EXHIBIT H

PLANS AND ABILITY OF APPLICANT TO OPERATE PROJECT EFFICIENTLY

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# H. PLANS AND ABILITY OF APPLICANT TO OPERATE PROJECT EFFICIENTLY

## H.1 EFFICIENT AND RELIABLE ELECTRIC SERVICE

Loup River Public Power District (Loup Power District or the District) has owned and operated the Loup River Hydroelectric Project (FERC Project No. 1256) since it was licensed and constructed in the 1930s. District personnel have extensive experience managing, operating, and maintaining the Loup River Hydroelectric Project (Project) in an efficient and reliable manner. In addition to maintaining the Project in excellent operating condition for over 7 decades, the District has willingly invested the funds required to make major capital improvements through the years and to provide public benefits (such as substantial recreation improvements). Notable examples include adding a second regulating reservoir (Lake North), developing extensive Project recreation facilities, completing a major rehabilitation of the turbine generating units, replacing major electrical and protective equipment, installing a sophisticated supervisory control and data acquisition (SCADA) system, and most recently, ordering a new and more efficient Project dredge. The District plans to continue operating and maintaining the Project as it has in the past.

### H.1.1 Increase in Capacity or Generation

The District has no plans to increase Project installed capacity or generation. All water that can reasonably be accessed by the existing Project infrastructure is productively used for generation. However the District may periodically reevaluate its hydroelectric generating facilities to assess life-extension and upgrade alternatives. If an economically feasible capacity expansion or generation alternative is identified in the future, the District will pursue a license amendment as appropriate.

### H.1.2 Coordination of Operation with Other Water Resource Projects

Except for local flood control and irrigation projects, there are no other water resource projects located in the vicinity of the Project. There are no specific requirements in place for the District to operate the Project in coordination with any other water resource projects. However, the District maintains communication with all relevant local, state, and Federal water management agencies as well as local irrigation and recreation interests. In the interest of public safety and good community relations, the District tries to accommodate special requests to temporarily modify its normal operations when appropriate.

### H.1.3 Coordination of Operation with Other Electrical Systems

Loup Power District operation of the Project is closely coordinated with the Nebraska Public Power District (NPPD), the singular purchaser of all hydroelectric power generated by the Project. This coordination includes everything from executive-level

long-term planning, to next-day water management decisions, to scheduled and unscheduled maintenance, to real-time dispatch of power generation at the Monroe and Columbus Powerhouses.

Loup Power District personnel operate the Project according to requests received from NPPD dispatchers, who are in a remote location. Loup Power District and NPPD staff communicate multiple times each day to monitor river conditions, weather, canal inflows, reservoir pondage, unit availability, and NPPD's power system loads. Based on this information, other data, and their collective experience, Loup Power District and NPPD staff coordinate to define and implement specific actions to obtain the maximum overall system benefit from the available resources under the existing conditions. These daily dispatch decisions are taken with full consideration for Project safety and operating guidelines as well as an appreciation that the Project must be available for generation the following day.

All necessary coordination with external third-party utilities and electrical systems is handled by NPPD.

## H.2 NEED FOR PROJECT POWER

Nebraska is the only state in the nation where all electric customers are served by public power. The Nebraska Legislature established the statutes that govern public power in 1933, the same year that the Loup Power District was formed. As a public power state, all utilities that generate, transmit, or distribute electric power for use in Nebraska must be publicly owned and operated.

Loup Power District is a wholesale and retail electric distribution utility that owns and maintains an extensive distribution system that serves over 18,000 customers in five counties. Loup Power District also owns and operates the licensed hydropower Project—its only generation asset. Loup Power District is a full-requirements wholesale customer of NPPD and purchases all of its electricity under a power supply agreement with NPPD. Separately and concurrently, Loup Power District also functions as a wholesale power producer that sells all Project power generated to NPPD (at the powerhouse sites) under a separate and distinct power purchase agreement (PPA).

Due to the unique buy and sell arrangements with NPPD described above, Loup Power District does not directly access or consume any of the power produced by the licensed Project that it owns. However, there can be no doubt that Loup Power District indirectly receives an unknown quantity of Project-produced power in the much larger blended mix of power it annually purchases from NPPD. Because all Project power is purchased at the powerhouse sites by NPPD, the NPPD system would be directly affected if Project power were no longer available for purchase. In that case, NPPD would need to replace Project power with equivalent power from an alternative source. Because all Project power and ancillary benefits are embedded within NPPD's generation portfolio, Loup Power District and all other NPPD

customers in Nebraska share in the economic, energy, and environmental benefits provided by the Project. In addition, Loup Power District's annual revenue from the sale of all Project power to NPPD is a critical element in keeping overall electrical rates low for Loup Power District's retail customers.

As discussed above, Loup Power District has only a limited "need" for Project power in the conventional sense of being the consumer of the resource. However, Loup Power District does benefit financially from the annual sale of Project power to NPPD. As the purchaser of all Project power, NPPD has expressed a significant need for and appreciation of the unique location and operational and ancillary benefits that the Project contributes to NPPD's generation and transmission portfolio (see Appendix H-1 for a letter of support from NPPD).

### H.2.1 Cost and Availability of Alternative Sources of Power

Loup Power District purchases all of its electric power exclusively from NPPD. NPPD is the largest power producer in Nebraska. It has a diverse generation portfolio and a major transmission system that provides low-cost public power throughout most of Nebraska. NPPD's sources of energy for 2010 are shown in Table H-1.

**Table H-1. NPPD Sources of Energy (2010)**

| Generation Type | Percentage |
|---|---|
| Coal | 43.6 |
| Nuclear | 40.7 |
| Purchases[a] | 7.7 |
| Hydro[b] | 5.7 |
| Wind | 1.6 |
| Gas & Oil | 0.7 |

Source: NPPD, January 1, 2011, "Information Guide on Public Power and the Nebraska Public Power District," available online at http://www.nppd.com/assets/publicpowerinformationguide.pdf.

Notes:

[a] Purchases = 5.8% Western Area Power; 1.9% other

[b] NPPD's hydro power resource includes Project power sold to NPPD by Loup Power District as well as other sources.

In addition to selling Project power to NPPD, Loup Power District also purchases all of its wholesale power from NPPD. This existing buy and sell arrangement currently represents the best available source of power for Loup Power District given the unique public power situation in Nebraska. As a full-requirements customer of

NPPD, Loup Power District currently has no other comparatively priced alternative source of power.

### H.2.2 Increased Cost to Replace Power Generated by the Project

Loup Power District has no other generation resources and no options to economically replace the locally generated Project power that it sells to NPPD. Given current contract requirements, Loup Power District would continue to purchase all of its power exclusively from NPPD. If Loup Power District no longer operated the Project, it would lose the annual revenue from the sale of Project power, which would likely result in an increase in electric rates for Loup Power District's retail customers.

Because all Project power is purchased at the powerhouse sites by NPPD, the NPPD system would be directly affected if Project power were no longer available for purchase. In that case, NPPD would need to replace Project power with equivalent power from an alternative source. The cost and availability of alternative sources of power would be determined by the types of resources available to NPPD at that time, both NPPD-owned resources as well as external resources such as those within the Southwest Power Pool (SPP). Regardless of the source and location of the alternative power, it would likely be more costly and provide fewer benefits (location, peaking, load following, power quality, spinning and non-spinning reserves, voltage control, and direct dispatch capability) than does the existing Project.

Given that the Project functions as a hydrocycling plant dispatched by NPPD to provide power during periods of high demand, the current prices of on-peak[1] energy in the SPP provide a reasonable estimate of NPPD's cost to secure replacement energy. For the period from April 1, 2009, to October 31, 2011, the average daily price for on-peak energy in the SPP was $30.54 per megawatt hour (MWh), with an average on-peak price fluctuation of $37.32/MWh and an average daily on-peak high price of $53.93/MWh. In addition to the cost of replacement energy, NPPD would also incur costs associated with the ancillary benefits that the Project provides, such as load following, spinning and non-spinning reserves, and voltage control.

The need for NPPD to replace Project power could also affect the wholesale rates paid by Loup Power District through its full-requirements PPA with NPPD.

### H.2.3 Effects of Alternative Sources of Power

The effects on Loup Power District caused by NPPD having to purchase equivalent power from unknown alternative sources would depend on the cost impact on NPPD's generation portfolio, the subsequent effect on NPPD's wholesale power rates to Loup

[1] The on-peak period for the Southwest Power Pool's Columbus Locational Imbalance Prices (LIP) is defined as 7:00 a.m. to 10:00 p.m. Monday through Saturday. The following holidays are excluded from on-peak regardless of the day of week on which they fall: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Power District, and the subsequent effects on Loup Power District's wholesale and retail power rates to its wholesale and retail customers. Considering NPPD's current generation resources, it is highly probable that alternative sources of power would involve some degree of fossil fuel combustion with its attendant environmental issues.

#### Effects on Customers

If the Project is not relicensed, NPPD and its wholesale customers would need to obtain the annual equivalent capacity and energy from sources other than the Project. The cost and availability of such alternative sources of power would be determined by NPPD's other generation sources, including outside sources such as those within the SPP.

#### Effects on the Applicant's Operating and Load Characteristics

Loup Power District does not directly use Project-generated power to supply its own electric distribution load; therefore, effects on Loup Power District's operating and load characteristics are not applicable. As the full-requirements power supplier to Loup Power District, the NPPD system would be subject to any effects on operating and load characteristics. These potential effects on NPPD's system are unknown.

#### Effects on Communities Served

As stated previously, if the Project is not relicensed, NPPD would need to obtain an equivalent amount of power produced by the Project, most likely at a higher cost than Project power. The cost and availability of such alternative sources of power would be determined by other resources available to NPPD. If NPPD's wholesale power prices were to increase as a result of the loss of Project power, these potentially higher wholesale prices paid by Loup Power District would be passed on to Loup Power District's retail customers. Higher retail electric rates for Loup Power District's customers would negatively affect economic development in the service area and would subsequently deter tax base expansion and quality of life improvements. More direct community effects would include the loss of recreation opportunities provided by Loup Power District facilities and the termination of employment for Loup Power District personnel directly affiliated with the Project.

## H.3 COST AND AVAILABILITY OF ALTERNATIVE SOURCES OF POWER

### H.3.1 Average Annual Cost of Power

Average annual costs of the Project for the period 2007 through 2010 are approximately $6.4 million, including operations and maintenance (O&M), administrative, legal, accounting, insurance, depreciation, and payments made for amortization of bonds.

### H.3.2 Projected Resources Required by the Licensee to Meet Short- and Long-Term Capacity and Energy Requirements

All power generated by the Project is sold by Loup Power District to NPPD under a negotiated PPA. All short- and long-term capacity and energy requirements are the responsibility of NPPD under its power supply agreement with the District.

## H.4 USE OF PROJECT POWER FOR THE DISTRICT'S INDUSTRIAL FACILITY

The District does not own or operate any industrial facilities that use Project power; therefore, this section is not applicable.

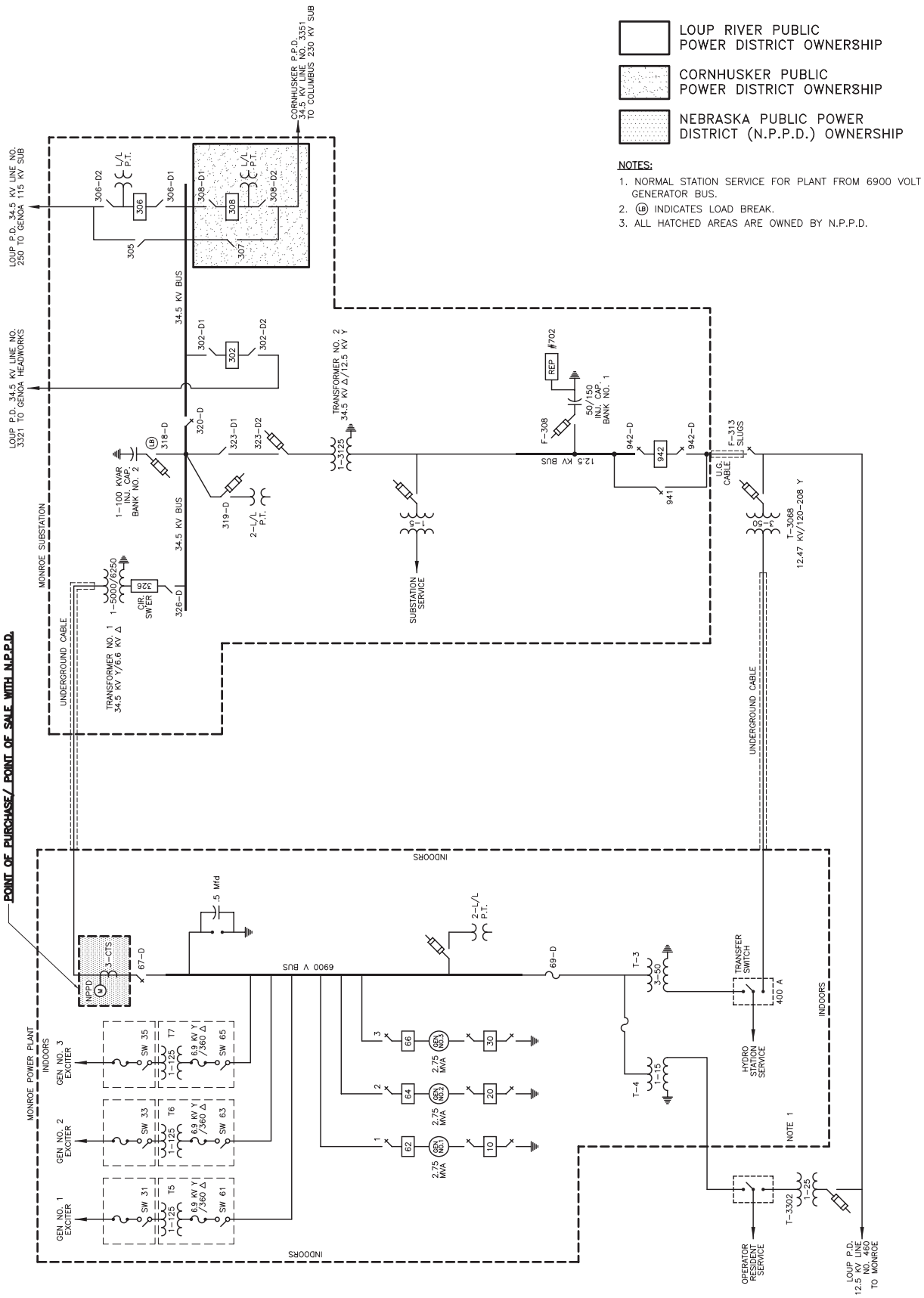
## H.5 USE OF PROJECT POWER BY INDIAN TRIBE AS APPLICANT

The District is not an Indian tribe and there are no Tribal lands within or directly adjacent to the Project Boundary; therefore, this section is not applicable.

## H.6 IMPACTS ON TRANSMISSION SYSTEM OF RECEIVING OR NOT RECEIVING PROJECT LICENSE

Loup Power District is a wholesale generator that sells all Project power to NPPD at the two powerhouse sites. All power produced at the Monroe and Columbus Powerhouses flows to the grid via underground bus cable at the Loup Power District-owned substation sites[2] located inside the Project Boundary. For this reason, no overhead transmission voltage lines are associated with the Project license. The Project's transmission system is limited to the cable buses that connect the Project powerhouses to the step-up transformers in the adjacent substations where the Project interconnects with the grid as shown in the single line drawings in Figures H-1, H-2 and H-3. NPPD takes ownership of Project power at the Monroe Powerhouse and the Columbus Powerhouse substation. Loup Power District does not own or operate any other transmission system resources that would be impacted; therefore, this section is not applicable.

[2] Loup Power District owns both substation sites and portions of the substation equipment at each site; however, NPPD and Cornhusker Public Power District also own equipment at the substations as shown in Figures H-1, H-2, and H-3.

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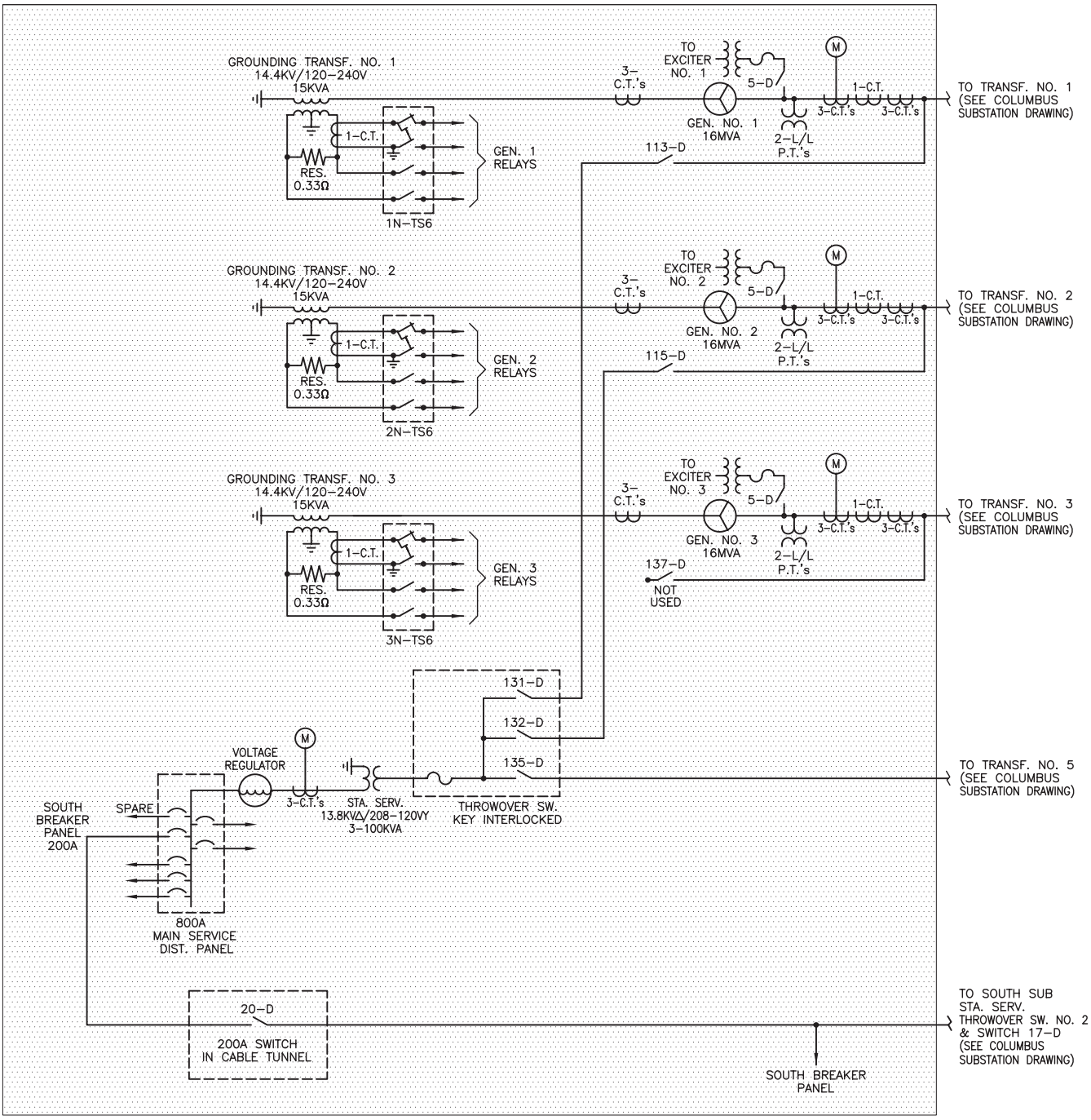
# Monroe Powerhouse Single Line Drawing

Loup River Hydroelectric Project
FERC Project No. 1256
Final License Application



DATE
April 2012

FIGURE
H-1




COLUMBUS HYDRO
LOUP RIVER PUBLIC
POWER DISTRICT

LOUP RIVER PUBLIC POWER
DISTRICT OWNERSHIP

# Columbus Powerhouse Single Line Drawing

Loup River Hydroelectric Project
FERC Project No. 1256
Final License Application



DATE
April 2012

FIGURE
H-2

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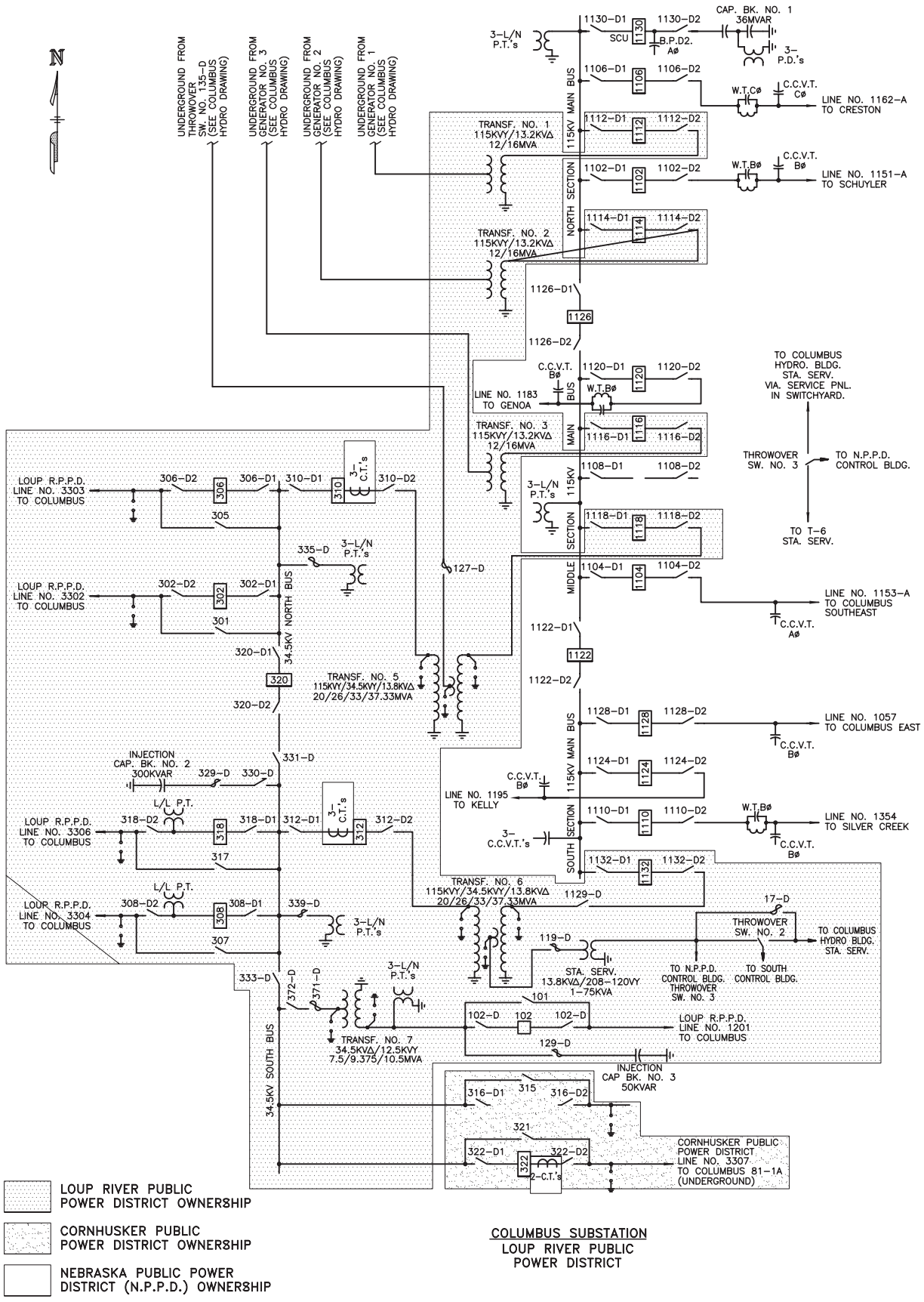


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# Columbus Powerhouse Substation Single Line Drawing

Loup River Hydroelectric Project
FERC Project No. 1256
Final License Application



DATE
April 2012

FIGURE
H-3

## H.7 NEED FOR PROJECT MODIFICATIONS AND CONSISTENCY WITH COMPREHENSIVE PLANS

The District has reviewed the Federal and State of Nebraska list of comprehensive plans adopted by FERC under Section 10(a)(2)(A) of the Federal Power Act (16 United States Code [USC] § 803(a)(2)(A)). The following nine plans are listed for the State of Nebraska (FERC, December 2011):

- The Nationwide Rivers Inventory (National Park Service, January 1982)
- Statewide Comprehensive Outdoor Recreation Plan (SCORP): A Guide to an Active Nebraska 2011-2015 (Nebraska Game and Parks Commission [NGPC], 2010)
- Platte River Management Joint Study, Biology Workgroup Final Report (Platte River Management Joint Study, July 20, 1990)
- Endangered Resources in the Platte River Ecosystem: Description, Human Influences and Management Options (U.S. Fish and Wildlife Service [USFWS], July 20, 1990)
- Fish and Wildlife Resources of Interest to the U.S. Fish and Wildlife Service on the Platte River, Nebraska (USFWS, May 15, 1987)
- Whooping Crane Recovery Plan (USFWS, December 23, 1986)
- Great Lake and Northern Great Plains Piping Plover Recovery Plan (USFWS, May 12, 1988)
- North American Waterfowl Management Plan (USFWS, May 1986)
- Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish and Wildlife Service (USFWS, December 5, 1989)

Based on a review of these comprehensive plans, the District has determined that the Project and associated operations are consistent with these plans (as discussed further in Exhibit E, Section E.8).

## H.8 FINANCIAL AND PERSONNEL RESOURCES

### H.8.1 Financial Resources

The District receives financial revenues from its power distribution business of approximately $68,371,000[3] annually. It also receives annual revenues from the sale of Project power of approximately $7,520,000.[2] As a public utility and a political unit of the State of Nebraska, the District periodically sells bonds for major capital projects in the tens of millions of dollars.

[3] 2007 to 2010 average revenue.

### H.8.2 Personnel Resources

The District maintains a total staff of approximately 118 full-time personnel. Of these, approximately 43 full-time-equivalent staff are assigned to the Project and its operation. Employees are certified and trained as appropriate to ensure the reliable continued operation of the Project, and the District maintains a number of management, engineering, technical, operating, and trade specialty staff who manage Project facilities as well as compliance with regulatory requirements. The District has always maintained, and will continue to maintain, adequate and well-trained staff to safely and efficiently operate the Project.

## H.9 EXPANSION OF PROJECT LANDS

The District has no plans to expand the Project Boundary to encompass additional lands. However, the District is proposing to make some minor revisions to refine the existing Project Boundary (a detailed explanation is provided in Exhibit G).

## H.10 ELECTRICITY CONSUMPTION EFFICIENCY IMPROVEMENT PROGRAM

Loup Power District is a publicly owned electrical wholesale and retail distribution utility with a single generation asset—the Project. As discussed previously, all Project power is sold to NPPD. Loup Power District has an established energy conservation program and actively promotes energy efficiency among its retail distribution customers; such retail sales are not subject to FERC's jurisdiction. Therefore, the details of its program are not relevant in this proceeding.

## H.11 AFFECTED INDIAN TRIBES

There are no Tribal lands within, or immediately adjacent to, the Project Boundary. A review of the Native American Consultation Database indicates that both the Omaha Tribe of Nebraska and the Pawnee Nation of Oklahoma have formal claims in the general vicinity of the Project.

Omaha Tribe of Nebraska
P.O. Box 368
Macy, Nebraska 68039

Pawnee Nation of Oklahoma
P.O. Box 470
Pawnee, Oklahoma 74058

Ponca Tribe of Nebraska
P.O. Box 288
Niobrara, Nebraska 68760

Ponca Tribe of Oklahoma
20 White Eagle Drive
Ponca City, Oklahoma 74601

Santee Sioux Tribal Council
425 Frazier Avenue N, Suite 2
Niobrara, Nebraska 68760

Winnebago Tribal Council
P.O. Box 687
100 Bluff Street
Winnebago, Nebraska 68071

## H.12 SAFE MANAGEMENT, OPERATION, AND MAINTENANCE OF THE PROJECT

As a respected public power utility and a political unit of the State of Nebraska, the District places a high priority on the safety of its personnel and the public at large. The following subsections describe how the Project is safely operated and maintained under various conditions and situations.

### H.12.1 Operation During Flood Conditions

Operation of the Project during high flow conditions is described in Section H.12.2.

### H.12.2 Warning Devices for Downstream Public Safety

The District has posted appropriate warning signs at multiple locations throughout the Project to warn the public about the presence of various risks and dangers. During the summer months, floating cable barriers are installed upstream of the siphons and powerhouses. The public is excluded from the operational areas of both powerhouses and the Headworks (excluding Headworks Park and Headworks [Off-highway Vehicle] OHV Park). In addition, a strobe light and audible alarm downstream of the Monroe Powerhouse activate when the radial gate is about to open. This system warns anglers that there may be release of a substantial flow of water.

There are only two areas of the Project that have been designated by FERC as high hazard due to the proximity of dwellings to embankment sections of the Loup Power Canal. Genoa High-Hazard Area 2 is a small group of homes just north of the Upper Power Canal in the town of Genoa. Columbus High-Hazard Area 1 is a residential subdivision just west of the Intake Canal as it approaches the Columbus Powerhouse. The District has installed an automated telephone callout system that allows the Columbus Powerhouse operator to quickly notify all threatened residences by phone in the event of a potential overtopping or embankment failure.

### H.12.3 Emergency Action Plan

The Project Emergency Action Plan (EAP) required under Part 12D of the Federal Power Act is evaluated and updated annually as needed. In addition to updating contact names and phone numbers, the District annually reviews potentially affected areas, and any changes in area development or risk factors are also addressed. Annual drills of EAP-defined procedures are performed to ensure that District staff are familiar with appropriate actions and responsibilities. The District is proposing no facility or operation changes that might affect the current EAP. The District also maintains a Public Safety Plan, as detailed in Section H.12.5.

### H.12.4 Monitoring Devices

Over the years, the District has deployed a number of water level sensors, pressure transducers, wells, and staff gages to monitor water elevations at key locations.

There are no seepage measuring weirs on the Project. The Genoa High-Hazard Area 2 has an early warning system that monitors water level in the drainage ditch directly adjacent to the left embankment of the Loup Power Canal and is connected to alarms at the Columbus Powerhouse. If the water level rises above normal conditions, an alarm is immediately activated at the Columbus Powerhouse. When the alarm activates, the alarm is evaluated by the operator, and if necessary, the FERC-approved EAP is activated.

The Columbus High-Hazard Area 1 near the Columbus Powerhouse and Intake Canal is equipped with an alarm circuit that runs directly to the Operator's station. The alarm sounds when water level in the Intake Canal rises above or falls below normal levels. When the alarm activates, the alarm is evaluated by the operator, and if necessary, the FERC-approved EAP is activated.

There are four settlement monuments established at the four corners of the Columbus Powerhouse and four more at the Powerhouse Inlet Structure.

There are six monitoring wells in the canal embankments. Four of these are located just upstream of the Columbus Powerhouse and two are located in the Genoa high-risk area just downstream of the Beaver Creek Siphon.

There are 25 crack monitoring gages at the Columbus Powerhouse.

Appropriate intervals have been established for inspecting, reading, and maintaining these devices. In addition, predicted values, threshold values, and action levels have been determined where needed. Additional details regarding the monitoring devices are classified as critical energy infrastructure information (CEII) and can be found in the Project Safety and Surveillance Monitoring Plan, which has been filed with the FERC regional office in Chicago.

### H.12.5 Employee and Public Safety

#### Employee Safety Record

The District has an outstanding employee safety record for operation of the Project. Specifically, during the period from January 1, 2006, to December 31, 2010, the District recorded only one lost-time accident (in 2007) associated with operation of the Project.

#### Public Safety Record

The District considers public safety essential to the successful operation of the Project and maintains a Recreational and Public Safety Plan per applicable FERC regulations. The Recreational and Public Safety Plan documents public safety considerations and

the measures taken by the District to minimize accident potential. The Recreational and Public Safety Plan is updated as necessitated by alterations to facilities or operations or, at a minimum, every 5 years. The Recreational and Public Safety Plan includes the locations of the various equipment and signs associated with public safety, including personal floatation devices, fencing, boat barriers, and buoys.

The District employs a full-time Supervisor of Safety and Training, who oversees all aspects of public safety. Additionally, each employee of the District is instructed to report any public safety deficiencies to the Supervisor of Safety and Training, who evaluates and rectifies the issue. If the issue is urgent or an imminent danger to the public, the employee is to contact his or her supervisor immediately. The supervisor then coordinates appropriate staff to resolve the problem.

Table H-2 lists the fatal incidents/accidents involving the public that have occurred on Project lands during the period from January 1, 2006, through October 31, 2011. None of these incidents were a result of Project operations.

**Table H-2. Fatal Incidents/Accidents Involving the Public**

| Date of Incident | Description | Date of Final Report to FERC |
|---|---|---|
| March 10, 2006 | Suicide on bank of Intake Canal near Columbus Powerhouse | March 13, 2006 |
| May 13, 2007 | Drowning accident at Tailrace Canal Outlet Weir | May 18, 2007 |
| July 27, 2007 | Drowning downstream of Oconee Siphon (vehicle entered canal) | August 3, 2007 |
| October 2, 2007 | Drowning suicide upstream of U.S. Highway 81 bridge (vehicle entered canal) | October 25, 2007 |
| July 23, 2011 | Suicide on Project lands south of the Headworks | July 27, 2011 |
| October 5, 2011 | Drowning accident[a] near Sawtooth Weir | October 17, 2011 |

Note:

[a] The drowning accident on October 5, 2011, was the result of a medical emergency suffered by a Lake Babcock visitor that resulted in the individual falling into Lake Babcock and drowning.

The District continues to post warning signs, exclude the public from hazardous operating areas, and coordinate with FERC and local law enforcement agencies to improve public safety while still allowing public access for recreation.

## H.13 CURRENT PROJECT OPERATIONS

There are currently no plans or constraints that would affect the manner in which the Project is operated. The following subsections describe how the Project is operated under four different flow and seasonal conditions.

### H.13.1 Normal Operations

Normal Project operating conditions are associated with Loup River flows below 10,000 cubic feet per second (cfs). All river flow above 3,500 cfs continues down the Loup River bypass reach because 3,500 cfs (6,942 acre-feet) is the District's water appropriation limit as well as the hydraulic capacity of the canal. In practice, the District is able to divert the maximum flow for only short periods of individual days when conditions allow. During normal operation, the Headworks are operated to divert the maximum practical amount of water (and the least amount of sediment) from the Loup River into the Settling Basin. The amount of flow that can be diverted at any given time is a function of Loup River stage and flow, sediment accumulation in front of the Intake Gate Structure, settings of the 11 fully adjustable gates comprising the Intake Gate Structure, Settling Basin stage, and the sediment situation in the Settling Basin on that particular day. These continuously variable factors make it difficult for operators to deliver a pre-selected rate of diverted flow. There is no automation at the Headworks; the Intake Gates and Sluice Gates are frequently manually adjusted to keep water flow and sediment movement within acceptable ranges.

Based on U.S. Geological Survey (USGS) gage data, the long-term average[4] for diverted flow is 1,630 cfs, or 3,233 acre-feet per day. Over the available period of record,[5] the Project has diverted approximately 69 percent of the total Loup River flow at the point of diversion.

The Monroe Powerhouse operates in a traditional run-of-river mode, passing all water coming to it in the Upper Power Canal with no regulation. Water level sensors at the station intake are used to initiate minor adjustments to the turbine wicket gates to maintain a constant upstream canal elevation. Control of the Monroe Powerhouse turbine generating units is normally dispatched remotely by the Columbus Powerhouse operator. Generation of each unit is determined by water levels in the Upper Power Canal and the wicket gate settings on the unit. A radial bypass gate at the Monroe Powerhouse can be operated in manual or automatic mode and is fitted with a floatation device that automatically opens the gate in response to high water levels. In the event of flows exceeding the capacity of the on-line turbine generating

[4] Average determined from USGS gage data for Water Years 1938 through 2009.

[5] The period of record for calculation of percent diverted flow begins in 1944, when USGS Gage 06793000, Loup River near Genoa, NE, went into operation.

units, the radial bypass gate will automatically open to a pre-determined position to pass excess flow into the Lower Power Canal.

Water exiting the Monroe Powerhouse enters the Lower Power Canal. Level control in this canal segment is provided by the Sawtooth Weir located at the entrance to Lake Babcock. Water level in the regulating reservoirs is controlled by adjusting incoming canal flow and/or turbine releases at the Columbus Powerhouse.

Project generation is dispatched from the NPPD Control Center in Doniphan, Nebraska. The NPPD dispatcher will request that Loup Power District bring generation on- or off-line as demand changes within the NPPD system. When the NPPD dispatcher issues an order, the Columbus Powerhouse Operator makes wicket gate adjustments, brings turbine generating units on-line, or takes turbine generating units off-line, depending on the order.

The turbines are capable of operating in the following four modes:

- Flow control – The flow through the unit remains constant.
- Headwater level control – The headwater elevation is maintained within a narrow band by adjusting turbine wicket gates.
- Power control – The flow is adjusted to maintain a steady generation rate.
- Tailwater control – Wicket gates are adjusted to maintain within a narrow band of a specified tailwater elevations.

The Columbus Powerhouse is generally operated as a daily hydrocycling plant by the NPPD dispatcher. This involves ponding some of the canal inflow in the regulating reservoirs and then drawing the level of the reservoirs down generally about 2 to 3 feet during certain times of the day by generating more power during peak demand. In the off-peak hours, when there is less electrical demand, the turbine generating units are turned down or shut off, and the regulating reservoirs are allowed to refill for hydrocycling the following day.

The controls at both the Monroe and Columbus powerhouses are interfaced electronically to provide optimum control of all water elevations during Project operation. This control, in turn, produces optimum generation from the available flow.

### H.13.2 High Flow Operations

Abnormally high flows in the Loup Power Canal could be produced by two scenarios: 1) excessive precipitation runoff into the Loup Power Canal from local drainage areas, and 2) high flows in the Loup River at the Headworks. Although there are several small drainages that flow into the Loup Power Canal, the resulting inflow, even during precipitation events, is relatively minor. However, high flows

(10,000 cfs[6] and greater) in the Loup River have historically occurred during the spring freshet (that is, the sudden high flow resulting from a thaw). High flows can and do occur whenever there is a major precipitation event in the Loup River Basin.

The District proactively maintains the Project to address high flows in the Loup River before a high flow event occurs. Dikes that connect the Diversion Weir and Intake Gate Structure with high ground on either bank are maintained in good repair. These dikes contain the river channel and prevent shoreline erosion.

When high flow events occur, the Loup River carries large amounts of trash, debris, and occasionally ice. These materials need to be passed down the river and not diverted into the Loup Power Canal. Most of the unwanted material will simply pass over the Diversion Weir; the remainder can be passed downstream using the Sluice Gate Structure. The Headgate Operator resides on site and monitors both weather and river flow conditions. To protect the Project, the Headgate Operator will reduce or curtail flow diversion as necessary prior to or during a high flow event.

The Project was designed to handle normal storm runoff entering the Loup Power Canal from adjacent areas. However, during extreme precipitation events, some storm runoff will enter the Loup Power Canal. To manage such events, the Headgate Operator can reduce diversion at the Headworks prior to an event to provide additional freeboard in the canal segments. If an event occurs with little or no warning, the Headgate Operator can cease diversion. The Headgate Operator can also call for over-generation[7] at both the Monroe and Columbus powerhouses as well as for opening the radial bypass gate at the Monroe Powerhouse. There is no spillway or flow bypass device at the Columbus Powerhouse. In an emergency, any two turbine generating units can safely pass up to 4,100 cfs. This outflow rate is 17 percent greater than the maximum inflow rate to Lake Babcock. These actions will move the high inflows through the Loup Power Canal at a much higher rate.

### H.13.3 Low Flow Operations

Low flow conditions on the Loup River can occur at any time of year but are most likely to occur during the summer months when river flow is often impacted by upstream water management practices, including irrigation withdrawals. During these periods, the Project continues to operate normally, albeit with reduced flow available for diversion and generation. Also, during hot summer conditions, the District defers non-emergency maintenance procedures that require substantial curtailment of Loup Power Canal flows. This measure has been implemented to minimize the potential for

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[6] The District has selected 10,000 cfs as a high flow based on institutional experience. A flow of 10,000 cfs in the Loup River upstream of the Project is equaled or exceeded 0.7 percent of the time. This means that on average, a 10,000 cfs or higher flow occurs approximately 3 days a year.

[7] Over-generation refers to the practice of admitting more than the rated flow through the turbine gates for short periods to release excessive flow.

low dissolved oxygen levels in the Loup Power Canal and potential fish kills that could result.

Low flow conditions in the Loup River, combined with District diversions for power generation, result in low flows in the Loup River bypass reach. As a means to enhance aquatic habitat in the bypass reach during low flow periods, the District proposes to formalize a previous operating practice for providing flow in the Loup River bypass reach. This previous practice was implemented at the request of NGPC. In accordance with the previous practice, the District would allow approximately 75 cfs of flow down the Loup River bypass reach (measured at USGS Gage 06793000, Loup River near Genoa, NE) on days when the ambient temperature at Genoa or Columbus is forecast to reach or exceed 98 degrees Fahrenheit. This practice of providing flow in the Loup River bypass reach had previously been suspended due to concerns expressed by the Nebraska Department of Natural Resources (NDNR) related to potential violation of the District's water appropriation. The District met with NDNR to discuss its concerns and believes that this issue has been resolved to allow additional flow in the Loup River bypass reach without jeopardizing the District's water appropriation. The District has requested formal confirmation of this from NDNR.

### H.13.4 Cold Weather Operations

Operations are modified as needed in cold weather (that is, when Project facilities become subject to freezing conditions). In winter, slush begins to form in the Loup River and the Settling Basin. A small amount of slush can normally be diverted into the Settling Basin without causing problems. Heavier concentrations of slush are bypassed down the Loup River to avoid a "plug" forming in the Settling Basin. If this should happen, there could be no further flow diversion until the ice plug melts or dissipates, and the ice plug could remain in place for the duration of the winter season.

As air temperature gets colder, an ice cap forms both on the Loup River and in the Loup Power Canal. Once a solid ice cap exists, a maximum winter diversion rate of about 2,000 cfs can be established. Typically, winter flows are less than the maximum that can be accommodated by the ice cap. Abrupt flow increases are avoided when there is an ice cap in the canal. Ice adheres to bridge pilings and could loosen or damage them if it rises. If a diversion increase is needed, all ice formed around the bridge pilings within the canal is manually removed first to avoid damaging infrastructure.

Steam produced by an on-site boiler is used to de-ice the intake and sluice gates and keep the Headworks operable. Heavy ice also accumulates on the Diversion Weir flashboards, which cannot be reached with steam. Ice accumulation, rising water, moving ice, and debris may cause damage to the sacrificial flashboards, requiring at least partial replacement each spring.

Winter operation at the Monroe Powerhouse involves monitoring water temperature and watching for the formation of frazil ice. If frazil ice begins to form, diversion is quickly halted at the Headworks as frazil ice can plug the trash racks and lead to overtopping of the Upper Power Canal. The radial bypass gate at the Monroe Powerhouse and its hoist are enclosed in a heated enclosure to prevent freezing. Additionally, the operator is responsible for ensuring that the gate seals are not frozen to the sill or sides of the gate bay. The operator thaws the gate seals as necessary and monitors them frequently to keep them from refreezing.

Winter operation at the Columbus Powerhouse also involves monitoring water temperature and responding rapidly to the formation of frazil ice. At the Columbus Powerhouse, declining pressure readings in the Penstocks indicate that frazil ice is forming on the trash racks. The Columbus Powerhouse Operator may reduce flow through the plant or take the turbine generating units off-line to inhibit additional icing and potential plugging of the trash racks. The Columbus Powerhouse has no bypass gate; therefore, when the powerhouse is taken off-line and the regulating reservoirs reach a certain elevation, flow diversion at the Headworks would need to be halted to allow for handling of water already in the canal system.

## H.14 PROJECT HISTORY

The District has owned and operated the Project since it was first licensed and constructed in the 1930s. Affordable electric power from this efficiently operated Project was a key component in the establishment of the City of Columbus and the surrounding area as a leading industrial region of Nebraska.

The following Project improvements have been—or are currently being—implemented pursuant to FERC authorization or as general maintenance since issuance of the District's license in 1982:

- Turbine Rehabilitation – As authorized by FERC in 2003 (105 FERC ¶ 62,235) and 2005 (112 FERC ¶ 62,138), each of the six turbine generating units associated with the Project was rehabilitated and modernized between 2004 and 2007. Confirmation of completion of that work as of June 1, 2007, was submitted to FERC in September 2007. This $18 million initiative substantially improved overall Project efficiency and made the turbine generating units viable for at least another 50 years of renewable energy operation.
- Major Equipment Replacement – The following major pieces of equipment associated with operation of the Project have been replaced or upgraded since the existing license was issued:
    - Monroe Powerhouse Generator Step-up Transformer – replaced in 1987
    - Monroe Powerhouse Governors – replaced from 1997 to 1999

- Columbus Powerhouse Unit Transformer 3 – replaced in 1998
- Monroe Powerhouse Exciter – replaced from 2000 to 2002
- Columbus Powerhouse Exciter and Governor – replaced from 2000 to 2002
- Monroe Powerhouse Unit Breakers – replaced from 2002 to 2004
- Columbus Powerhouse Unit Transformers 1 & 2 – replaced in 2003
- Columbus Powerhouse Unit Breakers – replaced in 2003
- Monroe Powerhouse Unit Transformer Circuit Switcher – installed from 2004 to 2008
- Monroe Powerhouse Generator Protection Panels – replaced from 2004 to 2008

- SCADA System Installation – The SCADA system was installed in 1993 and allows for automation of certain Project functions; however, in general, the Project remains manually controlled by a qualified operator 24 hours per day, 7 days per week. The SCADA system includes remote sensors at the Headworks, Monroe Powerhouse, and Columbus Powerhouse. Operation of turbine generating units in both powerhouses can be monitored and controlled from the Columbus Powerhouse through the SCADA system. In addition, each turbine generating unit has a manual interface in its respective powerhouse for local control.
- Dredge Replacement – Dredging at the Project is undertaken consistent with Article 21 of the existing license. The District's original 1937 dredge has reached the end of its economic life and is being replaced by a new hydraulic dredge that is scheduled to enter service in September 2012. The new dredge will be very similar to its predecessor in form and function. However, it will have a more powerful 3,000-horsepower pump and use more energy-efficient variable frequency drive electric motors. The new dredge will also employ modern controls and monitoring systems. A new substation and transformer are also required to meet the energy needs of the new dredge.
- Recreation Improvements – The following major improvements have been made to Project recreation facilities since the existing license was issued:
  - Trail Construction – Constructed three pedestrian/bicycle trails, totaling approximately 7 miles.
  - Shelter Construction – Constructed four park shelters: two at Headworks Park, one at Lake Babcock Park, and one at Lake North Park.

- Campsite Electrical Upgrade – Upgraded campsite electrical systems to meet applicable code requirements; upgrades have taken place in multiple years, including most recently in 2011.
- Pit Toilet Construction – Constructed seven concrete pit toilets.
- OHV Park Establishment – Established the designated OHV park and associated parking/unloading area and entrance trails.
- Potable Water Improvements – Replaced hand-pumped park wells with electric/pressurized potable water systems at Headworks Park, Lake Babcock Park, and Lake North Park.
- Sand Volleyball Court Construction – Constructed a sand volleyball court at Lake North Park.
- Playground Equipment Replacement – Replaced obsolete playground equipment, as necessary.
- Lake North Stabilization – Placed sheet pile and swimming ladders along the lake perimeter to deter erosion, maintain the recreational resource, and allow safe and effective entry/exist for swimmers.
- Tailrace Park Access Restriction – Closed both the east and west sides of Tailrace Park to vehicular access in efforts to deter litter, vandalism, and public safety concerns; maintained foot-traffic access.

## H.15 POWER GENERATION LOST DUE TO UNSCHEDULED OUTAGES

The District has an outstanding record of reliable Project operation. One unscheduled Project outage was recorded during the period from January 1, 2006, to October 31, 2011. On May 11, 2011, a storm-related outage occurred at the Monroe Powerhouse, the duration of which was less than 1 hour. The corrective action taken was to check units and relay targets, reset protective relays, re-synchronize the units, and close the breakers.

## H.16 COMPLIANCE WITH EXISTING LICENSE

The District has established a positive compliance history with respect to operation and maintenance of the Project. As of October 31, 2011, District files indicate no instances of non-compliance with any of the terms and conditions of the existing Project license.

## H.17 PROJECT-RELATED ACTIONS THAT AFFECT THE PUBLIC

The following are Project-related actions that currently affect the public in various ways; no substantial operational changes are planned or proposed that would change the actions in this list:

- The District works closely with resource management agencies to protect the endangered interior least terns and threatened piping plovers that frequent and nest on the North Sand Management Area.
- The District values and protects the historical and cultural resources associated with the Project.
- The District works closely with the public and local stakeholders to develop, improve, and properly maintain recreational opportunities at the Project. Overall, the District enjoys excellent relations with the public.
- The District maintains and annually updates a comprehensive EAP that is designed to notify the public and protect public infrastructure in the event an emergency should occur.
- Project operations provide clean, renewable energy and dispatchable capacity that are of considerable value to all electrical consumers in the local area and the region served by NPPD. However, daily hydrocycling by the Project results in small water level fluctuations in the Platte River downstream of the Project. Some riparian landowners and some persons recreating in the Platte River may be affected by these changes.
- Project operations at the Headworks such as Intake Gate adjustments and sluicing of sediment may impact downstream riparian landowners and some persons recreating in the Loup River bypass reach.

## H.18 OWNERSHIP AND OPERATING EXPENSES

If the Project license were transferred to another entity, the District's annual cost of operating and maintaining the Project would be eliminated. These expenses are estimated at approximately $6.4 million.[8]

## H.19 ANNUAL FEES FOR USE OF FEDERAL OR INDIAN LANDS

No annual use fees are paid by the District because no Federal or Indian lands are located within the Project Boundary.

[8] Average annual cost for the period from 2007 to 2010.

# APPENDIX H-1

## NPPD LETTER OF SUPPORT

**Nebraska Public Power District**
*"Always there when you need us"*

**Patrick L. Pope**
President & CEO
(402) 563-5029 / 5145 fax
Email: plpope@nppd.com

April 2, 2012

Mr. Neal Suess, P.E.
President & CEO
Loup Power District
2404 15th Street
Columbus NE 68602-0988

RE: **Loup River Hydroelectric Relicensing**
**FERC Project No. 1256**

Dear Neal:

The relationship between Loup River Public Power District (Loup) and Nebraska Public Power District (NPPD) goes back practically to the inception of the Loup River Hydroelectric Project. Over the years, our Districts have built a strong relationship that benefits not only our individual public power districts, but all electric ratepayers across Nebraska. This relationship has included the benefits of the Loup River Hydroelectric Project.

The Columbus Powerhouse units operate in a mode that enables use during peak periods of demand for electricity. Being able to help meet load changes is a valuable attribute of the Project for NPPD. The units offer us a tool during the peak demand hours, and also provide a very quick and responsive source of energy.

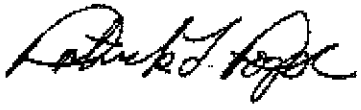
The Loup River Hydroelectric Project also provides benefits to the reliability of the transmission system. The Columbus Powerhouse units also provide ancillary services that are valuable in the operation of our transmission system, providing spinning and non-spinning reserves and a source of voltage control for NPPD.

When you look at what's going on in the world today, with concern for greenhouse gases and where energy supplies will come from in the future, hydroelectric projects like the Loup River Hydroelectric Project, are going to be more important in years to come. Hydroelectric projects do not emit greenhouse gases, they are a renewable energy source, and we need to make sure that we're capturing the value that they provide and can continue to provide for many years to come.

The Loup River Hydroelectric Project is a key component to the NPPD system, and helps us provide clean, reliable, and economical energy to the ratepayers of Nebraska. We wholeheartedly support the relicensing of the Loup project, and we urge the Federal Regulatory Commission to issue a new license in a timely manner and that maintains the operational flexibility for the Project.

Thank you.

Sincerely,



Patrick L. Pope
President & CEO