownback, Governor

May 13, 2013

Clifford Thornton
Assistant State Conservationist
Natural Resources Conservation Service
3020 West 18th, Suite B
Emporia, KS 66801

Dear Mr. Thornton:

This is to inform you that the Kansas Water Office (KWO) has completed the USDA Farmland Conversion Impact Rating - Form AD-1006. This form was initiated and completed for the preparation of the Final Programmatic Environmental Impact Statement (PEIS) for the proposed removal of sediment from John Redmond Reservoir. The KWO appreciates your assistance in completing this form and looks forward to your review and any further information you can provide. We request that once the form is reviewed and found to be satisfactory, that a letter be addressed to the US Army Corps of Engineers (USACE) stating the outcome of your review in reference to the PEIS.

We appreciate your assistance in this matter. If you have any questions, comments, or concerns please contact the KWO for assistance.

Sincerely,

Susan Metzger
Chief of Planning and Policy

cc: Susan M. Furgason, Soil Conservationist, NRCS, Salina, KS
Robert K. Harkrader, Supervisory District Conservationist, NRCS, Burlington, KS

Special Environmental Concerns

13. **Prime Farmland**

Notes to Planners:
- Almost all Kansas NRCS activities are not subject to FPPA due to the fact that they are directly related to an agricultural operation and to not irreversibly convert farmland to nonagricultural uses. However, FPPA needs to be considered per NEPA guidelines.
- We will use the Web Soil Survey (WSS) to determine the soils that qualify as Prime Farmlands.

Authority: Farmland Protection Policy Act of 1981, 7CFR§ 658

Purpose:
The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years.

The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

When does this apply?
Projects are subject to FPPA requirements if they may **irreversibly** convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency.

Activities not subject to FPPA include:
- Federal permitting and licensing
- Projects planned and completed without the assistance of a Federal agency
- Construction within an existing right-of-way purchased on or before August 4, 1984
- **Construction of on-farm structures needed for farm operations**
- Surface mining, where restoration to agricultural use is planned
- Construction of new minor secondary structures such as a garage or storage shed

For more information visit the NRCS Farmland Protection Policy Act website at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/?ss=16&navtype=SUBNAVIGATION&cid=nrcs143_008275&navid=100170180000000&position=Welcome.Html&ttype=detail. State FPPA contacts can be found on this page as well.

United States Department of Agriculture

Special Environmental Concerns

Prime and Unique farmlands

PRIME AND UNIQUE FARMLANDS

Congress passed the Agriculture and Food Act of 1981 (Public law 97-98) which contained the Farmland Protection Policy Act (FPPA). The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

What is it?

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. It may include lands currently used to produce livestock and/or timber.

Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables.

Farmland that is of statewide or local importance other than prime or unique farmland is used for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, and that the Secretary of Agriculture determines should be considered the same as prime or unique farmland under FPPA.

Why is it important?

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency, including NRCS.

What is required?

NRCS must use the criteria provided in regulations found at 7 CFR Section 658.5 to identify and take into account the adverse effects of Federal programs on the protection of farmland. As well as evaluating and minimizing the effects of our own actions, NRCS must assist Federal agencies to consider alternative actions, as appropriate, that could lessen such adverse effects on farmland conversion to nonagricultural uses. NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

Prime and Unique Farmlands at a Glance

Problems/Indicators – Proposed farmland conversion	
Potential Causes	**Potential Solutions**
• Proposed land use changes/conversion of agricultural lands • Ground disturbing/land clearing activities • Construction of infrastructure projects • Urban development	• Conduct LESA for conversion impact score • Share result with landowner or cooperating Federal agency proposing action (normally for NEPA analysis) • Offer alternatives (relocation) for consideration if adverse impacts to prime, unique, or locally important agricultural lands

Appendix F

Sediment Quality Sampling Data

PREVIOUS SEDIMENT QUALITY ASSESSMENTS REFERENCED WITHIN PEIS

Sedimentation, Sediment Quality, and Upstream Channel Stability, John Redmond Reservoir, East-Central Kansas, 1964-2009. Prepared by U.S. Geological Survey in cooperation with the U.S. Army Corps of Engineers, Tulsa District. Scientific Investigation Report 2010-5191.

http://www.kwo.org/projects_programs/JohnRedmondDredging/rpt_USGS_JohnRedmond_020413_sm.pdf

Bathymetric Survey of John Redmond Reservoir, Coffey County, Kansas. Prepared by Kansas Biological Survey Applied Science and Technology for Reservoir Assessment (ASTRA). December 2007, updated January 2010.

http://www.kwo.org/reservoirs/ReservoirBathymetry/JohnRedmondReservoir_revised_12010_kbs.pdf

Sediment Quality
Toxicity Characteristic Leaching Procedure (TCLP) Results
Composite Sample Collected Near John Redmond Reservoir Dam and Outlet Structures -
Proposed Initial Site for Dredging

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 17, 2013

Teresa Rasmussen
USGS
4821 Quail Crest Place
Lawrence, KS 66049

RE: Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Dear Teresa Rasmussen:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Emily Webb

emily.webb@pacelabs.com
Project Manager

Enclosures

cc: Kyle Juracek, USGS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 12-019-0
Illinois Certification #: 002885
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-12-3
Utah Certification #: KS000212012-2
Illinois Certification #: 003097

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SAMPLE SUMMARY

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60143883001	**1A**	Solid	04/30/13 13:00	05/03/13 13:15

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SAMPLE ANALYTE COUNT

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60143883001	**1A**	EPA 6010	JGP	7	PASI-K
		EPA 7470	TJT	1	PASI-K
		EPA 8270	JMT	18	PASI-K
		EPA 8260	RAB	14	PASI-K
		ASTM D2974	DWC	1	PASI-K

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Sample: 1A **Lab ID: 60143883001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Leachate Method/Date: EPA 1311; 05/07/13 00:00							
Arsenic	ND	mg/L	0.50	1	05/09/13 14:15	05/10/13 14:00	7440-38-2	
Barium	ND	mg/L	2.5	1	05/09/13 14:15	05/10/13 14:00	7440-39-3	
Cadmium	ND	mg/L	0.050	1	05/09/13 14:15	05/10/13 14:00	7440-43-9	
Chromium	ND	mg/L	0.10	1	05/09/13 14:15	05/10/13 14:00	7440-47-3	
Lead	ND	mg/L	0.50	1	05/09/13 14:15	05/10/13 14:00	7439-92-1	
Selenium	ND	mg/L	0.50	1	05/09/13 14:15	05/10/13 14:00	7782-49-2	
Silver	ND	mg/L	0.10	1	05/09/13 14:15	05/10/13 14:00	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Leachate Method/Date: EPA 1311; 05/07/13 00:00							
Mercury	ND	mg/L	0.0020	1	05/13/13 09:45	05/13/13 14:52	7439-97-6	
8270 MSSV TCLP Sep Funnel	Analytical Method: EPA 8270 Preparation Method: EPA 3510							
	Leachate Method/Date: EPA 1311; 05/07/13 00:00							
1,4-Dichlorobenzene	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	106-46-7	
2,4-Dinitrotoluene	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	121-14-2	
Hexachloro-1,3-butadiene	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	87-68-3	
Hexachlorobenzene	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	118-74-1	
Hexachloroethane	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	67-72-1	
2-Methylphenol(o-Cresol)	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	200	1	05/10/13 00:00	05/14/13 00:48		
Nitrobenzene	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	98-95-3	
Pentachlorophenol	ND	ug/L	500	1	05/10/13 00:00	05/14/13 00:48	87-86-5	
Pyridine	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	110-86-1	
2,4,5-Trichlorophenol	ND	ug/L	500	1	05/10/13 00:00	05/14/13 00:48	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	100	1	05/10/13 00:00	05/14/13 00:48	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	42-120	1	05/10/13 00:00	05/14/13 00:48	4165-60-0	
2-Fluorobiphenyl (S)	74	%	43-120	1	05/10/13 00:00	05/14/13 00:48	321-60-8	
Terphenyl-d14 (S)	73	%	38-120	1	05/10/13 00:00	05/14/13 00:48	1718-51-0	
Phenol-d6 (S)	71	%	41-120	1	05/10/13 00:00	05/14/13 00:48	13127-88-3	
2-Fluorophenol (S)	71	%	40-120	1	05/10/13 00:00	05/14/13 00:48	367-12-4	
2,4,6-Tribromophenol (S)	85	%	38-126	1	05/10/13 00:00	05/14/13 00:48	118-79-6	
8260 MSV TCLP	Analytical Method: EPA 8260 Leachate Method/Date: EPA 1311; 05/13/13 00:00							
Benzene	ND	ug/L	50.0	1		05/14/13 18:59	71-43-2	
2-Butanone (MEK)	ND	ug/L	1000	1		05/14/13 18:59	78-93-3	
Carbon tetrachloride	ND	ug/L	50.0	1		05/14/13 18:59	56-23-5	
Chlorobenzene	ND	ug/L	50.0	1		05/14/13 18:59	108-90-7	
Chloroform	ND	ug/L	200	1		05/14/13 18:59	67-66-3	
1,2-Dichloroethane	ND	ug/L	50.0	1		05/14/13 18:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	50.0	1		05/14/13 18:59	75-35-4	
Tetrachloroethene	ND	ug/L	50.0	1		05/14/13 18:59	127-18-4	
Trichloroethene	ND	ug/L	50.0	1		05/14/13 18:59	79-01-6	

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Sample: 1A **Lab ID: 60143883001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV TCLP	Analytical Method: EPA 8260 Leachate Method/Date: EPA 1311; 05/13/13 00:00							
Vinyl chloride	ND	ug/L	100	1		05/14/13 18:59	75-01-4	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	80-120	1		05/14/13 18:59	17060-07-0	
Toluene-d8 (S)	100	%	80-120	1		05/14/13 18:59	2037-26-5	
4-Bromofluorobenzene (S)	99	%	80-120	1		05/14/13 18:59	460-00-4	
Dibromofluoromethane (S)	105	%	80-120	1		05/14/13 18:59	1868-53-7	
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**58.2**	%	0.50	1		05/06/13 00:00		

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

QC Batch: MERP/7324 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury TCLP
Associated Lab Samples: 60143883001

METHOD BLANK: 1183644 Matrix: Water
Associated Lab Samples: 60143883001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	ND	0.0020	05/13/13 14:30	

LABORATORY CONTROL SAMPLE: 1183645

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0049	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1183646 1183647

Parameter	Units	60143762001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	.015	.015	ND	.0012J	6	8	75-125		20	M1

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

QC Batch: MPRP/22612 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET TCLP
Associated Lab Samples: 60143883001

METHOD BLANK: 1183889 | Matrix: Water
Associated Lab Samples: 60143883001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.50	05/10/13 13:39	
Barium	mg/L	ND	2.5	05/10/13 13:39	
Cadmium	mg/L	ND	0.050	05/10/13 13:39	
Chromium	mg/L	ND	0.10	05/10/13 13:39	
Lead	mg/L	ND	0.50	05/10/13 13:39	
Selenium	mg/L	ND	0.50	05/10/13 13:39	
Silver	mg/L	ND	0.10	05/10/13 13:39	

LABORATORY CONTROL SAMPLE: 1183890

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	1	0.86	86	80-120	
Barium	mg/L	1	0.94	94	80-120	
Cadmium	mg/L	1	0.85	85	80-120	
Chromium	mg/L	1	0.89	89	80-120	
Lead	mg/L	1	0.89	89	80-120	
Selenium	mg/L	1	0.83	83	80-120	
Silver	mg/L	.5	0.42	85	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1183891 1183892

Parameter	Units	60143762001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	ND	10	10	9.3	9.4	92	94	75-125	2	20	
Barium	mg/L	ND	10	10	9.1	9.5	90	95	75-125	4	20	
Cadmium	mg/L	ND	10	10	8.5	8.7	85	87	75-125	2	20	
Chromium	mg/L	ND	10	10	9.1	9.3	91	93	75-125	3	20	
Lead	mg/L	ND	10	10	8.4	8.6	84	86	75-125	3	20	
Selenium	mg/L	ND	10	10	9.4	9.7	93	97	75-125	3	20	
Silver	mg/L	ND	5	5	4.3	4.4	86	89	75-125	3	20	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

QC Batch: MSV/53640 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV TCLP
Associated Lab Samples: 60143883001

METHOD BLANK: 1186748 Matrix: Water
Associated Lab Samples: 60143883001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1-Dichloroethene	ug/L	ND	50.0	05/14/13 17:42	
1,2-Dichloroethane	ug/L	ND	50.0	05/14/13 17:42	
2-Butanone (MEK)	ug/L	ND	1000	05/14/13 17:42	
Benzene	ug/L	ND	50.0	05/14/13 17:42	
Carbon tetrachloride	ug/L	ND	50.0	05/14/13 17:42	
Chlorobenzene	ug/L	ND	50.0	05/14/13 17:42	
Chloroform	ug/L	ND	200	05/14/13 17:42	
Tetrachloroethene	ug/L	ND	50.0	05/14/13 17:42	
Trichloroethene	ug/L	ND	50.0	05/14/13 17:42	
Vinyl chloride	ug/L	ND	100	05/14/13 17:42	
1,2-Dichloroethane-d4 (S)	%	99	80-120	05/14/13 17:42	
4-Bromofluorobenzene (S)	%	98	80-120	05/14/13 17:42	
Dibromofluoromethane (S)	%	103	80-120	05/14/13 17:42	
Toluene-d8 (S)	%	100	80-120	05/14/13 17:42	

LABORATORY CONTROL SAMPLE: 1186749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	1000	1020	102	70-127	
1,2-Dichloroethane	ug/L	1000	959	96	72-122	
2-Butanone (MEK)	ug/L	5000	5020	100	69-124	
Benzene	ug/L	1000	956	96	73-122	
Carbon tetrachloride	ug/L	1000	1130	113	73-125	
Chlorobenzene	ug/L	1000	975	97	80-120	
Chloroform	ug/L	1000	921	92	76-120	
Tetrachloroethene	ug/L	1000	1040	104	79-122	
Trichloroethene	ug/L	1000	986	99	76-120	
Vinyl chloride	ug/L	1000	838	84	57-140	
1,2-Dichloroethane-d4 (S)	%			99	80-120	
4-Bromofluorobenzene (S)	%			98	80-120	
Dibromofluoromethane (S)	%			101	80-120	
Toluene-d8 (S)	%			100	80-120	

MATRIX SPIKE SAMPLE: 1186750

Parameter	Units	60143889001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethene	ug/L	ND	1000	967	97	66-142	
1,2-Dichloroethane	ug/L	ND	1000	918	92	53-144	
2-Butanone (MEK)	ug/L	ND	5000	5280	104	54-127	
Benzene	ug/L	ND	1000	909	91	48-150	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

MATRIX SPIKE SAMPLE: 1186750

Parameter	Units	60143889001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/L	ND	1000	997	100	68-145	
Chlorobenzene	ug/L	ND	1000	942	94	68-131	
Chloroform	ug/L	ND	1000	877	88	69-126	
Tetrachloroethene	ug/L	ND	1000	957	96	66-139	
Trichloroethene	ug/L	ND	1000	910	91	67-130	
Vinyl chloride	ug/L	ND	1000	861	86	47-159	
1,2-Dichloroethane-d4 (S)	%				96	80-120	
4-Bromofluorobenzene (S)	%				100	80-120	
Dibromofluoromethane (S)	%				99	80-120	
Toluene-d8 (S)	%				99	80-120	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

QC Batch: OEXT/38312 — Analysis Method: EPA 8270
QC Batch Method: EPA 3510 — Analysis Description: 8270 TCLP MSSV
Associated Lab Samples: 60143883001

METHOD BLANK: 1184281 — Matrix: Water
Associated Lab Samples: 60143883001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dichlorobenzene	ug/L	ND	100	05/13/13 22:02	
2,4,5-Trichlorophenol	ug/L	ND	500	05/13/13 22:02	
2,4,6-Trichlorophenol	ug/L	ND	100	05/13/13 22:02	
2,4-Dinitrotoluene	ug/L	ND	100	05/13/13 22:02	
2-Methylphenol(o-Cresol)	ug/L	ND	100	05/13/13 22:02	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	200	05/13/13 22:02	
Hexachloro-1,3-butadiene	ug/L	ND	100	05/13/13 22:02	
Hexachlorobenzene	ug/L	ND	100	05/13/13 22:02	
Hexachloroethane	ug/L	ND	100	05/13/13 22:02	
Nitrobenzene	ug/L	ND	100	05/13/13 22:02	
Pentachlorophenol	ug/L	ND	500	05/13/13 22:02	
Pyridine	ug/L	ND	100	05/13/13 22:02	
2,4,6-Tribromophenol (S)	%	80	38-126	05/13/13 22:02	
2-Fluorobiphenyl (S)	%	75	43-120	05/13/13 22:02	
2-Fluorophenol (S)	%	69	40-120	05/13/13 22:02	
Nitrobenzene-d5 (S)	%	77	42-120	05/13/13 22:02	
Phenol-d6 (S)	%	72	41-120	05/13/13 22:02	
Terphenyl-d14 (S)	%	83	38-120	05/13/13 22:02	

LABORATORY CONTROL SAMPLE: 1184282

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dichlorobenzene	ug/L	500	385	77	42-120	
2,4,5-Trichlorophenol	ug/L	500	407J	81	51-120	
2,4,6-Trichlorophenol	ug/L	500	390	78	50-120	
2,4-Dinitrotoluene	ug/L	500	346	69	53-120	
2-Methylphenol(o-Cresol)	ug/L	500	370	74	46-120	
3&4-Methylphenol(m&p Cresol)	ug/L	1000	761	76	35-120	
Hexachloro-1,3-butadiene	ug/L	500	391	78	43-120	
Hexachlorobenzene	ug/L	500	387	77	51-120	
Hexachloroethane	ug/L	500	361	72	38-120	
Nitrobenzene	ug/L	500	394	79	47-120	
Pentachlorophenol	ug/L	500	336J	67	39-123	
Pyridine	ug/L	500	229	46	1-120	
2,4,6-Tribromophenol (S)	%			82	38-126	
2-Fluorobiphenyl (S)	%			76	43-120	
2-Fluorophenol (S)	%			72	40-120	
Nitrobenzene-d5 (S)	%			81	42-120	
Phenol-d6 (S)	%			74	41-120	
Terphenyl-d14 (S)	%			83	38-120	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

QC Batch: PMST/8517 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 60143883001

METHOD BLANK: 1181614 Matrix: Solid
Associated Lab Samples: 60143883001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Percent Moisture	%	ND	0.50	05/06/13 00:00	

SAMPLE DUPLICATE: 1181689

Parameter	Units	60143866001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	ND	0.56		20	

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QUALIFIERS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143883

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60143883001	**1A**	EPA 3010	MPRP/22612	EPA 6010	ICP/17930
60143883001	**1A**	EPA 7470	MERP/7324	EPA 7470	MERC/7284
60143883001	**1A**	EPA 3510	OEXT/38312	EPA 8270	MSSV/12112
60143883001	**1A**	EPA 8260	MSV/53640		
60143883001	**1A**	ASTM D2974	PMST/8517		

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May 17, 2013

Emily Webb
PASI-KS
9608 Loiret Blvd.
Lenexa, KS 66219

RE: Project 20153961
Project ID: 60143883/USGS

Dear Emily Webb:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2013. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerly,

Karen Brown
karen.brown@pacelabs.com

REPORT OF LABORATORY ANALYSIS

Laboratory Certifications

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
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(504) 469-0333

Project: 20153961

Client: 60

Project ID: 60143883/USGS

Washington Department of Ecology C2078

Oregon Environmental Laboratory Accreditation - LA200001

U.S. Dept. of Agriculture Foreign Soil Import P330-10-00119

Pennsylviania Dept. of Env Protection (NELAC) 68-04202

Texas Commission on Env. Quality (NELAC) T104704405-09-TX

Kansas Department of Health and Environment (NELAC) E-10266

Florida Department of Health (NELAC) E87595

Oklahoma Department of Environmental Quality - 2010-139

Illinois Environmental Protection Agency - 0025721

California Env. Lab Accreditation Program Branch - 11277CA

Louisiana Dept. of Environmental Quality (NELAC/LELAP) 02006

Sample Cross Reference

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(504) 469-0333

Project: 20153961

Client: 60

Project ID: 60143883/USGS

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
1A	201088612	Other	30-Apr-13 13:00	03-May-13 00:00

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Project Narrative

Project: 20153961

Sample Receipt Condition:
All samples were received in accordance with EPA protocol.

Holding Times:
All holding times were met.

Blanks:
All blank results were below reporting limits.

Laboratory Control Samples:
LCS recoveries outside of QC limits are qualified in the Report of Quality Control section.

Matrix Spikes and Duplicates:
All MS/MSD recoveries or duplicate RPDs were within QC limits.

Surrogates:
Surrogate recoveries outside of QC limits are qualified in the surrogate results section.

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QC Cross Reference

Project: 20153961

Analytical Method	Batch	Sample used for QC
EPA 8151	208299	Project sample 1A
EPA 8081	208300	Project sample 1A

Narrative1 5/17/2013 10:27:25

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from a different client was used.

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Sample Results

		Client:	60		
Client ID:	1A	**Project:**	20153961		
Project ID:	60143883/USGS	**Site:**	None		
Lab ID:	201088612 (TCLP)	**Matrix:**	Other	**% Moisture:**	n/a
Description:	None	**Prep Level:**	TCLP	**Batch:**	208300
Method:	EPA 8081 (TCLP) 8081 Pests TCLP	**Collected:**	30-Apr-13	**Received:**	03-May-13
		Prepared:	13-May-13		

Units: mg/L

CAS No.	Analyte	Dilution	Result	Qu	Reporting Limit	Reg Limit	Analysis	
58-89-9	gamma-BHC (Lindane)	1	ND		0.000500	0.400	15-May-13 16:01	SLF
57-74-9	Chlordane	1	ND		0.00500	0.0300	15-May-13 16:01	SLF
72-20-8	Endrin	1	ND		0.00100	0.0200	15-May-13 16:01	SLF
76-44-8	Heptachlor	1	ND		0.000500	0.00800	15-May-13 16:01	SLF
1024-57-3	Heptachlor epoxide	1	ND		0.000500	0.00800	15-May-13 16:01	SLF
72-43-5	Methoxychlor	1	ND		0.00500	10.0	15-May-13 16:01	SLF
8001-35-2	Toxaphene	1	ND		0.0200	0.500	15-May-13 16:01	SLF

7 compound(s) reported

Protocol 5/17/2013 10:27:27

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

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St. Rose, LA 70087
(504) 469-0333

Sample Results

Client: 60

Client ID:	1A	**Project:**	20153961		
Project ID:	60143883/USGS	**Site:**	None		
Lab ID:	201088612 (TCLP)	**Matrix:**	Other	**% Moisture:**	n/a
Description:	None	**Prep Level:**	TCLP	**Batch:**	208299
Method:	EPA 8151 (TCLP) 8151 Herbs TCLP	**Collected:**	30-Apr-13	**Received:**	03-May-13
		Prepared:	13-May-13		

Units: mg/L

CAS No.	Analyte	Dilution	Result	Qu	Reporting Limit	Reg Limit	Analysis
94-75-7	2,4-D	1	ND		0.0200	10.0	14-May-13 12:54 SPP1
93-72-1	2,4,5-TP (Silvex)	1	ND		0.0200	1.00	14-May-13 12:54 SPP1

2 compound(s) reported

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Surrogate Recovery

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Batch: 208299 **Project:** 20153961

Method: TCLP GC Semivolatile Organics

Lab ID	Sample ID	Qu	Sur 1 %Rec	Sur 2 %Rec	Sur 3 %Rec	Sur 4 %Rec	Sur 5 %Rec	Sur 6 %Rec	Sur 7 %Rec	Sur 8 %Rec
201088612	1A		90	76						
201088727	1A MS 1		97	82						
201088728	1A MSD 1		101	84						
201088725	208299 BLANK 1		80	81						
201088726	208299 LCS 1		99	98						
	QC limits:		10-166	10-166						

Sur 1: 2,4-DCPA (Conf)(S)
Sur 2: 2,4-DCPA (S)

* denotes surrogate recovery outside of QC limits.
D denotes surrogate recovery is outside of QC limits due to sample dilution, and is not considered an excursion.

Surrogate Recovery

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Batch: 208300 **Project:** 20153961

Method: TCLP GC Semivolatile Organics

Lab ID	Sample ID	Qu	Sur 1 %Rec	Sur 2 %Rec	Sur 3 %Rec	Sur 4 %Rec	Sur 5 %Rec	Sur 6 %Rec	Sur 7 %Rec	Sur 8 %Rec
201088612	1A		91	98	72	66				
201088731	1A MS 1		81	87	84	70				
201088732	1A MSD 1		93	97	119	70				
201088729	208300 BLANK 1		83	89	61	57				
201088730	208300 LCS 1		159 *	156 *	121 *	122 *				
	QC limits:		10-137	10-137	18-119	18-119				

Sur 1: Decachlorobiphenyl (Conf)(S)
Sur 2: Decachlorobiphenyl (S)
Sur 3: Tetrachloro-m-xylene (Conf)(S)
Sur 4: Tetrachloro-m-xylene (S)

* denotes surrogate recovery outside of QC limits.
D denotes surrogate recovery is outside of QC limits due to sample dilution, and is not considered an excursion.

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Batch: 208300 **Project:** 20153961 **LCS:** 201088730 15-May-1 15:48

Method: TCLP GC Semivolatile Organics **MS:** 201088731 15-May-1 16:13

Units: mg/L **MSD:** 201088732 15-May-1 16:26

Original for MS: Client Sample 201088612

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
gamma-BHC (Lindane)	0.00500	0.00610	122	0.00500		0.00394	0.00443	79	89	12	28-128	17-149	20	
Endrin	0.00500	0.00582	116	0.00500		0.00356	0.00403	71	81	12	20-153	22-160	20	
Heptachlor	0.00500	0.00456	91	0.00500		0.00325	0.00340	65	68	5	10-115	10-134	20	
Heptachlor epoxide	0.00500	0.00536	107	0.00500		0.00384	0.00438	77	88	13	30-119	13-147	20	
Methoxychlor	0.00500	0.00551	110	0.00500		0.00423	0.00509	85	102	19	21-150	17-166	20	

5 compound(s) reported

*** denotes recovery outside of QC limits.**
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

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Quality Control

Batch: 208299 **Project:** 20153961 **LCS:** 201088726 14-May-1 12:37

Method: TCLP GC Semivolatile Organics **MS:** 201088727 14-May-1 13:10

Units: mg/L **MSD:** 201088728 14-May-1 13:26

Original for MS: Client Sample 201088612

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
2,4-D	0.0400	0.0461	115	0.0400		0.0420	0.0457	105	114	8	10-151	10-160	27	
2,4,5-TP (Silvex)	0.0400	0.0321	80	0.0400		0.0283	0.0276	71	69	2	22-158	16-164	20	

2 compound(s) reported

* denotes recovery outside of QC limits.
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

QC Protocol 5/17/2013 10:27:32

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Blank Results

Pace Analytical Services, Inc.
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St. Rose, LA 70087
(504) 469-0333

Blank ID: 208299 BLANK 1 **Project:** 20153961

Lab ID: 201088725

Prep Level: TCLP **Batch:** 208299

Method: TCLP GC Semivolatile Organics

Prepared: 13-May-13

Units: mg/L

CAS Numb	Analyte	Dilution	Result	Qu	Reporting Limit	Analysis	
94-75-7	2,4-D	1	ND		0.0200	14-May-13 12:21	SPP1
93-72-1	2,4,5-TP (Silvex)	1	ND		0.0200	14-May-13 12:21	SPP1

2 compound(s) reported

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Blank Results

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Blank ID: 208300 BLANK 1 **Project:** 20153961

Lab ID: 201088729

Prep Level: TCLP **Batch:** 208300

Method: TCLP GC Semivolatile Organics

Prepared: 13-May-13

Units: mg/L

CAS Numb	Analyte	Dilution	Result	Qu	Reporting Limit	Analysis	
58-89-9	gamma-BHC (Lindane)	1	ND		0.000500	15-May-13 15:35	SLF
57-74-9	Chlordane	1	ND		0.00500	15-May-13 15:35	SLF
72-20-8	Endrin	1	ND		0.00100	15-May-13 15:35	SLF
76-44-8	Heptachlor	1	ND		0.000500	15-May-13 15:35	SLF
1024-57-3	Heptachlor epoxide	1	ND		0.000500	15-May-13 15:35	SLF
72-43-5	Methoxychlor	1	ND		0.00500	15-May-13 15:35	SLF
8001-35-2	Toxaphene	1	ND		0.0200	15-May-13 15:35	SLF

7 compound(s) reported

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

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(504) 469-0333

Definitions/Qualifiers

Project: 20153961

Value	Description
J	This estimated value for the analyte is below the adjusted reporting limit but above the instrument reporting limit.
U	The analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.
B	This analyte was detected in the method blank.
E	The sample concentration is above the linear calibrated range of the analysis.
LCS	Laboratory Control Sample.
MS(D)	Matrix Spike (Duplicate).
DUP	Sample Duplicate.
RPD	Relative Percent Difference.

Pace Analytical Services, In
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St. Rose, LA 7008
(504) 469-033

Chains of Custody

20153961 PASI-KANS

Chain of Custody

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Workorder: 60143883 **Workorder Name:** JOHN REDMOND SEDIMENT **Owner Received Date:** 5/3/2013 **Results Requested By:** 5/17/2013

Report To	Subcontract To
Emily Webb Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219 Phone (913)599-5665 Fax (913)599-1759	Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: AGIU	Requested Analysis: 8081 PESTICIDES	8151 HERBICIDES	LAB USE ONLY
1	1A	PS	4/30/2013 13:00	60143883001	LEACHA	1	X	X	201088612
2									
3									
4									
5									

Transfers	Released By	Date/Time	Received By	Date/Time
1	[signature]	5/9/13 1200		
2	Fed EX	5-10-13 0910	[signature]	5-16-13 0910
3				

Comments: SAMPLE IS TCLP LEACHATE

Cooler Temperature on Receipt 1.2 °C **Custody Seal** Y or **Received on Ice** Y or **Samples Intact** Y or N

20153961 PASI-KANS

Pace Analytical

Sample Cond

1000 Riverbend. Blvd., Suite F
St. Rose, LA 70087

Courier: ☐ Pace Courier ☐ Hired Courier ☒ Fed X ☐ UPS ☐ DHL ☐ USPS ☐ Customer ☐ Other

Custody Seal on Cooler/Box Present: [see COC] **Custody Seals intact:** ☒ Yes ☐ No

Therometer Used:	☐ Therm Fisher IR 5 ☐ Therm Fisher IR 6 ☒ Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 05-10-13 MJ

Temp must be measured from Temperature blank when present

		Comments:
Temperature Blank Present"?	☒Yes ☐No ☐N/A	1
Chain of Custody Present:	☒Yes ☐No ☐N/A	2
Chain of Custody Complete:	☒Yes ☐No ☐N/A	3
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	4
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	5
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	6
Sufficient Volume:	☒Yes ☐No ☐N/A	7
Correct Containers Used:	☒Yes ☐No ☐N/A	8
Filtered vol. Rec. for Diss. tests	☐Yes ☐No ☒N/A	9
Sample Labels match COC:	☒Yes ☐No ☐N/A	10
All containers received within manafacture's precautionary and/or expiration dates.	☒Yes ☐No ☐N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	☐Yes ☐No ☒N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	13 If No, was preservative added? ☐Yes ☐No If added record lot no.: HNO3 ______ H2SO4 ______
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14
Trip Blank Present:	☐Yes ☒No	15

Client Notification/ Resolution:

Person Contacted: ______________________ Date/Time: ____________

Comments/ Resolution: ______________________

ALLC003rev.08, 15Feb2013 SCUR Form - mod

WO#: 60143883

60143883

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Sample Condition Upon Receipt

Optional
Proj Due Date:
Proj Name:

Client Name: USGS

Courier: Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Commercial ☐ Pace ☐ Other ☐

Tracking #: ______ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☐ No ☑ Seals intact: Yes ☐ No ☑

Packing Material: Bubble Wrap ☐ Bubble Bags ☑ Foam ☐ None ☐ Other ☐

Thermometer Used: ~~T-112~~ / T-194 **Type of Ice:** Wet Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 5.2

Temperature should be above freezing to 6°C

Date and initials of person examining contents: 5/3/13

Chain of Custody present:	☑Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☑Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☑Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☑Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	7.
Sufficient volume:	☑Yes ☐No ☐N/A	8.
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	9.
Containers intact:	☑Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	12.
Sample labels match COC: Includes date/time/ID/analyses Matrix: SL	☑Yes ☐No ☐N/A	run samples for total total 13.
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	14.
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	☐Yes ☑No	Initial when completed / Lot # of added preservative
Trip Blank present: Pace Trip Blank lot # (if purchased):	☐Yes ☐No ☑N/A	15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☑No ☐N/A	17. List State: KS.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ______

Project Manager Review: [signature] Date: 5/3/13

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company:	USGS	Report To: Kyle Juracek	Attention:	Same as section A
Address:	4821 Quail Crest Place	Copy To:	Company Name:	USGS
	Lawrence, KS 66049		Address:	
Email To:	kjuracek@usgs.gov	Purchase Order No.:	Pace Quote Reference:	130329_USGS_TCLP_7123
Phone: 785-832-3527	Fax:	Project Name: John Redmond sediment	Pace Project Manager:	Emily Webb
Requested Due Date/TAT:	standard	Project Number:	Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER ______

Site Location STATE: KS

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	TCLP VOC's	TCLP SVOC's	TCLP RCRA 8 Metals	TCLP Pesticides	TCLP Herbicides	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60143883
1	1a			4-20	10:00	4-20	13:00		1	✓									x	x	x	x	x		1 othr CU
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		5-3-13	13:15	E Brockett	5/3	1315	~~6.0~~ 5.2	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kyle Juracek

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 5-3-13

Page 33 of 33

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

Sediment Quality Sampling Results
Composite Sample Collected Near John Redmond Reservoir Dam and Outlet Structures - Proposed Initial Site for Dredging

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 21, 2013

Kyle Juracek
USGS

,

RE: Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Dear Kyle Juracek:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Emily Webb

emily.webb@pacelabs.com
Project Manager

Enclosures

cc: Earl Lewis, Ks Water Office

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CERTIFICATIONS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
A2LA Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-13-4
Utah Certification #: KS000212013-3
Illinois Certification #: 003097

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60143902001	**1B**	Solid	04/30/13 13:00	05/03/13 13:15

Pace Analytical Services, Inc.
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60143902001	**1B**	EPA 6010	NDJ	9	PASI-K
		EPA 7471	TJT	1	PASI-K
		EPA 8270	JMT	72	PASI-K
		EPA 8260	RAB	69	PASI-K
		ASTM D2974	DWC	1	PASI-K

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Sample: 1B **Lab ID: 60143902001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050							
Arsenic	**6.1**	mg/kg	1.8	1	05/13/13 14:20	05/14/13 12:27	7440-38-2	
Barium	**226**	mg/kg	1.8	1	05/13/13 14:20	05/14/13 12:27	7440-39-3	
Cadmium	ND	mg/kg	0.91	1	05/13/13 14:20	05/14/13 12:27	7440-43-9	
Chromium	**28.6**	mg/kg	0.91	1	05/13/13 14:20	05/14/13 12:27	7440-47-3	
Lead	**14.5**	mg/kg	0.91	1	05/13/13 14:20	05/14/13 12:27	7439-92-1	
Nickel	**20.6**	mg/kg	0.91	1	05/13/13 14:20	05/14/13 12:27	7440-02-0	
Selenium	ND	mg/kg	2.7	1	05/13/13 14:20	05/14/13 12:27	7782-49-2	
Silver	ND	mg/kg	1.3	1	05/13/13 14:20	05/14/13 12:27	7440-22-4	
Zinc	**62.2**	mg/kg	18.3	1	05/13/13 14:20	05/14/13 12:27	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471							
Mercury	ND	mg/kg	0.094	1	05/06/13 09:55	05/06/13 11:56	7439-97-6	
8270 MSSV Semivolatiles	Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	83-32-9	
Acenaphthylene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	208-96-8	
Anthracene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	120-12-7	
Benzo(a)anthracene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	56-55-3	
Benzo(a)pyrene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	207-08-9	
Benzoic acid	ND	ug/kg	11200	1	05/04/13 00:00	05/08/13 01:37	65-85-0	
Benzyl alcohol	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	101-55-3	
Butylbenzylphthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	85-68-7	
4-Chloro-3-methylphenol	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	59-50-7	
4-Chloroaniline	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	91-58-7	
2-Chlorophenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	7005-72-3	
Chrysene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	53-70-3	
Dibenzofuran	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	120-83-2	
Diethylphthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	105-67-9	
Dimethylphthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	131-11-3	

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Sample: 1B **Lab ID: 60143902001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles	Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Di-n-butylphthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	11200	1	05/04/13 00:00	05/08/13 01:37	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	11200	1	05/04/13 00:00	05/08/13 01:37	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	606-20-2	
Di-n-octylphthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	117-81-7	
Fluoranthene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	206-44-0	
Fluorene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	87-68-3	
Hexachlorobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	77-47-4	
Hexachloroethane	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	193-39-5	
Isophorone	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	78-59-1	
2-Methylnaphthalene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37		
Naphthalene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	91-20-3	
2-Nitroaniline	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	88-74-4	
3-Nitroaniline	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	99-09-2	
4-Nitroaniline	ND	ug/kg	4420	1	05/04/13 00:00	05/08/13 01:37	100-01-6	
Nitrobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	98-95-3	
2-Nitrophenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	88-75-5	
4-Nitrophenol	ND	ug/kg	11200	1	05/04/13 00:00	05/08/13 01:37	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	621-64-7	
N-Nitrosodiphenylamine	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	86-30-6	
Pentachlorophenol	ND	ug/kg	11200	1	05/04/13 00:00	05/08/13 01:37	87-86-5	
Phenanthrene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	85-01-8	
Phenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	108-95-2	
Pyrene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	129-00-0	
Pyridine	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	110-86-1	
1,2,4-Trichlorobenzene	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	2210	1	05/04/13 00:00	05/08/13 01:37	88-06-2	
Surrogates								
Nitrobenzene-d5 (S)	79	%	21-145	1	05/04/13 00:00	05/08/13 01:37	4165-60-0	
2-Fluorobiphenyl (S)	88	%	28-145	1	05/04/13 00:00	05/08/13 01:37	321-60-8	
Terphenyl-d14 (S)	99	%	29-158	1	05/04/13 00:00	05/08/13 01:37	1718-51-0	
Phenol-d6 (S)	92	%	43-120	1	05/04/13 00:00	05/08/13 01:37	13127-88-3	
2-Fluorophenol (S)	92	%	45-120	1	05/04/13 00:00	05/08/13 01:37	367-12-4	
2,4,6-Tribromophenol (S)	110	%	44-120	1	05/04/13 00:00	05/08/13 01:37	118-79-6	
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	**175**	ug/kg	46.9	1		05/06/13 20:02	67-64-1	
Benzene	ND	ug/kg	11.7	1		05/06/13 20:02	71-43-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Sample: 1B **Lab ID: 60143902001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Bromobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	108-86-1	M1
Bromochloromethane	ND	ug/kg	11.7	1		05/06/13 20:02	74-97-5	
Bromodichloromethane	ND	ug/kg	11.7	1		05/06/13 20:02	75-27-4	M1
Bromoform	ND	ug/kg	11.7	1		05/06/13 20:02	75-25-2	M1
Bromomethane	ND	ug/kg	11.7	1		05/06/13 20:02	74-83-9	
2-Butanone (MEK)	**40.3**	ug/kg	23.4	1		05/06/13 20:02	78-93-3	
n-Butylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	104-51-8	M1
sec-Butylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	135-98-8	
tert-Butylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	98-06-6	
Carbon disulfide	ND	ug/kg	11.7	1		05/06/13 20:02	75-15-0	
Carbon tetrachloride	ND	ug/kg	11.7	1		05/06/13 20:02	56-23-5	
Chlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	108-90-7	M1
Chloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	75-00-3	
Chloroform	ND	ug/kg	11.7	1		05/06/13 20:02	67-66-3	
Chloromethane	ND	ug/kg	11.7	1		05/06/13 20:02	74-87-3	
2-Chlorotoluene	ND	ug/kg	11.7	1		05/06/13 20:02	95-49-8	M1
4-Chlorotoluene	ND	ug/kg	11.7	1		05/06/13 20:02	106-43-4	M1
1,2-Dibromo-3-chloropropane	ND	ug/kg	23.4	1		05/06/13 20:02	96-12-8	
Dibromochloromethane	ND	ug/kg	11.7	1		05/06/13 20:02	124-48-1	M1
1,2-Dibromoethane (EDB)	ND	ug/kg	11.7	1		05/06/13 20:02	106-93-4	M1
Dibromomethane	ND	ug/kg	11.7	1		05/06/13 20:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	95-50-1	M1
1,3-Dichlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	541-73-1	M1
1,4-Dichlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	106-46-7	M1
Dichlorodifluoromethane	ND	ug/kg	11.7	1		05/06/13 20:02	75-71-8	
1,1-Dichloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	75-34-3	
1,2-Dichloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/kg	11.7	1		05/06/13 20:02	540-59-0	
1,1-Dichloroethene	ND	ug/kg	11.7	1		05/06/13 20:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	11.7	1		05/06/13 20:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	11.7	1		05/06/13 20:02	156-60-5	
1,2-Dichloropropane	ND	ug/kg	11.7	1		05/06/13 20:02	78-87-5	
1,3-Dichloropropane	ND	ug/kg	11.7	1		05/06/13 20:02	142-28-9	M1
2,2-Dichloropropane	ND	ug/kg	11.7	1		05/06/13 20:02	594-20-7	
1,1-Dichloropropene	ND	ug/kg	11.7	1		05/06/13 20:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	11.7	1		05/06/13 20:02	10061-01-5	M1
trans-1,3-Dichloropropene	ND	ug/kg	11.7	1		05/06/13 20:02	10061-02-6	M1
Ethylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	11.7	1		05/06/13 20:02	87-68-3	M1
2-Hexanone	ND	ug/kg	46.9	1		05/06/13 20:02	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/kg	11.7	1		05/06/13 20:02	98-82-8	
p-Isopropyltoluene	ND	ug/kg	11.7	1		05/06/13 20:02	99-87-6	
Methylene chloride	**41.5**	ug/kg	11.7	1		05/06/13 20:02	75-09-2	C9
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	23.4	1		05/06/13 20:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	11.7	1		05/06/13 20:02	1634-04-4	
Naphthalene	ND	ug/kg	23.4	1		05/06/13 20:02	91-20-3	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Sample: 1B **Lab ID: 60143902001** Collected: 04/30/13 13:00 Received: 05/03/13 13:15 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
n-Propylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	103-65-1	
Styrene	ND	ug/kg	11.7	1		05/06/13 20:02	100-42-5	M1
1,1,1,2-Tetrachloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	630-20-6	M1
1,1,2,2-Tetrachloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	79-34-5	M1
Tetrachloroethene	ND	ug/kg	11.7	1		05/06/13 20:02	127-18-4	
Toluene	ND	ug/kg	11.7	1		05/06/13 20:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	87-61-6	M1
1,2,4-Trichlorobenzene	ND	ug/kg	11.7	1		05/06/13 20:02	120-82-1	M1
1,1,1-Trichloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	11.7	1		05/06/13 20:02	79-00-5	M1
Trichloroethene	ND	ug/kg	11.7	1		05/06/13 20:02	79-01-6	
Trichlorofluoromethane	ND	ug/kg	11.7	1		05/06/13 20:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	11.7	1		05/06/13 20:02	96-18-4	M1
1,2,4-Trimethylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	95-63-6	M1
1,3,5-Trimethylbenzene	ND	ug/kg	11.7	1		05/06/13 20:02	108-67-8	M1
Vinyl chloride	ND	ug/kg	11.7	1		05/06/13 20:02	75-01-4	
Xylene (Total)	ND	ug/kg	11.7	1		05/06/13 20:02	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	101	%	76-125	1		05/06/13 20:02	1868-53-7	
Toluene-d8 (S)	100	%	80-120	1		05/06/13 20:02	2037-26-5	
4-Bromofluorobenzene (S)	101	%	80-120	1		05/06/13 20:02	460-00-4	
1,2-Dichloroethane-d4 (S)	112	%	76-132	1		05/06/13 20:02	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**58.2**	%	0.50	1		05/06/13 00:00		

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

QC Batch: MERP/7310 Analysis Method: EPA 7471
QC Batch Method: EPA 7471 Analysis Description: 7471 Mercury
Associated Lab Samples: 60143902001

METHOD BLANK: 1181610 Matrix: Solid
Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.050	05/06/13 11:29	

LABORATORY CONTROL SAMPLE: 1181611

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.5	0.40	80	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1181612 1181613

Parameter	Units	60143811001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.089	.44	.42	0.42	0.45	77	86	75-125	7	20	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

QC Batch: MPRP/22642 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 60143902001

METHOD BLANK: 1186247 Matrix: Solid
Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	1.0	05/14/13 12:01	
Barium	mg/kg	ND	1.0	05/14/13 12:01	
Cadmium	mg/kg	ND	0.50	05/14/13 12:01	
Chromium	mg/kg	ND	0.50	05/14/13 12:01	
Lead	mg/kg	ND	0.50	05/14/13 12:01	
Selenium	mg/kg	ND	1.5	05/14/13 12:01	
Silver	mg/kg	ND	0.70	05/14/13 12:01	

LABORATORY CONTROL SAMPLE: 1186248

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	44.3	89	80-120	
Barium	mg/kg	50	47.3	95	80-120	
Cadmium	mg/kg	50	43.9	88	80-120	
Chromium	mg/kg	50	46.0	92	80-120	
Lead	mg/kg	50	44.1	88	80-120	
Selenium	mg/kg	50	43.7	87	80-120	
Silver	mg/kg	25	21.0	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1186249 1186250

Parameter	Units	60143815001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	1.7	39.2	40.9	31.9	33.4	77	78	75-125	5	20	
Barium	mg/kg	50.9	39.2	40.9	85.9	83.4	89	79	75-125	3	20	
Cadmium	mg/kg	ND	39.2	40.9	30.4	31.8	77	78	75-125	4	20	
Chromium	mg/kg	4.0	39.2	40.9	35.5	36.1	80	79	75-125	2	20	
Lead	mg/kg	4.3	39.2	40.9	31.6	33.5	70	72	75-125	6	20	M1
Selenium	mg/kg	ND	39.2	40.9	28.7	30.2	73	74	75-125	5	20	M1
Silver	mg/kg	ND	19.6	20.4	14.6	15.2	74	74	75-125	4	20	M1

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

QC Batch: MSV/53421 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 60143902001

METHOD BLANK: 1181823 Matrix: Solid
Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,1,1-Trichloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,1,2,2-Tetrachloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,1,2-Trichloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,1-Dichloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,1-Dichloroethene	ug/kg	ND	5.0	05/06/13 19:00	
1,1-Dichloropropene	ug/kg	ND	5.0	05/06/13 19:00	
1,2,3-Trichlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,2,3-Trichloropropane	ug/kg	ND	5.0	05/06/13 19:00	
1,2,4-Trichlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dibromo-3-chloropropane	ug/kg	ND	10.0	05/06/13 19:00	
1,2-Dibromoethane (EDB)	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dichlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dichloroethane	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dichloroethene (Total)	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dichloropropane	ug/kg	ND	5.0	05/06/13 19:00	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,3-Dichlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
1,3-Dichloropropane	ug/kg	ND	5.0	05/06/13 19:00	
1,4-Dichlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
2,2-Dichloropropane	ug/kg	ND	5.0	05/06/13 19:00	
2-Butanone (MEK)	ug/kg	ND	10.0	05/06/13 19:00	
2-Chlorotoluene	ug/kg	ND	5.0	05/06/13 19:00	
2-Hexanone	ug/kg	ND	20.0	05/06/13 19:00	
4-Chlorotoluene	ug/kg	ND	5.0	05/06/13 19:00	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	10.0	05/06/13 19:00	
Acetone	ug/kg	ND	20.0	05/06/13 19:00	
Benzene	ug/kg	ND	5.0	05/06/13 19:00	
Bromobenzene	ug/kg	ND	5.0	05/06/13 19:00	
Bromochloromethane	ug/kg	ND	5.0	05/06/13 19:00	
Bromodichloromethane	ug/kg	ND	5.0	05/06/13 19:00	
Bromoform	ug/kg	ND	5.0	05/06/13 19:00	
Bromomethane	ug/kg	ND	5.0	05/06/13 19:00	
Carbon disulfide	ug/kg	ND	5.0	05/06/13 19:00	
Carbon tetrachloride	ug/kg	ND	5.0	05/06/13 19:00	
Chlorobenzene	ug/kg	ND	5.0	05/06/13 19:00	
Chloroethane	ug/kg	ND	5.0	05/06/13 19:00	
Chloroform	ug/kg	ND	5.0	05/06/13 19:00	
Chloromethane	ug/kg	ND	5.0	05/06/13 19:00	
cis-1,2-Dichloroethene	ug/kg	ND	5.0	05/06/13 19:00	
cis-1,3-Dichloropropene	ug/kg	ND	5.0	05/06/13 19:00	
Dibromochloromethane	ug/kg	ND	5.0	05/06/13 19:00	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

METHOD BLANK: 1181823 Matrix: Solid

Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromomethane	ug/kg	ND	5.0	05/06/13 19:00	
Dichlorodifluoromethane	ug/kg	ND	5.0	05/06/13 19:00	
Ethylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
Hexachloro-1,3-butadiene	ug/kg	ND	5.0	05/06/13 19:00	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	05/06/13 19:00	
Methyl-tert-butyl ether	ug/kg	ND	5.0	05/06/13 19:00	
Methylene chloride	ug/kg	ND	5.0	05/06/13 19:00	
n-Butylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
n-Propylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
Naphthalene	ug/kg	ND	10.0	05/06/13 19:00	
p-Isopropyltoluene	ug/kg	ND	5.0	05/06/13 19:00	
sec-Butylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
Styrene	ug/kg	ND	5.0	05/06/13 19:00	
tert-Butylbenzene	ug/kg	ND	5.0	05/06/13 19:00	
Tetrachloroethene	ug/kg	ND	5.0	05/06/13 19:00	
Toluene	ug/kg	ND	5.0	05/06/13 19:00	
trans-1,2-Dichloroethene	ug/kg	ND	5.0	05/06/13 19:00	
trans-1,3-Dichloropropene	ug/kg	ND	5.0	05/06/13 19:00	
Trichloroethene	ug/kg	ND	5.0	05/06/13 19:00	
Trichlorofluoromethane	ug/kg	ND	5.0	05/06/13 19:00	
Vinyl chloride	ug/kg	ND	5.0	05/06/13 19:00	
Xylene (Total)	ug/kg	ND	5.0	05/06/13 19:00	
1,2-Dichloroethane-d4 (S)	%	100	76-132	05/06/13 19:00	
4-Bromofluorobenzene (S)	%	98	80-120	05/06/13 19:00	
Dibromofluoromethane (S)	%	102	76-125	05/06/13 19:00	
Toluene-d8 (S)	%	100	80-120	05/06/13 19:00	

LABORATORY CONTROL SAMPLE: 1181824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	100	99.9	100	80-120	
1,1,1-Trichloroethane	ug/kg	100	95.3	95	75-128	
1,1,2,2-Tetrachloroethane	ug/kg	100	97.5	97	68-120	
1,1,2-Trichloroethane	ug/kg	100	93.4	93	73-120	
1,1-Dichloroethane	ug/kg	100	88.8	89	73-120	
1,1-Dichloroethene	ug/kg	100	94.6	95	75-128	
1,1-Dichloropropene	ug/kg	100	102	102	78-128	
1,2,3-Trichlorobenzene	ug/kg	100	99.6	100	77-120	
1,2,3-Trichloropropane	ug/kg	100	98.2	98	72-120	
1,2,4-Trichlorobenzene	ug/kg	100	97.0	97	76-120	
1,2,4-Trimethylbenzene	ug/kg	100	89.5	90	77-120	
1,2-Dibromo-3-chloropropane	ug/kg	100	108	108	66-125	
1,2-Dibromoethane (EDB)	ug/kg	100	105	105	78-120	
1,2-Dichlorobenzene	ug/kg	100	96.2	96	80-120	
1,2-Dichloroethane	ug/kg	100	95.9	96	76-120	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

LABORATORY CONTROL SAMPLE: 1181824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethene (Total)	ug/kg	200	182	91	77-120	
1,2-Dichloropropane	ug/kg	100	101	101	80-120	
1,3,5-Trimethylbenzene	ug/kg	100	92.7	93	76-120	
1,3-Dichlorobenzene	ug/kg	100	93.0	93	79-120	
1,3-Dichloropropane	ug/kg	100	92.6	93	73-120	
1,4-Dichlorobenzene	ug/kg	100	94.1	94	80-120	
2,2-Dichloropropane	ug/kg	100	85.8	86	66-131	
2-Butanone (MEK)	ug/kg	500	512	102	61-120	
2-Chlorotoluene	ug/kg	100	89.6	90	77-120	
2-Hexanone	ug/kg	500	533	107	66-120	
4-Chlorotoluene	ug/kg	100	91.8	92	76-120	
4-Methyl-2-pentanone (MIBK)	ug/kg	500	550	110	68-120	
Acetone	ug/kg	500	430	86	55-124	
Benzene	ug/kg	100	93.5	94	77-120	
Bromobenzene	ug/kg	100	95.1	95	80-120	
Bromochloromethane	ug/kg	100	92.5	93	77-120	
Bromodichloromethane	ug/kg	100	97.7	98	78-120	
Bromoform	ug/kg	100	93.2	93	68-123	
Bromomethane	ug/kg	100	95.2	95	60-140	
Carbon disulfide	ug/kg	100	81.9	82	68-123	
Carbon tetrachloride	ug/kg	100	106	106	74-136	
Chlorobenzene	ug/kg	100	93.8	94	80-120	
Chloroethane	ug/kg	100	90.9	91	60-149	
Chloroform	ug/kg	100	90.8	91	67-120	
Chloromethane	ug/kg	100	74.2	74	42-138	
cis-1,2-Dichloroethene	ug/kg	100	91.9	92	71-120	
cis-1,3-Dichloropropene	ug/kg	100	96.5	96	80-120	
Dibromochloromethane	ug/kg	100	104	104	80-120	
Dibromomethane	ug/kg	100	101	101	76-120	
Dichlorodifluoromethane	ug/kg	100	67.4	67	40-150	
Ethylbenzene	ug/kg	100	92.7	93	76-120	
Hexachloro-1,3-butadiene	ug/kg	100	98.8	99	68-131	
Isopropylbenzene (Cumene)	ug/kg	100	100	100	80-128	
Methyl-tert-butyl ether	ug/kg	100	101	101	71-124	
Methylene chloride	ug/kg	100	100	100	70-123	
n-Butylbenzene	ug/kg	100	97.2	97	73-131	
n-Propylbenzene	ug/kg	100	91.5	92	74-120	
Naphthalene	ug/kg	100	105	105	70-120	
p-Isopropyltoluene	ug/kg	100	93.9	94	76-121	
sec-Butylbenzene	ug/kg	100	95.2	95	75-123	
Styrene	ug/kg	100	90.6	91	78-120	
tert-Butylbenzene	ug/kg	100	96.0	96	77-120	
Tetrachloroethene	ug/kg	100	94.6	95	72-125	
Toluene	ug/kg	100	92.8	93	74-120	
trans-1,2-Dichloroethene	ug/kg	100	89.9	90	77-128	
trans-1,3-Dichloropropene	ug/kg	100	99.9	100	80-120	
Trichloroethene	ug/kg	100	93.9	94	76-120	
Trichlorofluoromethane	ug/kg	100	84.8	85	72-140	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

LABORATORY CONTROL SAMPLE: 1181824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Vinyl chloride	ug/kg	100	80.9	81	65-145	
Xylene (Total)	ug/kg	300	270	90	75-120	
1,2-Dichloroethane-d4 (S)	%			101	76-132	
4-Bromofluorobenzene (S)	%			100	80-120	
Dibromofluoromethane (S)	%			100	76-125	
Toluene-d8 (S)	%			100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1181839 1181840

Parameter	Units	60143902001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/kg	ND	234	235	95.9	84.6	41	36	40-141	12	50	M1
1,1,1-Trichloroethane	ug/kg	ND	234	235	142	130	61	55	40-144	9	46	
1,1,2,2-Tetrachloroethane	ug/kg	ND	234	235	100	87.1	43	37	40-150	14	50	M1
1,1,2-Trichloroethane	ug/kg	ND	234	235	97.1	87.1	41	37	40-137	11	49	M1
1,1-Dichloroethane	ug/kg	ND	234	235	123	113	53	48	40-131	9	46	
1,1-Dichloroethene	ug/kg	ND	234	235	168	160	72	68	40-142	5	42	
1,1-Dichloropropene	ug/kg	ND	234	235	143	144	61	61	40-144	1	48	
1,2,3-Trichlorobenzene	ug/kg	ND	234	235	72.7	57.8	31	25	40-131	23	50	M1
1,2,3-Trichloropropane	ug/kg	ND	234	235	108	89.8	46	38	40-146	19	49	M1
1,2,4-Trichlorobenzene	ug/kg	ND	234	235	69.0	57.9	29	25	40-134	18	50	M1
1,2,4-Trimethylbenzene	ug/kg	ND	234	235	90.6	84.3	39	36	40-137	7	50	M1
1,2-Dibromo-3-chloropropane	ug/kg	ND	234	235	122	101	52	43	40-147	19	50	
1,2-Dibromoethane (EDB)	ug/kg	ND	234	235	103	92.5	44	39	40-146	11	50	M1
1,2-Dichlorobenzene	ug/kg	ND	234	235	80.8	74.8	34	32	40-136	8	50	M1
1,2-Dichloroethane	ug/kg	ND	234	235	106	94.1	45	40	40-143	12	46	
1,2-Dichloroethene (Total)	ug/kg	ND	469	471	249	232	53	49	40-136	7	47	
1,2-Dichloropropane	ug/kg	ND	234	235	120	110	51	47	40-136	8	47	
1,3,5-Trimethylbenzene	ug/kg	ND	234	235	99.3	91.8	42	39	40-137	8	50	M1
1,3-Dichlorobenzene	ug/kg	ND	234	235	80.2	73.5	34	31	40-131	9	50	M1
1,3-Dichloropropane	ug/kg	ND	234	235	97.3	85.6	41	36	40-131	13	49	M1
1,4-Dichlorobenzene	ug/kg	ND	234	235	77.4	71.7	33	30	40-134	8	50	M1
2,2-Dichloropropane	ug/kg	ND	234	235	130	120	55	51	40-140	8	47	
2-Butanone (MEK)	ug/kg	40.3	1170	1180	849	709	69	57	40-139	18	48	
2-Chlorotoluene	ug/kg	ND	234	235	95.8	86.3	41	37	40-139	10	50	M1
2-Hexanone	ug/kg	ND	1170	1180	653	546	56	46	40-135	18	50	
4-Chlorotoluene	ug/kg	ND	234	235	88.0	82.3	38	35	40-138	7	50	M1
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	1170	1180	649	547	55	47	40-138	17	50	
Acetone	ug/kg	175	1170	1180	1020	896	72	61	40-142	13	50	
Benzene	ug/kg	ND	234	235	122	114	52	48	40-145	7	47	
Bromobenzene	ug/kg	ND	234	235	85.4	79.5	36	34	40-137	7	50	M1
Bromochloromethane	ug/kg	ND	234	235	110	101	47	43	40-140	9	48	
Bromodichloromethane	ug/kg	ND	234	235	97.8	90.5	42	38	40-136	8	49	M1
Bromoform	ug/kg	ND	234	235	72.6	63.3	30	26	40-136	14	50	M1
Bromomethane	ug/kg	ND	234	235	130	123	56	52	40-141	6	49	
Carbon disulfide	ug/kg	ND	234	235	143	134	61	57	40-136	6	49	
Carbon tetrachloride	ug/kg	ND	234	235	113	109	48	46	40-149	3	50	

QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1181839 1181840

Parameter	Units	60143902001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chlorobenzene	ug/kg	ND	234	235	98.1	90.3	42	38	40-135	8	50	M1
Chloroethane	ug/kg	ND	234	235	151	142	64	60	40-153	6	44	
Chloroform	ug/kg	ND	234	235	116	107	50	45	40-131	8	47	
Chloromethane	ug/kg	ND	234	235	133	126	57	54	40-133	5	46	
cis-1,2-Dichloroethene	ug/kg	ND	234	235	117	108	50	46	40-132	8	48	
cis-1,3-Dichloropropene	ug/kg	ND	234	235	85.8	78.2	37	33	40-135	9	50	M1
Dibromochloromethane	ug/kg	ND	234	235	86.4	79.1	37	34	40-144	9	48	M1
Dibromomethane	ug/kg	ND	234	235	107	100	46	43	40-135	7	46	
Dichlorodifluoromethane	ug/kg	ND	234	235	161	147	69	63	40-134	9	44	
Ethylbenzene	ug/kg	ND	234	235	107	103	46	44	40-151	4	48	
Hexachloro-1,3-butadiene	ug/kg	ND	234	235	91.0	79.3	39	34	40-133	14	50	M1
Isopropylbenzene (Cumene)	ug/kg	ND	234	235	118	110	50	47	40-149	7	50	
Methyl-tert-butyl ether	ug/kg	ND	234	235	113	100	48	43	40-144	12	48	
Methylene chloride	ug/kg	41.5	234	235	189	175	63	57	40-140	8	47	
n-Butylbenzene	ug/kg	ND	234	235	98.0	90.2	42	38	40-142	8	50	M1
n-Propylbenzene	ug/kg	ND	234	235	103	96.5	44	41	40-139	6	50	
Naphthalene	ug/kg	ND	234	235	80.5	66.5	34	28	40-158	19	48	M1
p-Isopropyltoluene	ug/kg	ND	234	235	99.3	94.3	42	40	40-138	5	50	
sec-Butylbenzene	ug/kg	ND	234	235	109	100	46	43	40-140	8	50	
Styrene	ug/kg	ND	234	235	76.1	69.5	32	30	40-133	9	50	M1
tert-Butylbenzene	ug/kg	ND	234	235	108	101	46	43	40-142	7	50	
Tetrachloroethene	ug/kg	ND	234	235	127	116	54	49	40-139	10	50	
Toluene	ug/kg	ND	234	235	115	109	49	46	40-150	5	46	
trans-1,2-Dichloroethene	ug/kg	ND	234	235	133	124	57	53	40-142	6	50	
trans-1,3-Dichloropropene	ug/kg	ND	234	235	84.8	76.3	36	32	40-146	11	50	M1
Trichloroethene	ug/kg	ND	234	235	125	119	53	51	40-151	5	49	
Trichlorofluoromethane	ug/kg	ND	234	235	158	150	68	64	40-145	5	45	
Vinyl chloride	ug/kg	ND	234	235	162	152	69	65	40-149	6	49	
Xylene (Total)	ug/kg	ND	703	705	304	288	43	41	40-153	5	47	
1,2-Dichloroethane-d4 (S)	%						111	112	76-132			
4-Bromofluorobenzene (S)	%						101	100	80-120			
Dibromofluoromethane (S)	%						101	101	76-125			
Toluene-d8 (S)	%						101	101	80-120			

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

QC Batch: OEXT/38242 | Analysis Method: EPA 8270
QC Batch Method: EPA 3546 | Analysis Description: 8270 Solid MSSV Microwave
Associated Lab Samples: 60143902001

METHOD BLANK: 1181480 | Matrix: Solid
Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	ND	329	05/07/13 23:53	
1,2-Dichlorobenzene	ug/kg	ND	329	05/07/13 23:53	
1,3-Dichlorobenzene	ug/kg	ND	329	05/07/13 23:53	
1,4-Dichlorobenzene	ug/kg	ND	329	05/07/13 23:53	
2,4,5-Trichlorophenol	ug/kg	ND	329	05/07/13 23:53	
2,4,6-Trichlorophenol	ug/kg	ND	329	05/07/13 23:53	
2,4-Dichlorophenol	ug/kg	ND	329	05/07/13 23:53	
2,4-Dimethylphenol	ug/kg	ND	329	05/07/13 23:53	
2,4-Dinitrophenol	ug/kg	ND	1660	05/07/13 23:53	
2,4-Dinitrotoluene	ug/kg	ND	329	05/07/13 23:53	
2,6-Dinitrotoluene	ug/kg	ND	329	05/07/13 23:53	
2-Chloronaphthalene	ug/kg	ND	329	05/07/13 23:53	
2-Chlorophenol	ug/kg	ND	329	05/07/13 23:53	
2-Methylnaphthalene	ug/kg	ND	329	05/07/13 23:53	
2-Methylphenol(o-Cresol)	ug/kg	ND	329	05/07/13 23:53	
2-Nitroaniline	ug/kg	ND	657	05/07/13 23:53	
2-Nitrophenol	ug/kg	ND	329	05/07/13 23:53	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	329	05/07/13 23:53	
3,3'-Dichlorobenzidine	ug/kg	ND	657	05/07/13 23:53	
3-Nitroaniline	ug/kg	ND	657	05/07/13 23:53	
4,6-Dinitro-2-methylphenol	ug/kg	ND	1660	05/07/13 23:53	
4-Bromophenylphenyl ether	ug/kg	ND	329	05/07/13 23:53	
4-Chloro-3-methylphenol	ug/kg	ND	657	05/07/13 23:53	
4-Chloroaniline	ug/kg	ND	657	05/07/13 23:53	
4-Chlorophenylphenyl ether	ug/kg	ND	329	05/07/13 23:53	
4-Nitroaniline	ug/kg	ND	657	05/07/13 23:53	
4-Nitrophenol	ug/kg	ND	1660	05/07/13 23:53	
Acenaphthene	ug/kg	ND	329	05/07/13 23:53	
Acenaphthylene	ug/kg	ND	329	05/07/13 23:53	
Anthracene	ug/kg	ND	329	05/07/13 23:53	
Benzo(a)anthracene	ug/kg	ND	329	05/07/13 23:53	
Benzo(a)pyrene	ug/kg	ND	329	05/07/13 23:53	
Benzo(b)fluoranthene	ug/kg	ND	329	05/07/13 23:53	
Benzo(g,h,i)perylene	ug/kg	ND	329	05/07/13 23:53	
Benzo(k)fluoranthene	ug/kg	ND	329	05/07/13 23:53	
Benzoic acid	ug/kg	ND	1660	05/07/13 23:53	
Benzyl alcohol	ug/kg	ND	657	05/07/13 23:53	
bis(2-Chloroethoxy)methane	ug/kg	ND	329	05/07/13 23:53	
bis(2-Chloroethyl) ether	ug/kg	ND	329	05/07/13 23:53	
bis(2-Chloroisopropyl) ether	ug/kg	ND	329	05/07/13 23:53	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	329	05/07/13 23:53	
Butylbenzylphthalate	ug/kg	ND	329	05/07/13 23:53	
Chrysene	ug/kg	ND	329	05/07/13 23:53	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

METHOD BLANK: 1181480 Matrix: Solid

Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Di-n-butylphthalate	ug/kg	ND	329	05/07/13 23:53	
Di-n-octylphthalate	ug/kg	ND	329	05/07/13 23:53	
Dibenz(a,h)anthracene	ug/kg	ND	329	05/07/13 23:53	
Dibenzofuran	ug/kg	ND	329	05/07/13 23:53	
Diethylphthalate	ug/kg	ND	329	05/07/13 23:53	
Dimethylphthalate	ug/kg	ND	329	05/07/13 23:53	
Fluoranthene	ug/kg	ND	329	05/07/13 23:53	
Fluorene	ug/kg	ND	329	05/07/13 23:53	
Hexachloro-1,3-butadiene	ug/kg	ND	329	05/07/13 23:53	
Hexachlorobenzene	ug/kg	ND	329	05/07/13 23:53	
Hexachlorocyclopentadiene	ug/kg	ND	329	05/07/13 23:53	
Hexachloroethane	ug/kg	ND	329	05/07/13 23:53	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	329	05/07/13 23:53	
Isophorone	ug/kg	ND	329	05/07/13 23:53	
N-Nitroso-di-n-propylamine	ug/kg	ND	329	05/07/13 23:53	
N-Nitrosodiphenylamine	ug/kg	ND	329	05/07/13 23:53	
Naphthalene	ug/kg	ND	329	05/07/13 23:53	
Nitrobenzene	ug/kg	ND	329	05/07/13 23:53	
Pentachlorophenol	ug/kg	ND	1660	05/07/13 23:53	
Phenanthrene	ug/kg	ND	329	05/07/13 23:53	
Phenol	ug/kg	ND	329	05/07/13 23:53	
Pyrene	ug/kg	ND	329	05/07/13 23:53	
Pyridine	ug/kg	ND	329	05/07/13 23:53	
2,4,6-Tribromophenol (S)	%	86	44-120	05/07/13 23:53	
2-Fluorobiphenyl (S)	%	84	28-145	05/07/13 23:53	
2-Fluorophenol (S)	%	81	45-120	05/07/13 23:53	
Nitrobenzene-d5 (S)	%	91	21-145	05/07/13 23:53	
Phenol-d6 (S)	%	82	43-120	05/07/13 23:53	
Terphenyl-d14 (S)	%	91	29-158	05/07/13 23:53	

LABORATORY CONTROL SAMPLE: 1181481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1650	1400	85	56-120	
1,2-Dichlorobenzene	ug/kg	1650	1350	82	56-120	
1,3-Dichlorobenzene	ug/kg	1650	1360	82	55-120	
1,4-Dichlorobenzene	ug/kg	1650	1340	81	55-120	
2,4,5-Trichlorophenol	ug/kg	1650	1550	94	61-120	
2,4,6-Trichlorophenol	ug/kg	1650	1530	93	59-120	
2,4-Dichlorophenol	ug/kg	1650	1480	90	59-120	
2,4-Dimethylphenol	ug/kg	1650	1030	62	48-120	
2,4-Dinitrophenol	ug/kg	1650	1830	111	10-136	
2,4-Dinitrotoluene	ug/kg	1650	1670	101	58-120	
2,6-Dinitrotoluene	ug/kg	1650	1650	100	60-120	
2-Chloronaphthalene	ug/kg	1650	1410	85	59-120	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

LABORATORY CONTROL SAMPLE: 1181481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Chlorophenol	ug/kg	1650	1420	86	57-120	
2-Methylnaphthalene	ug/kg	1650	1420	86	57-120	
2-Methylphenol(o-Cresol)	ug/kg	1650	1350	82	57-120	
2-Nitroaniline	ug/kg	1650	1550	94	61-120	
2-Nitrophenol	ug/kg	1650	1730	105	54-120	
3&4-Methylphenol(m&p Cresol)	ug/kg	1650	1400	85	58-120	
3,3'-Dichlorobenzidine	ug/kg	1650	2300	139	10-160	
3-Nitroaniline	ug/kg	1650	2150	130	11-140	
4,6-Dinitro-2-methylphenol	ug/kg	1650	1540J	93	27-121	
4-Bromophenylphenyl ether	ug/kg	1650	1490	90	60-120	
4-Chloro-3-methylphenol	ug/kg	1650	1490	90	61-120	
4-Chloroaniline	ug/kg	1650	1630	99	10-129	
4-Chlorophenylphenyl ether	ug/kg	1650	1460	88	58-120	
4-Nitroaniline	ug/kg	1650	1520	92	11-142	
4-Nitrophenol	ug/kg	1650	1590J	96	52-120	
Acenaphthene	ug/kg	1650	1430	87	58-120	
Acenaphthylene	ug/kg	1650	1460	89	58-120	
Anthracene	ug/kg	1650	1500	91	62-120	
Benzo(a)anthracene	ug/kg	1650	1570	95	63-120	
Benzo(a)pyrene	ug/kg	1650	1500	91	60-120	
Benzo(b)fluoranthene	ug/kg	1650	1570	95	61-120	
Benzo(g,h,i)perylene	ug/kg	1650	1540	94	59-120	
Benzo(k)fluoranthene	ug/kg	1650	1530	92	62-120	
Benzoic acid	ug/kg	1650	1480J	90	17-120	
Benzyl alcohol	ug/kg	1650	1380	83	49-120	
bis(2-Chloroethoxy)methane	ug/kg	1650	1390	84	56-120	
bis(2-Chloroethyl) ether	ug/kg	1650	1380	83	57-120	
bis(2-Chloroisopropyl) ether	ug/kg	1650	1370	83	49-120	
bis(2-Ethylhexyl)phthalate	ug/kg	1650	1710	104	62-120	
Butylbenzylphthalate	ug/kg	1650	1710	104	56-122	
Chrysene	ug/kg	1650	1520	92	62-120	
Di-n-butylphthalate	ug/kg	1650	1600	97	64-120	
Di-n-octylphthalate	ug/kg	1650	1630	99	55-127	
Dibenz(a,h)anthracene	ug/kg	1650	1500	91	60-127	
Dibenzofuran	ug/kg	1650	1450	88	57-120	
Diethylphthalate	ug/kg	1650	1500	91	61-120	
Dimethylphthalate	ug/kg	1650	1440	87	60-120	
Fluoranthene	ug/kg	1650	1590	96	62-120	
Fluorene	ug/kg	1650	1490	90	59-120	
Hexachloro-1,3-butadiene	ug/kg	1650	1390	85	53-120	
Hexachlorobenzene	ug/kg	1650	1440	87	59-120	
Hexachlorocyclopentadiene	ug/kg	3300	2590	78	40-120	
Hexachloroethane	ug/kg	1650	1370	83	54-120	
Indeno(1,2,3-cd)pyrene	ug/kg	1650	1480	90	60-120	
Isophorone	ug/kg	1650	1370	83	56-120	
N-Nitroso-di-n-propylamine	ug/kg	1650	1370	83	57-120	
N-Nitrosodiphenylamine	ug/kg	1650	1480	89	60-120	
Naphthalene	ug/kg	1650	1400	85	57-120	

QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

LABORATORY CONTROL SAMPLE: 1181481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrobenzene	ug/kg	1650	1510	92	58-120	
Pentachlorophenol	ug/kg	1650	1520J	92	54-120	
Phenanthrene	ug/kg	1650	1470	89	62-120	
Phenol	ug/kg	1650	1410	85	56-120	
Pyrene	ug/kg	1650	1590	96	64-120	
Pyridine	ug/kg	1650	919	56	16-120	
2,4,6-Tribromophenol (S)	%			107	44-120	
2-Fluorobiphenyl (S)	%			88	28-145	
2-Fluorophenol (S)	%			89	45-120	
Nitrobenzene-d5 (S)	%			97	21-145	
Phenol-d6 (S)	%			90	43-120	
Terphenyl-d14 (S)	%			98	29-158	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1181482 1181483

Parameter	Units	60143866003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trichlorobenzene	ug/kg	ND	5820	6060	4950	5050	85	83	42-120	2	24	
1,2-Dichlorobenzene	ug/kg	ND	5820	6060	4730	4760	81	78	41-120	1	24	
1,3-Dichlorobenzene	ug/kg	ND	5820	6060	4670	4630	80	76	39-120	1	24	
1,4-Dichlorobenzene	ug/kg	ND	5820	6060	4630	4650	80	77	40-120	0	24	
2,4,5-Trichlorophenol	ug/kg	ND	5820	6060	5360	5390	92	89	40-120	0	28	
2,4,6-Trichlorophenol	ug/kg	ND	5820	6060	5270	5470	90	90	36-120	4	27	
2,4-Dichlorophenol	ug/kg	ND	5820	6060	5130	5350	88	88	43-120	4	25	
2,4-Dimethylphenol	ug/kg	ND	5820	6060	5040	5220	86	86	24-124	4	28	
2,4-Dinitrophenol	ug/kg	ND	5820	6060	3470J	3560J	59	59	10-137		30	
2,4-Dinitrotoluene	ug/kg	ND	5820	6060	3410	3670	58	61	25-127	8	39	
2,6-Dinitrotoluene	ug/kg	ND	5820	6060	3590	3820	62	63	29-121	6	35	
2-Chloronaphthalene	ug/kg	ND	5820	6060	5050	5170	87	85	42-120	2	25	
2-Chlorophenol	ug/kg	ND	5820	6060	4850	4890	83	81	44-120	1	24	
2-Methylnaphthalene	ug/kg	ND	5820	6060	5040	5210	87	86	39-120	3	25	
2-Methylphenol(o-Cresol)	ug/kg	ND	5820	6060	5020	5000	86	82	36-120	0	28	
2-Nitroaniline	ug/kg	ND	5820	6060	4190	4590	72	76	41-129	9	26	
2-Nitrophenol	ug/kg	ND	5820	6060	3040	3100	52	51	21-127	2	33	
3&4-Methylphenol(m&p Cresol)	ug/kg	ND	5820	6060	5040	5030	86	83	40-120	0	30	
3,3'-Dichlorobenzidine	ug/kg	ND	5820	6060	9700	12000	167	198	10-160	21	50	M1
3-Nitroaniline	ug/kg	ND	5820	6060	6230	6860	107	113	10-155	10	30	
4,6-Dinitro-2-methylphenol	ug/kg	ND	5820	6060	ND	ND	9	7	10-121		30	M1
4-Bromophenylphenyl ether	ug/kg	ND	5820	6060	5160	5290	89	87	42-121	3	28	
4-Chloro-3-methylphenol	ug/kg	ND	5820	6060	5290	5420	91	89	43-120	2	29	
4-Chloroaniline	ug/kg	ND	5820	6060	6080	7050	104	116	10-134	15	40	
4-Chlorophenylphenyl ether	ug/kg	ND	5820	6060	5120	5220	88	86	42-122	2	25	
4-Nitroaniline	ug/kg	ND	5820	6060	4710	5180	81	85	10-151	10	30	
4-Nitrophenol	ug/kg	ND	5820	6060	4090J	4300J	70	71	27-128		30	
Acenaphthene	ug/kg	ND	5820	6060	5330	5500	87	87	38-124	3	27	
Acenaphthylene	ug/kg	ND	5820	6060	5120	5250	88	87	38-120	2	24	

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1181482 1181483

Parameter	Units	60143866003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Anthracene	ug/kg	ND	5820	6060	5460	5640	94	93	37-123	3	27	
Benzo(a)anthracene	ug/kg	ND	5820	6060	5200	5650	89	93	29-137	8	31	
Benzo(a)pyrene	ug/kg	ND	5820	6060	5070	5420	87	89	35-135	7	36	
Benzo(b)fluoranthene	ug/kg	ND	5820	6060	5170	5630	89	93	29-132	9	37	
Benzo(g,h,i)perylene	ug/kg	ND	5820	6060	4980	5200	85	86	34-120	4	33	
Benzo(k)fluoranthene	ug/kg	ND	5820	6060	4890	5220	84	86	31-127	7	34	
Benzoic acid	ug/kg	ND	5820	6060	3360J	4150J	58	68	10-120		30	
Benzyl alcohol	ug/kg	ND	5820	6060	4610	4780	79	79	42-120	4	25	
bis(2-Chloroethoxy)methane	ug/kg	ND	5820	6060	4760	4900	82	81	43-120	3	26	
bis(2-Chloroethyl) ether	ug/kg	ND	5820	6060	4800	4850	82	80	43-120	1	31	
bis(2-Chloroisopropyl) ether	ug/kg	ND	5820	6060	4740	4810	81	79	41-120	2	29	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	5820	6060	6140	6650	105	110	36-140	8	30	
Butylbenzylphthalate	ug/kg	ND	5820	6060	6140	6550	105	108	40-137	6	29	
Chrysene	ug/kg	ND	5820	6060	5120	5520	88	91	29-132	7	34	
Di-n-butylphthalate	ug/kg	ND	5820	6060	5700	5900	98	97	41-126	3	30	
Di-n-octylphthalate	ug/kg	ND	5820	6060	5980	6440	103	106	40-139	7	35	
Dibenz(a,h)anthracene	ug/kg	ND	5820	6060	5020	5170	86	85	28-130	3	34	
Dibenzofuran	ug/kg	ND	5820	6060	5010	5210	86	86	39-125	4	26	
Diethylphthalate	ug/kg	ND	5820	6060	5170	5420	89	89	42-120	5	25	
Dimethylphthalate	ug/kg	ND	5820	6060	5010	5210	86	86	40-120	4	28	
Fluoranthene	ug/kg	ND	5820	6060	5680	5850	98	97	28-136	3	29	
Fluorene	ug/kg	ND	5820	6060	5120	5430	88	89	36-126	6	27	
Hexachloro-1,3-butadiene	ug/kg	ND	5820	6060	4900	4870	84	80	41-120	1	25	
Hexachlorobenzene	ug/kg	ND	5820	6060	4890	4970	84	82	42-120	2	28	
Hexachlorocyclopentadiene	ug/kg	ND	11700	12100	1130J	1670	10	14	10-120		49	
Hexachloroethane	ug/kg	ND	5820	6060	3090	3020	53	50	24-120	2	32	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	5820	6060	4790	5150	82	85	28-129	7	35	
Isophorone	ug/kg	ND	5820	6060	4850	5000	83	82	43-120	3	25	
N-Nitroso-di-n-propylamine	ug/kg	ND	5820	6060	4860	4870	83	80	39-120	0	26	
N-Nitrosodiphenylamine	ug/kg	ND	5820	6060	6580	6900	113	114	31-132	5	26	
Naphthalene	ug/kg	ND	5820	6060	4890	4960	84	82	42-120	2	25	
Nitrobenzene	ug/kg	ND	5820	6060	3360	3510	58	58	34-120	4	27	
Pentachlorophenol	ug/kg	ND	5820	6060	5570J	5720J	96	94	22-120		30	
Phenanthrene	ug/kg	ND	5820	6060	5160	5310	89	88	24-137	3	30	
Phenol	ug/kg	ND	5820	6060	4810	4910	83	81	42-120	2	25	
Pyrene	ug/kg	ND	5820	6060	5530	5950	93	96	24-145	7	34	
Pyridine	ug/kg	ND	5820	6060	3130	3180	54	52	15-120	2	31	
2,4,6-Tribromophenol (S)	%						96	96	44-120			
2-Fluorobiphenyl (S)	%						86	85	28-145			
2-Fluorophenol (S)	%						85	84	45-120			
Nitrobenzene-d5 (S)	%						54	61	21-145			
Phenol-d6 (S)	%						86	85	43-120			
Terphenyl-d14 (S)	%						93	97	29-158			

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QUALITY CONTROL DATA

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

QC Batch: PMST/8517
Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 60143902001

METHOD BLANK: 1181614
Matrix: Solid
Associated Lab Samples: 60143902001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Percent Moisture	%	ND	0.50	05/06/13 00:00	

SAMPLE DUPLICATE: 1181689

Parameter	Units	60143866001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	ND	0.56		20	

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QUALIFIERS

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

C9 Common Laboratory Contaminant.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: JOHN REDMOND SEDIMENT
Pace Project No.: 60143902

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60143902001	**1B**	EPA 3050	MPRP/22642	EPA 6010	ICP/17954
60143902001	**1B**	EPA 7471	MERP/7310	EPA 7471	MERC/7269
60143902001	**1B**	EPA 3546	OEXT/38242	EPA 8270	MSSV/12090
60143902001	**1B**	EPA 8260	MSV/53421		
60143902001	**1B**	ASTM D2974	PMST/8517		

Pace Analytical Services, Inc.
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May 14, 2013

Emily Webb
PASI-KS
9608 Loiret Blvd.
Lenexa, KS 66219

RE: Project 20153855
Project ID: 60143902/USGS

Dear Emily Webb:

Enclosed are the analytical results for sample(s) received by the laboratory on May 08, 2013. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerly,

Karen Brown
karen.brown@pacelabs.com

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Laboratory Certifications

Project: 20153855

Client: 60

Project ID: 60143902/USGS

Washington Department of Ecology C2078
Oregon Environmental Laboratory Accreditation - LA200001
U.S. Dept. of Agriculture Foreign Soil Import P330-10-00119
Pennsylviania Dept. of Env Protection (NELAC) 68-04202
Texas Commission on Env. Quality (NELAC) T104704405-09-TX
Kansas Department of Health and Environment (NELAC) E-10266
Florida Department of Health (NELAC) E87595
Oklahoma Department of Environmental Quality - 2010-139
Illinois Environmental Protection Agency - 0025721
California Env. Lab Accreditation Program Branch - 11277CA
Louisiana Dept. of Environmental Quality (NELAC/LELAP) 02006

Pace Analytical™

Sample Cross Reference

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Project: 20153855

Client: 60

Project ID: 60143902/USGS

Client Sample ID	Lab ID	Matrix	Collection Date/Time	Received Date/Time
1B	201087971	Soil	30-Apr-13 13:00	08-May-13 09:10

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Project Narrative

Project: 20153855

Sample Receipt Condition:
All samples were received in accordance with EPA protocol.

Holding Times:
All holding times were met.

Blanks:
All blank results were below reporting limits.

Laboratory Control Samples:
All LCS recoveries were within QC limits.

Matrix Spikes and Duplicates:
MS or MSD recoveries outside of QC limits are qualified in the Report of Quality Control section.

Surrogates:
Surrogate recoveries outside of QC limits are qualified in the surrogate results section.

Pace Analytical Services, Inc.
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(504) 469-0333

QC Cross Reference

Project: 20153855

Analytical Method	Batch	Sample used for QC
EPA 8081	208143	Client sample SB-1 3-4' from project 20153869
EPA 8151	208146	Project sample 1B
Dry Weight Moisture	208350	Project sample 1B

Narrative1 5/14/2013 15:42:58

For the sample used as the original for the DUP or MS/MSD for the batch:

Project sample means a sample from this project was used.
Client sample means a sample from the same client but in a different project was used.
Batch sample means a sample from a different client was used.

Sample Results

Pace Analytical

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Client: 60

Client ID: 1B
Project: 20153855

Project ID: 60143902/USGS
Site: None

Lab ID: 201087971
Matrix: Soil
% Moisture: 56.7 Corrected

Description: None
Prep Level: Soil
Batch: 208143

Method: EPA 8081
8081 Pests Low Soil

Collected: 30-Apr-13
Received: 08-May-13

Prepared: 09-May-13

Units: ug/kg

CAS No.	Analyte	Dilution	Result	Qu	Reporting Limit	Reg Limit	Analysis	
309-00-2	Aldrin	1	ND		3.83		13-May-13 14:20	SLF
319-84-6	alpha-BHC	1	ND		3.83		13-May-13 14:20	SLF
319-85-7	beta-BHC	1	ND		3.83		13-May-13 14:20	SLF
319-86-8	delta-BHC	1	ND		3.83		13-May-13 14:20	SLF
58-89-9	gamma-BHC (Lindane)	1	ND		3.83		13-May-13 14:20	SLF
5103-71-9	alpha-Chlordane	1	ND		3.83		13-May-13 14:20	SLF
5103-74-2	gamma-Chlordane	1	ND		3.83		13-May-13 14:20	SLF
72-54-8	4,4'-DDD	1	ND		7.51		13-May-13 14:20	SLF
72-55-9	4,4'-DDE	1	ND		7.51		13-May-13 14:20	SLF
50-29-3	4,4'-DDT	1	ND		7.51		13-May-13 14:20	SLF
60-57-1	Dieldrin	1	ND		7.51		13-May-13 14:20	SLF
959-98-8	Endosulfan I	1	ND		3.83		13-May-13 14:20	SLF
33213-65-9	Endosulfan II	1	ND		7.51		13-May-13 14:20	SLF
1031-07-8	Endosulfan sulfate	1	ND		7.51		13-May-13 14:20	SLF
72-20-8	Endrin	1	ND		7.51		13-May-13 14:20	SLF
7421-93-4	Endrin aldehyde	1	ND		7.51		13-May-13 14:20	SLF
53494-70-5	Endrin ketone	1	ND		7.51		13-May-13 14:20	SLF
76-44-8	Heptachlor	1	ND		3.83		13-May-13 14:20	SLF
1024-57-3	Heptachlor epoxide	1	ND		3.83		13-May-13 14:20	SLF
72-43-5	Methoxychlor	1	ND		37.6		13-May-13 14:20	SLF
8001-35-2	Toxaphene	1	ND		150.		13-May-13 14:20	SLF

21 compound(s) reported

Protocol 5/14/2013 15:43:00

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

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Sample Results

Client: 60

Client ID: 1B
Project: 20153855

Project ID: 60143902/USGS
Site: None

Lab ID: 201087971
Matrix: Soil
% Moisture: 56.7 Corrected

Description: None
Prep Level: Soil
Batch: 208146

Method: EPA 8151
8151 Herbs Low Soil

Collected: 30-Apr-13
Received: 08-May-13

Prepared: 09-May-13

Units: ug/kg

CAS No.	Analyte	Dilution	Result	Qu	Reporting Limit	Reg Limit	Analysis	
94-75-7	2,4-D	1	ND		151.		10-May-13 21:32	SPP1
94-82-6	2,4-DB	1	ND		379.		10-May-13 21:32	SPP1
1918-00-9	Dicamba	1	ND		151.		10-May-13 21:32	SPP1
120-36-5	Dichloroprop	1	245.	C2	151.		10-May-13 21:32	SPP1
94-74-6	MCPA	1	ND		18900		10-May-13 21:32	SPP1
7085-19-0	MCPP	1	ND		18900		10-May-13 21:32	SPP1
93-76-5	2,4,5-T	1	ND		151.		10-May-13 21:32	SPP1
93-72-1	2,4,5-TP (Silvex)	1	ND		151.		10-May-13 21:32	SPP1

8 compound(s) reported

Protocol 5/14/2013 15:43:00

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Surrogate Recovery

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Batch: 208143 **Project:** 20153855

Method: Soil GC Semivolatile Organics

Lab ID	Sample ID	Qu	Sur 1 %Rec	Sur 2 %Rec	Sur 3 %Rec	Sur 4 %Rec	Sur 5 %Rec	Sur 6 %Rec	Sur 7 %Rec	Sur 8 %Rec
201087971	1B		26	29	62	70				
201088017	208143 BLANK 1		91	93	87	92				
201088018	208143 LCS 1		88	97	84	80				
201088166	SB-1 3-4' MS 1		53	61	56	55				
201088167	SB-1 3-4' MSD 1		79	92	81	85				
	QC limits:		15-179	15-177	10-144	10-178				

Sur 1: Decachlorobiphenyl (Conf)(S)
Sur 2: Decachlorobiphenyl (S)
Sur 3: Tetrachloro-m-xylene (Conf)(S)
Sur 4: Tetrachloro-m-xylene (S)

* denotes surrogate recovery outside of QC limits.
D denotes surrogate recovery is outside of QC limits due to sample dilution, and is not considered an excursion.

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Surrogate Recovery

Batch: 208146 **Project:** 20153855

Method: Soil GC Semivolatile Organics

Lab ID	Sample ID	Qu	Sur 1 %Rec	Sur 2 %Rec	Sur 3 %Rec	Sur 4 %Rec	Sur 5 %Rec	Sur 6 %Rec	Sur 7 %Rec	Sur 8 %Rec
201087971	1B	G1	678 *	72						
201088031	1B MS 1	G1	552 *	89						
201088032	1B MSD 1	G1	757 *	92						
201088029	208146 BLANK 1		102	100						
201088030	208146 LCS 1		103	100						
	QC limits:		10-169	10-161						

Sur 1: 2,4-DCPA (Conf)(S)
Sur 2: 2,4-DCPA (S)

* denotes surrogate recovery outside of QC limits.
D denotes surrogate recovery is outside of QC limits due to sample dilution, and is not considered an excursion.

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Quality Control

Batch: 208143 **Project:** 20153855 **LCS:** 201088018 13-May-1 13:55

Method: Soil GC Semivolatile Organics **MS:** 201088166 13-May-1 14:46

Units: ug/kg **MSD:** 201088167 13-May-1 14:58

Original for MS: Batch Sample 201088087

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
Aldrin	16.7	14.2	85	18.1		10.1	15.5	56	86	42 *	33-126	10-157	20	
alpha-BHC	16.7	12.5	75	18.1		9.93	15.3	55	84	42 *	31-124	15-161	20	
beta-BHC	16.7	12.2	73	18.1		9.51	11.4	52	63	18	33-130	10-169	20	
delta-BHC	16.7	9.42	57	18.1		8.07	11.5	45	64	35 *	20-135	10-170	20	
gamma-BHC (Lindane)	16.7	12.6	76	18.1		9.76	14.7	54	81	40 *	32-127	12-164	20	
alpha-Chlordane	16.7	14.4	86	18.1		9.39	13.6	52	75	36 *	36-127	10-166	20	
gamma-Chlordane	16.7	14.3	86	18.1		9.42	13.2	52	73	33 *	36-128	10-168	20	
4,4'-DDD	16.7	15.0	90	18.1		9.07	10.6	50	59	16	33-132	10-174	20	
4,4'-DDE	16.7	15.9	96	18.1		9.97	15.4	55	85	43 *	36-131	10-171	20	
4,4'-DDT	16.7	14.5	87	18.1		8.35	8.70	46	48	4	33-125	10-172	20	
Dieldrin	16.7	15.3	92	18.1		9.07	12.1	50	67	29 *	35-126	10-166	20	
Endosulfan I	16.7	5.29	32	18.1		5.36	10.0	30	56	61 *	10-115	10-143	20	
Endosulfan II	16.7	5.48	33	18.1		5.75	10.1	32	56	55 *	10-115	10-160	20	
Endosulfan sulfate	16.7	13.8	83	18.1		10.0	12.2	55	67	19	30-133	10-172	20	
Endrin	16.7	13.0	78	18.1		7.37	9.17	41	51	22 *	20-151	10-186	20	
Endrin aldehyde	16.7	12.1	72	18.1		8.09	8.17	45	45	1	26-128	10-162	20	
Endrin ketone	16.7	14.0	84	18.1		8.99	10.7	50	59	18	33-133	10-177	20	
Heptachlor	16.7	14.6	88	18.1		10.2	14.1	56	78	32 *	34-127	10-159	20	
Heptachlor epoxide	16.7	14.3	86	18.1		8.88	12.5	49	69	34 *	32-126	10-161	20	
Methoxychlor	16.7	13.8	83	18.1		ND	ND	45	45	0	24-143	10-195	21	

20 compound(s) reported

*** denotes recovery outside of QC limits.**
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

QC Protocol 5/14/2013 15:43:04

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Quality Control

Batch: 208146 **Project:** 20153855 **LCS:** 201088030 10-May-1 21:16

Method: Soil GC Semivolatile Organics **MS:** 201088031 10-May-1 21:48

Units: ug/kg **MSD:** 201088032 10-May-1 22:04

Original for MS: Client Sample 201087971

Parameter Name	LCS Spike	LCS Found	LCS %Rec	MS Spike	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	RPD	QC Limits LCS	QC Limits MS/MSD	Max RPD	Qu
2,4-D	667.	483.	73	1520		1080	1080	71	72	0	14-171	10-174	31	
2,4-DB	667.	574.	86	1520		1250	978.	79	62	25	12-173	10-193	27	
Dicamba	66.7	51.5	77	152.		147.	120.	97	80	20	10-166	10-184	41	
Dichloroprop	667.	550.	83	1520	245.	2210	1460	130	81	41 *	29-166	10-195	32	
MCPA	66700	59400	89	152000		277000	504000	182 *	336 *	58 *	12-169	10-170	29	Q1
MCPP	66700	51600	78	152000		137000	175000	90	117	25	10-176	10-164	30	
2,4,5-T	66.7	55.4	83	152.		160.	115.	106	77	33	13-174	10-210	33	
2,4,5-TP (Silvex)	66.7	49.7	75	152.		121.	119.	79	79	2	17-173	10-175	29	

8 compound(s) reported

*** denotes recovery outside of QC limits.**
MS/MSD RPD is calculated via SW-846 rules on the basis of spiked sample concentrations rather than spike recoveries.

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(504) 469-0333

Blank Results

Blank ID: 208143 BLANK 1 **Project:** 20153855

Lab ID: 201088017

Prep Level: Soil **Batch:** 208143

Method: Soil GC Semivolatile Organics

Prepared: 09-May-13

Units: ug/kg

CAS Numb	Analyte	Dilution	Result	Qu	Reporting Limit	Analysis	
309-00-2	Aldrin	1	ND		1.70	13-May-13 13:42	SLF
319-84-6	alpha-BHC	1	ND		1.70	13-May-13 13:42	SLF
319-85-7	beta-BHC	1	ND		1.70	13-May-13 13:42	SLF
319-86-8	delta-BHC	1	ND		1.70	13-May-13 13:42	SLF
58-89-9	gamma-BHC (Lindane)	1	ND		1.70	13-May-13 13:42	SLF
5103-71-9	alpha-Chlordane	1	ND		1.70	13-May-13 13:42	SLF
5103-74-2	gamma-Chlordane	1	ND		1.70	13-May-13 13:42	SLF
72-54-8	4,4'-DDD	1	ND		3.33	13-May-13 13:42	SLF
72-55-9	4,4'-DDE	1	ND		3.33	13-May-13 13:42	SLF
50-29-3	4,4'-DDT	1	ND		3.33	13-May-13 13:42	SLF
60-57-1	Dieldrin	1	ND		3.33	13-May-13 13:42	SLF
959-98-8	Endosulfan I	1	ND		1.70	13-May-13 13:42	SLF
33213-65-9	Endosulfan II	1	ND		3.33	13-May-13 13:42	SLF
1031-07-8	Endosulfan sulfate	1	ND		3.33	13-May-13 13:42	SLF
72-20-8	Endrin	1	ND		3.33	13-May-13 13:42	SLF
7421-93-4	Endrin aldehyde	1	ND		3.33	13-May-13 13:42	SLF
53494-70-5	Endrin ketone	1	ND		3.33	13-May-13 13:42	SLF
76-44-8	Heptachlor	1	ND		1.70	13-May-13 13:42	SLF
1024-57-3	Heptachlor epoxide	1	ND		1.70	13-May-13 13:42	SLF
72-43-5	Methoxychlor	1	ND		16.7	13-May-13 13:42	SLF
8001-35-2	Toxaphene	1	ND		66.7	13-May-13 13:42	SLF

21 compound(s) reported

Protocol Blank 5/14/2013 15:43:0

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Blank Results

Blank ID: 208146 BLANK 1 **Project:** 20153855

Lab ID: 201088029

Prep Level: Soil **Batch:** 208146

Method: Soil GC Semivolatile Organics

Prepared: 09-May-13

Units: ug/kg

CAS Numb	Analyte	Dilution	Result	Qu	Reporting Limit	Analysis	
94-75-7	2,4-D	1	ND		66.7	10-May-13 21:00	SPP1
94-82-6	2,4-DB	1	ND		167.	10-May-13 21:00	SPP1
1918-00-9	Dicamba	1	ND		66.7	10-May-13 21:00	SPP1
120-36-5	Dichloroprop	1	ND		66.7	10-May-13 21:00	SPP1
94-74-6	MCPA	1	ND		8330	10-May-13 21:00	SPP1
7085-19-0	MCPP	1	ND		8330	10-May-13 21:00	SPP1
93-76-5	2,4,5-T	1	ND		66.7	10-May-13 21:00	SPP1
93-72-1	2,4,5-TP (Silvex)	1	ND		66.7	10-May-13 21:00	SPP1

8 compound(s) reported

ND denotes the analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.

Limits are corrected for sample size, dilution and moisture content if applicable.
Qu lists qualifiers. Specific qualifiers are defined at the end of the report.
Regulatory limit may denote an actual regulatory limit or a client-requested notification limit.

Definitions/Qualifiers

Pace Analytical Services, Inc.
1000 Riverbend Blvd. Suite F
St. Rose, LA 70087
(504) 469-0333

Project: 20153855

Value	Description
C2	The relative percent difference between the two detectors is greater than 40%, indicating interference on one of the detectors. The lower of the two values is reported.
G1	Interferences are present which caused poor surrogate recovery.
Q1	The matrix spike recoveries are poor. Acceptable method performance for this analyte has been demonstrated by the laboratory control sample recovery.
J	This estimated value for the analyte is below the adjusted reporting limit but above the instrument reporting limit.
U	The analyte was analyzed for but not detected at the reporting limit or method detection limit indicated.
B	This analyte was detected in the method blank.
E	The sample concentration is above the linear calibrated range of the analysis.
LCS	Laboratory Control Sample.
MS(D)	Matrix Spike (Duplicate).
DUP	Sample Duplicate.
RPD	Relative Percent Difference.

Pace Analytical Services, In
1000 Riverbend Blvd. Suite F
St. Rose, LA 7008
(504) 469-033

Chains of Custody

Chain of Custody

20153855 PASI-KANS

Pace Analytical®
www.pacelabs.com

Workorder: 60143902 **Workorder Name:** JOHN REDMOND SEDIMENT **Owner Received Date:** 5/3/2013 **Results Requested By:** 5/17/2013

Report To	Subcontract To
Emily Webb Pace Analytical Services, Inc. 9608 Loiret Blvd. Lenexa, KS 66219 Phone (913)599-5665 Fax (913)599-1759	Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: none	8151 Herbicides	8081 Pesticides	LAB USE ONLY
1	1B	PS	4/30/2013 13:00	60143902001	Solid	2	X	X	20108797I
2									
3									
4									
5									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	[signature] Pace	5/7/13 1700			
2	Fed Ex	5-8-13 0910	J Miller	5-8-13 0910	
3					

Cooler Temperature on Receipt 2.0 °C **Custody Seal** Y or N **Received on Ice** Y or N **Samples Intact** Y or N

Pace Analytical

Sample Con

1000 Riverbend. Blvd., Suite F
St. Rose, LA 70087

20153855 PASI-KANS

Courier: ☐ Pace Courier ☐ Hired Courier ☑ Fed X ☐ UPS ☐ DHL ☐ USPS ☐ Customer ☐ Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact: ☑Yes ☐No

Therometer Used:	☐ Therm Fisher IR 5 ☐ Therm Fisher IR 6 ☑ Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Date and Initials of person examining contents: 05-09-13 AD

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Temp must be measured from Temperature blank when present

		Comments:
Temperature Blank Present"?	☑Yes ☐No ☐N/A	1
Chain of Custody Present:	☑Yes ☐No ☐N/A	2
Chain of Custody Complete:	☑Yes ☐No ☐N/A	3
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	4
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	5
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	6
Sufficient Volume:	☑Yes ☐No ☐N/A	7
Correct Containers Used:	☑Yes ☐No ☐N/A	8
Filtered vol. Rec. for Diss. tests	☐Yes ☐No ☑N/A	9
Sample Labels match COC:	☑Yes ☐No ☐N/A	10
All containers received within manafacture's precautionary and/or expiration dates.	☑Yes ☐No ☐N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	☐Yes ☐No ☑N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	13 If No, was preservative added? ☐Yes ☐No If added record lot no.: HNO3 ______ H2SO4 ______
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	14
Trip Blank Present:	☐Yes ☑No	15

Client Notification/ Resolution:

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ONly received 1 8oz JAr, Not 2 as was marked on the sub COC.

201087971
PASI-KANS
1B
20153855-001
Cont: OT zorz
Loc: OP
Col: 04/30/13
13:00

Not rece

MAY 08

Pace Analytical® www.pacelabs.com

Sample Condition Upon Receipt

WO#:60143902

60143902

Client Name: USGS

Optional
Proj Due Date:
Proj Name:

Courier: Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Commercial ☐ Pace ☐ Other ☐

Tracking #: ____________ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☐ No ☑ Seals intact: Yes ☐ No ☑

Packing Material: Bubble Wrap ☐ Bubble Bags ☑ Foam ☐ None ☐ Other ☐

Thermometer Used: T-112 / T-194 **Type of Ice:** Wet Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 5.2

Temperature should be above freezing to 6°C

Date and initials of person examining contents: 5/3/13

Chain of Custody present:	☑Yes	☐No	☐N/A	1.
Chain of Custody filled out:	☑Yes	☐No	☐N/A	2.
Chain of Custody relinquished:	☑Yes	☐No	☐N/A	3.
Sampler name & signature on COC:	☑Yes	☐No	☐N/A	4.
Samples arrived within holding time:	☑Yes	☐No	☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time requested:	☐Yes	☑No	☐N/A	7.
Sufficient volume:	☑Yes	☐No	☐N/A	8.
Correct containers used:	☑Yes	☐No	☐N/A	
Pace containers used:	☑Yes	☐No	☐N/A	9.
Containers intact:	☑Yes	☐No	☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes	☐No	☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes	☐No	☑N/A	12.
Sample labels match COC:	☑Yes	☐No	☐N/A	
Includes date/time/ID/analyses Matrix:	SL			13.
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☑N/A	14.
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	☐Yes	☑No		Initial when completed / Lot # of added preservative
Trip Blank present:	☐Yes	☐No	☑N/A	
Pace Trip Blank lot # (if purchased): ______				15.
Headspace in VOA vials (>6mm):	☐Yes	☐No	☑N/A	16.
Project sampled in USDA Regulated Area:	☐Yes	☑No	☐N/A	17. List State: KS

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: ____________ Date/Time: ____________

Comments/ Resolution: ____________

Project Manager Review: [signature] Date: 5/6/13

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical® www.pacelabs.com

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company:	USGS
Address:	4821 Quail Crest Place
	Lawrence, KS 66049
Email To:	kjuracek@usgs.gov
Phone:	785-832-3527 Fax:
Requested Due Date/TAT:	standard

Section B Required Project Information:

Report To:	Kyle Juracek
Copy To:	
Purchase Order No.:	
Project Name:	John Redmond sediment
Project Number:	

Section C Invoice Information:

Attention:	Earl Lewis- earl.lewis@kwo.ks.gov
Company Name:	KS Water Office 785-296-3185
Address:	901 S. Kansas Ave, Topeka, KS 66503
Pace Quote Reference:	130329_USGS_TCLP_7123
Pace Project Manager:	Emily Webb
Pace Profile #:	

Page: of

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: KS

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Total VOC's	Total SVOC's	Total RCRA 8 Metals	Total 8081 Pesticides	Total 8151 Herbicides	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	1b			4-30	10:00	4-30	13:00		1	X									x	x	x	x	x		1 other 001
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Pace Project No.: ~~60143884~~ ~~60143887~~ 60143902 (en 5/13; CS 5/3/13)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature]	5-3-13	13:15	E Brackett / PASI	5/3	1315	5.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kyle Juracek

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 5-3-13

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

APPENDIX G

Agency Correspondence

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
TULSA, OKLAHOMA 74128-4609

August 21, 2013

Planning and Environmental Division

Mr. Dan Mulhern
Acting Field Supervisor
U.S. Fish and Wildlife Service
Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, KS 66502

Dear Mr. Mulhern:

This letter is to request your concurrence pursuant to Section 7 of the Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1231 *et seq.*), with regard to effects on federally-listed species resulting from proposed dredging operations at John Redmond Dam and Reservoir, Kansas. The State of Kansas, acting through the Kansas Water Office (KWO), proposes to fully fund and perform removal of excessive accumulated sediment from John Redmond Reservoir for the purpose of at least partially restoring conservation pool storage capacity. The proposed action would restore water supply storage for water users as well as regain lost aquatic habitat to the benefit of recreational users and the lake ecosystem. Dredging activities are proposed by the State of Kansas in response to accumulation of excessive amounts of sediment at unanticipated in-lake settling locations and resulting adverse impacts to a critical water supply and important recreational and biological resource.

The proposed action entails dredging and disposal of sediments from the John Redmond Reservoir conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for authorized project purposes. In the first five years of dredging, approximately 3 to 6 million cubic yards of sediment would be removed using a barge-mounted, portable hydraulic dredge with cutter head ranging from 16- to 20-inches. Dredged materials would be transported to upland confined disposal facilities. Such facilities would initially include two sites on federal government fee lands at John Redmond Reservoir. Thereafter, disposal facilities would be located on private lands in the vicinity of the reservoir. It is estimated that approximately five 100-acre disposal sites may be needed for the first five years of dredging activities. A programmatic environmental impact statement (EIS) is being prepared for this action under the National Environmental Policy Act (NEPA) of 1969. The draft EIS will be provided to you for review when complete.

Based on coordination with your office, it is our understanding that current federally-listed species in or around the project area are limited to the endangered Neosho madtom (*Noturus placidus*) which inhabits portions of the Neosho River and the threatened western prairie fringed orchid (*Platanthera praeclara*), a plant species with a distribution generally north of John Redmond Reservoir and Coffey County, Kansas. It is also our understanding that two freshwater mussel species are currently proposed for listing, with a final listing determination to potentially be published as early as October 2013. These mussel species include the Neosho mucket (*Lampsilis rafinesqueana)*, proposed as endangered, and the rabbitsfoot mussel (*Quadrula cylindrica cylindrica)*, proposed as threatened. Finally, it is our understanding that no designated critical habitat for any currently-listed or proposed species occurs in the project area.

The proposed dredging and disposal activities would not alter current operations of John Redmond Dam and Reservoir with regard to the magnitude, duration, or timing of water releases. Sediment quality sampling in areas proposed for dredging indicate low or non-detectable levels of chemical constituents which could potentially be released to the reservoir water column or downstream through releases. Finally, substantial increases in suspended sediments in the Neosho River downstream of John Redmond Dam are not anticipated owing to reservoir sediment re-suspension which should be largely confined to the immediate area of dredging, as well as operational flexibility regarding gates from which to make low flow releases. Beginning in 2013, the KWO will cooperate with the U.S. Geological

Survey (USGS) to install and operate water quality monitors and collect suspended sediment samples on the Neosho River at Burlington, Iola, and Parsons, Kansas to quantify downstream conditions.

Based on our analyses of potential impacts of dredging activities and recent coordination of these analyses with your staff, it is our determination that the proposed dredging and associated activities at John Redmond Reservoir "may affect - not likely to adversely affect" the currently-listed Neosho madtom and proposed-for-listing Neosho mucket and rabbitsfoot mussels. It is also our determination that the proposed action will have "no effect" on the western prairie fringed orchid. By this letter, we are requesting your concurrence with these determinations as well as the absence of designated critical habitat in the project area for any federal currently-listed or proposed species. Should you concur with our determinations, it is our understanding that this concludes consultation under Section 7 of the ESA for this action.

Finally, we are requesting any additional comments you might have under the Fish and Wildlife Coordination Act regarding this proposal. Thank you for your efforts with regard to these issues and we look forward to working with you on this and other matters in the future. Questions can be directed to me at (918) 669-7660 or email Stephen.L.Nolen@usace.army.mil.

Sincerely,

Stephen L. Nolen
Chief, Planning and Environmental
Division

Copy Furnished

Ms. Susan Metzger
Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612-1249

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, Kansas 66502

September 16, 2013

FWS Tracking #13-CPA-0520

Mr. Stephen L. Nolen
Chief, Planning and Environmental Division
U.S. Army Corps of Engineers, Tulsa Division
1645 South 101st East Avenue
Tulsa, OK 74128-4609

RE: ESA Section 7 – John Redmond Dredging Project

Dear Mr. Nolen,

This correspondence is in regards to your August 21, 2013 letter requesting concurrence pursuant to Section 7 of the Endangered Species Act (ESA) regarding possible impacts to federally listed species resulting from the proposed dredging of John Redmond Reservoir in Coffey County, Kansas by the Kansas Water Office.

Federally listed or proposed species that occur occasionally or year-round near the proposed project site include: Neosho madtom (*Noturus placidus*); interior least tern (*Sternula antillarum*); western prairie fringed orchid (*Platanthera praeclara*); and two proposed mussel species (Final Rule scheduled for publication in the Federal Register on September 17, 2013), Neosho mucket (*Lampsilis rafinesqueana*) and rabbitsfoot mussel (*Quadrula cylindrical*). The Neosho madtom and Neosho mucket occur in flowing riverine habitat both upstream and downstream of the proposed project area, the rabbitsfoot mussel is known to occur downstream of the reservoir, the orchid is characteristic to moist prairies in this area, and the interior least tern is an occasional migrant to the area, using sand bar habitat.

At this time, we concur with your determination of "may affect, not likely to adversely affect" for the species listed above. However, we request that the Corps of Engineers annually supplies this office with the water quality data to be collected by the Kansas Water Office, as part of the project, downstream at Burlington, Iola, and Parsons, Kansas. This information will assist in recognizing the level of "affect" to the Neosho madtom and the two mussels, as well as their habitat. Also, as the proposed project proceeds, and additional sediment disposal sites are identified, we request continued coordination with this office in reviewing future disposal sites in regards to their location and potential impacts to listed species.

SEP 17 2013

Regarding federally designated critical habitat (DCH), at present, there is no DCH in or near the proposed project site. However, federally proposed critical habitat for the Neosho mucket and the rabbitsfoot mussel exists downstream of the proposed project site.

While we concur with your determination of "not likely to adversely affect" for this project, we wish to reiterate that we believe the Tulsa District should request initiation of section 7 consultation with the Service on current, ongoing operations of John Redmond Dam. Consultation could explore whether operations are affecting the Neosho madtom, Neosho mucket, and the rabbitsfoot mussel, and determine whether flexibility exists to improve dam operations concerning conservation of these species. Analysis of Neosho madtom population trends and John Redmond Dam operations indicates that current operations may be affecting the Neosho madtom (Wildhaber et al. 2000; Bryan et al. 2010), and similarly, operations may be affecting the freshwater mussel fauna of the Neosho River.

If you have any further question or comment concerning Section 7 consultation and the proposed project please feel free to contact me or Vernon Tabor of my staff.

Sincerely,

Heather Whitlaw
Field Supervisor

cc: KDWPT (Ecological Services), Pratt, KS
Flint Hills National Wildlife Refuge, Hartford, KS
Kansas Water Office (Susan Metzger), Topeka, KS

HW/vmt

Citations:

Bryan, J.L., M.L. Wildhaber, W.B. Leeds, and R. Dey. 2010. Neosho madtom and other ictalurid populations in relation to hydrologic characteristics of an impounded Midwestern warmwater stream—update. U.S. Geological Survey, Open-File Report 2010-1109, Columbia, Missouri.

Wildhaber, M.L., V.M. Tabor, J.E. Whitaker, A.L. Allert, D.W. Mulhern, P.J. Lambertson, and K.L. Powell. 2000. Ictalurid populations in relation to the presence of a mainstem reservoir in a Midwestern warmwater stream with emphasis on the threatened Neosho madtom. Transactions of the American Fisheries Society 129:1264-1280.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

December 9, 2013

Regulatory Office

Ms. Susan Metzger
Chief of Planning and Policy
Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612

Dear Ms. Metzger

This is in reference to the wetland delineation performed by Regulatory Personnel at John Redmond Lake on November 12 and 13, 2013, for the proposed Confined Disposal Facility Project. The proposed project is located in the South ½ of Section 9, Township 21 South, Range 15 East, near Burlington, Coffey County, Kansas. The area marked in red on the enclosed map denotes the limits of the property examined under this request. We have reviewed the submitted data relative to Section 404 of the Clean Water Act (CWA).

The Corps will assert jurisdiction over Pond 1 (29 acres), Pond 2 (8 acres), Pond 3 (1.6 acres), Wetland 1(28 acres), Wetland 2 (2 acres), Wetland 3 (0.5 acre), Stream A (3,000 linear feet), Stream B (1,300 linear feet), Stream C (480 linear feet), and the manmade channel (2,000 linear feet). The unnamed tributary and the manmade channels are shown in blue. The wetland areas are shown in pink, and the ponds are shown in light blue. The above defined features shown on the enclosed map are regulated waters of the United States. The total acreage of jurisdictional waters of the United States are 38.6 acres for Ponds, 30.5 acres for Wetlands, and 6,780 linear feet for stream channels. Drainage ditches 1, 2, and 3 are not regulated waters of the United States.

The placement of dredged or fill material in the jurisdictional waters or heavy mechanized land clearing within the wetland boundaries will require authorization from the Corps pursuant to Section 404 CWA.

The basis for this determination is the wetlands and/or waters have a nexus to the Neosho River, which is a tributary that ultimately flows in the Neosho (Grand) River, a navigable waterway.

We believe this determination to be an accurate assessment of the presence of jurisdictional wetlands and other waters on the site which are subject to Section 404 CWA. This is a final determination of federal jurisdiction on the property pursuant to Section 404 CWA. This determination is valid for 5 years from the date of this letter unless new information warrants revision of the determination before the expiration date.

This delineation has been conducted to identify the limits of the Corps CWA jurisdiction for the particular sites identified in this request.

This final determination constitutes an approved JD subject to the optional Corps Administrative Appeal Process. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed is a copy of the Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

Mr. Elliott Carman
Appeals Review Officer
U.S. Army Corps of Engineers
1100 Commerce Street, Suite 831
Dallas, TX 75242-0216
Tel: 469-487-7037
Fax: 469-487-7199

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by February 9, 2013. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

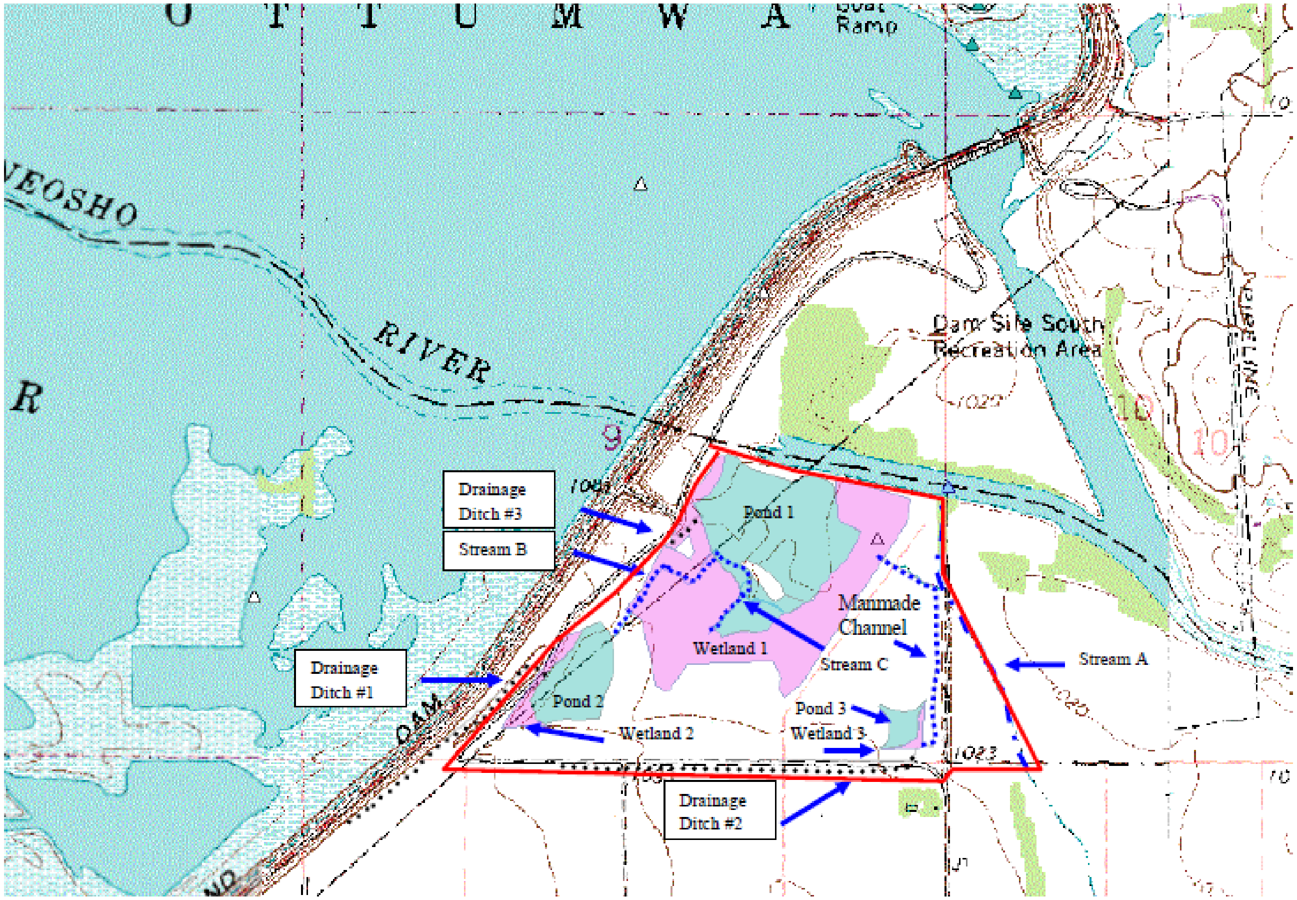
You need to be aware that wetlands merit special consideration in the Section 404 Regulatory Program regulations. Wetlands are recognized as a productive and valuable resource, the destruction of which is discouraged as contrary to the public interest. In developing plans for this site, ample consideration must be given to alternatives which avoid or minimize impacts to wetlands where practicable. The Corps is restricted from authorizing activities in wetlands where there is a practicable alternative with less adverse impact on the aquatic environment. Once the presumption of the availability of a less environmentally damaging practicable alternative is refuted, remaining wetland impacts which cannot be avoided or minimized will require compensatory wetland mitigation. Compensatory wetland mitigation may take the form of wetland restoration, enhancement, construction, or preservation.

This case has been assigned Identification No. SWT-2012-763. Please refer to this number during future correspondence. If you have any questions, contact Mr. Marcus Ware at 918-669-7403.

Sincerely,

Andrew R. Commer
Chief, Regulatory Office

Enclosures



SWT-2012-763

Jurisdictional streams are shown as the blue dotted line
Ponds are shown in blue
Wetlands are shown in pink
Drainage ditches are shown as a black broken dotted line.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Ms. Susan Metzger, KWO	File Number: SWT-2012-763	Date: Dec 9, 2013
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at https://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Mr. Marcus A. Ware 1645 South 101st E. Ave Tulsa, OK 74128-4629 Telephone 918-669-7403	Mr. Elliott Carman Appeals Review Officer (CESWD-PD-O) U.S. Army Corps of Engineers 1100 Commerce Street, Suite 831 Dallas, TX 75242-0216 Telephone 469-487-7061

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_______________________________ Signature of appellant or authorized agent.	Date:	Telephone number:

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

May 7, 2014

Regulatory Office

Ms. Susan Metzger
Chief of Planning and Policy
Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612

Dear Ms. Metzger:

This is in reference to a wetland determination for the proposed Confined Disposal Facility (CDF) Cells 1 and 2, and a wetland delineation performed by Regulatory personnel at John Redmond Lake on April 3, 2014, for Cell 3. The area marked in red on the enclosed map denotes the limits of the property examined under this request. We have reviewed the submitted data relative to Section 404 of the Clean Water Act (CWA).

The provided information for the identified properties does not indicate that a placement of dredged or fill material will be required, permanently or temporarily, into any "waters of the United States," including jurisdictional wetlands. However, there are two unnamed tributaries of the Neosho River that are adjacent to each CDF, as shown in blue on the enclosed map, which are regulated waterways. The placement of dredged or fill material in the unnamed tributaries will require prior authorization from the U. S. Army Corps of Engineers pursuant to Section 404 of the CWA.

Confined Disposal Facility 1 and 2: The proposed projects are located in the West 1/2 of Section 3, Township 21 South, Range 15 East, near Burlington, Coffey County, Kansas.

Confined Disposal Facility 3: The proposed project is located in the Southwest 1/4 of Section 10, Township 21 South, Range 15 East, near Burlington, Coffey County, Kansas.

The basis for this determination is the unnamed tributaries flow into the Neosho River, which ultimately discharge into the Grand (Neosho) River, a navigable waterway.

We believe this determination to be an accurate assessment of the presence of jurisdictional wetlands and other waters on the site which are subject to Section 404 of the CWA. This is a final determination of Federal jurisdiction on the property pursuant to Section 404 of the CWA. This determination is valid for 5 years from the date of this letter unless new information warrants revision of the determination before the expiration date.

This final determination constitutes an approved Jurisdictional Determination subject to the optional Corps Administrative Appeal Process. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed is a copy of the Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

Mr. Elliott Carman
Appeals Review Officer
U.S. Army Corps of Engineers
1100 Commerce Street, Suite 831
Dallas, TX 75242-1731
Tel: 469-487-7061
Fax: 469-487-7199

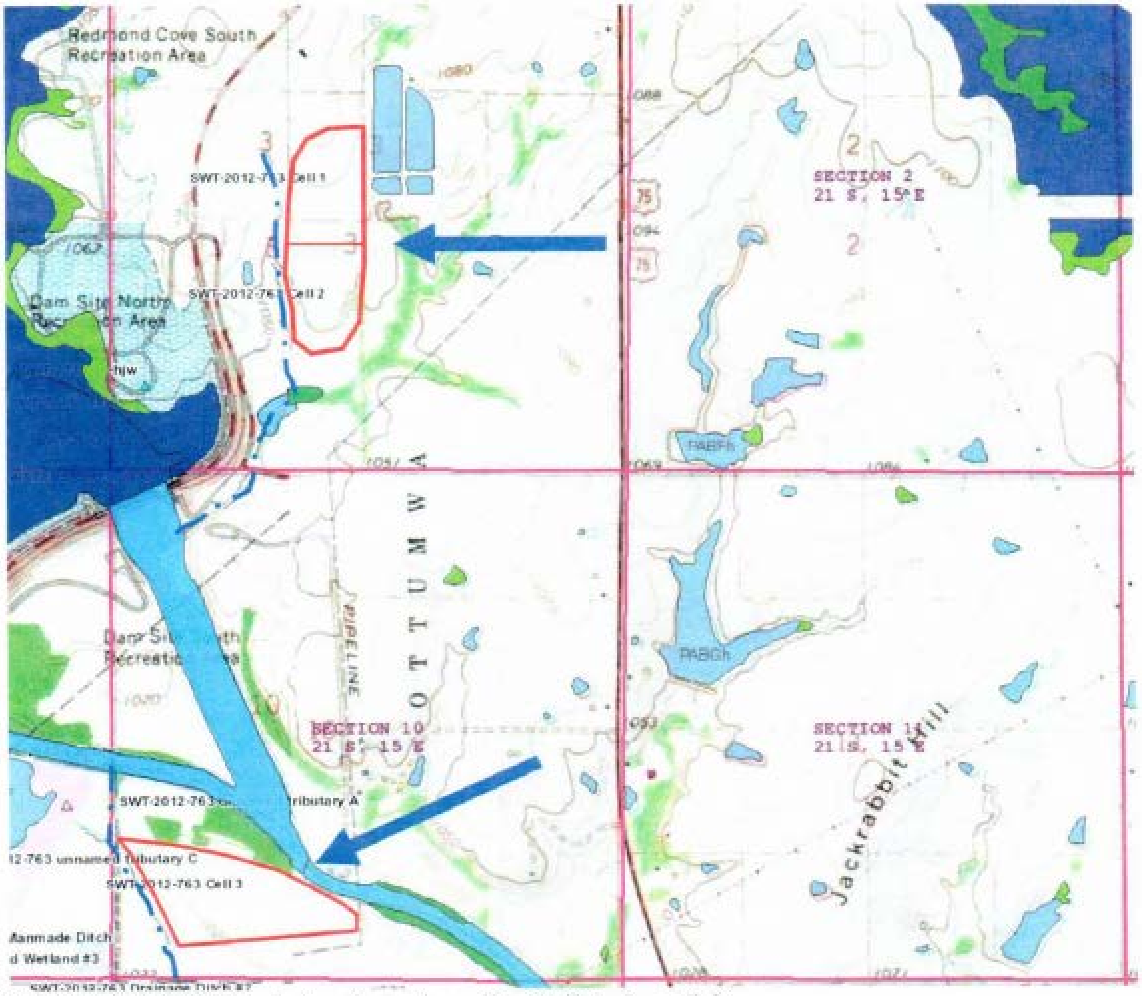
In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331 .5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by July 5, 2014. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

This case has been assigned Identification No. SWT-2012-763. Please refer to this number during future correspondence. If you have any questions, contact Mr. Marcus Ware at 918-669-7403.

Sincerely,

Andrew R. Commer
Chief, Regulatory Office

Enclosures



SWT-2012-763 Dredging Locations for Cell 1, 2, and 3

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Ms. Susan Metzger, KWO		File Number: SWT-2012-763	Date: May 7, 2014
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Marcus A. Ware 1645 South 101st E. Ave Tulsa, OK 74128-4629 Telephone 918-669-7403	If you only have questions regarding the appeal process you may also contact: Mr. Elliott Carman Appeals Review Officer (CESWD-PD-O) U.S. Army Corps of Engineers 1100 Commerce Street, Suite 831 Dallas, TX 75242-0216 Telephone 469-487-7061

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_______________________________ Signature of appellant or authorized agent.	Date:	Telephone number:

Division of Environment
1000 SW Jackson St, Ste 420
Topeka, KS 66612

Kansas

Phone: 785-296-5504
Fax: 785-296-0086
mtate@kdheks.gov
www.kdheks.gov

Robert Moser, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

TO: Susan Metzger, Kansas Water Office

FROM: Mike Tate, Director – Bureau of Water

DATE: August 7, 2014

SUBJECT: John Redmond Dredge Project EIS

The proposed dredging project at John Redmond Reservoir may require a National Pollutant Discharge Elimination System (NPDES) permit for any discharge dredge material decant water if there is discharge to a water of the State. The project will also require a construction storm water general permit for any construction areas that disturb greater than one acre. The Kansas Department of Health and Environment (KDHE) is authorized by the USEPA to issue NPDES permits.

KDHE and Kansas Water Office (KWO) staff have had numerous discussions regarding the NPDES permitting process for the project. The process for any new permitting action is as follows:

1. KWO submits an application for an NPDES permit.
2. Since this will be a new discharge, an antidegradation review will need to be completed as per KAR 28-16-28c. KDHE and KWO will meet to discuss the scope of the antidegradation review, and the format of the review which will include an alternatives analysis. The purpose of the antidegradation review is to ensure that if a permit to discharge is issued, it will allow for only minimal to no degradation of the current quality.
3. KWO staff will complete the antidegradation review and submit it to KDHE. KDHE will evaluate the review for adequacy, and identify the least degrading cost-effective treatment process.
4. KWO will submit plans and specifications for the chosen treatment.
5. Upon approval of the plans, KDHE will propose a draft permit if an NPDES permit is required. The permit will contain discharge limits and conditions that will ensure compliance with Kansas numeric and narrative limits.
6. Notice of the proposed permit and antidegradation review will be placed in the Kansas Register and distributed to those entities on KDHE's Public Notice notification list. The notification list includes State and Federal agencies as well as any citizen, non-government organization (NGO), or business who has requested to be notified of permitting actions.
7. If there is sufficient interest expressed regarding the proposed permit, a publicly noticed hearing will be held.
8. Following the public notice process the proposed permit will either be finalized or denied.
9. If a permit is issued, discharge may proceed.

Based on data collected from soil cores in the lake, it is anticipated the only pollutant of concern would be total suspended solids (TSS). While the Kansas Water Quality Standards (WQS) do not contain criteria for TSS, KDHE would require the discharge contain less than 50 mg/L which is the same value utilized for inert solids in

EPA's power plant effluent guidelines. The Kansas WQS also carry narrative criteria [KAR 28-16-28e(b)] that protect against aesthetic impacts such as coloration or solids build up.

In summary, KDHE will follow its standard permitting procedures for any permit issued for the John Redmond dredging project. Those permits ensure compliance with the Kansas Water Quality Standards.

From: Whitlaw, Heather <heather_whitlaw@fws.gov>
Sent: Friday, August 08, 2014 1:03 PM
To: Metzger, Susan
Subject: Re: John Redmond Reservoir Dredging Project

Hello Susan,

Thank you for this email keeping us in the loop, and coordinating with us on CDF locations. I will pass this message along to Michele, Vernon and Susan for their review and files, and we look forward to seeing the Final PEIS that is ready for USACE ATR.

Thanks again,
Heather

Heather Whitlaw
Field Supervisor, Ecological Services
US Fish and Wildlife Service, KS Field Office
2609 Anderson Ave.
Manhattan, KS 66502
heather_whitlaw@fws.gov
785-539-3474 ext 105
785-313-0772 (cell)

On Thu, Jul 31, 2014 at 1:27 PM, Metzger, Susan <Susan.Metzger@kwo.ks.gov> wrote:
Heather,

The Kansas Water Office is continuing to develop the Final Programmatic Environmental Impact Statement (EIS) for the *Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Kansas*. We anticipate the document will be ready for U.S. Army Corps of Engineers (USACE) Agency Technical Review (ATR) in a few weeks with a Record of Decision mid-fall. During the public comment period, USFWS commented on the need for continued coordination among USACE, KWO, USFWS and other partners as the project develops and as additional sediment Confined Disposal Facilities (CDFs) are identified.

I wanted to keep you informed of our progress and let you know that one additional CDF has been identified since you had the opportunity to review the PEIS. Attached is a map showing the three known CDFs. CDF Site A and B were described in the Draft PEIS. CDF Site E has been added to the analysis in the Final PEIS. CDF Site E is currently in both row crop production and managed grazingland. Following dredging activities, the site will be returned to these uses.

When the Final PEIS is ready for USACE ATR I will send a copy your way. In the meantime, I just wanted to keep you informed of any project adjustments or progress.

Thank you,

Susan

From: Whitlaw, Heather <heather_whitlaw@fws.gov>
Sent: Tuesday, September 02, 2014 12:38 PM
To: Metzger, Susan
Cc: Vernon Tabor; Susan Blackford
Subject: Re: John Redmond Reservoir Dredging Project

Hello Susan,

Thank you for keeping us informed on the progress of Final PEIS Agency Technical Review process. We look forward to a link, and a printed hard copy plus CD of the Final document.

Regarding the USACE question about Fish and Wildlife Coordination Act, we did not prepare a Coordination Act Report for this project. To my knowledge, it was not requested by the Corps or KWO. Our 21 May 2014 letter provided comments pursuant to, among other authorities, the Fish and Wildlife Coordination Act.

Please let me know if you need additional information, or would like further discussions on this topic.

Best,
Heather

Heather Whitlaw
Field Supervisor, Ecological Services
US Fish and Wildlife Service, KS Field Office
2609 Anderson Ave.
Manhattan, KS 66502
heather_whitlaw@fws.gov
785-539-3474 ext 105
785-313-0772 (cell)

On Fri, Aug 29, 2014 at 12:26 PM, Metzger, Susan <Susan.Metzger@kwo.ks.gov> wrote:
Heather,

We are nearing completion of the Agency Technical Review process for the Final PEIS for the dredging at John Redmond Reservoir. Once the review is complete, I can send you a link to the updated document, as well as, drop by a CD and printed copy of the Final to the Manhattan office.

One comment that I am hoping you can help me address. In the draft linked below in Appendix I, PDF Page #368, we have included the 21 May 2014 USFWS Comment letter. USACE has asked for acknowledgement that this letter serves as the Coordination Act Report? Can you help me address that comment?

Thank you,
Susan Metzger

From: Whitlaw, Heather <heather_whitlaw@fws.gov>
Sent: Wednesday, September 03, 2014 12:20 PM
To: Metzger, Susan
Cc: Vernon Tabor; Susan Blackford
Subject: Re: John Redmond Reservoir Dredging Project

Hi Susan,

Thank you for sending this letter (logged in our files as 2013-CPA-0520) from August 2013. Our 21 May 2014 letter can serve as comments under the Fish and Wildlife Coordination Act. We look forward to continued coordination among KWO, USACE and USFWS as future potential sediment disposal sites are identified.

Heather

Heather Whitlaw
Field Supervisor, Ecological Services
US Fish and Wildlife Service, KS Field Office
2609 Anderson Ave.
Manhattan, KS 66502
heather_whitlaw@fws.gov
785-539-3474 ext 105
785-313-0772 (cell)

Appendix H

Restoration Plant List for CDF Sites A, B and portions of Site E

Plant list for restoration of grasslands

Grasses:

Western Wheatgrass	*Agropyron smithii*
Big Bluestem	*Andropogon gerardii*
Sand Bluestem	*Andropogon hallii*
Sideoats Grama	*Bouteloua curtipendula*
Blue Grama	*Bouteloua gracilis*
Buffalo Grass	*Buckloe dactyloides*
Bluejoint Grass	*Calamagrostis canadensis*
Awl-fruited Sedge	*Carex stipata*
Canada Wild Rye	*Elymus canadensis*
Bottlebrush Grass	*Hystrix patula*
June Grass	*Koeleria macrantha*
Switch Grass	*Panicum virgatum*
Little Bluestem	*Schizachyrium scoparium*
Indian Grass	*Sorghastrum nutans*
Prairie Cordgrass	*Spartina pectinata*
N. Prairie Dropseed	*Sprorbolus heterolepis*
Porcupine Grass	*Stipa spartea*
Cattail	*Typhya latifolia*

Forbs:

Red Baneberry	*Actea rubra*
Wild Garlic	*Allium canadense*
Prairie Onion	*Allium stellatum*
Canada Anemone	*Anemone canadensis*
Columbine	*Aquilegia canadensis*
Jack-in-the-Pulpit	*Arisaema triphyllum*
Swamp Milkweed	*Asclepias incarnata*
Butterfly Weed	*Asclepias tuberosa*
Whorled Milkweed	*Asclepias verticillata*
Heath Aster	*Aster ericoides*
New England Aster	*Aster novi-angliae*
Sky Blue Aster	*Aster oolentangiensis*
Silky Aster	*Aster sericeus*
White False Indigo	*Baptisia alba*
Cream False Indigo	*Baptisia leucophaea*
Purple Poppy Mallow	*Callirhoe involucrata*
American Bellflower	*Campanula americana*
Partridge Pea	*Chamaecrista fasciculata*
Prairie Larkspur	*Delphinium virescens*
Tick-trefoil	*Desmodium canadense*
Shooting Star	*Dodecatheon meadia*
N.L. Purp. Coneflower	*Echinacea angustifolia*
Rattlesnake Master	*Eryngium yuccifolium*
Boneset	*Eupatorium perfoliatum*
Joe-Pye Weed	*Eupatorium purpureum*
Flowering Spurge	*Euphorbia corollata*
Wild Strawberry	*Fragaria virginiana*
Blanket Flower	*Gaillardia aristata*
Wild Geranium	*Geranium maculatum*
Common Sneezeweed	*Helenium autumnale*

Ox-eye Sunflower	*Heliopsis helianthoides*
Virginia Waterleaf	*Hydrophyllum virginianum*
Great St. John's Wort	*Hypericum pyramidatum*
Blue Flag Iris	*Iris shrevei*
R.H. Bush Clover	*Lespedeza capitata*
Rough Blazing Star	*Liatris aspera*
Prairie Blazing Star	*Liatris pycnostachya*
Turk's Cap Lily	*Lilium michiganese*
Great Blue Lobelia	*Lobelia siphilitica*
Wild Bergamot	*Monarda fistulosa*
Evening Primrose	*Oenothera biennis*
Beardtongue	*Penstemon digitalis*
Large-flo. Penstemon	*Penstemon grandiflorus*
White Prairie Clover	*Petalostemum candidum*
Purple Prairie Clover	*Petalostemum purpureum*
Blue Phlox	*Phlox divartica*
Prairie Phlox	*Phlox polosa*
Obedient Plant	*Physostegia virginiana*
Solomon's Seal	*Polygonatum biflorum*
Mountain Mint	*Pycnanthemu. virginianum*
Prairie Coneflower	*Ratibida columnifera*
Black-eyed Susan	*Rudbeckia hirta*
Blue Sage	*Salvia pitcheri*
Rosinweed	*Silphium integrifolium*
Compass Plant	*Silphium laciniatum*
Cup Plant	*Silphium perfoliatum*
White-eyed Grass	*Sisyrinchium campestre*
Gray Goldenrod	*Solidago nemoralis*
Stiff Goldenrod	*Solidago rigida*
Showy Goldenrod	*Solidago speciosa*
Tall Meadow Rue	*Thalictrum dasycarpum*
Blue Verbena	*Verbena gastata*
Ironweed	*Vernonia fasciculata*
Common Blue Violet	*Viola papilionacea*
Golden Alexanders	*Zizea aurea*

Shrubs:

Downy Serviceberry	*Amelanchier arborea*
Leadplant	*Amorpha canescens*
Fragrant False Indigo	*Amorpha nana*
New Jersey Tea	*Ceonanthus americanus*
Buttonbush	*Cephalanthus occidentalis*
Swamp Dogwood	*Cornus obliqua*
American Hazelnut	*Corylus americana*
Sand Cherry	*Prunus besseyi*
Chokecherry	*Prunus virginiana*
Smooth Sumac	*Rhus glabra*
Buffalo Currant	*Ribes odoratum*
Early Wild Rose	*Rosa blanda*
Illinois Rose	*Rosa setigera*
Elderberry	*Sambucus canadensis*
Silver Buffaloberry	*Sheperdia argentea*
Coralberry	*Symphoricarp. orbiculatus*

Trees:

Silver Maple	*Acer saccharinum*
Ohio Buckeye	*Aesculus glabra*
Shagbark Hickory	*Carya ovata*
Hackberry	*Celtis occidentalis*
Redbud	*Cercis canadensis*
Downy Hawthorn	*Crataegus mollis*
White Ash	*Fraxinus americana*
Green Ash	*Fraxinus pennsylvanica*
Kentucky Coffee Tree	*Gymnocladus dioica*
Black Walnut	*Juglans nigra*
Eastern Red Cedar	*Juniperus virginiana*
Prairie Crabapple	*Malus ioensis*
Ironwood	*Ostrya virginiana*
Sycamore	*Platanus occidentalis*
Eastern Cottonwood	*Populus deltoides*
Wild Plum	*Prunus americana*
Black Cherry	*Prunus serotina*
White Oak	*Quercus alba*
Bur Oak	*Quercus macrocarpa*
Red Oak	*Quercus rubra*
Basswood	*Tilia americana*

APPENDIX I

Comments Received During Review of Draft Programmatic Environmental Impact Statement (DPEIS)

Note – numbers shown throughout correspondence corresponds to comment number shown in Table 1-2.

Docket No.	Filed date	Presenter or requester
ER12–2237–000 EL13–62–000 ER14–543–000 4. ER13–1380–000 ER14–500–000 ER14–972–000	4–2–14	NYS Public Service Commission.
Exempt:		
1. ER13–1380–000	3–20–14	Members of Congress.[1]
2. ER13–1380–000	3–20–14	Hon. Charles Schumer.
3. CP13–499–000 CP13–502–000	3–21–14	Hon. Tom Reed.
4. P–2210–207	3–24–14	Hon. Bob Goodlatte.
5. ER13–1380–000	3–25–14	Hon. Didi Barrett.
6. P–2210–207	3–25–14	Hon. Robert Hurt.
7. P–2210–207	3–25–14	Hon. Tim Kaine.
8. CP13–113–000	3–25–14	Calvert County Board of County Commissioners, MD.
9. CP13–483–000 CP13–492–000.	3–25–14	FERC Staff.[2]
10. CP13–552–000 CP13–553–000.	3–26–14	FERC Staff.[3]
11. ER13–1380–000	3–26–14	Hon. Kirsten Gillibrand.
12. CP14–125–000	4–1–14	Hon. Mary L. Landrieu.
13. CP13–483–000 CP13–492–000.	4–3–14	FERC Staff.[4]

[1] Hons. Eliot Engel and Sean Patrick Maloney.
[2] March 19, 2014 Telephone Record.
[3] March 5, 2014 Meeting Summary.
[4] April 2, 2014 Telephone Record.

Dated: April 7, 2014.

Nathaniel J. Davis, Sr.,

Deputy Secretary.

[FR Doc. 2014–08176 Filed 4–10–14; 8:45 am]

BILLING CODE 6717–01–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–9909–14–Region–6]

Notice of Decision To Issue Clean Air Act Greenhouse Gas PSD Permit for the La Paloma Energy Center

Correction

In notice document 2014–07812 appearing on page 19329 in the issue of April 8, 2014, make the following correction:

On page 19329, in the third column, in the 10th line, "[insert date of publication]" should read "April 8, 2014".

[FR Doc. C1–2014–07812 Filed 4–10–14; 8:45 am]

BILLING CODE 1505–01–D

ENVIRONMENTAL PROTECTION AGENCY

[ER–FRL–9014–4]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information (202) 564–7146 or *http://www.epa.gov/compliance/nepa/*.

Weekly receipt of Environmental Impact Statements.

Filed 03/31/2014 through 04/04/2014.

Pursuant to 40 CFR 1506.9.

Notice

Section 309(a) of the Clean Air Act requires that EPA make public its comments on EISs issued by other Federal agencies. EPA's comment letters on EISs are available at: *http://www.epa.gov/compliance/nepa/eisdata.html*.

EIS No. 20140106, Draft EIS, USFS, WA, Bailey, Aeneas, Revis and Tunk C & H Livestock Grazing Analysis, Comment Period Ends: 05/27/2014, Contact: Phillip Christy 509–486–5137.

EIS No. 20140107, Draft EIS, USACE, KS, Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, Comment Period Ends: 05/27/2014, Contact: David Gade 918–669–7579.

EIS No. 20140108, Draft EIS, FTA, MN, Bottineau Transitway Corridor Light Rail Project, Comment Period Ends: 05/29/2014, Contact: Maya Sarna 202–366–5811.

EIS No. 20140109, Final EIS, FHWA, WV, Tier 1—US 220, National Highway System (NHS between I–68 and Corridor H (US 220), Review Period Ends: 05/19/2014, Contact: Jason Workman 304–347–5928.

EIS No. 20140110, Draft EIS, USFS, CA, Smith River National Recreation Area Restoration and Motorized Travel Management, Comment Period Ends: 06/10/2014, Contact: Christy Prescott 707–441–3661.

EIS No. 20140111, Draft EIS, BLM, WAPA, 00, Southline Transmission Line Project and Draft Resource Management Plan Amendment, Comment Period Ends: 07/10/2014, Contact: Mark Mackiewicz (BLM) 435–636–3616 and Mark Wieringa (WAPA) 720–962–7448.

The U.S. Department of the Interior's Bureau of Land Management and the U.S. Department of Energy's Western Area Power Administration are joint lead agencies for the above project.

EIS No. 20140112, Final EIS, NOAA, HI, Programmatic—Hawaiian Monk Seal Recovery Actions, Review Period Ends: 05/12/2014, Contact: Amy Sloan 301–427–8401.

Amended Notices

EIS No. 20140096, Draft EIS, FHWA, IL, 75th Street Corridor Improvement Project, Comment Period Ends: 05/22/2014, Contact: Catherine A. Batey 217–492–4600. Revision to the FR Notice Published 03/20/2014; Change Comment Period from 05/12/2014 to 05/22/2014.

Dated: April 8, 2014.

Cliff Rader,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 2014–08194 Filed 4–10–14; 8:45 am]

BILLING CODE 6560–50–P

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 67, Room 118
Post Office Box 25007 (D-108)
Denver, Colorado 80225-0007

TAKE PRIDE IN AMERICA

May 21, 2014

9043.1
ER 14/242

Dr. David Gade
U.S. Army Corps of Engineers
Environmental Technical Services Branch
Regional Planning and Environmental Center
101st E. Avenue
Tulsa, OK 74128-4629

Dear Dr. Gade:

The Department of the Interior (Department) has reviewed the Draft Programmatic Environmental Impact Statement (DPEIS) for the Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Reservoir, KS, and offers the following comments provided by the U.S. Fish and Wildlife Service (USFWS).

Three alternatives were evaluated in the PDEIS: (1) no action, (2) dredge and dispose of sediments from the conservation pool at a rate and quantity to ensure 55,000 acre-feet of conservation storage is available for authorized project purposes; and (3) dredge and dispose of sediments to restore the conservation pool to near original capacity. Alternative two was selected as their preferred alternative, with an estimated project life of approximately 30 years.

These comments are being provided pursuant to their authorities under the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*); section 404(b) of the Clean Water Act (33 U.S.C. 1344); the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 *et seq.*); the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*); the Bald and Golden Eagle Protection Act; the Fish and Wildlife Act of 1956; Water Resources Development Act of 1986, '90, '92, '96, '13 (WRDA); Executive Orders 11990 (wetland protection), 13112 (invasive species), and 11988 (floodplain management); and are consistent with the intent of the National Environmental Policy Act of 1969.

1.0 Purpose and Need for the Action

The effects of the disposal of dredged material have not been adequately evaluated in the DPEIS document. However, as stated in the DPEIS, the Kansas Water Office (KWO) is anticipating "continuous evaluation and adaptive change", and therefore cannot provide a quantitative analysis of the potential site-specific effects for all sediment removal and disposal activities related to the project. The KWO is expecting that U.S. Army Corps of Engineers' (USACE) staff and its state partners would consider site-specific effects at a second level of decision making (DPEIS, page 11). Page 12 states that "Project methodology and impacts will be assessed after the first five years and periodically throughout the full project period."

We recommend that the final PEIS contain a list of the agencies that will receive the opportunity to participate in the second level of decision making and review of the additional assessments and changes to the project. The project has the potential to impact important fish and wildlife resources and their habitats, including USFWS trust resources, Federal lands including the USFWS Flint Hills National Wildlife Refuge (FHNWR), and state and private lands which may have received federal funding associated with this or other projects. We request the opportunity to review potential disposal sites for their impacts to these resources. Federally listed species are subject to change, and as new information becomes available on these and other issues of concern, it is important that the USFWS be kept apprised of the most current information regarding potential sediment disposal sites in order to determine their effects on natural resources. #1

1.5.3 Project Development History

Table 1-3, page 23 is missing the Executive Order on Invasive Species (Executive Order 13112), the Migratory Bird Treaty Act, and the Water Resources Development Act (WRDA) - 1986,'90,'92, '96, & 2013 which address long-term disposal of dredged material and promotes decontamination technologies for the manufacturing of material for beneficial uses. These should be included in the final PEIS. #2

2.0 Description of the Proposed Action and Alternatives

Page 26 states that "Project methodology and impacts will be assessed after the first five years and periodically throughout the full project period, and that "Under the Programmatic approach of this EIS, future disposal sites will be coordinated with relevant local, state, and federal agencies…". We reiterate our request that the USFWS be kept apprised of the most current information regarding potential sediment disposal sites. #3

The final PEIS should discuss alternatives to Confined Disposal Facilities (CDF), including beneficial uses. One alternative may be to apply the sediment slurry through irrigation equipment directly on crop fields (http://web.extension.illinois.edu/iwrc/pdf/ 175.pdf, Retrieved April 24, 2014). Another is to deposit the sediment slurry behind crop terraces which allows crops to benefit from the effluent. After drying, the sediment could then be worked into the cropland. The final PEIS could also evaluate if it would be possible to reuse detention basins by excavating the dried sediment for other purposes, and then refilling the basins for potential repetitive use. #4

<u>3.4.5 Endangered, Threatened, and Candidate Species, Species of Special Concern and Sensitive Communities</u>

The document needs to add the following information on three additional species: Sprague's pipit is a candidate species for which the USFWS has on file substantial information on biological vulnerability and threats to support proposals to list as endangered or threatened species. Northern long-eared bat is proposed for listing under the ESA, and Mead's milkweed is federally listed as threatened. #5

Sprague's Pipit (Anthus spragueii): The Sprague's pipit is a small passerine bird (about the size of a bluebird) of the open grasslands. Although it prefers large tracts of shortgrass prairie for nesting, they seem to be a generalist in their preferences during migration and may occur infrequently in any short grass habitat of any size anywhere in Kansas during migration. It feeds and nests exclusively on the ground. Insects, spiders and some seeds comprise its diet. Spring migration primarily occurs in April and May while fall migration occurs primarily from late September through early November. It is unlikely that they would be found in the project area.

Northern Long-Eared Bat (Myotis septentrionalis): The northern long-eared bat (NLEB) is currently proposed for listing under the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). The final listing decision for the NLEB is expected in October 2014. At this time, no critical habitat has been proposed for the NLEB. During the summer, NLEBs typically roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥3 inches dbh). Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on presence of cavities or crevices or presence of peeling bark. It has also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). They forage for insects in upland and lowland woodlots and tree lined corridors. During the winter, NLEBs predominately hibernate in caves and abandoned mine portals. Occurrences have been documented from Ellis, Graham, Leavenworth, Marshall, Osborne, Phillips, Rooks, Russell and Washington counties. However, the species could potentially occur in suitable habitat anywhere east of a line bounded by U.S. Highway 283 from Nebraska south to I-70, I-70 east to Russell, then U.S. Highway 281 south to Oklahoma, which is inclusive of the proposed project location.

Pursuant to Section 7(a)(4) of the ESA, federal action agencies are required to confer with the USFWS if their proposed action is likely to jeopardize the continued existence of the NLEB (50 CFR 402.10(a)). Action agencies may also voluntarily confer with the USFWS if the proposed action may affect a proposed species. Species proposed for listing are not afforded protection under the ESA; however as soon as a listing becomes effective, the prohibition against jeopardizing its continued existence and "take"[1] applies **regardless of an action's stage of completion**. If the agency retains any discretionary involvement or control over on-the-ground actions that may affect the species after listing, section 7 applies. Therefore, if suitable NLEB habitat is present within the proposed project area, we recommend further coordination with our office to avoid potential project delays should the species be listed. NLEB surveys may be necessary depending on the time of tree clearing. Additional information regarding NLEB and conference procedures can be found (http://www.fws.gov/midwest/endangered/mammals/nlba/index.html).

Mead's milkweed (*Asclepias meadii*): Although it is not known from the project site as currently described in the DPEIS, the USACE may need to consider affects to it, as additional CDFs are identified into the future. Mead's milkweed is a perennial broad-leaved plant of unbroken tallgrass prairie, generally occurring as small populations or scattered individuals, and is listed as federally threatened.

4.3 Hydrology and Water Resources

Effluent from CDF's will release significant amounts of drainage waters and have the potential to significantly adversely affect fish and wildlife and their habitats. The PDEIS states that approximately 2,500 acres could ultimately be required for disposal sites (page 26). The PDEIS should list the specific criteria that will be used to guide the placement/selection of basin sites and identify all impacts of drainage runoff to down slope aquatic and terrestrial systems. **#6**

4.4 Biological Resources

The DPEIS gives a list of criteria to guide the selection of sites (page 26) and states that wetland and streams will be avoided where possible (page 98). However, there are other habitats that are high value, provide essential habitat to Federal trust resources, as well as local wildlife, and should also be avoided and added to the list of criteria. Unplowed (virgin) tallgrass prairie, riparian buffers, riparian woodlands, bottomland hardwood forests, wetlands, and streams are among the highest valued wildlife habitats. The USFWS established a Mitigation Policy (Federal Register 46:15, January 23, 1981/46 FR 7656) on mitigating the adverse impacts of land and water developments on fish, wildlife, their habitats, and uses thereof. This policy is established in accordance with the following major authorities among others: The Fish and Wildlife Act of 1956 (16 U.S. C. 742(a)-754; Fish and Wildlife Coordination Act (16 U.S.C. 661-667 (ec); Watershed Protection and Flood Prevention Act (16 U.S.C. 1001-1009); and National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347). **#7**

The USFWS Mitigation Policy uses four resource categories to determine that the level of mitigation recommended is consistent with the fish and wildlife resource values involved for individual project sites. Since only two of the disposal sites have been disclosed, we are not able to determine the type or amount of habitat impacted for the entire project. To guide the USACE/KWO to lower value sites, and allow them to anticipate what our mitigation recommendations might consist of, we provide the following information about the USFWS Mitigation Policy. Generally, species evaluations are typically those considered Federal trust resources, including federally threatened or endangered species, candidate species, migratory birds, bald and golden eagles, inter-jurisdictional fishes, and USFWS owned lands/facilities. As USFWS trust resources are subject to change, the designation of resource categories are also subject to change.

Resource category 1 is of high value for the evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section. Losses of existing habitat should be prevented. Native, unplowed prairie, riparian areas, riparian woodland, forested wetlands, shrub-scrub wetlands, bottomland hardwood forests, and streams are examples of resource category 1 habitats for the Federal Trust Resources in the project area.

Resource category 2 is of high value for the evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section. The goal is no net loss of this habitat type. Restored native prairie and Conservation Reserve Program lands using native grasses would be typical examples of this category in the project area.

Resource category 3 is high to medium value for the evaluation species and is relatively abundant on a national basis. The goal is no net loss of habitat value while minimizing the loss of in-kind habitat value. Farmed wetland would likely be an example of resource category 3 for the project area.

Resource category 4 is of medium to low value for the evaluation species. The goal is to minimize the loss of habitat value. Row cropland and domestic (tame) grasslands are examples of Resource category 4 habitat.

The DPEIS does not adequately evaluate direct effects to fish and wildlife from dredging related activities, nor does it thoroughly evaluate indirect/cumulative effects from this long term project with its many expected disposal sites. Overhead lines associated with the dredges can impact wildlife through collisions and electrocution. The noise from the dredges could impact wildlife and affect breeding, feeding, and nesting behaviors. This noise could **#8** impact wildlife on the FHNWR. The dredging activity can impact fish and other aquatic organisms by altering behavior, destroying habitat, being injured by the cutters, or sucked into the pipeline. Running the pipeline through culverts could impact aquatic organism passage. Laying the pipeline passively on the floor of the river (and possibly other streams) could also affect aquatic organism passage by creating a barrier. Releasing effluent from the disposal basins into rivers and streams could result in thermal pollution of the receiving stream, or change temporal flow regimes impacting aquatic organisms.

Page 98 states "If construction of CDFs impacts the hydrology of adjacent wetlands, the State of Kansas will ensure that measures are in place to avoid impacts to other aquatic resources." **#9** This statement is ambiguous. The DPEIS should explain this further and give examples.

<u>4.5 Threatened and Endangered Species</u>

In a September 16, 2013 letter, the USFWS delivered concurrence to the USACE pertaining to their determination of "may affect, not likely to adversely affect" for federally listed species that may be impacted by the dredge project, including the Neosho madtom, Neosho mucket mussel, rabbitsfoot mussel, interior least tern, and western prairie fringed orchid. **#10** This determination and concurrence was pursuant to section 7 of the Endangered Species Act, 16 U.S.C. 1231 *et seq*. That letter concluded informal consultation on the initial stages of the dredging project. However, USFWS also included a request for further information on the project as it proceeds, including possible unexpected or unknown downstream effects; and information on new CDFs as they are selected. This information is necessary to determine future unknown effects to federally listed species that may be associated with the dredging activity itself, and the selection of new, presently undetermined CDFs. The DPEIS describes the need for an additional 2,500 additional acres for future CDFs that we believe may have possible effects on listed or candidate species. If effects are identified, reinitiation of the section 7 consultation, and/or new consultation may be required, dependent on the action, site location, and severity of possible effects. #11

The USFWS views their consultation history to this point as analysis of the known or expected project affects inclusive of the preferred dredging activity itself, as described into the future; and the disposal of sediment at CDF A and B. At present we do not have the ability to analyze potential affects to listed species at any other presently unknown site. The USACE has continuing responsibility to assure that all future section 7 obligations are fulfilled.

Section 4.9.2 Land Use

Page 106 describes criteria for disposal of dredged sediment. Additional criteria should be added, including the avoidance of areas with high value natural areas (i.e., Resource categories 1 & 2). #13

Page 106 also states, "Under the Programmatic approach of this DPEIS, future disposal site selection will be coordinated with relevant local, state, and federal agencies, including the USACE, Tulsa District Regulatory Office". The DPEIS should include a list of those agencies that the USACE/KWO expects to include in the coordination. We recommend that the USFWS Kansas Ecological Services Field Office and KDWPT be included in that list due to continuing section 7 obligations and potential changes in threatened and endangered species lists and habitat concerns. #12

A plant list for restoration of areas should additionally be included. This could be a list of potential plants with an acknowledgment that site specific plant lists will be developed for each site with review from relevant agencies. #14

4.14 Cumulative Impacts

Page 114 states that land will be reverted back to the use of the landowner, most likely the pre-dredging purpose. The DPEIS claims that cumulative impacts will be negligible. We believe that it is highly likely that natural areas would be converted to agriculture following the dredge disposal, resulting in loss of wildlife habitat. #15

5.0 Mitigation Requirements and 5.4 Biological Resources

Page 118 states, "These assumptions included: Other criteria need to be developed to avoid other habitats such as riparian woodland, farmed wetlands, oxbows, virgin native prairie." See the discussion of the USFWS Mitigation Policy under comments on 4.4 Biological Resources.

Page 120 states, "Avoid existing vegetation". See the discussion of the USFWS Mitigation Policy under comments on 4.4 Biological Resources.

Page 121 states, "Ensure that equipment used is not infested with Zebra mussels as it leaves JRR". The DPEIS should list specific steps and Best Management Practices (BMPs) that will be required to ensure that equipment used is not infested with zebra mussels and include the management plan for contractors to ensure no transportation of zebra mussels. Also need to expand the discussion to include all exotic/invasive species. Invasive species of particular concern in Kansas include the zebra mussel (*Dreissena polymorpha*), Eurasian watermilfoil (*Myriophyllum spicatum*), purple loosestrife (*Lythrum salicaria*), Johnson grass (*Sorghum halepense*), sericea lespedeza (*Lespedeza cuneata*), salt cedar (*Tamarix spp.*), and reed canary grass (*Phalaris arundinacea*). We recommend Hazard Analysis and Critical Control Points (HACCP) planning for invasive species control. Tools to perform Hazard Analysis and HACCP planning for invasive species control are available at http://haccp-nrm.org/ **#16**

Page 121 states, "Use electricity from power lines/poles rather than temporary diesel or gasoline powered generators…" The interactions of migratory birds (e.g. eagles, hawks, owls, waterfowl, songbirds, etc.) may create operational risks, health and safety concerns, and avian injuries or mortalities. The frequency of electrocutions and collisions and the associated outages has been dramatically reduced in areas where efforts have been made to retrofit or replace hazardous poles and mark lines. The design and placement of transmission lines and towers can increase or decrease the exposure for bird collisions. Early evaluation of risk factors for bird electrocution and collision can reduce the risk potential and may reduce the need for costly modifications later. Mark and/or modify all overhead lines incorporating the guidelines found in the following documents: **#17**

Avian Protection Plan (APP) Guidelines
(http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Apr12005.pdf);
"Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006"
(http://www.aplic.org/uploads/files/2643/SuggestedPractices2006(LR-2).pdf); and
"Reducing Avian Collisions with Power Lines: the State of the Art in 2012 (Avian Power Line Interaction Committee (APLLIC), 2012)
(http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf).

Section 5.7 Prime or Unique Farmlands

Page 123 bullet states, "Dispose sediments on land that does not fit the criteria for prime or unique farmland." This will significantly limit the number of potential CDF sites and potentially could promote the selection of sites containing native vegetation. **#42**

Section 6.0 Applicable Environmental Laws

Table 6-1, page 126 is missing the Executive Order on Invasive Species (Executive Order 13112), the Water Resources Development Act (see previous comments under 1.5.3 Project Development History), the Migratory Bird Treaty Act, and the Rivers and Harbors Act of 1899. These should be added to the final PEIS. **#18**

Migratory Bird Treaty Act

The document should discuss the Migratory Bird Treaty Act (MBTA) and associated legal responsibilities under it. The MBTA prohibits the taking, killing, possession, transportation, #43 and importation of migratory birds, their eggs, parts, and nests. Takings could result from projects in lakes, prairies, wetlands, stream and woodland habitats, and those that occur on bridges and other structures. Additionally, confined disposal facilities have become nesting #18 grounds for a number of migratory birds and waterfowl and the disposal operations at these facilities may have to be scheduled seasonally to avoid the destruction of active nests.

Rivers and Harbors Act of 1899

Under Section 10 of the Rivers and Harbors Act of 1899 (RHA), the USACE regulates dredging and other construction activities in navigable waters. In conjunction with the Clean Water Act and Congressional requirements, the USACE operates Federal Civil Works navigation programs which apply to all extensive dredging and dredged material discharge activities. These programs are required by NEPA to analyze and document potential primary or secondary impacts, including those associated with dredging and dredged material discharges.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934, as amended, requires consultation with the U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agencies of states where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a federal permit or license. Procedurally, the USACE typically requests a letter from the USFWS for maintenance dredging projects when a new disposal site is proposed, or when a significant change in operations is considered. The Fish and Wildlife Coordination letter identifies fish and wildlife resources which might be impacted by the proposed dredging and disposal operations, and identifies any threatened or endangered species within the general area of the proposed dredging and disposal operations. This letter is typically included in NEPA documents, as an attachment.

NEPA is not a permit program and cannot force or deny any particular dredged material management decision. However, by requiring that the environmental effects of all reasonable management options are considered and documented, NEPA helps assure that the dredged material decision making process is open and comprehensive.

Synopsis

While generally the DPEIS provides a wide overview of the project and its effects, we believe several project specific actions and specifics from some Federal acts and authorities relevant to this project are lacking. Project specific actions lacking include CDF site locational information, site selection criteria for future sites, coordination planning with Federal and state agencies for selection of disposal sites in the future, possible impacts from CDFs on Federal trust resources, and resulting application of Federal authorities to possible future impacts from CDFs. These authorities (in part) include continuing responsibility to assure that all future Endangered Species Act (particularly section 7), Clean Water Act, and Migratory Bird Treaty Act obligations are fulfilled.

Additionally, regarding possible effects from this proposed project and other ongoing reservoir actions, including the general operation of John Redmond Dam and Reservoir, the USFWS wishes to reiterate that they believe the USACE Tulsa District should request initiation of section 7 consultation with the USFWS on current, ongoing operations of John Redmond Dam and Reservoir. Consultation could explore whether operations are affecting the Neosho madtom, Neosho mucket, and the rabbitsfoot mussel, and determine whether flexibility exists to improve dam operations concerning conservation of these species. Analysis of Neosho madtom population trends and John Redmond Dam operations indicates that current operations may be affecting the Neosho madtom (Wildhaber et al. 2000; Bryan et al. 2010), and similarly, may be affecting the overall freshwater mussel fauna of the Neosho River.

We appreciate the opportunity to provide these comments. If you need further assistance with these comments, please contact Vernon Tabor of the USFWS Kansas Field Office (785-539-3474, vernon_tabor@fws.gov).

Citations:

Bryan, J.L., M.L. Wildhaber, W.B. Leeds, and R. Dey. 2010. Neosho madtom and other ictalurid populations in relation to hydrologic characteristics of an impounded Midwestern warmwater stream—update. U.S. Geological Survey, Open-File Report 2010-1109, Columbia, Missouri.

Wildhaber, M.L., V.M. Tabor, J.E. Whitaker, A.L. Allert, D.W. Mulhern, P.J. Lambertson, and K.L. Powell. 2000. Ictalurid populations in relation to the presence of a mainstem reservoir in a Midwestern warmwater stream with emphasis on the threatened Neosho madtom. Transactions of the American Fisheries Society 129:1264-1280.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

cc: Susan Metzger, Chief of Planning and Policy, KWO
Katie Paterson-Ingels, Communications Director, KWO

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Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

KSR&C No. 13-04-096

April 11, 2014

Dr. David Gade
U.S. Army Corps of Engineers
Environmental Technical Services Branch
Regional Planning and Environmental Center
1645 S. 101st E. Avenue
Tulsa, OK 74128-4629

Via E-Mail

RE: Sediment Dredging
John Redmond Reservoir
Coffey and Lyon Counties

Dear Dr. Gade:

The Kansas State Historic Preservation Office has reviewed the Draft Programmatic Environmental Impact Statement (DPEIS) for the proposed sediment dredging project at John Redmond Reservoir as referenced in your public notice dated April 2, 2014. As we have noted in earlier correspondence with the Tulsa District and in meetings with staff from the Kansas Water Office, it is clear that sediment accumulation has become a serious problem in a number of the region's reservoirs (especially John Redmond), and we certainly understand the need for the dredging project. #19

Our office finds the DPEIS to be acceptable, as it incorporates all project elements previously presented to us. Our office has already commented on a draft version of the Memorandum of Agreement (MOA) that will guide cultural resource investigations and we have no additional concerns at this time.

If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Kim Gant at 785-272-8681 (ext.225).

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer

Timothy Weston
for

Patrick Zollner
Deputy SHPO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

MAY 27 2014

Dr. David Gade
U.S. Army Corp of Engineers
Environmental Technical Services Branch
Regional Planning & Environmental Center
1645 S. 101st E. Avenue
Tulsa, OK 74128-4629

Dear Dr. Gade:

RE: Review of Draft Programmatic Environmental Impact Statement for the Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Dam and Reservoir, Coffey County, KS (CEQ number 20140107)

The U.S. Environmental Protection Agency has reviewed the Draft Programmatic Environmental Impact Statement for the Removal and Disposal of Sediment and Restoration of Water Storage at John Redmond Dam and Reservoir, Coffee County, KS. Our review is provided pursuant to the National Environmental Policy Act (NEPA) 42 U.S.C. 4231, Council on Environmental Quality regulations on 40 C.F.R. Parts 1500-1508 and Section 309 of the Clean Air Act.

The stated purpose and need of the proposed action is to restore water supply storage for the benefit of the regional water users and restore the lost aquatic habitat for the benefit of public recreation and the lake ecosystem that has been lost due to sedimentation. While the Kansas Water Office is the project proponent, and will incur all costs associated with the proposed project, the federal action for NEPA purposes includes the authorization by the U.S. Army Corps of Engineers of the project on fee lands through the issuance of 33 U.S.C. Section 408 and Clean Water Act Section 404 permits; issuance of the DPEIS and executing the Record of Decision; and exercising a real estate instrument to allow for access to and use of fee lands.

The preferred alternative identified as a method to meet the basic project goal of increasing the water storage capacity in the conservation pool of JRR is Alternative #2: Dredge and Dispose of Sediments to Ensure 55,000 Acre-Feet of Conservation Storage with removal of approximately three (3) million cubic yards in the first five years of dredging activity.

EPA has rated this document as EC-2 (Environmental Concerns-Insufficient Information). This rating is based on the absence of thorough, comprehensive information regarding cumulative impacts, as well a lack of pertinent and relevant information surrounding potential water quality impacts. A copy of EPA's rating definitions are provided as an enclosure.

Of particular note, this DPEIS has a more limited scope than may be necessary for its intended application for future projects with respect to NEPA compliance. Additional NEPA documentation which may tier off of this DPEIS, may require a more robust assessment of project specific impacts. EPA offers the following observations and recommendations for the Corp's consideration in the Final PEIS.

Affected Environment

The DPEIS states that initial projections of the sedimentation rate for JRR supporting estimates for reservoir storage longevity were 404 acre-feet per year while the actual sedimentation rate is estimated to be 739 acre-feet per year. No explanation for this significant discrepancy is offered and, more importantly, no sources or causes of this increased sedimentation within the watershed are identified in the DPEIS. The DPEIS should more completely characterize the sources and causes of increased sedimentation in JRR. This characterization would then support the inclusion of land management practices in the watershed, which could reduce the amount of sediment delivered to JRR, as a component of any or all alternatives addressing reduced water storage. The absence of sediment transport reduction as a component of the restoration of water storage within this DPEIS is a deficiency, especially if viable CDF sites become more difficult to identify in out years. **#20**

Water Quality

The DPEIS should characterize water quality conditions in both JRR and the Neosho River downstream from JRR in the context of Kansas water quality standards and, specifically, criteria adopted by the State for measured or suspected contaminants (e.g., atrazine) and measured water quality parameters (e.g., phosphorous, suspended sediment, bacteria). The DPEIS should also compare water quality data to both the State's Clean Water Act, Section 303(d) list of impaired waters and any total maximum daily loads developed and adopted for JRR and the Neosho River upstream and downstream of JRR. This assessment of existing water quality and potential impacts to the water quality of JRR and the Neosho River from both dredging and discharges from CDFs <u>in the context of the State's water quality standards</u> is absent from the DPEIS. That comparison would support the determination whether the alternatives might cause exceedences of State water quality standards or worsen existing water quality impairments in either JRR or downstream in the Neosho River. The existing assessment is largely qualitative and not well supported. **#21**

Section 4.3 specifies only that discharges to the Neosho River from the initial two CDFs will not violate antidegradation requirements and will comply with the State's CWA Section 401 certification and National Pollutant Discharge Elimination System permit. The PDEIS does not attempt to characterize either the content of these CDF dewatering effluents or potential impacts resulting from these discharges. Further, the PDEIS states that if NPDES permit limits are exceeded, "the effluent will be piped back to John Redmond Reservoir." The PDEIS does not state whether an NPDES permit will be required for these discharges nor does it characterize any potential impacts to JRR water quality resulting from the discharge of polluted CDF effluent back to JRR. JRR is currently listed as impaired by siltation and nutrients which would be concentrated in these CDF discharges already expected to exceed NPDES permit limits governing discharges to the Neosho River. This approach raises concerns about important restrictions to planned management of dredged materials in both the short-term and over the planned 30 year span of potential dredging operations. **#22**

Dredging Specifics

Section 2.2 Proposed (Preferred) Action states that no parent material (non-deposited sediment) will be removed under this alternative, but does not offer an indication of how this will be ensured. Please consider including this information in the Final. #23

Section 4.3 Hydrology and Water Resources states that resuspension rates and sediment concentrations increasing over ambient conditions during dredging operations were found to be minimized by hydraulic dredges (rather than mechanical dredging) but does not provide specifics or quantitative information on how much these rates and concentrations are minimized by the use of hydraulic dredges versus mechanical dredging methods. Inclusion of supplementary information on these comparisons would be beneficial. #24

Cumulative Impacts

Section 2.2.1, Determination of CDF Sites, states that "If the dredging action were to continue beyond the initial five years and remove a quantity greater than three million cubic yards, approximately 2,000 additional acres, for a total of about 2,500 acres, may be needed for CDF sites over the next 30 years to maintain the 55,000 acre feet of storage in John Redmond Reservoir." While the DPEIS states that the initial five-year quantity of sediment to be removed from selected locations within the reservoir and stored in near-by CDFs amounts to three million cubic yards, the document only addresses the first year's estimated quantity of 700,000 cubic yards or 23% of the five-year total. Further, of the estimated five CDFs required to store the five-year dredged material total, this document only addresses the impacts of two CDFs of less than 100 acres each. Compounding the complexity of the analysis of impacts associated with movement of dredged material to and storage in CDFs is the lack of adequate public property to locate those CDFs. Locating adequate storage for dredged material on private property might necessitate movement of material over much longer distances than this document describes. In addition, reservoir storage capacity will be continue to be evaluated after the initial five-year time-frame and then throughout a time period linked directly to the life of the renewed Nuclear Regulatory Commission license for the Wolf Creek Generation Station (i.e., 2045). The Corps estimates that an additional 2,000 acres of storage space might be required to maintain the target reservoir storage capacity. #29

This DPEIS lacks a thorough consideration of what impacts the continuation of dredging activities may have on environmental resources beyond the first five years. The PDEIS states that the cumulative impacts due to dredging and sediment disposal will be negligible, but given that an additional 2,000 acres will potentially be affected in the foreseeable future, additional information is necessary to support this assertion. Wetlands, other waters of the U.S., prime or unique farm land and floodplains are all in close proximity to JRR, with most of the land privately owned. While it is understood that future sites will be evaluated for specific eligibility criteria, the Final PEIS should comprehensively characterize how additional CDF sites may affect the environment. For example, the document states that the use of lands for CDF sites is temporary and that the land will revert back to its original or other comparable use following the dewatering of dredged sediment. However, it is important to know how many approximate acres may be in active use any given time, given the projected rate of dredging activity. Additionally, as previously suggested, the cumulative impacts arising from pipelines carrying dredged material to CDFs located far from JRR could be significant.

Furthermore, while the 2013 Final Supplement to the Final Environmental Impact Statement for Storage Reallocation is cited and referenced throughout this document, a full review of the cumulative impacts of both the reallocation and this proposed action is lacking. Section 4.12, Cumulative Impacts, simply states that "The Preferred Alternative and Alternative #2 evaluated in this DPEIS combined with the reallocation would result in positive, long-term cumulative impacts." More comprehensive information on the combined effects of the synonymous projects is essential in order to substantiate that assertion. #25

Resources of concern may be identified by considering actions that alter ecological processes and therefore can be expected to produce cumulative effects. Changing hydrologic patterns, for example, is likely to elicit cumulative effects. Bedford and Preston (1988)[1] offered the following alterations that would likely initiate cumulative effects in wetlands or watersheds: 1) changes in sediment transport; 2) alteration of discharge and retention rates of water; 3) changes in velocity of water moving through the system; 4) disposal of organic pollutants where uptake is controlled by biological processes; 5) disposal of chemicals that easily separate from sediment and other materials to which they are attached.

If adequate data and analytical procedures are available, specific thresholds that indicate degradation of the resources of concern should be included in the NEPA analysis. The thresholds should be practical, scientifically defensible, and fit the scale of the analysis.

Mitigation

Section 5.0 Mitigation addresses the various actions that allow project-related impacts to a range of environmental resource areas, but fails to adequately identify what entity/entities will be responsible for ensuring that mitigation measures are applied and completed for each resource, and at what intervals monitoring activities will take place. #26

This section also states that mitigations to be considered for the dredging alternative in regards to Prime or Unique Farmlands is to dispose sediments on land that does not fit the criteria for prime or unique farmland, but does not identify a course of action or additional mitigation if such land cannot be avoided. #27

Other

CEQ issued draft guidance for public comment on when and how federal agencies must consider GHG emissions and climate change in their proposed action. While this guidance is not yet final, EPA recommends that the FPEIS reference the draft guidance, describe the elements of the draft guidance, and to the relevant extent, provide the assessments suggested by the guidance. We furthermore recommend a discussion of best management practices to reduce GHGs and other air emissions during operation of equipment, and vehicles. #30

The draft guidance proposes that climate change effects should be considered in the analysis of projects that are designed for long-term utility and located in areas that are considered vulnerable to specific effects of climate change within the project's timeframe. The focus of this analysis should be on those aspects of the environment that, based on the interaction between the proposed action and the

[1] Bedford, B.L. and E.M. Preston. 1988. Evaluating Cumulative Effects on Wetland Functions: a Conceptual Overview and Generic Framework. Environmental Management. Vol. 12, No. 5, pp. 565-583.

environment, are affected by the proposed action and on the significance of climate change on those aspects of the environment. Agencies should consider the specific effects of the proposed action (including the proposed action's effect on the vulnerability of affected ecosystems), the nexus of those effects with projected climate change effects on the same aspects of our environment, and the implications for the environment to adapt to the projected effects of climate change.

As the primary purpose and need for the proposed action is to restore water supply storage for the benefit of regional water users, EPA recommends that the project team thoroughly consider the need for measures to manage potential climate-related impacts, such as potential increases in storm frequency and intensity resulting in increased floodwater flows, and conversely, the potential for increased drought events. **#31**

While it is likely that your office is already aware of it, but because it does not appear that it is specifically mentioned in the document, we would like to point out that owners or operators of any project or combination of projects who engage in construction activities which will disturb one or more acres must have authorization to discharge stormwater under the Stormwater Runoff from Construction Activities General Permit S-MCST-0312-1. Construction activities consist of any activity (e.g. clearing, grubbing, excavating, and grading) which disturb a cumulative total of one or more acres or when the site is a part of a larger common plan of development or sale which will disturb a cumulative total of one or more acres. Kansas Department of Health & Environment authorizes these stormwater construction permits. **#33**

We would like to request clarification on a discrepancy in section 4.9.3 Recreation. The effects on recreation from the Preferred Alternative are said to be short-term, localized, minor, and adverse. The effect on recreation from Alternative #2 is said to be the same as the Preferred Alternative, but conversely states that "Alternative #2 would result in medium-term, minor, adverse effects on recreation." **#28** **#32**

Also, as outlined in 40 CFR 1502.8, we appreciate the use and inclusion of plain language and inclusion of definitions throughout the documents so that decision makers and the public can readily understand the document. We appreciate and commend this level of clarity.

EPA thanks you for the opportunity to review and provide comments for this document. If you have any questions or concerns, please feel free to contact Amber Tucker at 913-551-7565 or via email at tucker.amber@epa.gov.

Sincerely,

Jeffery Robichaud
Deputy Director
Environmental Services Division

Draft Environmental Impact Statement Rating Definitions

Environmental Impact of the Action

LO (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1 (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3 (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Kansas

Phone: 785-296-1535
Fax: 785-296-8464
www.kdheks.gov

Robert Moser, MD, Secretary

Department of Health & Environment

Sam Brownback, Governor

May 27, 2014

Mr. David Gade
Environmental Technical Services Branch
Regional Planning and Environmental Center
1645 S. 101 East Avenue
Tulsa, OK 74128

Ms. Susan Metzger, Chief of Planning and Policy
Kansas Water Office
901 S. Kansas Avenue
Topeka, KS 66612

RE: Draft Programmatic Environmental Impact Statement (DPEIS) for Dredging of John Redmond Reservoir

Dear Mr. Gade and Ms. Metzger:

#34

Thank you for the opportunity to review the DPEIS for the John Redmond dredging project. The Bureau of Water generally concurs with the selection of the preferred alternative of reclaiming 55,000 acre-feet of storage in the lake through the removal of 3 million cubic yards of accumulated sediment. We do have a concern regarding the discharge of any project water to the Neosho River below the dam. The Clean Water Act and its implementing regulations require new and expanding point source discharges satisfy the State's antidegradation policy regarding protection and maintenance of existing uses and current water quality.

Kansas Surface Water Quality Standards, codified in K.A.R. 28-16-28b through 28-16-28g, contain an antidegradation policy at K.A.R. 28-16-28c(a). Expectations for so called "Tier 2 waters" are "*For all surface waters of the state, existing water quality is better than applicable water quality criteria established in these regulations, that existing water quality shall be fully maintained and protected. Water quality may be lowered only if the department finds, after full satisfaction of the intergovernmental coordination and public participation requirements on antidegradation, ..., that a lowering of water quality is needed to allow for important social or economic development in the geographical area in which the waters are located. In allowing the lowering of water quality, the maintenance and protection of existing uses shall be ensured by the Department and the highest statutory and regulatory requirements for all new and existing point sources of pollution and all cost-effective and reasonable best management practices for nonpoint sources of pollution shall be achieved.*" (K.A.R. 28-16-28c(a)(1)(B)).

Additionally, "*Wherever surface waters of the state constitute exceptional state waters, discharges shall be allowed only if existing uses and existing water quality are maintained and protected.*" (K.A.R. 28-16-28c(a)(2)).

A discharge from Confined Disposal Facility B into the Neosho River will be viewed by the Bureau of Water as a new discharge, thereby triggering an antidegradation review. The reach of the Neosho River where the discharge may occur has a designated use of Special Aquatic Life and is generally viewed as a Tier 2 water for most pollutants, given its proximity to the dam at John Redmond Reservoir. Moreover, because of the transportability of sediments and their persistence in the stream environment, we have to view any introduction of suspended solids into the upper reaches of the Neosho River as having the potential to impact the downstream reaches deemed exceptional state waters in Labette and Cherokee Counties.

The underlying reason for the exceptional state water designation is the presence, past and present, of numerous mussel species, including several species on the Federal and State threatened and endangered species lists. The antidegradation provisions of the Kansas Surface Water Quality Standards calls for "*No degradation of surface water quality by artificial sources of pollution shall be allowed if the degradation will result in harmful effects on populations of any threatened or endangered species of aquatic or semiaquatic life...*" (K.A.R. 28-16-28c(a)(4)).

One of the principal threats to mussel communities has been increased siltation in the water column and on the riffle beds where mussels typically reside.

For this proposed discharge, three applicable narrative criteria apply and potentially limit the amount of suspended solids contained in the discharge.

1. *"Suspended solids added to surface waters by artificial sources shall not interfere with the behavior, reproduction, physical habitat, or other factors related to the survival and propagation of aquatic or semiaquatic life or terrestrial wildlife."* (K.A.R. 28-16-28e(c)(2)(B)).
2. *"Surface waters shall be free of deposits of sludge or fine solids attributable to artificial sources of pollution."* (K.A.R.28-16-28e(b)(6)).
3. *"The natural appearance of surface waters shall not be altered by the addition of color-producing or turbidity-producing substance of artificial origin."* (K.A.R. 28-16-28e(b)(8)).

An additional consideration is that Oklahoma has listed the Neosho River below the Kansas stateline and the upper reaches of Grand Lake for turbidity in its 2012 CWA Section 303(d) list of impaired waters. EPA will not sanction NDPES permits viewed as causing or contributing to impairment of downstream waters, particularly those of an interstate nature.

The Bureau is uncertain if the effluent discharged from CDF B will be able to adhere to those criteria. Typically, an antidegradation review examines if there are alternatives to discharging to the Tier 2 or 2.5 water. On page 95 of the DPEIS, the Kansas Water Office indicates, *"The quality of effluent discharged from these sites will meet the conditions and standards established by the Section 401 State water quality certification, as well as, the wastewater permitting limits established in a National Pollutant Discharge Elimination System (NPDES) permit. If limits are exceeded, the effluent <u>will be piped back</u> to John Redmond Reservoir. "* (emphasis added). Recognition of this option indicates a viable alternative to discharging to the Neosho River is available. Before a NPDES permit is issued for this discharge, the Kansas Water Office will need to: a) demonstrate that any such discharge and the suspended solid load will not be detrimental to downstream uses, especially at low flow conditions; and, 2) demonstrate why piping the CDF effluent back to John Redmond Reservoir is not done in lieu of the Neosho River discharge. Piping the effluent back to the reservoir would forego the need for any additional antidegradation considerations.

The Bureau notes that CDF A is located adjacent to the reservoir and could discharge its effluent back to the reservoir without need of a NPDES permit or consideration of any antidegradation considerations. Therefore, during the early stages of this project, the Bureau suggests foregoing any discharge to CDF B, returning the CDF A effluent back to the reservoir and monitoring its turbidity and suspended solid content. Meanwhile, the Office's plan for using the USGS gages and sensors to monitor downstream changes can build a baseline of conditions at various flows prior to any subsequent discharge into the Neosho River. This suggestion allows the Office to support its proposal and permit **#36** application to discharge from CDF B eventually with data on both the effluent quality as well as conditions throughout the lower reaches of the Neosho River. While Kansas' antidegradation policy allows for temporary sources of pollution producing ephemeral surface water quality degradation, the Bureau is quite sure the project's continual discharge over a five year period does not qualify as a short term impact to the existing uses of the Neosho River.

Regardless of the location of any discharge, the construction of the staging area, the pipeline route(s) and the sediment basins will disturb sufficient acres as to require a NPDES Construction Stormwater General Permit in addition to the **#35** NPDES discharge permit. We suggest the Office develop and submit the necessary applications as soon as possible to minimize delays to the dredging activity because of the timeframe of the permitting process. The process includes the review of the proposal, developing the draft permits, for the wastewater permit, a 30-day public notice period and issuance of the final permits, presuming no objectives were raised during the public notice period.

While the settling basins are not considered wastewater treatment systems subject to minimum design standards or lagoon regulations, we would suggest the design of their outfalls accommodate a release rate that minimizes downstream bank stability issues and erosion control at the outfall. Finally, after the CDF areas are stable and dewatered, another NPDES Construction Stormwater General Permit will be required for any soil disturbing activities occurring on areas over one acre in size. **#37**

The Bureau of Water stands ready to work with the Kansas Water Office to expedite any necessary permits to facilitate the start-up of dredging activities at John Redmond Reservoir. Please contact me or my staff if questions or issues arise during the permitting process.

Sincerely,

Michael B. Tate

Michael B. Tate, P.E.
Director, Bureau of Water
Kansas Department of Health and Environment

cc: John Mitchell, Tom Stiles, Don Carlson, Scott Satterthwaite

Gade, David SWT

From: Metzger, Susan [Susan.Metzger@kwo.ks.gov]
Sent: Wednesday, May 21, 2014 9:32 AM
To: Gade, David SWT
Subject: [EXTERNAL] FW: John Redmond Dredging Questions: Decker land adjacent to proposed site

David,

KWO has corresponded with Mary Sheridan, a landowner below John Redmond Reservoir. Mary would like to submit our correspondence into the formal comment period for the DPEIS. Please include the email exchange below.

Thank you,
Susan Metzger

#38

From: Mary [m2sheridan@aol.com]
Sent: Tuesday, May 20, 2014 5:21 PM
To: Metzger, Susan
Cc: Dolores home; Larry & Joanna Clark
Subject: Re: John Redmond Dredging Questions: Decker land adjacent to proposed site

Thank you for the comments addressing our preliminary questions concerning the upcoming dredging project. The email format is fine if that works as an attachment for the comments for the DPEIS.

The only other question to address would be possible devaluation of land if a sale would need to occur.

Thank you so much for the prompt communication.

Please let us know you received the request to attach for DPEIS comments.

Kind regards,
Mary Sheridan

Cc: Dolores Decker, Larry Clark

Sent from my iPhone

On May 12, 2014, at 2:38 PM, "Metzger, Susan" <Susan.Metzger@kwo.ks.gov<mailto:Susan.Metzger@kwo.ks.gov>> wrote:

Mary,

I can use the record of our emails as comments for the DPEIS or, if you prefer, you can submit comments more formally. We appreciate your input in either format.

Susan

From: Mary [mailto:m2sheridan@aol.com]
Sent: Monday, May 12, 2014 2:05 PM
To: Metzger, Susan
Subject: Re: John Redmond Dredging Questions: Decker land adjacent to proposed site

Thank you very much, Susan.

We greatly appreciate your time. Do we formalize our comments now to send in during the comment time?

Kind regards,
Mary
Sent from my iPhone

#38

On May 12, 2014, at 7:32 AM, "Metzger, Susan" <Susan.Metzger@kwo.ks.gov<mailto:Susan.Metzger@kwo.ks.gov>> wrote:
Mary,

Below are responses to the questions you pose. We would be glad to meet you in person to discuss these further or answer any other questions you may have.

Thank you,
Susan Metzger

1. Soil Quality

We know the quality of the soil currently on our farmland. The unknown is the quality of the sediment that is going to be pumped from the lake. If we choose to participate, what assurance do we have that the sediment pumped onto our land will be the same or better quality than our current soil? What happens to the current topsoil on our land?

Extensive sampling of the soils in the lake has also been conducted. Results from those samples can be found in Section 3.2.2 and Appendix F of the DPEIS. In general, the soils in John Redmond are similar, if not better in quality, than the soils found in other Kansas reservoirs and are typical of the nutrient concentrations found in the soils in the watershed above the lake. No toxic conditions or herbicides/pesticides were found in the samples.

When constructing the sediment disposal locations topsoil is excavated from the land to create the berms. Following sediment drying, the topsoil is replaced over the disposed sediment.

2. Production Quality

We have good bottom farmland that has a record of high yield production. If we choose to participate, we do NOT want a reduction in the current yield output. Since organic matter is reportedly low (3.2.2 Lake Sediment), what allowances will be made to leave our land at the same organic matter level as prior to the pumping process?

As described above, excavating the topsoil from the site to develop the berms and then replacing that topsoil over the disposed sediment helps to address the low organic content of the lake sediment. Ensuring landowners return to the yield they experienced prior to the sediment disposal is important to the Kansas Water Office. An option that may be offered is to include a Yield Clause in the agreement, committing to pay any difference in yield from pre to post project participation for a few years following completion of sediment disposal.

3. Contract Period

We want the contract period to be long enough to make sure the pumped sediment is solid and the organic level is restored for high production. Will the contract period be long enough to guarantee the pump in sediment will be completely dry and ready for production? Will the contract period take into account additional time to plant cover crops to add organic matter back in the soil at the same pre-project levels?

The contract period will be five year with the opportunity for one-year renewals if needed. Based on experience in other parts of the country from the time of construction to drying of sediment is typically less than five years, allowing time to remediate the site to pre-project levels. If the sites are not in the pre-project condition within the five year period, the contract may be renewed a year at a time until the sites recover.

4. Drainage

We will end up with a water drainage problem following the project. If my land is included in the project will we be assured that natural water drainage will be planned so water flows off property without causing erosion or loss of production? If my land is NOT included in the project and participating neighboring land is raised 5 to 6 feet above my land, how will drainage be addressed to keep natural water drainage from flowing off their property onto mine without causing erosion or loss of production? **#38**

Flooding. If the river reaches flood stage, our homestead will suffer more severe damage as lands surrounding it are higher. What steps will be taken to minimize greater damage from occurring in the instance of a flood?

Proper draining and flood impacts are important considerations to the proper design of the sediment disposal locations and the long-term remediation of these sites. The engineering and design of each Confined Disposal Facility (CDF) will be reviewed by the Kansas Department of Agriculture to ensure the CDFs do not impact the flood risk to local homes and structures. Section 4.9.5 describes the permits and analysis required. As these analyses are complete, KWO can share the results with local landowners to demonstrate assurance of the minimization of flood impacts.

5. Homestead

Our homestead will end up looking like an island surrounded by dikes and raised land. How close will sediment be pumped to existing homestead buildings? How will aesthetic components be taken into account while pumping sediment around existing homestead buildings?

Final locations for CDFs have not yet been determined, but the Kansas Water Office is considering proximity to existing homes and structures as an important consideration. Our intent is to locate CDFs away from homes to minimize adverse effects such as noise. See question #7 for additional information about aesthetics.

6. Compensation

The funding will not be equal to the production level income and funding may run out during the time period of the project.

While no contracts have been negotiated with landowners for this project at this point, we have verbally discussed compensation similar to the production level income. For example, if the return on corn acres in a good year is $375 per acre, the state is considering a rate of compensation per acre at least this value. Funding for the project will be through a state-backed bond and will be secured prior to entering into contracts with landowners – ensuring the funds are in hand for the full time period of the project.

7. Environmental impact to quality of life **#38**

Pumping noise, standing water odor, standing water insect infestation, etc. and proximity to our homestead. What steps are being taken to minimize these situations that are likely to arise?

As described in the DPEIS, the dredging may result in potential effects on aesthetics, particularly in the area of staging and hydraulic dredge activities, as well as, placement of dredge materials. Depending on the selected location for the excavated sediments, there would be a potential for effects on aesthetic character and visual resources through the changing of the topography in the vicinity of John Redmond Reservoir. In addition, dredging activities would likely result in the presence of heavy construction equipment and trucks. Effects on aesthetics are expected during the dredging process, but would dissipate as dredging was discontinued at the completion of the project.

To minimize negative aesthetic impacts, CDF sites will not be located immediately adjacent to occupied homes or structures. Construction activities can be limited to daytime hours to reduce the negative impacts of equipment noise. We are not experienced with the odor or insects that may be caused from the sediment disposal locations, but our contractor – Great Lakes Dredge and Dock, has extensive experience. We will coordinate with them to learn more about these potential temporary impacts to quality of life and learn more about what can be done to minimize these situations.

From: m2sheridan@aol.com<mailto:m2sheridan@aol.com> [mailto:m2sheridan@aol.com]
Sent: Wednesday, May 07, 2014 11:20 AM
To: Lewis, Earl; Metzger, Susan
Cc: clarklj@mchsi.com<mailto:clarklj@mchsi.com>; d1decker@yahoo.com<mailto:d1decker@yahoo.com>
Subject: John Redmond Dredging Questions: Decker land adjacent to proposed site

Hello, Earl. It was a pleasure speaking with you this morning since Susan was in meetings. We have some questions and appreciate any answers you can send us. It will probably be helpful, too, to set up an appointment to meet in person, but we look forward to any response in the meantime.

Thank you.

Kind regards,
Mary Sheridan
CC: Dolores Decker, Larry Clark

Concerns and questions regarding the proposed removal and disposal of sediment and restoration of water storage at John Redmond reservoir, Kansas

1. Soil Quality
According to the
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (DPEIS)
Prepared for the: REMOVAL AND DISPOSAL OF SEDIMENT AND RESTORATION OF WATER STORAGE AT JOHN REDMOND RESERVOIR, KANSAS, April 2014, page 41: 3.2.2 Lake Sediment, "Soils formed within the John Redmond Reservoir site and the project area are relatively shallow, silty loam and silty, clay loams that are fertile, but low in organic matter and phosphoric acid."

Concern
We know the quality of the soil currently on our farmland. The unknown is the quality of the sediment that is going to be pumped from the lake.

Questions
If we choose to participate, what assurance do we have that the sediment pumped onto our land will be the same or better quality than our current soil?

What happens to the current topsoil on our land?

2. Production Quality
Concern
We have good bottom farmland that has a record of high yield production. If we choose to participate, we do NOT want a reduction in the current yield output.

Question
Since organic matter is reportedly low (3.2.2 Lake Sediment), what allowances will be made to leave our land at the same organic matter level as prior to the pumping process?

3. Contract Period
Concern
We want the contract period to be long enough to make sure the pumped sediment is solid and the organic level is restored for high production.

Questions
Will the contract period be long enough to guarantee the pump in sediment will be completely dry and ready for production?

Will the contract period take into account additional time to plant cover crops to add organic matter back in the soil at the same pre-project levels?

4. Drainage
Concern
We will end up with a water drainage problem following the project.

#38

Questions

If my land is included in the project will we be assured that natural water drainage will be planned so water flows off property without causing erosion or loss of production?

If my land is NOT included in the project and participating neighboring land is raised 5 to 6 feet above my land, how will drainage be addressed to keep natural water drainage from flowing off their property onto mine without causing erosion or loss of production?

Concern
Flooding. If the river reaches flood stage, our homestead will suffer more severe damage as lands surrounding it are higher.

Questions
What steps will be taken to minimize greater damage from occurring in the instance of a flood?

5. Homestead
Concern
Our homestead will end up looking like an island surrounded by dikes and raised land.

Questions
How close will sediment be pumped to existing homestead buildings?

How will aesthetic components be taken into account while pumping sediment around existing homestead buildings?

6. Compensation
Concern
The funding will not be equal to the production level income and funding may run out during the time period of the project.

7. Environmental impact to quality of life

Concern
Pumping noise, standing water odor, standing water insect infestation, etc. and proximity to our homestead.

Questions
What steps are being taken to minimize these situations that are likely to arise?

#38

TELEPHONE OR VERBAL CONVERSATION RECORD For use of this form, see AR 340–15; the proponent agency is The Adjutant General's Office.		DATE 04/22/2014
SUBJECT OF CONVERSATION DPEIS_John Redmond Reservoir, Kansas: Dredging		
	INCOMING CALL	
PERSON CALLING Chauncey Shepard	ADDRESS	PHONE NUMBER AND EXTENSION 620.724.2694
PERSON CALLED David Gade	OFFICE CESWF-PEC-TN (Tulsa)	PHONE NUMBER AND EXTENSION 918.669.7579
	OUTGOING CALL	
PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	ADDRESS	PHONE NUMBER AND EXTENSION

SUMMARY OF CONVERSATION:

Mr. Shepard received a letter (on the mailing list) indicating the availability of the JR Dredging DPEIS.

Mr. Shepard initially inquired if dredge material confined disposal facility (CDF) sites had been identified, and then expressed concern about the potential for even more sediment to pass through John Redmond Reservoir, during runoff events and throughout the dredging process, clogging gravel bottoms in the Neosho River downstream from the dam. Additional comments expressed concern about the design and location of CDFs and their ability to hold contents and withstand extreme rain events. Mr. Shepard was a member of the Basin Advisory Committee (Neosho?) and formerly worked a gravel mining operation (Valley Gravel) on the Neosho River in the vicinity of Parsons, KS. Mr. Shepard indicated that harmful effects to the federally and State (KS) listed Neosho Madtom downstream of John Redmond Reservoir are likely. He expressed an opinion that the construction of reservoirs on the Neosho River has changed the character of the river irreparably leading to bank erosion and other detrimental downstream effects. **#39**

Mr. Shepard does not currently have the ability to access or view a digital copy ('pdf' download or CD) of the DPEIS, nor does he presently have the ability to travel to either the Burlington or the New Strawn public libraries where the DPEIS is on file.

DA FORM 1 APR 66 751 REPLACES EDITION OF 1 FEB 58 WHICH WILL BE USED. U.S.GPO:1982-0-564-036/1586

Date: April 24, 2014

Correspondence: Phone Call between Susan Metzger (Kansas Water Office) and Danny Hawkins (Water/Wastewater Superintendent City of Burlington)

Summary: Danny Hawkins completed a review of the Draft Programmatic Environmental Impact Statement (PDEIS) for John Redmond Reservoir and wanted to discuss the project. Mr. Hawkins noted that the PDEIS was thorough and answered many of the questions about the dredging initiative. With respect to the Water Treatment operations at Burlington, Mr. Hawkins **#40** noted that the PDEIS included all the information with respect to sediment quality and downstream turbidity with which he was interested. Mr. Hawkins sought clarification on why Site C had been eliminated from consideration for use as a Confined Disposal Facility (CDF). Susan Metzger confirmed that the site was removed from consideration because of potential impacts to wetlands, streams and fish rearing habitat. Mr. Hawkins expressed his appreciation for the opportunity to review the PDEIS and the quantity and quality of information contained in the PDEIS.

From: City Clerk [mailto:newstrawncityclerk@embarqmail.com]
Sent: Monday, May 19, 2014 9:09 AM
To: Ingels, Katie
Subject: John Redmond Dredging Initiative

Dear Ms. Patterson-Ingels,

#41

On behalf of the City of New Strawn, I am writing this letter to initiate formal comment/feedback regarding the John Redmond Dredging Initiative (JRDI). We, as the City of New Strawn, have concerns regarding how the state will adequately address the impact odor and noise pollution will have on our city and residents. At a recent City meeting, there was a discussion that the proposed dredging ponds, due to size and material, could have a negative impact on citizens of the city. Upon review of the "Draft Programmatic Environmental Impact Statement (DPEIS) - April 2014," it is unclear as to what analysis, measure, or comparison has been given regarding odor from dredged material and the impacts to our community.

Please let us know what the next steps in the process are and we will be looking forward to dialogue regarding these concerns.

Regards,
Mark Petterson
Mayor - City of New Strawn

Kerry Templeton
City Clerk
City of New Strawn, KS
620-364-8283
620-364-5110 fax

APPENDIX J

Plans and Specifications for CDF Sites A, B and E

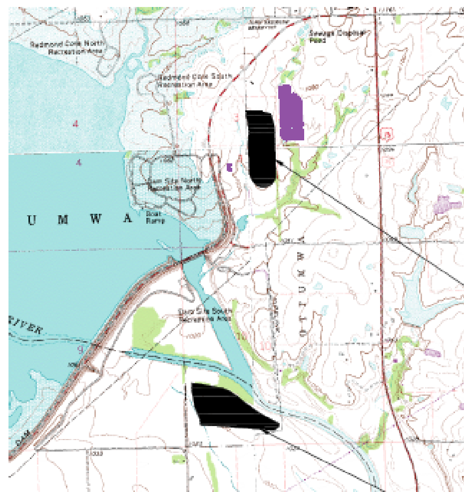
(Note – Mitigation measures identified in Section 5.0 of this Final PEIS will be incorporated, where appropriate, into the Final Specifications. Plans and Final Specifications will be posted to the project website at www.kwo.org)

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITES "A" & "B"

LEGEND

+	SPOT ELEVATION		GUY ANCHOR
—B—	BREAKLINE		GUY POLE
—F—	FLOWLINE		ELECTRICAL BOX
—TB—	TOP OF BANK		LIGHT POLE
—TS—	TOE OF SLOPE		ELECTRIC MANHOLE
—EOA—	EDGE OF ASPHALT		POWER POLE
—EBW—	EDGE OF BRICK	—UGE—	UNDERGROUND ELECTRIC
—EOC—	EDGE OF CONCRETE	—OHE—	OVERHEAD ELECTRIC WIRE
—CRP—	EDGE OF CROP		CABLE TELEVISION PEDESTAL
—EGV—	EDGE OF GRAVEL	—UGTV—	UNDERGROUND TELEVISION
—GTR—	EDGE OF GUTTER	—OHTV—	OVERHEAD TELEVISION WIRE
—HDG—	EDGE OF HEDGE		TELEPHONE AND POWER POLE
—EOR—	EDGE OF ROCK		TELEPHONE MANHOLE
—EOT—	EDGE OF TREES		TELEPHONE PEDESTAL
—EOW—	EDGE OF WATER		TELEPHONE POLE
—CB—	TOP, BACK OF CURB	—FO—	FIBRE OPTIC LINE
—FCE—	FENCE	—UGT—	UNDERGROUND TELEPHONE LINE
—SW—	SIDEWALK	—OHT—	OVERHEAD TELEPHONE WIRE
—SHL—	TOP, SHOULDER		GAS BOX
—TW—	TRAVELED WAY		GAS METER
—WST—	WHITE STRIPE		GAS VALVE
—YST—	YELLOW STRIPE		GAS VENT
	TRAFFIC CONTROL BOX		GAS WELL
	TRAFFIC SIGNAL MANHOLE	—GAS—	GAS LINE
	TRAFFIC SIGNAL		OIL WELL
—TFSW—	TRAFFIC SIGNAL WIRE		VENT PIPE
	ORNAMENTAL LITE	—PPL—	PETROLEUM PIPELINE
	POST		IRRIGATION SPRINKLER
	SIGN		IRRIGATION SPRINKLER VALVE
	UTILITY WARNING SIGN		IRRIGATION WELL
	RAILROAD CROSSING SIGNAL		FIRE HYDRANT
	BRACE POLE		2-WAY FIRE HYDRANT
	AIR VALVE		3-WAY FIRE HYDRANT
	BORE HOLE		WATER METER
	MONITORING WELL		WATER VALVE
	TEST HOLE		WATER SERVICE STOP
	FLAGPOLE		WATER WELL
	MAILBOX		YARD HYDRANT
MP	MILE POST	—W—	WATER LINE
	BUSH		SANITARY SEWER CLEANOUT
	STUMP		SANITARY SEWER LAMPHOLE
	CONIFEROUS TREE		SANITARY SEWER MANHOLE
	DECIDUOUS TREE		SANITARY SEWER LIFT STATION
			SANITARY SEWER VALVE
		—FM—	SANITARY SEWER FORCE MAIN
		—SS—	SANITARY SEWER LINE
			STORM SEWER MANHOLE
		—CMP—	CORRUGATED METAL PIPE
		—RCB—	REINFORCED CONCRETE BOX



LOCATION MAP

INDEX OF DRAWINGS

EBH & Associates
ENGINEERS, PLANNERS & SURVEYORS
Evans-Bierly-Hutchison & Associates, P.A.
Offices in Kansas
Great Bend, Cimarron, Goodland,
Hillsboro, Marion, Neodesha, & Pratt

15607
8-1-14

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"

Date	Description

Project # R2091.1

Title: COVER
Sheet:

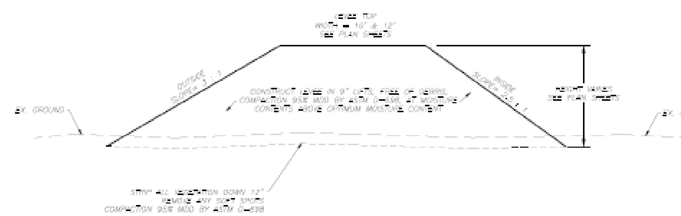
CONFINED DISPOSAL FACILITY GENERAL NOTES

1. CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, INCLUDING SERVICE CONNECTIONS AND DROPS, PRIOR TO CONSTRUCTION BY CONTACTING THE RESPECTIVE UTILITY COMPANY AND PROSPECTING. UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE NOT GUARANTEED AS TO COMPLETENESS NOR AS TO ACCURACY FOR POSITION, DEPTH, SIZE, OR TYPE OF MATERIAL. CONTRACTOR SHALL CALL KANSAS ONE CALL SYSTEM (DIG SAFE) 1-800-344-7233.
2. CONTRACTOR SHALL MAINTAIN TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS, AND SHALL PROVIDE SUCH PROTECTIVE MEASURES AS ARE REQUIRED TO ENSURE THE SAFETY OF THE GENERAL PUBLIC, EMPLOYEES, AND EQUIPMENT. ALLEYS, DRIVEWAYS, AND OTHER PUBLIC ACCESSES SHALL BE OPEN TO TRAFFIC AT THE END OF EACH DAY'S WORK UNLESS OTHERWISE APPROVED IN WRITING BY THE OWNER OR ENGINEER.
3. CONTRACTOR SHALL MAINTAIN DRAINAGE DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS. POSITIVE DRAINAGE SHALL BE MAINTAINED IN AND AROUND THE SITE TO ELIMINATE STANDING WATER.
4. REMOVAL AND REPLACEMENT OF SIGNS, MAILBOXES, FENCES, ORNAMENTAL OR DECORATIVE OBJECTS, LANDSCAPING, AND SIMILAR FEATURES SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM.
5. ALL MATERIALS SALVAGED FROM THIS PROJECT ARE THE PROPERTY OF OWNER. AT OWNER'S OPTION, CONTRACTOR SHALL DELIVER SUCH MATERIALS TO OWNER'S DESIGNATED STORAGE YARD OR PROPERLY DISPOSE OF ANY SUCH MATERIALS OWNER DOES NOT WANT. DELIVERY AND DISPOSAL COSTS SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL WASTE ENCOUNTERED OR GENERATED ON THIS PROJECT. DISPOSAL COSTS SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM. THE ENTIRE AREA SHALL BE LEFT IN A CLEAN AND SIGHTLY CONDITION.
7. ALL EXCAVATION IS UNCLASSIFIED. CONTRACTOR SHALL DETERMINE THE EXTENT OF ROCK EXCAVATION REQUIRED. ROCK EXCAVATION WILL BE SUBSIDIARY TO RELATED WORK. NO ADDITIONAL PAYMENT WILL BE MADE FOR ROCK EXCAVATION. ALL EXCAVATION SHALL BE DONE WITH MECHANICAL EQUIPMENT, i.e. TRENCHER, BACKHOE, ROCKSAW.
8. SUBSIDIARY ITEMS WILL NOT BE PAID FOR SEPARATELY, BUT ARE TO BE INCLUDED WITH THE APPROPRIATE ITEM THEY ARE RELATED TO.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY IRONS WHICH ARE SHOWN ON PLANS. THE CONTRACTOR SHALL BE REQUIRED TO REESTABLISH ANY PROPERTY IRONS WHICH HAVE BEEN SHOWN AND WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH IRONS SHALL BE REESTABLISHED BY A REGISTERED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS. NO SEPARATE MEASUREMENT OF PAYMENT WILL BE MADE FOR THIS WORK AS IT SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT.
10. CONTRACTOR TO FOLLOW ORDER OF WORK AS OUTLINED IN SECTION 01010 OF THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS UNLESS RELIEVED OF THOSE REQUIREMENTS IN WRITING BY THE ENGINEER.
11. CONTRACTOR SHALL ABIDE BY STORMWATER POLLUTION PREVENTION PLAN. ALL POLLUTION CONTROL MEASURES MUST BE INSTALLED AND MAINTAINED THROUGHOUT THE PERIOD OF CONSTRUCTION. CARE MUST BE TAKEN TO AVOID SILT OR OTHER POLLUTANTS FROM ENTERING STREETS RIGHT OF WAYS, STREAMS, AND OTHER ADJACENT PROPERTIES.
12. CONTRACTOR WILL PROVIDE PHONE NUMBER OF EMPLOYEE WHO WILL BE AVAILABLE TO MAKE NECESSARY REPAIRS TO THE POLLUTION CONTROL MEASURES IN THE EVENT OF A STORM WHICH DAMAGES SAID MEASURES.
13. CONTRACTOR TO HAVE WATER TRUCKS AND EQUIPMENT AVAILABLE DURING ALL CONSTRUCTION FOR USE IN SUPPRESSION OF BLOWING DIRT AND DEBRIS. OWNER CAN REQUEST WATERING OR OTHER SUPPRESSION MEASURES BE UNDERTAKEN AS CONDITIONS REQUIRE.
14. MAINTENANCE OF POLLUTION CONTROL STRUCTURES IN AND AROUND THE SITE IS THE RESPONSIBILITY OF THE CONTRACTOR AND CANNOT BE TURNED OVER TO ANY OTHER CONTRACTOR WITHOUT WRITTEN APPROVAL OF THE OWNER / ENGINEER.
15. CONTRACTOR SHALL SCHEDULE A FINAL MEETING WITH THE ENGINEER AT COMPLETION OF THE PROJECT TO REVIEW THE POLLUTION CONTROL STRUCTURES. ENGINEER WILL INSPECT ALL MEASURES FOR FINAL APPROVAL.
16. CONCRETE – PROPORTIONING OF CONCRETE SHALL BE AS FOLLOWS:

    MISCELLANEOUS
    A. AIR – ENTRAINED 4000 psi CONCRETE
    B. CEMENT CONTENT – 7 1/2 SACKS (94 LB. PER SACK) PER CUBIC YARD OF CONCRETE
    C. NET WATER/CEMENT RATIO – 0.49 lb. WATER PER lb. CEMENT
    D. MIXED AGGREGATE – 20 PERCENT CRUSHED ROCK, MINIMUM
    E. MAXIMUM SIZE AGGREGATE SHALL NOT EXCEED 1/4 OF SLAB THICKNESS
17. DEWATERING SHALL BE CONSIDER SUBSIDIARY TO RELATED WORK. CONTRACTOR TO INSPECT SITE AND MAKE OR OBTAIN SUCH EXPLORATIONS TO SATISFY HIMSELF AS TO THE ELEVATION OF THE WATER TABLE AND AMOUNT OF DEWATERING REQUIRED. DEWATERING AND ALL RELATED COSTS ARE SUBSIDIARY TO THE PROJECT. NO ADDITIONAL PAYMENT WILL BE MADE FOR DEWATERING ON PROJECT.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	CDF "A" & "B"		
1.	Mobilization	L.S.	1
2.	Clearing and Grubbing	C.Y.	94,199
3.	Common Excavation	C.Y.	199,230
4.	Compacted Embankment	C.Y.	84,101
5.	Sluice Gate Structure	Each	4
6.	Seeding	Acre	19
7.	Access Drive	S.Y.	AS NEEDED

FOR UNIT PRICE WORK: BIDDER AGREES THAT ESTIMATED QUANTITIES ARE NOT GUARANTEED AND THAT FINAL PAYMENT WILL BE BASED ON ACTUAL QUANTITIES. ENGINEER MAY ADJUST QUANTITIES AT TIME OF CONSTRUCTION.



TYPICAL LEVEE DETAIL

N.T.S.

UTILITY PROVIDERS

GAS	PHILLIPS 66 PIPELINE	(877) 267-2290
WATER	CITY OF NEW STRAWN	(620) 364-8283
KANSAS ONE-CALL SYSTEM		(800) 344-7233

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JOHN D. KROSSCHELL
15607
8-1-14
KANSAS
PROFESSIONAL ENGINEER

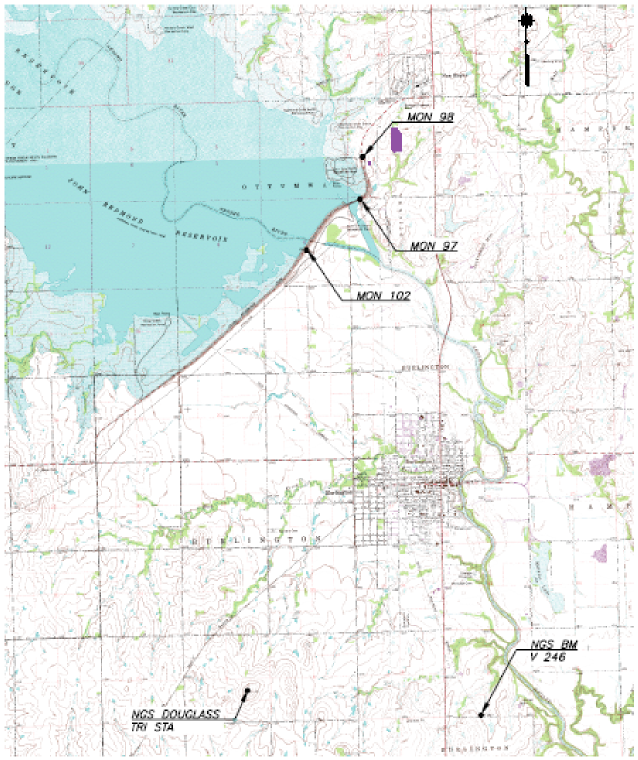
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"

Date	Description

Project # R2091.1

Title:
GENERAL
REQUIREMENT
NOTES

Sheet:
G-001



SURVEY CONTROL PLAN

0 1000' 2000'

DATE OF FIELD WORK: MONTH YEAR
PROJECT UNITS: ***** US FT
VERTICAL DATUM: NAVD88

SURVEY CONTROL

Point #	Northing	Easting	Elevation	Description
1	1867814.06	2094247.83	–	HORIZONTAL CONTROL NGS DOUGLASS TRI STA STANDARD BRONZE DISK SET IN CONCRETE ±2 MILES SOUTHWEST OF BURLINGTON ON THE HIGHEST GRASSY KNOLL
200	1866362.93	2108167.72	1047.79	VERTICAL CONTROL NGS BM V 246 1934 STANDARD DISK SET IN CONCRETE ±2 MILES SOUTH OF BURLINGTON 85 FT NORTH OF CENTERLINE OF 9TH ROAD
97	1897772.49	2100716.55	1082.83	MONUMENT 97 COE MONUMENT, NORTHERLY SIDE OF DAM, NEAR NORTHEASTERLY END
98	1900381.72	2100812.29	1082.49	MONUMENT 98 COE MONUMENT, FOUND IN CONCRETE BY "CASTLE" SIGN AT ENTRANCE TO "DAMSITE" STATE PARK
102	1894727.28	2097542.99	1081.10	MONUMENT 102 FOUND IN CONCRETE @ JR-BM-3, ON DAM WHERE ACCESS ROAD "T"S OFF

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JOEL D. KROSSCHELL
LICENSED
15607
6-1-14
KANSAS
PROFESSIONAL ENGINEER

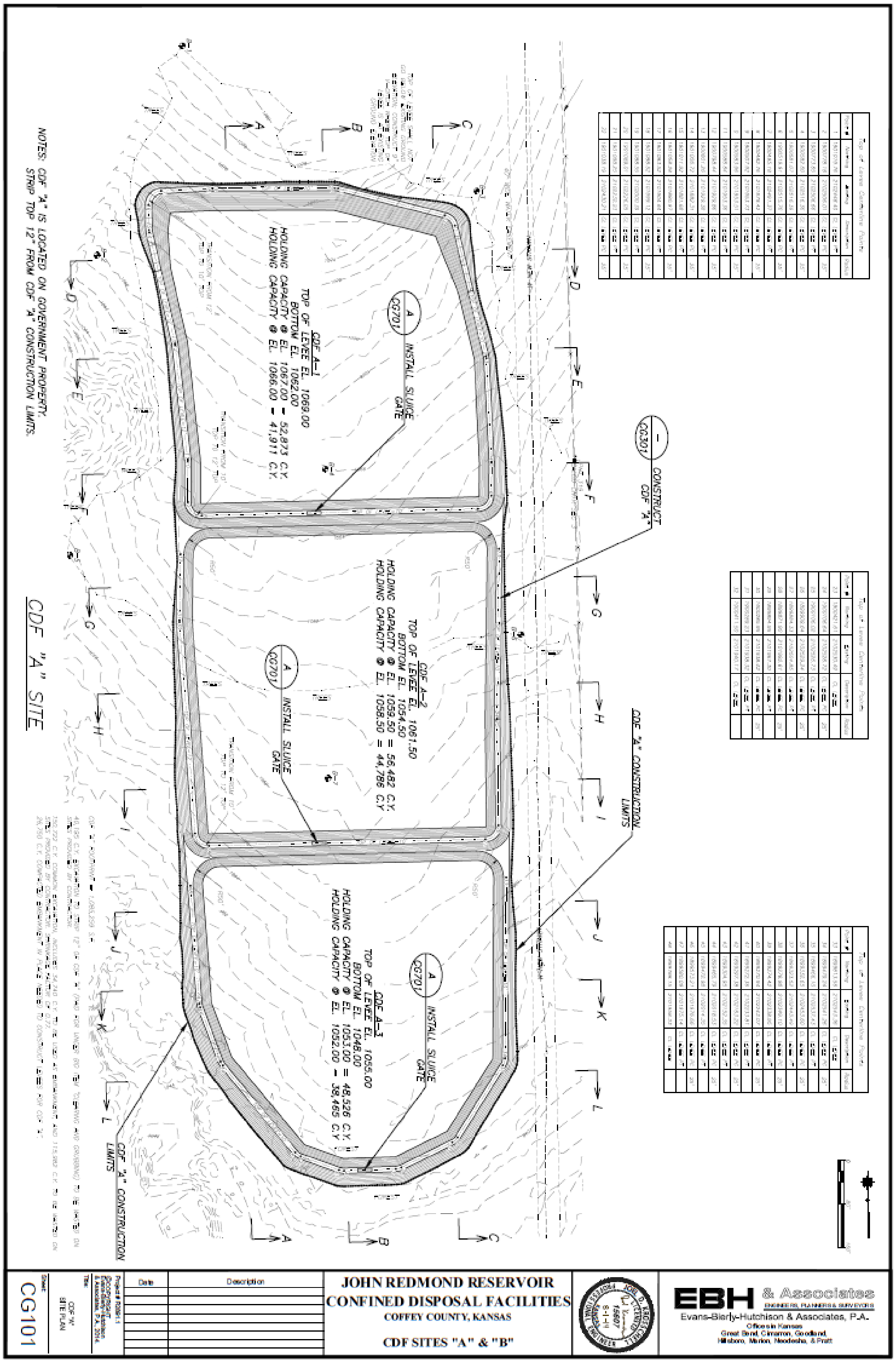
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"

Date	Description

Project # R2091.1

Title:
SURVEY CONTROL
PLAN AND DATA

Sheet:
V-001



NOTES: CDF "A" IS LOCATED ON GOVERNMENT PROPERTY.
STRIP TOP 12" FROM CDF "A" CONSTRUCTION LIMITS.
CDF "A" SITE
CDF A-1
TOP OF LEVEE EL. 1069.00
BOTTOM EL. 1062.00
HOLDING CAPACITY @ EL. 1067.00 = 52,873 C.Y.
HOLDING CAPACITY @ EL. 1066.00 = 41,911 C.Y.
CDF A-2
TOP OF LEVEE EL. 1061.50
BOTTOM EL. 1054.50
HOLDING CAPACITY @ EL. 1059.50 = 56,482 C.Y.
HOLDING CAPACITY @ EL. 1058.50 = 44,786 C.Y.
CDF A-3
TOP OF LEVEE EL. 1055.00
BOTTOM EL. 1048.00
HOLDING CAPACITY @ EL. 1053.00 = 48,526 C.Y.
HOLDING CAPACITY @ EL. 1052.00 = 38,465 C.Y.
INSTALL SLUICE GATE
CONSTRUCT CDF "A"
CDF "A" CONSTRUCTION LIMITS
Date
Description
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
EBH & Associates
Evans-Bierly-Hutchison & Associates, P.A.
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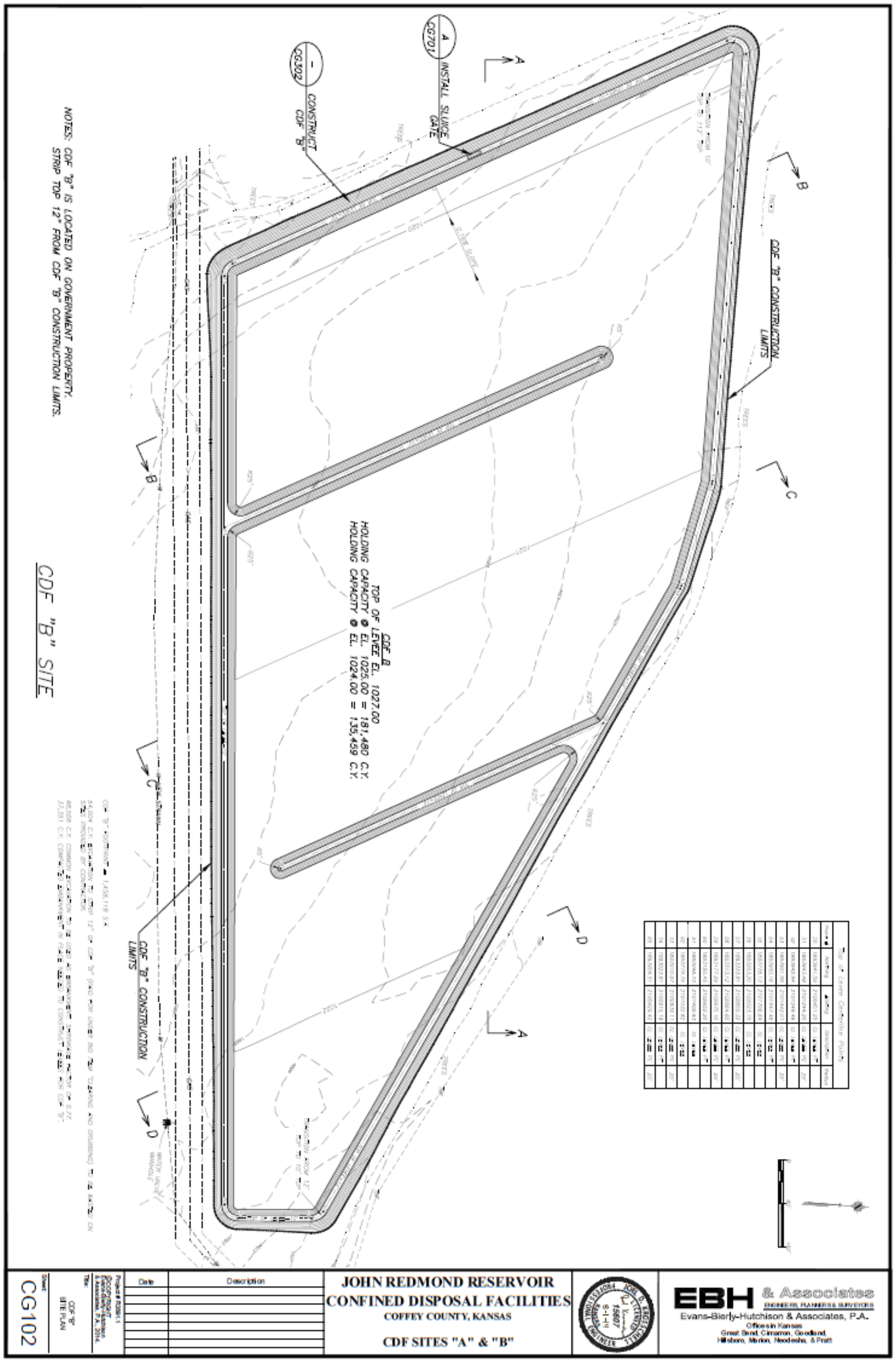
Title:
CDF "A" SITE PLAN
Sheet:
CG101


CDF "B" SITE
NOTES: CDF "B" IS LOCATED ON GOVERNMENT PROPERTY.
STRIP TOP 12" FROM CDF "B" CONSTRUCTION LIMITS.
CDF B
TOP OF LEVEE EL. 1027.00
HOLDING CAPACITY @ EL. 1025.00 = 181,480 C.Y.
HOLDING CAPACITY @ EL. 1024.00 = 135,459 C.Y.
INSTALL SLUICE GATE
CONSTRUCT CDF "B"
CDF "B" CONSTRUCTION LIMITS
Top of Levee Centerline Points
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
Date
Description
CDF "B" SITE PLAN
CG102
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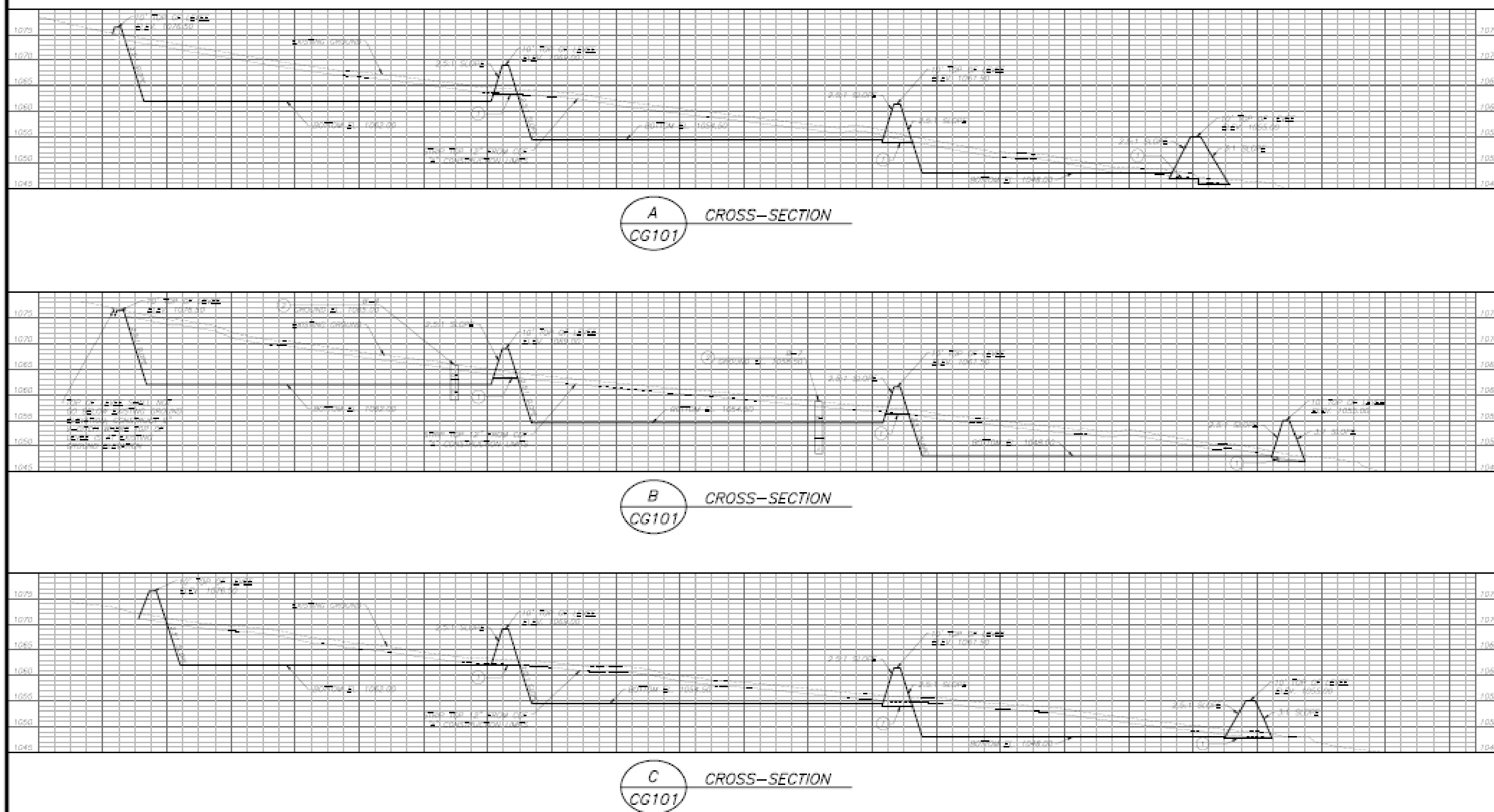

HORIZONTAL SCALE

LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.

THE SUBGRADE UPON WHICH THE LEVEES WILL BE CONSTRUCTED SHALL BE PROPERLY PREPARED TO PROVIDE ADEQUATE SUPPORT FOR COMPACTION AND BE FREE OF MASS MOVEMENTS. AFTER EXCAVATING AREAS TO 12 INCHES BELOW GRADE, THE SURFACE SHALL BE PROOF ROLLED WITH A DUMP TRUCK OR SIMILAR PIECE OF EQUIPMENT TO LOCATE ANY UNSTABLE SOILS. ANY UNSTABLE SOILS LOCATED WITHIN 6 INCHES OF THE EXPOSED SUBGRADE WILL BE REMOVED AND REPLACED WITH SUITABLE COMPACTED FILL.

CROSS-SECTION NOTES:

1. STEP & COMPACT NATIVE SOILS: 1'-0" MAXIMUM HEIGHT, 5' MINIMUM WIDTH ON ALL NATIVE SLOPES 1:8 OR GREATER PER GEOTECHNICAL RECOMMENDATIONS.

2. THE BORING DATA SHOWN IS VALID ONLY FOR THE LOCATION WHERE THE EXPLORATORY BORING WAS DRILLED. THE BORING DATA WAS EXTENDED TO THE CROSS SECTION LINE AND IS PROVIDED FOR INFORMATION ONLY. SEE THE GEOTECHNICAL REPORT IN SPECIFICATIONS.

FAT CLAY — SHALE — LEAN CLAY — LIMESTONE

BORING NUMBER — GROUND EL — BORING ELEVATION

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JOEL D. KROSSCHELL LICENSED 15607 8-1-14 KANSAS PROFESSIONAL ENGINEER

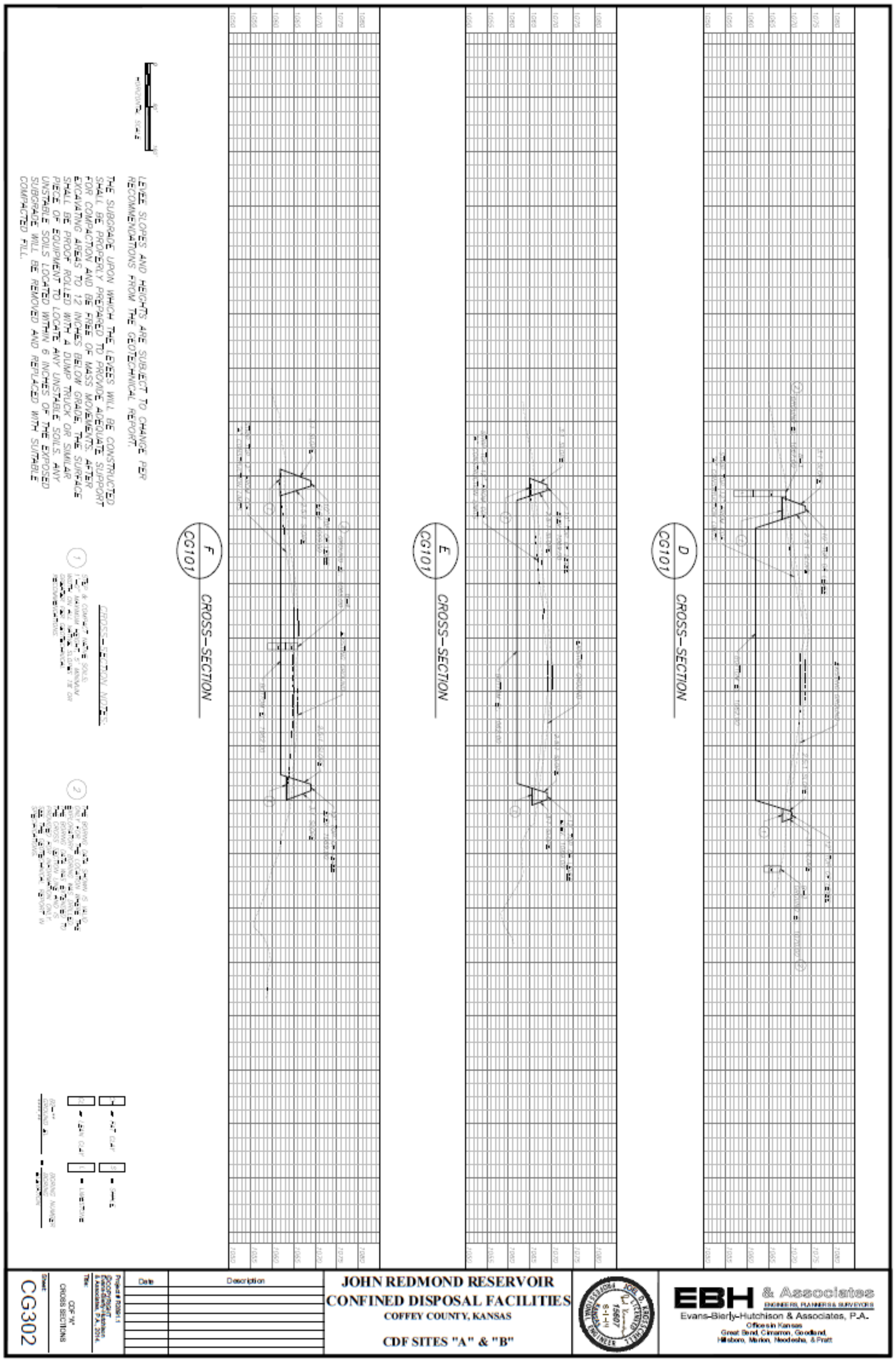
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITES "A" & "B"

Date	Description

Project # R2891.1

Title: CDF "A" CROSS SECTIONS
Sheet: CG301



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JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
Description
Date
CROSS SECTIONS
CG302
D CG101 CROSS–SECTION
E CG101 CROSS–SECTION
F CG101 CROSS–SECTION
CROSS–SECTION NOTES:
LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.
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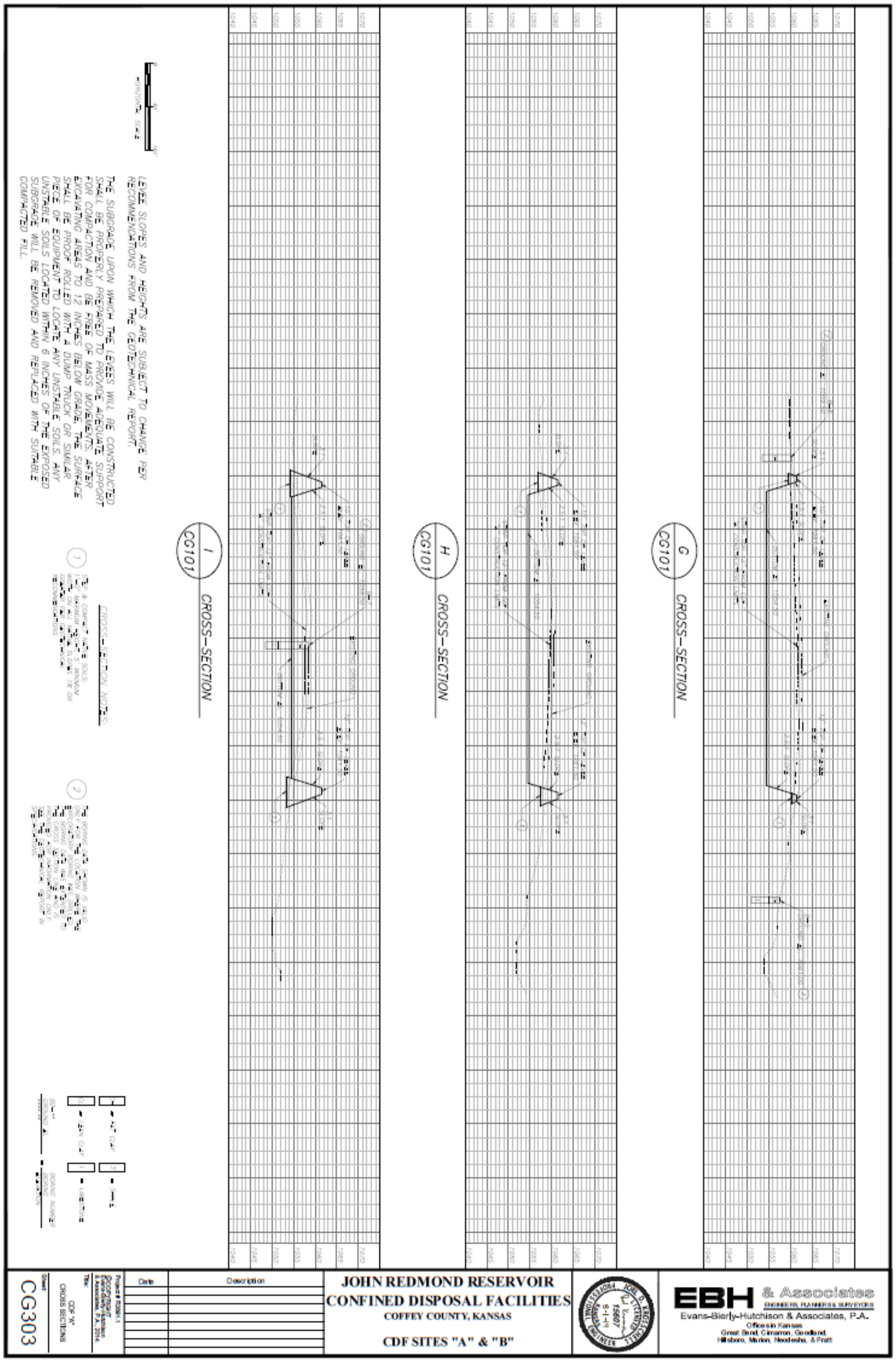
G CG101 CROSS–SECTION
H CG101 CROSS–SECTION
I CG101 CROSS–SECTION
CROSS–SECTION NOTES:
LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.
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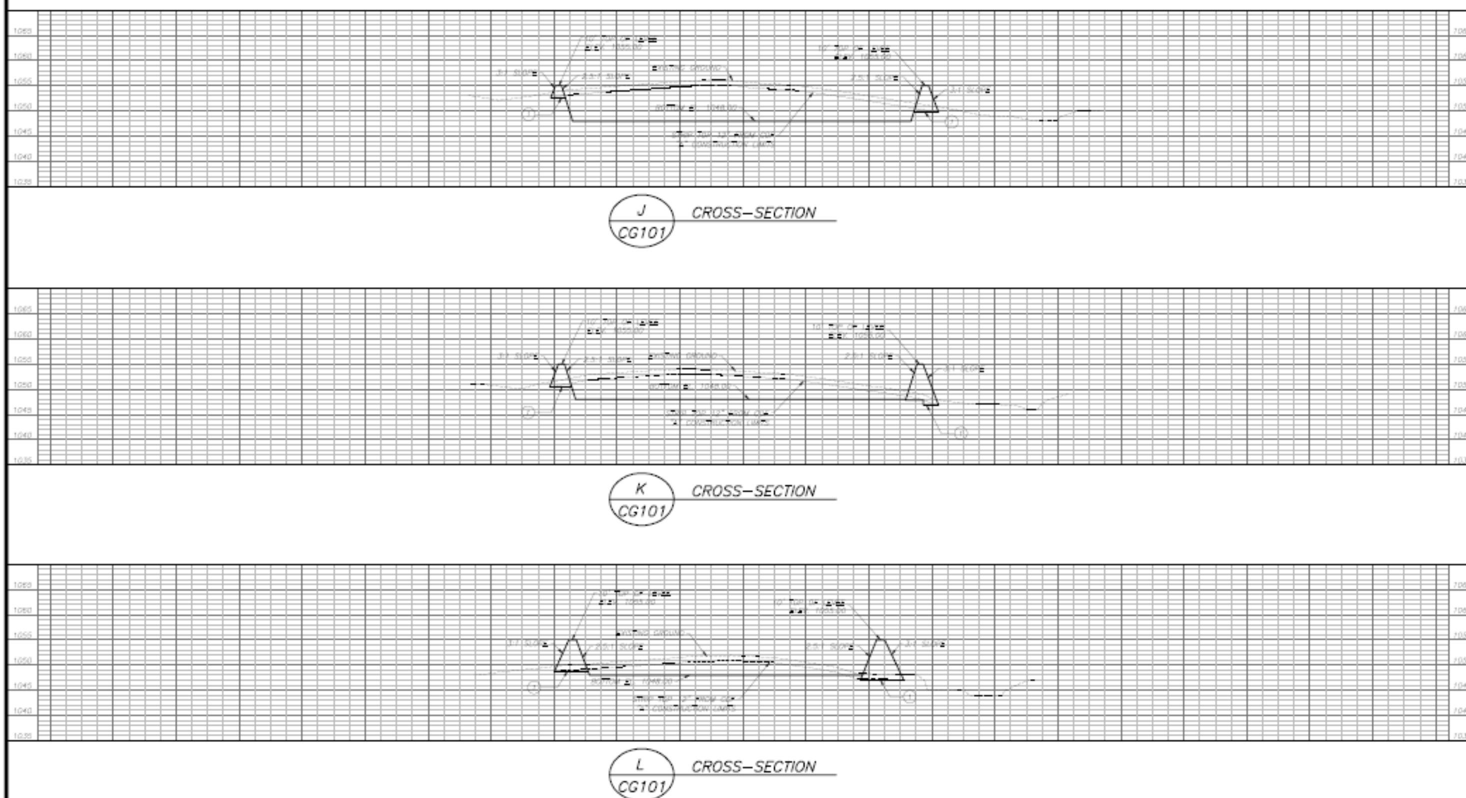
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
EBH & Associates
ENGINEERS, PLANNERS & SURVEYORS
Evans-Bierly-Hutchison & Associates, P.A.
Offices in Kansas
Great Bend, Cimarron, Goodland, Hillsboro, Marion, Neodesha, & Pratt
Date
Description
Title: CDF "A" CROSS SECTIONS
Sheet: CG303



LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.

THE SUBGRADE UPON WHICH THE LEVEES WILL BE CONSTRUCTED SHALL BE PROPERLY PREPARED TO PROVIDE ADEQUATE SUPPORT FOR COMPACTION AND BE FREE OF MASS MOVEMENTS. AFTER EXCAVATING AREAS TO 12 INCHES BELOW GRADE, THE SURFACE SHALL BE PROOF ROLLED WITH A DUMP TRUCK OR SIMILAR PIECE OF EQUIPMENT TO LOCATE ANY UNSTABLE SOILS. ANY UNSTABLE SOILS LOCATED WITHIN 6 INCHES OF THE EXPOSED SUBGRADE WILL BE REMOVED AND REPLACED WITH SUITABLE COMPACTED FILL.

CROSS–SECTION NOTES:

1. STEP & COMPACT NATIVE SOILS.

2. THE BORING DATA SHOWN IS VALID ONLY FOR THE LOCATION WHERE THE EXPLORATORY BORING WAS DRILLED.

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITES "A" & "B"

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Date	Description

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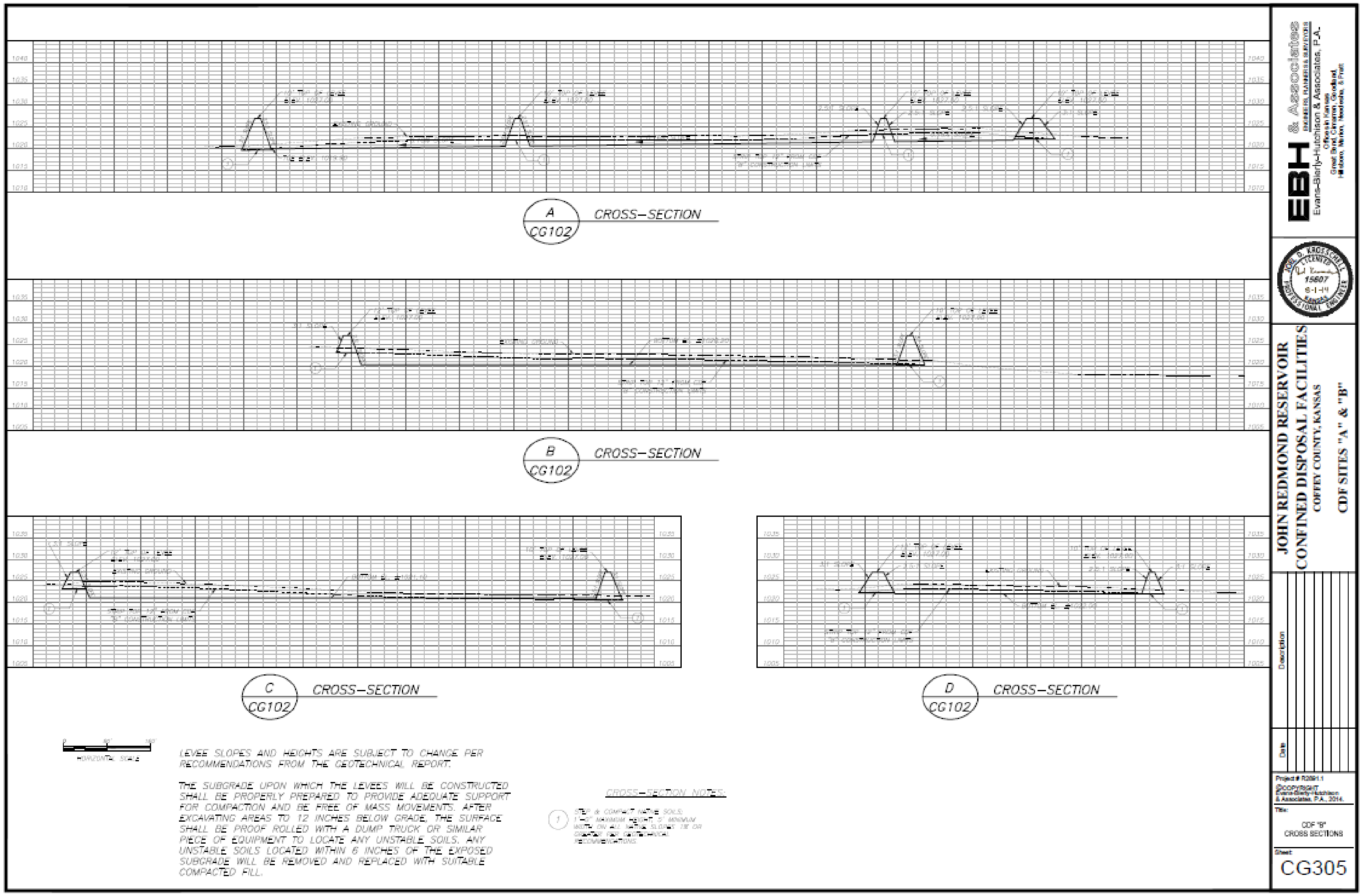
Title:
CDF "A"
CROSS SECTIONS

Sheet:
CG304



A CG102 CROSS-SECTION
B CG102 CROSS-SECTION
C CG102 CROSS-SECTION
D CG102 CROSS-SECTION
HORIZONTAL SCALE
LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.
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CROSS-SECTION NOTES:
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JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
15607
Description
Date
Project # R2091.1
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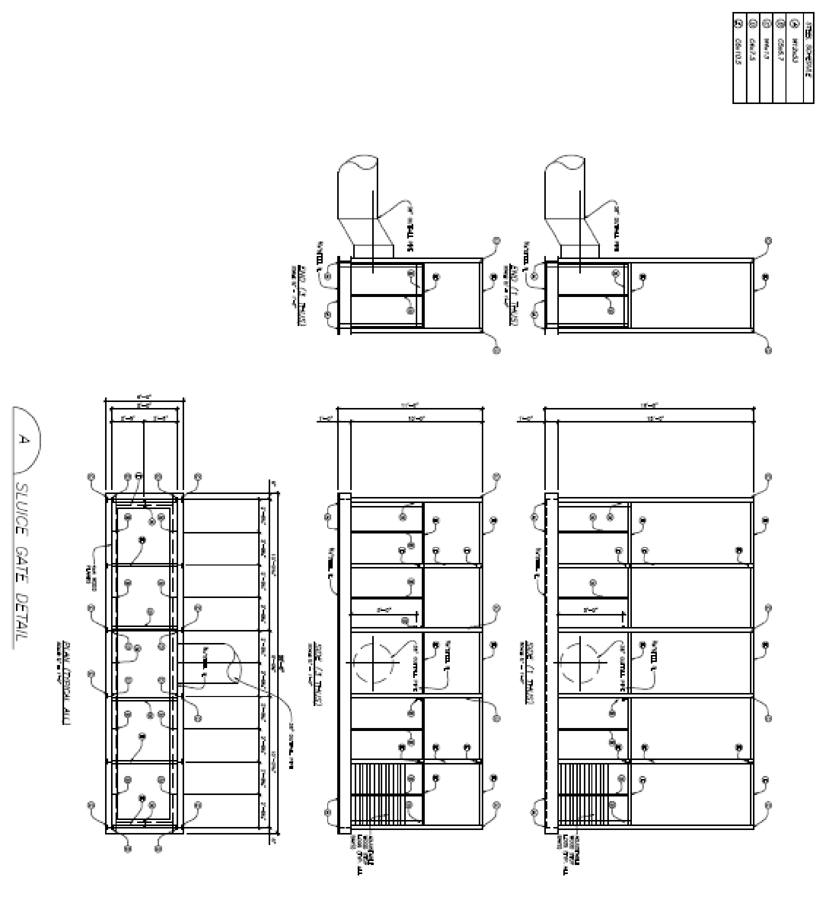
Title:
CDF "B"
CROSS SECTIONS
Sheet:
CG305



Sheet: CG701

Title: SLUICE GATE DETAILS

Date	Description

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"

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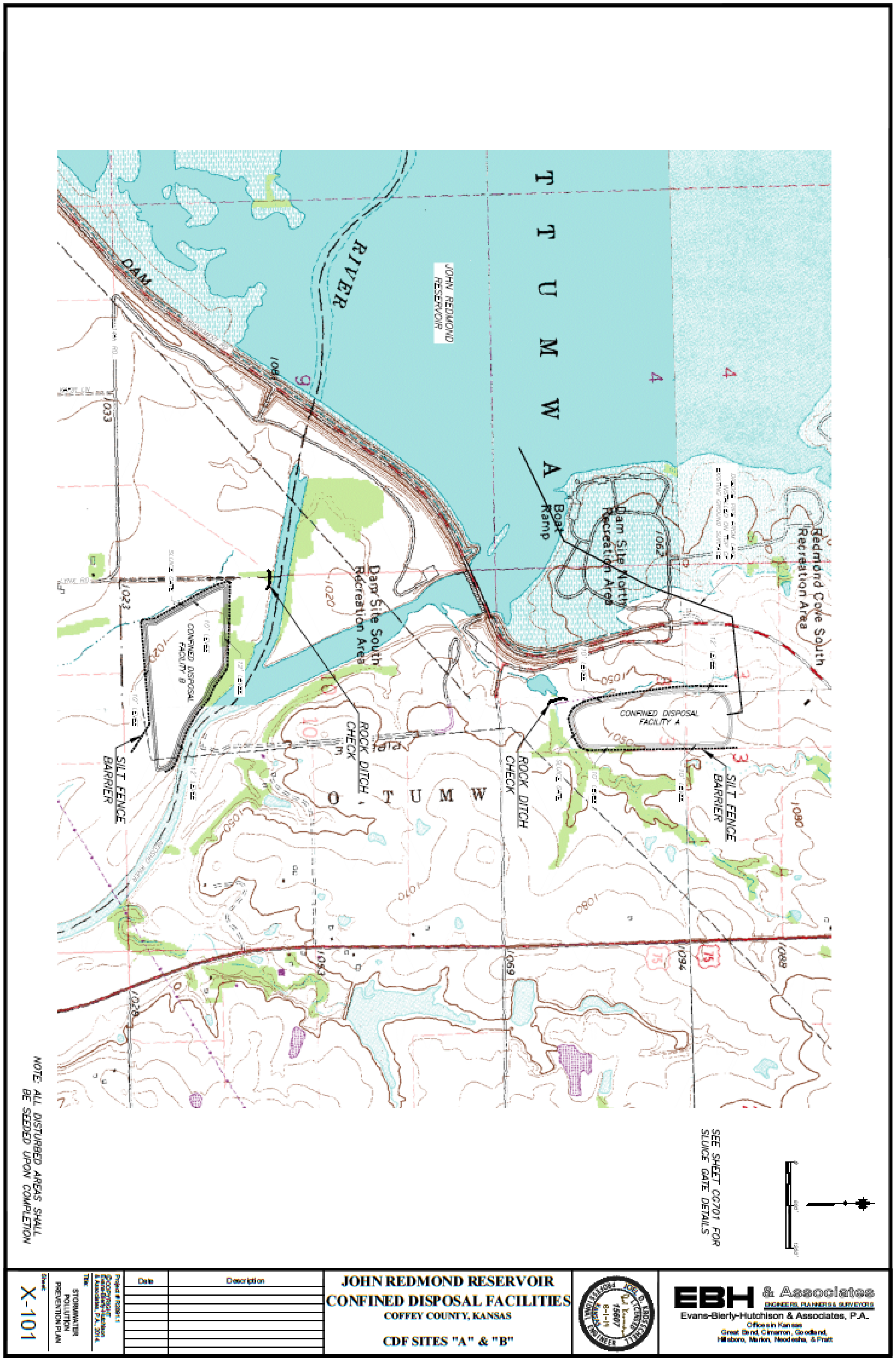
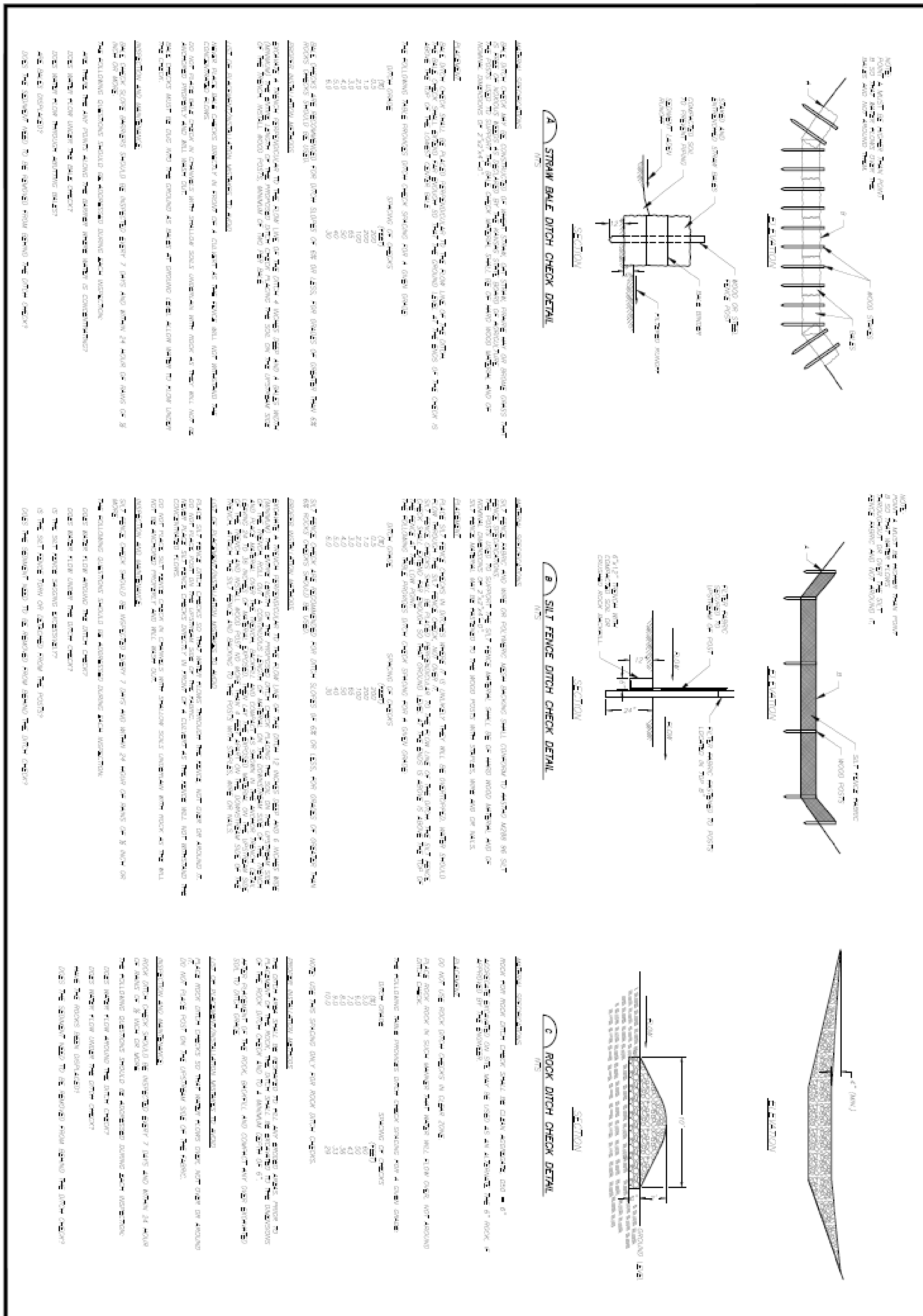

JOHN REDMOND RESERVOIR
DAM
RIVER
Boat Ramp
Dam Site North Recreation Area
Dam Site South Recreation Area
Redmond Cove South Recreation Area
CONFINED DISPOSAL FACILITY A
CONFINED DISPOSAL FACILITY B
ROCK DITCH CHECK
ROCK DITCH CHECK
SILT FENCE BARRIER
SILT FENCE BARRIER
SEE SHEET CG701 FOR SLUICE GATE DETAILS
NOTE: ALL DISTURBED AREAS SHALL BE SEEDED UPON COMPLETION
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
EBH & Associates
ENGINEERS, PLANNERS & SURVEYORS
Evans-Bierly-Hutchison & Associates, P.A.
Offices in Kansas
Great Bend, Cimarron, Goodland, Hillsboro, Marion, Neodesha, & Pratt
Date
Description
STORMWATER POLLUTION PREVENTION PLAN
X-101



Date	Description

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITES "A" & "B"

EBH & Associates
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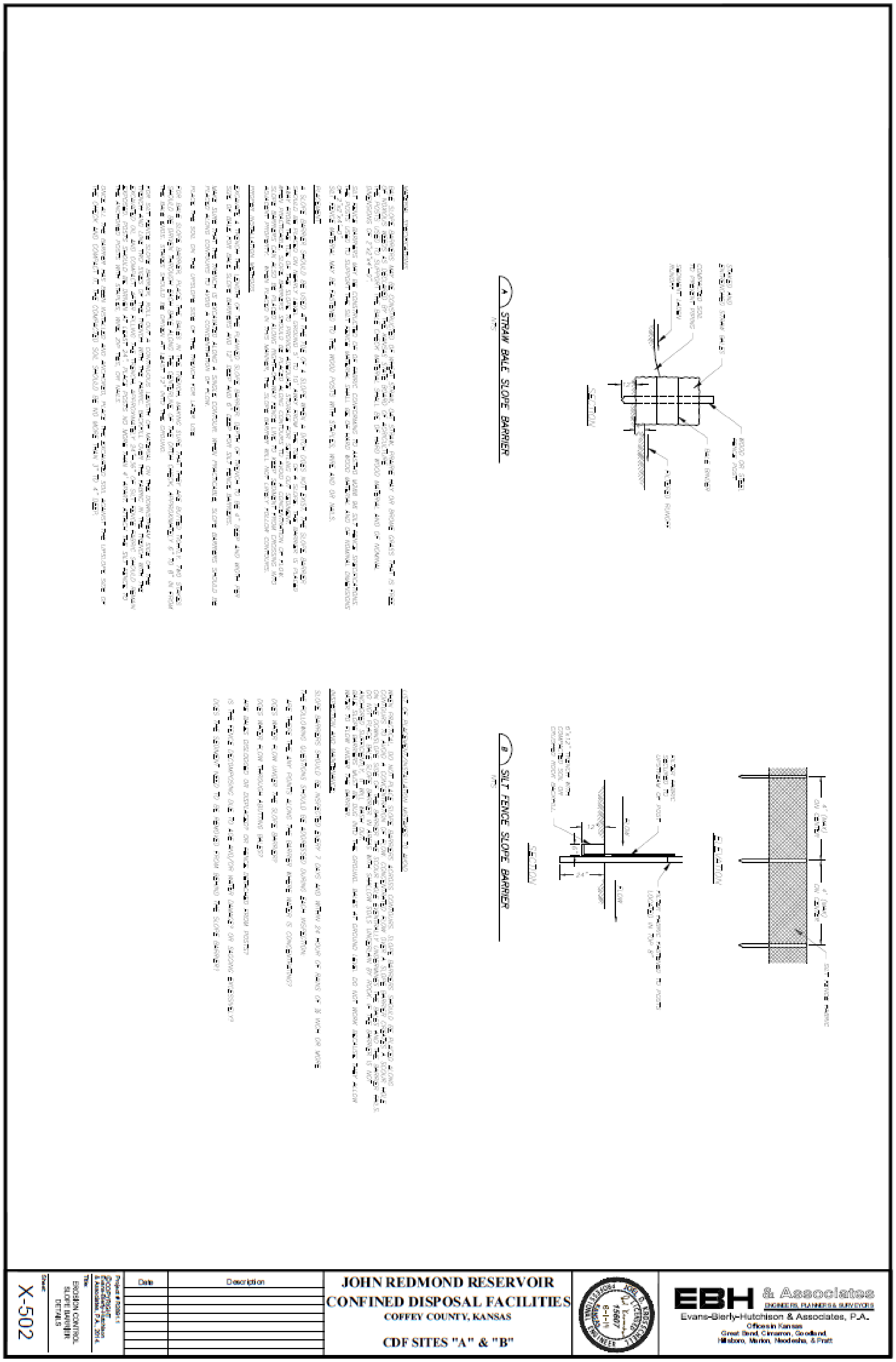
Great Bend, Cimarron, Goodland, Hillsboro, Marion, Neodesha, & Pratt

Title: EROSION CONTROL DITCH CHECK DETAILS

Sheet: X-501


A STRAW BALE SLOPE BARRIER
B SILT FENCE SLOPE BARRIER
SECTION
ELEVATION
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITES "A" & "B"
Date
Description
EROSION CONTROL
SLOPE BARRIER
DETAILS
X-502
EBH & Associates
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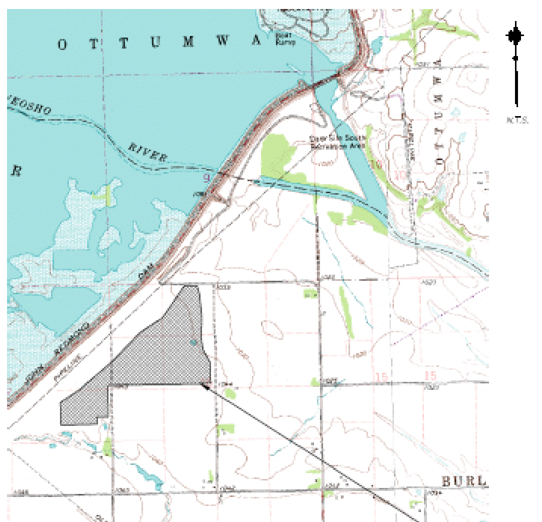
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITE "E"

LEGEND

SPOT ELEVATION	GUY ANCHOR
BREAKLINE	GUY POLE
FLOWLINE	ELECTRICAL BOX
TOP OF BANK	LIGHT POLE
TOE OF SLOPE	ELECTRIC MANHOLE
EDGE OF ASPHALT	POWER POLE
EDGE OF BRICK	UNDERGROUND ELECTRIC
EDGE OF CONCRETE	OVERHEAD ELECTRIC WIRE
EDGE OF CROP	CABLE TELEVISION PEDESTAL
EDGE OF GRAVEL	UNDERGROUND TELEVISION
EDGE OF GUTTER	OVERHEAD TELEVISION WIRE
EDGE OF HEDGE	TELEPHONE AND POWER POLE
EDGE OF ROCK	TELEPHONE MANHOLE
EDGE OF TREES	TELEPHONE PEDESTAL
EDGE OF WATER	TELEPHONE POLE
TOP, BACK OF CURB	FIBRE OPTIC LINE
FENCE	UNDERGROUND TELEPHONE LINE
SIDEWALK	OVERHEAD TELEPHONE WIRE
TOP, SHOULDER	GAS BOX
TRAVELED WAY	GAS METER
WHITE STRIPE	GAS VALVE
YELLOW STRIPE	GAS VENT
TRAFFIC CONTROL BOX	GAS WELL
TRAFFIC SIGNAL MANHOLE	GAS LINE
TRAFFIC SIGNAL	OIL WELL
TRAFFIC SIGNAL WIRE	VENT PIPE
ORNAMENTAL LITE	PETROLEUM PIPELINE
POST	IRRIGATION SPRINKLER
SIGN	IRRIGATION SPRINKLER VALVE
UTILITY WARNING SIGN	IRRIGATION WELL
RAILROAD CROSSING SIGNAL	FIRE HYDRANT
BRACE POLE	2-WAY FIRE HYDRANT
AIR VALVE	3-WAY FIRE HYDRANT
BORE HOLE	WATER METER
MONITORING WELL	WATER VALVE
TEST HOLE	WATER SERVICE STOP
FLAGPOLE	WATER WELL
MAILBOX	YARD HYDRANT
	WATER LINE
MILE POST	SANITARY SEWER CLEANOUT
BUSH	SANITARY SEWER LAMPHOLE
STUMP	SANITARY SEWER MANHOLE
CONIFEROUS TREE	SANITARY SEWER LIFT STATION
	SANITARY SEWER VALVE
DECIDUOUS TREE	SANITARY SEWER FORCE MAIN
	SANITARY SEWER LINE
	STORM SEWER MANHOLE
	CORRUGATED METAL PIPE
	REINFORCED CONCRETE BOX



CDF "E" SITE

LOCATION MAP

INDEX OF DRAWINGS

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Offices in Kansas
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JOEL D. KROSSCHELL
LICENSED
15607
8-1-14
KANSAS
PROFESSIONAL ENGINEER

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITE "E"

Date	Description
	PRELIMINARY

Project # R2891.1

Title: COVER

Sheet:

CONFINED DISPOSAL FACILITY GENERAL NOTES

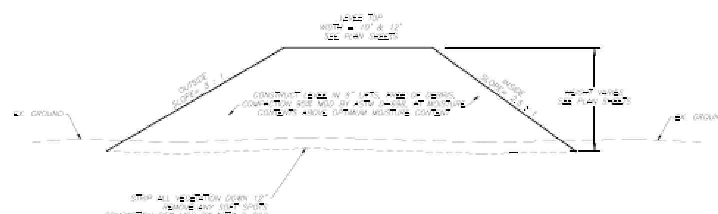
1. CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, INCLUDING SERVICE CONNECTIONS AND DROPS, PRIOR TO CONSTRUCTION BY CONTACTING THE RESPECTIVE UTILITY COMPANY AND PROSPECTING. UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE NOT GUARANTEED AS TO COMPLETENESS NOR AS TO ACCURACY FOR POSITION, DEPTH, SIZE, OR TYPE OF MATERIAL. CONTRACTOR SHALL CALL KANSAS ONE CALL SYSTEM (DIG SAFE) 1-800-344-7233.
2. CONTRACTOR SHALL MAINTAIN TRAFFIC FLOW AT ALL TIMES DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS, AND SHALL PROVIDE SUCH PROTECTIVE MEASURES AS ARE REQUIRED TO ENSURE THE SAFETY OF THE GENERAL PUBLIC, EMPLOYEES, AND EQUIPMENT. ALLEYS, DRIVEWAYS, AND OTHER PUBLIC ACCESSES SHALL BE OPEN TO TRAFFIC AT THE END OF EACH DAY'S WORK UNLESS OTHERWISE APPROVED IN WRITING BY THE OWNER OR ENGINEER.
3. CONTRACTOR SHALL MAINTAIN DRAINAGE DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS. POSITIVE DRAINAGE SHALL BE MAINTAINED IN AND AROUND THE SITE TO ELIMINATE STANDING WATER.
4. REMOVAL AND REPLACEMENT OF SIGNS, MAILBOXES, FENCES, ORNAMENTAL, OR DECORATIVE OBJECTS, LANDSCAPING, AND SIMILAR FEATURES SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM.
5. ALL MATERIALS SALVAGED FROM THIS PROJECT ARE THE PROPERTY OF OWNER. AT OWNER'S OPTION, CONTRACTOR SHALL DELIVER SUCH MATERIALS TO OWNER'S DESIGNATED STORAGE YARD OR PROPERLY DISPOSE OF ANY SUCH MATERIALS OWNER DOES NOT WANT. DELIVERY AND DISPOSAL COSTS SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL WASTE ENCOUNTERED OR GENERATED ON THIS PROJECT. DISPOSAL COSTS SHALL BE CONSIDERED SUBSIDIARY TO THE APPROPRIATE BID ITEM. THE ENTIRE AREA SHALL BE LEFT IN A CLEAN AND SIGHTLY CONDITION.
7. ALL EXCAVATION IS UNCLASSIFIED. CONTRACTOR SHALL DETERMINE THE EXTENT OF ROCK EXCAVATION REQUIRED. ROCK EXCAVATION WILL BE SUBSIDIARY TO RELATED WORK. NO ADDITIONAL PAYMENT WILL BE MADE FOR ROCK EXCAVATION. ALL EXCAVATION SHALL BE DONE WITH MECHANICAL EQUIPMENT, i.e. TRENCHER, BACKHOE, ROCKSAW.
8. SUBSIDIARY ITEMS WILL NOT BE PAID FOR SEPARATELY, BUT ARE TO BE INCLUDED WITH THE APPROPRIATE ITEM THEY ARE RELATED TO.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY IRONS WHICH ARE SHOWN ON PLANS. THE CONTRACTOR SHALL BE REQUIRED TO REESTABLISH ANY PROPERTY IRONS WHICH HAVE BEEN SHOWN AND WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH IRONS SHALL BE REESTABLISHED BY A REGISTERED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS. NO SEPARATE MEASUREMENT OF PAYMENT WILL BE MADE FOR THIS WORK AS IT SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT.
10. CONTRACTOR TO FOLLOW ORDER OF WORK AS OUTLINED IN SECTION 01010 OF THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS UNLESS RELIEVED OF THOSE REQUIREMENTS IN WRITING BY THE ENGINEER.
11. CONTRACTOR SHALL ABIDE BY STORMWATER POLLUTION PREVENTION PLAN. ALL POLLUTION CONTROL MEASURES MUST BE INSTALLED AND MAINTAINED THROUGHOUT THE PERIOD OF CONSTRUCTION. CARE MUST BE TAKEN TO AVOID SILT OR OTHER POLLUTANTS FROM ENTERING STREETS RIGHT OF WAYS, STREAMS, AND OTHER ADJACENT PROPERTIES.
12. CONTRACTOR WILL PROVIDE PHONE NUMBER OF EMPLOYEE WHO WILL BE AVAILABLE TO MAKE NECESSARY REPAIRS TO THE POLLUTION CONTROL MEASURES IN THE EVENT OF A STORM WHICH DAMAGES SAID MEASURES.
13. CONTRACTOR TO HAVE WATER TRUCKS AND EQUIPMENT AVAILABLE DURING ALL CONSTRUCTION FOR USE IN SUPPRESSION OF BLOWING DIRT AND DEBRIS. OWNER CAN REQUEST WATERING OR OTHER SUPPRESSION MEASURES BE UNDERTAKEN AS CONDITIONS REQUIRE.
14. MAINTENANCE OF POLLUTION CONTROL STRUCTURES IN AND AROUND THE SITE IS THE RESPONSIBILITY OF THE CONTRACTOR AND CANNOT BE TURNED OVER TO ANY OTHER CONTRACTOR WITHOUT WRITTEN APPROVAL OF THE OWNER / ENGINEER.
15. CONTRACTOR SHALL SCHEDULE A FINAL MEETING WITH THE ENGINEER AT COMPLETION OF THE PROJECT TO REVIEW THE POLLUTION CONTROL STRUCTURES. ENGINEER WILL INSPECT ALL MEASURES FOR FINAL APPROVAL.
16. CONCRETE – PROPORTIONING OF CONCRETE SHALL BE AS FOLLOWS:

    MISCELLANEOUS

    A. AIR – ENTRAINED 4000 psi CONCRETE
    B. CEMENT CONTENT – 7 1/2 SACKS (94 LB. PER SACK) PER CUBIC YARD OF CONCRETE
    C. NET WATER/CEMENT RATIO – 0.49 lb. WATER PER lb. CEMENT
    D. MIXED AGGREGATE – 20 PERCENT CRUSHED ROCK, MINIMUM
    E. MAXIMUM SIZE AGGREGATE SHALL NOT EXCEED 1/4 OF SLAB THICKNESS
17. DEWATERING SHALL BE CONSIDER SUBSIDIARY TO RELATED WORK. CONTRACTOR TO INSPECT SITE AND MAKE OR OBTAIN SUCH EXPLORATIONS TO SATISFY HIMSELF AS TO THE ELEVATION OF THE WATER TABLE AND AMOUNT OF DEWATERING REQUIRED. DEWATERING AND ALL RELATED COSTS ARE SUBSIDIARY TO THE PROJECT. NO ADDITIONAL PAYMENT WILL BE MADE FOR DEWATERING ON PROJECT.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
CDF "E"			
1.	Mobilization	L.S.	1
2.	Clearing and Grubbing	C.Y.	160,238
3.	Common Excavation	C.Y.	100,180
4.	Compacted Embankment	C.Y.	77,139
5.	Sluice Gate Structure	Each	1
6.	Seeding	Acre	20
7.	Access Drive	S.Y.	AS NEEDED

FOR UNIT PRICE WORK: BIDDER AGREES THAT ESTIMATED QUANTITIES ARE NOT GUARANTEED AND THAT FINAL PAYMENT WILL BE BASED ON ACTUAL QUANTITIES. ENGINEER MAY ADJUST QUANTITIES AT TIME OF CONSTRUCTION.



TYPICAL LEVEE DETAIL

N.T.S.

UTILITY PROVIDERS

GAS	PHILLIPS 66 PIPELINE	(877) 267-2290
WATER	CITY OF NEW STRAWN	(620) 364-8283
KANSAS ONE-CALL SYSTEM		(800) 344-7733

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PROFESSIONAL ENGINEER

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITE "E"

Date	Description
	PRELIMINARY

Project # R2891.1
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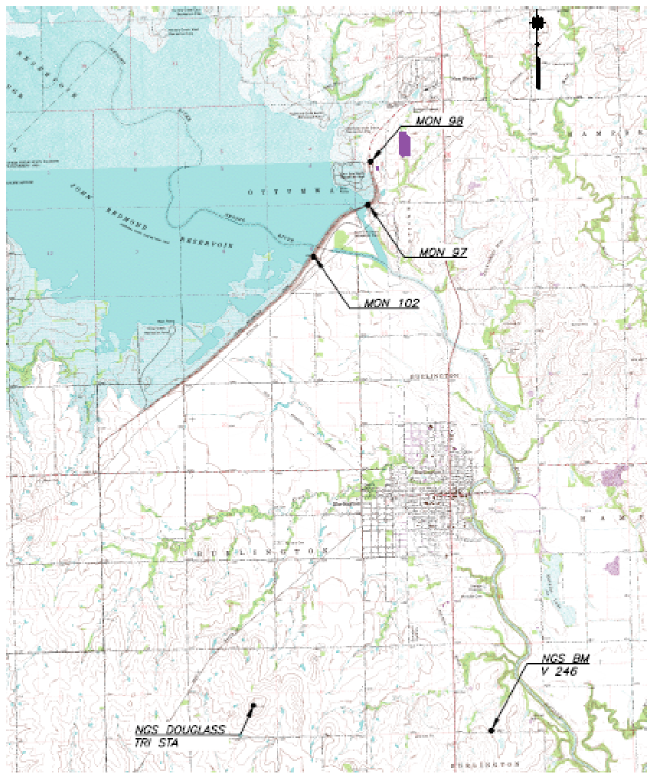
Title: GENERAL REQUIREMENT NOTES

Sheet: G-001



SURVEY CONTROL PLAN

DATE OF FIELD WORK: MONTH YEAR
PROJECT UNITS: ***** US FT
VERTICAL DATUM: NAVD88

SURVEY CONTROL

Point #	Northing	Easting	Elevation	Description
1	1867814.06	2094247.83	—	HORIZONTAL CONTROL NGS DOUGLASS TRI STA STANDARD BRONZE DISK SET IN CONCRETE ±2 MILES SOUTHWEST OF BURLINGTON ON THE HIGHEST GRASSY KNOLL
200	1866362.93	2108167.72	1047.79	VERTICAL CONTROL NGS BM V 246 1934 STANDARD DISK SET IN CONCRETE ±2 MILES SOUTH OF BURLINGTON 86 FT NORTH OF CENTERLINE OF 9TH ROAD
97	1897772.49	2100716.55	1082.83	MONUMENT 97 COE MONUMENT; NORTHERLY SIDE OF DAM, NEAR NORTHEASTERLY END
98	1900381.72	2100812.29	1082.49	MONUMENT 98 COE MONUMENT; FOUND IN CONCRETE BY "CASTLE" SIGN AT ENTRANCE TO "DAMSITE" STATE PARK
102	1894727.28	2097542.99	1081.10	MONUMENT 102 FOUND IN CONCRETE @ JR-BM-2; ON DAM WHERE ACCESS ROAD "T"S OFF

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JOEL D. KROSCHEL
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15807
KANSAS

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITE "E"

Date	Description
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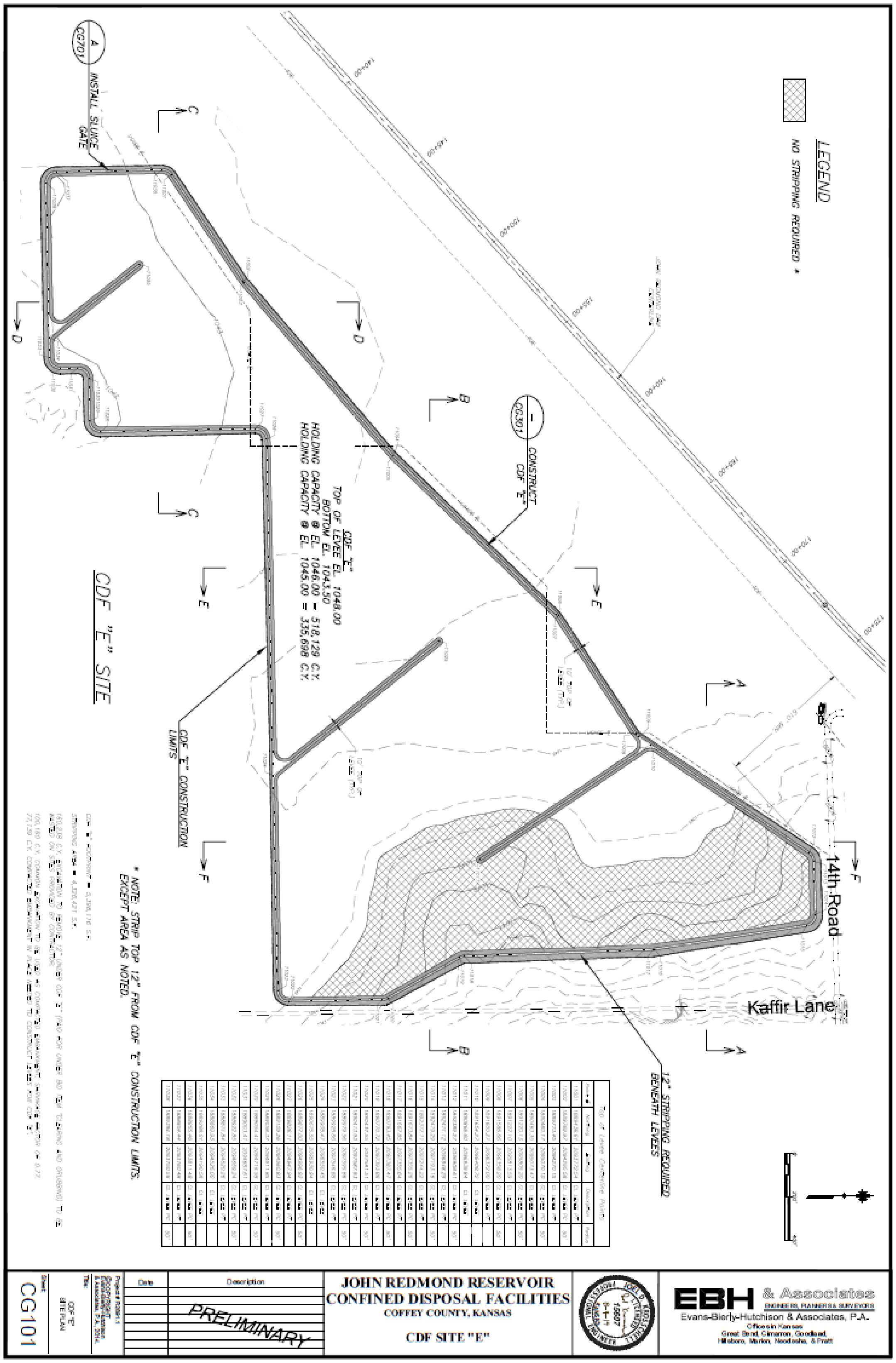
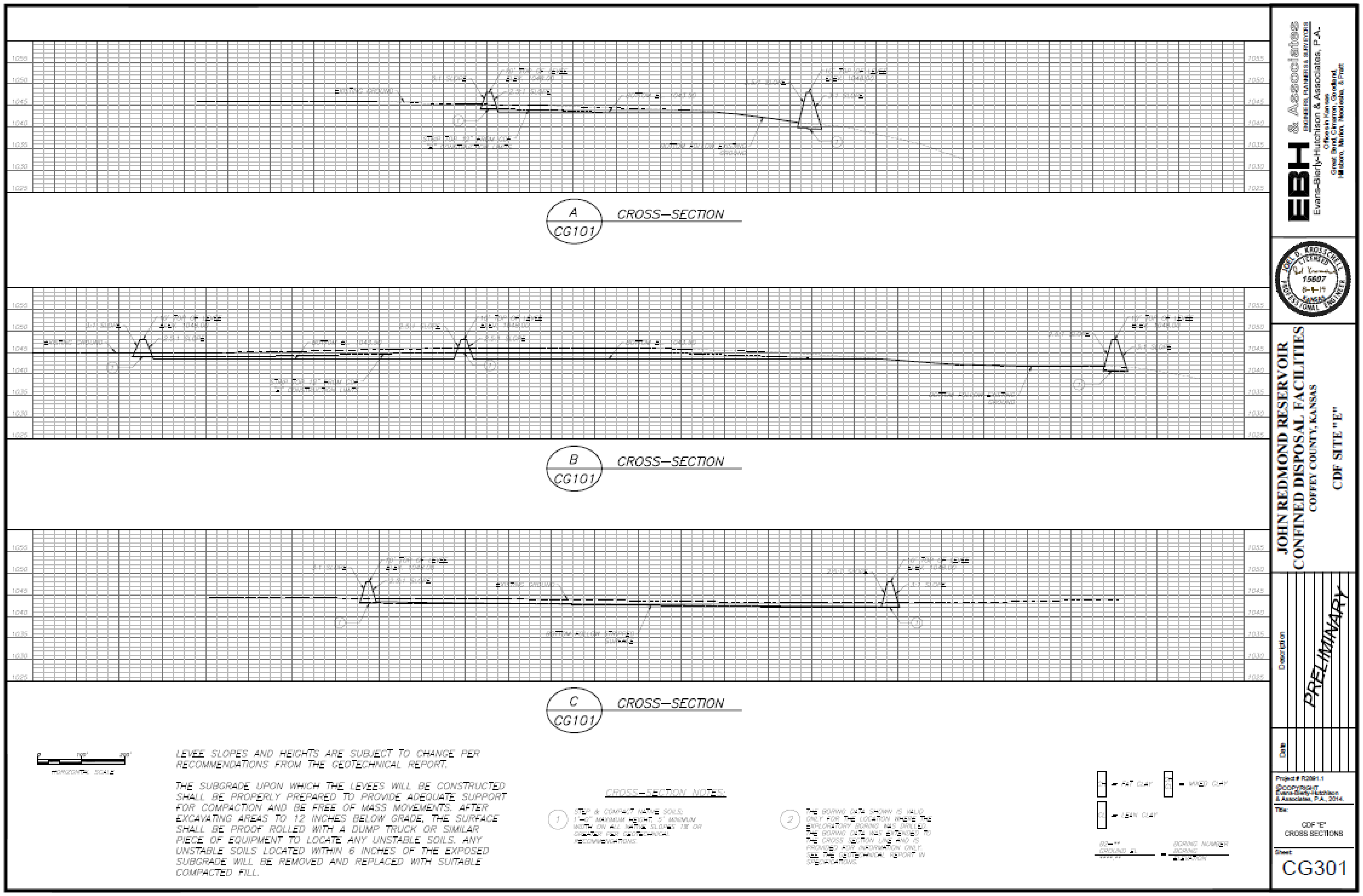
Title: SURVEY CONTROL PLAN AND DATA

Sheet: V-001


LEGEND
NO STRIPPING REQUIRED *
INSTALL SLUICE GATE
CONSTRUCT CDF "E"
CDF "E"
TOP OF LEVEE EL. 1048.00
BOTTOM EL. 1043.50
HOLDING CAPACITY @ EL. 1046.00 = 518,129 C.Y.
HOLDING CAPACITY @ EL. 1045.00 = 335,698 C.Y.
CDF "E" SITE
CDF "E" CONSTRUCTION LIMITS
14th Road
Kaffir Lane
12" STRIPPING REQUIRED BENEATH LEVEES
* NOTE: STRIP TOP 12" FROM CDF "E" CONSTRUCTION LIMITS. EXCEPT AREA AS NOTED.
PRELIMINARY
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITE "E"
EBH & Associates
Evans-Bierly-Hutchison & Associates, P.A.
CG101


A CG101 CROSS—SECTION
B CG101 CROSS—SECTION
C CG101 CROSS—SECTION
LEVEE SLOPES AND HEIGHTS ARE SUBJECT TO CHANGE PER RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT.
THE SUBGRADE UPON WHICH THE LEVEES WILL BE CONSTRUCTED SHALL BE PROPERLY PREPARED TO PROVIDE ADEQUATE SUPPORT FOR COMPACTION AND BE FREE OF MASS MOVEMENTS. AFTER EXCAVATING AREAS TO 12 INCHES BELOW GRADE, THE SURFACE SHALL BE PROOF ROLLED WITH A DUMP TRUCK OR SIMILAR PIECE OF EQUIPMENT TO LOCATE ANY UNSTABLE SOILS. ANY UNSTABLE SOILS LOCATED WITHIN 6 INCHES OF THE EXPOSED SUBGRADE WILL BE REMOVED AND REPLACED WITH SUITABLE COMPACTED FILL.
CROSS—SECTION NOTES:
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Evans-Bierly-Hutchison & Associates, P.A.
Offices in Kansas
Great Bend, Cimarron, Goodland, Hillsboro, Marion, Neodesha, & Pratt
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITE "E"
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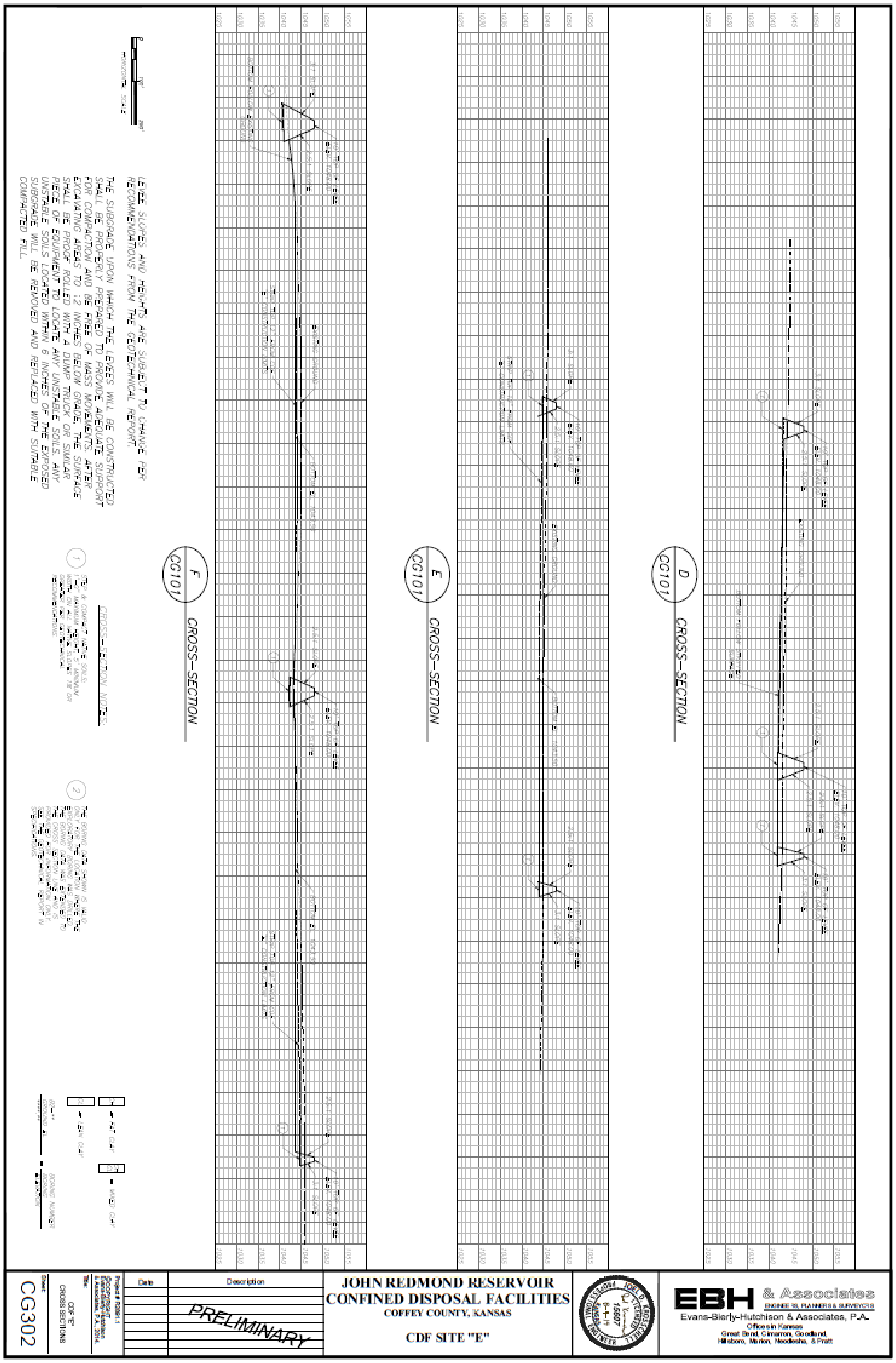
Title:
CDF "E"
CROSS SECTIONS
Sheet:
CG301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CROSS-SECTION NOTES
F CG101 CROSS-SECTION
E CG101 CROSS-SECTION
D CG101 CROSS-SECTION
JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS
CDF SITE "E"
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Date
Description
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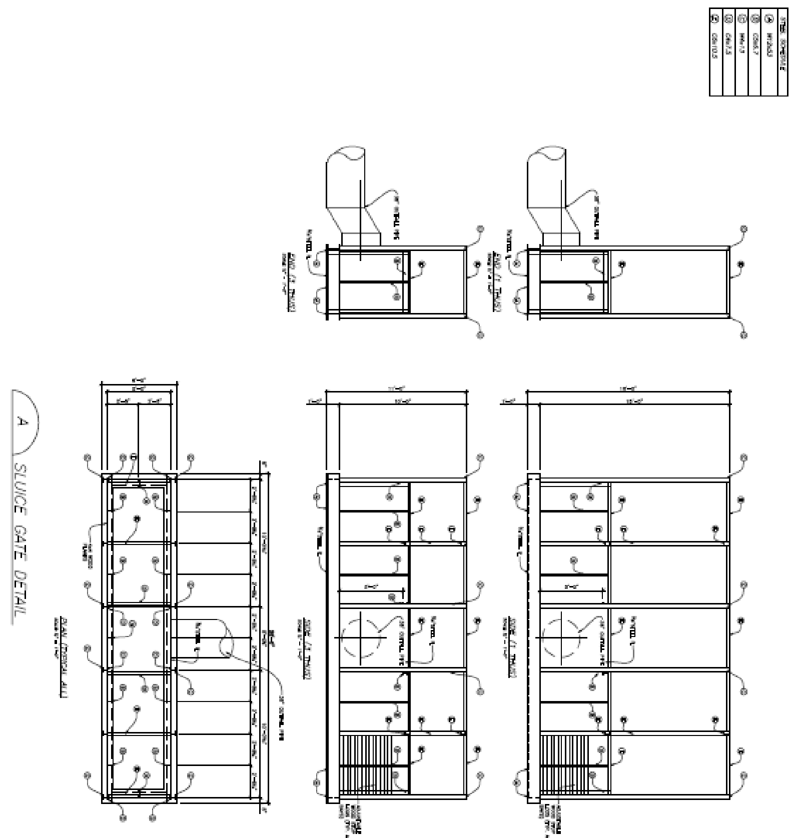
Offices in Kansas
Great Bend, Cimarron, Goodland, Hillsboro, Marion, Neodesha, & Pratt
CDF "E"
CROSS SECTIONS
Sheet:
CG302



Date	Description
	PRELIMINARY

JOHN REDMOND RESERVOIR
CONFINED DISPOSAL FACILITIES
COFFEY COUNTY, KANSAS

CDF SITE "E"

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Offices in Kansas
Great Bend, Cimarron, Goodland,
Hillsboro, Marion, Neodesha, & Pratt

Title: SLUICE GATE DETAILS

Sheet: CG701

TECHINICAL SPECIFICATIONS

For

JOHN REDMOND RESERVOIR CONFINED DISPOSAL FACILITIES

at

New Strawn, Kansas
May 2014

EBH Project No.: R2891.1

Evans-Bierly-Hutchison & Associates, P.A.

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Document

SPECIFICATIONS

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DIVISION 2 - SITEWORK

Section

DIVISION 3 - CONCRETE

<u>Section</u>

DIVISIONS 4 – 16 NOT USED

APPENDICIES

DRAWINGS: As shown on Sheet No. 1 of ***Drawings***.

DOCUMENT 00700

GENERAL CONDITIONS

ARTICLES

ARTICLE 1 - DEFINITIONS

1.1 Wherever used in the ***Contract Documents***, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

1.2 Addenda: written or graphic instruments issued by Engineer prior to opening of Bids which modify or clarify the ***Contract Documents***.

1.3 Bid: the offer or proposal of the bidder submitted on the prescribed form setting forth the price(s) for the Work.

1.4 Bonds: Bid, Performance, and Payment bonds and other instruments of security.

1.5 ***Change Order***: a Contract Document, recommended by Engineer and signed by Owner and Contractor, which provides for additions, deletions, or revisions in the Work, or for changes in Contract Price or Contract Time, or which amends, modifies, or supplements the ***Contract Documents***.

1.6 ***Contract Documents***: documents specifically identified and enumerated in the ***Agreement*** which, when taken together, comprise the entire agreement by and between Owner and Contractor regarding the Work to be furnished, performed, and completed.

1.7 Contract Price: the total moneys payable by Owner to Contractor under the ***Contract Documents*** for furnishing, performing, and completing the Work.

1.8 Contract Time: the number of successive calendar days or the date set forth in the ***Contract Documents*** for the completion of the Work

1.9 Contractor: the person or entity with whom Owner has entered into the ***Agreement***.

1.10 Defective Work: Work that: (i) is unsatisfactory, deficient, faulty, or defective; (ii) does not conform to the ***Contract Documents***; (iii) does not meet the requirements of any inspection, reference standard, test, or approval referred to in the ***Contract Documents***; or (iv) has been damaged prior to Engineer's recommendation of final payment.

1.11 Drawings: graphic and pictorial representations of the Work prepared or approved by Engineer which show the character and scope of the Work.

1.12 Engineer: the person or entity named as such in the ***Agreement***.

1.13 Field Order: a Contract Document issued by Engineer to Contractor effecting a minor change in the Work not involving a change in Contract Price or Contract Time.

1.14 Laws and (or) Regulations: laws, regulations, ordinances, resolutions, codes, rules, and (or) orders promulgated by a lawfully constituted body authorized to so issue.

1.15 Liens: liens, charges, security interests, encumbrances, or claims of like nature against the title to any Work or any materials or equipment to be or already incorporated in the Work.

1.16 Notice of Award: the written notice issued by Owner to the successful bidder stating acceptance of Bid and that, upon compliance with precedent conditions, Owner will enter into the ***Agreement***.

1.17 ***Notice to Proceed***: the written notice issued by Owner to Contractor fixing the date of commencement of Contract Time and authorizing Contractor to proceed with the Work at the site.

1.18 Owner: the person or entity who has entered into the ***Agreement*** with Contractor, and for whom the Work is to be furnished, performed, and completed.

1.19 Project: the total construction or undertaking to be produced or performed under the ***Contract Documents***.

1.20 Resident Project Representative: the authorized representative of Engineer who is assigned to the Project site or any part thereof.

1.21 Shop Drawings: drawings, diagrams, illustrations, brochures, schedules, charts, instruction, and other information and data prepared by or for Contractor to illustrate fabrication, installation, or other details for portions of the Work or for materials or equipment for portions of the Work.

1.22 ***Specifications***: written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work, and certain administrative and procedural requirements applicable thereto.

1.23 Subcontractor: a person or entity having a direct contract with Contractor or another Subcontractor to perform a part of the Work at the site.

1.24 ***Supplementary Conditions***: the Contract Document which amends, modifies, or supplements these ***General Conditions***.

1.25 Supplier: a manufacturer, fabricator, supplier, distributor, vendor, or person or entity of like nature who supplies materials or equipment for the Work but does not perform any Work at the site.

1.26 Unit Price Work: Work to be paid for on the basis of unit prices.

1.27 Work: all labor, services, materials, and equipment required to be furnished, performed, or incorporated in order to produce or perform the Project in accordance with the ***Contract Documents***.

ARTICLE 2 - PRELIMINARY MATTERS

Delivery of Required Contract Forms:

2.1 When Contractor delivers signed counterparts of the ***Agreement*** to Owner, Contractor shall also deliver to Owner:

2.1.1 Such Bonds as Contractor may be required to furnish in accordance with Paragraph 5.1; and

2.1.2 If Contractor is a nonresident (resident place of business is outside the state in which the Work is to be performed) individual, partnership, or unincorporated association, Contractor's appointment of process agent, which agent shall be a resident of the county where the Work is to be performed. Contractor shall also file a copy of said appointment with the Clerk of the District Court in said county. The process agent's term of appointment shall be the full term of the Bonds Contractor is required to furnish.

Copies of Documents:

2.2 Engineer will furnish to Contractor up to 3 copies of the ***Contract Documents***. Additional copies will be furnished upon request at reproduction cost.

Notice to Proceed; Commencement of Contract Time:

2.3 ***Notice to Proceed*** will be given within 30 days after the Effective Date of the ***Agreement***. Contract Time will commence on the date so fixed in the ***Notice to Proceed***. No Work shall be done at the site prior to the date of Contract Time commencement.

Before Starting Construction:

2.4 Before starting Work at the site, Contractor shall deliver to Owner certificates of insurance which Contractor is required to purchase and maintain under Article 5.

2.5 Before Contractor starts Work at the site, a preconstruction conference will be held to discuss administrative, procedural, coordination, and responsibility matters regarding the Work and the ***Contract Documents***, and to establish a working understanding among the parties involved.

Schedules:

2.6 Prior to preparation of the first progress payment estimate, Contractor shall submit to Engineer for review:

2.6.1 A construction schedule showing starting dates, durations, and completion dates for each major part, stage, or item of the Work, and delivery dates for major items of equipment and materials.

2.6.2 A schedule of submissions for Shop Drawings, samples, and substitute or "or equal" items.

2.6.3 A schedule of monthly progress payments that Contractor anticipates earning during the course of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS

Intent:

3.1 The intent of the ***Contract Documents*** is to describe a functionally complete Project to be constructed in accordance with the ***Contract Documents***. Any Work that may reasonably be inferred from the ***Contract Documents*** as being required to produce the intended result shall be supplied whether specifically called for or not.

3.2 The ***Contract Documents*** are complementary: what is called for by one is as binding as if called for by all. The ***Contract Documents*** are to be construed in accordance with the law of the place of the Project.

Changes and Interpretations:

3.3 The ***Contract Documents*** may be amended, modified, or supplemented only by a ***Change Order*** pursuant to Paragraph 9.3, or a Field Order pursuant to Paragraph 8.6.

3.4 Written clarifications and interpretations of the ***Contract Documents*** will be issued by Engineer in accordance with Paragraph 8.5.

ARTICLE 4 - SITE CONSIDERATIONS

Availability of Lands:

4.1 Owner will furnish the lands upon which the Work is to be performed, and rights-of-way and easements for access thereto, as indicated in the ***Contract Documents***. Contractor shall provide for any additional lands and access thereto that Contractor may desire for temporary construction facilities or storage of materials or equipment. Owner will not be liable for Contractor's entry on or use of properties not under Owner's control.

Reference Points:

4.2 Owner will provide suitable base line and benchmark reference points, sufficient in location and number in Engineer's judgment, for Contractor's use as construction survey control. Unless specified otherwise in the ***Contract Documents***, Contractor shall be responsible for laying out the Work and all other surveying required for proper execution of the Work.

4.3 Contractor shall protect and preserve established reference points and shall make no change or relocations thereof without prior written authorization of Owner. Contractor shall notify Engineer if any referenced point is lost, destroyed, or requires relocation, and shall be responsible for the accurate replacement or relocation thereof by professionally qualified personnel.

Physical Conditions - Underground Utilities

4.4 Information and data shown or indicated in the ***Contract Documents*** regarding existing underground utilities at or contiguous to the site are based on information and data furnished to Owner or Engineer by the owners of such utilities or by others. Owner and Engineer will not be responsible for the accuracy or completeness of any such information or data. Contractor shall have full responsibility for:

4.4.1 Reviewing and checking all such information and data;

4.4.2 Locating all underground utilities, including service connections, shown or indicated in the ***Contract Documents***;

4.4.3 Coordinating the Work with the owners of such underground utilities;

4.4.4 The safety and protection of such underground utilities;

4.4.5 Repairing any damage to such underground utilities resulting from the Work; and

4.4.6 Having included all costs of the foregoing responsibilities in the Contract Price.

4.5 If an underground utility is discovered at or contiguous to the site which is not shown or indicated in the ***Contract Documents***, Contractor shall, promptly and before performing any Work affected thereby (except in an emergency), identify the owner of such utility and give written notice of such discovery to Engineer. Engineer will promptly investigate the conditions and determine what changes, if any, will be allowed in Contract Price and Contract Time due to such underground utility. The ***Contract Documents*** will be modified accordingly. During such time, Contractor shall be responsible for the safety and protection of such underground utility.

Physical Conditions - Subsurface:

4.6 Contractor shall, promptly and before disturbing such conditions or performing any Work affected by such conditions (except in an emergency), give written notice to Engineer of:

4.6.1 Latent physical conditions at the site differing materially from those indicated or referred to in the ***Contract Documents***; or

4.6.2 Physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the ***Contract Documents***.

4.7 Engineer will promptly investigate the conditions and determine (i) to what extent, if any, the ***Contract Documents*** need to be modified, and (ii) what changes, if any, will be allowed in Contract Price and Contract Time due to such conditions. The ***Contract Documents*** will be modified accordingly.

4.8 Contractor's failure to give written notice as required shall constitute a waiver of all claims in connection with such differing conditions, whether direct, indirect, or consequential in nature.

ARTICLE 5 - BONDS AND INSURANCE

Bonds:

5.1 Contractor shall furnish Performance and Payment Bonds, each in a penal sum at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the ***Contract Documents***. Bonds shall be in the forms prescribed by the ***Contract Documents***, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Accounts, U.S. Treasury Department, and as are licensed to transact business in the state where the Work is to be performed. Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

5.2 If the surety on any Contractor-furnished Bond is declared bankrupt, becomes insolvent, or ceases to meet the requirements of Paragraph 5.1, Contractor shall, within 10 days thereafter, substitute another Bond and surety, both in accordance with Paragraph 5.1.

Insurance:

5.3 Contractor shall purchase and maintain such insurance as will protect Contractor from claims set forth below which may arise out of or result from Contractor's execution under the ***Contract Documents***, whether such execution be by Contractor, or by any Subcontractor, or by anyone directly or indirectly employed by any thereof, or by anyone for whose acts any thereof may be liable:

5.3.1 Claims under worker's compensation, disability benefits, and similar employee benefit acts;

5.3.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

5.3.3 Claims for damages because of bodily injury, occupational sickness or disease, or death of any person other than a Contractor employee;

5.3.4 Claims for damages insured by personal injury liability coverage which are sustained by (i) any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or (ii) any other person;

5.3.5 Claims of damages, other than to the Work, because of injury to or destruction of tangible property, including loss of use resulting there from;

5.3.6 Claims for damages because of bodily injury or death of any person or property damage arising out of ownership, maintenance, or use of any motor vehicle.

5.4 Contractor shall procure, and maintain during the Contract Time, Worker's Compensation insurance in accordance with the laws of the state in which the Work is to be performed. If exempt by statute, Contractor shall nonetheless maintain voluntary compensation coverage at the same limits as required by statute. Compensation coverage shall include Employers Liability coverage adequate and suitable for the protection of employees not otherwise protected. Contractor shall ensure that all Subcontractors are similarly insured.

5.5 Contractor shall procure, and maintain during the Contract Time or until termination for any coverage required to be maintained after final payment, General Liability insurance on a comprehensive basis, and such Liability insurance shall include: (i) Premises - Operations (with Explosion, Collapse, and Underground as applicable); (ii) Products and Completed Operations (to be maintained for one year after final payment); (iii) Personal Injury Liability (with Employment Exclusion deleted); (iv) Contractual Liability (with provision for Contractor's obligation under Paragraph 6.28); (v) Business Automobile Liability (including owned, nonowned, and hired vehicles); and (vi) Broad Form Property Damage (including Completed Operations).

5.5.1 Unless specified otherwise in the ***Contract Documents*** or required by law, General Liability insurance shall be written for not less than: (i) Bodily Injury - $500,000 each occurrence and

$1,000,000 aggregate; and (ii) Property Damage - $250,000 each occurrence and $500,000 aggregate.

5.6 Contractor shall procure, and maintain during the Contract Time, property insurance for the Work at the site. Such insurance shall be of completed value form and in an amount not less than the initial Contract Price. Property insurance shall include the interests of Owner, Contractor, and Engineer in the Work, all of whom shall be named as insureds or additional insureds. Such insurance shall be of "all-risk" form, shall insure against the perils of fire and extended coverage and physical loss or damage including theft, vandalism, malicious mischief, collapse, water damage, and flood, and shall include damages, losses, and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including without limitation fees and charges of engineers, architects, attorneys, and other professionals). Property insurance shall also cover portions of the Work stored on or off the site or in transit when such portions of the Work are to be included in a progress payment. The policy shall contain provisions to the effect that, in the event of payment of any loss or damage, the insurer shall have no rights of recovery against named insureds or additional insureds.

5.7 Contractor shall deliver to Owner, in accordance with Paragraph 2.4, certificates of insurance showing types, coverages, amounts, effective and expiration dates, and all insureds. Certificates and policies shall contain provisions that coverages afforded shall not be canceled, materially changed, or refused renewal until at least 30 days prior written notice has been delivered to Owner and Engineer.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

Review of Contract Documents and Field Conditions:

6.1 Before undertaking each part of the Work and as appropriate during the performance of such Work, Contractor shall compare actual field measurements and conditions with those shown or indicated in the ***Contract Documents***. Contractor shall promptly notify Engineer of any errors, discrepancies, or ambiguities discovered, and shall, before proceeding with Work affected thereby, obtain a written resolution thereof from Engineer. Contractor shall not be liable to Owner for failure to report any error, discrepancy, or ambiguity in the ***Contract Documents*** unless Contractor had actual knowledge or should reasonably have known thereof.

Supervision and Superintendence:

6.2 Contractor shall supervise and direct the Work, and shall be solely responsible for means, methods, techniques, sequences, and procedures of construction.

6.3 Contractor shall designate a competent superintendent to act as Contractor's representative at the site. Such superintendent shall have authority to act on behalf of Contractor, and communications given to the superintendent shall be as binding as if given to Contractor. Such superintendent shall be present on the site at all times required for adequate supervision and coordination of the Work.

Labor, Materials, and Equipment:

6.4 Contractor shall provide competent, suitably qualified personnel to lay out and construct the Work required under the ***Contract Documents***, and shall at all times maintain good discipline and order at the site.

6.5 Unless otherwise specified in the ***Contract Documents***, Contractor shall furnish and be fully responsible for all labor, materials, equipment, tools, appliances, construction equipment and machinery, fuel, power, heat, light, water, telephone, sanitary facilities, transportation, and other utilities, facilities, and services necessary (whether temporary or permanent and whether or not incorporated in the Work) for furnishing, performing, testing, starting, adjusting, and completing the Work in accordance with the ***Contract Documents***.

6.6 Materials and equipment to be incorporated in the Work shall be of good quality and new, except as otherwise provided in the ***Contract Documents***. If required by Engineer, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Materials and equipment shall be applied, used, installed, erected, connected, cleaned, and conditioned in accordance with Suppliers' instructions.

Substitutes or "Or Equal" Items:

6.7 Material or equipment specified or described in the ***Contract Documents*** using proprietary or particular Supplier nomenclature is intended to establish the type, function, and quality required. Where the ***Contract Documents*** permit substitution, Contractor may apply for such substitution, and such application shall be subject to review and evaluation by Engineer. Contractor shall provide sufficient data to allow Engineer to determine equivalency, and shall warrant that any incidental or consequential changes required in the Work to accommodate or adapt the design to the proposed substitute shall be made by Contractor without a change in Contract Price or Contract Time. No substitute shall be ordered, installed, or utilized without the prior written authorization of Engineer.

Subcontracting:

6.8 Contractor shall not employ any Subcontractor, Supplier, or other person or entity against whom Owner or Engineer may have reasonable objection; nor will Contractor be required to employ any Subcontractor, Supplier, or other person or entity against whom Contractor may have reasonable objection.

6.9 Contractor shall be fully responsible to Owner for the acts and omissions of Subcontractors, Suppliers, and other persons and entities furnishing or performing Work under a direct or indirect contract with Contractor, just as Contractor is fully responsible for Contractor's own acts and omissions.

6.10 By appropriate agreement, Contractor shall bind each Subcontractor, to the extent of the Work to be performed by such Subcontractor, to the applicable terms and conditions of the ***Contract Documents*** for the benefit of Owner and Engineer.

6.11 Nothing in the ***Contract Documents*** shall create any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other such person or entity.

Patents:

6.12 Contractor shall pay all royalties and license fees. Contractor shall defend suits or claims for infringement of patent rights, and shall indemnify and hold Owner and Engineer harmless from loss on account thereof, except Contractor shall not be responsible for such defense or loss if the particular design, process, product, or device subject to such patent rights is specifically required by the ***Contract Documents***.

Permits:

6.13 Unless otherwise provided in the ***Contract Documents***, Contractor shall obtain and pay for all construction permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution and completion of the Work, and shall pay all utility connection charges.

Laws and Regulations:

6.14 Contractor shall comply with and give notices required by all Laws and Regulations applicable to the furnishing, performance and completion of the Work. Contractor shall not be responsible for ascertaining that ***Contract Documents*** comply with Laws and Regulation; however, if Contractor observes that any ***Contract Documents*** are at variance therewith, Contractor shall promptly notify Engineer of such variance. If Contractor performs any Work knowing or having reason to know that such Work is contrary to Laws or Regulations and without such notice to Engineer, Contractor shall bear all costs arising there from.

Taxes:

6.15 Contractor shall pay all sales, labor, consumer, use, and other similar taxes required by the Laws and Regulations of the place of the Project which are applicable during the furnishing and performance of the Work.

Use of Premises:

6.16 Contractor shall confine construction equipment, storage of materials and equipment, and operations of workers to the Work site and other areas identified in and permitted by the ***Contract Documents*** or authorized by Laws or Regulations, and shall not unreasonably encumber the premises with equipment or materials. Contractor shall be fully responsible for damage to such premises or contiguous areas, or to owners or occupants thereof, resulting from the furnishing or performance of the Work. Contractor shall indemnify and hold Owner and Engineer harmless from loss against claims for such damage to the extent such a claim arises out of furnishing or performing the Work.

6.17 Contractor shall keep premises free from accumulation of waste materials, rubbish, and other debris resulting from the Work. Upon completion of the Work, Contractor shall remove all waste materials, rubbish, and debris from and about the premises, as well as all tools, construction equipment and machinery, and surplus materials, and shall restore all premises not designated for alteration to original condition.

6.18 Contractor shall not subject, nor permit subjecting, any portion of the Work or premises to loads, stresses, or pressures that may endanger the safety or integrity thereof.

Safety and Protection:

6.19 Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury, or loss to: (i) employees on the Work, and other persons and entities who may be affected by the Work; (ii) the Work, and materials and equipment to be incorporated therein, whether in storage on or off the site; and (iii) other property at the site or adjacent thereto, including without limitation trees, shrubs, lawns, walks, driveways, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

6.20 Contractor shall comply with applicable Laws and Regulations for the safety and protection of persons and property, and shall erect and maintain necessary safeguards for such safety and protection. Contractor shall notify owners and users of adjacent properties and utilities when prosecution of the Work may affect such owners or users, and shall cooperate therewith in the protection, removal, relocation, or replacement of such properties or utilities.

6.21 Contractor shall remedy all damage, injury, or loss to property caused, directly or indirectly, in whole or in part, by Contractor or by any Subcontractor, Supplier, or other person or entity directly or indirectly employed by any thereof or by anyone for whose acts any thereof may be liable; except damage, injury, or loss attributable to the ***Contract Documents*** or to acts or omissions of Owner or Engineer or anyone directly or indirectly employed by either or anyone for whose acts either may be liable, and not attributable to the fault or negligence of Contractor.

Emergencies:

6.22 In emergencies affecting the safety or protection of persons, the Work, or property at or adjacent to the site, Contractor shall, at Contractor's discretion and without special instruction or authorization from Owner or Engineer, act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice of any significant changes in the Work or deviations from the ***Contract Documents*** caused thereby. As determined by Engineer, the ***Contract Documents*** will be modified accordingly.

Shop Drawings and Samples:

6.23 Contractor shall prepare and submit Shop Drawings and samples as required by and in accordance with the ***Contract Documents***. By stamp or specific written notation on each submittal, Contractor shall certify that Contractor has: (i) checked and verified all field measurements and conditions related to such submittal; (ii) determined and verified all relevant data (including without limitation quantities, materials, dimensions, design and performance criteria, installation and maintenance requirements, component arrangement and operation, catalog numbers and identification) with respect to such submittal; (iii) verified the completeness of such submittal with respect to enabling Engineer's required action thereon; (iv) coordinated such submittal with other submittals and with the requirements of the Work and the ***Contract Documents***; and (v) directed Engineer's attention, by specific notation, to each variation from the ***Contract Documents*** such submittal may contain.

6.24 Contractor shall be fully responsible (and Engineer's review will provide no relief there from for errors and omissions in submittals, and for compliance with the requirements set forth in Paragraph 6.23. Contractor shall be fully responsible for deviations from requirements of the ***Contract Documents***, unless Contractor has received specific written authorization from Engineer for each such deviation.

6.25 Contractor shall not furnish or perform any Work requiring submission of Shop Drawings or samples until the respective submittal has been reviewed by Engineer. Thereafter, such Work shall be in accordance with the reviewed submittal. Any such Work furnished or performed prior to Engineer's review of the respective submittal shall be at Contractor's sole risk.

Record Documents:

6.26 Contractor shall maintain, in a safe place at the site, one record copy of all Drawings, ***Specifications***, Addenda, ***Change Orders***, Field Orders, written clarifications and interpretations, reviewed

Shop Drawings, and selected samples in good order and annotated to show all changes made during construction. These record documents shall at all times be available for Engineer's reference. Upon completion of the Work, record documents sufficient to fully indicate the Work as actually constructed shall be delivered to Engineer.

Continuing the Work:

6.27 Contractor shall diligently proceed with the Work and adhere to the construction schedule during all disputes and disagreements with Owner, except as permitted under Paragraph 14.4 or as Contractor and Owner may otherwise agree in writing.

Indemnification:

6.28 Contractor shall indemnify and hold Owner and Engineer and agents and employees thereof harmless from and against all claims, damages, losses, and expenses (including without limitation fees and charges of engineers, architects, attorneys, and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided such claim, damage, loss, or expense (i) is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work) including loss of use resulting there from, and (ii) is caused in whole or in part by any negligent or willful act or omission of Contractor, any Subcontractor, any person or entity directly or indirectly employed by any thereof, or anyone for whose acts any thereof may be liable.

6.29 In any and all claims against Owner or Engineer or agents or employees thereof by any employee of Contractor, any Subcontractor, any person or entity directly or indirectly employed by any thereof, or anyone for whose acts any thereof may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor, any such Subcontractor, or any such person or entity under worker's compensation, disability benefits, or other employee benefits acts.

6.30 Contractor's indemnification obligation shall not extend to the liability of Engineer or agents or employees thereof arising out of or resulting from the preparation or review of surveys, maps, opinions, reports, designs, Drawings, ***Specifications***, ***Change Orders***, or Field Orders.

ARTICLE 7 - OTHER WORK

Separate Contracts:

7.1 Owner reserves the right to perform other work related to the Project by awarding separate direct contracts for such work or by performing such work with Owner's forces. Separate direct contracts will contain ***General Conditions*** similar to these ***General Conditions***. If the performance of any such work is not noted in the ***Contract Documents***, Owner will give Contractor written notice thereof prior to commencement of such work. If Contractor believes such unnoted work involves changes in Contract Price or Contract Time for the Work under the ***Contract Documents***, claims therefore may be made under Articles 10 and 11.

Access and Coordination:

7.2 Contractor shall afford other contractors (and Owner as applicable) performing other work related to the Project proper and safe access to the site, and reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall properly connect and coordinate the Work with all such other work, and shall do all cutting, fitting, and patching of the Work that may be required to make the Work's several parts come together and properly integrate with such other work.

7.3 If any part of Contractor's Work depends upon the work of any other contractor (or Owner as applicable) for proper execution or results, Contractor shall inspect such work and promptly notify Engineer of any delays or defects rendering such work unavailable or unsuitable for such proper execution and results. Contractor's failure to so notify shall constitute Contractor's acceptance of such work as fit and proper for integration with Contractor's Work, except for latent defects or deficiencies in such work.

ARTICLE 8 – ENGINEER'S RESPONSIBILITIES

Status:

8.1 Engineer will be Owner's representative during the construction period. The duties, responsibilities, and limitations of authority of Engineer as Owner's representative are set forth in the ***Contract Documents*** and will not be extended without written consent of Owner and Engineer.

Resident Project Representatives:

8.2 Engineer may furnish one or more Resident Project Representatives to assist Engineer in observing the furnishing and performance of the Work. Resident Project Representatives will conduct on-site observations of the Work in progress, record daily conditions, activities, and observations, coordinate monthly progress payment estimates with Contractor, and report to Engineer regarding progress of the Work and compliance of the Work with the ***Contract Documents***. Resident Project Representatives will have the authority to reject Defective Work, delay affected portions of the Work until or while materials or equipment so requiring have been or are being reviewed by Engineer, and to suspend operations on any portion of the Work not meeting the requirements of the ***Contract Documents***.

8.3 Resident Project Representatives will not authorize any variation in or deviation from the ***Contract Documents***, nor review any submittal, nor act or perform as superintendent or supervisor for Contractor. The duties, responsibilities, and authorities of Resident Project Representatives will not exceed or in any way be contrary to those assigned to Engineer by the ***Contract Documents***.

Site Visits:

8.4 Engineer will visit the site at intervals appropriate to the stage of construction to observe the progress and quality of the Work and to determine, in general, if the Work is proceeding in accordance with the ***Contract Documents***. Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of on-site observations as an experienced and qualified design professional, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defects and deficiencies in the Work.

Clarifications and Interpretations:

8.5 Engineer will promptly issue such written clarifications and interpretations of the ***Contract Documents*** as Engineer may deem necessary, which clarifications and interpretations will be consistent with the intent of, and reasonably inferable from, the ***Contract Documents***.

Authorized Variations in the Work:

8.6 Engineer may authorize minor variations in the Work not involving changes in either Contract Time or Contract Price and consistent with the intent of the ***Contract Documents***. Such variations will be effected by issuance of a Field Order, and will be binding on Owner and Contractor. Contractor shall carry out such Field Orders promptly. If Contractor believes any Field Order involves changes in Contract Price or Contract Time, claims therefore may be made under Articles 10 and 11.

Rejecting Defective Work:

8.7 Engineer will have authority to disapprove or reject any Work or any component of Work which Engineer believes is or will result in Defective Work.

Substitutes or "Or Equal" Items:

8.8 Engineer will be allowed a reasonable time to review and evaluate each application for a proposed substitute, and Engineer will be the sole judge of equivalency. Engineer may require Contractor to furnish additional data for any proposed substitute. Engineer, on behalf of Owner, may require Contractor to furnish, at Contractor's expense, a special performance guarantee or other surety for any substitute as a condition of authorization.

Shop Drawings and Samples:

8.9 Engineer will review and act on Shop Drawing and sample submittals with reasonable promptness. Engineer's review and action will be only for conformance with the design concept of the Project and for compliance with the information given in the ***Contract Documents***; and such review or action will not extend to means, methods, techniques, sequences, or procedures of construction (except as specifically required by the ***Contract Documents***), nor to safety precautions or programs incident thereto.

Unit Price Work:

8.10 Engineer will have authority to determine the actual quantities and classifications of items of Unit Price Work performed by Contractor, and Engineer's written decisions thereon will be final and binding upon Owner and Contractor.

Decisions on Disputes:

8.11 Engineer will be the initial interpreter of requirements of the ***Contract Documents*** and the judge of Work acceptability thereunder. Claims, disputes, and other matters pertaining to Contract Document interpretation, Work acceptability, or changes in Contract Price or Contract Time shall be initially referred to Engineer in writing for a formal decision by Engineer. Written notice of each such claim, dispute, or other matter shall be delivered by claimant to Engineer and to the other party to the ***Agreement*** within 30 days after the occurrence giving rise thereto, and written supporting data shall be similarly delivered within 60 days after such occurrence. Engineer will render a formal written decision within 30 days after receipt of all supporting data.

8.12 Engineer's formal written decision pursuant to Paragraph 8.11 shall be a condition precedent to the exercise, by Owner or by Contractor, of rights or remedies either may otherwise have under the ***Contract Documents*** or under Laws or Regulations.

Limitations:

8.13 When functioning as interpreter or judge, Engineer will not show partiality to Owner or Contractor and will endeavor to secure faithful performance from both. Engineer will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

8.14 Wherever in the ***Contract Documents*** the terms "as directed", "as required", "as permitted", "suitable", "satisfactory", "proper", "acceptable", or terms of like effect or import are used to describe a requirement, direction, review, or judgment of Engineer as to the Work, the intention is that such requirement, direction, review, or judgment will be solely to evaluate the Work for compliance with the ***Contract Documents***. The use of any such term shall not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing or performance of any Work, nor any duty or authority to undertake any responsibility contrary to Paragraphs 8.15 or 8.16.

8.15 Engineer will not be responsible for (i) Contractor's construction means, methods, techniques, controls, sequences, or procedures, nor (ii) safety precautions or programs incident thereto, nor (iii) Contractor's failure to furnish or perform the Work in accordance with the ***Contract Documents***.

8.16 Engineer will not be responsible for the acts or omissions of Contractor, any Subcontractor, any Supplier, or any other person or entity furnishing or performing any of the Work.

ARTICLE 9 - CHANGES IN THE WORK

9.1 Without invalidating the ***Agreement***, Owner may at any time, order additions, deletions, or revisions in the Work. Such changes will be authorized by issuance of duly executed ***Change Orders***. Upon receipt of any such ***Change Order***, Contractor shall promptly proceed with the Work involved, and such Work shall be furnished and performed in accordance with the ***Contract Documents***.

9.2 Contractor shall not be entitled to an increase in Contract Price nor an extension of Contract Time with respect to any work furnished or performed which is not required by the ***Contract Documents*** as amended, modified, and supplemented, except in the case of emergency under Paragraph 6.22 and in the case of uncovering Work under Paragraph 12.8.

9.3 Owner and Contractor shall execute appropriate ***Change Orders*** covering (i) changes in the Work pursuant to Paragraph 9.1, (ii) changes in Contract Price or Contract Time agreed to by the parties, (iii) changes resulting from amending, modifying, or supplementing the ***Contract Documents***, and (iv) any other changes in the Work or ***Contract Documents*** agreed to by the parties.

ARTICLE 10 - CHANGE IN CONTRACT PRICE

10.1 The Contract Price may be changed only by a ***Change Order***. All claims for adjustments in the Contract Price shall be initially referred to Engineer in accordance with Paragraph 8.11, and no such claim will be valid unless so referred.

10.2 The value of any Work covered by a ***Change Order*** or involved in a claim for Contract Price adjustment will be determined based on (in order of precedence): (i) unit prices previously contained in the ***Contract Documents***; (ii) an agreed lump sum; or (iii) the actual field cost of the Work plus an agreed fee, not to exceed 15 percent, for overhead and profit.

Unit Price Work:

10.3 If any Work is Unit Price Work, initially the Contract Price will be deemed to include an amount for all Unit Price Work equal to the sum of the established unit price times the respective estimated quantity of each separately identified item of Unit Price Work indicated in the ***Agreement***. Estimated quantities are not guaranteed and are solely for the comparison of Bids and determining an initial Contract Price. Engineer will have authority to determine actual quantities and classifications in accordance with Paragraph 8.10. Each established unit price will be deemed to include an amount adequate to cover all necessary labor, materials, equipment, overhead, profit, and applicable taxes for that respective item of Unit Price Work.

10.4 If the actual quantity of a Unit Price Work item performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the ***Agreement***, and if there is no corresponding adjustment with respect to any other item of Work, and if Contractor believes such quantity variation so justifies, Contractor may make a claim for an increase in Contract Price under this Article 10. Any such claim shall be based on additional expenses incurred due solely to the variation above 125 percent or below 75 percent of the estimated quantity.

ARTICLE 11 - CHANGE IN CONTRACT TIME

11.1 Time limits set forth in the ***Contract Documents*** are of the essence of the ***Agreement***, and nothing in the ***Contract Documents*** shall exclude recovery for damages (including without limitation fees and charges of engineers, architects, attorneys, and other professionals, and court and arbitration costs) for delay by either party.

11.2 The Contract Time may be changed only by a ***Change Order***. All claims for adjustments in the Contract Time shall be initially referred to Engineer in accordance with Paragraph 8.11, and no such claim will be valid unless so referred.

11.3 Contract Time will be extended by an amount equal to time lost due to delays beyond Contractor's control if a claim therefore is properly made under Paragraph 11.2. Causes for such delays shall include, without limitation, acts or neglect of Owner or of Engineer or of others performing other work as contemplated by Article 7, acts of God or of the public enemy, fires, floods, abnormal and unforeseeable weather, epidemics, labor disputes, strikes, and freight embargoes.

ARTICLE 12 - QUALITY CONTROL

Access to the Work:

12.1 Owner and Engineer and representatives of either, testing organizations, and all participating and jurisdictional federal and state governmental agencies will have access to the Work, including relevant data and records, at all times for observation, inspection, examination, and testing. Contractor shall provide proper and safe conditions for such access.

Tests and Inspections:

12.2 Contractor shall make all arrangements for and pay all costs connected with tests and inspections required by the ***Contract Documents*** and by Laws or Regulations of jurisdictional public authorities.

12.3 Unless specified otherwise, Engineer will make all arrangements for and Owner will pay all costs of tests and inspections not included in Paragraph 12.2; provided, that if Defective Work is revealed, Contractor shall make all arrangements for and bear all costs of any subsequent retesting or reinspection.

12.4 Tests and inspections, except those by jurisdictional public authorities, shall be performed by organizations acceptable to Engineer and to Contractor. Contractor shall give Engineer timely notice of arrangements and readiness, and shall promptly deliver to Engineer required certificates of testing, inspection, or approval.

12.5 Neither observations by Engineer nor tests, inspections, or approvals by others shall relieve Contractor from Contractor's obligation to furnish, perform, and complete the Work in accordance with the ***Contract Documents***.

Owner May Stop the Work:

12.6 If Contractor fails to provide sufficient skilled workers or suitable materials or equipment, or if the Work is Defective Work, of if Contractor otherwise fails to furnish or perform the Work in accordance with the ***Contract Documents***, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. Owner's right to so stop the Work shall not give rise to any duty of Owner to exercise such right for Contractor's or any other party's benefit.

Uncovering Work:

12.7 If any Work is covered contrary to Engineer's written request, such Work shall, upon Engineer's request, be uncovered for Engineer's observation and re-covered, all at Contractor's expense.

12.8 If Engineer deems observation, inspection, or testing of any covered Work to be necessary or advisable, Contractor shall, upon Engineer's request, uncover, expose, or otherwise make available such Work. If such Work is found to be Defective Work, Contractor shall bear all direct, indirect, and consequential costs of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such Work is not found to be Defective Work, Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction, and if the parties are unable to agree, claims therefore may be made under Articles 10 and 11.

Correction of Defective Work:

12.9 Upon written notice from Engineer, Contractor shall promptly either (i) correct all Defective Work, whether or not fabricated, installed, or completed, or (ii) if such Defective Work has been rejected by Engineer, remove all Defective Work from the site and replace and re-execute the Work in accordance with the ***Contract Documents***.

12.10 Contractor shall bear all direct, indirect, and consequential costs of correction or removal and replacement of Defective Work, including without limitation fees and charges of engineers, architects, attorneys, and other professionals, and all costs attributable to the repair or replacement of other contractors' work damaged or destroyed by such operations by Contractor. If Contractor does not take action to correct or remove and replace Defective Work within 10 days after receipt of Engineer's written notice, Owner may correct or remove and replace such Defective Work and all costs thereof shall be at Contractor's expense.

Warranty, Guarantee, and Correction Period:

12.11 Contractor warrants and guarantees to Owner that all Work furnished, performed, and completed shall be in accordance with the ***Contract Documents*** and shall not be Defective Work.

12.12 If within one year after the date of completion, or such longer period as may be prescribed by Laws or Regulations or otherwise required by the ***Contract Documents***, any Work is found to be Defective Work, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, make such adjustments, repairs, and replacements as are necessary to remedy such Defective Work and any damage caused thereby or resulting there from. If Contractor fails to promptly comply with Owner's instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have such Defective Work and damage remedied, and all direct, indirect, and consequential costs thereof shall be paid by Contractor.

ARTICLE 13 - PAYMENTS AND COMPLETION

Progress Payment Estimates:

13.1 At least 10 days before each progress payment is scheduled (but not more often than once a month), Contractor shall prepare and submit to Engineer a progress payment estimate covering, as of the date of the estimate, all Work completed and all qualifying materials on hand. Contractor shall coordinate with Engineer in estimate preparation, and shall provide such supporting documentation as is required by the ***Contract Documents***. To qualify for payment, materials on hand shall be accompanied by such supporting data as will establish Owner's title thereto free and clear of all Liens, and protect Owner's interest therein, including applicable insurance; payment for materials on hand so qualified will be based only on Contractor's actual cost thereof, and will not include any overhead or profit. Retainage with respect to progress payments will be as stipulated in the ***Agreement***. Contractor shall sign each progress payment estimate as a confirmation that the estimate fairly and accurately reflects the amount due Contractor.

13.2 Engineer will, within 10 days after receipt of each progress payment estimate, either sign the progress payment as a recommendation to Owner for payment of the amount due Contractor and present the progress payment to Owner, or return the progress payment to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the progress payment estimate.

13.3 Ten days after presentation of the progress payment estimate with Engineer's recommendation to Owner, the recommended amount due Contractor will become due and, when due, will be paid by Owner to Contractor.

Partial Utilization:

13.4 Prior to completion and acceptance, Owner may, with the concurrence of Engineer and Contractor, use or place in service any part of the Work which Owner believes constitutes a separately functioning and useable part of the Work that can be used or placed in service without significant interference with Contractor's performance of the remainder of the Work. Such use or placing in service will not constitute acceptance of such portions of the Work.

Final Inspection:

13.5 When Contractor considers the entire Work complete, Owner, Engineer, and Contractor will make a final inspection of the Work. Engineer will, within 10 days thereafter, notify Contractor of all particulars of incomplete or Defective Work revealed by such inspection. Contractor shall immediately undertake such measures as are necessary to remedy such deficiencies.

Final Payment and Certificate of Completion:

13.6 After Contractor has remedied all deficiencies noted under Paragraph 13.5 to Engineer's satisfaction, and after Contractor has delivered a duly executed affidavit in the form prescribed by the ***Contract Documents***, and after Contractor has delivered all other documentation required by the ***Contract Documents***, including without limitation operating and maintenance instructions, record documents, guarantees, Bonds, and certificates of inspection or testing, Engineer will prepare a final payment statement and a certificate of completion.

13.7 Contractor shall sign the final payment statement as a concurrence with the amount due Contractor; Contractor shall sign the certificate of completion as a certification that all of Contractor's indebtedness connected with the Work has been paid or otherwise satisfied. Engineer will sign the final payment statement as a recommendation to Owner for payment of the amount due Contractor; Engineer will sign the certificate of completion as a representation to Owner that, to the best of Engineer's knowledge, information, and belief, the Work has been completed in accordance with the ***Contract Documents*** and Contractor's obligations under the ***Contract Documents*** have been fulfilled.

13.8 Within 30 days after presentation of the duly executed certificate of completion, Owner will sign such certificate as an acceptance of the Work; 30 days after approval of the duly executed final payment statement, the recommended amount due Contractor will become due and, when due, will be paid by Owner to Contractor.

Waiver of Claims:

13.9 The making of final payment will constitute a waiver of claims by Owner against Contractor, except claims arising from unsettled Liens, from Defective Work appearing after the final inspection of Paragraph 13.5, or from failure to comply with the ***Contract Documents*** or the terms of any special guarantees required therein.

13.10 The acceptance of final payment shall constitute a waiver of claims by Contractor against Owner, except claims previously made in writing and identified as unsettled at the time of final payment.

ARTICLE 14 - SUSPENSION OF WORK AND TERMINATION

Owner May Suspend Work:

14.1 Owner may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than 90 days by written notice to Contractor, which notice will fix the date of Work resumption. Contractor shall resume the Work on the date so fixed, and will be allowed an increase in Contract Price or an extension of Contract Time, or both, directly attributable to such suspension, and if the parties are unable to agree, claims therefore may be made under Articles 10 and 11.

Owner May Terminate:

14.2 Owner may, after giving Contractor and Contractor's surety 10 days written notice and without prejudice to any other right or remedy, terminate the services of Contractor upon the occurrence of any one or more of the following: Contractor files for protection under any debtor's act; Contractor is adjudged a bankrupt or insolvent; a receiver or trustee is appointed for Contractor or any of Contractor's property; Contractor makes a general assignment for the benefit of creditors; Contractor persistently fails to perform the Work in accordance with the ***Contract Documents*** (including without limitation failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the construction schedule); Contractor disregards Laws or Regulations of any public body having jurisdiction; Contractor disregards the authority of Engineer; or Contractor otherwise substantially violates any provision of the ***Contract Documents***.

14.2.1 If Contractor's services are terminated under Paragraph 14.2, Owner may take possession of the Work and all of Contractor's tools, appliances, and construction equipment and machinery at the site and finish the Work as Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect, and consequential costs of so completing the Work (including without limitation fees and charges of engineers, architects, attorneys, and other professionals and arbitration and court costs), such excess will be paid to Contractor. If such costs exceed such unpaid balance, Contractor shall pay the difference to Owner. Such costs incurred by Owner will be determined by Engineer and incorporated in a ***Change Order***. Owner will not be required to obtain the lowest price for so completing the Work.

14.3 Upon 10 days written notice to Contractor, Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the ***Agreement***. In such case, Contractor will be paid for all Work executed and any expense sustained plus reasonable profit.

Contractor May Stop Work or Terminate:

14.4 If, through no act or fault of Contractor: the Work is suspended for more than 90 days by Owner or under an order of court or other public authority; or Engineer fails to act on any progress payment estimate within 30 days after preparation thereof; or Owner fails to pay Contractor any sum finally determined to be due within 30 days after such payment becomes due; then Contractor may, upon 10 days written notice to Owner and Engineer, terminate the ***Agreement*** and recover from Owner payment of all Work executed and all expenses sustained plus reasonable termination expenses. In addition and in lieu of terminating the ***Agreement***, if Engineer has failed to act or if Owner has failed to pay as aforesaid, Contractor may, upon 10 days written notice to Owner and Engineer, stop the Work until payment of all amounts then due has been made.

ARTICLE 15 - ARBITRATION

15.1 All claims, disputes, and other matters in question between Owner and Contractor arising out of or relating to the ***Contract Documents*** or the breach thereof, except for claims which have been waived by the making or acceptance of final payment under Paragraphs 13.9 and 13.10, may be decided by arbitration, if mutually agreed upon by both parties, in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law.

15.2 No demand for arbitration of any claim, dispute, or other matter required to be initially referred to Engineer for decision under Paragraph 8.11 shall be made until the earlier of (i) the date Engineer renders a formal decision, or (ii) 30 days after the parties have delivered all supporting data to Engineer. No such demand for arbitration shall be made later than 30 days after Engineer renders a formal decision, and failure to so demand arbitration within said 30 day period shall make Engineer's formal decision final and binding on both parties. In other cases, demand for arbitration shall be made within a reasonable time after the claim, dispute, or other matter in question has arisen, and in no event shall any such demand be made which would be barred by any applicable statute of limitations.

15.3 Notice of demand for arbitration shall be filed in writing with the other party to the ***Agreement*** and with the American Arbitration Association, and a copy shall be sent to Engineer for information. Contractor shall continue the Work during any arbitration proceedings in accordance with Paragraph 6.27.

ARTICLE 16 - MISCELLANEOUS

Giving Notice:

16.1 Written notice shall be deemed to have been duly given if delivered in person to the individual or to an officer of the entity for whom the notice is intended, or if delivered at or sent by registered or certified mail (postage prepaid) to the last business address known to the notice giver.

Duties, Obligations, Rights, and Remedies:

16.2 Duties and obligations imposed by, and rights and remedies available under the ***Contract Documents*** shall be in addition to and not a limitation of duties, obligations, rights, or remedies otherwise imposed by or available under Laws or Regulations.

16.3 No act or failure to act by Owner, Engineer, or Contractor shall constitute a waiver of any duty or right accorded thereto by the ***Contract Documents***, nor shall such act or failure to act constitute approval of or acquiescence in any breach of the ***Contract Documents***.

Contractor's Continuing Obligation:

16.4 Contractor's obligation to furnish, perform, and complete the Work in accordance with the ***Contract Documents*** shall be absolute. No act or failure to act by Owner or Engineer, including without limitation reviews, recommendations, use or occupancy, corrections, and payments, will constitute an acceptance of Work not in accordance with the ***Contract Documents*** or a release of Contractor's aforesaid obligation. Representations, warranties, and guarantees made under the ***Contract Documents*** shall survive final payment and completion or termination of the ***Agreement***.

END OF SECTION

DOCUMENT 00800

SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS:

These ***Supplementary Conditions*** amend or supplement the ***General Conditions*** as indicated herein; all provisions not so amended or supplemented remain in full force and effect. Terms used in these ***Supplementary Conditions***, which are defined in the ***General Conditions***, have the meanings assigned thereto by the ***General Conditions***.

SC – 6.15.1:

Add a new paragraph immediately after Paragraph 6.15 of the ***General Conditions*** which read as follows:

6.15.1 Labor services, materials, and equipment incorporated into the Work under these ***Contract Documents*** **ARE** exempt from payment of the Kansas Sales Tax. A sales tax exempt number will be filed for after award of bid on the project.

END OF DOCUMENT

SPECIFICATIONS

DIVISION 1
GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 SPECIFICATIONS LANGUAGE

A. ***Specifications*** are written in imperative mood and streamlined form to the maximum extent practicable. Imperative language is directed to Contractor (i.e. “Contractor shall” is inferred) unless specifically noted otherwise. In lists of products, materials, reference standards, and other itemized specifications, a colon (:) represents “Contractor shall”, “shall be”, or “shall be in accordance with” as applicable. (e.g. “Install equipment plumb and level” and “Equipment: Install plumb and level” both mean “The Contractor shall install equipment plumb and level”; “Aggregate: ASTM C33” means “Aggregate shall be in accordance with ASTM C33”.)

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Location: Work is located within ***Owner***- provided property in and around John Redmond Reservoir.

B. Description: Work consists of constructing Confined Disposal Facilities Improvements and includes, but not specifically limited to:

1. Constructing earthen Confinement Levees, and appurtenant structures; ditch lining, access road, fencing, implementing pollution prevention plan, filling and seeding, as required.

C. Special Provisions:

1. In the preparation of the ***Contract Documents***, Engineer has utilized a geotechnical report prepared by Terracon, Wichita, Kansas consisting of various maps, bore hole logs, and test reports. This information is provided for informational purposes only and it is up to the Contractor to verify the technical data contained within this report. The Report includes: drilling and sampling methods; borehole logs, laboratory test methods and results; and similar factual data, all as of the dates made. A copy of this report is

included in its entirety, in APPENDIX A, Geotechnical Reports.

2. The Contractor shall commence work following receipt of the NPDES Permit, Notice of Intent prepared and submitted by the Engineer and ***Owner***. Work at the site will not be allowed to commence until the NPDES Permit been obtained, as required by federal regulation.

3. Contractor shall implement the Pollution Prevention Plan to minimize environmental impacts of construction under these ***Contract Documents.*** The Contractor shall be solely responsible for implementing and maintaining the provisions of the plan, as required by federal regulations.

4. Any changes in the work methods required to meet the project performance requirements will be addressed, of necessary, via Change Order.

1.3 WORK SEQUENCE AND COORDINATION

A. Construction Schedule: Prepare and submit construction schedule in accordance with Article 2 of the ***General Conditions***; update and revise as needed to reflect changes in progress of the Work, and resubmit to Engineer for review.

1.4 HISTORICAL AND ARCHEOLOGICAL PRESERVATION

A. If, during the course of construction, evidence of deposits of historical or archeological interest is found, cease operations affecting the find and notify ***Owner***, who will notify the Kansas Department of Health and Environment (KDHE) and the Executive Director of the Kansas State Historical Society. No further disturbance of the deposits shall occur until receipt of a notice to proceed from ***Owner***. ***Owner*** will issue such notice to proceed only after the State official has surveyed the find and made a determination to KDHE and ***Owner***. Changes, if any, required in the ***Contract Documents*** will be determined in accordance with the ***Change Order*** provisions of the ***Contract Documents***.

1.5 SALVAGE

A. Existing materials, equipment, or appurtenances salvaged in the course of new construction shall remain the property of ***Owner***.

B. Deliver and store salvaged items at a location designated by ***Owner***; properly dispose of salvaged items ***Owner*** does not want.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Document 00410-***Bid Form***, ***Exhibit A***: Bid Schedule.

1.2 SCOPE

A. Payment for the various priced items set forth in the Bid Schedule shall constitute full compensation to Contractor for providing all plant, equipment, machinery, materials, tools, supplies, transportation, labor, operations, and all other property, services, and expenditures required to furnish, perform, and complete the Work in accordance with the ***Contract Documents***. No separate payment will be made for any item not specifically set forth in the Bid Schedule, and all costs for necessary Work not specifically set forth in the Bid Schedule will be deemed to be included in prices for the most applicable priced items.

1.3 LUMP SUM ITEMS

A. No quantity measurement for payment will be made. Payment for each lump sum item of Work will be made at the lump sum price bid therefore in the Bid Schedule. ***Payments will be based on the percentage of the item completed***, and will be made in accordance with Article 14 of the ***General Conditions*** and as follows:

1. Item 1 – Mobilization

a. Includes movement of personnel, equipment, supplies and incidentals to and from the project site. Work also includes maintaining accessible routes to businesses, dust control, traffic control, erosion control, removal of materials from the site and hauling materials to an approved location.

b. Unit of measure: Payment will be based on percentage of work completed.

1.4 UNIT PRICE ITEMS

A. Measurement for payment will be made by Engineer in the manner considered most practicable by Engineer. Payment for each unit price item of Work will be made at the unit price per respective unit of measurement bid therefore in the Bid Schedule. Such payments will be made in accordance with Article 14 of the ***General Conditions*** and as follows:

1. Item 2 – Clearing and Grubbing

a. Includes all equipment and labor necessary for clearing, stripping, stockpiling, re-spreading topsoil as topdressing, and clearing and striping all vegetation and fencing within the construction limits not designated to remain including trees, bushes and weeds from the site.

b. Unit of measure: Square yards of ground cleared and stripped 12 inches deep.

2. Item 3 – Common Excavation

a. Includes all labor and equipment necessary for the excavation of stripped area to the elevations as shown on the ***Drawings***.

b. Includes all labor and equipment necessary for excavation of cut and benched areas in preparation of compacted embankment placement.

c. Unit of measurement: Cubic yards of material excavated.

3. Item 4 – Compacted Embankment

a. Includes scarifying, placing, moisture conditioning, compacting operations and removal and replacement of areas of substandard embankment as determined by Engineer, necessary to construct the underlying fill and compacted embankments in accordance with these ***Specifications*** and as shown on the ***Drawings***.

b. Any equipment, materials or labor required to obtain and apply water for moisture adjustment to the soil in the compacted embankment is subsidiary to this item. No additional cost will be paid.

c. Unit of measurement: Cubic yard plan quantity in place of Compacted Embankment constructed.

4. Item 5 – Sluice Gate Structure

   a. Includes all labor, equipment, concrete, internal pipe and fittings, weir plates, stop plates, gratings, and other metalwork for the finished sluice gate constructed in accordance with these ***Specifications*** and as shown on the ***Drawings***.

   b. Unit of measurement: Each Sluice Gate Structure constructed.

5. Item 6 – Fencing

   a. Includes labor, equipment, fencing, earthwork, concrete, materials and accessories, warning signs, and installation of all gates for the fencing types in and around the new lagoons as indicated on ***Drawings***.

   b. Unit of measurement: Linear foot of fence (continuous through gates) installed.

6. Item 7 – Seeding

   a. Includes seed, fertilizer, mulch, seedbed preparation, drilling, and all labor, equipment, and materials required for protection, repair, and maintenance at treatment facility.

   b. Unit of measurement: Each acre Seeded.

7. Item 8 – Access Drive

   a. Includes all labor and equipment necessary for the excavation, backfill, light type surfacing to the areas shown on the ***Drawings.***

   b. Unit of measurement: Square yard of Access Drive placed.

PART 2 **PRODUCTS** (Not Used)

PART 3 **EXECUTIONS** (Not Used)

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.1 RELATED SECTIONS

A**.** Document 00700 - *General Conditions*: Reference Points.

1.2 REFERENCE POINTS

A. Line and grade reference points for laying out and properly executing the Work are shown on the

Drawings, as set and established by:

Evans, Bierly, Hutchison and Associates,
P.A. (**EBH**) Consulting Engineers

1105 Williams

Great Bend, KS 67530

Telephone: (620) 793-8411 Fax: (620) 793-8413

A. Coordinate system shown is local as established by **EBH**;

C. Verify locations of survey control points prior to starting work. Promptly notify Engineer of discrepancies discovered.

1.3 CONSTRUCTION STAKING

A. **EBH** will provide construction staking services for the proper layout and execution of the Work.

B. Contractor shall coordinate with **EBH** regarding requests for staking services, including a minimum of 3 working days prior notification.

C. Contractor shall be responsible for protecting and preserving established staking. Contractor shall be charged for any stake replacement required at a rate of $120.00 per hour.

D. Construction staking for the proper layout and execution of the work shall consist of no more than the following:

1. Slope Staking (Earth work): Slope staking at 100 feet intervals with fills and cuts.

2. Sluice Gates: 2 offset stakes per structure

3. Fences: Stakes at 100 feet intervals and corners.

4. Drainage Swales: Stakes at 50 feet intervals with grades and at changes in direction.

PART 2 **PRODUCTS** (Not Used)

PART 3 **EXECUTIONS** (Not Used)

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.1 REFERENCE STANDARDS

A. Reference standards include published or standard specifications, codes, manuals, quality standards, test methods and procedures, and other similar requirements of a technical society, association, institute, or organization.

B. Reference standards are the latest edition or revision thereof (including amendments or supplements) in effect at the time of Bid opening unless otherwise specified.

C. If type, grade, or other option available under a reference standard is not specified, any of the types, grades, or options available may be selected.

D. In the event of conflict between reference standard and Contract Documents or another reference standard, promptly notify Engineer in writing and, before proceeding with any Work affected thereby, obtain Engineer's written directions regarding resolution thereof.

E. No provision, condition, or requirement of any reference standard (whether or not incorporated in the Contract Documents by reference) shall be effective to delete, change, or add to the duties, responsibilities, and authorities of Owner, Contractor, or Engineer set forth in the Contract Documents.

1.2 SCHEDULE OF REFERENCES

AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street N.W. Washington, DC 20001
ACI	American Concrete Institute 22400 West 7 Mile Road

Detroit, MI 48219

AISC	American Institution of Steel Construction 400 North Michigan Avenue Chicago, IL 60611
AISI	American Iron and Steel Institute 410 Commonwealth Drive Warrendale, PA 15086
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWS	American Welding Society 550 LeJeune Road N.W. Miami, FL 33126

AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
FS	Federal Specifications General Services Administration - Specifications & Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407
HI	Hydraulic Institute 712 Lakewood Center North 14600 Detroit Avenue Cleveland, OH 44107
IEEE	Institute of Electrical and Electronic Engineers 345 East 47th Street New York NY 10017
MSS	Manufacturers' Standardization Society of the Valve and Fittings Industry 127 Park Street N.E. Vienna, VA 22180
NACE	National Association of Corrosion Engineers P.O. box 218340 Houston, TX 77218
NEC	National Electrical Code (see NFPA)
NEMA	National Electrical Manufacturers Association 2101 L. Street N.W. Washington, DC 20037
NESC	National Electrical Safety Code (see IEEE)

NFPA National Fire Protection Association Batterymarch Park

Quincy, MA 02269

SAE Society of Automotive Engineers 400 Commonwealth Drive

Warrendale, PA 15086

UL Underwriter's Laboratory 333 Pfingsten Road

Northbrook, IL 60062

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Document 00710 - ***General Conditions***, Paragraph 2.06: Preconstruction conference.

1.2 PRECONSTRUCTION CONFERENCE

A. ***Engineer*** will arrange mutually agreeable time and place.

B. Attendees:

1. Contractor, Contractor's superintendent, and Subcontractors and Suppliers as Contractor deems appropriate.

2. Owner's representatives, agents, and consultants as Owner deems appropriate.

3. Engineer, Resident Project Representatives, and Engineer's agents and consultants as Engineer deems appropriate.

4. Governmental representatives as appropriate.

5. Others, including utility owners and operators, as requested by Owner, Contractor, or Engineer.

C. Purposes (without limitation):

1. Establish and identify responsible personnel regarding communications among and responsibilities of Owner, Contractor, and Engineer.

2. Review general responsibilities of Owner, including easements and rights-of-way, timely payment of Contractor, and working through Engineer on matters related to the Work or ***Contract Documents***.

3. Review general responsibilities of Engineer and Resident Project Representatives, including construction observation, submittal reviews, material and equipment inspections to ascertain compliance of the Work with the ***Contract Documents***, maintenance of a daily log of construction and the Work, impartial interpretation of Contract Documents, sole judging of Work acceptability, and initial reference for claims and disputes.

4. Review general responsibilities of Contractor, including use of premises, safety and first aid, housekeeping and cleanup, coordination, maintaining record documents, submittals, Bonds and insurance, tests and inspections required by the ***Contract Documents***, and compliance of the Work with the ***Contract Documents***.

5. Review major or critical requirements regarding or relating to the Work.

6. Review procedures, timing, and processing of submittals, progress payment estimates, and Change and Field Orders.

7. Review Contractor's preliminary schedules of construction operations and progress payment earnings.

D. Engineer will establish and distribute an agenda prior to the conference, preside over the conference, and arrange for keeping and distributing minutes of the conference.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Document 00710 - ***General Conditions***, paragraphs 6.17, 9.06A: ***Shop Drawings*** and Samples.

B. Document 00710 - ***General Conditions***, Paragraphs 6.05***: Substitutes*** or "Or Equal" Items.

C. Section 01600 - ***Materials and Equipment***: Options and Substitutions.

1.2 SHOP DRAWINGS

A. If for review, submit 7 copies each; if for information only, submit one copy each.

B. Clearly identify Project and Work, Contractor, Subcontractor or Supplier, reference ***Specifications*** section and ***Drawing*** sheet as applicable, and itemized contents of submittal. Submittals lacking such identifications will be returned for resubmittal without further action by Engineer.

C. Date, sign, and certify each sheet of submittal regarding fulfillment of Contractor's submittal responsibilities and conformance with requirements of the Work and the ***Contract Documents***. Submittals lacking such certifications will be returned for resubmittal without further action by Engineer.

D. Unless otherwise specified, Engineer will, within 14 days after receipt of a submittal for review, either:

1. Return 3 copies marked "REVIEWED" - no further action required;

2. Return 3 copies marked "FURNISH AS CORRECTED" - make indicated corrections,

but resubmittal not required;

3. Return one copy marked "REVISE AND RESUBMIT" - make indicated revisions and resubmit; or

4. Return one copy marked "REJECTED" - re-do entire submittal.

E. Provisions and requirements for original submittal apply to resubmittal.

1.3 SAMPLES

A. Submit 3 each.

B. Clearly identify Project and Work, Contractor, Subcontractor or Supplier, reference ***Specifications*** section and ***Drawing*** sheet as applicable, and itemized contents of submittal. Submittals lacking such identifications will be returned for resubmittal without further action by Engineer.

C. Tag or permanently label each sample indicating Supplier and specified physical characteristic represented.

D. Unless otherwise specified, Engineer will select product from manufacturer's standard line of colors, patterns, textures, materials, or equipment. Engineer will, within 14 days after receipt, return 2 samples clearly marked as to Engineer's selection.

1.4 PROPOSED SUBSTITUTES OR "OR EQUAL" ITEMS

A. Submit written application for review including:

1. Certification that the proposed substitute will adequately perform the functions and achieve equivalent results called for by the general design, and that the proposed substitute is similar to, of equivalent substance as, and suited to the same uses as that specified;

2. Identification of all variations of the proposed substitute from that specified and any changes in the Contract Documents which would be required by the use or incorporation of the proposed substitute, including a statement that all such changes would be made without cost to ***Owner***; and

3. Sufficient pertinent data about the proposed substitute to allow Engineer to verify equivalency with that specified, including availability of repair and replacement services.

B. Engineer will evaluate proposed substitutes considering all information and data submitted, and will be allowed a reasonable time to conduct such evaluation. Upon making a final decision, Engineer will either:

1. Retain entire submittal and notify Contractor in writing of authorization of the proposed substitute, including any conditions therefore; or

2. Return entire submittal with written justification for disallowance of the proposed substitute.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES, UTILITIES, AND CONTROLS

PART 1 GENERAL

1.1 TEMPORARY CONSTRUCTION FACILITIES

A. Access Roads: Investigate conditions of available public and private roads including clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site. Construct and maintain any access roads, haul roads, bridges, or drainage structures required for construction operations.

B. Sanitation Facilities: Provide and maintain sanitation facilities in accordance with applicable Laws and Regulations.

C. Medical Facilities: Provide and maintain, or ensure prompt access to, fully equipped first aid facilities with qualified personnel in attendance whenever Work is in progress; provide standing arrangement for ambulance service for the immediate removal and hospitalization of any employee sickened or injured on the Work, including Owner's and Engineer's employees.

1.2 TEMPORARY CONSTRUCTION UTILITIES

A. Water for Construction Purposes: Water provided by ***Owner*** for soil conditioning, backfill settlement, testing and other similar construction purposes will be provided at no cost by ***Owner***, at locations and in amounts authorized. Provide all facilities necessary to obtain, transport, and convey water to points of use. To the extent practicable, utilize such water during off-peak water use times. Use only special purpose hydrant wrenches to operate fire hydrants. Tank filling procedures to include an air gap for back flow prevention. Under no circumstances shall a fill line be directly connected to a tank without an air gap. Indiscriminate or wasteful use of water so provided will not be permitted. All water shall be metered for reporting purposes utilizing a meter that attaches to the hydrant supplied by the Contractor.

B. Electric Power for Construction Purposes: Make arrangements and pay all costs to obtain and provide electric power for all construction purposes, unless otherwise indicated on the ***Drawings***. Provide all transmission and distribution facilities and equipment to deliver suitable electric power to points of use.

C. Other Utilities: Make all arrangements and pay all costs to obtain and provide telephone services, lighting, heating, cooling, and other utilities necessary for construction purposes.

1.3 TEMPORARY CONSTRUCTION CONTROLS

A. Safety: Provide safe and healthful working conditions in accordance with Occupational Safety and Health Standards (29 CFR 1910) and Safety and Health Regulations for Construction (29 CFR 1926) of the Occupational Safety and Health Administration, "*Manual of Accident Prevention in Construction*" by Associated General Contractors of America, and all other applicable Laws and Regulations. Ensure that Subcontractors do likewise.

B. Protection of Existing Installations: Take all necessary precautions to safeguard existing installations and property which are to remain in place or undisturbed. Obtain or determine locations of buried utilities, service connections, ground mat, foundations, structures, and other buried facilities prior to excavation operations, and provide adequate protection therefore during excavation and backfill operations. Provide, install, and maintain protective installations so as to allow operation of existing equipment and use of existing facilities during Work progress. Construct enclosures to prevent dust, grit, or other foreign material from endangering personnel or contaminating or damaging equipment or facilities. Keep fire hydrants, control valves, and water supply equipment and facilities free from obstruction and available for use at all times. Repair damage to existing installations due to construction operations or failure to provide proper protection at no cost to Owner.

C. Fences: Prior to relocation or dismantling, obtain fence owners' written permission, including agreement as to the time period such fence is to be left relocated or dismantled. Maintain existing fences affected by the Work until completion of the Work, and replace or reassemble fences in preconstruction location and condition.

D. Landscape Preservation: Conduct construction operations and movements of crews and equipment so as to preserve the natural landscape and prevent unnecessary destruction, scarring, or defacing thereof at and in the vicinity of the site. Preserve and protect, by barriers or other positive means, trees, shrubbery, lawns, gardens, crops, and other landscape features not specifically required to be cleared or removed which are exposed to injury by construction operations. Do not remove trees or shrubs without specific authorization of Engineer.

E. Security: Provide and maintain such security measures as may be deemed necessary to prevent unauthorized entry or theft, vandalism, or misuse of any Work, materials, equipment, construction machinery, tools, supplies, or similar items.

F. Traffic: Conduct operations so as to offer the least possible interference with public traffic, whether vehicular or pedestrian. Make all necessary provisions for maintaining and safeguarding public traffic:

1. Provide and maintain safe and convenient access to roads, driveways, walks, residences, and buildings along the line of the Work, including temporary bridges, approaches, and detours.

2. Where public traffic will cross over or pass through the construction, provide a reasonably smooth, dustless, and unobstructed passageway for one line of traffic at all times. Where construction operations or equipment may endanger passing traffic, provide and station guards and flaggers as necessary to control traffic movement and ensure against accidents with, or damage or injury to, passing traffic.

3. Keep roads subject to interference by the Work open, or provide and maintain safe and suitable detours. Provide, erect, and maintain sufficient and suitable barricades, lights, signals, and signs and provide and station guards and flaggers as necessary for the protection of the Work and the safety of the public.

4. Provide, erect, and maintain sufficient and suitable barricades, lights, and signs around open excavations, material piles, equipment, and similar hazards or obstructions to adequately protect the public.

5. Barricades, hazards, and obstructions shall be illuminated by warning lights from sunset to sunrise.

6. Signs, signals, barricades, flaggers, and other traffic control and safety devices and measures: ANSI D6.1 - Manual of Uniform Traffic Control Devices for STREET IMPROVEMENTSs and Highways, Safety and Health Regulations for Construction (29 CFR 1926), and as required by any applicable jurisdictional authority

G. Cleanup and Disposal: At all times, keep the entire construction area, including the site, yards, storage areas, and haul roads, in a neat and clean condition free from accumulations of waste materials or rubbish. Dispose of waste materials and rubbish in accordance with applicable Laws and Regulations, including locations and methods.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. To the greatest extent practicable, provide materials or equipment of a singular generic nature or kind from a single source.

B. Select materials and equipment on the basis of compatibility with previously selected materials and equipment: compatibility is a basic and primary requirement for material and equipment selection.

C. Engineer will have the right to inspect materials and equipment at any stage of production or manufacture; however, neither such inspection nor waiver thereof shall relieve Contractor of any responsibility regarding such materials or equipment under the Contract Documents.

1.2 TRANSPORTATION AND HANDLING

A. Transport and handle materials and equipment in accordance with manufacturer's instructions and so as to prevent soiling, disfigurement, deterioration, or damage.

B. Deliver materials and equipment in manufacturers' unopened containers or packaging as applicable. Plan and control deliveries to minimize long-term storage and overcrowding of construction areas, particularly for materials or equipment recognized as hazardous, flammable, degradable, or otherwise sensitive to deterioration.

1.3 STORAGE AND PROTECTION

A. Store and protect materials and equipment in accordance with manufacturers' instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports above the ground. Cover products subject to deterioration with impervious sheeting and provide ventilation to prevent condensation.

C. Store loose granular materials on solid flat surfaces in a well-drained area, and prevent mixing with foreign matter.

D. Arrange storage to permit easy access for inspection and maintenance.

1.4 OPTIONS AND SUBSTITUTIONS

A. Product Specified by:

1. Reference Standard or Description Only: Furnish any product meeting the standard or description.

2. Manufacturer(s) named Without "Or Equal": Furnish the product of the named manufacturer meeting the specifications; no options or substitutions.

3. Manufacturer(s) Named With "Or Equal": Furnish the product of the named manufacturer meeting the specifications; or submit application for review for a proposed substitute of manufacturer not named in accordance with Section 01300-**Submittals**.

B. Substitutions will be considered when a product becomes unavailable through no fault of Contractor.

1.5 MATERIALS AND EQUIPMENT FURNISHED BY OWNER

A. Point of delivery of materials and equipment indicated by the ***Contract Documents*** to be furnished by ***Owner*** will be designated by ***Owner***. Thoroughly and carefully examine such items for damage or deficiency prior to taking possession thereof, and reject defective items: any damage or deficiency discovered after Contractor takes possession will be deemed Defective Work. ***Owner*** reserves the right to accept materials or equipment rejected by Contractor, and to authorize the use or installation thereof in the Work.

B. After taking possession, transport, handle, store, and protect such materials and equipment in accordance with the applicable provisions of this Section; repair or replace, at no cost to Owner, any such materials or equipment which are damaged, stolen, or lost.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF
SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 FINAL CLEANUP

A. Execute final cleanup prior to final inspection under Paragraph 13.5 of the ***General Conditions***. Include without limitation:

1. Disassemble and remove all plant, equipment, offices, yards, temporary facilities, supplies, and incidentals from the site.

2. Dismantle and remove all temporary construction utilities.

3. Remove all rubbish, unused and waste materials, concrete forms, and other like material used or generated during construction.

4. For all disturbed or used areas not requiring replanting or reseeding, scarify, re-grade as required to blend with the natural terrain, and leave all such areas in a condition that will facilitate natural re-vegetation, provide for proper drainage, and prevent erosion.

5. Provide a final cleaning of the Work including as applicable:

   a. Clean interior and exterior glass and surfaces exposed to view.

   b. Clean to sanitary condition and adjust to proper operating condition all equipment and fixtures, including cleaning or replacing filters as required.

   c. Clean debris from and ensure unclogged operation of all drainage systems.

1.2 RECORD DOCUMENTS

A. Store and maintain record documents separate from documents used for construction in accordance with Paragraph 6.26 of the ***General Conditions***. Update, annotate, and record information on the record documents concurrently with construction progress.

B. Drawings and Shop Drawings: Legibly mark and supplement as necessary to fully indicate the Work as actually constructed, including without limitation:

1. Measured foundation depths in relation to finished floor datum.

2. Measured horizontal and vertical locations of underground utilities and facilities.

3. Measured locations of conduit, utilities, and appurtenances embedded or concealed in the Work.

4. Field changes of dimensions or details, and details not shown on original ***Drawings*** or Shop Drawings.

C. Deliver record documents as required to fully indicate actual construction to Engineer prior to preparation of final payment statement.

1.3 CLOSEOUT PROCEDURES

A. Provide Owner and Engineer written certification that ***Contract Documents*** have been reviewed, the Work has been examined and is complete in accordance with the ***Contract Documents***, and the Work is ready for final inspection in accordance with Paragraph 13.5 of the ***General Conditions***.

B. Prepare and deliver to Engineer record documents, operation and maintenance manuals, warranties and guarantees, and all other documentation required by the ***Contract Documents***.

C. Identify in writing all claims against ***Owner*** remaining unsettled at the time of final payment statement preparation.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

DIVISION 2
SITEWORK

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.1 REMOVAL

A. Top twelve (12") inches of soil shall be removed from the entire "foot print" of the new Confinement Levees. This soil shall be stockpiled for use for top soiling the compacted embankments, drainage areas, and other seeded areas.

1.2 DISPOSAL OF SURPLUS MATERIALS

A. All excavated soil not required for fill or backfilling shall be stockpiled at locations designated by ***Owner.***

1.3 FENCING DURING CONSTRUCTION

A. No fence required.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Definitions: Over-excavation; Additional Excavation.

B Excavation: Safety; Classification; Limits and Conditions; Structure Foundations; Trenching; Boring; Tunneling; Stockpiling; Drainage; Disposal.

C. Backfill: Materials; Placing.

D. Embankment: Materials; Foundation Preparation; Placing.

E. Settlement and Compaction: Settling Earth Materials; Compacting Earth Materials.

1.2 DEFINITIONS

A. Over-excavation: Any and all excavation outside prescribed lines, whether done for convenience or required as a result of Contractor's operations.

B. Additional Excavation: Any and all excavation outside prescribed lines ordered and authorized by Engineer.

1.3 EXCAVATION

A. Safety: Provide and maintain safe working conditions within excavations by shoring, sheeting, bracing, benching, or sloping as required.

B. Classification: No classification as to type, origin, condition, or other characteristic will be made of excavated material.

C. Limits and Conditions:

1. Excavate to lines and grades shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer.

2. Excavate in the dry. Provide and maintain adequate dewatering equipment and systems to remove and dispose of surface and ground water entering excavations; maintain ground water levels at least one (1') foot below bottom of excavation. Discontinue dewatering operations only after construction has progressed to the extent necessary to prevent damage to the Work by such discontinuance. Do not excavate in frozen materials.

3. No blasting or explosives will be permitted. Take necessary precautions and exercise due care to preserve material beyond prescribed lines in soundest condition possible. Remove material rendered unsuitable by excavation or other operations: such removal will be deemed Over-excavation. Refill with compacted suitable material or structural grade concrete.

4. Over-excavation, and refill work occasioned thereby, shall be at no cost to ***Owner***. Additional Excavation, and refill work occasioned thereby, will be paid for by ***Change Order***.

D. Structure Foundations: Accurately finish excavation surfaces to receive concrete. Moisten and tamp or roll surfaces to provide a firm foundation for concrete. Refill Over-excavation and Additional Excavation in earth foundations with compacted suitable material; in rock foundations, refill with structural grade concrete.

E. Trenching: Except where boring or tunneling is required or permitted, excavate trenches by open cut from the surface. Use hand methods where trenching equipment would damage trees, buildings, utilities, or other property or structures above or below ground.

1. From at least one (1') foot above top of pipe to trench bottom, trench walls shall be vertical and trench width shall be not less than twelve (12") inches nor more than twenty-four (24") inches wider than the pipe's outside diameter, unless otherwise shown on the ***Drawings***.

2. Accurately finish trench bottoms to prescribed lines and grades. Provide suitable holes for bells, flanges, and other protrusions to ensure uniform longitudinal support under the pipe. Refill Over-excavation and Additional Excavation with compacted pipe embedment material.

F. Boring: Utilize only dry methods, such as percussion or rotary, for horizontal boring operations: no sluicing or jetting will be permitted. Bored hole diameter shall not exceed maximum section pipe diameter by more than 1½ inches for 12 inch pipe and smaller, or 2 inches for pipe larger than 12 inch. Fill excessive voids, cavities, cave-ins, and abandoned bore holes by pressure-grouting with sand-and-cement slurry (minimum of 2 bags cement per cubic yard slurry) as directed and approved by Engineer and at no cost to ***Owner***.

G. Tunneling: Utilize only dry methods: no sluicing or jetting will be permitted. Tunneling will not be permitted where the resultant tunnel length, measured at pipe grade, would exceed eight (8') feet.

H. Stockpiling: Pile excavated material so as to not endanger the Work, property, or people, so as to avoid obstructing traffic paths, vehicular and pedestrian, and so as to retain accessibility to fire hydrants, valves, call boxes, utility controls, and similar features. Keep gutters, ditches, culverts, and similar drainage facilities clear or provide for otherwise maintaining satisfactory drainage.

I. Drainage: Provide and maintain drainage through and across the Work at all times during construction. Drainage shall be sufficient to prevent ponding or standing water in excavations or other Work areas. Do not dam or divert runoff in such a manner as to cause damage to adjacent properties.

J. Disposal: Use suitable materials from required excavations, or as much thereof as may needed, in the permanent construction required under the ***Contract Documents***. Waste unsuitable and unneeded material away from the site at locations subject to Engineers' approval. Waste banks shall not interfere with natural drainage nor detract from property. Grade and shape waste banks to reasonably even and uniform lines and surfaces, and provide for proper drainage.

1.4 BACKFILL

A. Materials: As available, obtain backfill material from material moved in required excavations; if not available therefrom, obtain backfill material from an approved source. Backfill material shall be free of debris and organic material, and masses of moist, stiff clay shall not be used. Material used for backfill shall be subject to Engineers' approval.

1. Backfill Not to be Compacted: maximum particle size of three (3") inches.

2. Backfill to be Compacted: maximum particle size of 1½ inches or 1 inch if used for pipe embedment material.

3. Sand Backfill: clean, pit-run sand with 1 inch maximum particle size and less than 5 percent by weight passing No. 200 standard sieve.

B. Placing: Place backfill to lines and grades shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer. The manner of depositing backfill material shall be subject to Engineers' approval.

1. Place backfill in approximately horizontal, uniform layers and spread to fill spaces about rocks and clods. Backfill shall be free of lenses, pockets, and layers of material differing substantially from surrounding material.

2. Do not drop backfill directly on pipe. Place backfill to about the same elevation on both sides of pipe to prevent unequal loading and displacement of pipe.

3. Do not place backfill against newly constructed concrete walls until either the wall concrete, and any supporting or bracing concrete, has attained design strength or the wall has been adequately braced to support the lateral load.

4. Ram tunnel backfill in place to completely fill the excavated section and provide maximum compaction practicable. Do not transmit damaging shocks to pipe or structures.

5. Determine and place adequate depth of fill over pipe and conduit to prevent damage from construction equipment loads.

6. Backfill in the dry. Do not place backfill when either the material or the receiving surfaces are frozen.

1.5 EMBANKMENT

A. Materials: As available, obtain embankment material from material moved in required excavations; if not available there from, obtain embankment material from an approved source. Embankment material shall be free of rubbish, refuse, roots, stumps, logs, vegetation, and other foreign or objectionable material. Material used for embankment shall be subject to Engineer's approval.

1. Embankment Not to be Compacted: maximum particle size of twelve (12”) inches.

2. Embankment to be Compacted: maximum particle size of six (6”) inches.

3. Sand Embankment: clean, pit-run sand or gravelly sand with three (3”) inch maximum particle size and less than 5 percent by weight passing No. 200 standard sieve.

B. Foundation Preparation: Prior to placing embankment, strip foundation areas of all vegetation, scarify to six (6”) inch depth, and compact to the same requirements as the embankment to be placed thereon.

C. Placing: Place and maintain embankment to lines and grades shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer. The manner of depositing and leveling embankment material shall be subject to Engineer's approval.

1. Place embankment in approximately horizontal, uniform layers across the entire width of the embankment. Spread and level material so that rock and gravel are well distributed and not nested within or under the embankment. Embankment shall be free of lenses, pockets, and layers of material differing substantially from surrounding material.

2. Route hauling equipment to evenly distribute travel over entire width of previously placed layers.

3. Construct embankment in the dry. Do not place embankment when either the material or the receiving surfaces are frozen.

1.6 SETTLEMENT AND COMPACTION

A. Settling Earth Materials: Where settled backfill is required, settle material to such extent that no further or future settlement occurs: at any time during the correction period under the ***Contract Documents***, settlement requiring repair will be deemed Defective Work and Contractor's responsibilities and Owners’ rights shall be as set forth in the ***Contract Documents***.

1. Use methods and equipment suitable and appropriate for the material to be settled. Do not transmit damaging shocks to pipe or structures. Do not disturb or damage previously placed pipe embedment or compacted materials.

2. Add backfill material necessary to compensate for settlement below prescribed grades during settling operations.

3. Where water settlement is utilized, backfill to prescribed lines and grades prior to settling. Minimize water usage; overflow situations will not be permitted.

4. Where mechanical methods are employed, material lifts before settlement shall not exceed twelve (12") inches.

B. Compacting Earth Materials: Where compacted backfill or embankment is required, compact material to a minimum density of 95 percent of maximum density (ASTM D698) or 70 percent relative density (ASTM D2049), as applicable for the material involved.

1. Where mechanical methods are employed:

   a. Add water or dry out as required to obtain a uniform moisture content and achieve the specified density with the compaction method being used.

   b. Place material in horizontal layers so that the thickness of each layer before compaction is not more than six (6") inches.

   c. Compact with rollers or hand powered tampers. Rollers used on any one layer shall be the same type and same mass per area. Tampers used in confined areas, such as pipe haunches, shall be equipped with suitably shaped heads. Do not transmit damaging shock to pipe or structures.

2. Where water jetting and vibration is utilized:

   a. Use free draining material placed in lifts no thicker than the penetrating depth of the vibrator. Do not transmit damaging shock to pipes or structures. Do not disturb or damage previously place pipe embedment or compacted materials.

   b. Provide temporary bulkheads to control water as required to facilitate compaction. Take necessary precautions, such as sumps and pumps, to avoid floating or displacing pipes or structures.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 02503

ACCESS ROAD

PART 1 GENERAL

1.01 SUMMARY

A. Construct graded, surfaced access road as needed. Road shall generally follow the ground surface without large cuts or fills. Construct roadside ditches and shoulder slopes necessary for adequate drainage.

PART 2 PRODUCTS

2.01 MATERIALS

A. Surfacing Materials: Light Type Surfacing Material; locally available as used by County for all weather rural roads.

PART 3 EXECUTIONS

3.01 ROADWAY

A. Blade road alignment to remove vegetation and other unsuitable materials, and establish grade and drainage.

B. Compaction: 90% Standard Proctor.

C. Blade road surface smooth and place two-inch thick layer of surfacing material.

D. Seed all disturbed areas of access road construction in accordance with Section 02930 - **Seeding**.

END OF SECTION

SECTION 02505

DRAINAGE STRUCTURE

PART 1 GENERAL

1.01 SUMMARY

A. Install structures as shown in the Contract Documents.

B. Install the size and type of pipe culvert, erosion pipe, storm sewer, end section, concrete headwall, gate or structures specified in the Contract Documents.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforced Concrete Pipe: With end sections in accordance with KDOT specifications.

PART 3 EXECUTIONS

3.1 CONCRETE

A. Comply with DIVISION 3 for concrete form work, placing, curing and protection. Use Class 3 concrete, unless shown otherwise in the Contract Documents.

3.2 EXCAVATION

A. Beginning at the outlet end and proceeding toward the upper end, excavate the bottom of the channel to the line, grade and elevation shown in the Contract

Documents. Construct the width of the trench sufficient to lay and backfill the pipe with a minimum width equal to the diameter of the pipe plus 6 inches on each side. Follow OSHA safety regulations for sloping the sides of excavations. Use shoring and bracing as required. Do not disturb railroad or existing street or highway, when tunneling underneath is required. Methods of tunneling are subject to Engineer approval. When it is required to remove an existing street or highway surface in constructing the pipe or sewer, replace the surface with an equivalent material at Contractor's expense, unless otherwise shown in the Contract Documents. Firm the foundation in the trench to prevent subsequent settlement removing soft unstable materials and replace with suitable materials. If the foundation is in rock, place an equalizing bed a minimum of 6 inches thick of well- compacted sand or similar material upon the rock. If the foundation is on firm earth, pare or mold the earth to give full support to each pipe for a depth a minimum of ¼ the external diameter of the pipe. When bell and spigot pipe is used, cut notches to receive the bell. The Contractor may undercut the trench and backfill with well compacted sand or other suitable material to obtain proper, uniform bearing of the storm sewer pipe at no additional cost to KDOT. When shown in the Contract Documents, or ordered in writing by the Engineer, place a concrete cradle or encasement under or around the pipe to provide a suitable foundation for the pipe. Use the dimensions and grade of concrete as shown in the Contract Documents, or as directed by the Engineer.

3.2 LAYING

A. Do not lay pipe until the Engineer approves the foundation bed.

B. When placing 2 or more pipe culverts adjacent to each other, separate the pipe culverts by a distance equal to a minimum of ½ the diameter of the pipe. The minimum distance for pipe culverts is 18 inches, and the minimum distance for metal arch culverts is 24 inches.

C. Before installing corrugated steel pipe, repair any damage to the metallic coating on the pipe. Clean the damaged area to bright metal by blast cleaning, power disk sanding or wire brushing. Apply zinc-rich paint over the cleaned area. Use zinc-rich paint to repair both aluminized and galvanized coatings.

D. Before installing asphalt coated pipe, repair any damage to the asphalt coating on the pipe. Use material that is compatible with the original asphalt coating. The repaired area shall have the same thickness as the original asphalt coating. For erosion pipe, weld any bends or angles prior to applying the asphalt coating.

E. In finished trenches, start laying pipe at the outlet end so the spigot ends (when bell and spigot pipe is used) point to the direction of flow. Install all pipes true to line and grade, with ends abutting. When using multiple sections of pipe in an individual run, place the longest section at the upstream end, the next longest section at the outlet end, and shorter sections in the middle of the run. When installing helical, corrugated pipe, rotate the sections during installation so that the corrugations on the end of one section match those on the end of the adjoining section. Lay pipe in the bed so the lower portion of each pipe is supported for its entire length to a depth a minimum of ¼ the external diameter of the pipe. When laid in the trench, fit and match pipes to form a smooth, uniform invert. Carefully clean bell ends before pipes are lowered into the trenches. Avoid unnecessary handling in the trench when lowering.

F. Place sections of corrugated metal pipe with the ends abutting and join with the manufacturer's coupling bands. Install and tighten the coupling bands according to the manufacturer's recommendations.

G. Sections of clay pipe may be joined using factory molded joints with plain end compression coupling (slip type collar) or bell and spigot type. Cement joints of all other types of pipe over 24 inches in diameter with a cement mortar or plastic joint compound. Use cement mortar composed of 1 part portland cement and 3 parts fine aggregate mixed with sufficient water to form a plastic mortar. As each section of pipe is laid, clean the bell or hub of the preceding pipe and fill the bottom portion with mortar. After the pipe is placed, fill the remaining portion of the joint. Smooth finish and wipe clean the inside of the joint. After the initial set, protect the mortar on the outside from the sun using soil or other approved covering. Prepare and apply plastic joint compound according to the manufacturer's recommendations.

H. On 24 inch or smaller RCP's, use plastic joint compound to join the sections.

3.3 CONCRETE HEADWALLS

A. Construct headwalls for erosion pipe with Class 3 concrete. Formwork, placing, curing and protection of the concrete shall comply with **DIVISION 3**. Place reinforcing steel as shown in the Contract Documents.

3.4 BACKFILLING

A. Do not begin backfilling the pipe until the Engineer approves the pipe installation. Backfill all trenches and excavated areas with suitable material without disturbing or damaging the pipe.

B. Backfill trenches within the embankment or beneath entrances, side roads, sidewalks, other intersecting traveled ways, or those designated in the Contract Documents to the required grade in layers 6 inches (maximum, compacted thickness). Compact according to **SECTION 02200**.

C. On all sewers which do not meet the requirements of the preceding paragraph, carefully deposit and satisfactorily tamp the material in uniform layers a maximum of 6 inches thick until the backfill reaches the top of pipe. Backfill and tamp the remainder of the trench either in uniform layers a maximum of 12 inches thick, or completely fill the trench and settle by satisfactory methods of jetting or flushing. Continue operations until the backfill is slightly above ground level.

D. Install cover over the erosion pipe according to the Contract Documents. Place the cover in lifts l8 inches (maximum, loose measurement), and compact each lift according to **SECTION 02200**. Use hand or mechanical tampers or rollers to achieve compaction.

E. Backfill pipe culverts according to **SECTION 02200**.

F. When approved by the Engineer, granular material (of sufficient moisture content and that may be adequately rolled or tamped in place) may be used for backfill material. Place granular material in uniform layers a maximum of 12 inches thick. When deemed necessary by the Engineer, terminate the granular backfill material a minimum of 8 inches below the subgrade or ground level, and use suitable soil to backfill the remaining portion.

G. Dispose of excess material and leave the area in a neat presentable condition.

END OF DOCUMENT

SECTION 02774

CONFINED DISPOSAL FACILITY

PART 1 GENERAL

1.1 SUMMARY

A. Construct confinement levees, compacted embankment, drainage structures, piping, metalwork and other work and appurtenances where and as shown on the ***Drawings***.

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 - **Submittals**.

B. Prior to procurement, submit for review manufacturers' product specifications and performance data for pipe, fittings, slide gates, grating, weir and stop plates, manholes, control structures, riprap, filter fabric, and all other system components in sufficient detail to demonstrate compliance with the ***Specifications*** and compatibility with other components.

1.3 QUALITY ASSURANCE

A. Geotechnical investigations and laboratory testing of the soils at the confinement site have been conducted to determine material suitability and establish compaction requirements. Geotechnical investigations and testing of the confiment site were performed by Terracon of Wichita, KS. A copy of their Geotechnical Report is included as Appendix A. It is *highly recommended* that Terracon be retained to perform the geotechnical testing and monitoring for the compacted embankment. The design is based on Terracon's geotechnical recommendations.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS

3.01 CONSTRUCTION

A. Clear all embankment foundation and cut areas of organic matter and debris. Strip cleared areas to a depth of at least 12 inches, and stockpile topsoil to cover the outer slopes of the levees with at least 6 inches of topsoil. Excess material is to be wasted at the site subject to the Engineer's approval.

B. The subgrade upon which the levees will be constructed shall be properly prepared to provide adequate support for compaction and be free of mass movements. After excavating the areas to 12 inches below grade, the surface shall be proof rolled with a loaded dump truck or similar piece of equipment to locate any unstable soils. The thickness of any unstable soils shall be determined. Any unsuitable soils within 6-inches of the exposed subgrade shall be removed and replaced with compacted fill, or reworked to conform to the moisture content and compaction specifications. Areas that have been filled will be carefully examined and proof rolled if necessary. However, proper compacted fill placement should provide an adequate subgrade.

C. Prior to compaction, process soils on an as needed basis, as previously described in Item B. The soils shall then be compacted to conform to the requirements for compacted embankment.

D. Construct compacted embankment using materials excavated from cut areas. Construct berms to the lines and contours shown on the ***Drawings*** in accordance with the compacted embankment requirements given below. Use a motor patrol to keep the surface of the fill neat and smooth, and keep the bottoms as near the specified elevations as possible. Slope smoothing operations shall be subject to Engineer's approval at all times.

E. In fill and compacted embankment: prior to the placement of the next lift, the surface of the previously compacted lift shall be roughened to promote good contact between the new and old lifts. The depth of scarification shall extend at least 1-inch into the lift below. The soil lift shall then be placed. The loose lift may not be placed during adverse weather conditions or on layers that appear to be damaged due to desiccation or any other reason. The maximum loose lift thickness shall be limited to provide a compacted thickness of 6". Geotechnical engineer shall verify that the required thickness criteria is being met.

F. Construct structures as levees are being built as best practicable.

G. The following procedure will be utilized in determining compliance with the compaction controls specified above for compacted embankment.

1. At <u>each</u> location where a field density test will be made, the geotechnical engineer will determine which Soil Compaction curve will be the most representative of the

particular material to be tested. The appropriate Soil Compaction curve will be selected (or created) in using the procedures ASTM D698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

2. The field density test will be made, and the material's moisture content and dry density will be applied to the selected Soil Compaction curve to determine compliance.

H. During and after construction of the levees, sampling and testing will be performed. The types and frequencies of the tests are presented below. In addition to this testing, Contractor shall provide personnel to observe liner construction on a continuous basis. Personnel will be positioned near the working face of the levee so that they can observe any deleterious materials, such as stones, debris, or organic matter. Such matter shall be removed.

1. Minimum Testing Requirements.

Test	**Standard**	**Frequency**
Nuclear moisture content	ASTM 3017	One per lift for every 500' of levee.
Nuclear density	ASTM D 2922	One per lift for every 500' of levee.
Verification of nuclear moisture-density gage	*	One per day for each day's liner production.

2. Field testing procedures.

a. The optimum moisture contents and maximum densities of representative samples of the existing soils have been previously determined in accordance with ASTM D 698. New samples will be collected and tested for optimum moisture content and maximum dry densities on an as needed basis.

b. The nuclear gage results will be verified daily.

END OF SECTION

SECTION 02930

SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Areas to be seeded include the confinement site, except the inner slopes and bottoms of the disposal facilities, stock pile area, and all other areas disturbed by construction shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer.

B. Sow grass seed between August 1st and November 1st or between March 1st and May 1st. Mulch all disturbed seeded areas in accordance with this Section.

C. Provide protective and remedial measures as may be required to establish a satisfactory stand of grass in all such seeded areas. A grass stand will be deemed satisfactory when bare spots do not exceed one square foot in size and do not make up more than 3 percent of the seeded area, and when grass is uniform in color and density.

1. When the Work under the ***Contract Documents*** has been otherwise completed, if a determination of the satisfactory condition of such seeded areas cannot be made, payment for undetermined areas will be withheld until such determination can be made.

2. Contractor will not be held responsible for unsatisfactory areas provided that (i) the unsatisfactory condition is attributable to the property owners' lack of maintenance, and (ii) the property owner was promptly and duly notified, including maintenance instructions, at the completion of seeding operations for that area.

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 - **Submittals**.

B. Prior to sowing, submit to Engineer for information a Supplier certification that each lot of seed has been tested by a recognized seed testing laboratory within 6 months of date of delivery. Certification shall include:

1. Name and address of testing laboratory.

2. Lot number for each kind of seed tested, and date of test.

3. Test results, including type of seed, percentages of purity, germination, and weed content, and proportions of mixtures as applicable.

PART 2 PRODUCTS

2.1 SEED

A. Grass Seed: Standard containers labeled in accordance with U.S. Department of Agriculture “Rules and Regulations Under the Federal Seed Act” as to type, lot number, net weight, and percentages of purity, germination, and weed content. Seed mixture per acre shall consist of:

Seed Type		**Pounds Seed Per Acre**	**Pure**	**Live**
Species	Variety			
Blue Grama Grass	Lovington	2.0		
Buffalograss	Treated	35.0		
June Grass		2.0		
Rye Grass		15.0		

Total Pounds PLS per acres54.0

Other material shall not exceed one percent by weight.

2.2 FERTILIZER

A. Fertilizer: Commercial carrier of available nitrogen; 15-30-15; no cyanamide compounds or hydrated lime; unopened original containers clearly marked with guaranteed analysis of contents and net weight.

2.3 MULCH

A. Mulch: prairie (native) hay, free of bindweed, Johnson grass, and other undesirable weeds. No wheat straw will be allowed.

PART 3 EXECUTIONS

3.1 SEEDBED PREPARATION

A. Water critical areas to be seeded prior to planting to obtain adequate soil moisture for seed to sprout. Watering after seeding is on recommended.

B. Backfill the top 6 inches of trenched or excavated areas with soil equivalent to or better than that beneath adjacent grassed areas.

C. Scarify or otherwise loosen seedbeds to a depth of at least 5 inches.

D. Immediately prior to seeding operations, the top 3 inches of seedbeds shall be free of stones larger than 2 inches in maximum dimension, large clods, compacted areas, roots, established turf, sticks, stumps, debris, and other objectionable matter which could interfere with sowing, growing, or maintenance of seeded areas.

3.2 SEEDING

A. Sow grass seed by drilling, or other approved method, at the specified rate. Drill as required to provide row spacing of 3 to 6 inches, and sow seed to a depth of 1/4 to 1/2 inch. Cover seed to an average depth of 1/2 inch.

3.3 MULCHING

A. Mulching will be required for areas seeded.

1. After seeding, spread mulch to a uniform loose thickness of 1-1/2 to 2 inches. Anchor mulch with a straight, serrated disc weighted to press the mulch at least 2 inches into the seedbed. Disc spacing shall not exceed 12 inches. Do not leave spread mulch unanchored overnight. Mulch areas no more than 24 hours behind seeding operations.

3.4 NOTIFICATION, PROTECTION, AND REPAIR

A. Promptly notify property owner when seeding of that property is completed, including instructions as to watering and care of newly planted grass.

B. Protect seeded areas against traffic, erosional, and other construction-related damage by use of warning signs, barricades, or other effective means until completion and acceptance of the Work under these ***Contract Documents***.

C. Repair traffic, erosional, or other construction-related damage by re-grading and reseeding as required or as directed by Engineer.

END OF SECTION

DIVISION 3 CONCRETE

SECTION 03300

GENERAL CONCRETE REQUIREMENTS

PART 1 GENERAL

1.1 COMPOSITION

A. Concrete shall be composed of portland cement, fine and coarse aggregate, water, and admixtures as required or permitted, all thoroughly mixed and brought to the proper, uniform consistency.

1.2 STRENGTH

A. Concrete classification is based on 28-day design compressive strengths:

Classification	Design Compressive Strength
Class 1	1000 psi minimum
Class 2	2000 psi minimum
Class 3	3000 psi minimum
Class 4	4000 psi minimum
Class 5	5000 psi minimum

B. Evaluate actual compressive strengths using standard 6 x 12 inch cylinders:

1. Take 2 test cylinders for each 50 cubic yards, or part thereof, of concrete placed. Make and cure test cylinders in accordance with ASTM C31, and in the presence of Engineer.

2. Cylinder testing shall be in accordance with ASTM C39 by an approved testing laboratory. Submit certified test results to Engineer.

3. If any cylinder fails to test at the specified strength, all concrete represented by that cylinder will be deemed questionable. Test questionable concrete using 3 inch drilled cores in accordance with ASTM C42. If any drilled core fails to test at the

specified strength, all questionable concrete represented by that core will be deemed Defective Work.

1.3 MIX PROPORTIONS

A. Constituent proportions shall be designed and controlled within specified limits to produce concrete having suitable workability, strength, and durability. Engineer reserves the right to require adjustment of mix design and proportions to obtain required characteristics.

B. Cement content per cubic yard of concrete shall not be less than:

Class 1: 4.5 bags or 423 pounds

Class 2: 5.5 bags or 517 pounds

Class 3: 6.5 bags or 611 pounds

Class 4: 7.5 bags or 709 pounds

Class 5: 8.5 bags or 799 pounds

C. Net water/cement ratio, exclusive of water absorbed by aggregate but inclusive of surface moisture in aggregate, shall be the minimum necessary for workability consistent with required strength and durability, and shall not exceed:

Class 1: 0.75 (70.5 lbs water/bag cement)

Class 2: 0.62 (58.3 lbs water/bag cement)

Class 3: 0.55 (51.7 lbs water/bag cement)

Class 4: 0.45 (42.3 lbs water/bag cement)

Class 5: 0.40 (37.6 lbs water/bag cement)

D. Entrained air content of Class 3, 4, and 5 concrete shall be 5 percent, plus or minus 1 percent, by volume at placement when tested in accordance with ASTM C231.

1.4 CONSISTENCY

A. Consistency shall be uniform from batch to batch. Adjust amounts of water and aggregate as required to compensate for variations in moisture content or gradation of aggregate. Addition of water to compensate for stiffening of concrete after mixing (retempering) will not be permitted.

B. Slump shall not exceed 2 inches for paving and slab work, or 4 inches for all other concrete.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 03315

FORMWORK AND REINFORCEMENT

PART 1 GENERAL

1.1 FORMWORK

A. Use forms wherever necessary to confine and shape concrete to required lines and dimensions.

B. Design forms with sufficient strength to withstand pressures from placing and consolidating concrete, and with joints and surfaces sufficiently tight to prevent leakage of mortar.

1.2 REINFORCEMENT

A. Provide reinforcement for concrete as and where shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer.

B. Locate splices where shown on the ***Drawings***. Relocation of shown splices shall require Engineers' approval, and splices not shown on the ***Drawings*** shall be subject to Engineers' approval.

C. Unless otherwise shown, details of fabrication, cover, and splices shall conform to ACI 318.

D. If requested, submit bar placing and bar bending diagrams, and bar lists with weights.

PART 2 PRODUCTS

2.1 FORMWORK

A. Form surfaces shall be wood or metal unless otherwise approved. Wood surfaces shall be plywood or softwood lumber and shall prevent chemical deterioration or discoloration of concrete.

1. Plywood: exterior type, grade B-B or better, mill oiled, edge sealed.

2. Softwood lumber: dressed or worked lumber, common boards S2E, grade No. 2 or better.

B. Form release oil shall be commercial grade and shall not soften, stain, or otherwise damage concrete surfaces.

C. Form ties shall be such that removal of ends or end fasteners does not cause spalling. Ties that remain embedded shall terminate not less than one inch from concrete surfaces unless otherwise permitted.

2.2 REINFORCEMENT

A. Reinforcing bars: ASTM A615, deformed, Grade 60.

B. Welded wire fabric: ASTM A185.

C. Reinforcement shall be new and cold-bent.

PART 3 EXECUTIONS

3.1 FORMWORK

A. Use same type of form surfacing for all concrete not permanently concealed and, if board lumber is used, use boards of the same width.

B. Install chamfer strips in corners and tops of forms as necessary to produce required beveled edges.

C. Erect, brace, and secure forms as required to prevent floating, bulging, or other movement. Maintain forms rigidly in proper position before and during concrete placement.

D. Prior to concrete placement, clean form surfaces of encrustations, nails, and other foreign material, and oil with form release oil. Apply oil before required reinforcement is placed.

E. Remove forms as soon as practicable, but not until the concrete has hardened sufficiently to prevent damage by careful form removal. Do not remove supportive forms or shoring until the concrete has attained sufficient strength to safely support dead and live loads.

3.2 REINFORCEMENT

A. Position reinforcement accurately and secure to prevent displacement during concrete placement. Support and brace to maintain required covers and clearances.

B. Except as specifically authorized by Engineer, do not field bend or weld reinforcement.

C. Secure reinforcement with suitable wire ties or clips, but do not encroach upon cover or clearance. Support with chairs, hangers, spacers, or other supports of concrete, metal, or other approved material. Where such supports will be exposed on concrete surfaces not permanently concealed, use galvanized or other corrosion resistant material except concrete.

D. Before concrete placement, clean reinforcement of dirt, oil, grease, coatings that reduce or prevent bond, and flaky or loose rust or mill scale.

END OF SECTION

SECTION 03320

CONCRETE CONSTITUENTS

PART 1 GENERAL

1.1 SUBMITTALS

A. Submit in accordance with Section 01300 - **Submittals**.

B. If requested, submit documentation for cement including:

1. Manufacturer's certification (ASTM C150); manufacturing location, dates, and lot, bin, car, or other identification number; quantity and date shipped.

2. Suppliers' lot, bin, car, or other identification number; purchase order or contract number; quantity ordered.

C. If requested, submit product data for admixtures including name and type, manufacturer, chloride content, and manufacturer's certification of ASTM conformance.

1.2 QUALITY ASSURANCE

A. Engineer reserves the right to require sampling and testing of concrete constituents at any time prior to use to verify conformance with specified requirements. Sample and test in accordance with applicable ASTM standards, and submit certified test results to Engineer.

1.3 STORAGE AND HANDLING

A. Cement storage facilities shall be dry, weather-tight, properly ventilated enclosures permitting easy access for inspection and accounting, and providing protection from moisture. Bulk cement shall be stored immediately upon delivery. Bagged cement shall be stored so as to be readily distinguishable from other shipments, and shall not be piled over seven (7') feet high. Bagged cement shall be used in chronological order of delivery.

B. Aggregate shall be stored and handled to minimize segregation and breakage, and to prevent contamination with dust, soil, and other foreign matter. Stockpiles shall be free draining and protected from freezing and frost. Aggregate shall be deposited in final position in stockpiles in layers no more than four (4') feet deep.

PART 2 PRODUCTS

2.1 CEMENT

A. Portland cement: ASTM C150, Type I or II, including optional requirements for low-alkali cement and false set.

2.2 AGGREGATE

A. Fine (portion passing No. 4 sieve) and coarse (portion retained on No. 4 sieve) aggregate shall be clean, hard, dense, durable, uncoated granular rock material, natural or manufactured or a mix, meeting specified quality and gradation requirements. Except as specified, aggregate shall conform to ASTM C33.

B. Quality:

1. Bulk specific gravity, saturated surface-dry basis (ASTM C127 and C128): 2.60 minimum for fine aggregate; 2.54 minimum for coarse aggregate.

2. Soundness testing shall utilize sodium sulfate.

3. Deleterious substances in coarse aggregate shall conform to ASTM C33, Class 4M.

C. Gradation: Coarse aggregate gradation shall conform to ASTM C33, Size No. 467, 57, or 67, as large as practicable consistent with satisfactory placement and consolidation.

2.3 WATER

A. Water used in making and curing concrete, mortar, and grout shall be clean, clear, and free of objectionable quantities of silt, organic matter, alkalis, acids, salts, oils, and other impurities.

2.4 ADMIXTURES

A. Air-entraining admixture: ASTM C260; neutralized vinsol resin formulation if used with Type F or G chemical admixture.

B. Chemical admixtures: ASTM C494, Type A, F, or G.

C. Chemical admixtures which introduce more than 0.1 percent, by weight of cement, chloride shall not be used in concrete with embedded aluminum, galvanized metalwork, or prestressing steel.

D. Accelerating admixtures shall not be used.

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 03325

BATCHING AND MIXING

PART 1 GENERAL

1.1 BATCHING

A. Each concrete constituent amount shall be accurately measured and carefully controlled during batching operations. Inaccuracies, by weight or volume as applicable, shall not exceed 1.5 percent for cement, 2.0 percent for aggregate, 1.0 percent for water, and 3.0 percent for admixtures.

B. Batch plants and facilities shall permit ready access for observation of all operations at all times.

1.2 MIXING

A. Concrete constituents shall be thoroughly mixed in mixers designed to provide uniform distribution. Batch size shall be at least 10 percent, but not in excess, of rated capacity of mixer.

B. Concrete, as discharged from the mixer, shall be uniform in composition and consistency. Any mixer that, at any time, fails to produce satisfactory results shall be effectively repaired before further use, or shall be replaced.

C. Central mixers shall mix for not less than 1.5 minutes after charged; excessive mixing which requires additional water to maintain consistency will not be permitted.

D. Truck mixers shall be equipped with accurate water meters, drum revolution counters, and drum data plates. Mixing speed shall be 12 to 22 rpm. Mixing shall be performed for not less than 50 nor more than 100 revolutions after all constituents, except about 5 percent of the water which may be withheld, are charged. Mixing shall be continued for at least 30 revolutions after withheld water is added. After mixing has been completed, any additional revolutions shall be at manufacturer's designated agitation speed. After a period of agitation, 5 to 10 revolutions at mixing speed shall be provided immediately prior to discharge.

1.3 READY-MIX CONCRETE

A. Ready-mix concrete shall be manufactured and delivered by an approved Supplier in accordance with ASTM C94 and in accordance with the applicable requirements of this Division 3 - **Concrete**.

B. Each batch delivered shall be accompanied by a delivery ticket, and such delivery ticket shall be delivered to Engineer.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 03345

PLACING AND FINISHING

PART 1 GENERAL

1.1 PLACING

A. Preparations:

1. Surfaces of forms and reinforcement shall be in accordance with Section 03315- ***Formwork and Reinforcement***. Surfaces of embedments shall be free of encrustations, dirt, oil, grease, coatings that reduce or prevent bond, and flaky or loose rust and mill scale as applicable.

2. Foundation surfaces shall be free of frost, ice, water, mud, and debris. Rock surfaces shall be free of loose and unsound fragments, and shall be washed and brought to a uniform saturated surface-dry condition. Earth foundations shall be moist to a depth of one inch for nonporous material or three (3”) inches for free- draining material.

3. Construction joint surfaces shall be cleaned of laitance, loose and defective concrete, coatings, dirt, and other foreign matter, suitably roughened, washed, and brought to a uniform saturated surface-dry condition.

B. Concrete shall not be placed in standing or running water; nor subjected to running water until hardened sufficiently to prevent damage. Concrete shall not be placed in rain sufficiently heavy or prolonged to wash mortar from the concrete; nor in winds strong enough to make placing operations unsafe or, particularly in hot weather, sufficient to dry out unformed concrete before proper finishing can be performed.

C. Concrete shall be placed at a concrete temperature of 50° F to 90° F, and temperatures of constituents at the batch plant shall be adjusted and maintained as required. Constituent heating and cooling operations shall be subject to Engineers’ approval at all times.

D. Concrete shall be deposited in the placement within one hour after the introduction of water and cement in the mixer. Concrete which has become so stiff that proper placement cannot be ensured shall be wasted.

E. Methods and equipment used to transport concrete to the placement shall prevent segregation and loss of constituents, and objectionable loss of slump.

F. Concrete shall be placed as nearly as practicable in final position, and shall not be allowed to flow or fall so as to cause segregation. Drop chutes or tremies shall be used wherever vertical drops greater than five (5') feet are necessary. Concrete shall be deposited by use of buckets, chutes, conveyors, or pumps. Aluminum chutes or pipes shall not be used.

1. Buckets shall be capable of promptly discharging concrete of the required slump, and the dumping mechanism shall permit repeated discharges of small portions from a full bucket.

2. Chute slopes shall be 1:2 or less and such that concrete slides but does not flow. Delivery end shall be as close as practicable to point of deposit. When operation is intermittent, spout shall discharge into a hopper and the chute shall be thoroughly flushed with water before and after each run.

3. Pumps shall be equipped with five (5") inch minimum diameter slicklines.

G. Concrete shall be placed in approximately horizontal layers, each no more than twenty (20") inches deep. Rate of placement and exposed area of fresh concrete shall be such that previously placed adjacent concrete remains sufficiently plastic to allow each new deposit to be made monolithic therewith by normal consolidation.

H. Concrete shall be thoroughly consolidated by immersion-type vibrators or other suitable means to remove trapped air voids and completely close the concrete snugly against all surfaces of forms, joints, reinforcement, and embedments.

1. At construction joints, fresh concrete in the immediate joint vicinity shall be consolidated with twice as much time and effort as normally needed for concrete of that consistency to ensure satisfactory bond.

I. Cold joints (unplanned construction joints) shall be avoided; if occurrence appears imminent, concrete surface shall be consolidated to a stable and uniform slope and thereafter treated as a construction joint.

1.2 FINISHING

A. Formed Surfaces:

1. Surfaces permanently concealed: Form tie ends may be cut off flush or recessed without filling, except if exposed to water, form tie ends shall be recessed and filled with dry pack mortar.

2. Surfaces not permanently concealed: Form tie ends shall be recessed and filled with dry pack mortar; fins, ridges, and other surface projections shall be removed; Engineer reserves the right to require sack rubbing or other treatments to obtain uniform satisfactory appearance.

B. Unformed Surfaces:

1. Surfaces shall be sloped for drainage as shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer.

2. Surfaces permanently concealed shall receive sufficient screeding and leveling to produce even, uniform surfaces.

3. Surfaces not permanently concealed shall receive floated finishes. Following screeding and leveling, initial floating shall be started as soon as the surface has stiffened sufficiently and before bleed water forms, and shall be the minimum necessary to produce a surface uniform in texture and appearance. At the time of initial set, a final floating shall produce a dense surface uniform in texture, appearance, and color. Joints and edges shall be tooled as required.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTIONS (Not Used)

END OF SECTION

SECTION 03370

CURING, PROTECTION, AND REPAIR

PART 1 GENERAL

1.1 CURING

A. Concrete shall be cured to prevent loss of moisture for the required curing period or until immediately prior to covering such concrete with earthwork or concrete. Curing shall be commenced within 30 minutes after final finishing or form removal.

B. Water Curing: Surfaces shall be kept continuously wet by covering with water-saturated material (2 inches thick for earth), sprinkling, perforated hose or piping, or complete inundation for at least 14 days (24 hours for Class 5 concrete). Curing period may be reduced to 6 days if the mean daily temperature at the site is 40° F or less during the period. Curing shall be temporarily discontinued whenever concrete surfaces could freeze.

C. Polyethylene Sheeting Curing: Sheeting shall be white opaque polyethylene film in accordance with ASTM C171. Surfaces shall be thoroughly moistened and completely covered to provide an airtight, water-retaining barrier for at least 14 days (24 hours for Class 5 concrete). Sheeting shall be lapped and sealed at joints, and perimeters shall be secured to prevent air circulation between film and concrete surface. Sheeting that is punctured, torn, or otherwise damaged shall be repaired or replaced without delay.

D. Curing Compound: Compound shall be in accordance with ASTM C309, Type 2, Class A for wax-base, and Type 1 or 2, Class B for water-emulsified resin-base. Compound shall be spray applied to produce a uniform, continuous, water-retaining film for at least 28 days (24 hours for Class 5 concrete). Application shall be in one coat, with coverage rate not to exceed 150 square feet per gallon. Curing compound shall not be used on surfaces to receive concrete, and shall be kept off reinforcement and embedments. Curing compound coatings that are damaged or peel from surfaces shall be repaired without delay by moistening the surface and applying additional compound.

1.2 PROTECTION

A. Fresh concrete shall be protected from rain, hail, sleet, and snow whenever such precipitation is imminent or occurring. Freshly finished surfaces shall be protected from contamination and damage by traffic or construction operations.

B. Concrete shall be protected against freezing during the entire curing period, and shall be maintained at a temperature not less than 50° F for 72 hours after placement or, if water cured, after discontinuance of curing. Protective measures shall be subject to Engineers' approval. If artificial heat is used, special care shall be taken to prevent concrete drying. Use of unvented combustion heaters will not be permitted during the first 24 hours of curing unless unformed surfaces are sealed off from the resulting carbon dioxide rich environment. Discontinuance of freezing protection shall be such that concrete temperature drops gradually, not exceeding 40° F in 24 hours.

1.3 REPAIR

A. Concrete repair work, including preparation, materials, application, finishing, curing, and protection, shall be in accordance with all applicable requirements of this Division 3- ***Concrete***, and with U.S. Bureau of Reclamation's "*Concrete Manual"* and "*Standard Specifications for Repair of Concrete*". All materials and work required for repair of concrete shall be at no cost to ***Owner***, and shall be subject to Engineers' approval at all times.

B. Conditions requiring repair shall include without limitation:

1. Honeycomb or rock pockets; spalling, loosened, or drummy concrete.

2. Extensive or excessive surface imperfections such as air bubble pitting or sand streaking; fins, ridges, and other abrupt surface irregularities.

3. Surface damage due to form removal or inadequate protection; bolt holes and tie-rod end recesses.

C. Where repairs will be prominently exposed to view, Engineer reserves the right to require light grinding, white cement, sack-rubbed mortar finishing, or other treatments or methods to produce a repaired surface color and texture closely matching surrounding surfaces.

D. Repair work shall not interfere with the proper curing of surrounding concrete, and all repairs shall be properly cured.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION S (Not Used)

END OF SECTION

SECTION 03375

SPECIAL REQUIREMENTS AND ACCESSORIES

PART 1 GENERAL

1.01 JOINTS AND EDGES

A. Construction Joints: Construction joints are placed in structures to facilitate construction; to reduce initial shrinkage stresses and cracks; to allow for installation of embedments and reinforcement; or to allow for subsequent placing of other concrete. Bond is required at construction joints, and reinforcement is continuous across the joint.

B. Contraction Joints: Contraction joints are placed in slab work to provide for shrinkage and to force resultant cracking to occur at desired locations. Contraction joints can be full-depth (bond is prevented using curing compound on the first placed edge) or partial depth (joint is cut with a grooving tool in a monolithic slab, thus preventing full-depth bond), and reinforcement may or may not be continuous across the joint.

C. Expansion Joints: Expansion joints are placed in concrete to prevent transfer of stresses resulting from relative movement. Concrete surfaces are physically separated, and reinforcement is not continuous across the joint (with the exception of sleeved dowels). The gap between concrete surfaces is filled with bituminous or sponge rubber joint filler, including backup material as required, and then sealed with a joint sealing compound.

D. Edges: Outside edges of concrete slabs and structures which will remain exposed to view shall be neatly finished with either a ¾-inch chamfer, or a ¼-inch minimum radius edging tool.

PART 2 PRODUCTS

2.1 JOINT FILLER AND SEALING COMPOUND

A. Bituminous Joint Filler: preformed fiber type in accordance with AASHTO M33.

B. Sealing Compound: hot (when heated will pour to fill and seal joint) or cold (will pump through suitable nozzles to fill and seal joint) type meeting the following when tested in accordance with ASTM D1191:

1. Flow less than 0.5 cm at 140° F.

2. Penetration at 77° F, 150 grams, 5 seconds: 0.9 cm maximum (hot type); 2.2 cm maximum (cold type).

3. Penetration at 32° F, 200 grams, 60 seconds (cold type only): 1.0 cm maximum.

4. Bond shall be such that a crack, separation, or other opening over ¼ inch deep will be deemed a failure.

2.2 PVC WATERSTOP

A. Material: domestic virgin PVC with no reclaimed PVC or manufacturer's scrap, compounded with additional resins, plasticizers, stabilizers, and other materials as needed to meet the following physical requirements:

1. Tensile strength (ASTM D683, speed D, specimen type IV): 2,000 psi minimum.

2. Ultimate elongation (ASTM D683, speed D): 300 percent minimum.

3. Stiffness in flexure (ASTM D747): 600 psi minimum.

4. Low temperature brittleness at minus 35° F (ASTM D746): no cracking or chipping.

5. Volatile loss, change in weight (ASTM D1203, method A, 0.08-inch thick specimen): 0.50 percent maximum.

A. PVC waterstop shall be of the sizes and shapes shown on the ***Drawings***.

PART 3 EXECUTIONS

3.1 JOINTS

A. Construct joints of the types and in the locations shown on the ***Drawings***, described in the ***Specifications***, or established by Engineer. Prepare construction joint surfaces in accordance with Section 03345 - **Placing and Finishing**. Use wax-based curing compound or other suitable bond breaker on first placed edges in full-depth contraction joints; use a minimum 1-inch deep groove in partial depth contraction joints. Prepare expansion joint surfaces in accordance with filler and sealer manufacturers' instructions, and install filler and sealer in strict accordance with those same instructions.

3.2 PVC WATERSTOP

A. Install PVC waterstop in joints where and as shown on the ***Drawings*** to form a continuous, watertight diaphragm. Consolidate concrete around waterstops with extra effort to ensure complete embedment, and remove larger pieces of aggregate near the waterstop to ensure complete contact between waterstop and surrounding concrete.

B. Splice PVC waterstop in strict accordance with manufacturer's instructions.

END OF SECTION

Appendix K

Hydraulic Model Report for Dredge Disposal at John Redmond Reservoir

Hydraulic Model Report for Dredge Disposal at John Redmond Reservoir

A steady-state one dimensional hydraulic analysis was conducted to study the potential floodplain impacts of dredge disposal near John Redmond Reservoir. This section provides a brief description of the data and methodology used to create and calibrate the hydraulic model for the Neosho River reach between John Redmond Reservoir and Burlington, Kansas.

Modeling Approach

HEC-RAS version 4.0 was used as the hydraulic model for the analyses.

Discharges

The tail water rating curve for the John Redmond dam was provided by the Tulsa District Corps. The rating curve was used to select five profiles to model:

Profile Name	Discharge (cfs)
PF 1	20,000
PF 2	40,000
PF 3	60,000
PF 4	80,000
PF 5	100,000

Cross Sections

The Tulsa District provided an existing model of the Neosho River which included the river reach and cross section stations and geometries. The Manning's n values were provided with the model, 0.04 for the channel and 0.06 for the overbank for the entire reach.

Model Calibration

The model was calibrated using the USGS Stream Gage 07182510 located on the Neosho River at Burlington, KS. The USGS stage-discharge rating curve was obtained to allow comparison of model predicted stage-discharge at the stream gage location.

Known water surface elevations were used for the downstream boundary conditions for profile 1 and 2. Higher discharges have not been observed at the gage so the normal depth method was used for the remaining profiles.

Blocked Obstructions and Ineffective Flow Areas

Blocked obstructions were added to cross sections to represent CDF B and one additional potential future CDF site. Ineffective flow areas were assigned to non-conveyance areas of cross-sections such as areas just upstream of the CDF locations.

Results

The results of the model showed very minimal impacts to the floodplain in the vicinity of the proposed CDF structures. The model demonstrated less than a tenth of a foot change in water surface elevations for the profiles modeled. The results are shown in the table below.

				Existing Conditions	CDF B		Multiple CDFs	
Reach	Station	Profile	Q Total	W.S. Elev (ft)	W.S. Elev (ft)	Δ	W.S. Elev (ft)	Δ
Main	343.57	1	20,000	1020.91	1020.91	0	1020.91	0
Main	343.57	2	40,000	1024.27	1024.27	0	1024.27	0
Main	343.57	3	60,000	1025.97	1025.97	0	1025.97	0
Main	343.57	4	80,000	1027.35	1027.37	0.02	1027.37	0.02
Main	343.57	5	100,000	1028.62	1028.65	0.03	1028.65	0.03
Main	343.52	1	20,000	1020.93	1020.93	0	1020.93	0
Main	343.52	2	40,000	1024.29	1024.29	0	1024.29	0
Main	343.52	3	60,000	1026	1026	0	1026	0
Main	343.52	4	80,000	1027.39	1027.41	0.02	1027.41	0.02
Main	343.52	5	100,000	1028.66	1028.69	0.03	1028.69	0.03
Main	343.33	1	20,000	1020.9	1020.9	0	1020.9	0
Main	343.33	2	40,000	1024.25	1024.25	0	1024.25	0
Main	343.33	3	60,000	1025.95	1025.96	0.01	1025.96	0.01
Main	343.33	4	80,000	1027.33	1027.35	0.02	1027.35	0.02
Main	343.33	5	100,000	1028.59	1028.63	0.04	1028.63	0.04
Main	343.23	1	20,000	1020.89	1020.89	0	1020.89	0
Main	343.23	2	40,000	1024.24	1024.24	0	1024.24	0
Main	343.23	3	60,000	1025.93	1025.93	0	1025.93	0
Main	343.23	4	80,000	1027.3	1027.32	0.02	1027.32	0.02
Main	343.23	5	100,000	1028.56	1028.59	0.03	1028.59	0.03
Main	343.1	1	20,000	1020.86	1020.86	0	1020.86	0
Main	343.1	2	40,000	1024.19	1024.18	-0.01	1024.18	-0.01
Main	343.1	3	60,000	1025.85	1025.84	-0.01	1025.84	-0.01
Main	343.1	4	80,000	1027.2	1027.18	-0.02	1027.18	-0.02
Main	343.1	5	100,000	1028.44	1028.41	-0.03	1028.41	-0.03
Main	342.98	1	20,000	1020.82	1020.82	0	1020.82	0
Main	342.98	2	40,000	1024.14	1024.13	-0.01	1024.13	-0.01
Main	342.98	3	60,000	1025.79	1025.78	-0.01	1025.78	-0.01
Main	342.98	4	80,000	1027.12	1027.11	-0.01	1027.11	-0.01
Main	342.98	5	100,000	1028.34	1028.33	-0.01	1028.33	-0.01
Main	342.86	1	20,000	1020.69	1020.69	0	1020.69	0
Main	342.86	2	40,000	1024.03	1024.03	0	1024.03	0
Main	342.86	3	60,000	1025.65	1025.64	-0.01	1025.64	-0.01
Main	342.86	4	80,000	1026.96	1026.96	0	1026.96	0
Main	342.86	5	100,000	1028.17	1028.16	-0.01	1028.16	-0.01

Main	342.74	1	20,000	1020.13	1020.13	0	1020.13	0
Main	342.74	2	40,000	1023.71	1023.71	0	1023.71	0
Main	342.74	3	60,000	1025.3	1025.3	0	1025.3	0
Main	342.74	4	80,000	1026.61	1026.61	0	1026.61	0
Main	342.74	5	100,000	1027.82	1027.82	0	1027.82	0
Main	342.29	1	20,000	1017.89	1017.89	0	1017.89	0
Main	342.29	2	40,000	1022.01	1022.01	0	1022.01	0
Main	342.29	3	60,000	1023.99	1023.99	0	1023.99	0
Main	342.29	4	80,000	1025.52	1025.52	0	1025.52	0
Main	342.29	5	100,000	1026.86	1026.86	0	1026.86	0
Main	342.02	1	20,000	1017.59	1017.59	0	1017.59	0
Main	342.02	2	40,000	1021.62	1021.62	0	1021.62	0
Main	342.02	3	60,000	1023.58	1023.58	0	1023.58	0
Main	342.02	4	80,000	1025.11	1025.11	0	1025.11	0
Main	342.02	5	100,000	1026.45	1026.45	0	1026.45	0
Main	341.846	1	20,000	1017.37	1017.37	0	1017.37	0
Main	341.846	2	40,000	1021.4	1021.4	0	1021.4	0
Main	341.846	3	60,000	1023.33	1023.33	0	1023.33	0
Main	341.846	4	80,000	1024.84	1024.84	0	1024.84	0
Main	341.846	5	100,000	1026.18	1026.18	0	1026.18	0
Main	341.673	1	20,000	1017.05	1017.05	0	1017.05	0
Main	341.673	2	40,000	1021.05	1021.05	0	1021.05	0
Main	341.673	3	60,000	1023.01	1023.01	0	1023.01	0
Main	341.673	4	80,000	1024.53	1024.53	0	1024.53	0
Main	341.673	5	100,000	1025.88	1025.88	0	1025.88	0
Main	341.5	1	20,000	1016.58	1016.58	0	1016.58	0
Main	341.5	2	40,000	1020.62	1020.62	0	1020.62	0
Main	341.5	3	60,000	1022.68	1022.68	0	1022.68	0
Main	341.5	4	80,000	1024.23	1024.23	0	1024.23	0
Main	341.5	5	100,000	1025.59	1025.59	0	1025.59	0
Main	341.03	1	20,000	1014.89	1014.89	0	1014.89	0
Main	341.03	2	40,000	1019.2	1019.2	0	1019.2	0
Main	341.03	3	60,000	1021.69	1021.69	0	1021.69	0
Main	341.03	4	80,000	1023.34	1023.34	0	1023.34	0
Main	341.03	5	100,000	1024.75	1024.75	0	1024.75	0
Main	339.68	1	20,000	1011.69	1011.69	0	1011.69	0
Main	339.68	2	40,000	1017.32	1017.32	0	1017.32	0

Main	339.68	3	60,000	1020.18	1020.18	0	1020.18	0
Main	339.68	4	80,000	1021.84	1021.84	0	1021.84	0
Main	339.68	5	100,000	1023.23	1023.23	0	1023.23	0
Main	338.16	1	20,000	1010	1010	0	1010	0
Main	338.16	2	40,000	1016	1016	0	1016	0
Main	338.16	3	60,000	1019.34	1019.34	0	1019.34	0
Main	338.16	4	80,000	1021	1021	0	1021	0
Main	338.16	5	100,000	1022.37	1022.37	0	1022.37	0