

November 15, 1996

Mr. Lee Dunbar  
DEP/Water Management Division  
Aquatic Toxicity  
79 Elm Street  
Hartford, CT 06106

Re: Results of the TIE/Remedial Activities Under Consideration

Dear Mr. Dunbar:

As stated in the October 25, 1996 Fourth Quarter Aquatic Toxicity Monitoring Report (ATMR) cover letter, the purpose of this letter is to present the results of the recent Toxicity Investigation Evaluation (TIE) performed due to two consecutive failures of quarterly toxicity testing. This letter also presents the remedial actions under consideration at the AlliedSignal Stratford Army Engine Plant (SAEP) located at 550 Main Street, Stratford, Connecticut, to correct these failures. The facility's National Pollution Discharge Elimination System (NPDES) permit number is CT0002984.

## HISTORY

Historically, the SAEP has performed toxicity testing for its quarterly ATMR for NPDES Discharge, Serial Numbers (DSN) 007 and 008. DSN 007 includes non-contact cooling water, boiler blow down water, and stormwater. DSN 008 includes metal finishing waste water. Until the second quarter (June) of 1996, both of these outfalls had passed all of their toxicity testing. In June 1996, DSN 007 failed the toxicity testing for the Mysidopsis bahia test species (24% survival rate). DSN 007 also failed the mandatory toxicity testing retest (performed, as required in the following month July, 1996; with a 66% survival rate) using M. bahia. The results of these ATMRs were forwarded to you on August 5, 1996, and August 13, 1996, respectively (it should be noted that DSN 008 continues to pass all of its toxicity testing and that DSN 007 has failed only its M. bahia toxicity tests while continuing to pass its Cyprinodon variegatus toxicity tests).

## TOXICITY IDENTIFICATION EVALUATION

Based upon these toxicity testing failures, a Toxicity Identification Evaluation (TIE) was initiated (using M. bahia only, with CT DEP concurrence) to determine the source of the toxicity from DSN 007. Samples for this TIE were collected on August 13 (8/13), 20 (8/20), and 27 (8/27) and on September 10 (9/10), 1996. Sample collection was performed by SAEP personnel. The TIE was performed by New England Bioassay, Inc. of Manchester, Connecticut. Samples collected on 8/13 and 8/27 passed (with 100% and 96% survival rates, respectively) the toxicity testing. Samples collected on 8/20 and 9/10 failed (with 86% and 42% survival rates, respectively) the toxicity testing.

In addition to the baseline testing, to determine the cause of the toxicity, several manipulations of the samples that failed the toxicity testing the samples collected on (8/20 and 9/10) were performed.



These manipulations included: cation removal and EDTA chelation to test for metals, C<sub>18</sub> organics removal to test for volatile organic compounds (VOCs); aeration (both gentle and vigorous) to test for VOCs and surfactants; and a toxicity persistence test. The cation removal manipulation was effective reducing the toxicity in both samples. The C<sub>18</sub> organics removal reduced toxicity only in the 9/10 sample.

Based upon the aeration manipulations, neither halogenated VOCs or surfactants are suspected toxicants. Results of the cation removal and C<sub>18</sub> organics removal indicate that potential toxicants may include metals and/or non-polar organic (aliphatic) compounds. Laboratory analysis of the toxicity test samples (including those collected for regular ATMR quarterly monitoring) found that elevated levels of total oil and grease (O&G) were present in the DSN 007 sample collected for the second quarter (June) of 1996 sample (O&G = 11 mg/L) which had a survival rate of 24%. No other compounds in the toxicity test samples correlated with failure of the toxicity testing. Therefore, it is possible that elevated levels of O&G (flushed through the treatment system during storm events) is responsible for the toxicity from DSN 007.

In summary, toxicity failures at 007 are intermittent. The TIE did not determine the precise toxicant responsible for the toxicity test failures. However, based upon the TIE results, toxicity failures could be caused by one or a combination of metals, non-polar organic compounds, or O&G. A complete copy of the TIE prepared by New England Bioassay is enclosed.

### REMEDIAL ACTION/ADDITIONAL INVESTIGATION

Based upon the results of the TIE, SAEP has initiated several projects designed to reduce the suspected compounds causing the toxicity failures from DSN 007. These projects include:

- Redesign of the scrap yards. Currently, scrap metal from the SAEP is stored in one of two outside scrap yards prior to recycling. These scrap yards are in the process of being combined and redesigned to improve containment of stormwater runoff. In addition, an oil/water separator is being installed to pre-treat runoff from the new scrap yard before the runoff reaches the Oil Abatement System for final treatment and discharge through DSN 007. This project is expected to significantly reduce O&G discharged from the SAEP and will be completed in December, 1996.
- Improvement of catch basin design. SAEP has retained an engineering firm to develop plans for catch basin systems designed to reduce total suspended solids (including metals) and O&G in stormwater runoff before the runoff reaches the Oil Abatement System for final treatment and discharge through DSN 007. Preliminary catch basin designs will be completed in November. Selection of the most effective design and completion of final plans will be accomplished by mid December. Installation of the pre-treatment devices is expected during the first quarter of 1997.



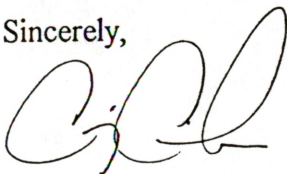
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- Enhancement of treatment in the Oil Abatement System. SAEP is in the process of enhancing its chemical treatment of effluent at the Oil Abatement System prior to discharge through DSN 007. Enhancements include: "bench testing" the use of different brands and grades of treatment chemicals; improving automated sampling strategy and equipment specifically for metals and O&G; and upgrading automated treatment chemical feed systems for metals and O&G. This is an on-going project which requires a degree of experimentation. Enhancements are expected to be completed during the first quarter of 1997.
- Direction of boiler blow down water to the sanitary sewer. SAEP is in the process of removing boiler blow down water from the DSN 007 discharge and directing it to the sanitary sewer under a general permit. This may remove materials potentially contributing to test failure. The design for this project is complete. Construction is expected to be completed by January 1997.
- Investigate the need to clean pump house sumps. SAEP is planning to investigate the sumps in the six pump houses which direct stormwater and other effluent to the Oil Abatement System prior to discharge through DSN 007. Based upon this investigation, SAEP may elect to clean these structures.

All the work described above should be completed by the end of the first quarter of 1997. It is anticipated that this work will stop the toxicity testing failures at DSN 007. SAEP will continue its quarterly ATMR testing to determine the effectiveness of the remediation activities. According to New England Bioassay, this testing should be performed through the second quarter of 1997 to collect sufficient data to evaluate the effectiveness of the activities described above. After the second quarter 1997 toxicity testing retest (July, 1997), should DSN 007 continue to fail toxicity testing, additional TIE work including: comparing levels of O&G with toxicity events; examination of solvent extracted material from C<sub>18</sub> organic removal manipulation to determine which non-polar organic compounds might be present; and the examination of toxicity testing samples for various metals to identify a specific metal possibly responsible for the toxicity.

Please do not hesitate to contact either myself at (203)385-3741 or R. Keith Knauerhase at (203)385-5124 if you have any questions regarding this information.

Sincerely,



Craig Cunningham

Team Leader

Enclosure: