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NAS PENSACOLA
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LETTER FROM U S NAVY REGARDING IMPLEMENTATION OF PHASE II FOR NATURAL
ATTENUATION EVALUATION OF CHLORINATED ETHENES AND CHLORINATED
BENZENES NAS PENSACOLA FL
6/24/1998
U S NAVY



DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P.O. BOX 190010
2155 EAGLE DRIVE
NORTH CHARLESTON, S.C. 29419-5010

5090
Code 18213
24 Jun 98

From: Commanding Officer, Southern Division, Naval Facilities Engineering Command
To: Commanding Officer, Navy Public Works Center, Pensacola Fl. (Tom Kelly)

Subj: IMPLEMENT PHASE II OF NATURAL ATTENUATION EVALUATION OF
CHLORINATED ETHENES AND CHLORONATED BENZENES, WASTE WATER
TREATMENT PLANT (WWTP), NAS PENSACOLA

Ref: (a) Natural Attenuation of Chlorinated Ethenes and Chlorinated Benzenes, Wastewater
Treatment Plant, NAS Pensacola, USGS, June 1998.

Encl: (1) Minutes from 15 June Meeting with FDEP at Tallahassee, Florida.

1. A meeting was held on 15 June 1998 with Florida Department of Environmental Protection (FDEP) at 2600 Blair Stone Rd., Tallahassee, Florida, to present the results of Phase I of a natural attenuation evaluation of chlorinated solvents in groundwater at Naval Air Station Pensacola WWTP Sludge Drying Beds (SWMU 00001).
2. Results of the Phase I evaluation, i.e., with the ground water recovery system in operation, were reported in reference (a) previously forwarded to FDEP and in a presentation to FDEP at the 15 June meeting. In brief, anaerobic redox conditions existing in the aquifer at this site are reported to be favorable for complete natural biodegradation of chlorinated ethenes but are less efficient for biodegradation of chlorinated benzene compounds. However, neither chlorinated benzenes nor chlorinated ethenes were detected in groundwater diffusion samples installed in sediments at the groundwater and surface water interface of Pensacola Bay.
3. Phase II of this ongoing evaluation is intended to determine whether biodegradation processes and natural attenuation of chlorinated ethenes and chlorinated benzene compounds remain effective with the groundwater recovery system turned off. In accordance with RCRA Permit HF17-292641 Part V paragraph (3), Southern Division requests approval from FDEP to turn off the ground water recovery system in order to proceed with Phase II of the natural attenuation evaluation.
4. As proposed at the 15 June meeting, reference enclosure (1), Southern Division is planning to implement a demonstration project using the Fenton's Reagent chemical oxidation technology

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for source reduction of the chlorinated ethenes hotspot in the vicinity of MW-66. FDEP generally concurred with the proposal to implement the demonstration project. The technology demonstration will be implemented in a phased approach. A copy of the technology contractor's site specific proposal will be forwarded to FDEP in the near future. SOUTHDIV and the contractor will provide a presentation of the project design to FDEP prior to implementation.


MICHAEL J. MAUGHON
By Direction

Copy to:
NAS PENSACOLA (Environmental, Bill Taylor)

MEETING MINUTES

DATE: 15 JUNE 1998

TIME: 10:30 - 12:00

SUBJECT: NATURAL ATTENUATION OF CHLORINATED ETHENES AND CHLORINATED BENZENES, WASTEWATER TREATMENT PLANT NAS PENSACOLA FLORIDA.

PLACE:

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TWIN TOWERS OFFICE BUILDING
2066 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-240

RECORDER: Minutes were recorded by Maxie Keisler.

ATTENDING:

Shelton Graves	FDEP Tallahassee	(850) 488-0300
Merlin D. Russell Jr.	FDEP Tallahassee	(850) 921-9239
John Mitchell (JM)	FDEP Tallahassee	(850) 921-9989
Frank Chapelle	US Geological Survey	(803) 750-6116
Paul Bradley	US Geological Survey	(803) 750-6125
Maxie Keisler	Southern Division NAVFAC	(843) 820-7322
Mike Maughon	Southern Division NAVFAC	(843) 820-7422

Introduction:

This meeting was the second meeting held in Tallahassee Florida at FDEP on natural attenuation of chlorinated compounds at Naval Air Station Pensacola Wastewater Treatment Plant. The purpose of this meeting was to present the US Geological Survey's data and conclusions collected during quarterly visits over the past year with the recovery system operating. The USGS report, *NATURAL ATTENUATION OF CHLORINATED ETHENES AND CHLORINATED BENZENES, WASTEWATER TREATMENT PLANT NAS PENSACOLA*, June 1998, mailed to FDEP on 12 June 1998, was the basis for the presentation.

Discussion:

(USGS) Dr. Frank Chapelle opened with a description of the hydrogeology underlying the wastewater treatment site, describing the shallow aquifer and underlying confining layer. He described sampling strategies and methods employed to obtain data to

characterize redox conditions at the site and concentrations of chlorinated ethenes, chlorinated benzenes, and their biodegradation daughter products.

(USGS) Results were reported for Phase I of the evaluation, i.e., data collected with the ground water recovery system in operation. In brief, current anaerobic conditions existing in the aquifer at this site are reported to be favorable for complete natural biodegradation of chlorinated ethenes but are less efficient for biodegradation of chlorinated benzene compounds which degrade more efficiently under aerobic conditions.

(FDEP) Questioned the fate of vinyl chloride in an anaerobic environment. The USGS indicated that the current state of the science has shown that vinyl chloride biodegrades under iron reducing conditions in an anaerobic environment. Because the redox zonation at the site transitions from methanogenic and sulfate reducing to iron reducing, the sequential biodegradation of TCE, cis-1, 2 DCE, and vinyl chloride is complete and very efficient at this site. Frank Chapelle indicated he would provide FDEP with a copy of a USGS technical paper that was published in the *Engineering Science and Technology* (ES&T) journal on the biodegradation of vinyl chloride under iron reducing conditions.

(USGS) Stated that results of diffusion samples placed in sediments at the groundwater and surface water interface indicate that neither chlorinated ethenes nor chlorinated benzenes are being transported in groundwater to Pensacola Bay. Data show the chlorinated ethenes are completely biodegraded in the anaerobic aquifer within the first few hundred feet down-gradient of MW-66. Chlorinated benzenes, however, are still present in the closest well to the Bay, well 33G20, which is approximately 150 feet up-gradient from the bay. The hypothesis, as the literature suggests, is that the chlorinated benzenes are being biodegraded under oxic conditions induced by tidal fluctuations at the groundwater and saline surface water interface. SOUTH DIV and USGS proposed installing additional temporary wells and/or Geoprobe sampling between monitoring well 33G20 and the bay to verify the oxic conditions and the biodegradation of the chlorinated benzenes. SOUTH DIV and USGS also proposed performing a site specific laboratory study to confirm that chlorinated benzenes biodegrade in soils at this site under oxic conditions.

(FDEP) Indicated their previous concern with the chlorinated benzenes was that concentrations at the bay may exceed surface water standards. FDEP indicated that new surface water standards have been issued.

(SOUTH DIV) Stated that Phase II of this ongoing evaluation is intended to determine whether biodegradation processes and natural attenuation of chlorinated ethenes and chlorinated benzenes remain effective with the groundwater recovery system turned off. In accordance with RCRA Permit HF17-292641 Part V paragraph (3), Southern Division requested approval from FDEP to turn off the ground water recovery system in order to proceed with Phase II of the natural attenuation evaluation. FDEP responded that they generally concurred but that a letter needed to be forwarded requesting the system to be

turned off during the Phase II evaluation. SOUTHDIV stated the request would be included in the letter transmitting the meeting minutes to FDEP.

(SOUTHDIV) Proposed implementing a technology demonstration project using the Fenton's Reagent chemical oxidation technology for source reduction of the chlorinated ethenes hotspot in the vicinity of MW-66. FDEP generally concurred with the concept of the demonstration project and indicated that a copy of the technology vendor's proposal would need to be submitted. SOUTHDIV indicated a copy of the proposal will be submitted in the near future. Mike Maughon stated he would also forward a copy of the case study report for the Fenton's Chemistry chemical oxidation project recently completed by the Department of Energy at the Savannah River Site. SOUTHDIV also proposed having the contractor provide a presentation of the site-specific design to FDEP before project implementation. The proposed schedule is to implement the demonstration project after the two quarterly sampling events of Phase II are completed.

(FDEP) Requested additional sampling be performed during the two quarterly sampling events of Phase II. Consensus was that a couple of additional temporary wells will be installed or Geoprobe samples taken in the first 150 feet down-gradient of MW-66 to better define the efficiency of biodegradation of chlorinated ethenes during Phase II. If data during the two quarterly sampling events of Phase II indicate an increase in concentrations of chlorinated ethenes from previous sampling events, then additional sampling may be necessary to further evaluate the effectiveness of natural attenuation. The recovery well system will be available to again provide containment if data trends indicate natural attenuation of chlorinated ethenes is no longer protective of the bay.