

**Industry Ground Water Protection  
Action Plan Development  
Interim Guidance Document – June 2006**

**Action Plan Development (Action 1 of Industry Initiative)**

The Industry Groundwater Protection Initiative requires that by July 31, 2006, each member company operating or decommissioning a nuclear power plant will:

“Put in place a company/site-specific action plan(s) to help assure timely detection and effective response to situations involving inadvertent radiological releases in groundwater to prevent migration of licensed radioactive material offsite and quantify impacts on decommissioning.”

**Generic Guidance:**

Each company/site will develop a written action plan utilizing company or site specific methods.

Throughout the development and implementation of the site/company specific action plan(s), risk<sup>1</sup> should be continually evaluated. The higher the risk or potential for off-site groundwater contamination, the shorter the timeframe for completion of the action plan.

Attachment 1 to this document contains additional guidance.

**Specific Guidance:**

The written action plan should consider the following key elements:

1. Background/Purpose:

The background section will contain a brief description of the industry issue and an affirmation of the company/site commitment to the NEI Industry Initiative. A brief description of the events surrounding the industry issue would also be appropriate.

2. Objectives:

The following objectives should be described:

- i. Maintenance or improvement of public trust and confidence in the station commitment to environmental stewardship.
- ii. Identification of potential leakage pathways.
- iii. Assessment of the adequacy of the current groundwater monitoring program.
- iv. Development of a corrective action protocol.
- v. Development of a communication protocol.

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<sup>1</sup> In this document, RISK is in reference to the ability to meet or not meet the objectives of the NEI Industry Initiative on Groundwater Protection. Specifically, RISK, as used in this guideline, does not refer to a context of a risk to public health and safety.

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3. Organizational and Reporting Structure:

- i. Identify key roles and responsibilities including Radiation Protection, Chemistry, Operations, Engineering, Licensing, Environmental, Public Relations, Emergency Preparedness, and Legal.
- ii. Identify the project lead (or leads, if multiple sites are addressed in the action plan).
- iii. Identify an executive or senior management sponsor.
- iv. Identify external stakeholders.

4. Identify Project Controls

- i. Budget
- ii. Schedule/Contracts

5. Record Keeping

Describe the method for documenting completion of the action plan. This could be via the station corrective action program or a stand-alone plant document.

6. Action Plan Template:

- i. Identify short term actions to comply with the Industry Initiative.
  1. Identify and revise site procedures to include the communication protocol contained in the Industry Initiative.
  2. Identify the external stakeholders that will be contacted.
  3. Communicate with the external stakeholders. This communication is intended to be prior to 7/31/06 to inform the external stakeholders of the initiative and to solicit their feedback.
  4. Include actions required to complete the Groundwater Questionnaire (i.e. review of the 10 CFR 50.75(g) file, any legal or licensing reviews of responses).
- ii. Identify longer term actions:
  1. Identify site risks based on plant design. This review should include all systems or components that have a credible pathway to groundwater which contain radioisotopes. Examples include: Refueling water storage tanks (if outdoors), spent fuel pools, spent fuel pool leak detection systems, outdoor tanks, outdoor storage of contaminated equipment, buried piping, retention ponds or basins. For each system or component deemed to be at risk, identify existing and possible leak detection methods. This may include existing groundwater monitoring, operator rounds,

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leak-detection systems, scheduled hydrostatic testing. Also, identify potential enhancements to leakage detection systems/programs such as increased rounds, remote piping walkdowns, etc. Review the site spills and countermeasures procedures to determine if radiological spills are addressed with respect to groundwater and soil protection. The completion of the site risk review may result in the shortening of the timeframe for completion of the remainder of the action plan if risks are deemed higher than originally anticipated.

2. Update/perform/evaluate the site hydro-geological conditions. This effort should result in an understanding of predominant groundwater gradients based upon current conditions. This effort should also include identification of potential pathways for groundwater migration from on-site locations to off-site locations through the groundwater. Existing hydrology studies (from plant construction), historical environmental studies, license renewal reports, are all inputs to this action item. This action item should also track updates to the site Final Safety Analysis Report hydrology study, as appropriate.
3. Evaluate the existing site risks, leakage detection capability (for each at risk system), and the plant history (50.75(g) file review) against the hydro-geological conditions. Consider placement of groundwater monitoring wells in the down gradient from the plant, and sentinel wells close to higher risk systems or components where leak detection capability is limited.
4. Establish sampling and analysis protocols and analysis lower limits of detection. This effort will be closely tied to the on-going communication protocol development work. Evaluate the existing station or company resources or contracts with outside labs against the increased number of samples. Review existing lab protocols and analytical sensitivities.
5. Establish remediation thresholds. This is site specific and should include migration pathways and concentrations. Remediation thresholds should also consider that credited releases may result in detectible levels of activity in the environment.
6. Establish communication protocols before discovering groundwater contamination. Stakeholders may include site employees, local residents, etc. in addition to State/Local entities.
7. Revise the station ODCM, as necessary, to include the following:
  - a. The communication protocol (from the industry initiative) including immediate, 30-day, and annual report items.
  - b. New monitoring locations which are to be permanent monitoring locations.
  - c. New sampling frequencies.

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8. Identify long term, program maintenance items. This action targets activities such as equipment and program maintenance to sustain performance. For example, an action item may be established to perform a self-assessment on the implementation of the program 6 months to a year after changes have been implemented.

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Attachment 1

The following was provided as part of the Q&A document from NEI and provides further guidance on development and implementation of site or company specific action plans:

**Q:** What is the intended scope of the site-specific action plans referred to in the initiative?

**A:** At a minimum, a site-specific action plan should include the following:

- An assessment of sources of potential groundwater contamination (i.e., gaseous and liquid releases and plant structures, systems and components that contain radioactive liquids) and related pathways to groundwater.
- An assessment of site operating history in regard to routine gaseous and liquid releases and previous occurrences of leaks or spills that represent a potential source(s) of groundwater contamination.
- An assessment of the site geo-hydrology, especially in regard to the location, flow patterns, and interrelationship of surface, sub-surface, and groundwater aquifers.
- An assessment of the site program for radiological monitoring of surface, sub-surface, and groundwater aquifers.

The purpose of the assessments is to identify, prioritize, and schedule enhancements to site programs and procedures as needed to prevent migration of licensed radioactive material offsite and to quantify impacts on decommissioning. At a minimum, this includes programs and procedures for leak/spill prevention and detection, radiological monitoring of surface, sub-surface and groundwater aquifers, and response and remediation in regard to groundwater contamination.

**Q:** Does the commitment in Item 1 of the initiative, to “identify and schedule implementation of a company/site-specific action plan,” specifically require that companies drill more monitoring wells, modify plant systems, structures or components, etc.?

**A:** Not necessarily. Companies are expected to complete an evaluation of the specific situation at each site to identify and schedule any needed enhancements to meet the objective of helping to assure timely detection and effective response to situations involving inadvertent radiological releases to groundwater. The scope of such enhancements will vary from site to site, depending on such factors as the specific history of previous occurrences involving leaks or spills, the extent and quality of current programs for detecting and preventing leaks, and the efficacy of the current site program for monitoring groundwater.

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Voluntary Communication Protocol  
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**Voluntary Communication (Section 2 of Industry Initiative)**

The Industry Groundwater Protection Initiative requires that by July 31, 2006, each member company operating or decommissioning a nuclear power plant:

“Expand the scope of the licensee’s existing Radiological Environmental Monitoring Program (REMP) or Radiological Effluent Technical Specification Program (RETS) reporting requirements to include additional voluntary formal and informal reporting.”

**Objective/Acceptance Criteria:**

The following objective/acceptance criteria only apply to licensed radioactive materials that are generated as a result of plant operations.

- 2.1 “Document all onsite groundwater sample results and a description of any significant onsite leaks/spills into groundwater for each calendar year in the Annual Radiological Environmental Operating Report (AREOR) for REMP or the Annual Radioactive Effluent Release Report (ARERR) for the RETS as contained in the appropriate Site level reporting procedure, beginning with the report covering the calendar year 2006.”

Acceptance Criteria:

- a. It is expected that appropriate site procedures contain the communication expectations by July 31, 2006.
- b. The appropriate changes to the ODCM are expected to be completed in a timeframe to support the 2007 report of 2006 performance.
- c. The following are to be included in one or both of the above referenced annual reports\*:
  - i. All onsite and offsite groundwater sample results taken in support of the Industry Initiative unless it will be documented in accordance with the ODCM and provided in the ARERR.
  - ii. A description of all spills or leaks that are communicated per 2.2 and 2.3 of this Initiative.

\* The distribution of information between the RETS and REMP reports will be based on a position paper developed during the industry RETS/REMP workshop and will be incorporated in to this guidance at a later date.

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- 2.2 “Submit a written 30-day report to the NRC for any water sample result for onsite groundwater that is or may be used as a source of drinking water that exceeds the criteria in the licensee’s existing REMP/ODCM for 30-day reporting of offsite water sample results. Copies of the written 30-day reports for both onsite and offsite water samples will also be provided to the appropriate State/Local officials.”

Acceptance Criteria:

- a. All groundwater samples taken for the Industry Initiative will be analyzed and compared to the standards and limits contained in the station’s REMP/ODCM. A written 30-day NRC report is required for all sample results (either onsite or offsite) that exceed the REMP/ODCM reporting criterion and could potentially reach the groundwater that is or could be in the future used as a source of drinking water. If the groundwater is not currently used for drinking water but is potable, each station should consider the groundwater as a potential source of drinking water.

The initial discovery of groundwater contamination greater than the REMP/ODCM criterion is the event documented in a written 30-day report. It is not expected that a written 30-day report will be generated each time a subsequent sample(s) from the same “plume” identifies concentrations greater than the REMP/ODCM criterion.

For conditions that existed prior to July 31, 2006, it is not necessary to generate a 30 day report if the condition has been reported previously and communicated to State/Local officials.

- b. All written 30-day NRC reports generated under item 2.2.i are to be concurrently forwarded to the designated State/Local officials.
- 2.3 “Make informal<sup>1</sup> communication as soon as practicable to appropriate State/Local officials, with follow-up notification to the NRC, as appropriate, regarding significant<sup>2</sup> onsite leaks/spills into groundwater (see Item 2.2) and onsite or offsite water sample results exceeding the criteria in the REMP/ODCM.”

<sup>1</sup> “Informal” is intended to mean a communication between the station and the State/Local officials. It is not intended to mean a “notification” that would require a 4-hour 10 CFR 50.72 notification to the NRC. The NRC has been asked to clarify this issue and will contact NEI prior to July 31<sup>st</sup>. However, this guidance does not take the place of any existing State requirements or regulations. If a station makes a “formal” communication to a State because of a regulatory requirement, then a 4-hour 10 CFR 50.72 NRC notification needs to be considered.

<sup>2</sup> “Significant” as used in the Industry Initiative is intended to be defined in part as what is of interest to the public. It is not intended to imply or refer back to regulatory terminology nor is it intended to indicate that the leak or spill has public health and safety or environmental protection consequences.

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Acceptance Criteria:

This guidance provides a maximum threshold for reporting. Some States may require lower reporting thresholds. Also, as described in 2.2 a. above, the criteria below applies to groundwater that is used for drinking water or could be used for drinking water.

- a. Communication to the designated State/Local officials will be made before the end of the next business day if an inadvertent unmonitored leak or spill to the environment has or can potentially get into the groundwater and exceeds any of the following criterion:
  - i. If a spill or leak from a radiologically contaminated source exceeds 100 gallons; or
  - ii. If a spill or leak volume cannot be quantified.
- b. All leaks, regardless of volume or activity from a higher risk system or component (e.g. spent full pool or outdoor refueling water storage tank) and can potentially get into groundwater will be communicated to the appropriate State/Local officials before the end of the next business day.
- c. Communication with the designated State/Local officials will be made before the end of the next business day for water sample results if:
  - i. A water sample from offsite groundwater or surface water exceeds the reporting criterion for water provided in the REMP/ODCM.
  - ii. A water sample from an onsite groundwater monitoring well or surface water that is hydrologically connected to groundwater exceeds the reporting criterion for water in the REMP/ODCM.
- d. ~~When communicating to the State/Local officials, be clear and precise on quantifying the actual release information as it applies to the appropriate regulatory criteria (i.e. put it in perspective).~~
- e. Each station should consider reviewing their site specific action plan with the designated State/Local officials and clearly articulate:
  - i. “Why” the action plans were put in place, i.e. industry events.
  - ii. Past events that would have triggered this communication.
  - iii. Ask if there is additional information that the State/Local officials need to better understand the issue.
  - iv. Gain an understanding of “what” the State/Local officials will do with the information.
- f. For stations that are located in States that have multiple nuclear power plant locations and multiple owner companies, it is highly recommended that the utilities communicate with each other and gain agreement on a common message to be delivered to the State officials.



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**Objective/Acceptance Criteria:**

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Acceptance Criteria:

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  - i. All onsite and offsite groundwater sample results taken in support of the Industry Initiative unless it will be documented in accordance with the ODCM and provided in the ARERR.
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    - The distribution of information between the RETS and REMP reports will be based on a position paper developed during the industry RETS/REMP workshop and will be incorporated in to this guidance at a later date.

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**Acceptance Criteria:**

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- i. If a spill or leak from a radiologically contaminated source exceeds 100 gallons; or**
- ii. If a spill or leak volume cannot be quantified.**

**b. All leaks, regardless of volume or activity from a higher risk system or component (e.g. spent full pool or outdoor refueling water storage tank) and can potentially get into groundwater will be communicated to the appropriate State/Local officials before the end of the next business day.**

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- i. A water sample from offsite groundwater or surface water exceeds the reporting criterion for water provided in the REMP/ODCM.**
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**d. When communicating to the State/Local officials, be clear and precise on quantifying the actual release information as it applies to the appropriate regulatory criteria (i.e. put it in perspective).**

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