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January 29, 1999  
EA-99-014

Mr. Michael B. Leat  
Iowa Department of Natural Resources  
Wallace State Office Building  
900 East Grand Avenue  
Des Moines, Iowa 50319

Proj: Alliant Energy Former Manufactured Gas Plant Program  
Subj: Ground Water Monitoring Program Evaluation Memorandums  
File: SPF-116.A06A

Dear Mr. Leat:

Enclosed are the ground water monitoring program evaluation memorandums for the Atlantic State Street, Belle Plaine, Centerville, Cherokee, Muscatine, and Washington sites. These memorandums evaluation each site monitoring program with respect to the Iowa Department of Natural Resources (IDNR) guidelines presented in your letter of February 26, 1998, and further discussed in the meeting our on May 19, 1998.

If you have any questions or comments regarding the enclosed memorandums, please call me at 319-398-4658.

Sincerely,

Dean A. Hargens, P.E.  
Environmental Consultant  
FMGP Project Coordinator

Enclosure

cc. J. Golchin - IDNR w/o  
B. Greer - MSN w/o  
D. English - B&V w/e

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NATURAL RESOURCES

MEMORANDUM

Alliant Energy  
Atlantic State Street FMGP Site  
Ground Water Monitoring Program

B&V Project 40492.113  
B&V File A04B  
January 29, 1999

To: Dean Hargens

From: Chris Robb

A review of the ground water monitoring program at the Atlantic State Street former manufactured gas plant (FMGP) site has been completed with respect to the Iowa Department of Natural Resources' (IDNR's) most recent comments on the Alliant Energy Corporation (Alliant Energy) ground water monitoring program. These comments were included in a letter from Michael B. Leat, dated February 26, 1998, regarding the Quality Assurance Plan (QAPP) and were further discussed in a meeting with IDNR on May 19, 1998. As indicated in the responses to these comments, which were transmitted to IDNR in June 1998, IDNR's guidelines for ground water monitoring have been evaluated on a site-specific basis. The evaluation of the Atlantic State Street ground water monitoring program is summarized in this memorandum.

The objectives of this memorandum are as follows:

- Summarize IDNR's ground water monitoring program guidelines.
- Evaluate the current Atlantic State Street monitoring program with respect to IDNR's guidelines.
- Propose actions to revise the current monitoring program to meet IDNR's guidelines or justify on a site-specific basis why modifications are not required.
- Summarize proposed monitoring program for the Atlantic State Street FMGP site.

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Summary of Current Atlantic State Street Ground Water Monitoring Program

The current sampling network at the Atlantic State Street FMGP site includes eleven monitoring wells, the locations of which are listed below.

<u>Well</u>	<u>Location</u>
SSW-01	Northwest portion of the site.
SSWD-01	Northwest portion of the site.
SSW-02	Southwest portion of the site.
SSWD-02	Southwest portion of the site.
SSW-03	West of the site.
SSW-04	Southwest of the site.
SSWD-04	Southwest of the site.
SSW-05	Northeast portion of the site.
SSWD-05	Northeast portion of the site.
SSW-06	Northeast of the site.
SSWD-06	Northeast of the site.

A total of seven sampling events have been completed at the site over a 6-year period. (Additional sampling events were conducted prior to 1992, but these events have not been included as part of the current ground water monitoring program due to the questionable comparability of data collected during these earlier monitoring events to subsequent data). The samples from each of these wells have been analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEXs) and polynuclear aromatic hydrocarbons (PAHs).

Comparison of Atlantic State Street Ground Water Monitoring Program with IDNR's Guidelines

IDNR's general guidelines for ground water monitoring are listed numerically, followed by a comparison of the guideline with the current program being implemented at the Atlantic State Street site.

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- 1) The monitoring network must contain at least two downgradient wells that have historically contained consistently detectable levels of PAHs, if ground water contamination is present.**

Although the contaminant concentrations in the ground water at the site have generally been low, samples from downgradient monitoring wells SSW-01 and SSW-05 have contained PAHs and BTEXs during previous sampling rounds. Monitoring well SSW-05 has not been included in recent sampling rounds, however. Monitoring well SSW-06, which is further downgradient and has been included in the monitoring program for the past several years, has not consistently shown evidence of contamination. To provide a monitoring well that is not as far downgradient and thus may be more likely to consistently show the presence of trace levels of contamination, well SSW-05 will be added to the monitoring program. Wells SSW-01 and SSW-05 will be used to monitor ground water within the contaminant plume and satisfy this IDNR guideline.

- 2) The network must contain at least one well located within a few feet of a contaminant source area to characterize maximum contaminant concentrations in ground water.**

Monitoring well SSW-01 is located approximately 40 feet north (downgradient) of the alleged tar disposal pit on the western portion of the property. Contaminated soil in this area has previously been removed, and SSW-01 is positioned to monitor contaminants from this contaminant source location. The former tar separator, located southeast of the former contaminated soil area, was also previously remediated, and no evidence of tar outside the tar separator structure was noted. Based on data from previous investigations, no other contaminant source locations have been identified on the property. Therefore, well SSW-01 should be sufficient to monitor leaching from former subsurface contaminant source areas.

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**3) The network must contain at least one background well.**

Monitoring well SSW-02 is located upgradient of the site and has been sampled annually over the past several years. Although this well is upgradient of the State Street site, it is downgradient of the Poplar Street FMGP site, and the McAtee Tire and Gasoline Alley leaking underground storage tank (UST) sites. Consequently, PAHs and BTEXs have been detected in samples from this well on several occasions, and this well tends to monitor contamination that may be migrating onto the State Street site from these other sites.

Monitoring well SSW-02 will continue to be monitored, and analytical data from monitoring well MW-13, located upgradient of the Poplar Street FMGP site, will be used to supplement the State Street data.

**4) The network must contain two or more compliance wells located outside the known downgradient edge of the contaminant plume.**

Monitoring well SSW-06 is believed to be located on the downgradient edge of the contaminant plume, based on the most recent monitoring event, which indicated the absence of detectable levels of PAHs and BTEXs. Historically, contaminant concentrations in downgradient monitoring wells have been low. And, because contaminant sources at the site have been removed, only trace levels of ground water contamination are expected to be detected during future downgradient ground water monitoring events. Monitoring SSW-06 and the other downgradient monitoring wells to be included in the monitoring program (SSW-01 and SSW-05) should provide an adequate network for indication of contaminant concentration variations.

**5) The network must contain both water table and deeper aquifer monitoring wells if the conditions are conducive to DNAPL formation or migration.**

Although deep wells have been installed at the site, only extremely low levels of PAHs (well below IDNR cleanup criteria) have been detected during previous sampling events.

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In addition, due to the impermeable nature of the consolidated limestone bedrock present on site, significant downward migration of contaminants is not expected to occur. Therefore, the deep wells have not been included in the monitoring network and IDNR guideline 5 is not applicable.

- 6) Semiannual sampling is required; the first event to be performed in the spring and the second in the fall.**

Currently, annual ground water monitoring is being conducted at the site. Semiannual monitoring will be conducted in the future to meet this guideline. However, previous monitoring events will be included in evaluating the duration of the monitoring.

- 7) Monitoring must take place for a minimum five-year period from approval of the monitoring program. Or, as indicated by IDNR in the May 19, 1998 meeting, a total of 10 sampling events would be required before termination of ground water monitoring could be considered at any FMGP site.**

Under the existing monitoring program, a total of seven monitoring events have been conducted over a 6-year period at the Atlantic State Street site. To meet the 10-event requirement, at least three additional sampling events must be completed. We assume that, because areas downgradient of well SSW-05 have been monitored during the previous seven events, these events do not need to be duplicated for well SSW-05. It is proposed that the monitoring program be re-evaluated after two more years of semiannual monitoring (four sampling events) have been completed.

- 8) Monitoring memoranda must include ground water flow maps depicting the most recent flow conditions and graphical displays of all historic ground water data collected from the site.**

The 1998 ground water memorandum for the Atlantic State Street FMGP site included graphical displays of the ground water flow direction and the historic ground water data. Therefore, this IDNR guideline is currently being met.

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**9) All data collected must be statistically validated and the relevancy of the data collected must be examined.**

Ground water analytical data are currently being statistically validated and evaluated as specified in the monitoring and statistical analysis program in the QAPP. Therefore, this guideline is currently being met.

**10) The length of the monitoring period may be extended if it is demonstrated that the contaminant plumes have not stabilized.**

This guideline will be evaluated after a total of 11 sampling events have been completed at the site. Seven of these events have already been completed.

Proposed Ground Water Monitoring Program for the Atlantic State Street FMGP Site

On the basis of IDNR's guidelines, it is recommended that the current ground water monitoring program at the Atlantic State Street FMGP site be modified. The proposed monitoring well network will include monitoring wells SSW-01, SSW-02, SSW-05, SSW-06, and the background monitoring well (MW-13) at the upgradient Poplar Street FMGP site. Ground water monitoring at the State Street and Poplar Street sites will be conducted during the same events, so analytical data for the sample from the Poplar Street background well will be from the same time frame. Ground water samples from all of the wells will be analyzed for PAHs (SW-846 Method 8310), BTEXs (SW-846 Method 8020), and Petroleum Hydrocarbons (Methods OA-1 and OA-2). Other analysis programs that had previously been requested by the IDNR (volatile organics at SSW-02 and SSW-05, and pesticides at SSWD-04) will not be continued, due to the absence of the target parameters in the latest round of ground water monitoring data. During each monitoring event, ground water level measurements will be recorded for each monitoring well at the site.

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Ground water monitoring will be conducted at the site on a semiannual basis (either in spring and fall or summer and winter). One ground water memorandum will be prepared annually to summarize the results of the two ground water monitoring events. Specifically, this memorandum will include the following:

- Summary of the ground water samples collected.
- Summary of the ground water levels and corresponding elevations in tabular form and a figure showing the ground water flow direction.
- Discussion of the data validation results (a hard copy of the data validation memoranda will be included as an attachment).
- Summary of the presence and magnitude of the contaminants detected; a figure showing the historical analytical results for each monitoring well in the sampling network will be included.
- Discussion of the analytical results and comparison of data to upper tolerance limits (UTLs). UTLs will be established for all PAH and/or BTEX compounds that do not currently have UTLs.
- Conclusions and recommendations.

A total of four additional sampling events will be completed at the site. The first two will be completed in 1999. The second two will be completed in 2000. The need for continued ground water monitoring will be evaluated after these four sampling events have been completed.