Harry S. Truman Dam
Dissolved Oxygen Working Group

Presenter

[redacted]

US Army Corps of Engineers
BUILDING STRONG®

Background

- May 29, 2013 fish kill in the tailrace and dead channel below Truman Dam.
- August 26, 2013 fish kill in unit 5 draft tube after emergency shut down.
- April 22, 2014 violation letter from DNR for 2013 fish kills.
- March 22, 2015 Environmental Protection Specialist Hired.
- June 8, 2015 Fish Kill Meeting at Jefferson City, established a need for a work group.

DO Work Group Members

USACE:

[redacted]

MDC:

[redacted]

SWPA:

[redacted]

MDNR:

[redacted]

DO Work Group Meetings

June 8, 2015 – Jefferson City

- Formation of a DO work group.
- Follow up meeting to be held at Truman.

July 29, 2015 – Truman Dam

- Toured the Dam.
- MDNR to draft a memorandum of understanding.

June 2, 2016 – Truman Dam

- Corps proposed a “DO Action Plan”.
- MDC & MDNR to provide response to the plan.

ACTIONS IN PLACE

- Skimming Weir
- Flip Lip
- DO Monitoring SOP
- Draft DO Action Plan
- Downstream Data Buoy
- Gate Slot Monitoring
- Monthly Profiles

ACTIONS IN PROGRESS

- Upstream Data Buoy
- USGS Data Sharing Agreement
- TDG Sensor
- HDC Study
- Final DO Action Plan

Stockton Lake Reallocation Study

- Stakeholders: Missouri Department of Natural Resources and the Tri-State Water Resource Coalition (representing a 16 county region in southwest Missouri)
- Purpose: To evaluate alternatives and determine if additional water supply storage can be reallocated to water supply at Stockton Lake
- Need: Data and studies show there will be a shortage of municipal and industrial water supply in the southwest Missouri region based on population and industry growth.

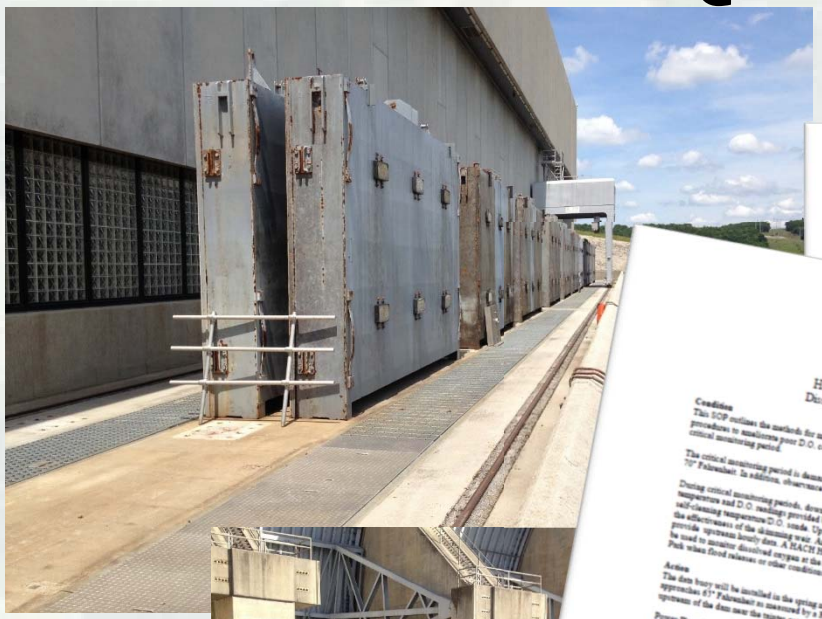
Stockton Lake Reallocation Study, cont.

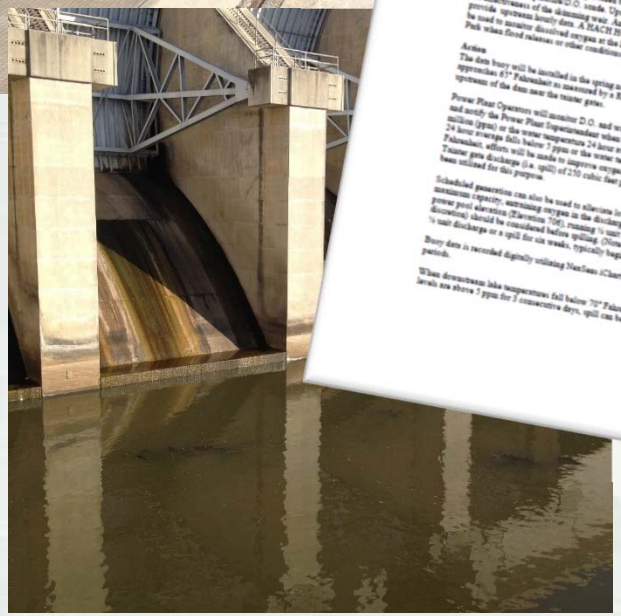
- Current study phase: Feasibility
- Current study tasks: H&H modeling, HAC analysis
- Upcoming activities: Formulate and evaluate alternatives
- Known environmental concerns: Endangered mussels and cultural resources site downstream of lake

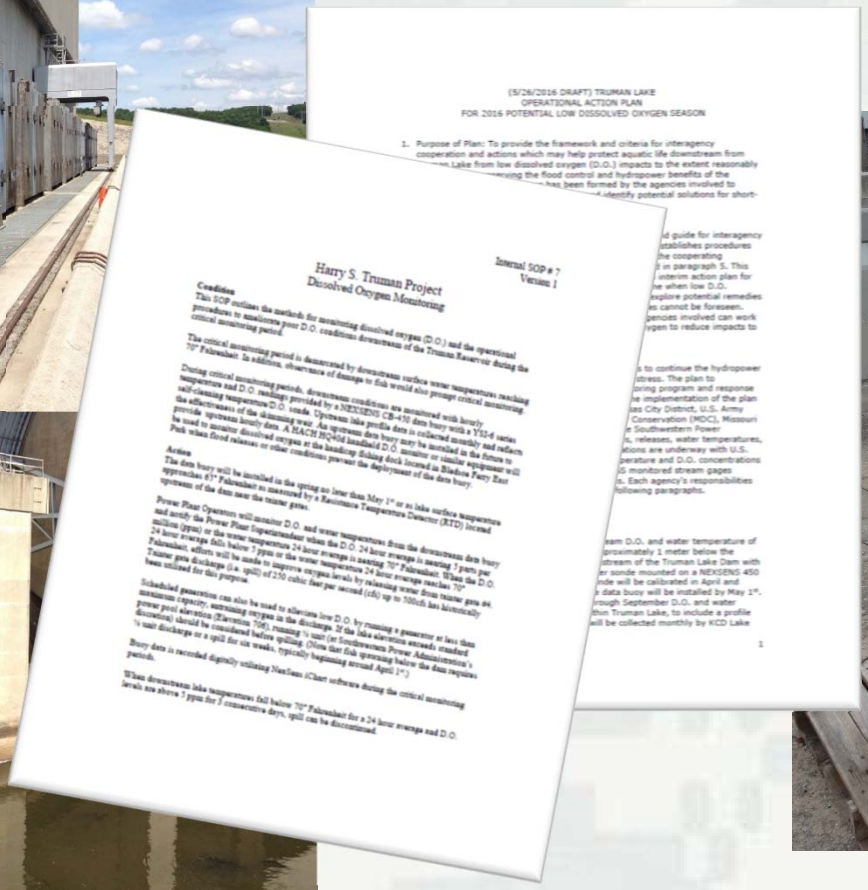
Stockton Lake Reallocation Study

- Stockton Lake Reallocation POCs:
  - [redacted]
  - [redacted]

Questions?






(5/26/2016 DRAFT) TRUMAN LAKE
OPERATIONAL ACTION PLAN
FOR 2016 POTENTIAL LOW DISSOLVED OXYGEN SEASON

1. Purpose of Plan: To provide the framework and criteria for interagency cooperation and actions which may help protect aquatic life downstream from ...n Lake from low dissolved oxygen (D.O.) impacts to the extent reasonably ...ving the flood control and hydropower benefits of the ...has been formed by the agencies involved to ...dentify potential solutions for short-

...d guide for interagency ...stablishes procedures ...he cooperating ...3 in paragraph 5. This ...interim action plan for ...e when low D.O. ...explore potential remedies ...es cannot be foreseen. ...gencies involved can work ...ygen to reduce impacts to

...s to continue the hydropower ...stress. The plan to ...oring program and response ...e implementation of the plan ...as City District, U.S. Army ...Conservation (MDC), Missouri ...e Southwestern Power ...s, releases, water temperatures, ...tions are underway with U.S. ...perature and D.O. concentrations ...G monitored stream gages ...s. Each agency's responsibilities ...following paragraphs.

...am D.O. and water temperature of ...proximately 1 meter below the ...stream of the Truman Lake Dam with ...er sonde mounted on a NEXSENS 450 ...nde will be calibrated in April and ...k data buoy will be installed by May 1st. ...rough September D.O. and water ...hon Truman Lake, to include a profile ...ill be collected monthly by KCD Lake

1

Internal SOP # 7
Version 1

Harry S. Truman Project
Dissolved Oxygen Monitoring

Condition
This SOP outlines the methods for monitoring dissolved oxygen (D.O.) and the operational procedures to ameliorate poor D.O. conditions downstream of the Truman Reservoir during the critical monitoring period.

The critical monitoring period is demarcated by downstream surface water temperatures reaching 70° Fahrenheit. In addition, observance of damage to fish would also prompt critical monitoring.

During critical monitoring periods, downstream conditions are monitored with hourly temperature and D.O. readings provided by a NEXSENS CB-450 data buoy with a YSI-6 series multi-cleaning temperature/D.O. sonde. Upstream lake profile data is collected monthly and reflects the effectiveness of the skimming weir. An upstream data buoy may be installed in the future to provide upstream hourly data. A HACH HQ40d installed D.O. sensor or similar equipment will be used to monitor dissolved oxygen at the landing/ fishing dock located in Bladen Ferry East Park when flood releases or other conditions prevent the deployment of the data buoy.

Action
The data buoy will be installed in the spring no later than May 1st or as lake surface temperature approaches 65° Fahrenheit as measured by a Resistance Temperature Detector (RTD) located upstream of the dam near the trainer gates.

Power Plant Operators will monitor D.O. and water temperatures from the downstream data buoy and notify the Power Plant Superintendent when the D.O. 24 hour average is nearing 7 parts per million (ppm) or the water temperature 24 hour average is nearing 70° Fahrenheit. When the D.O. 24 hour average falls below 7 ppm or the water temperature 24 hour average reaches 70° Fahrenheit, efforts will be made to improve oxygen levels by releasing water from trainer gate #4. Trainer gate discharges (i.e. spill) of 250 cubic feet per second (cfs) up to 700cfs has historically been utilized for this purpose.

Scheduled generation can also be used to alleviate low D.O. by running a generator at less than maximum capacity, entraining oxygen in the discharge. If the lake elevation exceeds standard power pool elevation (Elevation 706), running ½ unit (at Southwestern Power Administration's discretion) should be considered before spilling. (Note that fish spawning below the dam requires ½ unit discharge or a spill for six weeks, typically beginning around April 1st.)

Buoy data is recorded digitally utilizing NexSens iChart software during the critical monitoring periods.

When downstream lake temperatures fall below 70° Fahrenheit for a 24 hour average and D.O. levels are above 7 ppm for 3 consecutive days, spill can be discontinued.