EAST KENTUCKY POWER COOPERATIVE

RECEIVED

APR 27 2007

PUBLIC SERVICE
COMMISSION

April 27, 2007

HAND DELIVERED

Ms. Elizabeth O'Donnell
Executive Director
Public Service Commission
211 Sower Boulevard
Post Office Box 615
Frankfort, KY 40602

Case No. 2007-00168

Dear Ms. O'Donnell:

Please find enclosed for filing with the Commission, an original and ten copies of the Application of East Kentucky Power Cooperative, Inc. for a certificate of public convenience and necessity to construct modifications to the water intake system at its Cooper Power Station. Due to the urgency of these modifications, which are required due to the potential lowering of the level of Lake Cumberland, EKPC is requesting expedited review of this application.

Very truly yours,

Charles A. Lile

Charles A. Lile
Senior Corporate Counsel

Enclosures

4775 Lexington Road 40391
P.O. Box 707, Winchester,
Kentucky 40392-0707

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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED
APR 27 2007
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

THE APPLICATION OF EAST KENTUCKY POWER COOPERATIVE, INC FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF MODIFICATIONS TO THE WATER INTAKE SYSTEM AT COOPER POWER STATION IN PULASKI COUNTY, KENTUCKY	))))))	CASE NO. 2007-00168

APPLICATION

1. Applicant, East Kentucky Power Cooperative, Inc., hereinafter referred to as "EKPC", Post Office Box 707, 4775 Lexington Road, Winchester, Kentucky 40392-0707, files this Application for a Certificate of Public Convenience and Necessity for the purchase and installation of modifications to its water intake system at its Cooper Generating Facility in Pulaski County, Kentucky ("Cooper Station"). The proposed facilities are urgently needed to maintain the operational status of Cooper Station in the event that the Army Corps of Engineers reduces the level of Lake Cumberland below the current plant water intake level.

2. This Application is made pursuant to KRS §278.020 and related statutes, and 807 KAR 5:001 Sections 8, 9, and related sections.

3. A copy of Applicant's restated Articles of Incorporation and all amendments thereto were filed with the Public Service Commission (the "Commission") in PSC Case No. 90-197, the Application of EKPC for a Certificate of Public Convenience and Necessity to Construct Certain Steam Service Facilities in Mason County, Kentucky.

4. A copy of the resolution from Applicant's Board of Directors approving the construction of the subject facilities is filed herewith as Application Exhibit 1.

5. Pursuant to KRS §278.020 and 807 KAR 5:001, Section 9, Applicant states that the power requirements of EKPC and its sixteen (16) member distribution cooperatives require the construction of the proposed water intake facilities on an emergency basis. The proposed facilities are more fully described in the various exhibits filed with this Application. In further support of Applicant's contention that the public convenience and necessity requires the proposed facilities, Applicant submits the following:

(a) The need for the proposed water intake facilities and the alternatives considered, are documented in the Stanley Consultants, Inc. ("Stanley") Recommendation prepared in March 2007, designated as Application Exhibit 2; and in the Prepared Testimony of James C. Lamb, EKPC Senior Vice President of Power Supply, attached as Application Exhibit 6, which discusses and explains the urgent circumstances creating the need for the modifications to the Cooper Station water intake system, and the potential EKPC system impacts that could result from the interruption of Cooper Station operation;

(b) Applicant's Exhibit 3 references a description of the proposed water intake facilities, and explains the manner of construction. Maps showing the proposed location of the water intake modifications at Cooper Station are included in the Stanley Report, Application Exhibit 2, at Appendix A. The proposed facilities will not compete with any other public utilities, corporations or persons.

(c) A Project Cost Estimate for the proposed facilities is included as Application Exhibit 4.

(d) An Estimated Annual Cost of Operation schedule is attached as Application Exhibit 5.

6. The manner of financing proposed for the project, which will include the issuance of indebtedness to the United States of America through the Rural Utilities Service ("RUS"), is discussed in the Prepared Testimony of John R. Twitchell, EKPC Senior Vice President of G&T Operation, which is included as Application Exhibit 7. Since U.S. Government financing is anticipated, which does not require Commission approval under KRS §278.300(10), no request for financing approval is made herein.

7. Applicant's plans for obtaining permits required for the proposed facilities are as follows: EKPC has obtained a No Wake Zone permit from the Kentucky Department of Fish and Wildlife relating to the installation of the proposed water intake modifications at Cooper Station. EKPC has also obtained a construction permit for the cooling tower proposed for Cooper Station Unit 2 from the Kentucky Division for Air Quality. EKPC has applied for permits from the U.S. Army Corps of Engineers, which are required for any construction work on Lake Cumberland, and for a revision of the existing Kentucky Pollution Discharge Elimination System permit, which is a clerical change. Finally, EKPC will need to complete work associated with National Environmental Policy Act compliance, in order to obtain long term financing for this construction from the Rural Utilities Service. These permits and approvals, and their status, are also discussed in the Prepared Testimony of John R. Twitchell, Application Exhibit 7.

8. The Prepared Testimony of John R. Twitchell, Application Exhibit 7, also includes an explanation of the equipment and technology involved, the capital and operating costs of the proposed facilities, the proposed implementation schedule (attached as Twitchell Testimony Exhibit 1), and the evaluation of alternative mitigation approaches conducted by EKPC.

9. The construction of the proposed facilities is required to address current operational risks to Cooper Station as a result of the lowered level of Lake Cumberland, and to prepare for the potential for additional lowering of the level of lake in conjunction with on-going repairs to

the Wolf Creek Dam. The current level of Lake Cumberland is very close to the minimum level for water intake at Cooper Station, and EKPC has been notified by a letter from the Army Corps of Engineers dated February 9, 2007, attached hereto as Application Exhibit 8, that it must be prepared for the potential that the lake level will be lowered to 650 feet by early 2008. The proposed facilities must be constructed, on an emergency basis, to address these risks, and EKPC urgently requests that this Application be considered on an expedited basis.

WHEREFORE, the Applicant, East Kentucky Power Cooperative, Inc., requests that this Commission issue an order granting a Certificate of Public Convenience and Necessity for the construction of the Proposed Facilities.

Respectfully submitted,

DAVID A. SMART

CHARLES A. LILE

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(859) 744-4812

(CooperWolfCreekApp)

FROM THE MINUTE BOOK OF PROCEEDINGS OF THE BOARD OF DIRECTORS OF EAST KENTUCKY POWER COOPERATIVE, INC.

At a regular meeting of the Board of Directors of East Kentucky Power Cooperative, Inc. held at the Headquarters Building, 4775 Lexington Road, located in Winchester, Kentucky, on Tuesday, April 10, 2007, at 10:45 a. m., EDT, the following business was transacted:

Low-Water Mitigation Plan for Cooper Power Station/Wolf Creek Dam on Lake Cumberland

After review of the applicable information, a motion was made by Jimmy Longmire and, there being no further discussion, passed to approve the following:

Whereas, The Wolf Creek Dam on Lake Cumberland in South Central Kentucky is in need of repair by the Department of the Army, Corps of Engineer ("COE");

Whereas, On February 9, 2007, the COE notified East Kentucky Power Cooperative, Inc. ("EKPC") J.S. Cooper Power Station ("Cooper Power Station") to be prepared for the water level at Lake Cumberland to be lowered to 650 feet National Geodetic Vertical Datum ("NGVD") by December 31, 2007;

Whereas, Cooper Power Station requires the water level on Lake Cumberland to be at approximately 675 feet or higher in order to operate;

Whereas, EKPC retained Stanley Consultants ("Stanley") to identify alternatives that would permit the Cooper Power Station to operate at a water level of 650 feet;

Whereas, EKPC's staff, in conjunction with Stanley has selected a method of protecting the ability of Cooper Power Station to operate in a low water level environment;

Whereas, This project is not in the 2007 Budget and Work Plan and the latest Three-Year Construction Work Plan; and it is requested on an emergency basis;

Whereas, In order to strategically manage costs and optimize the use of assets, careful planning must take place to ensure that the generating units of EKPC have sufficient power supply for the Members Systems in the future; and

Whereas, The Fuel and Power Supply Committee and EKPC management recommend the approval of Option No. 3, Supplemental Supply System for High Water Temperature, and Option No. 6, Hybrid Plan which is a Cooling Tower on Unit No. 2 and Barge Mounted Pumps on Unit No. 1; now, therefore, be it

Resolved, That the EKPC Board hereby gives EKPC's staff approval to proceed with the installation of the recommended options to mitigate against the possibility of low water levels on Lake Cumberland; and

Resolved, That EKPC management is authorized to spend up to $24 million to install said mitigation options; and

Resolved, That the Interest During Construction dollars are not included in the project due to the project being less than one year; and

Resolved, That EKPC management is authorized to apply for any and all permits necessary to install and operate the said mitigation alternative; and

Resolved, That EKPC management is authorized to acquire any necessary materials and services for the installation of said mitigation alternative as cost effectively as possible within the time constraints established by the COE and hereby authorized the President and Chief Executive Officer, or his designee, to execute all necessary documents for the award of this project; and

Resolved, That approval is given for the use of general funds for this project, subject to reimbursement from loan funds, when and if such funds become available.

The foregoing is a true and exact copy of a resolution passed at a meeting called pursuant to proper notice at which a quorum was present and which now appears in the Minute Book of Proceedings of the Board of Directors of the Cooperative, and said resolution has not been rescinded or modified.

Witness my hand and seal this 10th day of April 2007.

A. L. Rosenberger

A. L. Rosenberger, Secretary

Corporate Seal

APPLICATION EXHIBIT 2

Cooper Station Circulating Water Intake Study

East Kentucky Power Cooperative
Somerset, Kentucky

Preliminary
March 2007

Stanley Consultants INC.

A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

Table of Contents

Section 1

Introduction

General

Wolf Creek dam, near Jamestown, Kentucky, forms Lake Cumberland, the largest reservoir east of the Mississippi River. The 5,736 foot long dam provides a total flood storage capacity of 6,089,000 acre-feet of water. The dam was completed in 1951.

Repairs to the dam were required both in the 1960s and 1970s. Sinkholes appeared in 1968 which were repaired by grouting. A slurry cutoff wall was completed in 1979 which was intended as a permanent repair. The dam includes six turbines which can generate 312 MW of electricity.

The Nashville District of the US Army Corps of Engineers (COE) maintains and operates the dam. The Southeast Power Administration (SEPA) manages the electrical power that is produced. East Kentucky Power Cooperative (EKPC) has a contract with SEPA to purchase 100 MW for 1,500 hours per year. EKPC has the ability to schedule the power into its system when it is needed. The current power purchase contract expires in 2016.

Wolf Creek Dam is currently leaking. Major repairs are required which are expected to cost $309 million and take up to seven years to complete. A new, longer and deeper diaphragm wall through the length of the dam will be constructed as the long-term repair.

A decision was made in January 2007 by COE to lower the lake to a 680' elevation for the remainder of 2007. In a letter to EKPC dated February 9, 2007, COE indicated they will re-evaluate the lake level this fall. Although it is not anticipated, COE has warned that the emergency grouting program currently underway to stem leaks, if not successful, could result in further lowering of the lake level to elevation 650'. COE advised EKPC to take all measures necessary to allow for water intake with the lake at elevation 650', and that these measures should be in place no later than December 31, 2007.

With a summer pool elevation of 680', EKPC will have to deploy supplemental pumps to provide additional supply to the circulating water system. The higher summer lake water temperatures will cause higher turbine back pressures, which will result in lower electrical generation from the units. To compensate, higher condenser water flow rates are required. Also, COE may not be able to maintain the lake at 680' in the event of a drought. A floating pump system is required this summer, before other potential systems are in place. A floating intake system was employed in the 1970s and again in 1981 when the lake level was low. Below elevation 675', the existing water intake system will be above the lake level and Cooper Station will not be able to operate.

EKPC should review and implement the most cost effective and reliable measures available to deliver cooling water to Cooper Station and maintain operations in the event Lake Cumberland's level is lowered below 680' this fall due to continued dam leakage.

Section 2

Scope of Study

General

The scope of this study is to investigate various alternatives to supply lake water to Cooper Station for plant cooling in the event Lake Cumberland is lowered further than the current 680' elevation.

Stanley Consultants will review both temporary and permanent alternatives. Temporary plans include pumps mounted on barges in the lake with coffer dams with variations thereof. The feasibility of installing cooling towers on an expedited basis by December 2007 will be evaluated as a temporary measure. Permanent alternatives include constructing a lake water intake structure further out in the lake in deep water with permanent pumps to the existing intake structures. The cooling tower option with a makeup system will also be evaluated as the permanent solution for both Units 1 and 2 when the lake falls below the current level.

Cost estimates, schedules for completion, general arrangement drawings and discussions of the advantages and disadvantages are provided for each plan.

Section 3

Water Supply Plans

General

A number of temporary and permanent plans to supply water to Cooper Station's circulating water system were developed and evaluated. These plans include:

- Temporary Plans:
  - Plan A – Barge-Mounted Pumps / Coffer Dams
  - Plan B – Barge-Mounted Pumps to Existing Water Intakes
- Permanent Plans:
  - Plan C – Cooling Towers with Makeup Water Intake
  - Plan D – Permanent Lake Intake Structure
- Hybrid Plan:
  - Plan E –Cooling Tower Unit 2 / Barge-Mounted Pumps Unit 1
- Supplemental Supply Plan F.

Several of the alternatives require temporary pumps to provide water from the lowered lake to the existing intake structures. The proposed system of temporary pumps for these particular plans is described in this section. There will be a separate configuration of pumps for each Unit. The potential lowering of Lake Cumberland 30 feet or more below the existing 680' elevation will require the temporary pumps to be located approximately 600' away from the existing shoreline. The temporary pumps will be installed at this distance to avoid mud and debris and the need to shut down a unit down to reposition the pumps to deeper water as the lake is lowered.

EKPC provided preliminary information from Fantasy Yachts for a 16' x 48' barge / float. The barge construction is aluminum with one pontoon on each side with a platform spanning between the pontoons. The manufacturer's drawing was reviewed and the capacity of the barge estimated. The manufacturer indicated a capacity of 70,000 lbs, but an independent check assuming a draft of 65 percent indicates the capacity may be lower. There are concerns that the heavy electrical and mechanical loads concentrate too much load to a small area and the barge construction is not sufficient to support these types of loads. Also the aluminum construction does not allow for direct welding to the deck for attachment of equipment. Therefore the aluminum barge has been removed from further consideration.

The preferred method of providing temporary pumping is to mount vertical turbine pumps on construction barges. Construction barges are available in sizes that can be transported on a truck to the project site and assembled into larger configurations. The barges are constructed of steel which allows for welding directly to the deck. Two separate companies were contacted to obtain information on sizes, delivery time, capacities, and pricing. Accessories are available including spud piles and winches. Since the depth to the river bottom is greater than 40' during installation, spud piles will not work and winches will have to be used to moor the barges.

For each unit, the barges have been configured to support the required number of pumps. The barges are assembled to provide a space between two barges. A structural platform spans across the space between the barges and the pumps are mounted on the platform. The pump discharges will be combined together on the barge with valves to permit isolation individual pumps. Steel piping will be utilized for the discharge piping on the barges. A header is provided at the edge of the barge to transition from carbon steel piping to high density polyethylene pipe (HDPE).

HDPE pipe will deliver water from the temporary pumps to the shore. The HDPE pipe will float between the barges and the intakes. HDPE pipe is naturally buoyant but will require additional floats spaced approximately every 20 feet.

Drawings are provided showing the proposed configuration of the barges for both Unit 1 and Unit 2. A list of the major components of the temporary pump systems is listed below by unit.

- Unit 1 Requirements:
  - 11 barges.
  - Winches and anchorages for moorings.
  - Steel support platform spanning across the barges to support the pumps.
  - Seven vertical turbine pumps rated at 10,000 gpm each.
  - Check valve and butterfly valve at each pump.
  - Steel pipe for discharge lines on the barges.
  - 20" diameter HDPE pipe for the discharge lines from the barges to shore.
  - Floats for the HDPE piping.
  - Floating access walkway.

- Unit 2 Requirements:
  - 12 barges.
  - Winches and anchorages for moorings.
  - Steel support platform spanning across the barges to support the pumps.
  - Ten vertical turbine pumps rated at 10,000 gpm each.
  - Check valve and butterfly valve at each pump.
  - Steel pipe for discharge lines on the barges.
  - 20" HDPE pipe for the discharge lines from the barges to shore.
  - Floats for the HDPE piping.
  - Floating access walkway.

Plans A through F are described in detail in the following sections.

Plan A – Temporary Barge Mounted Pumps / Coffer Dams

A cofferdam at each existing water intake will provide lake water storage areas. The cofferdams will be connected to the existing water intakes to provide a flooded suction for the existing hydraulic turbine pumps. The current once-through cooling systems will continue to operate as before. The barge mounted temporary pumps will discharge into the cofferdams. The cofferdams will be located about 10' in front of the existing intakes. The cofferdams will be 60' in diameter and approximately 52' in height and extend from elevation 648' to 700'. Each cofferdam will provide 5 to 10 minutes of storage volume. The cofferdams will have a fabricated steel connection to the existing intakes. Sluice gates are provided on the river side of the cofferdams to admit water to allow for conversion back to a high lake level. A platform will be provided to access the sluice gate operators.

The sheet piling for the cofferdams will be driven to refusal resulting in several feet of embedment into the rock of the lake bottom. The joints of the sheet piling will be sealed with a urethane pre-polymer water swelling product to minimize the leakage out of the cells. A minimum of 2' of concrete will be poured in the bottom to seal the bottom and minimize leakage.

The floating HDPE pipes from the temporary pumps will transition to steel piping at the cofferdam structures. The steel piping will be mounted to the side of the cofferdam and discharge the water over the top.

An outage of the Units will be required to complete some of the construction for this plan such as the installation of the steel fabricated connection between the cofferdam and existing intakes.

When lake levels are raised in the future, the sluice gates on the river side of the cofferdams will be opened. Water will flow into the cofferdam through the sluice gates and then be drawn through the fabricated connection into the existing intakes. When lake level is above elevation 700', the water can also flow into the cofferdam over the top.

The barge mounted pump systems for this plan are described in the preceding section. Drawings are provided showing the proposed configuration of the cofferdams for both Units 1 and 2.

The modifications to the electrical system can be seen on Drawing XE100. This configuration utilizes three secondary unit substations (SUS) located on the barges. The unit substations are provided power from the existing spare breakers on the Unit 1 and Unit 2 general service busses. Two circuits would be solid dielectric cable extended in above grade conduit the floating access bridge. The electrical equipment and cabinets will be NEMA 3R or 4, outdoor rated with dry epoxy dipped distribution transformers. The electrically operated pump starter breakers would be 125VDC extended from the plant DC system and controlled from a local PLC connected to the existing plant control system via fiber optic cable. The power and controls system will be segregated between Units 1 and 2. Lighting, valves, control power, sump pumps, etc. will be supplied from motor control centers also located on the barges (as required).

Plan B – Temporary Barge Mounted Pumps to Existing Water Intakes

This plan is similar to Plan A except that the supply lines from the barge mounted emergency pumps are connected directly to the existing water intakes. There are no cofferdams. Water supply headers will be attached by coring two holes through the tops of the intakes. The holes are sized to allow for pipes from the pipe header to match the existing pipe sizes in the intakes. Butterfly valves will be included in each of these pipes. The headers will extend upstream with individual connections for each of the HDPE lines from the barge mounted pumps. A butterfly valve will be included in each one of these connections.

The existing stop log slots will be utilized to close the intake from the river. New heavier duty stop logs will be required for each intake. The stop logs will have seals to minimize the leakage out of the intake. This will be pressurized during operation.

The floating HDPE pipes from the temporary pumps will be connected to the header pipes attached to the intakes. The header pipe on Unit 1 will be located behind the discharge pipe so the HDPE pipes will have to go over the top of the discharge pipe. Structural supports may be required to avoid placing the weight of the HDPE pipes directly on the discharge line. The header pipe on Unit 2 will extend past the existing discharge line to avoid interference issues.

An outage of the Units will be required to complete the construction for this alternative. The coring and connection of the headers at the intakes will require the units to be shut down. The butterfly valves at the intakes allow the header connections to be isolated after installation which will permit the remainder of the header and HPDE lines to be installed with the units in operation.

When the lake levels are raised, the stop logs to the river can be removed and the butterfly valves closed on the headers. This will restore the flow of water into the intakes similar to the existing condition.

Drawings are provided showing the proposed configuration of the connections for both Units 1 and 2.

A variation of this alternative is to fabricate a steel structure on the front of the intakes. The fabricated structure will be attached to the intake with a connection out the side for the header pipe. The HPDE pump discharge lines would connect to the headers as above. A knife gate or stop logs would be required to isolate the intake from the river. Existing openings in the intake structure such as the existing stop log and trash rack slots will be sealed to reduce the water leakage.

The barge mounted pump systems required for this plan are described in the previous section.

The required modifications to the electrical system are shown on Drawing XE100 and are similar to Plan A. Refer to Plan A for a description of the electrical system changes.

Plan C – Cooling Towers with Makeup Water Intake

Plan C will provide a permanent solution to the cooling water problem by installing cooling towers in place of the existing once through cooling water system.

Separate cooling towers will be constructed for both Units 1 and 2. Circulating water pumps (two 50 percent capacity each unit), piping, makeup water intake system, clarifier, and blowdown systems will be included.

To save engineering and construction time by the cooling tower manufacturer, the cooling tower will be identical to those erected and planned for Gilbert Unit 3, Spurlock Unit 4, and Smith 1. The circulating water pumps currently in storage and intended for Spurlock Unit 4 can be installed at Cooper. Otherwise these pumps require a 12 month lead time. Identical pumps can then be purchased for installation at Spurlock Station later.

The Unit 2 condenser is designed to operate with a maximum temperature cooling water temperature of 85°F. The cooling tower is designed to operate with a return temperature of 109°F and supply temperature of 89°F. The condenser was evaluated to see if the higher temperature inlet temperature could be tolerated. With an increased flow from 83,000 gpm to 107,000 gpm, the condenser will be able to maintain the vacuum required for the turbine. The velocity in the condenser tubes will increase from 7 ft / sec to 9 ft / sec. The circulating water pumps can accommodate the increased pressure losses.

The circulating water piping will be run above ground and tie into the existing circulating water supply and return piping where it goes under ground at the edge of the river bank.

Unit 2 design parameters:

- Cooling tower equal to Spurlock Unit 4:
  - Water flow: design 146,000 gpm or 1,217,000 lb/min.
  - Wet bulb temperature: design 79°F.
  - Inlet water temperature to tower: design 109°F.

- Return water temperature from tower: design 89°F
- Cooling tower Btu rating: design 24,340,000 Btu/min.

- Circulating water pumps from Spurlock 4:
  - Flow and head: 73,000 gpm @ 67 ft head.
- Piping:
  - Fabricated steel pipe installed above ground.
  - Approximately 2,000 ft of 78" diameter.
- Makeup water system from lake:
  - Permanent structure with design similar to Smith Unit 1 river intake.
  - Pumps: Two submersible pumps.
  - Caisson diameter at shore line: Approximately 23 feet.
  - Suction intake to deep water: Approximately 200 ft of 36" HDPE pipe with Johnson well screens and compressed air cleaning system.
  - Piping from intake to clarifier: approximately 1,500 ft.
- Clarifier rating: 5,000 gpm.
- Chemical and electrical building to support cooling tower and clarifier: similar to Smith Unit 1.
- Control system: Approximately 100 point PLC control.
- Cooling tower blowdown:
  - Chemically treated to remove free chlorine biocide; return to lake.
  - Piping: 12" pipe HDPE; approximately 1000 feet required.
- Fire protection:
  - Fire protection valve building.
  - Fire hydrants located all around the cooling tower.

The cooling tower for Unit 1 will be of similar design to the Unit 2 cooling tower with the following differences:

- Cooling tower approximately 66 percent of the capacity of Unit 2. Five cells will be constructed instead of eight cells.
- Circulating water pump capacity: 66 percent of water flow with the same head as Unit 2's pumps.
- Piping: 3,000 ft. of 72" diameter pipe.

The modifications to the electrical system for Plan C are provided on Drawing XE300. This configuration utilizes new 4160V distribution switchgear and dry type unit substations located in an electrical building adjacent to the new cooling towers. The power will be derived from the two existing circulating water pump breakers for each unit. The circuits will be extended to the cooling tower electrical building via above grade solid dielectric cables. The cooling tower electrical building control power will be derived from a new 125 VDC battery/UPS system. The DC/UPS system will provide DC power to the electrically operated breakers and 120V safe AC to the controls and emergency lighting. The cooling tower fan motors will be provided with 2-speed non-reversing starters. The circulating water pumps and lake water makeup pumps will be served from the 4,160V switchgear. The power will be segregated between Unit 1 and 2 with the only tie being at the intake structure MCC to ensure support of local equipment in the event of one unit not being available. A fiber optic link will provide control of cooling tower equipment.

Plan D – Permanent Lake Intake Structure

This plan will provide a permanent solution to the cooling water supply problem by constructing a permanent structure in deep water in the old river channel with intake pumps.

A 60 feet diameter concrete caisson with four pumps would provide water to coffer dams located at the existing intake structures. The coffer dams would be as described in Plan A. Each pair of pumps will be sized to provide the total flow to Units 1 and 2 with a 100 percent backup. A separate concrete pipe line will be run from the caisson to each of the coffer dam structures.

The caisson will be embedded in the river bottom. A temporary sheet pile coffer dam will need to be constructed to permit work on the caisson structure to occur in a dry environment. The caisson will be 170 feet in height to maintain electrical, control, and ventilating systems above historical flood levels.

Requirements:

- Caisson:
  - Dimensions: Approximately 60 feet in diameter and 170 feet tall.
  - Electric building on top.
  - Water intake screens around bottom.
- Pumps:
  - Unit 1: Two 100 percent capacity - 65,000 gpm @ 100 ft head each.
  - Unit 2 pumps: Two 100 capacity - 90,000 gpm @ 100 ft head each.
- Temporary coffer dam for construction: approximately 80 feet diameter and 80 feet in height.
- Piping:

- Two pipes will run from the discharge of the pumps to the permanent intake coffer dams.
- Unit 2 piping: Minimum 60-inch diameter concrete, 600 feet.
- Unit 1 piping: Minimum 54-inch diameter concrete, 600 feet.

The Plan D configuration utilizes new 4,160V distribution switchgear and a small dry type distribution transformer located at the top of the permanent intake structure. The power will be derived from two new auxiliary switchgear breakers. The circuits will be extended to the new structure via above grade solid dielectric cable through the plant and then transition to submarine cable and be installed across the lake floor to the structure. The submarine cable will be a three conductor cable with integral ground and fiber optics installed within the overall cable jacket and steel armored. The cable will utilize the steel armor to provide protection as well as vertical support when the cable ascends the structure to the top electrical equipment enclosure. The switchgear will be provided with vacuum type main and tie breakers with medium-voltage contactors for medium-voltage motor starters. The controls will utilize the fiber optics within the submarine cable and a local PLC will provide indication and control of the equipment.

Plan E – Cooling Tower for Unit 2 with Barge Mounted Pumps for Unit 1

Plan E is a combination of floating pumps for Unit 1 and a permanent cooling tower for Unit 2. This plan can be constructed much quicker than Plan C with two permanent cooling towers. Plan E does not waste as much money on temporary solutions as do the two floating pump systems as in Plans A and B. Since the cooling tower for Unit 2 is a duplicate of the cooling towers for Gilbert Unit 3, Spurlock Unit 4, and Smith Unit 1, the cooling tower supplier can begin production immediately upon being released. The circulating water pumps for this cooling tower would be borrowed from Spurlock Unit 4 and replaced by new pumps at a later date. This cooling tower is inadequate to supply the circulating water needs of both Cooper units.

The barge system with floating pumps for Unit 1 would be as described in Plan A. At a later date, a new cooling tower and circulating water pumps could be installed for unit 2 with its own pumps and piping similar to Unit 2. For a description of the Unit 1 cooling tower, pumps and accessories, refer to the Plan C description.

The modifications to the electrical system for the hybrid will be a combination of the cooling tower equipment shown on XE300 and the barge option configuration shown on XE100. Descriptions provided previously for these plans will serve as the basis of the electrical system design.

Plan F – Supplemental Supply System

The COE plans to maintain Lake Cumberland at an elevation of 680' at least to year end. Ordinarily, there will not be any problems with using water from the lake with the existing pumps and intake at that elevation. However, if summer 2007 is a drought year and the lake level falls below elevation 680', problems in obtaining a sufficient volume of water can occur. Also, if the lake temperature rises sufficiently, more water than typical may be required to maintain the output of Cooper Units 1 and 2. A supplemental supply system is recommended for the summer of 2007 until the larger temporary or permanent water supply systems are put in place.

This supplemental system would include a barge system with three 10,000 gpm capacity pumps. These pumps would be piped into the existing circulating water wet wells through existing openings. The piping would be a combination of HPDE pipe over the water and carbon steel as it rises up the exterior of the existing water intake structures. One pump would provide water to Unit 1 and two pumps would serve Unit 2.

This plan's modifications to the electrical system are similar to the modifications shown on Drawing XE100. This configuration utilizes one secondary unit substation located on the barges. The unit substation is supplied power from an existing spare breaker on the Unit 2 general service bus. The circuit would be solid dielectric cable extended in above grade conduit across the floating access walkway. The electrical equipment cabinets will be NEMA 3R or 4, outdoor rated with dry epoxy dipped distribution transformers. The electrically operated pump starter breakers would be 125 VDC extended from the plant DC system and will be controlled from a local PLC connected back to the existing plant via fiber optics. Lighting, valves, control power, etc. will be supplied from motor control centers also located on the barges (as required).

Section 4

Review of Intake Plans and Conceptual Costs

General

This section provides the conceptual costs of each plan under consideration. The auxiliary power cost, risk and benefits, outage requirements, schedule, and permitting requirements are also reviewed. A detailed breakdown of the conceptual cost estimates are included in Appendix B.

Plan A – Temporary Barge Mounted Pumps / Coffer Dams (temporary solution)

- Costs:

$15.2 million	Capital
$ 0.8 million	Engineering / Inspection
$ 1.5 million	Contingency
$17.5 million	Total

- Auxiliary Power Cost:

$7,700	per day[1]

[1] Lost revenue to EKPC @ 5 cents per kW-hr.

- Risk / Benefit:
  - Susceptible to outside vandalism and security threat.
  - Still uses existing head recovery structure.
  - Completion / construction difficulty – high.
  - Impact of storms on floating pumps; lightning could result in loss of pumps and shut down plant.

- Assign plant personnel to intake system to monitor – adjust barge tie downs; 1 spare pump on each barge system.
- Monitor lake activity – large section of lake taken up with temporary structures.

- Outage Cost:
  - Minimal – 1 day outage each unit to tie intake duct (prefab to existing intakes). If lake water elevation rises, use of existing intake structures is normal.
- Cost Recovery After Use:
  - No Permanent Use – probable 10 percent recovery.
- Schedule:
  - Can complete by December 2007 deadline.
- Permitting:
  - Required for construction in lake.

Plan B – Temporary Barge Mounted Pumps to Existing Water Intakes

- Cost:

$11.5 million	Capital
$ 0.6 million	Engineering / Inspection
$ 1.2 million	Contingency
$13.3 million	Total

- Auxiliary Power Costs:

$7,700	cost per day

- Risk / Benefit:
  - Susceptible to outside vandalism and security threat.
  - Still uses head recovery structure.
  - Completion / construction difficulty – high. Impacts of storms on floating pumps: lightning could result in loss of pumps and shut down plant.
  - Assign plant personnel to intake system to monitor – adjust barge tie downs; 1 spare pump on each barge system.
  - Monitor lake activity – large section of lake taken up with temporary structures
  - Operating pumps in series (pressurizing intake) will result in leaks at intake and possible trips due to lack of restart time.
  - Higher likelihood of outages due to pumps on barges operating in series.
- Outage Cost:
  - To connect to existing intakes, cut into top of existing water inlet structures and install flanged pipe to header (estimate 4 days outage each unit

- Cost Recovery After Use:
  - No Permanent Use – Probable 10 percent recovery.
- Schedule:
  - Can Meet December 2007 deadline
- Permitting:
  - Required for construction in lake

Plan C – Cooling Towers with Makeup Water Intake

- Costs:

$31.1 million	Capital
$ 1.4 million	Engineering / Inspection
$ 3.1 million	Contingency
$35.6 million	Total

- Auxiliary Power Costs:

$5,700	cost per day

- Risk Benefit:
  - Can complete Unit 2 cooling tower by December 2007.
  - Unit 1 completion 6 months later.
  - Secure installation (on-site).
  - No additional personnel required.
  - No monitoring of lake necessary.
  - Additional maintenance on permanent cooling towers.
  - Small permanent water intake for makeup, can use temporary system until in place.
- Outage Cost:
  - Minimal: Units 1 and 2 down 2 days each for piping tie ins.
- Cost Recovery After Use:
  - 100 percent of cost is permanent; will be able to use for life of plant when needed.
  - Will replace existing once through cooling systems when lake level requires; future regulatory actions for once through systems uncertain due to fishery impacts and thermal impacts on receiving waters.
- Schedule:
  - Can meet December 2007 date for Unit 2.

- Permitting:
  - Smaller structure in lake for cooling tower makeup system.
  - Air permit modification required for particulate discharge from cooling towers.
  - Discharge permit required for blowdown to lake.

Plan D – Permanent Lake Intake Structure

- Costs:

$24.4 million	Capital
$ 1.2 million	Engineering / Inspection
$ 3.7 million	Contingency
$29.3 million	Total

- Auxiliary Power Cost:

$4,500	cost per day

- Risk/Benefit:
  - Secure structure; piping on lake bottom to intakes.
  - Construction difficulty – high.
  - Will disturb lake; large areas required in lake to build structures.
  - Access by boat necessary (too far out in lake for floating walkway).
  - Lake level could be lowered with no effect on plant.
  - No spare pumps (large circulating pumps matched to plant capacity).
- Outage Cost:
  - Minimal – 1 day each unit to tie intake duct to existing intakes.
- Cost Recovery After Use:
  - All cost is for permanent structures – assumes use of once through cooling is continued indefinitely.
- Schedule:
  - Will require until September 2008 to complete (pumps are long lead items).
- Permitting:
  - Construction at multiple locations in lake.

Plan E – Combination Plan – Cooling Tower for Unit 2 and Barge Mounted Pumps for Unit 1

- Cost:

$20.9 million	Capital
$ 1.0 million	Engineering / Inspection
$ 2.1 million	Contingency
$24.0 million	Total

- Auxiliary Power Cost:

$5,300	cost per day

- Risk / Benefit:
  - Partial permanent system / partial temporary installation.
  - Loss of Unit 1 due to temporary system shut down not as severe as both units being lost.
  - Lowers overall cost by not installing permanent cooling tower for Unit 1.
  - Unit 1 still susceptible to outside vandalism and security threat.

  Not as much lake area covered with equipment.

  Will require makeup structure on lake for Unit 2
- Outage Cost:
  - Low – Unit 1 down 1 day; Unit 2 down 2 days for piping tie-ins.
- Cost Recovery After Use:
  - 100 percent for Unit 2 cooling tower system (permanent).
- Schedule:
  - Can meet December 2007 deadline
- Permitting:
  - COE permit required for construction in lake for Unit 1 and makeup structure for Unit 2.
  - Air permit modifications required for Unit 2 cooling tower
  - Discharge permit required for blowdown to lake.

Plan F – Supplemental Supply System with Floating Pumps on Barges to Existing Wet Wells

- Cost:

$1.9 million	Capital
$0.1 million	Engineering / Inspection
$0.2 million	Contingency
$2.2 million	Total

- Auxiliary Power Costs:

$1,340	cost per day

- Risk/Benefit:
  - Temporary solution that would leave pipes permanently attached to structure.
  - No lake construction except floating components and structure at existing wet wells.
  - Susceptible to outside vandalism and security threat.

- Use of existing one-through system still usable when lake level is sufficient.
- Construction difficulty high (high pipe rack must be built on side of existing intake structures).

- Outage Cost:
  - Low – 1 day to connect piping to existing intake structure openings.
- Cost Recovery After Use:
  - No Permanent Use – probable 10 percent chance. Piping structure at intakes would stay in place
- Schedule:
  - Must be operable as soon as possible in event of drought and high water temperatures during summer 2007.
- Permitting:
  - Only for pipe rack at structure.

The costs of construction, equipment, materials, labor, etc. were developed from published data sources, industry references, vendor budget quotes, and previous work performed by Stanley Consultants. The costs are evaluated on a present value basis.

The costs include the categories of undeveloped design details, engineering design and inspection, and contingency. The term undeveloped design details is used for items that are not currently included in the cost estimate but will need to be included in the final project. This includes items unknown or not considered at the time of estimate preparation.

Engineering design covers the cost of executing the design including the preparation of plans and specifications and contract negotiations. Engineering inspection includes the cost of the resident engineer at the worksite to monitor the contractor's work activities. Contingency is included in a project cost estimate to allow for minor scope changes, variations in bidding climate, cost estimating inaccuracy, and unforeseen problems during construction.

The cost estimates are conceptual in nature and are based on the information available at the time of the estimate. The final costs will depend on actual labor and material costs and availability, actual site conditions, productivity, competitive market conditions, final project scope, and other variable factors. Thus the final project costs may vary somewhat from the conceptual costs presented.

Appendix A

Drawing List

XM100	Site Plan Cofferdam Option
XM101	Circulating Water Structure Cofferdam Option
XM200	Site Plan Direct Connection to Intakes Option
XM201	Unit 1 Direct Connection to Intakes Sheet 1
XM202	Unit 1 Direct Connection to Intakes Sheet 2
XM203	Unit 2 Direct Connection to Intakes Sheet 1
XM204	Unit 2 Direct Connection to Intakes Sheet 2
XM300	Site Plan Cooling Tower Option
XM301	Mechanical Details Cooling Tower Option
XM400	Permanent Pump Station Option
XM500	Mechanical Details Temporary Pump Option Unit 1 Pumps
XM501	Mechanical Details Temporary Pump Option Unit 2 Pumps
XE100	Electrical One Line Floating Barge Option
XE300	Electrical One Line Cooling Tower Option
XE400	Electrical One Line Pump Station Option
1	Hydrographic Survey - Cooper Power Generation Station
Q-2-461	Cumberland River, Kentucky - Wolf Creek Reservoir
2934-051	Circulating Water Structure Sheet 1 (Unit 1)
2934-053	Circulating Water Structure Sheet 9 (Unit 1)
3900-19	Circulating Water Structure Sheet 3 (Unit 2)
3900-20	Circulating Water Structure Sheet 4 (Unit 2)

OS - 2

(10/84)

KENTUCKY PUBLIC SERVICE COMMISSION

MAIN CASE FILE NOTES

2007-00168 - East KY Power - Application
received 4-27-07 - Appendix A
Maps Not Scanned
available for review
at PSC main case file

Appendix B

Cost Estimates

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION A - FLOATING PUMPS TO COFFER DAMS

Project name	20170-OPTA
Estimator	D.R. DRAKE L.G. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1				
	DIVERS	450.00 DAYS	2,000.00	900,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	45.00 DAYS	2,300.00	103,500
	PILE DRIVING RIG	20.00 DAYS	2,000.00	40,000
	FLOATING WALKWAY	750.00 LF	150.00	112,500
	BUOY LINE "NO WAKE ZONE"	1,800.00 LF	50.00	90,000
	CONCRETE SEAL	330.00 CY	500.00	165,000
	SLUICE GATE 5' X 6'	2.00 EA	36,000.00	72,000
	STEEL SUPPORT PLATFORM	1,200.00 SF	50.00	60,000
	SHEET PILING W/ LINER	9,800.00 SF	45.00	441,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	BARGES	11.00 EA	50,000.00	550,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" STEEL PIPE	120.00 LF	360.00	43,200
	36" STEEL PIPE	150.00 LF	860.00	129,000
	REDUCER 20" X 36"	2.00 EA	10,000.00	20,000
	20" HDPE	4,200.00 LF	130.00	546,000
	FLOATS FOR HDPE PIPE	210.00 EA	1,000.00	210,000
	20" CHECK VALVE	7.00 EA	20,600.00	144,200
	20" BUTTERFLY VALVE	14.00 EA	7,000.00	98,000
	PUMPS - 10,000 GPM VERTICAL TURBINE	7.00 EA	120,000.00	840,000
	4" RGS CONDUIT	3,540.00 LF	73.60	260,551
	#2/0 600V CABLE	840.00 LF	5.92	4,974
	350 MCM 600V COPPER CONDUCTOR	2,520.00 LF	12.56	31,658
	500 MCM 5KV CABLE	8,100.00 LF	27.55	223,155
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	SECONDARY UNIT SUBSTATION	1.00 EA	240,000.00	240,000
	MOTOR CONTROL CENTER	1.00 EA	50,000.00	50,000
	TRANSFORMER 480- 120/240V, 50KVA	1.00 EA	4,500.00	4,500
	POWER PANEL 200A 120/240V, 42CKTS	1.00 EA	2,500.00	2,500
	UNIT 1			**5,925,233**
UNIT 2				
	DIVERS	450.00 DAYS	2,000.00	900,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	45.00 DAYS	2,300.00	103,500
	PILE DRIVING RIG	20.00 DAYS	2,000.00	40,000
	CONCRETE SEAL	330.00 CY	500.00	165,000
	SLUICE GATE 5' X 6'	2.00 EA	36,000.00	72,000
	STEEL SUPPORT PLATFORM	1,200.00 SF	50.00	60,000
	SHEET PILING W/ LINER	9,800.00 SF	45.00	441,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	BARGES	12.00 EA	50,000.00	600,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" STEEL PIPE	130.00 LF	360.00	46,800
	36" STEEL PIPE	130.00 LF	860.00	111,800
	REDUCER 20" X 36"	3.00 EA	10,000.00	30,000
	20" HDPE	6,000.00 LF	130.00	780,000
	FLOATS FOR HDPE PIPE	300.00 EA	1,000.00	300,000
	20" CHECK VALVE	10.00 EA	20,600.00	206,000
	20" BUTTERFLY VALVE	20.00 EA	7,000.00	140,000
	PUMPS - 10,000 GPM VERTICAL TURBINE	10.00 EA	120,000.00	1,200,000
	4" RGS CONDUIT	3,900.00 LF	73.60	287,048
	#2/0 600V CABLE	1,200.00 LF	5.92	7,106

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 2				
	350 MCM 600V CQPPER CONDUCTOR	3,600.00 LF	12.56	45,226
	500 MCM 5KV CABLE	8,100.00 LF	27.55	223,155
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	SECONDARY UNIT SUBSTATION	2.00 EA	240,000.00	480,000
	UNIT 2			**6,782,130**

Estimate Totals

Labor	4,934,930	
Material	7,772,433	
	12,707,363	12,707,363
UNDEV DESIGN DETAILS (20%)	2,541,473	
SUBTOTAL	2,541,473	15,248,836
CONTINGENCY (10%)	1,524,884	
ENGINEERING & FIELD INSPECTION	800,000	
	Total	17,573,720

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION B - FLOATING PUMPS DIRECT TO INTAKE

Project name 20170-OPTB

Estimator D.R. DRAKE L. G. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1				
	CONCRETE DEMOLITION	39.00 SF	100.00	3,900
	FLOATING WALKWAY	750.00 LF	150.00	112,500
	BUOY LINE "NO WAKE ZONE"	1,800.00 LF	50.00	90,000
	STEEL SUPPORT PLATFORM	1,200.00 SF	50.00	60,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	BARGES	11.00 EA	50,000.00	550,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" STEEL PIPE	120.00 LF	360.00	43,200
	36" STEEL PIPE	150.00 LF	860.00	129,000
	REDUCER 20" X 36"	2.00 EA	10,000.00	20,000
	20" HDPE	4,200.00 LF	130.00	546,000
	FLOATS FOR HDPE PIPE	210.00 EA	1,000.00	210,000
	60" TEES	2.00 EA	25,000.00	50,000
	42" CONNECTION TO EXISTING	2.00 EA	20,000.00	40,000
	PIPE CAP 60"	2.00 EA	5,000.00	10,000
	20" STEEL BUTTERFLY VALVES	7.00 EA	6,000.00	42,000
	20" CONNECTION WELDING NECK FLANGE	7.00 EA	3,000.00	21,000
	20" CHECK VALVE	7.00 EA	20,600.00	144,200
	20" BUTTERFLY VALVE	14.00 EA	7,000.00	98,000
	PUMPS - 10,000 GPM VERTICAL TURBINE	7.00 EA	120,000.00	840,000
	42" STEEL PIPE	6.00 LF	386.16	2,317
	60" STEEL PIPE	50.00 LF	550.00	27,500
	4" RGS CONDUIT	3,540.00 LF	73.60	260,551
	#2/0 600V CABLE	840.00 LF	5.92	4,974
	350 MCM 600V COPPER CONDUCTOR	2,520.00 LF	12.56	31,658
	500 MCM 5KV CABLE	8,100.00 LF	27.55	223,155
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	MOTOR CONTROL CENTER	1.00 EA	40,000.00	40,000
	TRANSFORMER 480- 120/240V, 50KVA	1.00 EA	4,500.00	4,500
	POWER PANEL 200A 120/240V, 42CKTS	1.00 EA	2,500.00	2,500
	SECONDARY UNIT SUBSTATION	1.00 EA	240,000.00	240,000
	UNIT 1			**4,338,850**
UNIT 2				
	CONCRETE DEMOLITION	50.00 SF	100.00	5,000
	STEEL SUPPORT PLATFORM	1,200.00 SF	50.00	60,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	BARGES	12.00 EA	50,000.00	600,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" STEEL PIPE	130.00 LF	360.00	46,800
	36" STEEL PIPE	130.00 LF	860.00	111,800
	REDUCER 20" X 36"	3.00 EA	10,000.00	30,000
	20" HDPE	6,000.00 LF	130.00	780,000
	FLOATS FOR HDPE PIPE	300.00 EA	1,000.00	300,000
	60" TEES	2.00 EA	25,000.00	50,000
	48" CONNECTION TO EXISTING	2.00 EA	22,000.00	44,000
	PIPE CAP 60"	2.00 EA	5,000.00	10,000
	20" STEEL BUTTERFLY VALVES	10.00 EA	6,000.00	60,000
	20" CONNECTION WELDING NECK FLANGE	10.00 EA	3,000.00	30,000
	20" CHECK VALVE	10.00 EA	20,600.00	206,000
	20" BUTTERFLY VALVE	20.00 EA	7,000.00	140,000
	PUMPS - 10,000 GPM VERTICAL TURBINE	10.00 EA	120,000.00	1,200,000
	48" STEEL PIPE	6.00 LF	469.43	2,817
	60" STEEL PIPE	64.00 LF	550.00	35,200
	4" RGS CONDUIT	3,900.00 LF	73.60	287,048

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 2				
	#2/0 600V CABLE	1,200.00 LF	5.92	7,106
	350 MCM 600V COPPER CONDUCTOR	3,600.00 LF	12.56	45,226
	500 MCM 5KV CABLE	8,100.00 LF	27.55	223,155
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	SECONDARY UNIT SUBSTATION	2.00 EA	240,000.00	480,000
	UNIT 2			**5,276,046**

Estimate Totals

Labor	2,900,408	
Material	6,714,488	
	9,614,896	9,614,896
UNDEV DESIGN DETAILS (20%)	1,922,979	
SUBTOTAL	1,922,979	11,537,875
CONTINGENCY (10%)	1,153,788	
ENGINEERING & FIELD INSPECTION	600,000	
	Total	13,291,663

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION C - COOLING TOWERS - UNIT 1 & 2 + MAKEUP STRUCTURE IN LAKE

Project name	20170-OPTC
Estimator	D.R. DRAKE L.G. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1				
	ROCK EXCAVATION FOR COOLING TOWER UNIT 1	7,700.00 CY	60.00	462,000
	COOLING TOWER FOUNDATION - UNIT 1	1.00 LS	1,207,000.00	1,207,000
	78" STEEL PIPE	2,500.00 LF	800.00	2,000,000
	COOLING TOWER PUMPS	1.00 LS	860,000.00	860,000
	COOLING TOWER - UNIT 1	1.00 EA	2,640,000.00	2,640,000
	4" RGS CONDUIT	5,200.00 LF	73.60	382,730
	#1/0 600V CABLE	300.00 LF	5.10	1,531
	500 KCMIL CABLE	4,500.00 LF	16.45	74,020
	500 MCM 5KV CABLE	17,700.00 LF	27.55	487,635
	TERMINATION 600V 500 MCM	36.00 EA	82.88	2,984
	TERMINATION 600V #1/0	30.00 EA	66.42	1,993
	TERMINATION 5 KV 500 MCM	42.00 EA	991.22	41,631
	SECONDARY UNIT SUBSTATION	1.00 EA	156,000.00	156,000
	SWITCHGEAR	1.00 EA	420,000.00	420,000
	MOTOR STARTER	5.00 EA	25,000.00	125,000
	UNIT 1			**8,862,524**
UNIT 1 & 2				
	DIVERS	120.00 DAYS	2,000.00	240,000
	DIVE BOATS	60.00 DAYS	120.00	7,200
	TOWBOAT & BARGE	60.00 DAYS	2,300.00	138,000
	PILE DRIVING RIG	30.00 DAYS	2,000.00	60,000
	ROCK EXCAVATION FOR MAKEUP STRUCTURE	926.00 CY	80.00	74,080
	SHEET PILING STEEL - (TEMPORARY COFFER DAM)	14,840.00 SF	25.00	371,000
	DEWATERING	1.00 LS	50,000.00	50,000
	BUOY LINE "NO WAKE ZONE"	900.00 LF	50.00	45,000
	REINFORCED CONCRETE PIPE 36"	200.00 LF	114.29	22,858
	REINFORCED CONCRETE FOUNDATION WALL - MAKEUP STRUCTURE	3,267.00 CY	732.90	2,394,392
	REINFORCED CONCRETE SLAB ON GRADE - MAKEUP STRUCTURE	127.00 CY	311.39	39,546
	REINFORCED CONCRETE ELEVATED SLAB - MAKEUP STRUCTURE	64.00 CY	877.69	56,172
	FLOATS FOR HDPE PIPE	100.00 EA	1,000.00	100,000
	PUMPS	2.00 EA	456,000.00	912,000
	18" HDPE PIPE (TEMPORARY PIPING TO BARGE)	2,000.00 LF	125.00	250,000
	UNIT 1 & 2			**4,760,249**
UNIT 2				
	TRENCH EXCAVATION ROCK FOR PIPING	1,000.00 LF	30.00	30,000
	ROCK EXCAVATION FOR COOLING TOWER UNIT 2	10,200.00 CY	60.00	612,000
	COOLING TOWER FOUNDATION - UNIT 2	1.00 LS	1,600,000.00	1,600,000
	12" HDPE PIPE	1,000.00 LF	95.00	95,000
	78" STEEL PIPE	2,500.00 LF	800.00	2,000,000
	COOLING TOWER PUMPS	1.00 LS	1,015,000.00	1,015,000
	CLAIRIFIER	1.00 EA	600,000.00	600,000
	CHEMICAL & ELECTRICAL BUILDING	7,200.00 SF	100.00	720,000
	ACID TANK	1.00 EA	30,000.00	30,000
	COOLING TOWER - UNIT 2	1.00 EA	3,500,000.00	3,500,000
	4" RGS CONDUIT	5,300.00 LF	73.60	390,091
	#1/0 600V CABLE	4,800.00 LF	5.10	24,499
	500 KCMIL CABLE	4,800.00 LF	16.45	78,954
	500 MCM 5KV CABLE	17,700.00 LF	27.55	487,635
	TERMINATION 600V 500 MCM	48.00 EA	82.88	3,978
	TERMINATION 600V #1/0	48.00 EA	66.42	3,188
	TERMINATION 5 KV 500 MCM	42.00 EA	991.22	41,631
	SWITCHGEAR	1.00 EA	420,000.00	420,000

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 2				
	SECONDARY UNIT SUBSTATION	2.00 EA	156,000.00	312,000
	MOTOR STARTER	8.00 EA	25,000.00	200,000
	MOTOR CONTROL CENTER	2.00 EA	50,000.00	100,000
	UNIT 2			**12,263,977**

Estimate Totals

Labor	9,197,451	
Material	16,689,298	
	25,886,749	25,886,749
UNDEV DESIGN DETAILS (20%)	5,177,350	
SUBTOTAL	5,177,350	31,064,099
CONTINGENCY (10%)	3,106,410	
ENGINEERING & FIELD SERVICES	1,400,000	
	Total	35,570,509

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION D - PERMANENT STRUCTURE INTAKE WITH PUMPS TO COFFER DAMS

Project name	20170-OPTD
Estimator	D.R. DRAKE L.G. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1				
	DIVERS	450.00 DAYS	2,000.00	900,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	45.00 DAYS	2,300.00	103,500
	PILE DRIVING RIG	20.00 DAYS	2,000.00	40,000
	BUOY LINE "NO WAKE ZONE"	1,800.00 LF	50.00	90,000
	CONCRETE SEAL	330.00 CY	500.00	165,000
	SLUICE GATE 5' X 6'	2.00 EA	36,000.00	72,000
	SHEET PILING W/ LINER	9,800.00 SF	45.00	441,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	UNIT 1			**1,883,100**
UNIT 1 & 2				
	DIVERS	360.00 DAYS	2,000.00	720,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	90.00 DAYS	2,300.00	207,000
	PILE DRIVING RIG	90.00 DAYS	2,000.00	180,000
	ROCK EXCAVATION FOR MAKEUP STRUCTURE	747.00 CY	80.00	59,760
	SHEET PILING STEEL	72,000.00 SF	25.00	1,800,000
	DEWATERING	1.00 LS	50,000.00	50,000
	BUOY LINE "NO WAKE ZONE"	600.00 LF	50.00	30,000
	REINFORCED CONCRETE FOUNDATION WALL - INTAKE STRUCTURE	8,695.00 CY	732.90	6,372,587
	REINFORCED CONCRETE SLAB ON GRADE - INTAKE STRUCTURE	572.00 CY	311.39	178,114
	REINFORCED CONCRETE ELEVATED SLAB - INTAKE STRUCTURE	331.00 CY	877.69	290,514
	SUBMARINE CABLE	3,200.00 LF	90.00	288,000
	PUMPS (4 EA)	1.00 LS	1,900,000.00	1,900,000
	54" CONCRETE PIPE - PRESSURIZED	600.00 LF	2,800.00	1,680,000
	60" CONCRETE PIPE - PRESSURIZED	600.00 LF	3,000.00	1,800,000
	4" RGS CONDUIT	2,880.00 LF	73.60	211,974
	500 MCM 5KV CABLE	8,640.00 LF	27.55	238,032
	TERMINATION 5 KV 500 MCM	48.00 EA	991.22	47,579
	MOTOR CONTROL CENTER	1.00 EA	50,000.00	50,000
	SWITCHGEAR	1.00 EA	420,000.00	420,000
	5KV - 480V TRANSFORMER 150KVA	1.00 EA	10,000.00	10,000
	UNIT 1 & 2			**16,555,159**
UNIT 2				
	DIVERS	450.00 DAYS	2,000.00	900,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	45.00 DAYS	2,300.00	103,500
	PILE DRIVING RIG	20.00 DAYS	2,000.00	40,000
	BUOY LINE "NO WAKE ZONE"	1,800.00 LF	50.00	90,000
	CONCRETE SEAL	330.00 CY	500.00	165,000
	SLUICE GATE 5' X 6'	2.00 EA	36,000.00	72,000
	SHEET PILING W/ LINER	9,800.00 SF	45.00	441,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	UNIT 2			**1,883,100**

Estimate Totals

Labor	10,045,900	
Material	10,275,459	
	20,321,359	20,321,359
UNDEV. DESIGN DETAILS (20%)	4,064,272	
SUBTOTAL	4,064,272	24,385,631
CONTINGENCY (15%)	3,657,845	
ENGIN. & FIELD INSPECTION (5%)	1,219,282	
	Total	29,262,758

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION E-COOLING TOWER FOR UNIT 2 FLOATING PUMPS ON BARGE FOR UNIT 1

Project name	20170-OPTE
Estimator	D.R. DRAKE L.G. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1				
	DIVERS	450.00 DAYS	2,000.00	900,000
	DIVE BOATS	180.00 DAYS	120.00	21,600
	TOWBOAT & BARGE	45.00 DAYS	2,300.00	103,500
	PILE DRIVING RIG	20.00 DAYS	2,000.00	40,000
	FLOATING WALKWAY	750.00 LF	150.00	112,500
	BUOY LINE "NO WAKE ZONE"	1,800.00 LF	50.00	90,000
	CONCRETE SEAL	330.00 CY	500.00	165,000
	SLUICE GATE 5' X 6'	2.00 EA	36,000.00	72,000
	STEEL SUPPORT PLATFORM	1,200.00 SF	50.00	60,000
	SHEET PILING W/ LINER	9,800.00 SF	45.00	441,000
	MISC. STEEL - FABRICATED CONNECTION	10,000.00 LB	3.00	30,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	20,000.00	20,000
	BARGES	11.00 EA	50,000.00	550,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" STEEL PIPE	120.00 LF	360.00	43,200
	36" STEEL PIPE	150.00 LF	860.00	129,000
	REDUCER 20" X 36"	2.00 EA	10,000.00	20,000
	20" HDPE	4,200.00 LF	130.00	546,000
	FLOATS FOR HDPE PIPE	210.00 EA	1,000.00	210,000
	20" CHECK VALVE	7.00 EA	20,600.00	144,200
	20" BUTTERFLY VALVE	14.00 EA	7,000.00	98,000
	PUMPS - 10,000 GPM VERTICAL TURBINE	7.00 EA	120,000.00	840,000
	4" RGS CONDUIT	3,540.00 LF	73.60	260,551
	#2/0 600V CABLE	840.00 LF	5.92	4,974
	350 MCM 600V COPPER CONDUCTOR	2,520.00 LF	12.56	31,658
	500 MCM 5KV CABLE	8,100.00 LF	27.55	223,155
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	SECONDARY UNIT SUBSTATIONS	1.00 EA	240,000.00	240,000
	MOTOR CONTROL CENTER	1.00 EA	50,000.00	50,000
	TRANSFORMER 480- 120/240V, 50KVA	1.00 EA	4,500.00	4,500
	POWER PANEL 200A 120/240V, 42CKTS	1.00 EA	2,500.00	2,500
	UNIT 1			**5,925,233**
UNIT 2				
	TRENCH EXCAVATION ROCK FOR PIPING	1,000.00 LF	30.00	30,000
	ROCK EXCAVATION FOR COOLING TOWER UNIT 2	10,200.00 CY	60.00	612,000
	COOLING TOWER FOUNDATION - UNIT 2	1.00 LS	1,600,000.00	1,600,000
	18" HDPE PIPE (TEMPORARY PIPING TO BARGE)	2,000.00 LF	125.00	250,000
	12" HDPE PIPE	1,000.00 LF	95.00	95,000
	78" STEEL PIPE	2,500.00 LF	800.00	2,000,000
	CLAIRIFIER	1.00 EA	600,000.00	600,000
	CHEMICAL & ELECTRICAL BUILDING	7,200.00 SF	100.00	720,000
	ACID TANK	1.00 EA	30,000.00	30,000
	COOLING TOWER - UNIT 2	1.00 EA	3,500,000.00	3,500,000
	4" RGS CONDUIT	5,300.00 LF	73.60	390,091
	#1/0 600V CABLE	4,800.00 LF	5.10	24,499
	500 MCM CABLE 600V	4,800.00 LF	16.45	78,954
	500 MCM 5KV CABLE	17,700.00 LF	27.55	487,635
	TERMINATION 600V 500 MCM	48.00 EA	82.88	3,978
	TERMINATION 600V #1/0	48.00 EA	66.42	3,188
	TERMINATION 5 KV 500 MCM	42.00 EA	991.22	41,631
	SWITCHGEAR	1.00 EA	420,000.00	420,000
	SECONDARY UNIT SUBSTATION	2.00 EA	156,000.00	312,000
	MOTOR STARTER	8.00 EA	25,000.00	200,000
	MOTOR CONTROL CENTER	2.00 EA	50,000.00	100,000

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
	UNIT 2			**11,498,977**

Estimate Totals

Labor	6,105,904	
Material	11,318,307	
	17,424,211	17,424,211
UNDEV DESIGN DETAILS (20%)	3,484,842	
SUBTOTAL	3,484,842	20,909,053
CONTINGENCY (10%)	2,090,905	
ENGIN. & FIELD SERVICES (5%)	1,045,453	
	Total	24,045,411

CIRCULATING WATER STUDY
EKPC - COOPER STATION
OPTION F - FLOATING PUMPS ON BARGES

Project name	20170-OPTF
Estimator	D. R. DRAKE G. J. JENSEN

Location	Description	Takeoff Quantity	Total Cost/Unit	Total Amount
UNIT 1 & 2				
	DIVERS	20.00 DAYS	2,000.00	40,000
	DIVE BOATS	10.00 DAYS	120.00	1,200
	RELOCATE BARGES TO PUMPING AREA	1.00 LS	10,000.00	10,000
	TOWBOAT	10.00 DAYS	2,300.00	23,000
	BUOY LINE "NO WAKE ZONE"	500.00 LF	50.00	25,000
	MISC. STEEL - PIPE SUPPORTS	1.00 LS	5,000.00	5,000
	WINCHES FOR MOORING	4.00 EA	90,000.00	360,000
	MOORINGS IN RIVER	4.00 EA	25,000.00	100,000
	20" HDPE	150.00 LF	130.00	19,500
	20" STEEL PIPE	200.00 LF	360.00	72,000
	FLOATS FOR HDPE PIPE	8.00 EA	1,000.00	8,000
	20" BUTTERFLY VALVE	3.00 EA	7,000.00	21,000
	20" CHECK VALVE	6.00 EA	20,600.00	123,600
	PUMPS - 10,000 GPM VERTICAL TURBINE	3.00 EA	120,000.00	360,000
	4" RGS CONDUIT	1,525.00 LF	73.60	112,243
	#2/0 600V CABLE	360.00 LF	5.92	2,132
	350 MCM 600V COPPER CONDUCTOR	1,085.00 LF	12.56	13,631
	500 MCM 5KV CABLE	3,485.00 LF	27.55	96,012
	TERMINATION 5 KV 500 MCM	12.00 EA	991.22	11,895
	SECONDARY UNIT SUBSTATION	1.00 EA	156,000.00	156,000
	MOTOR CONTROL CENTER	1.00 EA	50,000.00	50,000
	TRANSFORMER 480- 120/240V, 50KVA	1.00 EA	4,500.00	4,500
	POWER PANEL 200A 120/240V, 42CKTS	1.00 EA	2,500.00	2,500
	UNIT 1 & 2			**1,617,212**

Estimate Totals

Labor	500,735	
Material	1,116,477	
	1,617,212	1,617,212
UNDEV DESIGN DETAILS (20%)	323,442	
SUBTOTAL	323,442	1,940,654
CONTINGENCY (10%)	194,065	
ENGINEERING & FIELD SERVICES	100,000	
	Total	2,234,719

Appendix C

Vendor Information and Cost Data

Shell, Larry

From: Schebler, Steven
Sent: Thursday, February 22, 2007 10:31 AM
To: Shell, Larry
Subject: FW: EKPC, Cooper Plant

From: Brian Bridgeford [mailto:brian.bridgeford@stoermer-anderson.com]
Sent: Thursday, February 15, 2007 3:15 PM
To: Schebler, Steven
Cc: ROBERT.FLEMING@ct.spx.com; Paul.Secen@ct.spx.com; TERRY.DWYER@marleyct.SPX.COM
Subject: EKPC, Cooper Plant

Steve,

Concerning our discussion today for the potential new cooling tower for the subject plant, we offer the following per your request.

The cooling tower for J K Smith was priced at $3,351,800 plus $78,100 and $60,000 for extra drift eliminators and drift test, respectively. This was priced based on 2008 dollars and Marley could provide a like tower for the same price. You may at your discretion add a 5% pad for the unknowns, but I am confident, based on the aggressive schedule and construction in 2007, Marley could meet these costs.

Time Line issue, since the J K Smith cooling tower is already engineered, upon execution of a contract an almost immediate release of the B/M would happen. Thus Marley is confident the following schedule could be executed.

Delivery of material	12 weeks
Construction	16 – 20 weeks
Total time	28 – 32 weeks (7-8 months)

Thus with the discussed May 1st contract we could get the tower built by end of 2007.

Please feel free to contact Bob Fleming at SPX, or myself if you should have any additional questions or concerns.

Respectfully,

Brian R. Bridgeford
Stoermer-Anderson, Inc.
513-527-7737 Phone

Stanley Consultants INC

TELEPHONE CALL REPORT

Date:	March 6, 2007	**Time:**	**Project No.:** 20170
To:	Mike Lane	**Representing:**	Poseidon Barges
Location:	Zellwood, FL	**Phone No.:**	866-992-2743
From:	Candice Oppitz	**Representing:**	East Kentucky Coal Power Plant
Location:	Muscatine Office	**Phone No.:**	563-264-6656
Subject:	Barge Inquiry		

Poseidon has 2 size barges: 40' x 10' and 20' x 10'. The drafts for both sizes are 5 feet and they are made of Grade A-36 steel. There are no limitations to the amount of barges that can be connected. The 40' x 10' barge has a capacity of 35,000 lbs and the 20' x 10' barge has a capacity of 17,500 lbs. The barges can be bought or rented but for a long-term project (over 2 years) it is highly recommended that they are bought. For example, one 40' x 10' barge sells for $37,000 and rents for $1200/month. Double drum winches are available new for $74,000 as well as 40-ft deep spud and Pockets for $10,000. Delivery is available to Kentucky and would see a 6-8 week turnaround.

Stanley Consultants INC

TELEPHONE CALL REPORT

Date: March 6, 2007 **Time:** **Project No.:** 20170

To: Justin Warren **Representing:** Flexifloat-Robishaw Engineering

Location: Houston, TX **Phone No.:** 713-468-1706

From: Candice Oppitz **Representing:** East Kentucky Coal Power Plant

Location: Muscatine Office **Phone No.:** 563-264-6656

Subject: Barge Inquiry

Flexifloat offers various size barges. The dimensions range from 30-40 feet long, 7.5-10 feet wide, and 3.8-7 feet deep. There are no limitations to how many barges can be connected as long as the formations are similar to what is presented on their website. They are made of steel and have winches and other accessories available to help maintain position of the moored boat. Justin advised buying the barges versus renting them especially for long-term projects. Purchase costs are as followed:

Style	Quad	Double
H50	$29,500	$18,600
S50	$38,900	$23,200
S70	$47,000	$29,500

Their stock is depleted from the Katrina incident and so their production rate is the same as the order rate. Turnaround time depends on the number of orders already received and production time; production time is approximately 1 quad per day. Delivery is available to Kentucky.

Barge Comparisons

	Flexifloat		Poseidon
Models	Quadrafloat	Duofloat	Poseidon I
Model Dimensions, ft	7.5 x 30 x 3.8 10 x 40 x 5 10 x 40 x 7	7.5 x 15 x 3.8 20 x 10 x 5 20 x 10 x 7	10 x 20 x 5 10 x 40 x 5
Model Capacities, tons -65% Draft for Flexifloat -50% draft for Poseidon	10.5 27 40	5.25 13.5 20	8.75 17.5
Rent or Buy	Manufacturers recommend to buy		
Cost per Barge	$29,500 $38,900 $47,500	$18,600 $23,200 $29,500	$37,000 for 10' x 40' (rent: $1200/mo)
Configuration Limitations	No		
Barge Material	Steel		
Winches Available	Yes		
In Stock	No		-
Production Time	Depends on Current Orders (build 1 quadrafloat/day)		6-8 wk wait (build 70 units/yr)
Dilivery to Kentucky	Yes		Yes

Shell, Larry

From: Jerry Purvis [jerry.purvis@ekpc.coop]
Sent: Friday, March 02, 2007 6:52 AM
To: Shell, Larry
Subject: FW: Budgetary Estimate for WCA 66x48 pumps
Importance: High
Attachments: Jerry Purvis.vcf

FYI

Jerry Purvis | East Kentucky Power Cooperative | J.S.Cooper Power Station

Plant Engineer

7130 Highway 1247 | Somerset, KY 42501

P.O. Box 38 | Burnside, KY 42519

☎ 606.561.4138 606.561.5697 jerry.purvis@ekpc.coop

EAST KENTUCKY POWER COOPERATIVE

-----Original Message-----
From: Ken O'Roark [mailto:koroark@dxpe.com]
Sent: Monday, February 26, 2007 10:33 AM
To: Jerry Purvis
Subject: Re: Budgetary Estimate for WCA 66x48 pumps
Importance: High

Dear Jerry,

I just received confirmation that delivery is projected at 58-60 weeks ARO.

Regards,

Ken O'Roark
Account Manager
RA Mueller Inc. (A DXP Company)
email: koroark@dxpe.com
Cell: (304) 634-6883
Fax: (304) 525-5022

For a complete listing of all products and services, please visit www.ramueller.com and www.dxpe.com

----- Original Message -----
From: Ken O'Roark
To: Jerry Purvis
Sent: Monday, February 26, 2007 10:31 AM
Subject: Budgetary Estimate for WCA 66x48 pumps

Dear Jerry,

I have received a budgetary estimate from ITT A-C:

Quantity (2) - Model WCA 66x48 pumps. Equipped with 1550 HP TECO Westinghouse motors. This is a duplication to the units quoted to Spurlock station Unit #4 is $845,000.00.

I am still waiting for a delivery confirmation. I will advise ASAP.

Thank you for the opportunity to work with you, Jerry.

P.S. Any status update on the package you submitted for approval?

Regards,

Ken O'Roark
Account Manager
RA Mueller Inc. (A DXP Company)
email: koroark@dxpe.com
Cell: (304) 634-6883
Fax: (304) 525-5022

For a complete listing of all products and services, please visit www.ramueller.com and www.dxpe.com

Shell, Larry

From: Jerry Purvis [jerry.purvis@ekpc.coop]
Sent: Monday, March 05, 2007 10:17 AM
To: Shell, Larry
Cc: Schebler, Steven; Charles Leveridge; Mark Moneyhon
Subject: Goulds
Attachments: Jerry Purvis.vcf; KO070205-1.pdf; 20GHXC Pump Data Sheet.pdf; 20GXHC Drawing and Specs.pdf; bturbine 1 .pdf

Here are the pump quotes from a couple suppliers. Flow serve could not locate any motors to drive their pumps. They are still looking.

Vertical Turbines: 10,000 gpm at 150 ft. hd.

A copy of his email for price breaks should we decide to buy in qty.

Please read below.

Jerry P

Dear Gentlemen,

I appreciate your patience on this reply. The longer that Goulds had to work with their suppliers, the better the result for EKPC.

Per my quotation # KO070205-1, the original price for one complete pump and motor unit was $98,099.00.

I really challenged Goulds on the pricing issue. Here is our revised breakdown:

For a quantity of (3) pumps - 10% discount - $88,289.00 each
For a quantity of (6) pumps - 15% discount - $83,384.00 each
For a quantity of (8) pumps - 20% discount - $78,479.00 each

I hope that you find this pricing agreeable. If you have any questions or feedback in response to this, by all means, please contact me. Goulds, RA Mueller and I personally want to do everything possible to earn your business. We certainly appreciate the opportunity to work with you.

Finally, as I stated in a previous email, we are currently at 13 weeks delivery at Cooper station from the date the purchase order is received by Goulds. If the PO is received and entered to Goulds by next Friday, February 23, then pumps would arrive on May 25th. In short, as you well know, time is critical.

Once again, thank you for this opportunity.

Regards,

Ken O'Roark
Account Manager

RA Mueller Inc. (A DXP Company)
email: koroark@dxpe.com
Cell: (304) 634-6883
Pager: (304) 353-8550
Home Office: (304) 525-5022
Fax: (304) 525-5022

For a complete listing of all products and services, please visit www.ramueller.com and www.dxpe.com

Jerry Purvis | East Kentucky Power Cooperative | J.S.Cooper Power Station

Plant Engineer

7130 Highway 1247 | Somerset, KY 42501

P.O. Box 38 | Burnside, KY 42519

606.561.4138 606.561.5697 jerry.purvis@ekpc.coop

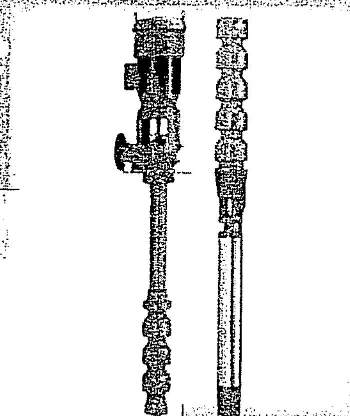
EAST KENTUCKY POWER COOPERATIVE

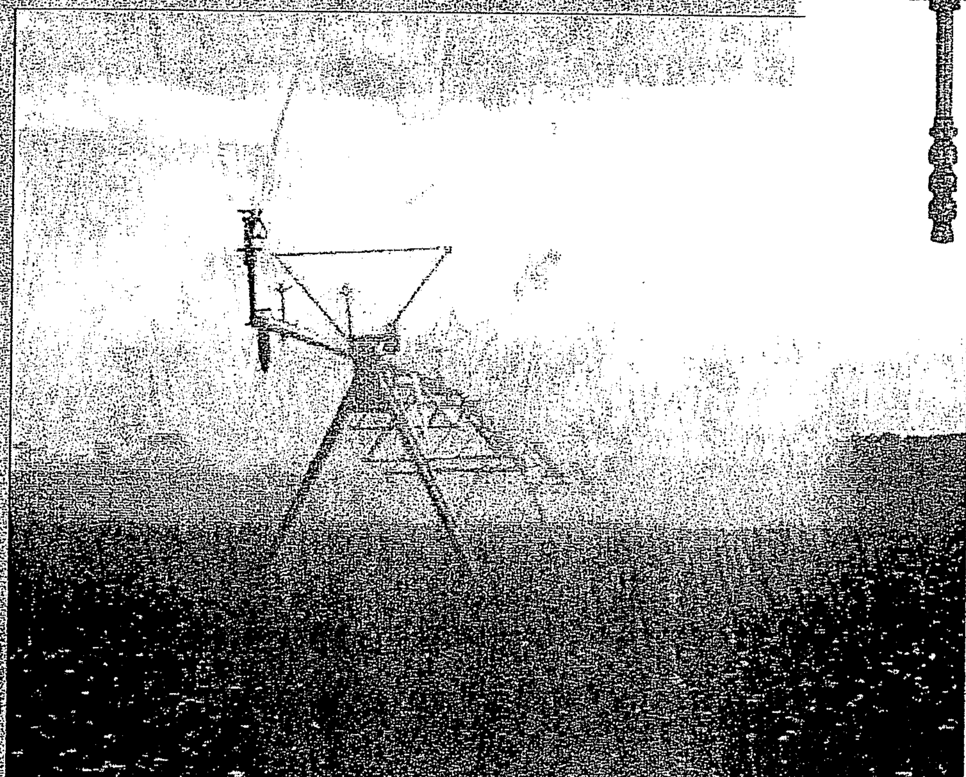
ITT

Vertical Turbines

Goulds Pumps

Lineshaft and Submersible Turbine Pumps





Goulds Pumps is a brand of ITT Residential and Commercial Water.

www.goulds.com

Engineered for life

Section 3

Water Supply Plans

General

A number of temporary and permanent plans to supply water to Cooper Station's circulating water system were developed and evaluated. These plans include:

- Temporary Plans:
  - Plan A – Barge-Mounted Pumps / Coffer Dams
  - Plan B – Barge-Mounted Pumps to Existing Water Intakes
- Permanent Plans:
  - Plan C – Cooling Towers with Makeup Water Intake
  - Plan D – Permanent Lake Intake Structure
- Hybrid Plan:
  - Plan E –Cooling Tower Unit 2 / Barge-Mounted Pumps Unit 1
- Supplemental Supply Plan F.

Several of the alternatives require temporary pumps to provide water from the lowered lake to the existing intake structures. The proposed system of temporary pumps for these particular plans is described in this section. There will be a separate configuration of pumps for each Unit. The potential lowering of Lake Cumberland 30 feet or more below the existing 680' elevation will require the temporary pumps to be located approximately 600' away from the existing shoreline. The temporary pumps will be installed at this distance to avoid mud and debris and the need to shut down a unit down to reposition the pumps to deeper water as the lake is lowered.

EKPC provided preliminary information from Fantasy Yachts for a 16' x 48' barge / float. The barge construction is aluminum with one pontoon on each side with a platform spanning between the pontoons. The manufacturer's drawing was reviewed and the capacity of the barge estimated. The manufacturer indicated a capacity of 70,000 lbs, but an independent check assuming a draft of 65 percent indicates the capacity may be lower. There are concerns that the heavy electrical and mechanical loads concentrate too much load to a small area and the barge construction is not sufficient to support these types of loads. Also the aluminum construction does not allow for direct welding to the deck for attachment of equipment. Therefore the aluminum barge has been removed from further consideration.

The preferred method of providing temporary pumping is to mount vertical turbine pumps on construction barges. Construction barges are available in sizes that can be transported on a truck to the project site and assembled into larger configurations. The barges are constructed of steel which allows for welding directly to the deck. Two separate companies were contacted to obtain information on sizes, delivery time, capacities, and pricing. Accessories are available including spud piles and winches. Since the depth to the river bottom is greater than 40' during installation, spud piles will not work and winches will have to be used to moor the barges.

For each unit, the barges have been configured to support the required number of pumps. The barges are assembled to provide a space between two barges. A structural platform spans across the space between the barges and the pumps are mounted on the platform. The pump discharges will be combined together on the barge with valves to permit isolation individual pumps. Steel piping will be utilized for the discharge piping on the barges. A header is provided at the edge of the barge to transition from carbon steel piping to high density polyethylene pipe (HDPE).

HDPE pipe will deliver water from the temporary pumps to the shore. The HDPE pipe will float between the barges and the intakes. HDPE pipe is naturally buoyant but will require additional floats spaced approximately every 20 feet.

Drawings are provided showing the proposed configuration of the barges for both Unit 1 and Unit 2. A list of the major components of the temporary pump systems is listed below by unit.

- Unit 1 Requirements:
  - 11 barges.
  - Winches and anchorages for moorings.
  - Steel support platform spanning across the barges to support the pumps.
  - Seven vertical turbine pumps rated at 10,000 gpm each.
  - Check valve and butterfly valve at each pump.
  - Steel pipe for discharge lines on the barges.
  - 20" diameter HDPE pipe for the discharge lines from the barges to shore.
  - Floats for the HDPE piping.
  - Floating access walkway.

- Unit 2 Requirements:
  - 12 barges.
  - Winches and anchorages for moorings.
  - Steel support platform spanning across the barges to support the pumps.
  - Ten vertical turbine pumps rated at 10,000 gpm each.
  - Check valve and butterfly valve at each pump.
  - Steel pipe for discharge lines on the barges.
  - 20" HDPE pipe for the discharge lines from the barges to shore.
  - Floats for the HDPE piping.
  - Floating access walkway.

Plans A through F are described in detail in the following sections.

Plan A – Temporary Barge Mounted Pumps / Coffer Dams

A cofferdam at each existing water intake will provide lake water storage areas. The cofferdams will be connected to the existing water intakes to provide a flooded suction for the existing hydraulic turbine pumps. The current once-through cooling systems will continue to operate as before. The barge mounted temporary pumps will discharge into the cofferdams. The cofferdams will be located about 10' in front of the existing intakes. The cofferdams will be 60' in diameter and approximately 52' in height and extend from elevation 648' to 700'. Each cofferdam will provide 5 to 10 minutes of storage volume. The cofferdams will have a fabricated steel connection to the existing intakes. Sluice gates are provided on the river side of the cofferdams to admit water to allow for conversion back to a high lake level. A platform will be provided to access the sluice gate operators.

The sheet piling for the cofferdams will be driven to refusal resulting in several feet of embedment into the rock of the lake bottom. The joints of the sheet piling will be sealed with a urethane pre-polymer water swelling product to minimize the leakage out of the cells. A minimum of 2' of concrete will be poured in the bottom to seal the bottom and minimize leakage.

The floating HDPE pipes from the temporary pumps will transition to steel piping at the cofferdam structures. The steel piping will be mounted to the side of the cofferdam and discharge the water over the top.

An outage of the Units will be required to complete some of the construction for this plan such as the installation of the steel fabricated connection between the cofferdam and existing intakes.

When lake levels are raised in the future, the sluice gates on the river side of the cofferdams will be opened. Water will flow into the cofferdam through the sluice gates and then be drawn through the fabricated connection into the existing intakes. When lake level is above elevation 700', the water can also flow into the cofferdam over the top.

The barge mounted pump systems for this plan are described in the preceding section. Drawings are provided showing the proposed configuration of the cofferdams for both Units 1 and 2.

The modifications to the electrical system can be seen on Drawing XE100. This configuration utilizes three secondary unit substations (SUS) located on the barges. The unit substations are provided power from the existing spare breakers on the Unit 1 and Unit 2 general service busses. Two circuits would be solid dielectric cable extended in above grade conduit the floating access bridge. The electrical equipment and cabinets will be NEMA 3R or 4, outdoor rated with dry epoxy dipped distribution transformers. The electrically operated pump starter breakers would be 125VDC extended from the plant DC system and controlled from a local PLC connected to the existing plant control system via fiber optic cable. The power and controls system will be segregated between Units 1 and 2. Lighting, valves, control power, sump pumps, etc. will be supplied from motor control centers also located on the barges (as required).

Plan B – Temporary Barge Mounted Pumps to Existing Water Intakes

This plan is similar to Plan A except that the supply lines from the barge mounted emergency pumps are connected directly to the existing water intakes. There are no cofferdams. Water supply headers will be attached by coring two holes through the tops of the intakes. The holes are sized to allow for pipes from the pipe header to match the existing pipe sizes in the intakes. Butterfly valves will be included in each of these pipes. The headers will extend upstream with individual connections for each of the HDPE lines from the barge mounted pumps. A butterfly valve will be included in each one of these connections.

The existing stop log slots will be utilized to close the intake from the river. New heavier duty stop logs will be required for each intake. The stop logs will have seals to minimize the leakage out of the intake. This will be pressurized during operation.

The floating HDPE pipes from the temporary pumps will be connected to the header pipes attached to the intakes. The header pipe on Unit 1 will be located behind the discharge pipe so the HDPE pipes will have to go over the top of the discharge pipe. Structural supports may be required to avoid placing the weight of the HDPE pipes directly on the discharge line. The header pipe on Unit 2 will extend past the existing discharge line to avoid interference issues.

An outage of the Units will be required to complete the construction for this alternative. The coring and connection of the headers at the intakes will require the units to be shut down. The butterfly valves at the intakes allow the header connections to be isolated after installation which will permit the remainder of the header and HPDE lines to be installed with the units in operation.

When the lake levels are raised, the stop logs to the river can be removed and the butterfly valves closed on the headers. This will restore the flow of water into the intakes similar to the existing condition.

Drawings are provided showing the proposed configuration of the connections for both Units 1 and 2.

A variation of this alternative is to fabricate a steel structure on the front of the intakes. The fabricated structure will be attached to the intake with a connection out the side for the header pipe. The HPDE pump discharge lines would connect to the headers as above. A knife gate or stop logs would be required to isolate the intake from the river. Existing openings in the intake structure such as the existing stop log and trash rack slots will be sealed to reduce the water leakage.

The barge mounted pump systems required for this plan are described in the previous section.

The required modifications to the electrical system are shown on Drawing XE100 and are similar to Plan A. Refer to Plan A for a description of the electrical system changes.

Plan C – Cooling Towers with Makeup Water Intake

Plan C will provide a permanent solution to the cooling water problem by installing cooling towers in place of the existing once through cooling water system.

Separate cooling towers will be constructed for both Units 1 and 2. Circulating water pumps (two 50 percent capacity each unit), piping, makeup water intake system, clarifier, and blowdown systems will be included.

To save engineering and construction time by the cooling tower manufacturer, the cooling tower will be identical to those erected and planned for Gilbert Unit 3, Spurlock Unit 4, and Smith 1. The circulating water pumps currently in storage and intended for Spurlock Unit 4 can be installed at Cooper. Otherwise these pumps require a 12 month lead time. Identical pumps can then be purchased for installation at Spurlock Station later.

The Unit 2 condenser is designed to operate with a maximum temperature cooling water temperature of 85°F. The cooling tower is designed to operate with a return temperature of 109°F and supply temperature of 89°F. The condenser was evaluated to see if the higher temperature inlet temperature could be tolerated. With an increased flow from 83,000 gpm to 107,000 gpm, the condenser will be able to maintain the vacuum required for the turbine. The velocity in the condenser tubes will increase from 7 ft / sec to 9 ft / sec. The circulating water pumps can accommodate the increased pressure losses.

The circulating water piping will be run above ground and tie into the existing circulating water supply and return piping where it goes under ground at the edge of the river bank.

Unit 2 design parameters:

- Cooling tower equal to Spurlock Unit 4:
    - Water flow: design 146,000 gpm or 1,217,000 lb/min.
    - Wet bulb temperature: design 79°F.
    - Inlet water temperature to tower: design 109°F.

- Return water temperature from tower: design 89°F
- Cooling tower Btu rating: design 24,340,000 Btu/min.

- Circulating water pumps from Spurlock 4:
  - Flow and head: 73,000 gpm @ 67 ft head.
- Piping:
  - Fabricated steel pipe installed above ground.
  - Approximately 2,000 ft of 78" diameter.
- Makeup water system from lake:
  - Permanent structure with design similar to Smith Unit 1 river intake.
  - Pumps: Two submersible pumps.
  - Caisson diameter at shore line: Approximately 23 feet.
  - Suction intake to deep water: Approximately 200 ft of 36" HDPE pipe with Johnson well screens and compressed air cleaning system.
  - Piping from intake to clarifier: approximately 1,500 ft.
- Clarifier rating: 5,000 gpm.
- Chemical and electrical building to support cooling tower and clarifier: similar to Smith Unit 1.
- Control system: Approximately 100 point PLC control.
- Cooling tower blowdown:
  - Chemically treated to remove free chlorine biocide; return to lake.
  - Piping: 12" pipe HDPE; approximately 1000 feet required.
- Fire protection:
  - Fire protection valve building.
  - Fire hydrants located all around the cooling tower.

The cooling tower for Unit 1 will be of similar design to the Unit 2 cooling tower with the following differences:

- Cooling tower approximately 66 percent of the capacity of Unit 2. Five cells will be constructed instead of eight cells.
- Circulating water pump capacity: 66 percent of water flow with the same head as Unit 2's pumps.
- Piping: 3,000 ft. of 72" diameter pipe.

The modifications to the electrical system for Plan C are provided on Drawing XE300. This configuration utilizes new 4160V distribution switchgear and dry type unit substations located in an electrical building adjacent to the new cooling towers. The power will be derived from the two existing circulating water pump breakers for each unit. The circuits will be extended to the cooling tower electrical building via above grade solid dielectric cables. The cooling tower electrical building control power will be derived from a new 125 VDC battery/UPS system. The DC/UPS system will provide DC power to the electrically operated breakers and 120V safe AC to the controls and emergency lighting. The cooling tower fan motors will be provided with 2-speed non-reversing starters. The circulating water pumps and lake water makeup pumps will be served from the 4,160V switchgear. The power will be segregated between Unit 1 and 2 with the only tie being at the intake structure MCC to ensure support of local equipment in the event of one unit not being available. A fiber optic link will provide control of cooling tower equipment.

Plan D – Permanent Lake Intake Structure

This plan will provide a permanent solution to the cooling water supply problem by constructing a permanent structure in deep water in the old river channel with intake pumps.

A 60 feet diameter concrete caisson with four pumps would provide water to coffer dams located at the existing intake structures. The coffer dams would be as described in Plan A. Each pair of pumps will be sized to provide the total flow to Units 1 and 2 with a 100 percent backup. A separate concrete pipe line will be run from the caisson to each of the coffer dam structures.

The caisson will be embedded in the river bottom. A temporary sheet pile coffer dam will need to be constructed to permit work on the caisson structure to occur in a dry environment. The caisson will be 170 feet in height to maintain electrical, control, and ventilating systems above historical flood levels.

Requirements:

- Caisson:
  - Dimensions: Approximately 60 feet in diameter and 170 feet tall.
  - Electric building on top.
  - Water intake screens around bottom.
- Pumps:
  - Unit 1: Two 100 percent capacity - 65,000 gpm @ 100 ft head each.
  - Unit 2 pumps: Two 100 capacity - 90,000 gpm @ 100 ft head each.
- Temporary coffer dam for construction: approximately 80 feet diameter and 80 feet in height.
- Piping:

- Two pipes will run from the discharge of the pumps to the permanent intake coffer dams.
- Unit 2 piping: Minimum 60-inch diameter concrete, 600 feet.
- Unit 1 piping: Minimum 54-inch diameter concrete, 600 feet.

The Plan D configuration utilizes new 4,160V distribution switchgear and a small dry type distribution transformer located at the top of the permanent intake structure. The power will be derived from two new auxiliary switchgear breakers. The circuits will be extended to the new structure via above grade solid dielectric cable through the plant and then transition to submarine cable and be installed across the lake floor to the structure. The submarine cable will be a three conductor cable with integral ground and fiber optics installed within the overall cable jacket and steel armored. The cable will utilize the steel armor to provide protection as well as vertical support when the cable ascends the structure to the top electrical equipment enclosure. The switchgear will be provided with vacuum type main and tie breakers with medium-voltage contactors for medium-voltage motor starters. The controls will utilize the fiber optics within the submarine cable and a local PLC will provide indication and control of the equipment.

Plan E – Cooling Tower for Unit 2 with Barge Mounted Pumps for Unit 1

Plan E is a combination of floating pumps for Unit 1 and a permanent cooling tower for Unit 2. This plan can be constructed much quicker than Plan C with two permanent cooling towers. Plan E does not waste as much money on temporary solutions as do the two floating pump systems as in Plans A and B. Since the cooling tower for Unit 2 is a duplicate of the cooling towers for Gilbert Unit 3, Spurlock Unit 4, and Smith Unit 1, the cooling tower supplier can begin production immediately upon being released. The circulating water pumps for this cooling tower would be borrowed from Spurlock Unit 4 and replaced by new pumps at a later date. This cooling tower is inadequate to supply the circulating water needs of both Cooper units.

The barge system with floating pumps for Unit 1 would be as described in Plan A. At a later date, a new cooling tower and circulating water pumps could be installed for unit 2 with its own pumps and piping similar to Unit 2. For a description of the Unit 1 cooling tower, pumps and accessories, refer to the Plan C description.

The modifications to the electrical system for the hybrid will be a combination of the cooling tower equipment shown on XE300 and the barge option configuration shown on XE100. Descriptions provided previously for these plans will serve as the basis of the electrical system design.

Plan F – Supplemental Supply System

The COE plans to maintain Lake Cumberland at an elevation of 680' at least to year end. Ordinarily, there will not be any problems with using water from the lake with the existing pumps and intake at that elevation. However, if summer 2007 is a drought year and the lake level falls below elevation 680', problems in obtaining a sufficient volume of water can occur. Also, if the lake temperature rises sufficiently, more water than typical may be required to maintain the output of Cooper Units 1 and 2. A supplemental supply system is recommended for the summer of 2007 until the larger temporary or permanent water supply systems are put in place.

This supplemental system would include a barge system with three 10,000 gpm capacity pumps. These pumps would be piped into the existing circulating water wet wells through existing openings. The piping would be a combination of HPDE pipe over the water and carbon steel as it rises up the exterior of the existing water intake structures. One pump would provide water to Unit 1 and two pumps would serve Unit 2.

This plan's modifications to the electrical system are similar to the modifications shown on Drawing XE100. This configuration utilizes one secondary unit substation located on the barges. The unit substation is supplied power from an existing spare breaker on the Unit 2 general service bus. The circuit would be solid dielectric cable extended in above grade conduit across the floating access walkway. The electrical equipment cabinets will be NEMA 3R or 4, outdoor rated with dry epoxy dipped distribution transformers. The electrically operated pump starter breakers would be 125 VDC extended from the plant DC system and will be controlled from a local PLC connected back to the existing plant via fiber optics. Lighting, valves, control power, etc. will be supplied from motor control centers also located on the barges (as required).

Estimate Capital Cost of Cooper Low Water Mitigation Facilities
Application Exhibit 4

Barge Mounted Pumps for Cooper Station Unit 1

Capital Cost	\$ 5,925,000
Contingency and Undeveloped Design Details	1,896,000
Subtotal	\$ 7,821,000

Cooling Tower for Cooper Station Unit 2

Capital Cost	\$11,500,000
Contingency and Undeveloped Design Details	4,121,000
Subtotal	\$15,179,000
Engineering and Field Services	\$ 1,045,500
Total	\$24,045,411

Note: Supplemental Cooling pumps are estimated to have a total cost of \$2,300,000, which is included in the estimate for the Barge Mounted Pumps for Unit 1

Estimated Cost of Operation
Application Exhibit 5

Annual Operation and Maintenance Cost for Proposed Facilities to mitigate low water levels on the Cooper Station

Operations and Maintenance	$ 334,100
Water Treatment for Cooling Tower	150,000
Electrical Service	1,913,000
Total Annual O & M Cost	$2,397,100

APPLICATION EXHIBIT 6

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

APR 27 2007

PUBLIC SERVICE
COMMISSION

IN THE MATTER OF:

THE APPLICATION OF EAST KENTUCKY POWER	)	
COOPERATIVE, INC. FOR A CERTIFICATE OF	)	
PUBLIC CONVENIENCE AND NECESSITY FOR THE	)	**CASE NO.2007-** 00168
CONSTRUCTION OF MODIFICATIONS TO THE	)	
WATER INTAKE SYSTEM AT COOPER POWER	)	
STATION IN PULASKI COUNTY, KENTUCKY	)	

PREPARED TESTIMONY OF JAMES C. LAMB
ON BEHALF OF
EAST KENTUCKY POWER COOPERATIVE, INC.

Q1. Please state your name and address.

A1. James C. Lamb, Jr., East Kentucky Power Cooperative, Inc., 4775 Lexington Road, P.O. Box 707, Winchester, Kentucky 40392-0707.

Q2. By whom are you employed, and in what capacity?

A2. I am employed by East Kentucky Power Cooperative, Inc., ("EKPC") and I am Senior Vice President of Power Supply.

Q3. What are your responsibilities at EKPC in that position?

A3. I am responsible for Resource Planning, Transmission Planning, Mid-Term Planning, Market Forecasting & Analysis, Generation Dispatch, Strategic Planning, Fuels & Emissions, Rates & Regulatory Filings, and Financial Forecasts.

Q4. What was your role in the preparation of information that has been provided to the Commission by EKPC in this proceeding?

A4. I was responsible for reviewing the information related to power supply issues and advising the senior management team that EKPC, its member systems and their member consumers are facing significant operational and financial risks due to the current water levels at Lake Cumberland.

Q5. How would low water levels at Lake Cumberland create significant operational risks for EKPC?

A5. Under current power plant operating conditions and design, existing water levels in the 680 feet range at Lake Cumberland can result in a derate of EKPC's Cooper Power Station generating capability this summer when temperatures are high. The high surface water temperature will restrict the amount of power that can be generated by the Cooper Station due to lack of sufficient cooling water for the plant. If the water levels are lowered below approximately 675 feet, Cooper Power Station will not be able to operate at all. The Army Corps of Engineers notified EKPC on February 9, 2007 that we needed to take necessary measures to allow for water intake with the lake at Elevation 650 feet and that these measures needed to be in place no later than December 31, 2007, see Application Exhibit 8.

Q6. How would the loss of the Cooper Power Station's generating capability impact EKPC?

A6. Cooper Power Station has two coal-fired generating units. Unit One is capable of supplying 116 MW of net generation to the EKPC system and Unit Two has a net generation capability of 225 MW. This is a total of 341 MW of base load, coal-fired generating capacity that EKPC is depending on to serve native load customers.

If the station's generating capability is cut in half due to high surface water temperatures and lack of cooling water, EKPC would expect to pay an additional $8.5 million for replacement power during the summer period of 2007. This cost is based on the expected market prices for June, July, August and September (ranging from $56 to $65/MWh) 7x24 products, with firm transmission costs added for delivery to the EKPC system, approximately $10/MWh. EKPC expects that it would lose over 201,000 MWh of generation due to the derate at an average incremental cost of approximately $42/MWh . Each additional summer period would be expected to cost more due to escalation of prices.

If the station were not available at all, EKPC would have to purchase replacement power at an additional cost of approximately $41 million more than what it would cost to supply that power from Cooper Station for the remainder of 2007. This is based on losing 1.2 million MWh of generation and having to replace it with market purchases ranging in price from $54 to $70 per MWh plus an additional $10 per MWh for firm transmission service. The replacement power costs for 2008 would be approximately $71 million since the entire 12 month period would be included at an expected generation loss of 2.0 million MWh. EKPC would expect replacement power costs to continue to escalate in price each year forward.

Q7. Are there any adverse impacts to the bulk transmission system due to the loss of the Cooper Power Station?

A7. Yes. The transmission system in the area has been designed to provide adequate voltage levels, assuming the Cooper Power Station is available as a generation resource, and to maintain flows on all transmission facilities within applicable ratings during an outage of any single transmission facility in conjunction with the outage of any single generating unit during peak load periods. In the southern Kentucky area, the worst generating unit outage would be an outage of the larger of the two units at Cooper Power Station. Since the system has not been designed for a simultaneous outage of a transmission facility and both units at Cooper, system problems are expected. Furthermore, if the Lake Cumberland water level is not sufficient to allow operation of the Cooper generating units, the hydro units operated by the U.S. Army Corps of Engineers at Wolf Creek Dam would also not be available to supply real power to the transmission grid, although the units may still be able to operate in a synchronous mode to continue to supply reactive power.

The results of power flow analyses with the Cooper and Wolf Creek units off indicate that inadequate voltage levels could be experienced in the area during an outage of any one of three critical transmission contingencies in the area, see Lamb Testimony Exhibit 1. These low voltages would result in unacceptable service to area customers. The power flow analysis also indicates that seven 138 or 161 kV transmission facilities could be overloaded for a single transmission contingency in the area, as power flows inform other areas in response to Cooper Power Station being off-line. These loadings could be as high as approximately 130% of the facilities' emergency ratings. If the flows on these facilities were to reach these extreme levels, the likelihood of cascading outages in the area exists. To avoid this possibility, load shedding would be necessary. In either case, the result would be customer interruptions and segmentation of the transmission network in the area. See Lamb Testimony Exhibit 1.

Q8. Will these adverse impacts affect electric consumers other than EKPC consumers?

A8. Yes. EKPC has several interconnections with E.ON U.S. and TVA in this area. The outages of the Cooper and Wolf Creek units would impact the transmission network in the area, which includes E.ON U.S. and TVA facilities. All of these transmission providers and associated distribution providers in the area could be negatively impacted by simultaneous outages of the Cooper units.

Q9. Based on the results of your power supply analyses, what was your recommendation?

A9. I recommended that EKPC evaluate all of its options for modifying the Cooper Power Station operations and design to ensure that the station is capable of operating under all feasible water levels in Lake Cumberland. That evaluation has been completed and is included in this filing with the Public Service Commission, along with the recommended course of action to ensure adequate and secure power supply for EKPC, its member systems and their member consumers.

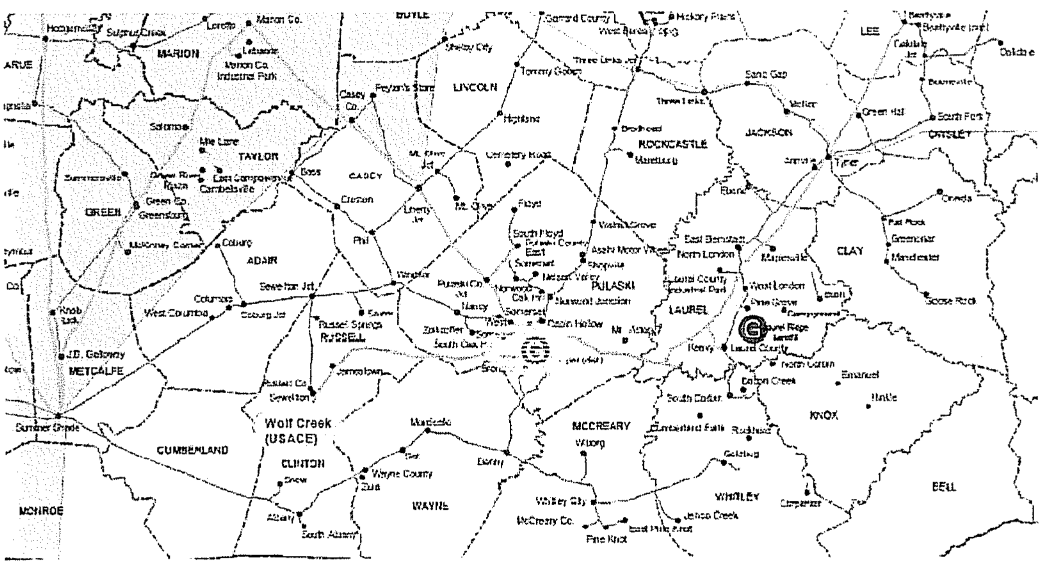
Q10. Does this conclude your testimony?

A10. Yes.

Lamb Testimony Exhibit 1
Summary of Power Flow Analysis for Simultaneous Outages of Cooper Units 1 and 2

Power flow analyses of EKPC's 2007 Summer and 2007/08 Winter peak system models were performed to ascertain the ramifications of potential outages of the Cooper Station generating units. The south-central Kentucky area demand is met by four primary sources – the Cooper Station generating units, the Wolf Creek Dam generating units, the E.ON U.S. 345/161 kV transformer at Alcalde, and the Wolf Creek TVA-Russell County-Cooper 161 kV line. Additional support is provided to the area by the following EHV elements – the E.ON U.S. Pineville 345/161 kV transformer, the E.ON U.S. Pocket 500/161 kV transformer, and the Pocket (E.ON U.S.)-Phipps Bend (TVA) 500 kV line. As part of its normal planning process, EKPC evaluates an outage of any one of these sources to determine if transmission system reinforcements are required. EKPC also designs its system for an outage of any single generating unit in conjunction with an outage of a transmission line and transformer. Therefore, in this area EKPC evaluates an outage of Cooper Unit #2 plus an outage of any single line or transformer. However, due to the possibility of decreased water levels for Lake Cumberland that could eliminate the needed water source for the Cooper generating units, the possibility exists that both units could be off simultaneously during the summer. The transmission system must be designed to withstand an additional contingency for this scenario. Furthermore, the U.S. Army Corps of Engineers has informed EKPC that the hydroelectric generating units at the Wolf Creek Dam would be unavailable if the Lake Cumberland water level is lowered below 673 feet. This would eliminate an additional generation source for the area.

South-Central Kentucky (EKPC)



161kV line
69kV line

NOTE: Both 161kV and 69kV system is heavily interconnected to EON throughout this area.

In addition to the potential generating unit outages that could occur due to the Lake Cumberland water level, other typical system issues could exacerbate the problems in the area. In particular, the Kentucky transmission system is often subjected to large levels of parallel flows due to transactions that usually involve energy sales from areas north of Kentucky to areas south of Kentucky. These north-south transfers increase loadings on the Kentucky 161 kV, 138 kV, and 69 kV transmission facilities. The increased flows through the system result in decreased system voltages. Due to the high frequency of these transfers – which are usually in the range of 1000 to 8000 MW – it is prudent to consider the potential impacts of these transfers in the south-central Kentucky area if the generation at Cooper and Wolf Creek is unavailable. Therefore, EKPC has performed power flow analyses for base transfer conditions (0 MW north-south transfer) and for a reasonably expected level of north-south transfer (4000 MW).

The results of these analyses are summarized in the Tables below.

Table 1
2007 Summer

System Overloads Identified
Cooper #1 & #2 off, all Wolf Creek Dam units off

North-South Transfer Level	**Limiting Facility**	**Contingency**	**MVA Flow**	**MVA Rating**	**Possible Load Shed Required**
0 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	None	210	205	0 MW
0 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	Wolf Creek-Russell County Jct. 161 kV Line (TVA-EKPC)	261	254	15 MW
0 MW	Marion County-Casey County 161 kV Line (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	86	78	15 MW
4000 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	None	257	205	5 MW
4000 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	293	254	175 MW
4000 MW	Marion County-Casey County 161 kV Line (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	102	78	110 MW
4000 MW	Casey County-Liberty Junction 161 kV Line (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	82	78	5 MW
4000 MW	Danville North Tap-Lebanon 138 kV Line	Brown-Alcalde-Pineville 345 kV	192	176	70 MW

	(E.ON U.S.)	Line (E.ON U.S.)			

Table 2
2007 Summer

System Undervoltages Identified
Cooper #1 & #2 off, all Wolf Creek Dam units off

No system undervoltages were identified in 2007 Summer for any north-south transfer level up to 4000 MW

Table 3
2007-08 Winter

System Overloads Identified
Cooper #1 & #2 off, all Wolf Creek Dam units off

North-South Transfer Level	**Limiting Facility**	**Contingency**	**MVA Flow**	**MVA Rating**	**Possible Load Shed Required**
4000 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	Wolf Creek-Russell County Jct. 161 kV Line (TVA-EKPC)	331	330	0 MW
4000 MW	Alcalde-Elihu 161 kV Line (E.ON U.S.)	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	336	330	30 MW
4000 MW	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	249	223	95 MW
4000 MW	Marion County 161/138 kV Transformer (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	211	186	155 MW
4000 MW	Lake Reba Tap-West Irvine Tap 161 kV Line (E.ON U.S.)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	240	237	15 MW

Table 4
2007-08 Winter

System Undervoltages Identified
Cooper #1 & #2 off, all Wolf Creek Dam units off

North-South Transfer Level	**Critical Bus**	**Contingency**	**Percent Voltage**	**Minimum Required Voltage**	**Possible Load Shed Required**
0 MW	South Oak Hill 12 kV (EKPC)	Wolf Creek-Russell County Jct. 161 kV Line (TVA-EKPC)	92.3%	92.5%	0 MW
0 MW	Waynesburg 69 kV (E.ON U.S.)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	83.6%	90%	45 MW
0 MW	Norwood 12 kV (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	86.3%	92.5%	45 MW
0 MW	Manchester South 69 kV (E.ON U.S.)	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	87.4%	90%	10 MW
0 MW	Maplesville 12 kV (EKPC)	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	89.2%	92.5%	10 MW
4000 MW	Waynesburg 69 kV (E.ON U.S.)	None	91.76%	94%	0 MW
4000 MW	Waynesburg 69 kV (E.ON U.S.)	Wolf Creek-Russell County Jct. 161 kV Line (TVA-EKPC)	89.5%	90%	0 MW
4000 MW	Norwood 12 kV (EKPC)	Wolf Creek-Russell County Jct. 161 kV Line (TVA-EKPC)	91.5%	92.5%	0 MW
4000 MW	Norwood 12 kV (EKPC)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	82.2%	92.5%	65 MW
4000 MW	Waynesburg 69 kV (E.ON U.S.)	Brown-Alcalde-Pineville 345 kV Line (E.ON U.S.)	80.8%	90%	65 MW
4000 MW	Manchester South 69 kV (E.ON U.S.)	Delvinta-Green Hall Jct. 161 kV Line (E.ON U.S.-EKPC)	86.2%	90%	10 MW
4000	Maplesville 12	Delvinta-Green	87.8%	92.5%	10 MW

MW	kV (EKPC)	Hall Jct. 161 kV Line (E.ON U.S.-EKPC)			

The following are the conclusions from the results contained in these Tables:

- System problems may occur with or without a contingency and with or without north-south transfers
- Load shedding up to a level of approximately 175 MW may be required for the most critical single-contingency/transfer combination
- Some of the system problems can possibly be mitigated through upgrades of the facilities in a relatively short timeframe (such as the Marion County-Casey County-Liberty Junction 161 kV line sections)
- Insufficient time exists to address several of the system problems – the Alcalde-Elihu 161 kV line, the Marion County 161/138 kV transformer, the widespread system undervoltages – prior to 2007 Summer and/or 2007/08 Winter

It should also be noted that subsequent to EKPC's initial analysis, E.ON U.S. evaluated its Alcalde-Elihu 161 kV line and provided increased ratings for this facility. The Tables above reflect these revised ratings.

Analysis of potential voltage collapse issues in the area for double contingencies with the Cooper and Wolf Creek generating units off has also been performed. The major finding from this study is that simultaneous outages of the Brown-Alcalde-Pineville 345 kV line (E.ON U.S.) and the Phipps Bend-Pocket 500 kV line (TVA-E.ON U.S.) is likely to result in voltage collapse, regardless of transfer patterns. For this scenario, problems could exist even at load levels that are only 85% of the peak load forecast with no transfers. Furthermore, at load levels that are approximately 90% of peak load values, voltage collapse could occur for north-south transfer levels of approximately 3500 MW for these double contingency conditions.

Based upon the findings summarized above, EKPC concludes that a substantial risk of transmission system problems in the south-central Kentucky area exists if the Cooper and Wolf Creek generating units are unavailable during high load periods. Depending on system loads and transfer patterns, the problems could be severe enough to cause facilities to trip. This could cause cascading outages in the area, resulting in localized blackouts. A nine-county area stretching from Adair County to Clay County could be impacted by these outages. In order to avoid loss of most or all customers in this area, some controlled load shedding may be necessary to minimize the number of customers out of service and to maintain the integrity of the local transmission grid.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

THE APPLICATION OF EAST KENTUCKY POWER	)	
COOPERATIVE, INC. FOR A CERTIFICATE OF	)	
PUBLIC CONVENIENCE AND NECESSITY FOR THE	)	**CASE NO.2007-**
CONSTRUCTION OF MODIFICATIONS TO THE	)	
WATER INTAKE SYSTEM AT COOPER POWER	)	
STATION IN PULASKI COUNTY, KENTUCKY	)	

PREPARED TESTIMONY OF JAMES C. LAMB
ON BEHALF OF
EAST KENTUCKY POWER COOPERATIVE, INC.

AFFIDAVIT

STATE OF KENTUCKY)
)
COUNTY OF CLARK)

James C. Lamb, being duly sworn, states that he has read the foregoing prepared testimony and that he would respond in the same manner to the questions if so asked upon taking the stand, and that the matters and things set forth therein are true and correct to the best of his knowledge, information and belief.

James C. Lamb

Subscribed and sworn before me on this 27th day of April, 2007.

Della E. Damron
Della E. Damron
Notary Public
My Commission expires 5-15-2011

APPLICATION EXHIBIT 8

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

FEB 0 9 2007

IN REPLY REFER TO

Engineering-Construction Division

Mr. Jerry Purvis
East Kentucky Power Cooperative
P.O. Box 38
Burnside, KY 42519

Dear Mr. Purvis:

Our records show that the Eastern Kentucky Power Cooperative has a water supply intake on Lake Cumberland with the intake at an elevation of 670 feet National Geodetic Vertical datum of 1929 (NGVD 1929). This letter serves as formal notification that the U.S. Army Corps of Engineers, Nashville District, is modifying pool operations at Lake Cumberland in order to respond to seepage problems at Wolf Creek Dam. The Nashville District will target Lake Cumberland at elevation 680 feet NGVD29 for at least the remainder of this year, unless conditions in the dam change significantly.

We are taking emergency measures to reduce the risk of failure at Wolf Creek Dam. Public safety is the Corps' paramount concern. Seepage under the dam's foundation threatens the structural integrity of the project. Lowering the lake will reduce the pressure on the dam's foundation. We are currently placing grout in the most critical sections of the dam. Trained engineers and construction specialists will continually monitor the ongoing construction effort.

Based on conditions at the project, a possibility always exists that we may lower the pool even more. Because of this real possibility, you need to take necessary measures to allow for water intake with the lake at Elevation 650 feet NGVD29. We recommend that these measures be in place no later than 31 December 2007.

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We do not anticipate any significant time delays in processing Section 10 or Section 404 permits for these extensions. We will use all appropriate means to expedite issuance of a permit. If possible, modification of the existing permit or use of Nationwide Permit #12, Utility Lines, may be one course of action. Please contact Mr. Craig Shoe, the Resource Manager for Lake Cumberland, at (606) 679-6337, as soon as practical to discuss particular issues.

We are cognizant of the effort that this requires and we hope that we will not have to be in a position to lower the pool any further; however, this is a real possibility. Please address any questions to the Project Manager, Mr. David Hendrix, at 615-736-7841.

Sincerely,

Steven J. Roemhildt, P.E.
Lieutenant Colonel
Corps of Engineers
District Engineer