

DRAFT

Indian Point Fish Analysis Lab Conf Call

2/27/07

1:30PM

Background

Entergy, the NRC, and State agencies are currently planning for a spring split sampling effort for fish and invertebrates in the Hudson River. This effort is a one-time enhancement of IPEC's routine REMP sampling program. The purpose of this enhanced program is to address questions about additional data needs raised by the 2006 REMP Sr-90 in fish results. These samples will be split into three (flesh) or two (bone and organ) aliquots for analysis by AREVA, ORISE, and Wadsworth labs.

Purpose

This call is intended to bring the labs together to attempt to minimize to potential variability between the three sets of results. The concept, which worked well for IP split groundwater analyses, is to reach agreement wherever possible on a common approach to sample preparation and analysis.

Another goal of this call is to determine each labs sample requirements (minimum mass, QA/QC needs, etc.) for the field crews. Normandeau Associates needs this information in the near future in order to develop field collection and initial sample preparation protocols.

Discussion Topics

- Minimum sample mass for the analyses to be performed:

Flesh

Bone/Organ

- Minimum Detectable Concentrations:

Analyte

MDC pCi/Kg

Sr-90

Cs-137

Cs-134

Co-60

_____?

- Sample analysis method(s)

- Sample preparation method(s)

- Data reporting protocol:

? Report all pos and negative data, method detection limit, and analysis MDC?

DRAFT

Quality Assurance Project Plan

Sr⁹⁰ Analysis of Bone Taken from Hudson River Fish

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

New York State Department of Health
Flanigan Square, 547 River Street
Troy, New York 12180

Nuclear Regulatory Commission
(ADDRESS)
Washington, DC

Project Leaders: _____
(To be determined) NYS Department of Environmental Conservation

(To be determined) NYS Department of Health

(To be determined) Nuclear Regulatory Commission

Project Quality Assurance Officer: _____
(To be determined)

Date: March __, 2007
Revised:

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1. Project Name: Sr⁹⁰ Analysis of Bone Taken from Hudson River Fish
2. Project Leaders: (To be determined)
NYS Department of Environmental Conservation (DEC)

(To be determined)
NYS Department of Health (DOH)

(To be determined)
Nuclear Regulatory Commission (NRC)
3. Project Quality Assurance Officer: (To be determined)
[Agency name]
4. Date Project Proposed: February 21, 2007
5. Date of Project Initiation: May 1, 2007
6. Project Requested By: NYS Department of Environmental Conservation
NYS Department of Health

7. Project Description:

A. Background

In 2006, Entergy, Inc. discovered the presence of a cooling water leak to groundwater from its Indian Point Nuclear Power Plant. The leak may contain small quantities of Sr⁹⁰, therefore, Sr⁹⁰ was added to the list of radiological analytes required for annual biological surveillance, and which is conducted as a condition of their NRC operating license.

The 2006 Radiological Environmental Monitoring Program (REMP) conducted by Entergy Inc. for its Indian Point Nuclear Power Plant detected the presence of Sr⁹⁰ in four of 10 samples of fish taken from the Hudson River. One of five samples from the indicator location near the plant discharge and three of five samples from an upstream "control" location near the Roseton Power Plant contained Sr⁹⁰ above detection limits (Table 1). The tissues analyzed were edible flesh of composited fish of several species. However, it has been determined by DEC that the home ranges of at least some of the fish species, and all the striped bass, either could or would overlap the two sampling sites. The samples may not represent independent sampling sites.

Upon review of the data, including comparison with data for other facilities and historical information, Entergy concluded that the Sr⁹⁰ levels found are low and appear to be indistinguishable from background levels. DOH and DEC have concurred but also concluded that additional work is needed to enhance the level of confidence in the data and the conclusions drawn from the data. The concentrations of Sr⁹⁰ residuals appear to be consistent with those

expected as a consequence of fallout from nuclear weapons testing in the 1950's and 1960's.

DEC, DOH, NRC and Entergy have concurred that a limited one time enhancement of fish surveillance for Sr^{90} is to be conducted in spring 2007. Entergy will be conducting Sr^{90} analysis on edible tissues of a revised list of fish or shellfish species, if available at the time of sampling. Due to public concern and the fact that Sr^{90} accumulates preferentially in bone, the government agencies have opted to conduct additional Sr^{90} analyses of the bones of the fish samples. This QAPP addresses the methods to be employed for these latter analyses, the responsible parties, and the project is defined as beginning following delivery of fish carcasses by Entergy or their contractors.

B. General description of enhanced Sr^{90} surveillance program

The routine surveillance of fish for radiological analytes consists of analysis of edible tissues taken from at least two important commercial and/or recreational fish or invertebrate species. Target species include striped bass, white perch, American eel, catfish (channel or white), sunfishes (e.g., pumpkinseed, bluegill, or redbreast sunfish), and blue crab. Sampling occurs in spring and fall at two locations, i.e., the vicinity of the Indian Point Nuclear Power Plant (the indicator station at approximate river mile 42) and the vicinity of the Roseton Power Generating Station (the "control" location at approximate river mile ___) (Figure 1). Typically, one composite sample of each species from each location is analyzed for a host of radio-nucleids, and in 2006 and the current study Sr^{90} . Sampling is conducted by Normandeau Associates, Inc. (under contract with Entergy) and the samples consist of by-catch taken as a consequence of sampling for other purposes. The sample mass of edible tissues (1200 g/sample) taken is sufficient for a three-way split of each sample for analysis by contract laboratories for Entergy and NRC, and by the DOH radiological laboratory.

The enhancements for this one time effort include the addition of carp (a benthic feeder) to the species target list and sampling fish at a third location, i.e., the Catskill Region defined in the Longitudinal River Survey as the river reach between river miles 107 and 125 (Figure 1). This upstream location assures appropriate separation of populations of resident fish species and, consequently, removal of the resident fish populations from the potential influence of the Indian Point facility. Special effort will be made to obtain all the species from each location, if available, by standard means and with alternative sampling methods, if needed.

In addition to the enhancements noted above, the carcasses of each sample are to be retained and provided to the government for examination of Sr^{90} in bone of fish, and if available, the carapace of blue crab. The QAPP below addresses these samples from the point of receipt of the carcass samples through analysis and reporting of the analytical findings.

C. Objectives

1. To improve the assessment of the suitability the "control" station as a representative

and adequate reference station for the Indian Point Nuclear Power Plant;

2. To examine the potential for spatial differences in Sr^{90} concentrations in resident fish populations within the Hudson River estuary;
3. To further examine whether Sr^{90} concentrations, as represented by Sr^{90} concentrations in bone of fish, may be present at levels greater than background;
4. *[others?]* [Inform public?]

D. Data usage

The information to be obtained is directed toward improving an understanding of the relationship of the "control" station to the indicator station and to assess whether there may be cause for concern about Sr^{90} concentrations in bone of fish as a surrogate for potential human exposures.

E. Project design and rationale

The carcasses of each composite fish and/or invertebrate sample from the enhanced REMP shall be provided to _____, and shall be accompanied by collection record and chain of custody documentation. To the extent feasible, soft tissues and fins will be removed manually from each sample and discarded. The remaining bones and soft tissues of individual samples will be placed in individual labeled food grade plastic containers containing a colony of dermestid beetles, be closed, and shall remain in the container until the beetles have consumed remaining soft tissues. *[Note: Other common bone preparation methods, including boiling or treatment with mild acids and/or alkalis, may increase bone porosity and may encourage loss of Sr^{90} prior to the bones being subject to chemical analysis. Such bone preparation methods are to be avoided.]* Upon removal of skeletal and cranial bones (fins are to be excluded) from the containers, the bones are to be inspected for any remaining soft tissue fragments; such fragments are to be removed manually, if possible. The bones of each sample are to be broken into minute fragments, powder consistency if possible, by use of a Waring (or similar make) blender. Large bones may require pounding to create smaller bone fragments prior to placement in a blender, e.g., place the bones within a plastic, seal, cover top and bottom with a towel, and pound with a mallet or hammer.

Two subsamples are to be made from each sample. Preferred sample mass for each subsample is at least ___ g, although smaller mass per subsample is acceptable if greater than ___ g each. Each subsample shall be placed in a chemically clean clear glass jar, sealed and appropriately labeled. One subsample from each sample shall be sent to the DOH Radiological Laboratory (*contact, phone and address needed*), and the remaining sets of subsamples are to be delivered to the NRC contract laboratory (*name, contact, phone and address needed*). An analytical request and chain of custody must accompany the samples.

E. Analyte list, methods, detection limits, accuracy and precision determinations

See Table 2. Pertinent information is provided for both laboratories conducting the radiological analyses.

8. Environmental Outputs/Outcomes/Deliverables

Outputs:

Concentrations of Sr⁹⁰ (*and other radionuclides?*) present in bone of fish taken from the Hudson River during spring 2007.

Outcomes:

A limited assessment of the status of Sr⁹⁰ (*and other radionuclides?*) in bone of Hudson River fish, including a limited assessment of the potential for spatial differences in Sr⁹⁰ (*and other radionuclides?*) and an assessment of the relationship to anticipated background levels of Sr⁹⁰ (*and other radionuclides?*).

Deliverables:

Information
Report

9. Project fiscal information:

The following summarizes anticipated cost estimates for the conduct of this project.

<u>Type of cost</u>	<u>NYSDEC</u>	<u>NYSDOH</u>	<u>NRC</u>
Personnel			
Fringe benefits			
Indirect costs			
Non-personal services			
- Supplies/materials			
- Travel			
- Contractual services			
- Equipment			
Totals			

10. Schedule of Tasks:

Generalized time frames for the conduct of this project follow.

<u>Activity</u>	<u>Time frame</u>
Sample receipt	July 2007
Sample preparation	August/September 2007
Ship samples to laboratories	September 2007
Radiological analyses	September - _____, 2007
Reporting	?

11. Project organization:

Figure 2 provides a schematic of the project organization and responsibilities.

12. Data quality assessments:

[Consult with DOH and NRC - incorporate input]

13. Calibration procedures and preventative maintenance:

[Consult with DOH and NRC - incorporate input]

14. Documentation, data reduction, and reporting

[Consult with DOH and NRC - incorporate input]

15. Data validation:

[Develop Table 3 to address from the point of sample receipt and thereafter]

16. Performance and system audits:

[Consult with DEC Radiation section, DOH and NRC - incorporate input]

17. Corrective actions:

[Consult with DOH and NRC - incorporate input]

18. Reports:

A data report in memorandum form shall be provided to the following individuals.

NYSDEC

Barbara Youngberg
Timothy Rice
Larry Skinner
Larry Wilson
Larry Rosenmann
Alex Czuhanych
Edwin Dassatti

NRC

John White
James Noggle
James Kottan
Timothy Fry
Adam Schwartzmann
Steve Geary

Normandeau Associates, Inc.

Michael Ritchie

NYSDOH

Edward Horn
Anthony Forti
Robert Snyder
Steve Gavitt

Entergy, Inc.

Tom Burns
James Furfaro
Joseph Adler
Don Croulet
Dara Gray
Gary Ré
Gary Hinrichs
Steve Sandike
Pat Donahue

{Others?}

19. References *[eliminate if none included]*

Table 1: Summary of Sr⁹⁰ concentrations in edible tissues of fish taken from the lower Hudson River in 2006.

Location	Species	Sr ⁹⁰ concentration (pCi/kg)	
		Measured detection limit (DL)	Sample
Indian Point Nuclear Power Plant (indicator site)	Striped bass	8.5	<DL
	Blue crab	5.7	<DL
	American eel	7.1	<DL
	Catfish	6.4	<DL
	Sunfish	15	<DL
	White perch	9.0	18.8
Roseton Power Generating Station ("control" site)	Striped bass	4.2	<DL
	Blue crab	11.0	13.6
	American eel	4.3	<DL
	Catfish	7.6	<DL
	Sunfish	9.6	17.1
	White perch	8.7	24.5

Table 2: *{Analyte list and related info}*

Table 3: Review, verification and validation of project processes and data.

Figure 1: {MAP - see Mike Kane}

Figure 2: Schematic of project organizational responsibilities.

