

Illinois EPA – Point of Entry Treatment Program

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Problem Statement

- Small systems unable to afford central treatment plants – about 30 small systems have Radium MCL violations
- Cost of radium analyses prohibitive for small systems
- SDWA requires POE/POU operations to achieve results similar to those of a central treatment plant

Selecting an Innovative Solution

- Basis-USEPA / States (ECOS) agreement for Regulatory Innovation (*63 FR 24784; 5/5/1998*)
- IEPA & USEPA reached agreement on small CWS innovative projects (Nov. 2002)
- Within constraints of SDWA, USEPA Guidance and State regulations, propose alternative sampling requirements

Project Objectives

- How many samples and homes needed for home softeners to demonstrate hardness as indicator of radium content
- How many homes needed to demonstrate the softeners actually work
- How many radiological samples are needed to verify public health protection equivalent to central treatment

Initial Program Design Basis

- 100 % user participation
- CWS totally responsible for all parts of the operation
- Only POE units allowed – initially home softeners to be installed
- Other permit requirements to be developed in consultation with USEPA
- Pilot CWS selected for demonstrating results

Project Development

- Meetings held initially with USEPA Region 5 and later HQ starting Spring 2002 where the following items were agreed
- IEPA confirms Regulatory Authority
- List of possibly interested CWSs
- Develop generic program QAPP
- Develop protocol for indicator monitoring and maintenance program for Pilot CWS & other CWSs wishing to participate

Pilot CWS – Initial Steps

- Work with Pilot CWS & consultant to develop technical provisions & time lines/ dates for a compliance agreement
- Pilot CWS submits plan documents, compliance agreement, operating plan, contractor agreement and related documents
- IEPA reviews submission, drafts permit and reviews with USEPA Region 5
- Permit is issued and pilot project starts

Pilot CWS Selection

- Selection based on
 - Compliance commitment shows willingness to pursue POE alternative
 - Confirmation that all users will participate
 - Confidence in capability to fully implement

Protocol

- Select one home for softener installation
- 1st month – collect sample, analyze for hardness, gross alpha & combined radium
- 2nd month – collect sample and analyze – if satisfactory results, initiate softener installation in other homes

Hardness Indicator Demonstration

- Select 11 additional homes for softener installation, monitoring, sampling and analyses for hardness, gross alpha & combined radium.
- If analyses from the 12 homes indicate acceptable results, hardness as an indicator of radium content is verified.
- Hardness is to be monitored at each home at least quarterly

Operational Practice Confirmation

- Select 4 homes from the 12 for collection of 4 quarterly samples for compositing
- Samples collected at the end of the 2nd quarter and 4 quarter composite are analyzed for gross alpha and combined radium
- If results are satisfactory, operational practices are confirmed satisfactory

Second & Third Year Operations

- Continue quarterly hardness monitoring for all homes
- Select 2 homes for 4 quarter composite sample collection with analyses for gross alpha & combined radium
- Follow-up report – discussed later

Other CWS Participation

- Other CWSs wishing to participate will be allowed following the first quarter work at the pilot CWS
- Initial testing (hardness v. Ra) will not be required, but all other testing will have to be performed over the three year period

Compliance Procedures

- A hardness indicator level for combined radium exceeding 5 pCi/L will be selected for each CWS in consultation with Region 5
- The hardness indicator level will be incorporated as a permit condition
- Should the hardness indicator show an excursion, the softener must be serviced promptly
- After servicing, a sample is collected and analyzed for hardness, gross alpha and combined radium

Compliance –Continued/2

- Results are evaluated and
 - No further radionuclide monitoring required if gross alpha and combined radium less than MCL
 - If radionuclides exceed the MCL, continue quarterly monitoring for that unit & continue servicing
 - If after one year of quarterly monitoring the radionuclides continue to exceed the MCL, the CWS is out of compliance, must issue PN & take actions deemed necessary by the state

Compliance – Continued/3

- For any radiological analyses greater than 4 times the MCL, the CWS is deemed immediately out of compliance, must issue PN & take actions deemed necessary by the state.

Repeated Excursions

- If there are any subsequent hardness indicator incidents at the same CWS, the problem will be evaluated by IEPA & Region 5 to determine the appropriate remedy and testing.
- Within the same CWS & for any softener that has repeated hardness failures, resin change out or radium testing will occur unless other actions are more appropriate.

IEPA Follow-up

- After the 3 year testing period at the pilot CWS, IEPA will prepare draft project findings & evaluate functionality of indicator monitoring. IEPA & USEPA will evaluate project results & finalize a project report.