Attachment 10 to

GNRO-2012/00039

Entergy Nuclear Grand Gulf Nuclear Station License Renewal Environmental Audit – Hydrology Patton – Attachment P labeled "Thermal Monitoring Procedural Protocols"

Attachment P

Thermal Monitoring Procedural Protocols

THERMAL MONITORING REQUIREMENTS

I. MONITORING REQUIREMENTS:

a). Monitoring is performed during discharge of the heated plant effluent in accordance with Part III, Section D.3., of the NPDES Permit.

b). River stages are monitored and documented by chemistry. If a river stage exceeds a Permit monitoring requirement, notify the Chemistry Superintendent, or designee, and perform monitoring.

c). Documentation of river stage is kept with NPDES data file for reporting to and inspection by MDEQ.

d). Measurements are taken at the water surface and 5 feet subsurface if possible. The detector may float on the water surface for the surface measurement. Suspend the detector below the surface for the subsurface measurements. [M&TE maintains a specially designed device with an extended stainless steel probe for subsurface river measurements. If this is not available an improvised device may be used.]

e). At each location, allow the thermometer to stabilize before recording measurement.

II. SAFETY PRECAUTIONS:

a). Complete the operational checklist for boat operation (attached) to ensure it is functioning safely prior to entering the Mississippi River.

b). A pre-job brief must be performed before measurements commence.

c). Lifejackets must be worn by all GGNS boat occupants and contractors under Chemistry oversight even if they provide their own vessel.

III. MONITORING LOCATIONS:

a). Upriver (Point 1):
Approximately 400 feet North of the mouth of the barge slip and not more than 60 feet from the Eastern shoreline, in a depth of water approximately 5 feet.

b). Discharge Outlet:
The plant discharge pipe opening. In periods of high water this may be taken in the vicinity of the discharge plume. This may be indicated by an area of turbulent water near the South shoreline of the barge slip. In periods of low water when a 5' depth measurement is impractical, a measurement may be taken directly from the pipe plume. The location should be noted on the data sheet and an N/A entered in the discharge outlet temperature 5 ft. blank.

c). Barge Slip Outlet:
The opening or "mouth" of the barge slip where waters enter into the Mississippi River. If subsurface sample must be collected at less than 5 feet, note the approximate depth on the data sheet.

d). Downriver (Point 7):
Approximately 100 feet South of the mouth of the barge slip in the mixing zone, approximately not more than 60 feet from the Eastern shoreline, in a depth of water approximately 5 feet.

THERMAL MONITORING REQUIREMENTS

e). Ambient Air Temperature:
This may be a stabilized measurement using a calibrated temperature device or determined from meteorological tower data.

f). Mississippi River Level:
Daily river stages are obtained by contacting the U.S. Army Corps of Engineers, U.S. Weather Service or similar information source.

g). Outfall 001 Temperature:
Data is an instantaneous measurement from PDS or the strip chart recorder located at the 001 Outfall.

h). Receiving Water:
Waters outside of the mouth of the barge slip. These include the mixing zone as well as the Mississippi River.

IV. **RECORDS:**

a). Record measurements on a copy of the attached data form, or similar.

b). On completion of measurements forward to Chemistry Superintendent, or designee, for review and signature.

c). Forward completed forms to the NPDES Specialist. This becomes part of the NPDES data file for reporting and inspection by MDEQ.

V. **TABLES AND FORMS:**

The following items are attached:

Page 3 Discharge Path Locations

Page 4 River Measurement Locations

Page 5 Boat Operational Checklist

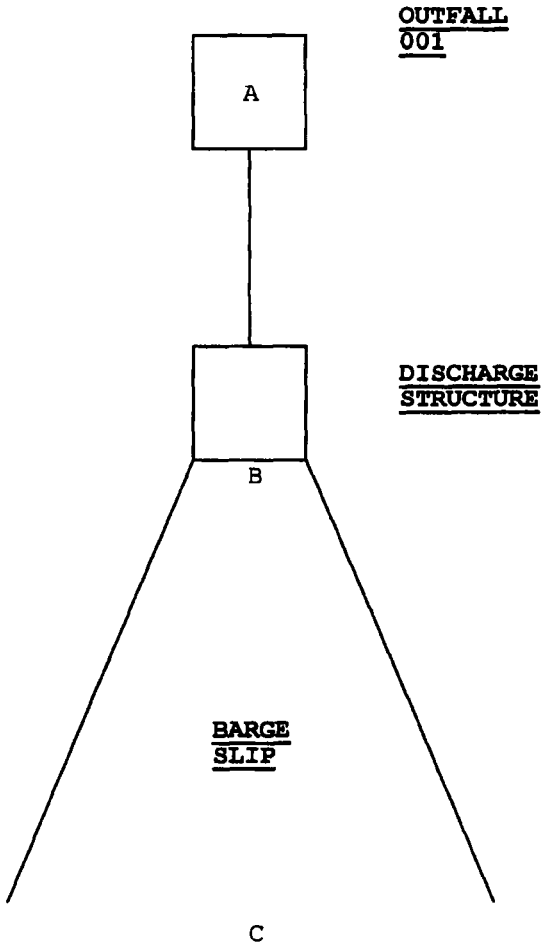
Page 6 Thermal Monitoring Data Sheet

THERMAL MONITORING REQUIREMENTS
DISCHARGE PATH LOCATIONS

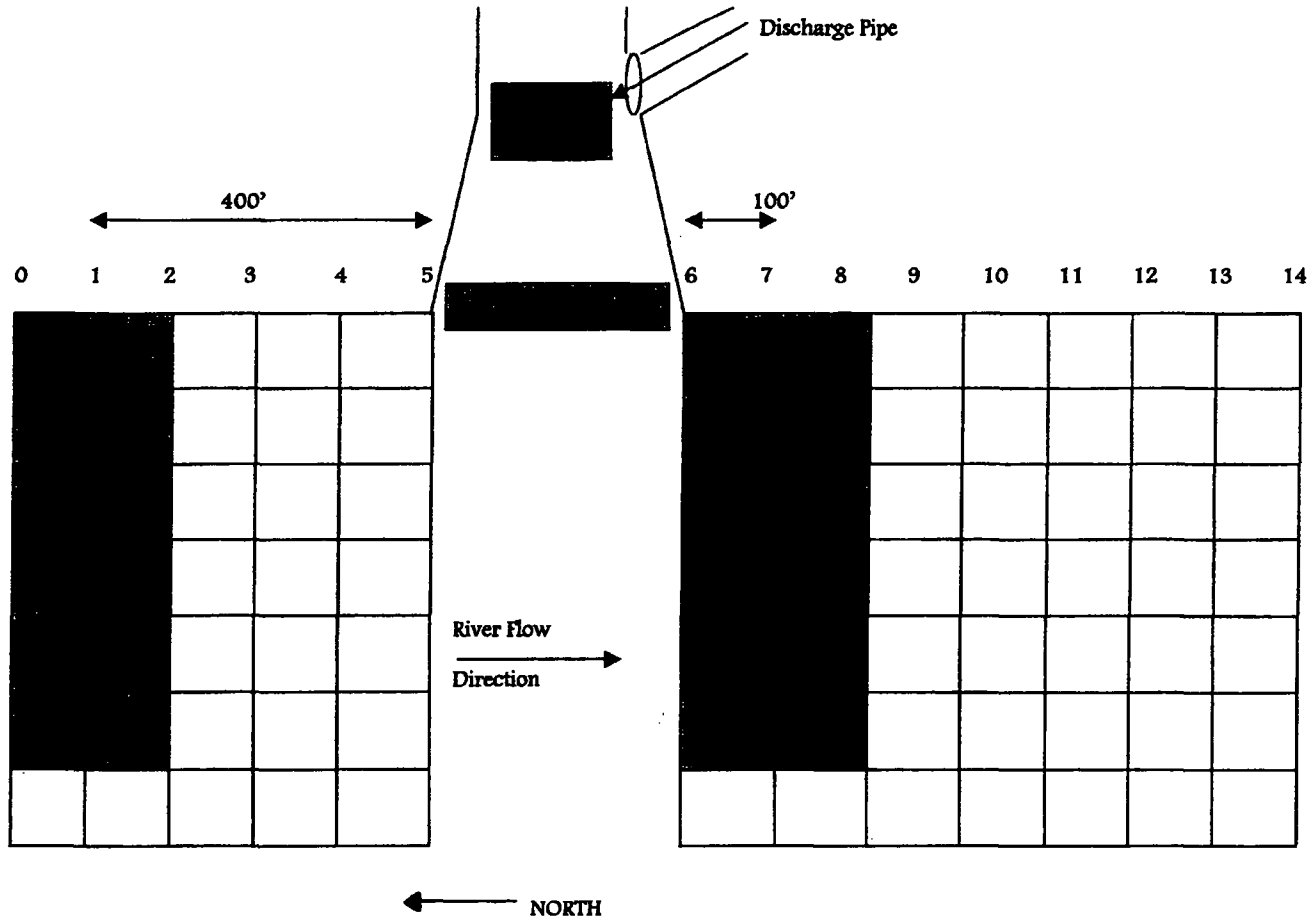
A Installed temperature recorder at Outfall 001

B Discharge Outlet

C Barge Slip Outlet



THERMAL MONITORING REQUIREMENTS
RIVER MEASUREMENT LOCATIONS



THERMAL MONITORING REQUIREMENTS
BOAT OPERATIONAL CHECKLIST

_____Visual Inspection of Hull for Damage

_____Gas Tank greater than 1/4 full (Unleaded gasoline >89 octane level recommended.)

_____Battery charged

_____Sufficient amount of life jackets provided

_____Fire Extinguisher on Board and Charged

_____Two-Way Radio Communication established

_____Paddle provided

_____Boat plug in place

_____Kill switch activated (Do not crank engine when out of water)**

_____Trailer tires aired up

_____Winch rope serviceable

_____Trailer hitch Operational

_____Outboard motor lubricant reservoir > 1/2 full of outboard lubricant/oil.

Checked by:_____
Initials /Date

Reviewed by:_____
Initials /Date

**When finished, disconnect fuel line with engine running to use residual fuel and avoid gumming engine.

THERMAL MONITORING REQUIREMENTS
THERMAL MONITORING DATA SHEET

I.	Date Performed		_____
II.	Upriver Temperature (Point 1)	Surface	_____ °C
		5 ft	_____ °C
III.	Discharge Outlet Temperature(Note 1)	Surface	_____ °C
		5 ft	_____ °C
IV.	Barge Slip Outlet Temperature(Note 2)	Surface	_____ °C
		5 ft	_____ °C
V.	Downriver Temperature (Point 7) (Receiving Water)	Surface	_____ °C
		5 ft	_____ °C
VI.	Ambient Air Temperature		_____ °C
VII.	River Level at Vicksburg		_____ ft
VIII.	Outfall 001 Recorder Temperature		_____ °C

NOTE:

A. Any temperature measurement in RECEIVING WATER which is equal to or greater than UPRIVER TEMPERATURE +2.8°C must be reported to the Chemistry Superintendent.

B. Any temperature measurement in RECEIVING WATER which exceeds 32.2°C must be reported to the Chemistry Superintendent.

Prepared by _____
Signature/Date

Reviewed by _____
Signature/Date

(Note 1) If the 5 ft. sample is impractical, note location of measurement and N/A the 5 ft blank. (See Page 1, III. b)

(Note 2) If subsurface measurement depth is less than 5 ft. note the approximate depth on the data sheet (See Page 1, III. c)