



ALABAMA POWER COMPANY

BIRMINGHAM, ALABAMA

MARTIN HYDROELECTRIC PROJECT

FERC NO. 349

STUDY PLAN 12 (C) – EFFECTS OF A RULE CURVE CHANGE ON WATER QUALITY

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Prepared by:



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**ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA**

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STUDY PLAN 12 (C) – EFFECTS OF A RULE CURVE CHANGE ON WATER QUALITY

1.0 GOALS AND OBJECTIVES OF STUDY

Many stakeholder groups have requested that Alabama Power Company (Alabama Power) investigate the feasibility of raising the winter rule curve at Martin. In Study Plan 12 (a), Alabama Power is conducting a study that will model an increase in the winter pool elevation in increments of 1 foot from el. 481 ft msl¹ to el. 486 ft msl. (i.e., el. 482, 483, 484, 485, and 486 ft msl) as well as to examine extending the summer pool level in the shoulder seasons (raise the Lake to full pool earlier in the Spring and maintain full pool into the early/mid Fall). As a result of this modeling study, Alabama Power must address potential changes to water quality if these rule curve changes are implemented.

Objectives:

- Provide ADEM with sufficient data, to the extent possible, to examine the potential effects on water quality as a result of changing the winter rule curve elevation and/or extending the duration of the summer pool.
- Determine the probability that water quality will change (improve or degrade) with each change to lake level from existing conditions using the above data.

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

ADEM's goal is for the Martin Project to meet all state water quality standards. The USFWS and ADCNR have similar goals in that they want to reduce or eliminate any project related water quality impacts to aquatic resources associated with the Martin Project. FERC also requires that Alabama Power evaluate and disclose any effects from proposed operational changes on water quality of Lake Martin. These goals are relevant in protecting the public resources associated with the Martin Project.

3.0 BACKGROUND AND EXISTING INFORMATION

There is a fairly extensive amount of baseline water quality and water chemistry data that exists for the Martin Hydroelectric Project. These data have been collected primarily by the Alabama Power and ADEM over the past years and summarized in the Alabama Power Water Quality Report (2005), ADEM 305(b) Report (2004), the existing Thurlow tailrace information (distributed by CD in 2008), and the Alabama Power Pre Application Document (PAD). As part of Study Plan 8, Alabama Power plans to collect additional nutrient information for Lake Martin.

¹ Elevation 481 ft msl is equivalent to el. 480 Martin Datum (MD).

4.0 PROJECT NEXUS

The Project is licensed by FERC and all effects on water quality as a result of the proposed operational changes (elevation and duration of summer pool) must be disclosed and affects addressed in the license application to FERC.

5.0 STUDY AREA AND STUDY SITES

The study area includes all of the waters located within the Martin Project boundary and the tailrace of the project.

6.0 PROPOSED METHODOLOGY

Alabama Power will determine the probability that water quality will change (improve or degrade) with a change in winter pool elevation or changes in the shoulder seasons. To accomplish this, they will examine the current baseline water quality in the lake (including historic and additional nutrient data collected in Study Plan 8) and determine how the physical changes to the lake may impact the current baseline. Areas to be included in this analysis are:

- changes to retention time in the lake
- changes to surface area of the lake
- changes to shoreline areas exposed during the various drawdown levels
- consider sources and/or changes in nutrient loading (historic and current data)

This analysis will determine the probability that water quality will change (improve or degrade) with each change to lake level from existing conditions. A report will be prepared that describes the predicted changes in water quality and will be distributed to ADEM and the MIG 3 for review and comment.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study will employ generally accepted practices for evaluating water quality at hydroelectric projects. The study methodology will be consistent with generally accepted water quality sampling principles and practices.

8.0 PRODUCTS

Data and analyses from this study will be included in periodic reports to the agencies and the MIG 3.

9.0 SCHEDULE

This schedule corresponds to Alabama Power’s Process Plan and Schedule filed with FERC on February 16, 2009. Actual consultation meeting dates will be determined with MIG 1 members upon FERC approval of the study plan.

Alabama Power files Final Study Plan	March 2009
FERC Approval	April 2009
WQ Data Analysis	June 2009 – March 2010
MIG 3 Consultation	April 2009 – December 2010
Initial Study Report	November 2009
Initial Study Report Meeting	December 2009
Prepare 401 Water Quality Certification	April 2010
Final Report	October 2010
FERC Updated Study Report.....	September 2010
Updated Study Report Meeting	September 2010

10.0 LEVEL OF EFFORT AND COST

Alabama Power estimates that consultation with the MIG 3 and data analysis on the effects on water quality as result of the potential rule curve change at Lake Martin will cost approximately \$80,000.

11.0 REFERENCES