APPENDIX A – LIST OF REFERENCES

NUMBER	TITLE AND AUTHOR	DATE
1.	Recommended Modifications for the Dead River Hydroelectric Project, Stone & Webster	December 1995
2.	Letter Report Re: Silver Lake Safety Improvements, Stone & Webster	December 1998
3.	Flood Routing Probable Maximum Floods in Dead River Basin (Draft), MWH	March 2001
4.	Silver Lake Basin Project – Design Report, Emergency Fuse Plug Spillway and Channel Design [Initial Design Report], MWH	May 2001
5.	Silver Lake Dam, Fuse Plug Spillway and Dam Modifications, Design Report, MWH	March 2002
6.	Drawings and Specifications for Silver Lake Fuse Plug Project, MWH	June 2002
7.	Quality Control and Inspection Plan, MWH	March 2002

APPENDIX B – LIST OF EXHIBITS

EXHIBIT NUMBER	DESCRIPTION	DATE
1.	Michigan Department of Natural Resources letter to FERC including a table of Start-of-Month Target Elevations and Minimum Elevations under a heading "Reservoir Operating Limits" (page 1 through 7 of 19)	5/25/99
2.	FERC comments and request to initiate work	6/6/00
3.	FERC letter to WPS requesting revised PMF study and plan and schedule for remedial measures addressing the inadequate spillway capacity at Silver Lake	8/1/00
4.	FERC letter to UPPCO with review comments on August 2000 PMF study for Silver Lake	12/15/00
5.	FERC letter to UPPCO with results of detailed review of March 2001 PMF study and channel spillway velocities; states that degree of erosion does not need to be evaluated	6/21/01
6.	FERC letter to UPPCO with review comments on fuse plug design	6/28/01
7.	Harza letter to WPS/UPPCO transmitting draft drawings and specifications and selected pages of draft drawings and specifications mentioning stop log removal	6/29/01
8.	FERC letter to WPS authorizing construction to proceed	5/16/02
9.	FERC letter to WPS approving 2001 QCIP	8/30/01
10.	UPPCO Final Construction Report representing to FERC that the contractor had completed the work on October 15, 2002	December 2002
11.	Operating procedures for Silver Lake submitted to FERC (submitted on 6/12/03)	6/12/03
12.	UPPCO response to FERC's August 1, 2003, letter request for Silver Lake reservoir operating plan	8/11/03
13.	Article from Marquette Mining-Journal: "Wild Weekend Weather"	5/12/03

19990603-0122

ORIGINAL

STATE OF MICHIGAN

JOHN ENGLER, Governor
DEPARTMENT OF NATURAL RESOURCES
STEVENS T MASON BUILDING, PO BOX 30028, LANSING MI 48909-7526
WEBSITE: www.dnr.state.mi.us
K. L. COOL, Director

REPLY TO:
FISHERIES DIVISION
PO BOX 30446
LANSING MI 48909-7946
Refer to: 4202.2.7

May 25, 1999

Mr. David P. Boergers
Secretary
Federal Energy Regulatory Commission
888 First St., NE
Washington, DC 20426

Dear Secretary Boergers:

Re: COMMENTS, RECOMMENDATIONS, TERMS AND CONDITIONS
Dead River Hydroelectric Project (FERC Project No. 10855)
Upper Peninsula Power Company, License Application

The Michigan Department of Natural Resources has completed our review of the license application for the Dead River Hydroelectric Project (FERC Project No. 10855). We request that the enclosed Terms and Conditions be incorporated into any license issued for the Dead River Hydroelectric Project pursuant to Section 10(j) of the Federal Power Act.

1) Flow Requirements

The Licensee shall discharge the following minimum and maximum flows in the river from each of the developments for the protection and enhancement of fish and wildlife resources, riparian vegetation, aesthetic resources, water quality, and recreation.

Minimum and maximum flows may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the resource agencies (Michigan Department of Natural Resources [MDNR or Department], Michigan Department of Environmental Quality [MDEQ] and US Fish and Wildlife Service [USFWS]). If the flow is so modified, the Licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

a) Silver Lake Dam
The Licensee shall maintain the following minimum flows from the Silver Lake Dam to the Dead River, as measured immediately below the Dam:

Month	Minimum flow (cfs)
January-March	15
April	25
May	20
June	15
July-September	10
October-December	15

The Licensee shall not discharge a flow from the Silver Lake Dam in excess of 100 cfs when such discharges are under their control.

b) Hoist Powerhouse
The Licensee shall maintain a minimum flow of 100 cfs from the Hoist Powerhouse to the Dead River at all times and shall operate in a non-peaking mode during the period March 15 to June 15.

c) McClure Powerhouse – discharge channel
The Licensee shall maintain a minimum flow of 80 cfs from the McClure Powerhouse to the discharge channel at all times.

d) McClure Dam – bypassed river channel
The Licensee shall provide a minimum flow of 40 cfs, using a deep water draw from the McClure Dam to the bypassed river channel immediately downstream of the Dam at all times. The Licensee shall also provide periodic flushing flows to the bypassed channel; the amount and duration of these flows shall be designed to prevent injurious sedimentation of the channel and to provide for the natural movement of woody debris.

Within 180 days of license issuance, the Licensee shall file for Commission approval a plan for providing the minimum instream flow in the bypassed reach below the McClure Dam. Upon Commission approval, the Licensee shall implement the plan.

Justification: The Department of Natural Resources has the mission to "Protect and maintain healthy aquatic environments and fish communities and rehabilitate those now degraded" and has made the above recommendations to protect the public trust resources of the State of Michigan, which are property of the State of Michigan. The past operation of this project has been documented to have severely impaired this common property and the right of the public to use its property.

The documentation supporting the minimum flow recommendations for Dead River below Silver Lake Basin and the bypassed Dead River reach below McClure Dam are contained in Appendix 1. Providing a minimum flow to the bypassed river channel will restore over six miles of river for many fish species at all life stages. These flows are needed to protect and enhance aquatic habitat, fish and wildlife resources, riparian vegetation, aesthetic resources, water quality and recreation.

The Department's recommendation for minimum flows from the Hoist and McClure Powerhouses are designed to reduce the negative impacts of peaking flows on downstream riverine habitat. Hoist Dam has a riverine tailwater that provides an important brown trout fishery over its 0.5 miles until it reaches the McClure Impoundment. Maintenance of minimum flows will result in modified peaking, dampening the range of flow fluctuation and thereby providing some protection and enhancement of the aquatic habitat, fish and wildlife resources, riparian vegetation, aesthetic resources, water quality and recreation.

The springtime non-peaking requirement from Hoist Dam is designed to protect young of the year fish, which are not able to avoid rapid flow changes. Studies by Bain and Finn (1988), Cushman (1985), Nelson (1986) and Gislason (1985) all documented significant negative impacts, that included reductions in river productivity and recruitment failure in stream fishes, that peaking operations cause by de-stabilizing daily flow patterns on riverine systems. Large amounts of habitat are impacted by the daily changes in river elevation from peaking operations as documented by Jourdonnais (1993). IFIM studies at other projects in Michigan support these studies. These studies have documented habitat losses up to 99% for non-mobile life stages and species (i.e. spawning, incubating eggs, fry and benthos) and between 40-70% for mobile life stages and species (i.e. juvenile and adult fish) for projects proposing full peaking operation. The springtime non-peaking operation would provide stable flows, which result in stable amounts of habitat, in the riverine reach below the Hoist Powerhouse.

Significant impacts from peaking operations have also been documented for mussel species, one of the most threatened faunas in the United States. Many mussel species have very specific habitat needs and only can utilize a narrow range of physical habitat in rivers. The richest mussel assemblages occur in riffle or shoal areas, because of their filter feeding foraging method and their high dissolved oxygen requirements, which are those habitats most impacted by peaking operations (Layher et. al. 1993). Layher also stated that mussels, generally incapable of long distance movements in short periods,

Exhibit
Ex. 1, p. 2

cannot tolerate prolonged and frequent periods of dewatering below hydroelectric projects. The springtime non-peaking operation, which provides for stable daily flows, should provide additional habitat for the re-establishment of a higher molluscan diversity.

The springtime non-peaking operation will also allow this project to comply with the Resource Protection Goal of the State's SCORP plan, which calls for the acquisition, protection and enhancement of natural resources essential to recreation opportunities. Specifically, the springtime non-peaking recommendation will protect this valuable natural resource as called in the SCORP plan, which has been accepted as comprehensive plan by FERC. In addition, the Fisheries Division Strategic Plan calls for the protection of and maintenance of healthy inland waters and fish communities and the rehabilitation of those currently degraded. Springtime non-peaking operation will meet this goal of this plan that was submitted October 7, 1994 as a FERC Comprehensive Plan.

The 120 cfs minimum flow recommendation for the other times of the year from the Hoist Powerhouse is based upon the IFIM data provided in the license application and will enhance the resource over the current condition. While this minimum flow will not completely offset the losses in habitat from the operation of this project, it will greatly reduce that current diurnal fluctuation that is documented to impair aquatic production. Normally, the Department's policy is to recommend non-peaking flows at all times from the Hoist Dam to protect the 0.5 miles of downstream riverine habitat but has decided (in partial agreement with the applicant) to forego this condition to obtain flows in the bypassed river reach below McClure Dam. Thus, it is critical that our recommended flow regime for the bypassed river reach be incorporated as a license article to offset the continued losses of habitat from peaking operations in the non-spring period from Hoist Dam. This amount will also provide sufficient flows for a 40 cfs minimum flow to the bypassed river reach and will allow for the continuous operation of the McClure Powerhouse that requires 80 cfs to operate.

The McClure Powerhouse Canal empties directly into Forestville Impoundment and the Impoundment has a backwater effect to the powerhouse. When the powerhouse is shut off, the canal water level drops between 1 to 2 feet but does not dewater the tailwater because of this backwater effect. It is the Department's policy to allow the project to conduct some peaking at locations where they have impoundment backwater effects in the powerhouse tailwater. The 80 cfs minimum will enhance the existing condition by ensuring the project's operation at all times thus providing a better distribution of water velocities (and habitat) in this tailwater, and will allow for some more limited peaking at this project. The Department would prefer non-peaking flows at all times from the McClure Dam to protect the tailwater habitat and to protect downstream river reaches but has agreed (in partial agreement with the applicant) to forego this condition to obtain flows in the bypassed river reach below McClure Dam. Thus, it is critical that our recommended flow regime for the bypassed river reach be incorporated as a license article to offset the continued losses of habitat from peaking operations from McClure Dam.

Literature Cited

Bain, M.B. and J.T. Finn. 1988. Streamflow regulation and fish community structure. Ecology 69(2):382-392.

Cushman, R.M. 1985. Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities. North American Journal of Fisheries Management 5:330-339.

Gislason, J.C. 1985. Aquatic insect abundance in a regulated stream under fluctuating and stable diel flow patterns. North American Journal of Fisheries Management 5(1):39-46.

Jourdonnais, J.H. 1993. Electrical frequency control and its effects on flow and river ecology of the lower Flathead River, Montana. Rivers 4(2):132-145.

Layzer, J.B., M.E. Gordon, and R.M. Anderson. 1993. Mussels: the forgotten fauna of regulated rivers. A case study of the Caney Fork River. Regulated Rivers: Research & Management 8:63-71.

Exhibit

Ex. 1, p. 3

Nelson, F.A. 1986. Effect of flow fluctuations on brown trout in the Beaverhead River, Montana. North American Journal of Fisheries Management 6:551-559.

2) Reservoir Operating Limits

a) Silver Lake Basin
The Licensee shall maintain the Silver Lake Basin at all times at or higher than the following minimum elevations (feet National Geodetic Vertical Datum-NGVD) and shall achieve the following start-of-month target elevations if possible. The rate of lowering and refill shall not exceed 0.5 foot per day.

Month	Start-of-month Target Elevation (ft NGVD)	Minimum Elevation (ft NGVD)
April	1477.5	1477.0
May	1479.0	1478.5
June	1481.0	1480.5
July	1481.5	1480.0
August	1480.0	1479.0
September	1479.5	1479.0
October	1479.5	1479.0
November	1479.0	1478.5
December	1479.0	1478.5
January	1479.0	1477.5
February	1477.5	1477.0
March	1477.5	1477.0

b) Dead River Storage Basin (Hoist Development)
The Licensee shall maintain the Hoist Basin at all times at or higher than the following minimum elevations (feet NGVD) and shall achieve the following start-of-month target elevations if possible. The Licensee shall not exceed an elevation of 1340.5 feet at any time and if natural conditions cause this elevation to be exceeded, the Licensee shall take steps to lower the impoundment to the target elevation. The rate of lowering and refill shall not exceed 0.5 foot per day.

Month	Start-of-month Target Elevation (ft NGVD)	Minimum Elevation (ft NGVD)
April	1337.5	1337.0
May	1340.0	1339.0
June	1340.5	1339.0
July	1340.5	1339.0
August	1340.5	1339.0
September	1340.5	1339.0
October	1340.5	1339.0
November	1340.5	1339.0
December	1339.0	1338.5
January	1339.0	1337.5
February	1337.5	1337.0
March	1337.5	1337.0

c) McClure Storage Basin
The Licensee shall maintain the McClure Storage Basin between 1194.8 and 1196.4 feet NGVD at all times and the fluctuation in elevation shall not exceed 1.0 foot in any 24-hour period. This condition does not apply to instances beyond the control of the Licensee, including periods of high flow, or if higher elevations are temporarily needed to pass organic debris over the spillway or to provide flushing flows to the bypassed river channel.

Exhibit
Ex. 1, p. 4

d) At all Reservoirs

The Licensee shall notify the MDNR and MDEQ at the earliest possible opportunity, but no later than twenty-four (24) hours, of any proposed or already enacted emergency flowage drawdown done to prevent dam failure and/or imminent risk to public health and safety. The Licensee shall consult with the MDNR and MDEQ in determining the amount, if any, of resource damage and the appropriate response measures. After the emergency has passed, the Licensee shall consult with the MDNR and MDEQ on the proposed remedial measures, mitigation and appropriate methodology and timing of the flowage level restoration. Within thirty (30) days after the emergency drawdown, the Licensee shall consult with and submit a report to the MDNR and MDEQ describing the emergency, action taken, remedial measures proposed, mitigation proposed, and measures proposed to prevent reoccurrence.

For all proposed reservoir drawdowns (and refills) for dam maintenance purposes that exceed one foot, the Licensee shall obtain any necessary State of Michigan permits.

The recommended elevations may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the MDNR and MDEQ.

Justification: We have recommended specific elevations and operating ranges to provide for the maximum amount of habitat in the reservoirs at all times and to protect Project wetlands. These elevation limits will ensure that the elevations of the Project reservoirs will not be lowered without MDNR consultation, and will protect the reservoirs and associated aquatic community. These reservoirs have shallow water habitat and associated riparian wetlands, especially the Dead River (Hoist) Basin, that would be adversely effected by fluctuating water levels and drawdowns. The Silver Lake Basin has relatively little shallow water habitat, with an estimated 156 of the 1,273 acres less than eight feet of depth at an elevation of 1483.5 feet msl, making this a scarce habitat in this reservoir. Dead River (Hoist) Basin has an estimated 2,429 surface acres, with 378 acres of inundated wetland at a pool elevation of 1,342 feet msl. The McClure Basin is only 94 acres in size at the 1,195.8 feet msl elevation with most of the aquatic plants occurring in the upstream end of the reservoir. The shallow water habitat is critical for spawning and nursery habitat for fish, reproduction and adult habitat for amphibians and reptiles, nesting and rearing habitat for waterfowl, and den areas for furbearers. The maintenance of specified elevations in the reservoirs will directly protect associated emergent wetlands. Recommended elevations at Silver Lake and Dead River (Hoist) basins vary with season, being highest in spring to protect the critical spawning and nesting period and matching a natural lake hydrograph. These elevations also allow for some drawdown, accommodating flow augmentation for hydropower generation. The maximum elevation specified for McClure Basin will reduce the amount of shoreline erosion that occurs at higher elevations previously maintained.

The timing, duration and rate of drawdowns for maintenance and other purposes can have significant adverse impacts to aquatic resources, public recreation, and water quality. Appropriate consultation with the MDEQ, through the Act 451, Part 301, Inland Lakes and Streams permit program, will greatly minimize such impacts.

The Department's recommendation also provides for extreme conditions (i.e. prolonged drought) by allowing for elevations different from the values recommended above after consultation with the Departments. This provision will ensure that even extreme conditions are considered and covered during the operation of this project.

3) **Compliance Monitoring**:

a) To demonstrate operational compliance with all minimum flow and maximum flow requirements in the Dead River downstream of the Silver Lake Dam, downstream of the Hoist and McClure powerhouses, and downstream of the McClure Dam in the bypassed river channel, the Licensee shall develop and implement a gauging and compliance plan within 12 months of license issuance, in consultation with the USFWS, the US Geological Survey (USGS), and the MDNR and MDEQ. This plan shall include means to continuously record flow and include provision of funds to operate and maintain the USGS

Exhibit
Ex. 1, p. 5

FEDERAL ENERGY REGULATORY COMMISSION

CHICAGO REGIONAL OFFICE
230 SOUTH DEARBORN STREET, ROOM 3130
CHICAGO, ILLINOIS 60604

In reply refer to:
P-10855

NATDAM: MI00197, MI00175,
MI00183

June 6, 2000

Mr. Charles A. Schrock
Senior Vice President - Energy Supply
Wisconsin Public Service Corporation
600 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Dear Mr. Schrock:

We have completed our review of the December 2, 1998, Letter Report for your Dead River Development Project No. 10855. The report was prepared by Stone and Webster Inc. and attached as Appendix D to the Second (1999) Consultant Safety Inspection Report (CSIR).

This letter report was in response to our letter dated October 9, 1997. By this letter, we approved the First Consultant Safety Inspection Report dated October 1993 and Recommended Modification Report (dated December 1995) and requested that residual strength parameters be used for the revised stability analyses. Since remedial measures are needed, we further requested that your consultant provide recommendations for a foundation exploration and testing program to substantiate the strength parameters needed for design.

We reviewed and re-analyzed the 1993 CSIR concrete and rock strength evaluation and, using the available laboratory test data, performed an independent analysis. Based on the review and independent analysis, we have the following comments:

Exhibit
Ex. 2, P. 1

1. In general, your consultant determined the strength parameters for the concrete/foundation contact and concrete lift joints as an average between the peak friction angle and the residual friction angle and as a percentage of the cohesion component based on the percentage of the interface that was assumed to be intact. We do not support this methodology, particularly when at least 50% of all of the contacts were not intact.

2. Your consultant did not agree with our request for additional foundation exploration and testing. He notes that the rock, particularly at Silver Lake and Hoist sites, is vertically foliated slate which is easily damaged by the drilling process. We concur with your consultant that no additional explorations or testing is needed.

3. Your consultant was asked in our October 9, 1997 letter to evaluate the various concrete structure stabilities at the lift joints assuming 55 degrees for the friction angle and no cohesion. Your consultant did not comply with this request. The test data does not support your consultant's nor our proposed strength parameters. Since the parameters that were used are so much greater than what can be substantiated by test data, all of the structures that were evaluated at lift joints need to be reevaluated. Please see the attached plots.

4. Sufficient test data was available for determination of the foundation strength parameters at your McClure dam. Your consultant based his conclusions on data from four samples. We note that one of the tests for peak shear was carried out to a residual shear value. For this reason, we evaluated five data points. Your reevaluation of the stability and your design for remedial measures should be based on the residual test data as shown in the attached plots. Please be reminded that we will accept a factor of safety of 2.0, 1.5 and 1.5 for the Normal, Normal + Ice and PMF loading conditions because you have completed site specific exploration and testing. Should you choose to exclude cohesion in the re-analysis and for design, we will accept a factor of safety of 1.5 for the most critical static loading condition.

5. Sufficient test data was not available for an accurate evaluation of the foundation strength parameters at Silver Lake. Since 80 percent of the foundation contact for the intake and 100 percent of the foundation contact for the spillway were not intact, you should not use any cohesion in the re-analysis and design for remedial measures. We support the use of 31 degrees and zero cohesion for the spillway and 40 degrees and zero cohesion for the intake. You are reminded that we will accept a factor of safety of 1.5 for the most critical static loading condition.

Exhibit
Ex. 2, p. 2

6. Sufficient test data was not available for an accurate evaluation of the foundation strength parameters at Hoist. We note, however, that the foundation rock at Hoist is similar to that of the Silver Lake, which has strength parameters at or below 40 degrees. Construction photographs for Hoist indicate that the foundation rock was broken enough that the excavation was able to be done by pick and shovel. The eight boring logs for Hoist, H-C1 through H-C8, were reviewed specifically for conditions at or near the concrete/rock contact. Seven boring logs indicated that the concrete/rock contact was broken. Boring H-C7, which had a partially intact concrete/rock contact, is shown to have a break slightly below the concrete/rock interface. The breaks at or near the concrete/rock contact in all eight borings indicate that there is iron stain on the joints and foliation. None of the breaks, shown on the boring logs, indicate they were a result of a drill break, since they do not have DB (drill break) beside the break. As a result of this information, the strength parameter for the concrete/rock contact at Hoist should not exceed 40 degrees and zero cohesion.

   The concrete/rock contact and concrete lift joints strength parameters that we find acceptable at each of the developments are listed in the following table:

Site	Location	Friction Angle	Cohesion
Silver Lake Spillway	Concrete/rock contact	31 °	0 psi
	Concrete lift joint	55 °	0 psi
Silver Lake Intake	Concrete/rock contact	40 °	0 psi
	Concrete lift joint	55 °	0 psi
McClure Dam	Concrete/rock contact	45 °	0 psi
	Concrete lift joint	55 °	0 psi
Hoist Dam	Concrete/rock contact	40 °	0 psi
	Concrete lift joint	55 °	0 psi

At this time, we would like to initiate work on the spillway capacity and stability improvements for your Silver Lake Project. As will be reiterated by separate correspondence, we continue to support the approved PMF of 40,700 cfs. Further developments in Chapter 8 of the FERC Engineering Guidelines regarding the development of the PMF have been evaluated. These developments will not affect the PMF for Silver Lake. Since you have completed the necessary foundation exploration and testing for design, you should provide your plan and schedule for remedial measures to your Silver Lake Dam by July 31, 2000. Actual construction work should begin no later than 2001.

Exhibit
Ex. 2, p. 3

Regarding your Hoist and McClure dams, we anticipate further comments and discussion on the PMF's. These comments will be provided under separate cover.

If you have any questions, please call Mr. Busuioc at (312) 353-6172 or me at (312) 353-6171.

Sincerely,

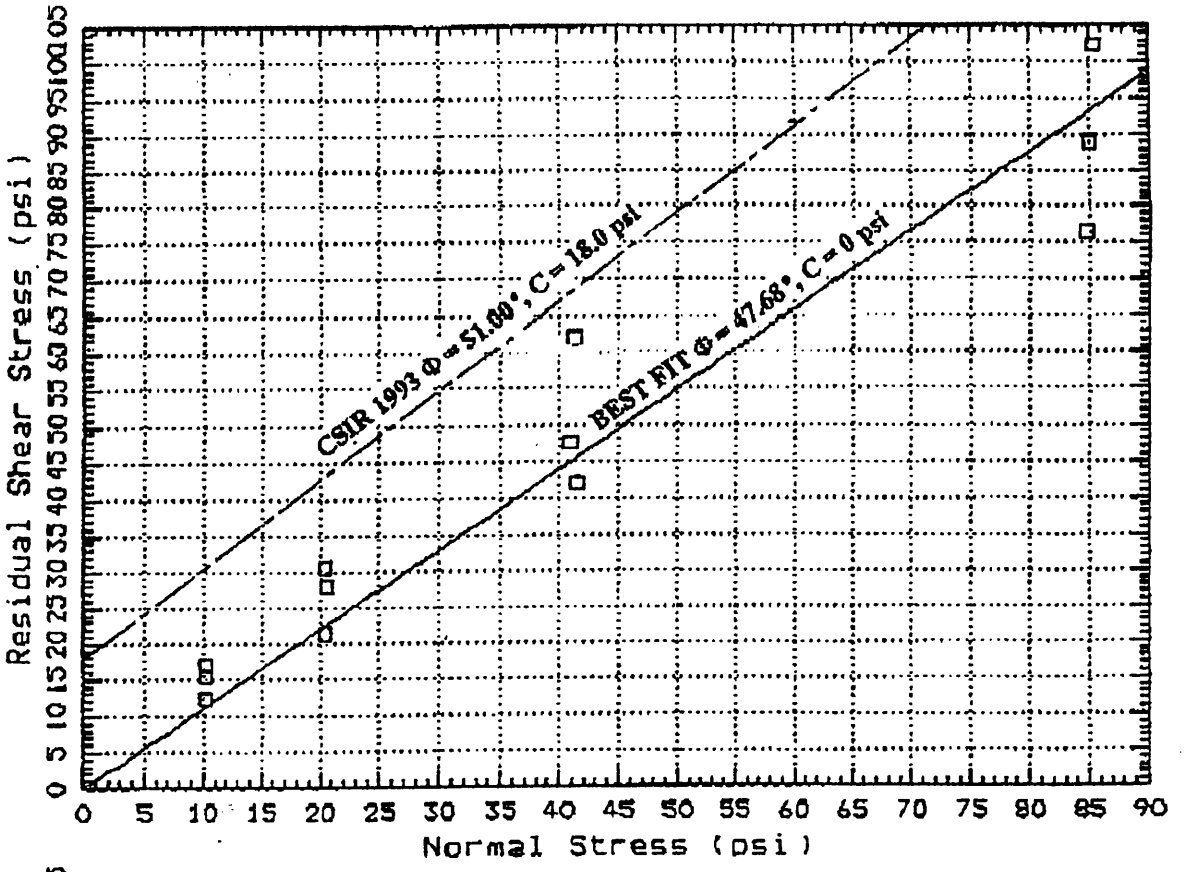
Peggy A. Harding, PE
Regional Director

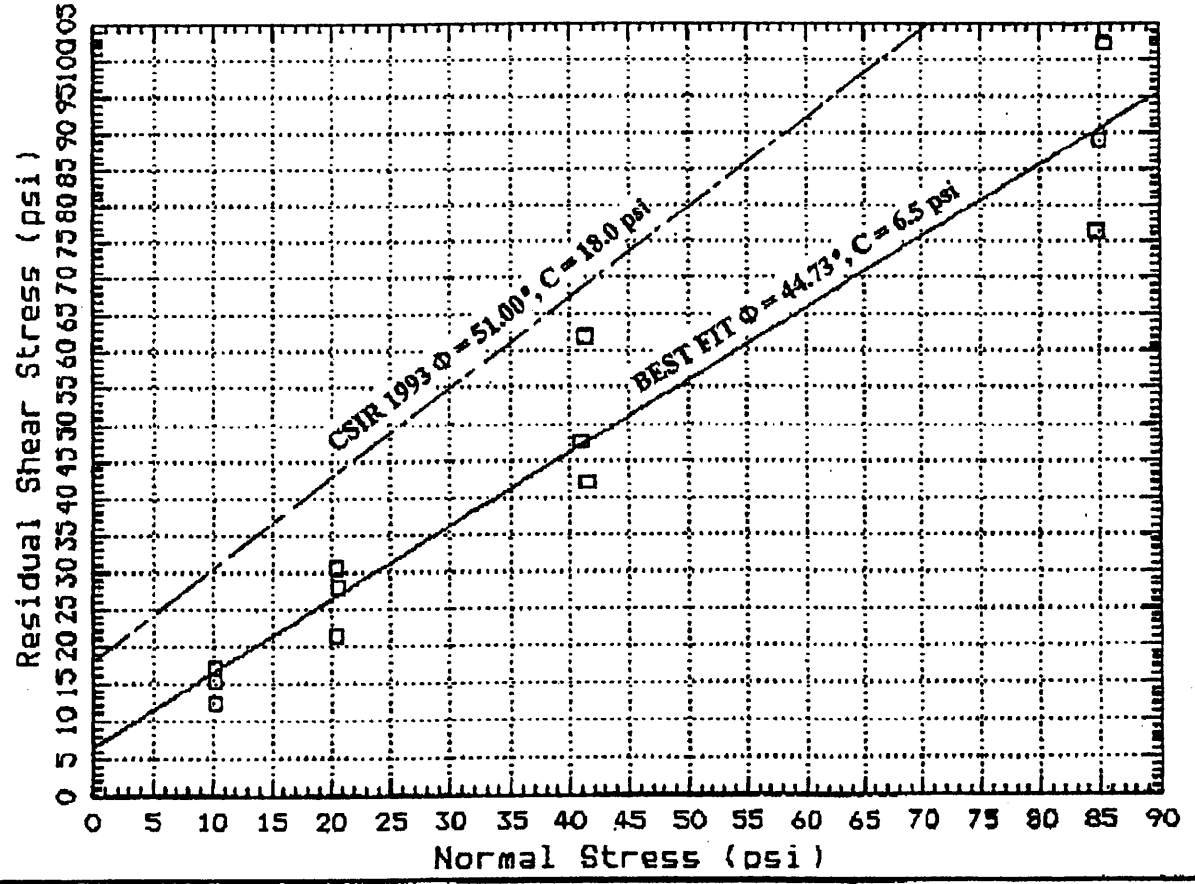
Attachments:

- **Silver Lake Dam** - Concrete Lift Joint Shear
- **Hoist Dam** - Concrete Lift Joint Shear
- **McClure Dam** - Concrete Lift Joint Shear
- **McClure Dam** - Concrete/Rock Shear (Five Data Points)

Exhibit
Ex. 2, P. 4

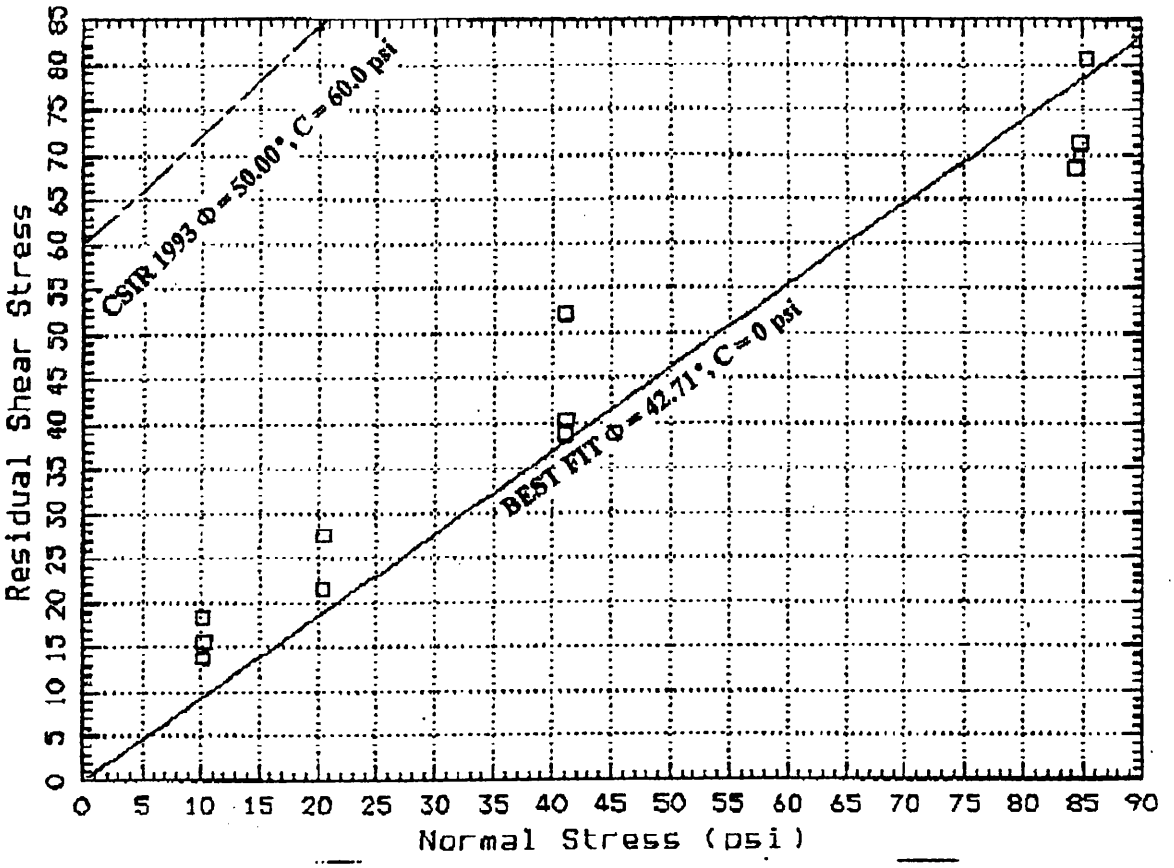
Exhibit
Ex. 2, p. 5

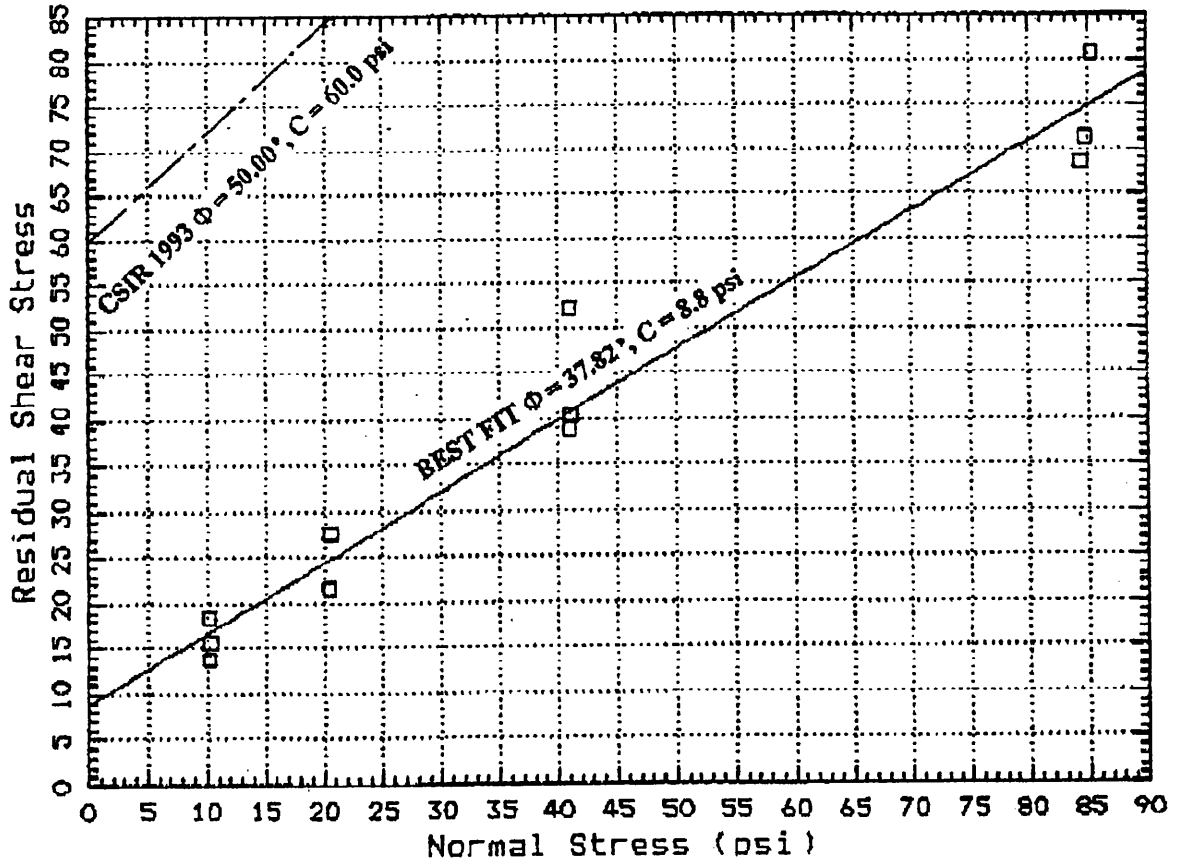




DATE	SILVER LAKE DAM	PROJECT No. 10855
02.02.00	Concrete Lift Joint Shear	FERC - D2SI-CRO

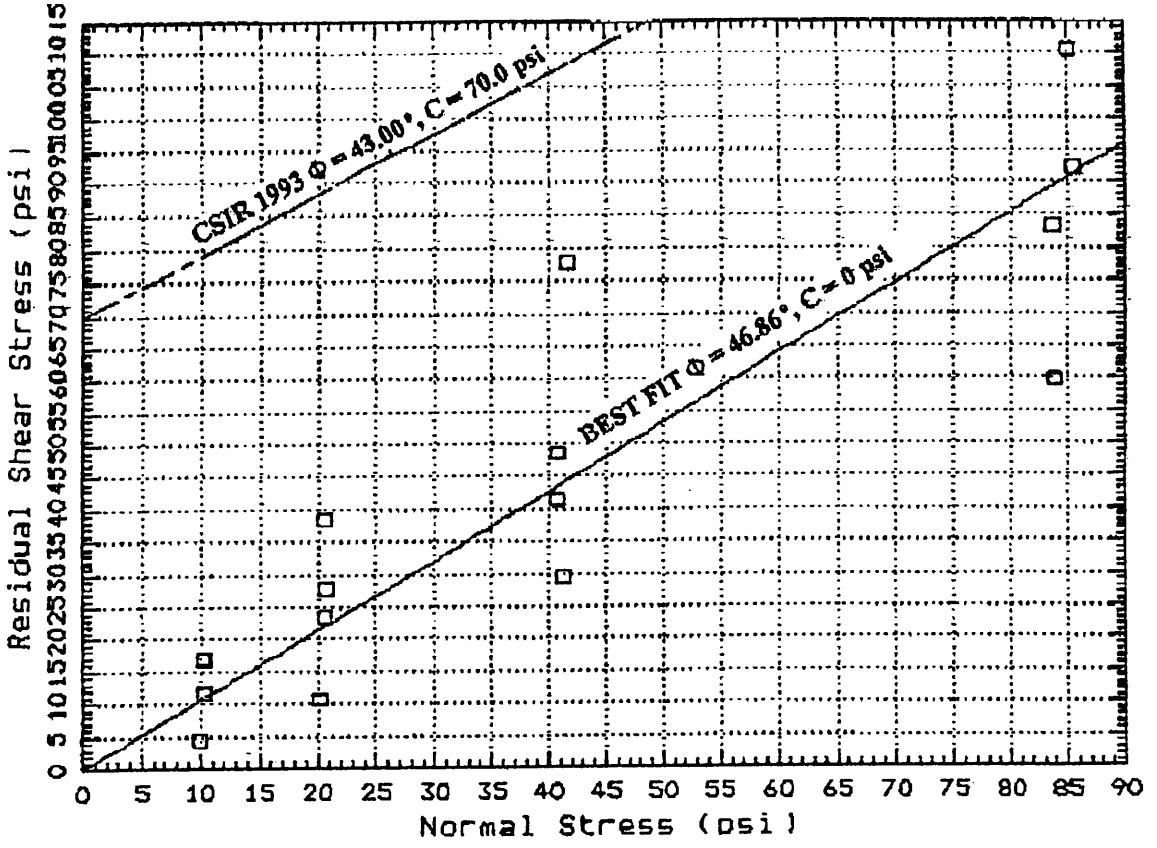
Exhibit
Ex. 2, p.6

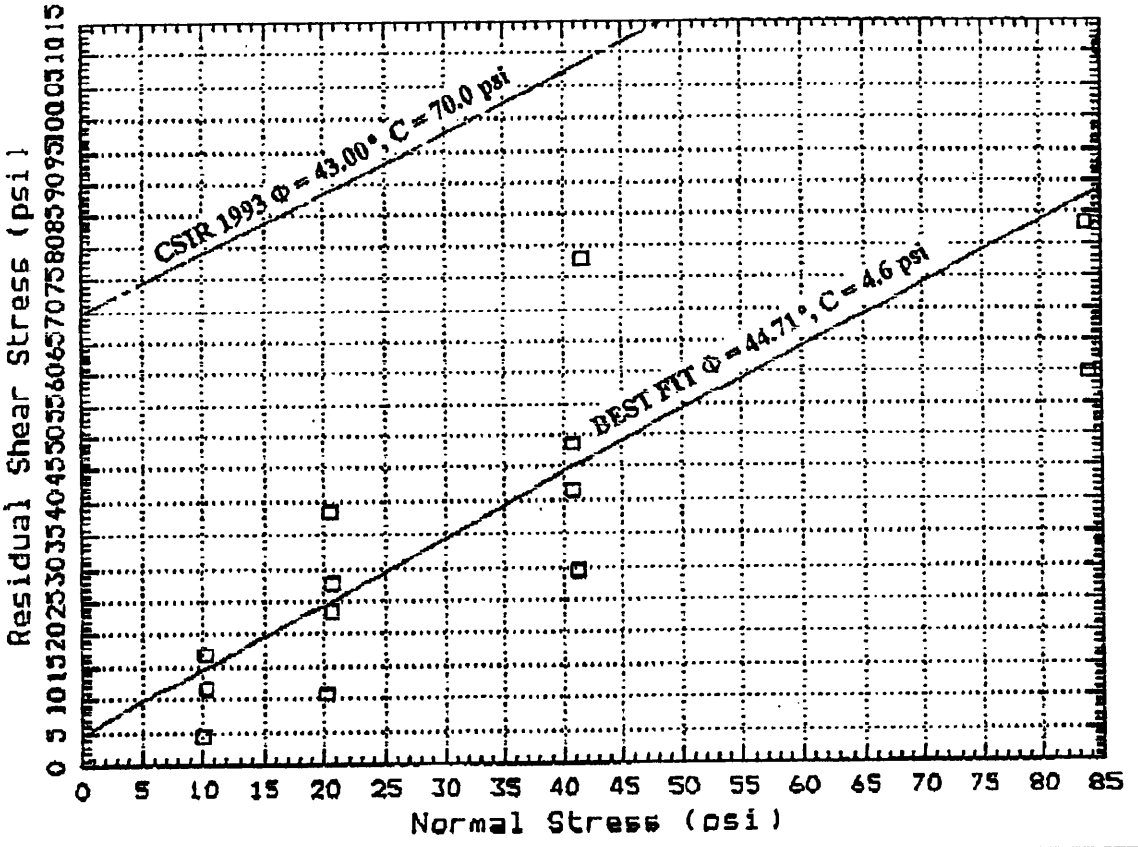




DATE	HOIST DAM	PROJECT No. 10855
02.02.00	Concrete Lift Joint Shear	FERC - D2SI-CRO

Exhibit
EX. 2, p.7

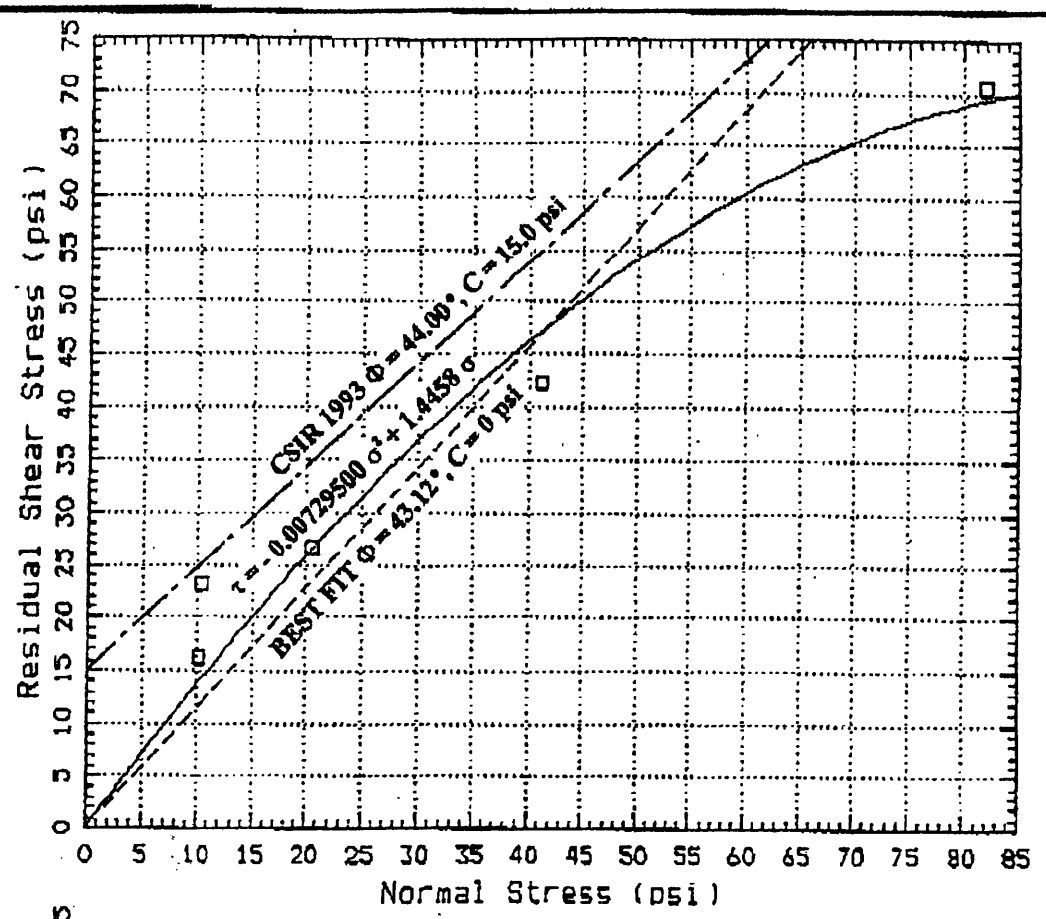


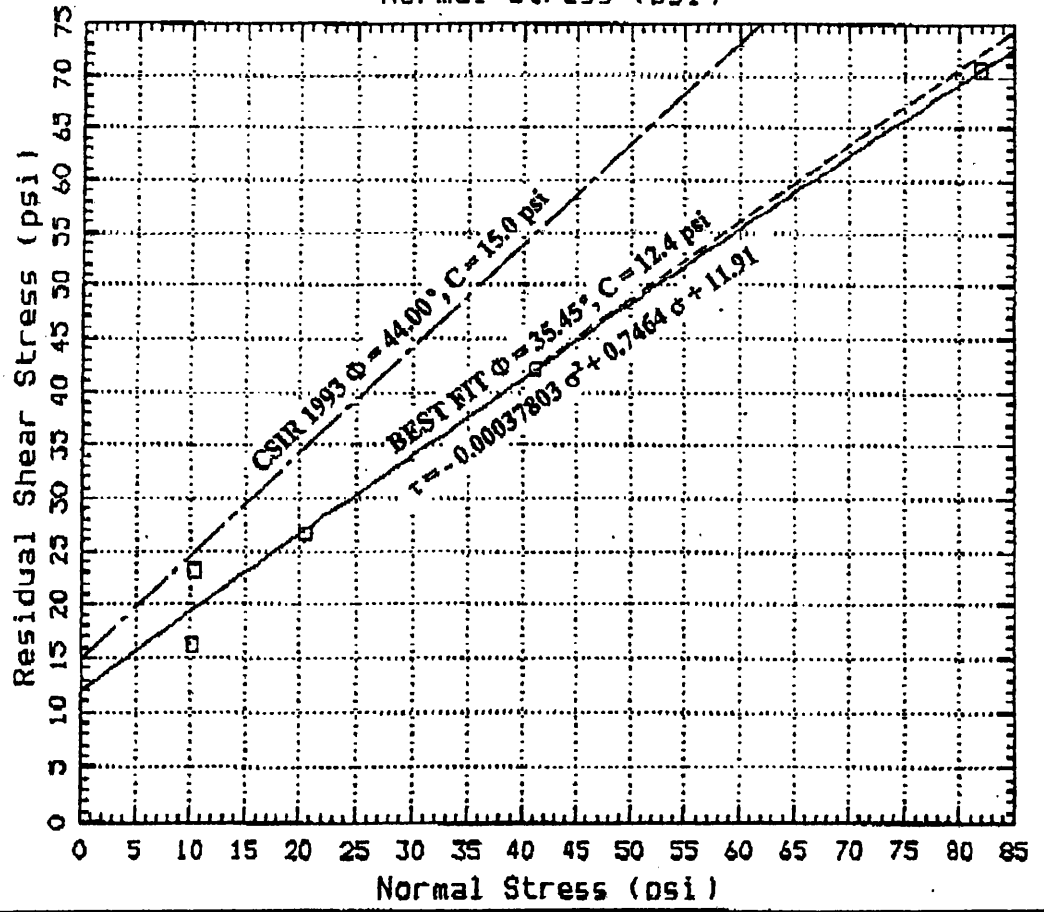


DATE	McCLURE DAM	PROJECT No. 10855
02.02.00	Concrete Lift Joint Shear	FERC - D2SI-CRO

Exhibit

Ex. 2, p. 8





DATE		PROJECT No. 10855
02.02.00	McCLURE DAM Concrete/Rock Shear (Five Data Points)	FERC - D2SI-CRO

FEDERAL ENERGY REGULATORY COMMISSION

CHICAGO REGIONAL OFFICE
230 SOUTH DEARBORN STREET, ROOM 3130
CHICAGO, ILLINOIS 60604

N. Bishop
J. Freed
Y. Shou
file 1837-4

In reply refer to:
P-10855
NATDAM No. MI00197

August 1, 2000

Mr. Charles A. Schrock
Senior Vice President - Energy Supply
Wisconsin Public Service Corporation
600 North Adams Street
P.O. Box 19002
Green Bay, Wisconsin 54307-9002

Dear Mr. Schrock:

On July 28, 2000, a telephone conference was held with Mr. Robert Edwards of your staff, your consultant Mr. Norm Bishop, and Mr. Michael Davis of my staff. The discussion centered on the assumptions used in the probable maximum flood (PMF) studies for your Dead River Project No. 10855, and the schedule for completing the PMF studies and needed remedial measures at the three developments. Based on the discussion, the following agreements were reached:

1. The PMF study for the Silver Lake development will be revised to incorporate STATSGO data for determining the losses, which will be determined by using the minimum permeability of the least permeable layer for each soil classification within the basin. Mr. Bishop indicated that he has already performed this analysis with these assumptions, resulting in the PMF being reduced from 40,700 cfs to 26,000 cfs.

2. As with the PMF study for Hoist and McClure, we will not require any revisions to the Silver Lake PMF study due to any proposed revisions to Chapter 8 of our engineering guidelines, provided that you use the minimum permeability of the least permeable layer for each soil classification in the STATSGO database for the losses as discussed in Item 1 above.

Exhibit
Ex. 3, p. 1

3. Mr. Edwards will submit by August 28, 2000, three copies of the revised Silver Lake PMF study, along with a plan and schedule for remedial measures for an inadequate spillway capacity at Silver Lake.

The plan and schedule, which was originally requested in my June 6, 2000 letter, should include milestone dates for the submittal of the design report and the plans and specifications, and for the start and completion of the remedial measures. The work should be completed during the 2001 construction season. In order to meet this, we request that you submit the final contract plans and specifications at least 90 days prior to the start of construction, and the design report at least 180 days prior to the start of construction. In addition, a quality control inspection program, commensurate with the scope of the work, should be submitted for approval at least 30 days prior to the start of construction.

A schedule for submitting the revised PMF study for Hoist and McClure and completing needed remedial measures for these developments will be established after we have completed our review of the July 1999 Supplement to the May 1999 Consultant's Safety Inspection Report.

Thank you for your cooperation in this matter. If you have any questions regarding this letter, please call Mr. Davis at 312-353-3787, or me at 312-353-6171.

Sincerely,

Peggy Ann Harding

Peggy A. Harding, P.E.
Regional Director

Exhibit
Ex. 3, p. 2

FEDERAL ENERGY REGULATORY COMMISSION

CHICAGO REGIONAL OFFICE
230 SOUTH DEARBORN STREET, ROOM 3130
CHICAGO, ILLINOIS 60604

In reply refer to:
P-10855 [NATDAM NOS. MI00197
MI00175 & MI00183]

December 15, 2000

Mr. Charles A. Schrock
Senior Vice President Energy Supply
Wisconsin Public Service Corporation
600 N. Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Dear Mr. Schrock:

We have completed our review of the July 1999 Supplement to the Periodic Safety Inspection Report No. 2 for your Silver Lake, Hoist and McClure developments of your Dead River Project No. 10855. The supplement was submitted with your letter dated September 8, 1999, in response to our February 12, 1999 letter regarding the Probable Maximum Flood (PMF) studies for these developments. The supplement was prepared by the approved independent consultant, Mr. Jonathan S. Field, P.E.

Silver Lake PMF

The PMF for the Silver Lake dam was initially approved by my letter dated February 12, 1999, but it has since been revised per the August 2000 PMF study that was transmitted with your August 28, 2000 letter. As discussed with Mr. Yung Shen of your consultant's firm this week, the loss rates derived from the permeability values in STATSGO cannot be directly input into HEC-1 as a weighted average. Instead, they must be used in the distributed method as described in the 1993 Chapter 8 of our engineering guidelines. Using this method, the rainfall excess hyetograph for each loss rate class in each subbasin is computed outside of HEC-1, then the rainfall excess hyetographs are summed for each loss rate class and input into HEC-1 for each subbasin with all loss rates assumed to be zero. Our 1993 guidelines allowed the use of values greater than the minimum permeability of the least permeable layer to be the loss rates for

Exhibit
Ex. 4, p. 1

ungaged basins such as this basin. However, as discussed in our January 18, 2000 letter, this has been revised.

Three copies of the revised PMF study for Silver Lake dam should be submitted by January 16, 2001. An updated plan and schedule for completing remedial measures in 2001 for an inadequate spillway capacity at Silver Lake should be included with the study.

Hoist and McClure PMF's

For the Hoist and McClure dams, your consultant determined that the PMF would occur under the Cool-season with Snowmelt scenario, and it would have a peak outflow of 59,582 cfs and 60,122 cfs, at the Hoist and McClure dams, respectively. Subsequently, you proposed to revise the study by using the HEC-1 input data files from the July 1994 Supplement to the 1993 consultant's safety inspection report for the City of Marquette's Upper Dam Project No. 2589. Our comments to your proposal are discussed in our January 18, 2000 letter. We have the following comments:

1. The cool season analysis was done using the degree-day method as described in the HEC-1 program, with impervious surfaces for all subbasins. This is extremely conservative for a basin that is about 85% forested and has at least 40% sandy-type soils with a high infiltration capacity. In accordance with the 1993 version of Chapter 8 of our engineering guidelines, you may assume the forested areas and the non-forested areas with granular soils in non-wetland areas have frozen infiltration rates equal to the unfrozen infiltration rates for those soils. Although our guidelines for frozen ground infiltration rates will not change with the pending update to Chapter 8, the method for computing snowmelt will change. The update will recommend that you use the energy-budget method, since the degree-day method was specifically developed for rain-free periods, which is not the case here. However, since you have already performed the analysis using the degree-day method, we will not require that you change this.

2. As discussed in our January 18, 2000 letter, the PMF is very sensitive to the Manning's values used for dynamically routing of the river through the Hoist reservoir. Your analysis should be revised to address the comments in that letter.

3. As also discussed in our January 18, 2000 letter, if you choose to use the HEC-1 input files from the City of Marquette report in which the loss rates were developed from the soil types in the STATSGO database, we will accept this provided that each loss rate is changed to the minimum permeability of the least permeable layer for each soil class.

Exhibit
Ex. 4, p. 2

4. By letter dated October 11, 2000, you submitted additional information regarding the PMF study for Hoist and McClure. As discussed with Mr. Yung Shen of your consultant's firm this week, this needs to be revised for the same reasons that the August 2000 PMF study for Silver Lake should be revised.

Three copies of your plan and schedule for addressing our comments concerning the PMF study for the Hoist and McClure dams should be submitted by January 16, 2001. The submittal should include an update to your plan and schedule for completing all needed remedial measures that were dependent on the finalization of the PMF for these two dams. The remedial measures should incorporate the comments in my June 6, 2000 letter.

If you have any questions about this correspondence, please call Mr. Michael Davis at 312-353-3787, or me at (312) 353-6171.

Sincerely,

Peggy Ann Harding

Peggy A. Harding, P.E.
Regional Director

Exhibit
Ex. 4, p. 8

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, Illinois 60604
(312) 353-6171 Office - (312) 353-0109 Facsimile

In reply refer to:
P-10855 [NATDAM Nos.
MI00197, MI00175 & MI00183]

June 21, 2001

Mr. David W. Harpole
Assistant Vice President - Energy Supply
Wisconsin Public Service Corporation
600 N. Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Dear Mr. Harpole:

By letter dated April 4, 2001, you transmitted a report entitled, "Flood Routing of Probable Maximum Flood in Dead River Basin", dated March 2001. Harza Engineering Company of Denver, Colorado prepared the report. The report is a follow-up to the January and February 2001 probable maximum flood (PMF) reports that were submitted with your January 30, 2001 and Harza's February 19, 2001 letters. We also received your April 6, 2001 letter regarding the fuseplug spillway at Silver Lake.

In our March 19, 2001 letter, we accepted the inflow PMF of 36,500 cfs for your Silver Lake dam, and the cool season and warm season runoff from each of the subbasins for the Hoist and McClure dams. This study contains the routing of the runoff from each subbasin through the Dead River from the Silver Lake reservoir to the McClure dam for the warm season and the two cool season scenarios. The routing was modified to address our comments regarding the Manning's n values, the change in the runoff, the proposed modifications at Silver Lake, and a change in the starting reservoir elevation. The effect of these changes are discussed below for each development.

Silver Lake

At Silver Lake, your consultant proposed that a channel with a 6.0-foot high fuseplug spillway be constructed in place of the remote earth embankment Dike 2. The channel would have a bottom elevation of 1480.0 feet NGVD, a bottom width of 265

Exhibit
Ex. 5, p. 1

feet, 1V:2.5H side slopes, and a channel slope of 0.005. Using this design, the maximum headwater elevation would be 1488.29 feet NGVD, with a maximum outflow of 20,000 cfs. Since the crest of the embankments is at elevation 1491.3 feet NGVD, this would provide a 3.0-foot freeboard on the embankments. No modifications to the main spillway would be needed. However, the low spots in the embankment and the other saddle dikes would need to be raised to this elevation, and a small saddle dike would need to be constructed at a low spot at the left abutment of the embankment.

This analysis was done assuming a starting reservoir elevation of 1481.5 feet NGVD, which is 2.0 feet below the starting elevation in the previous analysis. We were concerned that since this is a target elevation, you may be operating at higher elevations. However, as discussed in Dr. Yung Shen's May 18, 2001 e-mail to Mr. Michael Davis of my staff, a change of 2.0 feet in the starting elevation results in only a change of 0.2 feet in the design elevation at Silver Lake. Since this change is small, we will accept the proposed recommendations for Silver Lake, provided that you do not allow the normal maximum reservoir to exceed 1483.5 feet NGVD.

By letter dated April 6, 2001, you provided additional information regarding the grass-lined engineered outflow channel of the fuseplug spillway. By e-mail dated April 30, 2001, Dr. Yung requested if he needed to perform an erosion analysis of the channel. As stated in Mr. Davis' May 1, 2001 e-mail, since the PMF is an extreme event, we will not require the degree of erosion to be evaluated. Any damage that results to the approach and exit channels will need to be repaired.

By letter dated June 6, 2001, you provided the design report for the fuseplug spillway and channel. We will provide you with our comments when we have completed our review. Plans and specifications for the work should be submitted at least 30 days prior to the September 10, 2001 construction start of the work. In addition, a quality control and inspection program (QCIP), commensurate with the scope of the work, should be submitted for approval at least 30 days prior to the start of work. The QCIP should be prepared in accordance with Chapter 7 of our engineering guidelines. In addition, monthly construction reports should be prepared and submitted by the 15th of each month following the month of construction activity. The monthly construction reports should be prepared in accordance with the attached guidelines. The contractor's construction schedule should be sent to us as soon as it is available so that we may plan our inspections.

Hoist and McClure

You determined the outflow PMF to be equal to 22,420 cfs at elevation 1352.47 feet NGVD at Hoist, and 22,720 cfs at elevation 1204.39 feet at McClure. As a result, a

Exhibit

Ex. 5, p. 2

fuseplug is not needed at Hoist; instead, a small saddle dike 225 feet long would need to be provided at the left abutment and the right embankment would need to be raised 0.2 feet to elevation 1355.5 feet NGVD to provide adequate freeboard, provided the flashboards are left off the spillway. At McClure, the embankment would need to be raised 3.0 feet to elevation 1207.4 feet NGVD to provide adequate freeboard. Also, the stability analysis of both dams needs to be recomputed for these new PMF headwater elevations, and plans for remedial measures developed for those structures not meet stability criteria.

We reviewed the changes to the Manning's n values and have no comments. However, because of the large volume of storage in the Hoist reservoir, the starting reservoir elevation may have a more significant impact to the peak elevations at both the Hoist and McClure dams during the routing of the PMF. Therefore, you should rerun the analysis using the annual maximum normal operating elevations for all three dams in order to determine the PMF headwater elevations at the Hoist and McClure dams.

Three copies of a report addressing this should be submitted by October 21, 2001. The report should include the stability analysis for the PMF headwater elevations at all three dams, and a conceptual design for the needed remedial measures with supporting stability analyses. If there are any questions regarding the starting headwater levels or any other concerns, these should be resolved before any analyses are done so that construction planned for the year 2002 (Hoist) and 2003 (McClure) is not delayed.

Thank you for your cooperation in these matters. If you have any questions about this correspondence, please call Mr. Michael Davis at 312-353-3787, or me at (312) 353-6171.

Sincerely,

Peggy A. Harding, P.E.
Regional Director

Attachment: Guidelines for Constructions Reports From Licensees

Exhibit
Ex. 5, p. 3

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, Illinois 60604
(312) 353-6171 Office - (312) 353-0109 Facsimile

In reply refer to:
P-10855 NATDAM NO. MI00197

June 28, 2001

Mr. David W. Harpole
Assistant Vice President - Energy Supply
Wisconsin Public Service Corporation
600 N. Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Dear Mr. Harpole:

We have completed our review of the Design Report, Emergency Fuse Plug Spillway and Channel Design for your Silver Lake development of your Dead River Project No. 10855. The report was prepared by your consultant, Harza Engineering Company and it was submitted by letter dated June 6, 2001. We have the following comments:

1. Page 8, Section 5.4 Duration of Outflow - indicates that turbine flows are included in the total outflow of the project during extreme flood events. There are no turbines at the Silver Lake Development. We will assume the consultant intended to specify flows through the spillway and the outlet structure. A flow of 280 cfs through the outlet structure appears adequate even under extreme flood conditions when the outlet structure is not expected to work optimally.

2. Drawing 18305G-03 provides a cross section of a typical proposed fuse plug section. A typical pilot channel cross section is also needed. Attachment 1 shows typical cross sections of a fuse plug and a pilot channel from page 17 of the Bureau of Reclamation publication REC-ERC-85-7. The materials in the fuse plug and pilot channel cross sections are not the same, ie Type 6 material in the pilot channel section replaces Type 3 material in the fuse plug embankment and Type 3 material in the pilot channel section replaces the downstream Type 2 material in the fuse plug embankment.

3. Table 6-1 has two significant errors:

See Attachment 2 for material gradation shown in the Bureau publication. Type 1 and Type 3 materials, which are core material and slope protection material respectively, are not shown

Exhibit
Ex. 6, p. 1

as bands of materials. The gradations should be relatively close to those shown in Attachment 2.

a. Type 1 material, Silty Sand Core, should show approximately 100% passing the #40 sieve and 63% passing the #200 sieve.

b. Type 3 material, Riprap Slope Protection, should show approximately 100% passing the 6 inch sieve, 70% passing the 5 inch sieve, and 0% passing the 3 inch sieve.

As requested in my letter dated June 21, 2001, please submit a quality control and inspection program (QCIP) and a response to the above items for our review and approval at least 30 days prior to the September 10, 2001 scheduled date for start of construction.

If you have any questions about this correspondence, please call Mr. Teodor Strat at (312) 353-3790, or me at (312) 353-6171.

Sincerely,

Peggy Ann Harding

Peggy A. Harding, P.E.
Regional Director

Attachments

Exhibit
Ex. 6, p. 2

ATTACHMENT 1

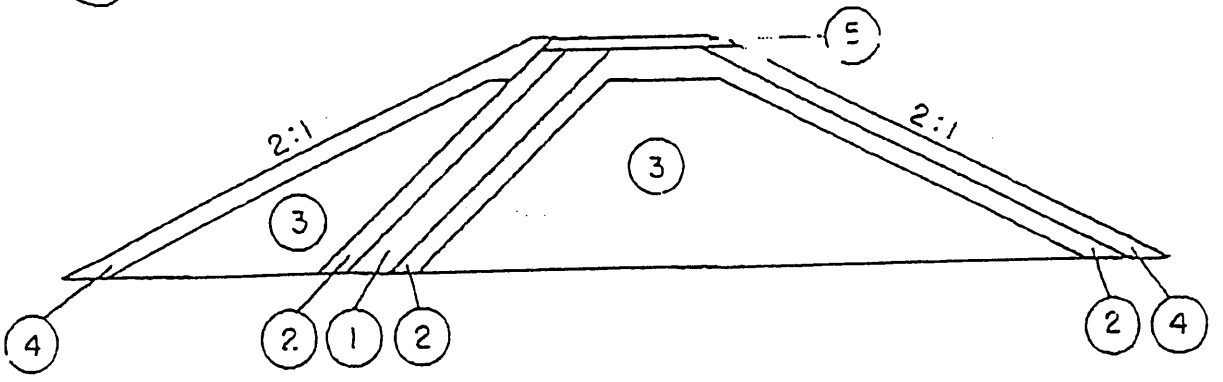
(1) CORE MATERIAL

(2) SAND FILTER

(3) COMPACTED SAND AND GRAVEL

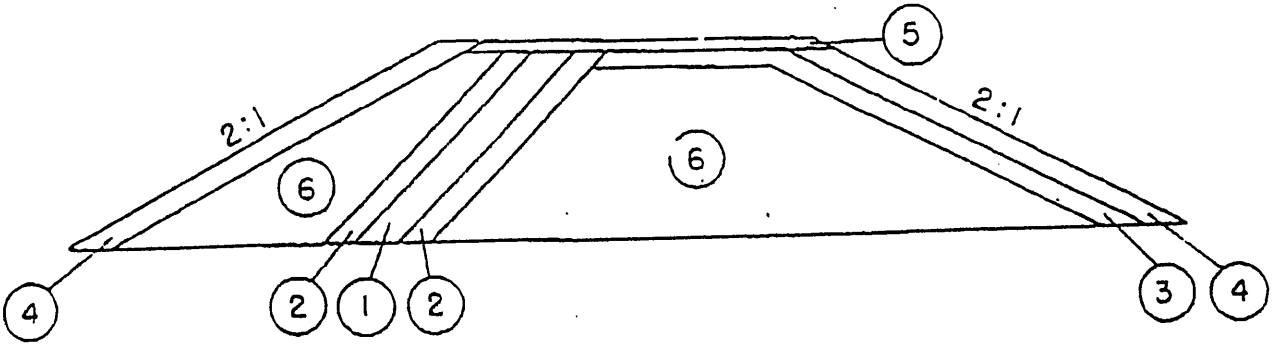
(4) SLOPE PROTECTION

(5) GRAVEL SURFACING



EMBANKMENT

(6) COMPACTED ROCKFILL



PILOT CHANNEL

Figure 8 – Fuse plug embankment and pilot channel cross sections.

Exhibit

Ex. 6, p. 3

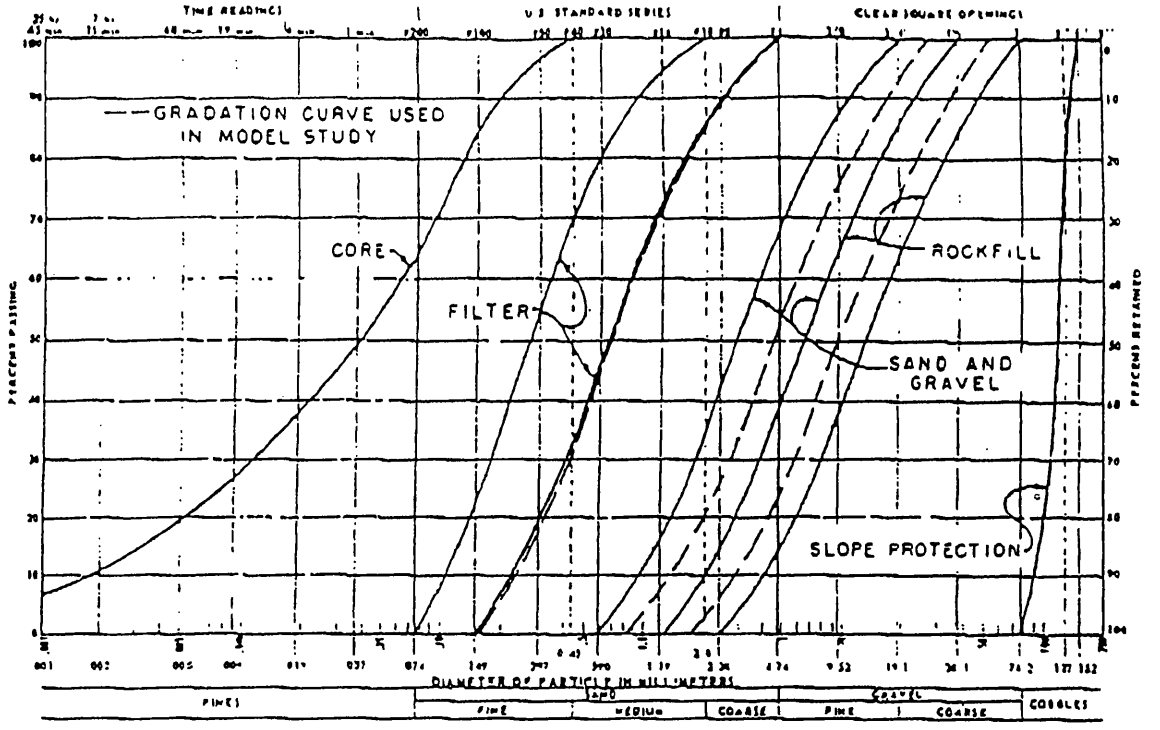


Figure 9. – Prototype gradation curves.

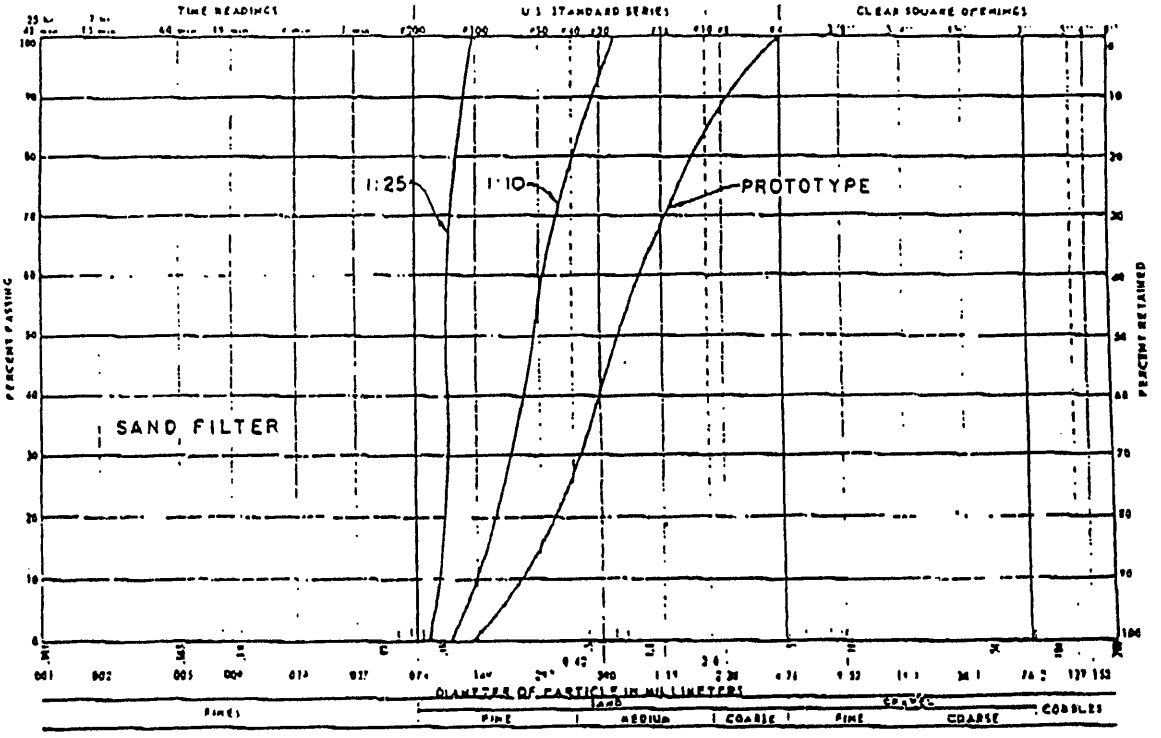


Figure 10. – Gradation curves, sand filter.

Exhibit
Ex. 6, p. 4

18305 G.2

HARZA ENGINEERING COMPANY

June 29, 2001

Wisconsin Public Service Corp. - UPPCO
600 North Adams Street
Green Bay, WI 54301

Attention: Mr. Benjamin Trotter
Project Coordinator

Subject: Silver Lake Basin – Fuse Plug Spillway
Plans and Specifications
Draft Submittal

Dear Mr. Trotter,

Enclosed is one copy of our draft plans and specification for the Emergency Fuse Plug Spillway and Channel at the Silver Lake Basin Project. Please review and provide any comments you may have. The final Special Conditions sections will require some input as far as laydown areas, parking facilities, operating facilities, etc.

Please do not hesitate to contact me at (720) 932-7741 or Jason Hedien at (312) 831-3095 if you have any questions.

Very truly yours,

for Norman Bishop, P.E., M.B.A.

Enclosures: As noted.

Exhibit
Ex. 7, p. 1

UPPER PENINSULA POWER COMPANY
Silver Lake Basin Project
Fuse Plug Spillway
Specification No: UPC-XXXXX, Project No: 0100100.019

DIVISION 1 - GENERAL REQUIREMENTS

100. INTRODUCTION

101. BACKGROUND

101.1 Upper Peninsula Power Company (the Company), a subsidiary of WPS Resources Corporation, solely owns and operates two generating units at the Dead River Hydroelectric Project. Storage for the two units is provided by Silver Lake Basin, Dead River Storage Basin, and McClure Storage Basin. Water levels in Silver Lake Basin are controlled by Silver Lake Dam, while water levels in Dead River Storage Basin and McClure Storage Basin are regulated by Hoist Dam and McClure Dam, respectively. The two project powerhouses, Hoist Powerhouse and McClure Powerhouse provide a total installed generating capacity of 15.5 MW.

101.2 Silver Lake Basin is a natural water body located near the headwaters of the Dead River near the City of Marquette in the Upper Peninsula of Michigan. The Silver Lake Basin Project is licensed as part of the Dead River Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project Number 10855. Silver Lake Dam consists of a main embankment dam, a concrete gravity outlet structure on the left abutment, an ungated concrete ogee spillway and four earthen saddle dikes to the east of the project. Silver Lake Dam was originally constructed in 1896 and was subsequently rebuilt in 1911-1912. The existing Silver Lake Dam was constructed between 1944 and 1945 by the original developer, Cleveland-Cliffs Iron Company (CCI) to serve its downstream power plants.

101.3 The embankment dam is 1,500 feet long with a maximum height of approximately 30 feet. The embankment has a crest width of 15 feet at El. 1491 and is separated into three sections by the spillway and outlet structures.

101.4 The spillway is an ungated concrete ogee spillway with a maximum height of approximately 9 feet. The 100-foot-long spillway is divided into 10 bays, each of which is approximately 9 feet wide and is separated by a concrete pier. The crest elevation of nine of the bays is at 1486.2 feet while the crest elevation of the fourth bay from the left is at El. 1480. This bay is normally fitted with stoplogs up to the elevation of the other bays, El. 1486.2. All the spillway bays are fitted with slots to accommodate stoplogs which are installed from a walkway on top of the spillway piers. Wingwalls extend upstream and downstream of the structure to retain the embankment.

Exhibit
Ex. 7, p. 2

102. TRANSPORTATION FACILITIES

102.1 The Silver Lake Basin is located approximately 20 miles northwest of Marquette, Michigan in the Upper Peninsula of the State. A dirt access road provides access to the dam off of route 573. Access to the saddles dikes is currently provided by logging trails which require the use of off road vehicles....

102.2 SITE TOPOGRAPHY

102.3 An aerial topographic survey of the entire area was performed by Aerometrics, Inc. in 1994. An additional detailed survey of the Dikes 1, 2 and 3 was performed by Sundberg, Carlson and Associates, Inc. in 2000. The drawings provided with these technical specifications are based on the information from these surveys. The Company makes no representation as to the accuracy of the survey data provided or as to changes in the site conditions since the time of the field survey for data collection.

103. SCOPE OF WORK

103.1 The scope of work required under this contract is generally described as furnishing and installing all labor and materials necessary for removal of the existing saddle Dike 2 at Silver Lake Basin; construction of a new fuse plug spillway and inlet and outlet channels; regrading of the Silver Lake Dam embankment crest and the crests of Dikes 1, 3 and 4; and removal of the wooden stop logs in the existing concrete spillway deep bay. The work is more fully described in Division 3 Technical Requirements for General Construction and project drawings.

103.2 The Work includes furnishing all plant, labor, tools, equipment, appliances, materials, transportation and services, and performing all necessary operations for and properly incidental to the construction and proper completion of the Project.

103.3 The Contractor shall obtain and pay for any necessary permits or licenses for his operations under this contract, including for transportation and shipping to the project site.

103.4 The Contractor shall be responsible for all activities being in conformance with all permits, licenses, laws and regulatory requirements applicable to the Work.

Exhibit
Ex. 7, p. 3

Exhibit
Ex. 7, p. 4

UPPER PENINSULA POWER COMPANY
Silver Lake Basin Project
Fuse Plug Spillway
Specification No. UPC-XXXXXX Project No. 0100100.019

DIVISION 3 - TECHNICAL REQUIREMENTS FOR GENERAL CONSTRUCTION

300. GENERAL

300.1 This project is for removal of existing dike fill at Dike 2 and construction of a new emergency fuse plug spillway and inlet and outlet channels at Dike 2 at the Silver Lake Basin Project near Marquette, Michigan. This work shall also include regrading of the crests of Silver Lake Dam and Dikes 1, 3 and 4 and removal of the wooden stoplogs from the existing concrete spillway.

300.2 The Contractor shall conform to the applicable requirements of supplements and standards indicated in Divisions 1 and 2 and to the requirements herein specified.

300.3 The Work covered by these Specifications shall be performed, in general, as indicated on the drawings, with any necessary modifications required to assure an efficient, economical, and trouble-free installation. Contractor shall submit for Company's approval, the design and shop details before any WORK is released for construction.

300.4 The Company and/or their representative shall have full access to the Contractor or Subcontractor's shop and all project site areas to spot check quality control and assurance, for reviewing progress and determining the acceptability of the WORK being performed.

300.5 Unless otherwise indicated or specified, all manufactured materials, products, processes, equipment, or the like shall be installed or applied in accordance with the manufacturers' instructions, directions, or specifications. Said installation or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the job site. Two copies of such instructions shall be furnished to the Engineer, and acceptance thereof shall be obtained before Work is begun.

300.6 Any deviation from the manufacturers' printed recommendations shall be explained and acknowledged as correct for the circumstances, in writing by the particular manufacturer. Contractor will be held responsible for all installations contrary to the manufacturers' recommendations. If any item of material or equipment is found to be installed not in accordance with the manufacturer's recommendations, Contractor shall make all changes necessary to achieve such compliance.

300.7 All work shall be performed by workers skilled and experienced in the construction, and installation of the Work involved. All Work required by the Contract Documents shall be performed in accordance with the best practices of

the various trades involved and in accordance with the Drawings, reviewed shop drawings, and these Specifications.

300.8 All Work shall be manufactured and installed plumb, level, square and true or true to indicated angle, and in proper alignment and relationship to the work of other trades. All finished Work shall be free from defects and damage.

300.9 The Company reserves the right to reject any materials and Work quality that are not considered to be up to the highest standards of the various trades involved. Such inferior material or Work quality shall be repaired or replaced, as directed, at no additional cost to the Company.

301. WORK TO BE PERFORMED

301.1 The Work required to be performed by the Contractor generally consists of: clearing and grading of the inlet and outlet channel areas and fuse plug area, removal of existing saddle Dike 2; preparation of the foundation to receive new materials; construction of the fuse plug (including furnishing, placement and compaction of the materials); construction of grassed inlet and exit channels; regrading of the crests of Silver Lake Dam and Dikes 1, 3 and 4; removal of wooden stop logs in the existing concrete spillway; and provision of other appurtenances and ancillary work as required.

301.2 The Work includes furnishing all plant, labor, tools, equipment, appliances, materials, transportation and services, and performing all necessary operations for and properly incidental to the construction and proper completion of the Project as shown and noted on the Drawings and as specified in these Specifications.

301.3 The Contractor shall prepare and submit a plan for performing the Work. The plan shall describe the means and methods of performing the work, including any dewatering, excavation, foundation preparation, furnishing, placement and compaction of fill materials, grading operations and procedure for stop log removal. The plan shall include a bar chart schedule showing individual tasks, duration of tasks, relationship and interdependency of tasks, and a construction schedule. Schedule shall support Company's overall construction schedule as indicated in the Contract Documents.

301.4 The Contractor shall submit with his proposal, a Quality Control and Quality Assurance Plan outlining all certifications, surveying, alignment checks, and inspections. The plan shall state frequency and acceptance criteria. This plan will be submitted to the Federal Energy Regulatory Commission for its review and approval.

301.5 Contractor's field services shall be tailored to the actual construction schedule realized by the Company. Contractor shall assist Company in scheduling and resolving installation or other difficulties involving materials supplied by or work provided by Contractor under this contract.

Exhibit
Ex. 7, p. 5

Exhibit
Ex. 7, p. 6

changes to the specified gradation have occurred due to contamination or improper storage or handling.

305.5.4 Moisture Control

a. The moisture content of the silty sand core and sand filter material shall be maintained within ±2% of the optimum moisture content in accordance with ASTM D2216.

b. Moisture control for placement of the granular shell, granular cover, granular fill, riprap slope protection and rockfill material will not be required.

305.5.5 Compaction

a. Density tests on the fill shall be conducted to ascertain performance of the work in compliance with these Specifications. Densities of fill in place will be determined by the Engineer in accordance with ASTM D 1556 or similar method.

305.5.6 Maintenance of Seeded Areas

a. The Contractor provide protection, including water, fertilizer and mulch to the seeded areas until a sufficient stand of vegetation is established. In accordance with Section 816 of the MDOT Standard Specifications, areas where at least two seeds are not sown in every square inch, the area shall be re-seeded at no cost to the Company.

b. Following the end of Construction, the responsibility for maintenance of the seeded inlet and exit channels will remain the Company's.

306. REMOVAL OF STOP LOGS AT SPILLWAY

306.1 SCOPE

306.1.1 The Work to be performed under this Section consists of the removal of the existing wooden stop logs in the fourth bay from the left of the existing concrete spillway.

306.2 Products

306.2.1 Equipment

a. The equipment for removal of the stop logs shall be sufficient to remove the existing wooden stoplog.

306.3 Execution

306.3.1 All of the spillway bays are fitted with slots to accommodate stop logs which are installed from a walkway on top of the spillway piers. The existing wooden stoplogs

are currently in place to Elevation 1486.5. The Contractor shall remove the stop logs in the existing concrete spillway deep bay (fourth bay from the left as seen with the direction of the flow downstream) to Elevation 1482.5.

306.3.2 The Contractor shall dispose of the stoplogs in a location as directed by the Company.

Exhibit
Ex. 7, p. 7

105. MICHIGAN SALES AND USE TAX

This bid specification to complete all related work for the Silver Lake Fuse Plug Spillway is real property construction. The following tax message applies to this portion of the specification.

"Contractors" and "Subcontractors" are the consumers of tangible personal property used by them in real property construction activities and the sales and use tax applies to the sale of tangible personal property to them. The tax which a contractor pays on its purchases of materials consumed in real property construction increases its cost of such materials, thereby becoming a cost of doing business. Note: there should be no sales/use tax included on the labor to construct real property. The following sales /use tax message is applicable to this specification:

> Michigan sales/use tax notice - -Do not bill sales/use tax. This purchase order covers material and/or labor which will enter into the construction, alteration, repair or improvement of real property. Michigan sales or use tax for these materials is the responsibility of the Contractor at the time of purchase by the Contractor.

106. LIQUIDATED DAMAGES

106.1 Contractor shall not cause undue delay to the Company, or Company's Contractor(s). In case of failure on the part of the Contractor to meet the required delivery dates in support of the Company's schedule, Contractor shall pay to the Company fixed and agreed to the payment of liquidated damages of $2000 per day for each day of delay. Liquidated damages shall apply to the following critical dates:

a. [redacted]

107. RETAINAGE

107.1 The Company shall withhold a 10% retainage on all invoices. The retainage shall be released upon a successful completion of the construction of all work required for the emergency fuse plug spillway.

Exhibit
Ex. 7, p. 8

UPPER PENINSULA POWER COMPANY
Silver Lake Basin Project
Fuse Plug Spillway
Specification No: UPC-XXXXX, Project No: 0100100.019

DIVISION 2 - SUPPLEMENTS, STANDARDS, AND DRAWINGS

201. SUPPLEMENTS

The Contractor's attention is directed to the following supplemental documents which are attached hereto and form a part hereof:

201.1 Application and Certificate for Payment/Schedule of Values

201.2 Special Conditions

202. STANDARDS & REFERENCES

202.1 Unless otherwise shown or specified, the work shall conform to the latest issue of the following standards:

a. United States Department of the Interior, Bureau of Reclamation (USBR)

1) Hydraulic Model Studies of Fuse Plug Embankments, Engineering and Research Center, REC-ERC-85-7

b. Associated General Contractors of America (AGC)

1) Manual of Accident Prevention in Construction

c. International Conference of Building Officials (ICBO)

1) Uniform Building Code

(i) Chapter 44, "Protection of Pedestrians During Construction and Demolition"

(ii) Chapter 70, "Excavation and Grading"

d. Occupational Safety and Health Administration (OSHA)

1) Safety and Health Standards

e. Michigan Department of Transportation

1) Standard Specifications for Construction, 1996

Exhibit
Ex. 7, p. 9

f. ASTM - American Society for Testing and Materials

1) ASTM D2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.

2) ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

3) ASTM D3740, Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

4) ASTM E329, Standard Practice for Use in Evaluation of Testing and Inspection Agencies as Used in Construction.

g. Water Pollution Control Act (WPCA)

1) Public Law 92-500, October 18, 1972.

h. Code of Federal Regulations (CFR)

1) Title 40 – Protection of the Environment

2) Chapter 1 – Environmental Protection Agency

i. U. S. Environmental Protection Agency (EPA)

1) EPA 430/9-73-007, Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity.

2) EPA 430/9-73-016, Comparative Costs of Erosion and Sediment Control, Construction Activities.

3) EPA R2-72-015, Guidelines for Erosion and Sediment Control Planning and Implementation.

202.1.2 Any material, method, or procedure specified by reference to the number, symbol, or title of a specific code, specification, or standard, such as a Commercial Standard, American National Standard, Federal or State Specification, industry or trade association code or standard, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect on the date of these Contract Documents, as indicated on the cover, except as limited to type, class, or grade or modified in such reference.

203. DRAWINGS AND DATA (Company's)

203.1 The following drawings, dated or revised as noted, form a part hereof.

Exhibit
Ex. 7, p. 10

203.1.1 Design Drawings

Drwg.#	Rev.	Title
18305G-01	07/01	Area Map, Site Location Map, and Site Plan
18305G-02	07/01	Fuse Plug and Spillway Channel Plan and Profile
18305G-03	07/01	Profile and Cross Sections, Fuse Plug

203.2 Information regarding existing structures and equipment depicted on Company's drawings, insofar as they affect Contractor's work, shall be verified in the field by the Contractor as to accuracy or dimension and location. The Contractor is required to visit the site and familiarize himself with all site conditions.

203.3 The location of the WORK, together with details for construction, is as shown on the drawings incorporated herein. Where figures are shown on drawings, they shall take precedence over scaled distances and dimensions.

203.4 In the event of any discrepancy between the Drawings and these specifications, the interpretation of the Company shall be final. Figured dimensions on plans are to be taken as correct, but the Contractor is required to carefully check all dimensions before beginning WORK thereon. Should errors be discovered, the Company's attention shall be called to same and proper corrections made. All notes on plans shall be carefully observed by Contractor and are part of the contract.

204. DRAWINGS AND DATA (CONTRACTORS)

204.1 Contractor's drawings, documents, and data shall be submitted to the Company in accordance with the contract Special Conditions and specification requirements.

Exhibit
Ex. 7, p. 11

301.6 TEMPORARY FACILITIES

301.6.1 Mobilization and demobilization shall include all preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to and from the project site; for the establishment and removal of offices, buildings, and other facilities necessary for work on the project, and for all other work or operations which must be performed or costs incurred when beginning or ending work on the project.

301.6.2 The Contractor shall furnish all labor and materials to construct access roads or improve existing access, create laydown and storage areas, turn-arounds, and other provisions as deemed necessary by the Contractor to move material to its required location, including obtaining permits from utilities or other stakeholders.

301.6.3 The Contractor shall provide all labor, tools, construction equipment, materials, utilities, facilities, transportation, services, and incidental work needed for constructing the Project as specified in these Specifications and as shown on the Drawings, unless otherwise specified in these specifications.

301.6.4 The Contractor shall provide an off-site borrow source, processing facility, and off-site location for temporary storage of materials required for the Work.

301.6.5 The Contractor shall provide, implement, and maintain all water, pollution, and erosion & sedimentation control measures and devices necessary. Provide all safety provisions for work around energized high voltage lines and in and around water as required by code and law. The Contractor shall furnish, construct, operate, and remove all water diversion and/or collection features, including pumps and turbidity control measures that may be required to perform the Work. The Contractor shall determine the need for temporary water diversion or collection and submit proposed plans for approval.

301.6.6 The Contractor shall furnish, install, and maintain other site security as necessary for protection of the public and/or site features from damage due to Contractor's activities.

301.6.7 Cleanup and restoration of all disturbed areas to pre-construction conditions or better shall be performed, as determined by the Company.

301.6.8 The Contractor shall maintain a complete set of construction drawings at the jobsite clearly marked to reflect as-built conditions. Upon completion of the Work, the Contractor shall transfer these drawings to a set of drawings of the latest revision of the Construction Drawings and shall send them to the Engineer.

301.6.9 The Contractor's operations shall not interrupt existing power lines or communications lines in the area of Dike 2. If interruption of service is required for Contractor's activities under this contract, Contractor shall coordinate with Company and provide Company at least 48 hours advance notice.

Exhibit
Ex. 7, p. 12

Exhibit
Ex 7, p. 15

301.6.10 Contractor shall relocate existing power or lighting poles that interfere with construction of the new fuse plug spillway. These poles shall be identified in the field by the Contractor and approved by the Company prior to relocation. The new location shall be staked by the Contractor and approved by the Company.

302. FIELD MEASUREMENTS AND TEMPLATES

302.1 Contractor shall confirm field measurements and conditions relevant to proper performance of the work. Contractor shall immediately bring to the attention of the Company and Engineer for resolution any differences noted between the contract documents and actual field conditions. Contractor shall also furnish or obtain all templates, patterns, and setting instructions required for the installation of all Work.

303. QUALITY CONTROL/QUALITY ASSURANCE

303.1 SCOPE

303.1.1 This section shall apply to all Contractor's activities performed under this Contract.

303.2 EXECUTION

303.2.1 The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in accordance with these specifications. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The system shall cover all construction operations, both on-site and off-site, and shall be coordinated with the proposed construction sequence.

303.3 QUALITY CONTROL PLAN

303.3.1 The Contractor shall furnish for review by the Company and Engineer, not later than 15 days after receipt of Notice of Award, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Specifications. The plan shall identify personnel, procedures, equipment, control, instructions, tests, records, and forms to be used in the Contractor's performance of the work.

303.3.2 The CQC plan shall include the following to cover all construction operations, both on-site and off-site, including work by subcontractors, suppliers and purchasing agents:

a. A description of the quality control organization with an organization chart and acknowledgment that the CQC staff shall implement the control system for all aspects of the work specified. The staff shall include a CQC system manager who shall report to the individual with responsibility for the overall management of the project including quality and production, or higher level.

b. The name, qualifications, duties, responsibilities, and authorities of each person assigned a CQC function.

Exhibit
Ex. 7, p. 14

c. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, fabricators, suppliers and agents.

d. Control, verification and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test.

e. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

f. Reporting procedures, including proposed reporting formats.

g. No field work shall be conducted until the Company's acceptance of the Contractor's quality control plan. Acceptance is conditional on satisfactory performance during construction. The Company reserves the right to require the Contractor to make changes in the CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

h. After acceptance of the CQC plan, the Contractor shall notify the Company in writing a minimum of seven (7) calendar days prior to any proposed change.

303.4 QUALITY CONTROL ORGANIZATION

303.4.1 The Contractor shall identify a CQC System Manager who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC system manager shall be a professional in construction management, with a minimum of five (5) years construction experience on similar type construction projects. The CQC System Manager shall be on the site at all times during construction and will be employed by the Contractor, except as noted in the following. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the system manager's absence. The requirements for the alternate will be the same as for the designated CQC manager.

303.4.2 The Contractor shall provide as part of the CQC organization, support personnel to assist and report to the CQC system manager. Each person will be responsible for assuring the construction complies with the contract requirements for their area of specialization. These individuals shall present at the construction site during work on their areas of responsibility; and have the necessary education and/or experience to ensure contract compliance. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The CQC plan will clearly state the duties and responsibilities of each staff member.

303.5 SUBMITTALS

303.5.1 The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements. The submittals shall be professional,

concise, with correct spelling and grammar, and ready for submittal to the Federal Energy Regulatory Commission.

303.6 CONTROL

303.6.1 Contractor Quality Control is the means by which the Contractor ensures that the construction, including that of subcontractors and suppliers, complies with the Contract requirements. The controls shall cover all construction operations, including both on-site and off-site fabrication, and will be keyed to the construction sequence. The controls shall include two phases to be conducted by the CQC system manager for all definable features of work, as follows:

303.6.2 Preparatory Phase. This phase shall be performed prior to beginning work on each definable feature of work and shall include:

a. A review of each paragraph of applicable specifications.

b. A review of the contract plans.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. A check to assure that provisions have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Discussion of procedures for constructing the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that phase of work.

h. Verify required control inspection and testing.

i. Review the activity with the site safety personnel.

303.6.3 Follow-up Phase. Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

Exhibit
Ex. 7, p. 15

Exhibit
Ex. 7, p. 16

303.7 TESTS

303.7.1 The Contractor shall perform tests specified or required to verify that control measures are adequate to provide a product which conforms to contract requirements. A list of tests to be performed shall be furnished as a part of the CQC plan. The list shall give the test name, frequency, specification paragraph containing the test requirements, and an estimate of the number of tests required. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, will be recorded on the Quality Control report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. Actual test reports shall be submitted to the Engineer with a reference to the test number and date taken.

f. The Company reserves the right to check laboratory equipment for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories used for testing shall meet the criteria detailed in ASTM D 3740 and ASTM E 329.

303.8 DOCUMENTATION

303.8.1 The Contractor will prepare a written report every two weeks on his program for submittal to the Company and Engineer that will include, as a minimum, the following:

a. Construction Progress Schedule: Report important critical events and dates, such as start and completion of construction activities. Show actual progress compared to scheduled progress.

b. Sources of Major Construction Materials: Provide information on the sources from which major construction materials and equipment are being obtained including all materials and equipment that may have an important bearing on the safety and efficiency of the project works.

Exhibit
Ex.7, p.17

c. Problem Areas: Discuss problems encountered and resolution thereof, and potential problem areas in upcoming scheduled work.

d. The reports shall be professional, concise, with correct spelling and grammar, ready for submittal to the Company, Engineer and Federal Energy Regulatory Commission.

303.8.2 The Contractor shall maintain current records of quality control operations, activities, and tests performed, including the work of subcontractors and suppliers. These records shall be on an acceptable form and shall include factual evidence that required quality control activities and/or tests have been performed, including but not limited to the following:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed today, giving location, description, and by whom.

d. Test and/or control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies and corrective action.

e. Material received with statement as to its acceptability and storage.

f. Identify submittals reviewed, with contract reference, by whom, and action taken.

g. Off-site surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. List instructions given/received and conflicts in plans and/or specifications.

j. These records shall include a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Company daily, except that reports need not be submitted for days on which no work is performed. Reports shall be signed and dated by the CQC system manager, and shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

303.9 Except as specifically required under detailed material specifications, tests will be made by the Contractor in accordance with the commonly recognized standards of United States national organizations. The Contractor, when requested by the Company or Engineer, shall furnish samples of all materials as required by the

Exhibit
Ex. 7, p.18

Engineer for testing without charge. No material shall be used unless it has been approved by the Engineer. Where inspection and testing are to be conducted by an independent laboratory or agency, the sample or samples of materials to be tested shall be selected by such laboratory or agency or the Engineer and not by the Contractor.

303.10 When requested, the Contractor shall furnish access, facilities and labor assistance as necessary for the duties to be performed by the testing laboratory and inspector and Engineer or Company, including scaffolding, ladders, hoists, temporary lighting, safety equipment and procedures, temporary water supply and similar equipment and services. Testing by the Company and/or Engineer is for spot-checking of the Contractor's Quality Control and Quality Assurance measures, and does not relieve the Contractor of his responsibilities.

303.11 Contractor is responsible to provide material certifications for all material furnished by the Contractor and used in the work. If certifications cannot be produced, tests to confirm the metallurgy and mechanical characteristics of the materials is required. Company may conduct its own independent tests. The Contractor shall cooperate fully with the Company by providing items for testing or retesting.

303.12 Test Reports: All tests specified shall be provided to the Company and Engineer. Unless otherwise specified, three copies of each report shall be submitted to the Engineer for record. The results of any tests performed are for the information of the Company and Engineer. Regardless of any test results, the Contractor is solely responsible for the quality of workmanship and materials and for compliance with the requirements of the Drawings and Specifications.

303.13 At the conclusion of the Work, the Contractor shall compile three (3) copies of the complete Quality Control and Quality Assurance documentation. These copies will be submitted to the Company for submittal to the Federal Energy Regulatory Commission.

303.14 COSTS OF TESTING

303.14.1 The Contractor shall be responsible for and shall pay for all tests for quality control, except as specified otherwise. The Company and Engineer shall have the right to witness all tests.

303.14.2 When, in the opinion of the Engineer, additional tests or inspections are required because of the manner in which the Contractor executes his work, such additional costs thereof will be paid for by the Contractor. Examples of such additional tests and inspections are tests of materials substituted for previously accepted materials or substituted for specified materials or re-tests made necessary by failure of material to comply with the requirements of the Specifications.

303.14.3 Company shall pay the costs of any testing performed for spot-checking the Contractor's Quality Control/Quality Assurance procedures, provided results of such tests are satisfactory. If results of such tests are unsatisfactory, Contractor shall make necessary adjustments and bear the cost of the original testing and retesting until satisfactory results are achieved.

Exhibit
Ex. 7, p. 19

304. SITEWORK GENERAL PROVISIONS

304.1 SITE CONDITIONS

304.1.1 The existing ground contours and site conditions on the Drawings are shown for information only. The Contractor shall be responsible for conducting any additional site investigations required for proper performance of the work. It is anticipated that materials for construction of the new fuse plug and inlet and exit channels will be provided from offsite sources. Suitable materials excavated for removal of the existing Dike 2 fill and clearing and grading of inlet and exit channels may be used for regrading of the embankment dam and remaining saddle dikes as approved by the Company.

304.2 GENERAL

304.2.1 Contractor shall perform all general site work required for performing the Work as a whole, including but not limited to the following:

a. Identify required lines, levels, contours, and datum.

b. Protect trees, shrubs, and other features to remain as directed.

c. Protect benchmarks and existing structures.

d. Maintain and protect existing utilities remaining which pass through work area.

304.3 CLEARING AND GRUBBING

304.3.1 The site shall be cleared and grubbed to the excavation and fill limits shown on the Drawings for access to Work areas and execution of Work, or as required to perform the specified Work. Brush, shrub, rocks and debris shall be removed to the ground surface within these limits. Stumps and roots shall be grubbed out as required to create a proper foundation to construct the fuse plug spillway, inlet and exit channels. Clearing beyond the limits shown on the Drawings shall be for the convenience of the Contractor. Existing vegetation cleared beyond the limits shown shall be re-established to the existing conditions.

304.3.2 The footprint of the new constructed features shall be 100 percent grubbed a minimum of twelve (12) inches below final excavation lines and grades or until all organic matter is removed.

304.3.3 Where removal and disposal of material is required, remove and dispose of all materials in accordance with all applicable laws, permits, regulations, and ordinances, or orders made thereunder, and the lawful requirements of any public authority in any way affecting or applicable to this Work. The Company shall make an on-site disposal area available for use by the Contractor. Materials shall be disposed of as soon as practicable following clearing and grubbing activities. Burning will not be allowed.

304.3.4 Upon discovery of unknown utility or concealed conditions, discontinue affected Work; notify Company and Engineer immediately.

304.3.5 The Contractor shall excavate topsoil from areas to be further excavated or areas where new fill is to be placed over existing fill. Topsoil will be stockpiled for future use in seeding of the fuse plug dike, inlet and outlet channels, and other site restoration. Debris or inappropriate materials, such as tree stumps, branches, stones larger than two (2) inches, shall be removed from the topsoil. The Contractor may elect to chop or shred wood debris into mulch and mix it with the topsoil for site restoration purposes.

304.4 ENVIRONMENTAL RESTORATION

304.4.1 Upon completion of construction operations and after all debris, excess materials, and equipment and tools have been removed from the site, all unfinished areas and areas affected by construction operations shall be dressed and restored and otherwise made to conform with the natural features and environment of surrounding areas.

304.4.2 All excavation scars, cut surfaces, filled or backfilled surfaces, and other bare earth surfaces affected by construction operations shall be dressed and restored as specified above or by other sections of these specifications.

305. EXCAVATION AND FILL PLACEMENT AND COMPACTION

305.1 SCOPE

305.1.1 The Work to be performed under this Section consists of the removal of saddle Dike 2; furnishing, placement and compaction of fill material for the construction of the new fuse plug spillway; furnishing, placement and compaction of fill material and geotextile fabric for the construction of the rock trap; and furnishing placement and compaction of fill material for regrading of Silver Lake Dam and Dikes 1, 3 and 4.

305.2 SUBMITTALS

305.2.1 The following items shall be submitted to the Engineer:

a. Data, including gradations and certifications for all materials used, including silty sand core, granular shell, riprap slope protection, granular cover, granular fill, sand filter, rockfill, and geotextile.

b. Records of inspections and quality control tests performed, and any corrective actions taken.

Exhibit
Ex. 7, p. 20

Exhibit
Ex. 7, P. 21

305.3 PRODUCTS

305.3.1 Materials

a. Silty Sand Core: Silty sand core material for use in constructing the impervious core of the fuse plug dike shall be uniformly graded and shall be free from topsoil, roots, trash, wood waste and other deleterious material unless otherwise noted.

1) Gradations for materials proposed for use as silty sand core material shall be submitted to the Engineer for review and approval prior to the transport and delivery of such materials to the site in accordance with Section 305.5. The gradation of silty sand core material obtained from offsite sources, shall be a standard silty sand material with 100% passing #4 sieve and 30% passing #200 sieve.

b. Granular Shell: Granular material for use in constructing upstream and downstream shells of fuse plug dike shall be uniformly graded and shall conform to MDOT 20AAA except that no material should be finer than the #30 sieve.

c. Riprap Slope Protection: Riprap slope protection material shall be a select minus 3-inch rounded stone from an alluvial source with the following minimum stone size requirements.

D_{100} = 3 inches
D_{50} = ¾ inch
D_{10} = ½ inch

d. Granular Cover: Granular cover material for use in finishing the top of the fuse plug dike shall conform to MDOT Granular Materials Class II.

e. Granular Fill: Granular fill material for use in construction of the pilot channels atop the fuse plug dike shall be a uniformly graded material and shall conform to MDOT 21AA.

f. Sand Filter: Sand filter material for use in constructing the sand filter flanking the core within the fuse plug dike shall conform to MDOT 2NS..

g. Geotextile Fabric: Geotextile fabric to be used to line the rock trench shall be a standard nonwoven synthetic Geotex 801 fabric as manufactured by Synthetic Industries of Chattanooga, Tennessee, or approved equal.

h. Rockfill: Rockfill material to be used to construct the rock trench shall be a cobble fill with a maximum particle size of 18" cobble and a minimum size of 6".

[redacted] Seeding: Seeding for the fuse plug dike, inlet and exit channels shall conform to the physical characteristics of MDOT ___ Roadside Blend, or

Exhibit
Ex. 7, p. 22

approved equal [redacted]

305.3.2 Construction Equipment

a. Excavation: The construction equipment for excavation and removal activities shall consist of excavation and transportation equipment adaptable to the Work specified herein and approved by the Engineer.

b. Compaction: The compaction equipment required for the construction of the fuse plug dike shall be that capable of producing a compacted fill meeting the requirements of this specification, and shall be approved by the Engineer.

1) Mechanical hand compactors or power tampers, for use in compacting material in confined areas, or where fill cannot be placed in proper lift sizes for compaction by typical means, shall be of satisfactory size and have sufficient power to achieve the required compaction.

2) Alternative compaction equipment other than that specified herein shall not be used without prior approval of the Engineer. Approval will be based on satisfactory evidence that such alternative equipment will produce compacted fill equal to or better than that obtained with the specified equipment under similar operating conditions.

305.4 EXECUTION

305.4.1 Lines and Grades. The fuse plug dike and inlet and exit channels shall be constructed to the lines, grades and cross sections shown on the Drawings. The lines and grades shown are intended to be the final surfaces after placement, compaction and settlement during construction.

305.4.2 Excavation and Removal

a. Excavation Limits: The Contractor shall excavate to specified lines, grades and dimensions as shown on the Drawings to or to suitable foundations as directed by the Engineer. Such lines, grades and dimensions will be referred to hereafter as excavation limits. No excavation will be permitted outside the excavation limits as shown unless such excavation is approved by the Engineer. The Contractor shall be responsible for verifying the elevations and dimensions shown.

b. Excavation shall include excavation for removal of Dike 2 and excavation for the inlet and exit channels and rock trench. All excavations shall be approved by the Engineer.

c. The Engineer may modify excavation depths to fit conditions encountered during construction. Rock or boulders encountered in the excavation shall

be removed as required. Overburden slopes shall be dressed to present a neat and orderly appearance.

1) All necessary precautions shall be taken to preserve the materials beyond and below the lines and grades of excavation as shown on the Drawings, or as directed by the Engineer, in a sound and undisturbed condition, and any unauthorized overexcavation shall be backfilled as directed by the Engineer.

2) Work areas shall be protected against damage from erosion and traffic. Particular care shall be exercised to ensure that the excavated grades and slopes are not rutted, squeezed, or otherwise damaged by repeated travel of construction equipment. Any such damage shall be repaired.

d. Removal of Dike 2

1) The existing Dike 2 shall be removed to the existing ground elevation to facilitate the construction of the new emergency fuse plug spillway and inlet and exit channels

2) Suitable material salvaged from the removal activities shall be stockpiled at an approved location onsite for use in regrading activities.

e. Excavation of Channel Limits

1) The Contractor shall excavate and grade the floor and side slopes of the inlet and exit channels to the lines, grades and limits shown on the Drawings.

2) Suitable material removed from the channel excavation shall be stockpiled for future use in regrading activities. Unsuitable material removed from channel excavation shall be stockpiled at an approved off-site location as directed by Company.

3) Those areas beyond the limits shown on the Drawings which have been disturbed will be considered for the convenience of the Contractor's activities and shall be restored to their original condition prior to the Completion of Construction.

f. Excavation of the Rock Trench

1) Excavation of the rock trench shall be performed to the lines and grades as shown on the Drawings or as otherwise approved by the Engineer.

Exhibit
Ex. 7, p. 24

305.4.3 Fuse Plug Dike and Rock Trench Fill Placement and Compaction

a. General

1) Silty sand core material, granular shell, sand filter, riprap slope protection, granular cover, granular fill, rockfill and geotextile material that has not been accepted by the Engineer as suitable for their intended purposes shall not be transported to the placement area.

2) Materials shall not be placed on any part of the fuse plug foundation or excavated rock trench area until such areas have been inspected and approved by the Engineer. Fuse plug dike materials shall be placed and spread to be free from lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material. Areas shall be free from debris, snow, ice and water and ground surfaces shall not be in a frozen condition.

3) Fuse plug dike materials and rockfill shall not be placed over ponded surface water or existing subgrade surfaces which are yielding or softened. All material shall be carefully placed to grades, contours, levels and elevations shown to drain freely without ponding. Placement of these materials shall be suspended when the climatic conditions will not allow proper placement and compaction of fill. Successive layers of fuse plug dike materials shall be placed to produce the best practical distribution of material.

4) Any material not in compliance with the requirements of this Specification and considered unsuitable by the Engineer shall be excavated and removed from the fill and shall be disposed of in approved disposal areas. Excavated areas shall be properly refilled with suitable material and be compacted to the proper density.

b. Foundation Preparation

1) Following clearing, grubbing and stripping of the foundation beneath the footprint of the fuse plug dike, the Contractor shall scarify the foundation to a depth of at least six (6) inches or as directed by the Engineer.

2) Earth surfaces upon which fuse plug dike fill is to be placed shall be leveled sufficiently to allow efficient use of compacting equipment. The surfaces shall be moistened or dried as directed in accordance with Section 305.5.4 of these Specifications. The Engineer may require the Contractor to proofroll the areas of the fuse plug dike foundation.

c. Fuse Plug Dike Fill Placement and Compaction

1) Contractor shall submit the proposed plan for placement and compaction of all materials in the fuse plug dike prior to delivery and placement of dike materials on site. The plan shall include the

procedures and equipment proposed to achieve and maintain the required fuse plug dike zonal geometry.

2) Placement operations, including handling, stockpiling and transporting shall be accomplished in such a manner as to prevent segregation of material. Material in offsite stockpiles shall be protected from changes in gradation and contamination. Gradation testing will be performed on stockpiled material prior to delivery and placement onsite in accordance with Quality Control Testing methods. Placed material shall be free from large open areas, objectionable pockets of stones and clusters of large stones and shall have a reasonably regular finished surface.

3) Placement and compaction of fuse plug dike material shall be in accordance with approved placement and compaction procedures and in the presence of the Engineer.

4) The maximum layer thickness of granular shell, granular cover and granular fill material before compaction shall be twelve (12) inches.

5) The maximum layer thickness of sand filter and silty sand core before compaction shall be eight (8) inches.

6) Any areas where fuse plug dike has been damaged due to other activities shall be repaired and compacted by the Contractor to the lines and grades as shown on the Drawings, or as directed by the Engineer.

7) During the dumping and spreading of the material, roots, trash, and debris shall be removed from the fill and disposed of in disposal sites approved by the Company.

8) Care shall be exercised when operating construction equipment adjacent to existing structures to avoid causing damage. Disturbed material shall be repaired as directed by the Engineer.

9) Fuse plug dike shall be maintained and protected in a satisfactory condition at all times until final completion and acceptance of the Work. Travel on the fuse plug dike shall be controlled to prevent contamination or fouling of the dike.

10) Fuse plug dike materials shall be compacted to at least 70% relative density as determined by ASTM D698, as recommended in USBR REC-ERC-85-7. Testing of the fill shall be performed at the discretion of the Engineer in accordance with Section 305.5.

Exhibit
Ex. 7, p. 25

Exhibit
Ex. 7, p. 26

Rock Trench Rockfill Placement

d. Placement of Geotextile

1) Non-woven geotextile shall be placed along sides and bottom of excavated trench to provide a suitable surface for placement of fill.

2) Shipping, handling and storage of the geotextile fabric shall be in accordance with the manufacturer's requirements, and in no case shall the geotextile fabric be left exposed to ultraviolet light for periods exceeding five days.

3) Surfaces where geotextile is to be placed shall be prepared by grading, placement of suitable fill, and/or by the removal of sharp rocks or other protrusions so as to avoid stretching or tearing of the fabric.

4) Care should be taken to ensure intimate contact with the existing ground material such that no void spaces exist between the underlying soil and the geotextile.

5) Adjacent geotextile sheets shall be overlapped proceeding downstation and shall be joined by either sewing or overlapping. Overlapped sheets shall have a minimum overlap of 1.5 feet. Geotextile fabric shall be pinned at intervals of 5 feet to avoid slippage.

6) Care must be taken to avoid contamination or damage to the geotextile during construction. Contaminated or damaged geotextile shall be removed and replaced to the satisfaction of the Engineer.

e. Placement of Rockfill

1) Trench shall be constructed to protect the exit channel from excess velocities during a flow event.

2) Rockfill material shall be placed in trench to the grade shown on the Drawings.

305.4.4 Regrading of Existing Dikes and Dam

a. The Contractor shall place and compact material to regrade the top of existing Silver Lake Dam and existing Dikes 1, 3 and 4 to Elevation 1491.5 using suitable material recovered during the removal of Dike 2 and from borrow sources as needed.

305.4.5 Inlet and Exit Channel Protection

a. The Contractor shall furnish and place a base layer of topsoil on the prepared floor and side slopes of the inlet and exit channels within the limits as shown on the Drawings and shall prepare the channel for seeding in accordance with Section 816 of the MDOT Standard Specifications. Areas

beyond the limits shown on the Drawings that have been damaged due to Contractor's activities shall be restored to original conditions or better.

1) Topsoil shall be obtained from stockpile from project excavations and from offsite borrow sources, if necessary.

b. The Contractor shall furnish and place [redacted] on all prepared surfaces along the inlet and exit channels.

c. Due to the location of the project within the Upper Peninsula, the Contractor shall complete all seeding operations between May 1 and September 20.

d. Seeding activities shall be performed in accordance with Section 816 of the MDOT Standard Specifications.

305.5 QUALITY CONTROL/QUALITY ASSURANCE

305.5.1 Sampling and Approval of Materials

a. Prior to beginning excavation or fill placement and compaction activities, the Contractor shall perform sampling and testing of the borrow sites proposed as sources of fill materials and obtain approval of fill materials by the Engineer.

b. Contractor shall provide Certificate of Compliance for geotextile fabric.

305.5.2 Testing

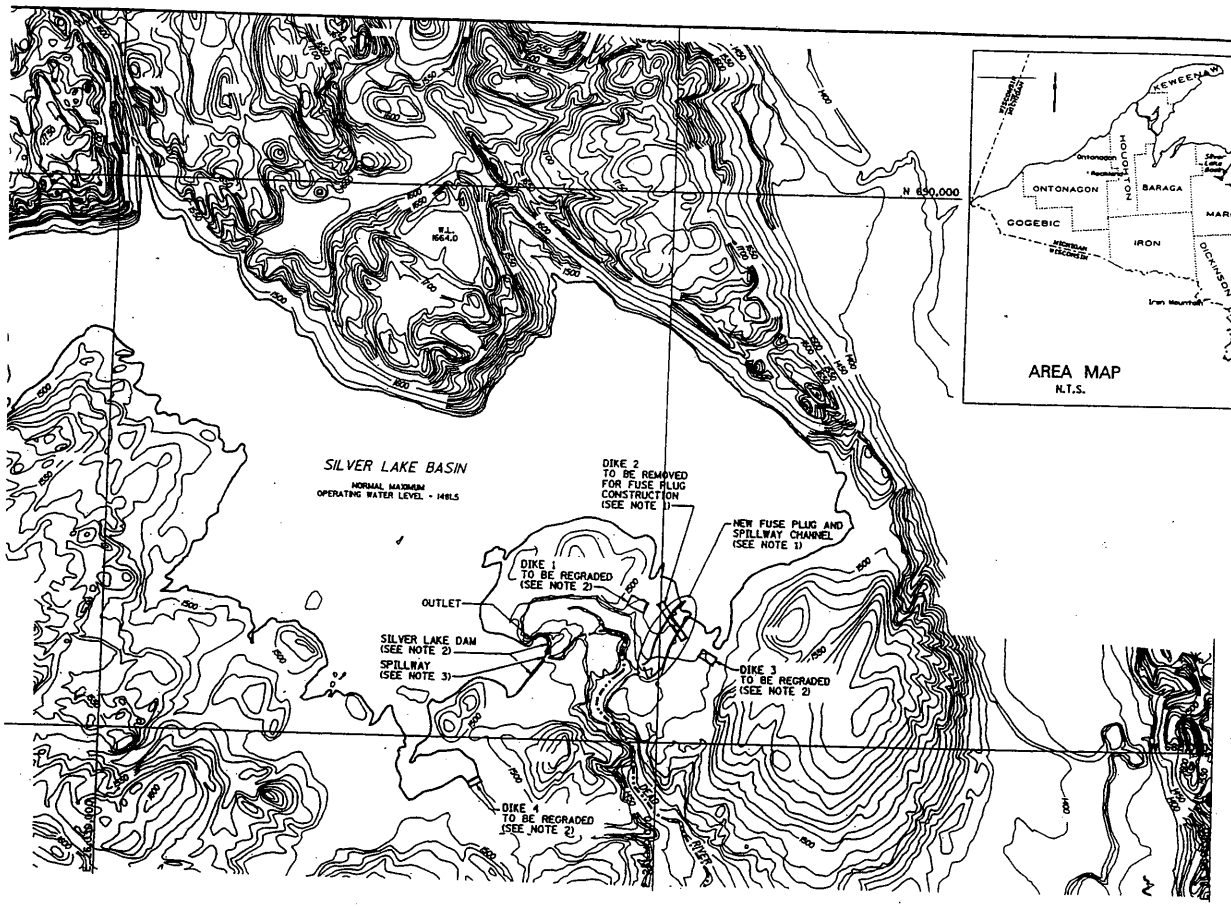
a. The Contractor shall be responsible for testing of the fill materials. Equipment shall not be operated within an area that may influence the test results. At the discretion of the Engineer, the gradation of materials shall be determined on samples taken in the field after fill placement and compaction. Gradation testing and density testing shall be performed in accordance with 305.5.3 and 305.3.4 to confirm the adequacy of the materials to be used for construction of the fuse plug.

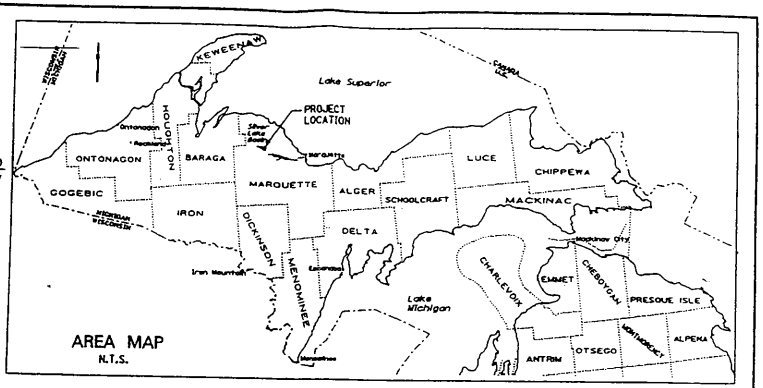
b. Results of Quality Control Testing as specified herein shall be submitted on a daily basis to the Engineer for evaluation and approval.

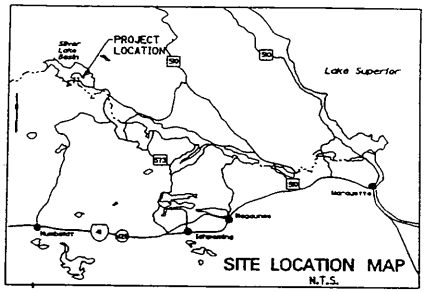
305.5.3 Gradation Testing

a. Sieve analyses shall be performed in accordance with ASTM C136 at a frequency of at least one test per material and not less than one test for every 200 cubic yards from each material source, unless previous testing indicates suitable consistency in the production, and a reduced frequency is agreed to by the Company.

b. Sieve analyses shall be performed on samples taken from on-site stockpiles for each 200 cubic yards of material delivered to the site to confirm that no







REFERENCE DRAWINGS:

WORK THIS DRAWING WITH 1830G-02 AND 18305G-03

NOTES:

1. DETAILS OF WORK TO BE PERFORMED BY CONTRACTOR FOR CONSTRUCTION OF NEW FUSE PLUG AND SPILLWAY CHANNEL AND REMOVAL OF DIKE 2 ARE SHOWN ON DRAWINGS 18305G-02 AND 18305G-03.
2. CONTRACTOR SHALL REGRADE EXISTING DAM AND DIKES 1, 3 AND 4 TO EL. 1491.5 USING SUITABLE MATERIAL RECOVERED DURING REMOVAL OF DIKE 2 IN ACCORDANCE WITH THE SPECIFICATIONS.
3. CONTRACTOR SHALL REMOVE WOODEN STOPLOGS FROM FOURTH SPILLWAY BAY FROM THE LEFT IN ACCORDANCE WITH THE SPECIFICATIONS. STOPLOGS ARE CURRENTLY IN PLACE AT EL. 1486.5 AND SHALL BE REMOVED TO EL. 1482.5.
4. HORIZONTAL PROJECT DATUM IS MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD 83/86, NORTH ZONE. VERTICAL PROJECT DATUM IS NGVD 1929.

SCALE 0 1000 2000 FEET

UPPER PENINSULA POWER COMPANY
"A SUBSIDIARY OF WPS RESOURCES"

SILVER LAKE BASIN PROJECT
FUSE PLUG SPILLWAY

AREA MAP, SITE LOCATION MAP AND SITE PLAN

HARZA ENGINEERING COMPANY
APPROVED
CHICAGO, ILLINOIS DATE DWG.NO. 18305G-01

REVIEWED

Exhibit
Ex-7, p. 28

20030623-0196

FERRIS

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, Illinois 60604
(312) 353-6171 Office - (312) 353-0109 Facsimile

In reply refer to:
P-10855 NATDAM NO. MI00197

May 16, 2002

Mr. David W. Harpole
Assistant Vice President - Energy Supply
Wisconsin Public Service Corporation
600 N. Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

ORIGINAL

Re: Dam Safety Modification Design and Quality Control Inspection Program

Dear Mr. Harpole:

This is in response to your letter dated March 27, 2002, submitting the Dam Safety Modification Design and the Quality Control and Inspection Program (QCIP) for the work to be conducted at your Silver Lake development of your Dead River Project No. 10855. This work includes the fuse plug construction at dike No.2 that was approved by our letter dated August 30, 2001.

By letter dated June 6, 2001, you submitted the Design Report, Emergency Fuse Plug Spillway and Channel Design report for the work to be conducted at your project. We reviewed the report, and by letter dated June 28, 2001, we provided you with our comments. By letter dated August 7, 2001, you addressed our comments and submitted the Quality Control and Inspection Program for the work to be conducted. By letter dated August 30, 2001, we provided you with our comments and allowed you to proceed with the work as scheduled. For various reasons, you had not started work as scheduled. By letter dated January 15, 2002, we approved your updated work schedule (for the work to be conducted in 2002) submitted by letter dated December 18, 2001.

We note that the present submittal extends the scope of work of your June 6, 2001 submittal, (Design Report, Emergency Fuse Plug Spillway and Channel Design), adding to the work to be completed three items: construction of toe drain berm, excavation and construction of toe drain, and repair of the deteriorated concrete at the outlet structure. In addition, the top of the existing dam and the three remaining dikes will be regraded to their original elevation of 1491.5 feet, the slopes along the main dam will be regraded to a minimum 2H:1V grade to

Exhibit
Ex. 8, p. 1

allow the embankment to meet the required factors of safety, and the stop logs in the fourth bay of the spillway will be removed to elevation 1482.5 feet.

We have two comments regarding drawing no. 20895-C3 in the Design Report:

1. The top one foot of fill in the toe drain trench should be a relatively impervious material to prevent surface runoff from flowing into the drain trench and distorting drain seepage measurements.

2. Geotextile filter fabric is shown being used under the rip rap on the saddle dike. This is because any place that the geotextile does not lay flat against the embankment there is a potential place for erosion to occur from surface runoff during rains. Also, the rip rap is shown being placed directly on the geotextile which could cause punctures in the geotextiles. Natural bedding materials that meet filter criteria should be used in lieu of geotextile.

Your submittal also lists the factors of safety for the spillway for all loading conditions, including the PMF, as requested in our letter dated December 13, 2001. All factors of safety exceed the recommended minimum factors of safety as listed in Chapter III of the Engineering Guidelines.

We have reviewed your March 27, 2002 submittal and have no additional comments at this time. Please refer to our August 30, 2001 letter for comments on personnel, prevention of water contamination, and changes to the design package. The work is scheduled to start on July 1, 2002, and be completed by November 1, 2002. Your construction reports should be prepared in accordance with the, "Guidelines for Construction Reports from Licensees" sent to you with my June 28, 2001 letter.

You may proceed with this work. If you have any questions, please call Mr. Teodor Strat at (312) 353-3790, or me at (312) 353-6171.

Sincerely,

PEGGY ANN HARDING

Peggy A. Harding, P.E.
Regional Engineer

bc: D2SI, RIMS/RMC
Strat, T.G.
MSD

Exhibit
Ex. B, p. 2

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections - Chicago Regional Office
230 South Dearborn Street, Suite 3130
Chicago, Illinois 60604
(312) 353-6171 Office - (312) 353-0109 Facsimile

R J Meyers UISC
R W Edwards D2
G W Egtvedt A2
D W Harpole D2
J F Johanek D2 (original
G E Snyder D2
S C Puzen A2
P F Fulsher UES (Escana

In reply refer to:
P-10855 NATDAM NO. MI00197

August 30, 2001

Mr. David W. Harpole
Assistant Vice President - Energy Supply
Wisconsin Public Service Corporation
600 N. Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Dear Mr. Harpole:

This is in response to your letter dated August 7, 2001, submitting the Quality Control and Inspection Program (QCIP), the resume of your inspectors and details of the emergency fuse plug spillway to be constructed at your Silver Lake development of your Dead River Project No. 10855. In addition, your submittal also addresses the comments contained in my June 28, 2001 letter.

We have reviewed your submittal and have the following comments:

1. Mr. Craig Harris, P.E., of Harza Engineering Company will be the Project Manager. He will be responsible for the review and approval of contractor technical submittals and will have authority to approve changes to the contract drawings and specifications and to recommend stop work to the Upper Peninsula Power Company (UPPCO) Project Manager/Construction Manager. Mr. Harris will be aided by Mr. Jason Hedien, P.E., Project Engineer, and Ms. Manoshree Sundaram, P.E., Geotechnical Engineer, also of Harza Engineering Company. Ms. Sundaram will also serve as the Quality Assurance Engineer. This is satisfactory.

2. Mr. Ben P. Trotter of Wisconsin Public Service Corporation (WPSC) will be UPPCO's Project Manager/Construction Manager. He will have overall responsibility for the project and for the on-site execution of the QCIP; he will perform site inspections and review all field reports and will have authority to stop work if the work is not in accordance with the contract documents. Mr. Trotter will observe the work and the quality control testing and will supervise the services of the independent testing laboratory. This is satisfactory.

Exhibit
Ex. 9, p. 1

3. We understand from section G of your submittal that you will be taking all necessary precautions to prevent the contamination of the waterway. Mr. Rick Moser of WPSC – UPPCO will serve as the Environmental Coordinator and will have authority to stop work due to adverse quality conditions. Please note that this office is to be immediately notified of all stop work orders issued by the quality control and inspection team.

4. If the contractor or the consultant makes any significant changes to the design package or the drawings submitted to us, you should notify us immediately and confirm the changes and the purpose of the changes in writing within 10 days for our review and comments.

The work is scheduled to start on September 10, 2001 and be completed by the end of the construction season. Your construction reports should be prepared in accordance with the "Guidelines for Construction Reports from Licensees" sent to you with my June 28, 2001 letter.

You may proceed with this work. If you have any questions, please call Mr. Teodor Strat at (312) 353-3790, or me at (312) 353-6171.

Sincerely,

Peggy Ann Harding

Peggy A. Harding, P.E.
Regional Director

Exhibit
Ex. 9, p. 2

FINAL CONSTRUCTION REPORT

UPPCO - Silver Lake Basin Emergency Fuse Plug & Dam Safety Modifications FERC Project No. 10855

Upper Peninsula Power Company

December 2002

Silver Lake Basin - Construction Report
Table of Contents

Exhibit

Ex. 10, p. 2

2002 Final Construction Report
UPPCO – Silver Lake Basin Project
FERC Project No. 10855

A. Project Summary

The Silver Lake Basin is a natural water body located near the headwaters of the Dead River near the City of Marquette in the Upper Peninsula of Michigan. The Silver Lake Basin Project is licensed as part of the Dead River Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project Number 10855. Silver Lake Dam consists of a main embankment dam, a concrete gravity outlet structure on the left abutment, an ungated concrete ogee spillway and four (4) earthen saddle dikes. Silver Lake Dam was originally constructed in 1896 and was subsequently rebuilt in 1911-1912. The existing Silver Lake Dam was constructed between 1944 and 1945 by the original developer, Cleveland-Cliffs Iron Company (CCI) to serve its downstream power plants.

The first environmental permit application was issued on August 3, 2001 to the Michigan Department of Environmental Quality (M.D.E.Q.). Some of the work involved wetlands and more than five (5) acres disturbed. UPPCO did not own the property and the existing landowners agreed to sell the property to them. Therefore, the construction work was re-scheduled for the year 2002. The existing permit was amended and resubmitted. Two (2) temporary bridge permits were needed to get heavy loads to the project site.

Montgomery Watson Harza Engineering Company (M.W.H.) was retained to prepare the construction drawings, specification and the quality control and inspection plan (Q.C.I.P.). Moyle Construction Incorporated was selected as the civil works contractor. Moyle subcontracted Coleman Engineering to perform all the material testing and site survey.

The following dam safety modifications are listed below.

- Clearing, grubbing and stockpile excessive material
- Construct new emergency for plug
- Regrade existing dikes
- Construct saddle dike at the main dam
- Install new to drain and manholes
- Repair concrete damage at the outlet structure and spillway

Moyle Construction started the work on August 5, 2002 and completed all the work on October 15, 2002.

Exhibit

Ex. 10, p. 3

B. Construction Summary and Schedule

All of the environmental permits were received on June 10, 2002. The civil works contract was awarded on June 14, 2002 to Moyle Construction Company. A pre-construction meeting was held on June 27, 2002 at the UPPCO District office in Ishpeming, Michigan. The Q.C.I.P. was reviewed and the requirements of all environmental permits. The group went to the site to review work areas and temporary bridge locations.

During the month of July, Moyle submitted all the material test reports for the toe drain and fuse plug. Also submitted was manufactures cut sheets for manholes, drain pipe, Geotextile fabric and concrete patch materials. The drawn down of the pond continued.

During the month of August, Moyle mobilized to the site on August 5, 2002. The needed repair areas were marked and Molye started saw cutting and concrete demolition. The second week Moyle mobilized their heavy equipment and started clearing and grubbing the fuse plug area. The following week Moyle installed one (1) of the temporary bridges over an existing 14 ton rated county bridge. Two (2) representatives from SIKA products were on site for the first concrete pour. They assisted in mixing and placement details. A representative from Coleman Engineering took concrete cylinders for testing. The final week Moyle continue concrete demolition and making concrete pour patches. Moyle also prepared access roads and stockpile area for fuse plug material.

During the month of September Moyle excavated dike 2 and topsoiled and seeded dikes 1 and 3. They started hauling in the materials for the fuse plug and stockpiled them on site. Moyle's concrete crew filled sand bags and made temporary discharge canal. They also tied rebar and made concrete pours. The second week Coleman was on site to take density test for the foundation of the fuse plug. A representative from Mongomery Watson Hartza (M.W.H.), the assigned geotechnical engineer was onsite all week, while the fuse plug was being built. Moyle worked long hours each day to complete the construction of the fuse plug. Coleman Engineering also took concrete cubes for testing the concrete grout. The third week Moyle hauled topsoil to the main dam and rough graded the exit channel for the fuse plug. The other temporary bridge was installed. A FERC inspector was on site and reviewed the project. Eliminating the rock trench was discussed and was reviewed. Divers were on site to inspect the intake wing walls. They provided a video sketch of the damaged areas. Moyle's concrete crew worked on the trash rack and intake structure. The last week of September Moyle started the toe drain excavation and had certified welder on site to make all the seam welds for the drainpipe. A convention concrete pour was made on the larger damaged area on both sides of the dam. Traffic barriers were installed.

During the month of October Moyle continued work on the toe drain system and continued concrete patchwork. Representatives from FERC and M.W.H. were on site to review the rock trench requirements. FERC notified UPPCO that the rock trench could be deleted. Coleman engineering was on site to gather as built information. Moyle

Exhibit

Ex. 10, p. 4

placed large stone and grout pipes on the intake walls. Grout was pumped on both sides of the wall through pipes. A diesel pump was used to maintain discharge water requirements while the outlet valve was closed. Moyle finish grading and seeding saddle dike. Moyle completed the final site clean-up and removed temporary bridges.

Exhibit

Ex, 10, p. 5

C. Material Data Sheets

The following materials were utilized on this project:

Concrete Repair
Sika Corporation
1317 Amber Court
Grayslake, IL 60030
Phone: (847) 548-7006
Fax: (847) 548-7064
Attn: Todd C. Spinkler

1) Sika ARMATEC 110-Bonding Agent
2) Sika Top 123 plus-two (2) component mortor
3) Sika Top 111 plus – two (2) component mortor

Aggregates
A. Lindberg & Sons
560 Mather Avenue
Ishpeming, MI 49849
Phone: (906) 486-4459
Attn: Gary Saari

HDPE Pipe
Forrer Supply Co., Inc.
W194 N11811
P.O. Box 220
Germantown, WI 53022-0220
Phone: (262) 255-3030
Fax: (262) 255-4064
Attn: Carter Kruis

1) Performance Pipe – Driscoplex PE 3408 HPDE
2) McElroy #412 Fusion Machine
3) Certification for Fusion Welding

Manholes and Geotextile
U.P. Concrete Pipe Co.
P.O. Box 313
Escanaba, MI 49829
Phone: (906) 786-0934
Fax: (906) 786-2622
Attn: Steve Delaire

1) 48" Manhole with Connectors
2) LINQ Geotetile Fabric

Exhibit
Ex. 10, p. 6

Upper Peninsula Power Company Hydro Plant Operating Procedure Section - Operating Subject - Silver Lake project description	Procedure Number Issued Page of

I. PURPOSE AND SCOPE

This procedure provides information and guidance to plant personnel for the correct and safe operation of Silver Lake.

II. DESCRIPTION

The reservoir, known as the Silver Lake Basin is located upstream of the Hoist Project and is the uppermost impoundment on the Dead River. The principle project features include the reservoir, dam, spillway, outlet and four saddle dikes. The reservoir is located approximately 20 miles Northwest of the City of Marquette, Michigam. The reservoir has an area of about 1,570 acres and a gross capacity of 27,400 acre-feet.

I.I.I. DAM

Silver Lake is located in Section 17, Township 49 North, Range 28 West in Michigan's Upper Peninsula. It is accessible by about 9 miles of dirt roads from the end of Marquette County Highway 573.

The dam consists of a 1650 foot long embankment with a maximum height of about 36 feet. This embankment is separated into three sections by a spillway and an outlet structure. The embankment crest is at elevation of 1491 feet and is about 15 feet wide.

The upstream slope is overall about 2.5 horizontal to 1 vertical (2.5:1), but typically steeper above the normal water level and flatter below due to erosion and beaching. There is slope protection on the upstream face. The downstream slope varies from about 2.5:1 in the lower sections to about 1.8:1 in the maximum section near the outlet structure.

A 6-inch clay-tile drain is located along the downstream toe of the embankment left of the outlet structure and along a short portion of the embankment to the right of the structure. Clean out pits

Exhibit

Ex. 11, p. 1

are located along the drains.

IV. OUTLET

The outlet structure is located in the river valley at the maximum section of the dam. It is a concrete gravity non-overflow structure with a crest elevation of 1490.7 feet. It has a maximum height of about 36 feet and crest width of 11.9 feet. The downstream face is vertical for about 8 feet then slopes at about 0.6:1 for most of its height, then has a vertical face for the bottom 8 feet. One and one-half foot-thick wingwalls angle upstream and downstream from the four corners of the structure to retain the embankment

The upstream side of the structure has two piers which extend into the reservoir, a sloping trash rack and a manually operated slidegate. Metal stoplogs are stored on top of the structure and are lowered into slots along the sides of the piers using a winch. Water is discharged through 4-foot-diameter pipe, with an invert at about elevation 1461.

V. SPILLWAY

The spillway is an ungated concrete ogee spillway 100 feet long with a maximum height of about 9 feet. The spillway is divided into 10 bays, each about 9 feet wide and separated by a concrete pier. Nine of the bays have a crest elevation of 1486.2 feet. The forth bay from the left has a crest elevation of 1479.9 feet, but is normally fitted with stoplogs to the elevation of the other bays. All the bays have slots for stoplogs which are installed from the walkway on top of the spillway piers. Wingwalls extend upstream and downstream of the structure to retain the embankment.

VI. SADDLE DIKES

Four small earthen dikes are located at low topographic saddles along the edge of the reservoir. Three of the dikes are located to the northeast of the main dam.

These dikes are numbered 1 (closest to main dam) thriugh 3. The fourth dike is located to the southwest of the main dam.

Dike 1 is about 200 feet long with a maximum height of 5 feet. The crest is at about elevation

Exhibit

Ex. 11, p. 2

1489 feet and has a minimum width of 8 feet. The upstream slope is about 3:1 and the downstream slope is about 2:1.

Dike 2 is about 360 feet long with a maximum height of 7 feet. The crest is at about elevation 1489 feet and has a minimum width of 7 feet. The upstream slope is 2:1 and the downstream slope is about 2:1.

Dike 3 is about 280 feet long with a maximum height of 6 feet. The crest is at about elevation 1488 feet and has a minimum width of 10 feet. The upstream slope is about 1.5:1 and the downstream slope is about 2.5:1.

Dike 4 is about 130 feet long with a maximum height of 5 feet. The crest is at about elevation 1489 feet and has a minimum width of 7 feet. The upstream slope is about 2:1 and the downstream slope is about 2:1.

Exhibit

Ex 11, p. 3

Upper Peninsula Power Company Hydro Plant Operating Procedure Section - Operating Subject - Installation of the Stop Logs	Procedure Number Issued Page of

I. PURPOSE AND SCOPE

This procedure provides information and guidance to plant personnel for the correct and Safe Installation of the Stop Logs at the out-flow structure.

II. DESCRIPTION

The manually operated slidegate type main valve is used to govern the amount of water that leaves the Silver Lake impoundment under normal conditions. When the need arises to stop the flow completely for any reason i.e. inspect the 4' discharge tunnel, perform repair work downstream of the structure, the stop logs must be installed and sealed. There are a total of five (5) stoplogs. Two (2) remain in place at all times and three(3) are stored on top of the structure.

III. PROCEDURE

NOTE: It is very advantaguis if at all possible to have a diver check the sealing surface of the installed log and cleaning it prior to the installation of the first log. This could save you time if the logs do not seal and have to be removed again.

1. Install the 1Ton beam dolly on the center superstructure beam.

2. Install the 3 ton beam dolly on the center superstructure beam - up stream of the 1 ton dolly. Attach the 3 ton electric hoist to this dolly. Attach the scissors to the electric hoist. Make sure the hooks have safely latches or a safely wired.

3. Close the gate valve.

4. Attach a come-along to the small beam dolly and install a chain around the stop log center support, raise the stop log and move it over the log slot, lower the come-along and reconnect to the large 3 ton electric hoist and lower the log into place. Note: Prior to installing the first log, spray paint the

Exhibit
Ex. 11, p. 4

the top surface (spray a few diagonal lines) to identify it as the first log in and the last log out.

5. Repeat the procedure for the remaining logs.

6. Once the logs are in place, open the gate valve a small amount to empty the tunnel area. This is also the time you check for leaks from between or around the installed stop logs. If leaks are encountered and they are not heavy, you can seal them by using whole kernel corn and sod.

7. Removal is the reverse procedure but prior to raising the log, make sure you are connected securely to the log.

8. Safety is of the upmost concern when performing this operation, you are working over the water for the most part not to mention the mass and weight of the stop logs themselves. so Think Safety.

EQUIPMENT REQUIRED

1. Portable Generator (check fuel level).
2. Ground fault interrupters and extension cords.
3. Hand tools.
4. Chains and lifting scissors.
5. Electric pipe threader. (Used to close and open the gate valve)
6. Drive line for the threader to operating valve connection.
7. Small and the Large beam dollies.
8. Cleaves to attach the lifting scissers and/or the come-along to dollies.
9. Come-alongs - both the 3/4 ton and the 3 ton units.
10. Can of spray paint to mark the first stop log prior to installation.
11. Whole kernel corn for sealing of the logs and a spade type for sod.
12. The small 1 ton chain fall to use in raising the large 3 ton electric hoist to the dolly.
13. The 3 ton electric hoist.
14. Step ladder and small extension ladder to access the superstructure center beam.
15. Safety belts and personnel floation devices (life vests).

Exhibit

Ex. 11, P. 5

Upper Peninsula Power Company **Hydro Plant Operating Procedure**	**Procedure Number**
Section – Operating	**Issued**
Subject – Silver Lake Main Valve	**Page of**

I. PURPOSE AND SCOPE

This procedure provides information and guidance to plant personnel for the correct and Safe Operation of the Silver Lake Main Valve at the Outlet structure

II. DESCRIPTION

The manually operated slidegate type main valve is used to govern the amount of water that that leaves the Silver Lake impoundment under normal controlled conditions. There are times when do to runoff etc that the water can go over the spillway and is uncontrolled. Under controlled conditions, the valve is opened/closed to increase/decrease the amount of water that goes into the Hoist basin via the Dead River

III. PROCEDURE

1. The Vehicle must be driven up onto the levee and parked at the top of the spillway.
2. The two chains in front the valve operating mechanism must be unlocked and removed. The locks on these chains as well as the chain that secures the hand wheel are locks that were used by CCI and have a Master key. All the Maintenance men- Operators have this key.
3. If you are going to open the valve and are going to use the portable generator, remove the hand wheel and store it out of the way.
4. Set the pipe threading vise on the spillway in front of the valve operating tower. Install the drive line into the vise and slide the end over the connection on the operating tower.
5. Connect the pipe threading vise to the portable generator. Making sure the pipe threading motor is in the off position, start the generator.
6. Measure the stem at the top of the valve operating tower. Determine how much you are going to open the valve by the length of the stem.

Exhibit
Ex. 11, P. 6

7. Turn on the pipe vise motor in the direction indicated to open the valve. There are arrows on the valve that will indicate the direction you must go.
8. During the open/closing feel the vise motor housing to insure it is not overheating. Also watch the valve stem to insure a smooth operation. If the valve seems tight discontinue electrical operation and use the manual method using the hand wheel.

EQUIPMENT REQUIRED

1. Portable generator. Make sure it's fueled and check the lubrication.
2. Pipe threading vise.
3. Ground fault interrupter and extension cord.
4. Small hand tools to include a tape measure.
5. Equipment will need to be taken to the site by Company pickup.
6. It would also be a good idea to take along some spray lubrication to spray the valve stem for smoother operation.
7. The short pike pole to remove any material that might be in the intake.

Exhibit

Ex. 11, p. 7

Upper Peninsula Power Company **Hydro Plant Operating Procedure**	**Procedure Number**
Section-Operating	**Issued**
Subject-Instrumentation Data Collection and Evaluation Procedure	**Page** **of**

I. **PURPOSE AND SCOPE**

This procedure provides the needed information and guidance to plant personnel for the Instrumentation Date collection anc Evaluation of the Silver Lake Piezometers.

II. **DESCRIPTION**

Data will be collected by Maintenance Man-Operators, Maintenance Generation Specialists. Foreman. or other job classifications. as assigned. Training will be provided for all individuals responsible for the collection and evaluation of the instrumention data. The training will invoive the utilizaton of the proper sampling techniques, the monitoring of the headwater/tailwater alarms. the odservation of potenelially hazardous dam conditions, and the procedures detailed in the Emergency Action Plan.

III. **PROCEDURE**

1 Data collected wil be plotted and compared to previous readings to identify any abnormal conditions and/or trends

2. If the current recorded reading is within ten percent of the previous reading, take one additional reading for verification. Review the trend of the readings to determine if past changes have occurred under similar conditions, I.e. lower pond elevations, spring runoff conditions or summer drought.

3 If the current recorded reading differs by more than ten percent, but less than fifty percent, of the previous reading, take at least two additional readings for verification. When verified, highlightthe reading and bring it to the attention of the next level of supervision. Inspect the area of the reading, upstream, adjacent, and downstream, for any abnormalities and/or any unusual conditions (I.e.flows. depressions, slumps.

Exhibit

Ex. 11, p. 8

budges, etc.). Review data from other in line or adjacent instrumentation to possibly determine the extent of the problem area. The next level of supervision will verify the instrument workability and arrange for an additional reading to be taken. If the reading still differs by more than ten percent but less than fifty percent, of the previous reading, the supervisor will notify the Supervisor of Hydros of the particular conditions and changes. The Supervisor of Hydros will determine the need for a new instrument, the correction or repair of the fixture providing the abnormal reading, or other measures required to ensure correct data. If replacement is necessary, details fo the new instrument will be submitted to the FERC for review prior to installation. If the reason (s) for the variation in the readings cannot be explained, more frequent readings will be taken to help verify the change in conditions.

4) If the current recorded reading differs by more that fifty percent of the previous reading, follow the measures as described above in Item 3. Contact the next level of supervision from the field and arrange to do the follow-up testing as soon as possible. If conditions observed in the field show that there is a potential hazard developing, activate the Emergency Action Plan (EAP) in accordance with the procedures defined therin. If the reason (s) for the variation in the readings cannot be explained, the Supervisor of Hydros will arrange for engineering assistance to help evaluate the condition and/or perform corrective action.

5) Enter the verified data into the appropriate computer spreadsheet and update the graphs. Forward the graphs to the Supervisor of Hydros for the annual submittal and have them available for the FERC - CRO inspector. If the graphs show any abnormal or unexplained changes, an investigation will be performed to determine the root cause of the changes.

EQUIPMENT REQUIRED

1. Water level indicator. Note: check to insure the battery is good.
2. The field record book for recording your readings.
3. Paper towel to clean the tip of the level indicator.

Exhibit

Ex. 11, p. 10

FERRIS

Upper Peninsula Power Company
(a subsidiary of WPS Resources Corporation)
600 E. Lakeshore Drive
P.O. Box 130
Houghton, MI 49931-0130

August 11, 2003

Mr. Constantine Tjoumas
Director, Division of Dam Safety and Inspection
Federal Energy Regulatory Commission
888 First Street, NE
Routing Code: PJ-13
Washington, DC 20426

Additional Information on Fuse Plug Spillway
WPS Project No. 0570003211
Silver Lake Reservoir – FERC Project No. 10855, NATDAM #MI

Dear Mr. Tjoumas:

Per your request letter dated August 1, 2003, we are submitting three (3) copies of the attached additional information pertaining to the fuse plug design, construction, and operation. The request consisted of seven (7) items, each of which has been repeated below. Our response is listed in bold type below each numbered item.

1. Rain gage readings for the years 1988, 1996, and 2002 should be provided for the following volunteer cooperative observers gage sites: Baraga, Herman, Pelkie 5SW, Watton, Champion 4E, Champion/Clarksburg, Covington 3NW, Huron Mtn Club, and Marquette NWS. These should be obtained from the National Weather Service Marquette Office. If there were any other rain gages maintained within the vicinity of these gages and the Silver Lake basin during these years, then the data for these years should be included. Also, all reservoir level readings for the Silver lake Dam, particularly for the years 1988 and 1996, should be provided.

   Response: Requested rain gage readings are attached. Reservoir level readings for 1957 through 1993 and 1995 through 2002 are attached.

2. A complete set of the construction drawings for the work done last year at the main dam.

   Response: As-built construction drawings are attached.

3. Electronic and hard copies of all photos taken by the operator at the Silver Lake Dam on May 14, 2003 should be provided.

   Response: Hard copies and electronic copies of the photos are attached.

4. The reservoir operation plan for operating the reservoir after the completion of the construction of the fuse plug spillway should be provided.

Exhibit
Ex. 12, p. 1

Response: WPS previously provided a copy of the operation plan for the Silver Lake Reservoir on June 12, 2003.

5. The engineering geologist's report on the soils and foundation investigation at the site that is currently underway. The report should include a description of the investigation and the data obtained to date. The report should also include an explanation of how the high water marks were established in the channel shown on the drawing enclosed with your letter dated July 23, 2003 letter.

   Response: The geologist's report will include a description of the investigations conducted and the data obtained. It will also explain how the indicated high water marks were established. The geologist's report will be included in the root cause evaluation report scheduled to be submitted on September 16, 2003.

6. The analysis and description of the analysis should be provided that supports the statement on page 22 of the March 2001 *Flood Routing of the Probable Maximum Floods in Dead River Basin* by Harza Engineering Company that, "Due to the large storage at the Silver Lake between the normal maximum operating water level and the top elevation of the fuse plug at Dike 2, the fuse plug would not be breached for a 1,000 year flood." Also, on the same page, the consultant states that, "Different top elevation for the fuse plug at Silver Lake Dam has negligible effect on the maximum stage and outflow at Hoist and McClure." A description of the range of elevations considered should be provided.

   Response: Our consultant is preparing a response to this request but was not able to complete the task in time for this submittal. Their response will be submitted as soon as it is available.

7. The reference in the March 2002 Design Report entitled, "Fuse Plug Structures Designed to Fail" by Jones, Marold, and Borg of Harza Engineering Company.

   Response: A copy of the requested technical paper is attached.

Should you have any comments or questions regarding the work described above, please contact Mr. John Myers at (920) 433-4957, or myself at (920) 433-1264.

Sincerely,

Dennis J. Maki for DW Harpole

David W. Harpole
Vice President – Energy Supply

Attachments

1. Rain Gage and Reservoir Readings
2. Construction Drawings
3. May 14th Photographs
4. Technical Paper

cc: Peggy Harding - FERC Chicago (2 Copies)

D J Maki	WES	G E Snyder	D2
R J Meyers	UISH	J F Johanek	D2
J W Myers	D2		

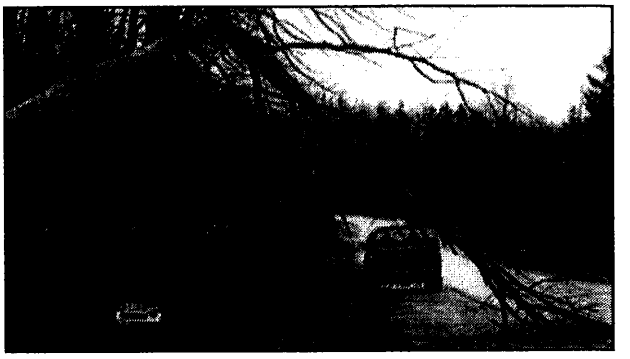
Exhibit

Ex. 12, p. 2

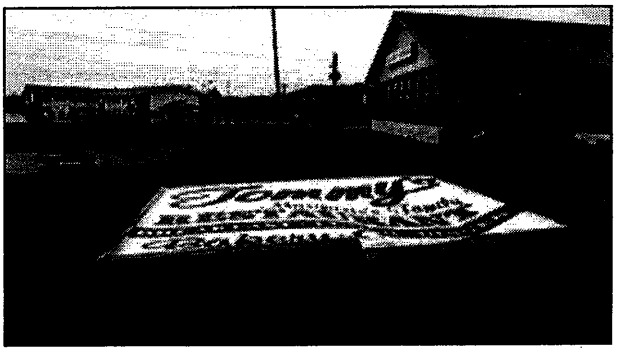
Exhibit
Ex. 13, p. 1

Monday, May 12, 2003

Record rainfall, high winds slam area
Wild weekend weather



A downed tree is hung up on power lines along Grove Street in Marquette Township this morning. (Journal photo by Aaron Peterson)



The sign for Tommy's Restaurant at the corner of McClellan Avenue and U.S. Highway 41 in Marquette lies on the ground after being knocked down by high winds this morning. (Journal photo by Aaron Peterson)

By JACQUELINE PERRY
and JOHN PEPIN
Journal Staff Writers

ISHPEMING — A rainfall record was set in Marquette County Sunday while high winds caused several power outages.

A record 2.32 inches of rain fell at the National Weather Service in Negaunee Township, said Dave Obmann of the NWS. The previous record for May 11 was 1.47 inches set in 1974. As of this morning, the NWS recorded more than 3 inches of rainfall since the beginning of the storm Sunday.

Meanwhile, flood warnings were still in effect until noon today for Baraga, Gogebic, Houghton, Keweenaw and Ontonagon counties, according to the National Weather Service.

Heavy rainfall of up to 4.5 inches during the past 24 hours caused several rivers, streams and roads across the Western Upper Peninsula to flood.

A portion of downtown L'Anse was closed Sunday due to the overflow of Linden Creek, said Sgt. Tom Brunet at the Michigan State Police L'Anse post. The downtown area has since been reopened.

About seven roadways throughout Baraga County have been closed due to flooding, including the Golf Course Road and the Plains Cut-off Road, said Norm Tikkanen of the Baraga County Road Commission.

Highway M-26 in Keweenaw County remained closed this morning from Eagle River to Eagle Harbor. Jacobs River was flowing over M-26 just east of Eagle River, according to the NWS.

The Ontonagon County Road Commission closed about 16 roads due to flooding problems, said Mike Maloney of the road commission.

Some people could not leave their home due to the poor road conditions, he said. However, no emergencies had been reported as of this morning, he said.

A high wind advisory was issued Sunday for Marquette and Baraga counties, Obmann said. Sustained winds at the weather station ranged from 30 to 40 miles per hour with gusts reaching 50 miles per hour, he said. Winds this morning steadied at about 25 miles per hour, he said.

The high winds caused several power outages for Upper Peninsula Power Company customers. About 1,000 Palmer residents were without power Sunday night due to trees and branches on the power lines and another 500 customers on the Dead River Basin were without power, according to UPPCO.

"Our single biggest incident was in Palmer, but at no time was there a large amount of people without power," Jerry LePage of UPPCO said this morning.

The power outage in Palmer and the Dead River Basin occurred at about 9 p.m. Sunday and power was restored in both areas within four to six hours, an UPPCO news release said.

A total of less than a dozen customers, including some in Gwinn and on the Dead River Basin and Marquette County Road 581, were still without power this morning, LePage said.

East of Marquette County, the storm had less of an impact. Michigan State Police troopers reported steady rainfall, but no traffic crashes or other roadway mishaps from the areas surrounding the Munising, Newberry and Manistique state police posts.

No serious flooding was reported from those places, but overnight rains did swell some rivers and creeks beyond their banks. Strong winds whipping off Lake Superior blew sand from beaches onto M-28 at Sand River and AuTrain today.

Police had no reports of downed power lines, trees or other damage typically associated with heavy rain or

thunderstorms.
Showers were expected to taper off during the day today with partly cloudy skies and significantly warmer temperatures forecast over the next few days. Highs were predicted at around 60 degrees.

Print This Story

> Local News-Sports | National News | National Sports | World News | Archive

> Back to Top

THE MINING Journal

Exhibit
Ex. 13, p. 2