



**CERTIFIED MAIL**

August 15, 2006

Kent Tosch  
Manager  
Radiation Protection Programs  
Bureau of Nuclear Engineering  
New Jersey Department of Environmental Protection  
33 Arctic Parkway  
Trenton, New Jersey 08625

Dear Mr. Tosch:

**QUARTERLY REMEDIAL ACTION PROGRESS REPORT, SECOND QUARTER 2006  
PSEG NUCLEAR, LLC, SALEM GENERATING STATION**

PSEG Nuclear LLC (PSEG) has prepared this Quarterly Remedial Action Progress Report (RAPR) to provide a summary of groundwater remediation activities conducted since the submission of the first quarter 2006 RAPR at PSEG's Salem Generating Station (the Station). We are transmitting 3 copies of this report to you.

**Continued Groundwater Monitoring**

Groundwater elevations and tritium concentrations in groundwater continue to be monitored as part of the regular site monitoring program. These two metrics are used to evaluate the control that the Groundwater Recovery System (GRS) maintains over the shallow groundwater in the general area of the plume.

Drawing 1 present the groundwater levels in May 2006. From Drawing 1 it is apparent that the GRS is effectively reducing the groundwater elevation in the area of the plume to below the mean river level elevation creating an inward gradient from the river to the Unit 1 Yard area. The reduced water levels in the yard area serve to continue to effectively restrict the zone of groundwater containing tritium to within the limits of the PSEG protected area.

A001

Groundwater samples continue to be collected from the monitoring well network according to the agreed upon and published schedule. Drawing 2 presents the recent groundwater analytical results.

Beyond the limits of the cofferdam, tritium concentrations in groundwater samples continue to be generally stable or decreasing. Well W has shown a slight increase in concentration, and is scheduled to be spot remediated following Well AM. Well S has not been operating recently due to low yield. This has temporarily reduced the GRS effectiveness on this portion of the plume. Well AM also increased in concentration in March, believed to be caused by the movement of a localized small tritium plume. The mobile unit has been placed in service to address the concentrations in Well AM. The use of the mobile unit has previously been effective in reducing the increased concentrations of tritium observed last year in samples from well AP.

To date the groundwater analytical data continues to indicate that the GRS is effective at recovering tritium and thereby reducing the overall amount of tritium in groundwater. The pilot system and the GRS have removed approximately 2.13 curies of the originally projected 8 to 10 curies in the shallow groundwater. Note that this estimate did not originally consider the curies of tritium still in the seismic gap, and therefore, the remediation is estimated to be approximately 21% complete at this time.

PSEG is currently reassessing the initial plume tritium curie estimate, based on current monitoring data and monitoring results. This will be reported in a subsequent RAPR.

## **Groundwater Extraction**

In accordance with the RAWP, groundwater extraction activities continue using the GRS that was activated on February 16, 2005.

## **Mobile Groundwater Extraction Unit**

The mobile unit was designed as a means to spot remediate localized areas of higher tritium concentrations that were expected to occur during the remediation of the tritium plume in the Unit 1 yard area. These areas of varying tritium concentrations were anticipated as a result of the complex underground infrastructure present at this facility.

The unit was recently mobilized to address tritium concentrations in Well AM. Additionally, Well W, located approximately at the edge of the present plume will be spot remediated after Well AM tritium concentrations have been reduced. Concentrations of tritium have trended down to slightly above the New Jersey Groundwater Quality Criteria (GWQC) of 20,000 picocuries per liter (pCi/L). At Well AM a recent increase in tritium concentrations of approximately one order of magnitude is believed to be associated with a period of increased precipitation (the period October 2005-June 2006 is the sixth wettest on record) causing local movement of tritiated water.

Initial results indicate that the spot remediation activities at Well AM to address the higher concentrations observed there in recent months have been successful in

reducing the tritium concentrations. Initial monitoring sample screening indications from Salem Chemistry suggest that concentrations have peaked and are now decreasing in this well. The mobile unit will continue to be operated at Well AM until tritium concentrations have been shown to be steadily decreasing. After this point the mobile unit will be relocated to Well W to address the concentrations there, should they persist above the NJDEPGWQC.

## Full-Scale System

The present GRS system configuration includes Wells AB, AD, AJ, AN, AO, AS and AT, (as noted previously, Well S is not currently operating due to low yield). As of June 30, 2006, the GRS system has recovered greater than 9.3 million gallons of groundwater. Total well field operations have resulted in the recovery of 2.13 curies. The results of the groundwater remediation activities conducted using the well field are summarized on **Drawing 3**. The recent average system effluent concentrations have been approximately 20,000 pCi/L. Thus the composite tritium concentration in groundwater extracted from the active GRS extraction wells is nominally at or slightly below the New Jersey Groundwater Quality Criteria.

The various groundwater recovery activities conducted to date have been, and continue to be successful in recovering tritium from groundwater at and down gradient of the Salem Unit-1 seismic gap.

## Operation of the Seismic Gap Drain

To date, periodic operation of the seismic gap drain in Unit 1 has resulted in the recovery of approximately 35,500 gallons of tritiated water. The Unit 1 gap is drained consistently on a weekly basis. **Drawing 4**, presents a summary of the activity of the Unit 1 Seismic Gap drain. As of June 29, 2006 a total of approximately 5.85 curies of tritium has been recovered from the operation of the Unit 1 seismic gap drain. Recent tritium concentrations in water collected from the Unit 1 seismic gap have been in the range of 71 million pCi/L. This recent increase in recovered concentrations has increased the cumulative curies recovered from the Unit 1 seismic gap. This increase is believed to be associated with an increased availability of groundwater through the Seismic Gap associated with the increased precipitation for the period October 2005 to June 2006. Additionally the increased draining frequency that has been put into effect as part of station operating procedures has resulted in an increased recovery rate of tritium. The combination of these two factors is responsible for the step change increase in the slope of cumulative tritium recovered through the seismic gap as expected.

A portion of the curie content of the seismic gap drain effluent is from water that has been drawn back into the seismic gap from the environment due to the ingradient created during the draining activities. This cannot be specifically quantified and therefore the curies removed from the seismic gap are conservatively not included in the estimate of curies removed from the plume.

The Unit 2 gap is also drained on a weekly basis and recovered water continues to indicate a low tritium level and no plant related gamma activity.

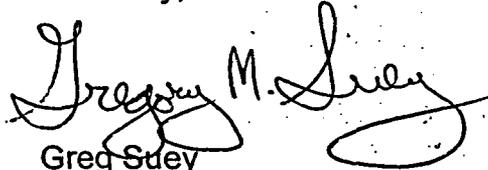
### Upcoming Activities

Activities projected for the Third Quarter of 2006 (July through September) include the following:

- Periodic download of data from permanent data-logging pressure transducers installed in 14 wells throughout the south yard area to demonstrate that groundwater extraction is effectively maintaining hydraulic control;
- Continued groundwater monitoring activities in accordance with the schedule;
- Continued operation and evaluation of data obtained through the full-scale groundwater extraction system;
- Continued mobile unit spot remediation; and,
- Continued seismic gap draining.

If you have any questions or comments regarding the contents of this report, please do not hesitate to contact me at (856) 339- 5066.

Sincerely,



Greg Stuey  
Manager – Salem Chemistry and  
Environmental

C Ron Nimitz- NRC  
NRC – Salem Resident Inspector  
NRC – Document Room

BC: Steve Mannon S05  
Fredric Bevington S07  
William Biggs S07  
Richard Blackman T17  
Brendan Daly S07  
Carl Fricker S02  
Clifton Gibson N21  
Edward Keating N33  
John Leopardi S07  
Stan LaBruna T17A  
Christopher McAuliffe T5C  
Jeff Pantazes N21  
Phillip Quick S07  
File#Groundwater

EXTERNAL

Zigmund Karpa, Exelon  
Peter Milionis, ARCADIS  
Bradley Pierce, ARCADIS  
Scott Potter, PhD., ARCADIS  
Christopher Sharpe, ARCADIS

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FIGURE,  
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DRAWING NO.: 1  
"WATER TABLE ELEVATION  
CONTOURS DURING OPERATION OF  
THE PERMANENT SYSTEM,  
MAY 16, 2006"**

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DOCUMENT/REPORT  
DRAWING NO. 1**

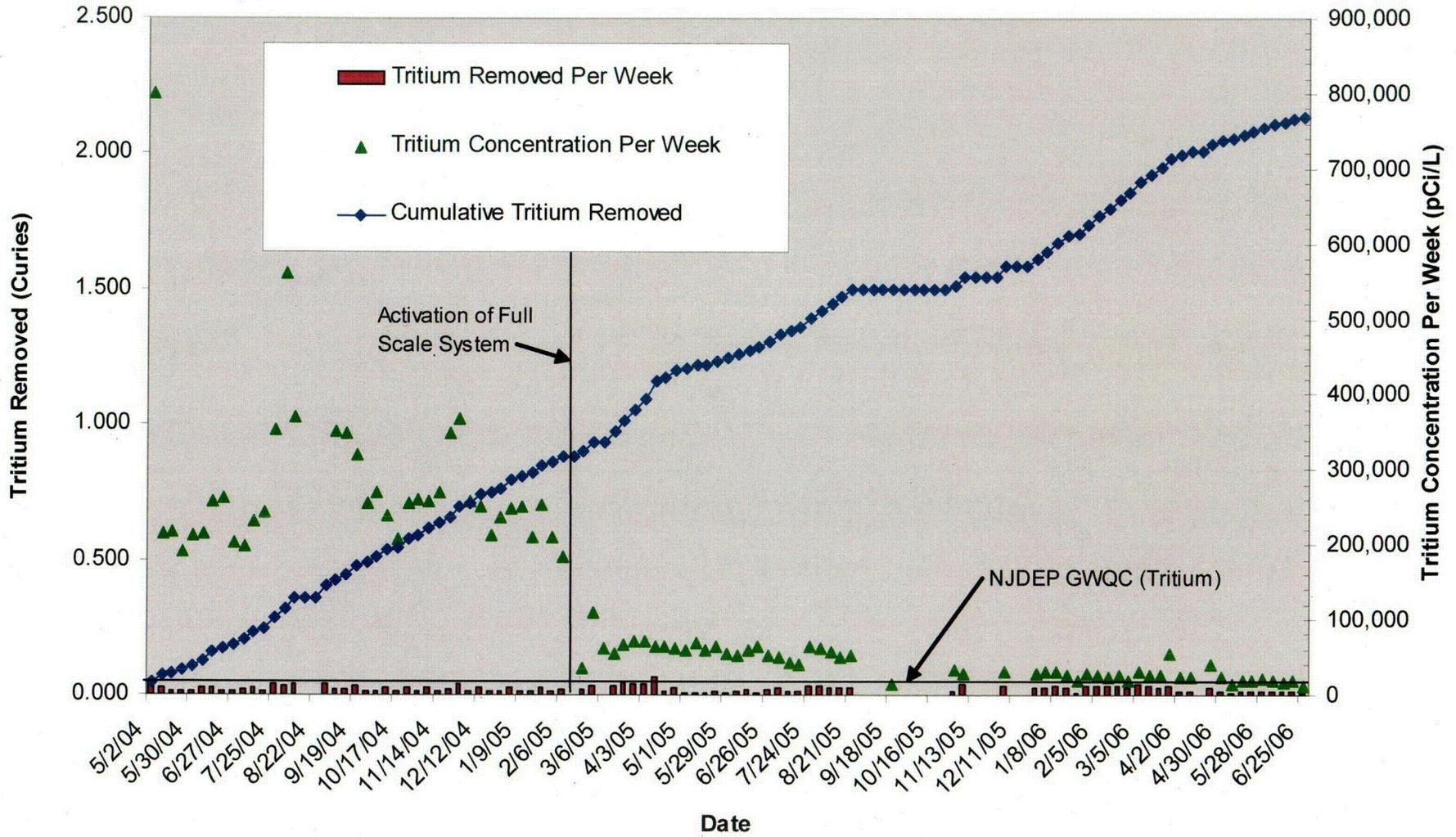
**D-01**

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"GROUNDWATER TRITIUM  
RESULTS"**

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**D-02**

# PSEG Nuclear, LLC Salem Generating Station - Unit 1 Tritium Recovered Through Well Field Operation



G:\PROJECT\PSE&G\Salem - Unit 1 - Tritium\NP000571.0005 - Continued Reporting and Recovery\CADD\RAPR'S\RAPR 7\FIG-03 HISTORIC TRITIUM RECOVERED THROUGH WELL FIELD OPERATION.D  
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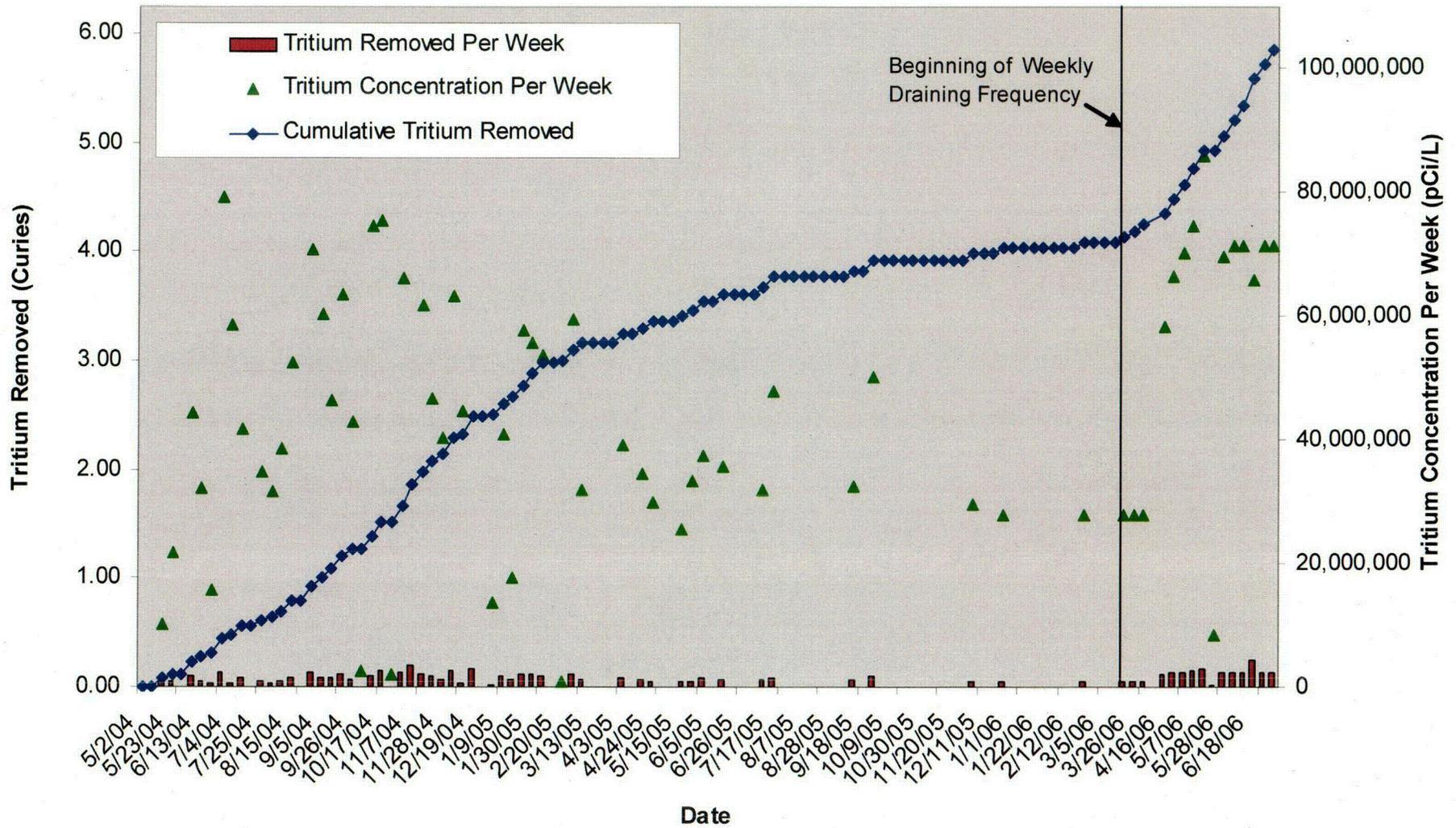
**ARCADIS**



PSEG NUCLEAR, LLC  
SALEM GENERATING STATION  
ARTIFICIAL ISLAND  
HANCOCK'S BRIDGE, NEW JERSEY

DRAWN M. WASILEWSKI	DATE 8/17/06	PROJECT MANAGER P. MILONIS	DEPARTMENT MANAGER M. BEDARD
HISTORIC TRITIUM RECOVERED THROUGH WELL FIELD OPERATION		LEAD DESIGN PROF. S. POTTER	CHECKED C. SHARPE
		PROJECT NUMBER NP000571.0005	DRAWING NUMBER 3

## PSEG Nuclear, LLC Salem Generating Station - Unit 1 Tritium Recovered Through Seismic Gap Drain Operation



G:\PROJECT\PSE&G\Salem - Unit 1 - Tritium Reporting and Recovery\CADD\RAPR\7\FIG-04 TRITIUM RECOVERED THROUGH SEISMIC GAP DRAIN OPERATION.DWG  
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SALEM GENERATING STATION  
ARTIFICIAL ISLAND  
HANCOCK'S BRIDGE, NEW JERSEY

DRAWN M. WASILEWSKI	DATE 8/1/06	PROJECT MANAGER P. MILONIS	DEPARTMENT MANAGER M. BEDARD
HISTORIC TRITIUM RECOVERED THROUGH SEISMIC GAP DRAIN OPERATION		LEAD DESIGN PROF. S. POTTER	CHECKED C. SHARPE
		PROJECT NUMBER NP000571.0005	DRAWING NUMBER 4