November 17, 2006

MEMORANDUM TO: A. Randolph Blough, Director
Division of Reactor Safety
Region I

Joseph W. Shea, Director
Division of Reactor Safety
Region II

Cynthia D. Pederson, Director
Division of Reactor Safety
Region III

Dwight D. Chamberlain, Director
Division of Reactor Safety
Region IV

FROM: Elmo E. Collins, Director */RA/*
Division of Inspection and Regional Support
Office of Nuclear Reactor Regulation

SUBJECT: REQUEST FOR REGIONAL REVIEW OF SITE-SPECIFIC RESPONSES TO THE NEI GROUND WATER QUESTIONNAIRE

This memorandum is to request your assistance and to provide guidance for the review of the Nuclear Energy Institute (NEI) ground water questionnaire responses for each site in your region. These questionnaire responses were submitted to the Nuclear Regulatory Commission by the licensee for each site as part of the industry voluntary groundwater protection initiative (GPI).

As described in the NEI guidance for the GPI, several short and long term actions are being taken by the industry to not only identify previous spills and leaks of radioactive liquids, but also to evaluate monitoring and remediation capabilities at each site to address these groundwater contamination events. The staff have reviewed the voluntary actions proposed by the industry as part of the GPI, and have concluded that they should be effective if implemented consistently across the industry. However, the staff needs to continue to interact with the industry and monitor and assess the implementation of the GPI to evaluate whether additional regulatory actions are needed to address this issue.

CONTACT: Timothy Frye, NRR/DIRS
(301) 415-9676

L-4

Headquarters staff have done a cursory review of the questionnaire responses, and have summarized the results for all sites in attachment 1, "Summary of NEI Ground Water Protection Initiative Questionnaire Plant Response Data." We request that the regional Health Physics inspectors perform a more detailed review of each questionnaire response to assess how complete and accurate the information is that has been provided on the historical spills and leaks for a given site. Regional inspectors should compare the licensee questionnaire responses to information and knowledge previously collected for each site to answer the six worksheet questions found in attachment 2 of this memorandum.

To complete the worksheet each reviewer should gather together previously collected and/or licensee reported information on each site's ground-water monitoring program and methods, ground-water monitoring results, 50.75 (g) file, and any information on past and current remediation efforts. The word "information," for the purposes of this worksheet, is defined as: (1) any knowledge formally or informally collected by regional Health Physics staff and (2) any corporate knowledge an inspector may have acquired during his or her career (this knowledge should have some certainty associated with it, e.g. the inspector is relatively certain that the spill/leak occurred and a large volume was spilled, but is not necessarily certain about the exact details of the leak). The information used in the review need not have been formally docketed. The reviewer should also list all sources of information that were used to complete the worksheet, other than the attached spreadsheet.

It is expected that each review should take no more than four hours per questionnaire. Please send the completed review worksheet to Timothy Frye, Chief, Health Physics Branch, by Friday, January 19, 2007. Time charged for this effort should be charged to TAC No. MD2962.

Enclosures:
As stated

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Enclosures:
As stated

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DATE	10/19/06	10/23/06	11/17/06

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WORKSHEET TO REVIEW SITE-SPECIFIC NEI GROUND WATER QUESTIONNAIRE RESPONSES

Operating Utility:
Nuclear Power Plant:
Reviewer:

		Circle One	
1.	Is there any kind of onsite ground water monitoring being performed? If not, skip questions 2 and 5.	**Yes**	**No**
2.	Do the number of onsite ground water sampling locations reported in the questionnaire match the information you have collected previously and any corporate knowledge you are aware of? If not, briefly describe any differences:	**Yes**	**No**
3.	Review whether onsite and/or offsite contamination was reported. Does this agree with your information? If not, briefly describe why:	**Yes**	**No**
4.	Do the **number** and **sources** of leaks/spills reported in the questionnaire match your information? If not, briefly describe any differences or reasons why not:	**Yes**	**No**

5. Were ground water activity levels greater than EPA limits reported? **Yes** **No**

   Does this agree with your information? If not, describe why:

6. Does the site remediate spills or leaks? **Yes** **No**

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   Does this agree with your information? If not, describe why:

6. Does the site remediate spills or leaks? **Yes** **No**

Summary of NEI Ground Water Protection Initiative Questionnaire Plant Response Data

Plant	Total no. of leaks	Onsite and/or offsite contamination found	Activity > EPA limits?	Radionuclides detected above MDA levels	Where was activity > EPA limits?	Source(s) of contamination[4]	Onsite ground water sampling locations[4]	Remediation (in addition to repairs)	Technical review of systems (beyond walkdowns)?	Submittal relative to July 31st deadline?
Arkansas Nuclear One	1	Onsite	No information	No information	n/a	SF pool tilt pit overflow	None - no ground water monitoring performed	None	No	On
Beaver Valley 1 & 2	9	Onsite	No	No information	n/a	Unit 1 (U1) Primary Grade Storage Water Tank spills, RWST leak, Liquid Waste Storage Tank leak, plant sumps sent radioactive water to catch basin	None, only catch basin (storm drain)	None	No	On
Braidwood	5, see report	Both	Yes	Tritium	Circulating Water Blowdown (CWBD) Vacuum breaker vaults	A heating system relief valve dischcarge, CW vacuum breaker valves, steam release from the turbine bulding (for more details, see Braidwood's hydrological investigation report)	21 + 200 temporary	Yes	Yes - leak detectors for each VB valve and preventative maintenance surveys of tanks and underground piping	Before
Browns Ferry	4	Onsite	No	Tritium, Co-60, Cs-137	n/a	Unit 3 (U3) Condenser Circulating Water conduit, overflow of the cooling tower basin, HPCI test return line break, the Radwaste Ball Joint vault	4 onsite wells and 4 additional ground water sampling locations will be added	Cleaned up of spills and some soil removal	Yes - one time pressure testing of the radwaste discharge lines	After
Brunswick 1 & 2	1	Onsite	Yes	1.39E6 pCi/L tritium	Backfill of the protected area due to discharge line leaks	Aux boiler release, radwaste discharge line leaks, low level warehouse sump, storm drain stabilization pond	8 wells	None - only monitoring. No ground water remediation has been warranted	Yes - pressure testing	Before
Byron	>4	Both	No	Tritium - offsite ~<3700 pCi/l	n/a	CWBD fiberglass line, Containment Access Facility, treated runoff ponds and sewage treatment drying beds, vacuum breaker vaults	19 wells + 22 along CW Makeup and Blowdown lines to the river	None - only monitoring. Review of sample results and hydrology indicate no migration	Yes - leakage monitors inside the relief valve vaults of the CWBD	Before
Callaway	8	Onsite	Yes	Tritium, Co-60, Cs-137	ARV manhole shows 25,863 pCi/L of tritium	Discharge pipeline breaks, backflow eddy which carries plant effluent discharge upriver to plant intake, Air Release Valve's (ARVs) which contaminate french drains and groundwater in the vicinity of the associated manholes	6 wells + sump next to SFP building	Still characterizing	No	After
Calvert Cliffs	1	Onsite	No	Tritium	n/a	Eroded pipe connected to the plant circulating water system	REMP - 5 shallow wells, deep wells used if necessary	Yes, monitoring and excavation used as necessary, see 50.75 (g) file for more details	No	On

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Catawba	5	Onsite	No	Tritium - low levels in groundwater around Conventional Waste Water (WC) ponds	n/a	The groundwater drainage system has levels of tritium above EPA limits (~30,000 pCi/L). Several small leaks from systems. Also WC ponds.	10 wells, 2 offsite residential wells and groundwater drainage system	None. Will evaluate need to remediate leakage from WC ponds.	No	After
Clinton Power Station	See hydological investigation report (report[3])	See report	No	See report	n/a	See report	14 wells	None	No	Before
Columbia[1]	5	Onsite	No	Tritium in excess of EPA limits due to USDOE Hanford	US DOE Hanford site contaminated onsite CGS groundwater	Turbine building sumps, cross connection with Hanford, circulating water blowdown line, sediment from cleanout of the service water spray ponds	Plant on Hanford site 700 wells at Hanford. 3 drinking water wells on CGS site + discharge to storm drain pond	Yes, sediment that was discovered to be contaminated was moved to specific onsite location with State agreement	No	Before
Comanche Peak	None	n/a	No	n/a	n/a	n/a	8 shallow wells and artesian basin	n/a	No	Before
Cooper	None	n/a	n/a	n/a	n/a	n/a	2 groundwater and 2 drinking wells	None	No	On
Crystal River Unit 3	1	Onsite	No	Tritium	n/a	Fiberglass wastewater line leak	No onsite wells - REMP has all offsite wells	Yes, soil was excavated and disposed	No	Before
D. C. Cook	4	Onsite	No	Tritium, Cs-134, Cs-137 and Co-60	n/a	Significant primary to secondary leakage in old SGs lead to ground-water contamination through absorption pond. This is an identified release path in ODCM. On-site disposal of contaminated absorption pond dredging, heating boiler fuel oil system, SG startup flash tank vents	15 onsite REMP wells, 4 of which are around the U2 SG mausoleum. Also sample storm water drains, turbine room sump, absorption pond.	SGs replaced and tritium levels are carefully monitored in ground water (which flows toward Lake Michigan) to determine and fix the presence of leaks. Hydrology study was performed in 1991	Yes - fuel oil tank and pipe integrity testing programs for underground storage tanks that contain potentially contaminated oil	On
Davis-Besse	4	Onsite	No	Cs-134,Cs-137, trititum (average of 1000 pCi/L)	n/a	Backwash Receiver Tank leak, Hydrogen Addition System, pump discharge hose for the North Settling Basin, contaminated secondary resin in the South Settling Basin	1 well + catch basin	Yes, contaminated soil was excavated and disposed of	No	On

Plant	Total no. of leaks	Onsite and/or offsite contamination found	Activity > EPA limits?	Radionuclides detected above MDA levels	Where was activity > EPA limits?	Source(s) of contamination[4]	Onsite ground water sampling locations[4]	Remediation (in addition to repairs)	Technical review of systems (beyond walkdowns)?	Submittal relative to July 31st deadline?
Diablo Canyon	1	Onsite	No	Tritium and C-14	n/a	Release to inappropriate floor drain eventually evaporated on an asphalt covered area	Additional sample locations have been added near U1 and U2 containment foundation sumps, the aux french drain system, Diablo Creek and beach samples - no potable water (near ocean).	None	No mention	On
Dresden	4	Onsite, see report	Yes	Tritium (>20,000 pCi/L)	Wells inside the Protected Area due to HPCI leaks	SFP overflow, High Pressure Core Injection (HPCI) piping leaks, contaminated demin water line leak, river water discharge isolation valve leak	57 wells. Plans to add 21 more	Yes, excavating and disposal of soil/blacktop	No	Before
Duane Arnold	1	Onsite	No	No information	n/a	Barrel of condensate water tipped over, pit that surrounds the condensate storage tanks	Common header to 4 onsite REMP wells, sewage plant liquid effluent, precipitation, circulating water, and three non-radioactive release points	None	Yes - operational leak testing of radioactive systems each cycle	On
Farley	3	Onsite	No	No information	n/a	Concrete radwaste pad; underground rad liquid effluent release line, underground SG blowdown discharge line.	Drinking water wells are sampled and groundwater wells will be in the future. Containment access gallery sump sampling and yard drains are also sampled	Contaminated soil was drummed up and shipped for offsite disposal	No	On
Fermi 2	2	Onsite	No	No information	n/a	CST spill and leak	4 onsite REMP wells + 14 decommissioning wells around Fermi 1	None, contaminated soil stored onsite	No	Before
Fort Calhoun	2	Onsite	No	No information	n/a	Safety Injection Refueling Water Tank (SIRWT), Reverse Osmosis piping.	3 wells and 1 offsite well	Yes, soil was excavated and disposed of for SIRWT spill	No	On
Grand Gulf	4	Onsite	No	Tritium	n/a	Contaminated hydrolaser, Plant Chilled Water System, SFP hydrolaser activities	3 drinking water wells	Yes, clean up was performed - removal of water and soil	No	On

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H. B. Robinson	10	Onsite	No	Tritium, and particulate activity	n/a	RWST spill during safety injection system testing, RWST overflow, SG A leak, 2 gal spill when tanker was overfilled with Waste Disposal System water, Boron Injection Tank termowell coupling failure, RWST leak through isolation valve, temporary tank leak, lab radioactive waste drains leak, abandoned waste evaporator cooling tower leak, resin fill valve leakage	1 REMP well and 1 offsite artesian REMP well	None needed for groundwater, some contamination kept in place with NRC approval and some soil removed and disposed of	No	Before
Haddam Neck	11	Onsite	Yes	Tritium	One well (20,800pCi/L decreasing over time)	Various including 200,000 gal from rx cavity seal ring failure.	45 wells	Almost decommissioned, significant remediation has been done	No	Before
Hatch	7	Onsite	Yes	Tritium	A few onsite test wells near the leaks have seen > EPA limits tritium levels over the years. Yard drain systems and outfalls have also occasionally seen levels > EPA limits	SFP expansion bellows deflation, rad. water tanks and components, demineralized water isolation valve failure, outside radioactive water tank transfer pump piping deterioration, underground radioactive liquid line break, abandoned underground line, outside radioactive water storage tank transfer pump seal and piping failures and discharges, subsurface drain discharges	Several wells including test wells, drinking wells, piezometer wells and drain sumps	Yes, enhanced ground-water monitoring, fixed leaks, hired hydrologist	Yes, radioactive underground piping integrity scans, periodic inspections and preventative maintenance on outside equipment	On
Hope Creek	none, see report	n/a	No	n/a	n/a	n/a	13 shallow wells	None, no contamination present in onsite or offsite ground water	No	Before
Humboldt Bay	7	Onsite	No	Tritium	n/a	Acid tank water spill, overflow of LRW concentrator, overflow of condensate tank, overflow of condensate demineralizers, ultrasonic water spill, radwaste spills, condensate pump spill to yard drain, contaminated resin leak in offgas tunnel	5 SPF wells, groundwater leakage into the reactor caisson. Once from three wells down gradient of the offgas tunnel	Currently in SAFSTOR status. Will be decommissioned after ISFSI is constructed and loaded with HBPP fuel. Decommissioning requirements will be met.	Most systems, except for SFP have been drained	On

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Indian Point 1, 2 and 3	Several	Onsite	Yes	Sr-90 and tritium	Near Unit 1 & 2 (U1 & U2) SFPs	SFPs, storm drains with contaminated sediment resulting from spills, and an impoundment containing contaminated soil from U1 septic leach field	> 30 wells	Yes	Inspections of systems, structures and components to identify potential leak points	On
James E. FitzPatrick	2	Onsite	No	No information	n/a	Radioactive material was discharged from the boiler to the atmosphere via the *aux boiler pressure relief* valve. The aux boiler was contaminated and over pressurized from the liquid radioactive waste evaporator bottoms. Rain brought the resulting contamination to Lake Ontario. Also, de-silting of the inlet canal forebay and the inlet canal reverse flow *crosstie tunnel resulted in* contaminated sediment materials that were subsequently "stabalized"	None, sump is sampled that collects ground water and *surface water run-off* from vacinity of rx building excavation	Recovery plan and radiological assessment was *developed for the* aux boiler release	No	After
Kewaunee	None, but reviewing records	n/a	No	n/a	n/a	n/a	2 potable wells + 5 surface water locations	None	No	After
LaSalle	2 are significant, based on *report*	Onsite	No	No information	n/a	HPCS return line to the Cycled Condensate (CY) storage tank line break, U2 CY storage tank overflow	1 drinking well sample,17 permanent wells, 5 temp wells along radwaste discharge line and blowdown	None, except for excavation and disposal of soil for line break	No	On
Limerick	1, see report	Onsite	No	See report	n/a	Steam seal evaporator *leak, see report*	15 wells	Yes, evaporator leak *gravel contamination* was disposed of.	No	Before
McGuire	6	Onsite	No	Tritium - -30,000 pCi/L found in drainage system *near* aux building and low levels in groundwater near waste water hold-up ponds	n/a	RMWST rupture, RWST spill, U1 reactor coolant drain tank leak, Groundwater Drainage System Sump, pipe trench between the radwaste facility and the solidification pad	8 wells and ground water drainage system	None. Surronding groundwater flows into the McGurie ground water drainage system, due to higher ground water elevations around the plant. May line WC ponds to reduce low levels of tritium in groundwater around pond	No	After

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Millstone	10	No information - refers the reader to 50.75 (g) file	No	No information - refers the reader to 50.75 (g) file	n/a	No information - refers the reader to 50.75 (g) file	30 wells inside protected area, two of which are sampled on a rotating basis + catch basins, and Unit 3 containment under-drains	Yes, clean up of soil/gravel/asphalt has occurred in response to spills or leaks. Further remediation will be performed during decommissioning	No	After
Monticello	None	n/a	n/a	n/a	n/a	n/a	1 potable well +1 residential well + 1 public well - all are REMP wells	n/a	No	On
Nine Mile Point	none	n/a	no	n/a	n/a	n/a	Several shallow wells, storm drains for NMP-2 that include ground water and building sumps in NMP-1 and 2	n/a	No	On
North Anna	56	No information - refers the reader to 50.75 (g) file	No	No information	n/a	No information - refers the reader to 50.75 (g) file	3 wells + storm drain out falls and subsurface drains	Yes, clean up of soil/gravel/asphalt has occurred in response to spills or leaks. Further remediation will be performed during decommissioning	No	After
Oconee	25	Onsite	No	Tritium	n/a	Several small spills, inservice letdown filter vent line spill, Chem-Nuclear Transport tanker spill, overflow of chemical treatment pond, SFP and FTC spill when pump drain and vent valves were left open, High Activity Waste Tank backed up through floor drains in the HPI pump room, overflow of U3 Borated Water Storage Tank, secondary system contaminated due to SG tube leak, liquid waste disposal system leak, BWST spill due to freeze plug melting, SFP overflow, and ground water around chemical treatment ponds 1 and 2 has low levels of tritium	24 wells + 1 offsite residential well	CTP sludge is being stabilized and a synthetic liner is being added to the pond. Also, pipes between the ponds were slip lined	No	After

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Oyster Creek	See report	See report	No	See report	n/a	See report	15 wells, 88 that are available if needed, one onsite drinking water well, and two municipal water systems	None	Yes - Periodic testing and inspections of storage tanks and associated piping that may contain radioactive materials are controlled via storage tank and piping programs	On
Palisades	2	Onsite	No	No information	n/a	Utility water storage tank, cooling tower overflow that contacted contaminated equipment	3 REMP wells	Yes, soil removal + retained soil in accordance with 10 CFR 20.2002	No	On
Palo Verde	2	Onsite	Yes	Tritium (> 20,000 pCi/L)	Subsurface water within the Unit 3's Radiological Controlled Area	Historical Operation of the boric acid concentrator during rain events causing washout of tritiated water vapor, condensate water spills.	2 drinking wells, 4 offsite residential wells, 22 wells for Aquifer Protection Permit Ground Water monitoring program	Yes, accumulated subsurface tritiated water will be pumped that has been captured by sand and loose fill around buried underground utilities. New wells will be installed to ensure that the compacted soil, with its lower permeability, acts as a barrier and traps the water within the courser grained soils surrounding or underlying buried utilities. In addition, tanks will be replaced with above ground tanks	No	Before
Peach Bottom	1, see report	Onsite	No	No information, see report	n/a	CST overflow, see report	14 wells	Yes, soil was removed for CST overflow	No	Before
Perry	4	Onsite	No	Tritium (59,500 pCi/L in site underdrain system that captures leaks from plant systems and routes water to Emergency Service Water System)	n/a	ESW forebay silt contamination, Sealand container storing radioactive components, contaminated feedwater system water	None, underdrain system transfers ground water away from plant strutures and is sampled quarterly	None	No	On

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Pilgrim	12	Onsite	None performed	No information	n/a	Various small spills < 200 gal described. Resin leaked out of open valves on the condensate resin fill hopper of "B" Condensate Demineralizer. A spill through an open vent valve occurred while transferring SFP resin to the spent resin storage tank. Everything was decontaminated.	None - no ground water monitoring performed. Next to Atlantic. 4 storm drain outfalls are monitored.	None	No	On
Point Beach	2	Onsite	No	Tritium	n/a	SG tube rupture, buried discharge line to the retention pond	3 potable water wells	Yes, retention pond was remediated, most of buried line replaced	No	On
Prairie Island	2+	Both	No	Tritium, Co-60, Cs-134, Cs-137	n/a	Planned discharges of rad waste that seeped from the discharge canal, possibly from piping, turbine building sump discharge.	22 wells, seven offsite residential wells	Yes - double-walled discharge pipe installed and monitoring was increased. Contaminated soil removed after turbine building sump discharge.	No	On
Quad Cities	3, see report	Onsite	Yes	Tritium (32,000 pCi/L)	1 well	Feedwater leak, RHR heat exchanger leak during drainage, integrated leak rate compressor, see report	22 wells	Yes, excavating + removal of soil. Tritium plume is being characterized	No	On
R.E. Ginna	2	Onsite	Yes	Tritium (~20,000 pCi/L)	Downgradient sample wells	Degraded steam generator overboard blowdown piping, SG tube rupture	4 ground water and 1 bedrock well	Monitoring + piping was repaired and SG replaced	No	On
River Bend	4	Onsite	No	None detected	n/a	Rx recir system pump seal cask was dropped, buried fiberglass line of the Liquid Waste System has small leaks, fuel handling crane got rained on, a hydrolazer was contaminated.	2 REMP wells. Potable water for the site is provided by ground water which is also monitored.	None	Yes - Discrepancies in the actual and calculated flow rates in the Blowdown Structure are recorded	On
Salem	1, See report	Onsite	Yes	Tritium	In the shallow ground water near U1	Clogged salem U1 SFP drains	36 for U1 SFP leak + 8 wells	Yes, removal and processing of ground water + monitoring + repair of drains	No	Before

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San Onofre 1 & 2	5	Onsite	Yes	Tritium	Between the U1 containment sphere and the underlying reinforced concrete foundation	U1 yard drain and reheater pit sumps have overflowed, hose connection, RWST, FHB sump back up, secondary plant systems sample valves relief leak-by unmonitored drainage	None - next to Pacific Ocean	Yes, clean up was performed - removal of water and soil. U1 is being decommissioned	No	After
Seabrook	1	Onsite	No	Tritium	n/a	Spent fuel cask wash pit/transfer canal area	15 wells, offsite well, and offsite town drinking water	Yes, pumping and processing water from wells within the powerblock buildings (where the leak occurred)	Yes - one time piping integrity test on Waste Liquid Discharge Line	On
Sequoyah	8	Onsite	No	Tritium	n/a	Water leached through concrete wall of the Condensate Demineralizer Waste Evaporator building, hose burst, unfiltered fuel handling ventilation trains, outfall of the U2 RWST moat drain pipe, conductivity probe on the inlet to the Modularized Transfer Demineralization System (MFTDS) failed spilling contaminated water, sump overflow, U1 RWST moat water	6 wells and 7 geoprobe monitoring points were added	Yes, soil excavation done as necessary. Actions taken to lessen the probability of rain water escape from moats, and survey's of previously contaminated areas are done. Site characterization being planned.	Yes - leak testing of radwaste discharge line.	After
Shearon Harris	1	Onsite	No	Cs-134, Cs-137, Co-60	n/a	Water runoff from the outdoor SF car staging area	4 onsite REMP wells	None	No	Before
South Texas Project	Several minor spills onsite, none were documented	Onsite	no	Tritium	n/a	Main Cooling Reservoir (MCR) seepage (analayzed pathway).	760 wells for the shallow aquifer under the MCR are available as well as onsite drinking water wells. 3 wells located near the units and associated piping, relief well, 2 shallow aquifier wells, 3 test wells in the OCA and 1 residential well	Yes - for small spills, not reservior	No	Before

Plant	Total no. of leaks	Onsite and/or offsite contamination found	Activity > EPA limits?	Radionuclides detected above MDA levels	Where was activity > EPA limits?	Source(s) of contamination[4]	Onsite ground water sampling locations[4]	Remediation (in addition to repairs)	Technical review of systems (beyond walkdowns)?	Submittal relative to July 31st deadline?
St Lucie, Units 1 & 2	8	Onsite (no offsite wells)	Yes, 2 spills	Tritium (22,800-161,000 pCi/L)	5 monitoring well locations	2 Refueling Water Tank (RWT) overfills, RWT leak, Primary Water Tank overfill, waste monitor tank (WMT) leak, hose leak connected to WMT, resin dewatering hose became dislodged, line break occurred during the dredging of the discharge canal	1 well in the RCA, Several onsite wells, and a surface water sample	Yes, for the Unit 1 RWT area 92,360 pounds of soil were removed and disposed of	no	On
Surry	8	No information - refers the reader to 50.75 (g) file	No	No information - refers the reader to 50.75 (g) file	n/a	No information - refers the reader to 50.75 (g) file	1 ground water well, 1 offsite residential, onsite domestic water system is sampled, storm drain out falls connected to the subsurface drain and turbine building drains and surface water	Yes, clean up of soil/gravel/asphalt has occurred in response to spills or leaks. Further remediation will be performed during decommissioning	RWST and selected underground piping assoicated with the RWST are "monitored"	After
Susquehanna	4	Onsite	No	No information	n/a	Condensate system leaks, radwaste/condensate-transfer system spill	4 potable water wells within the site boundary, storm water collection basin and the three underdrain system manholes	Yes, removal of soil for one leak. Further remediation will be done at decommissioning	No	Before
Three Mile Island[2]	6, see report	Onsite	No	Tritium, see report	n/a	U2 and U1 borated water storage tank leaks, feed water heater leak, U1 liquid radwaste discharge line leak, U1 aux boiler blowdown sump leak, de-icing line leak on U1 CST	27 + 32 new wells	No information[2]. No Sr-90 or gamma emitters detected.	No	On
Turkey Point Units 3 & 4	9	Onsite	No	Only Co-60, Cs-134 and Cs-137 levels recorded as late as 2003 (was tritium sampled for?)	n/a	SFP and SFP cooling pump leaks, Refueling Water Storage Tank (RWST) leak, RWST valve misalignment, B Monitor Tank, temp. pump for Molybdate tank spill, water hose valve misalignment, waste water inadvertently pumped into storm drain	None, only surface water monitored	None - some contaminated soil approved to remain in place in the RCA	Operational leak testing of selected radioactive systems are performed every cycle	On

Plant	Total no. of leaks	Onsite and/or offsite contamination found	Activity > EPA limits?	Radionuclides detected above MDA levels	Where was activity > EPA limits?	Source(s) of contamination[4]	Onsite ground water sampling locations[4]	Remediation (in addition to repairs)	Technical review of systems (beyond walkdowns)?	Submittal relative to July 31st deadline?
Vermont Yankee	>2	Onsite	No	Beta/gamma, including tritium	n/a	CST leaked into plant storm drain system to river	Potable wells + storm drain systems + ground water wells	Yes, remediation of small amounts of tritiated air conditioning condensate entering the plant storm drain system is underway. Nothing else reported	No	On
Virgil C. Summer	3	Onsite	No	Tritium	n/a	Waste treatment ponds, liquid radwaste discharge line leak detection manhole, accidental flooding of the Fuel Handling Building (FHB) Charcoal plenum	16 wells	Yes, for 2 small, 4 to 15 gal leaks (a hose leak and a spent condensate resin liner puncture)	Effluent discharge is routed through buried double walled pipe that passes through manholes containing leak collection pots and level switches.	On
Vogtle	4	Onsite	No	No information	n/a	RWST moat, temporary storage tank containing radioactive material, contaminated sludge in Waste Water Rention Basin, one gallon of contaminated liquid spilled in yard drain	Observation wells inside and outside the PA are being evaluated for availability in a groundwater sampling program. Yard drain sumps are currently sampled	Removal of contaminated soil and concrete	No	On
Waterford	1	Onsite	No	No information	n/a	SFP valve misalignment lead to overflow	Ground water = surface water at this site, REMP sample point monitors storm runoff and non-radioactive discharges to the 40 Arpent Canal. No wells.	Contaminated dirt and asphalt was removed	Yes - piping and tank integrity testing (ASME pressure testing)	On
Watts Bar	3	Onsite	Yes	Tritium (397,600 pCi/L at D and 80,300 pCi/L at B)	At Point D: downgradient between the Yard Holding Pond and the Intake Pump Station for the facility. And Point B: further downgradient from D	High levels of tritium thought to be due to a leak at the temp radwaste line tie-in to the permanent line and to a leak downstream of the tie-in on the Cooling Tower Blowdown Line	37 wells to support monitoring in addition to 6 REMP wells	Yes, equipment was fixed or replaced and some soil was removed and disposed of. Plume is being monitored.	Yes - pressure testing of radwaste discharge line and conducting a boroscopic investsigation of the SFP and Fuel Transfer Canal leak collection system channels and drains	After

Plant	Total no. of leaks	Onsite and/or offsite contamination found	Activity > EPA limits?	Radionuclides detected above MDA levels	Where was activity > EPA limits?	Source(s) of contamination[4]	Onsite ground water sampling locations[4]	Remediation (in addition to repairs)	Technical review of systems (beyond walkdowns)?	Submittal relative to July 31st deadline?
Wolf Creek	3	Onsite	No	Tritium	n/a	SFP liner leakage, and reuse of Coffey County Lake water (9000 pCi/L - 16,000 pCi/L)	3 dewatering well casings, looking at other locations that may provide additional opportunities to optimize leak detection	None	No	Before
Yankee Nuclear Station	15	Onsite	Yes	Tritium (currently fluctuates up to 6000 pCi/L in Sherman Spring due to excavation in the up-gradient area), Cs-137, Co-60	One onsite well currently ~40,000 pCi/L near SFP corner	SFP - ion exchange pit structural interface, Neutron Shield Tank (NST) Cavity fill, de-watering pump packing leakage, seal water tank spill, SFP water spill, plastic garden hose failure, waste holdup tank moat spill, rad. sump transfer line puncture, resin spill, contamination of yard during rx head removal, drain pipe failure, leakage from frozen fuel chute dewatering line and NST tell-tales.	> 50 wells	Yes, decommissioning remediation work almost done. Ground water will continue to be monitored until it meets state and federal standards	n/a	Before
Zion	None	n/a	No	n/a	n/a	n/a	11 wells plus 4 temporary ones	Yes, clean up of spent resin spills and primary water storage tank overflow	No	On

[1]Plant has not made a liquid radioactive discharge since 1998

[2]Site has 3 production supply wells that are pumped continuously for supply water to various systems. The benefit of this is that the station recovers tritiated water beneath the site for use at the station

[3]The word "report" in this document refers to the licensee's hydrological investigation report, unless otherwise state

[4]In additon to REMP sampling locations, unless otherwise stated.