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ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY

MEMORANDUM

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Media: Air, Water, Solid, Hazardous
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TO : Tom Boston, Chief, Solid Waste Division
Larry Wilson, Deputy Director

FROM : Tony Morris, Geologist Supervisor, SWD

DATE : 9-AUG-1991

SUBJECT : Response to Sunray Sanitation Letter
and Enclosures

TM #
GOOD RESPONSES

MQL/PQL
DISCUSSION
GOOD RESPONSES 014
UP GRADIENT
DOWN GRAD -
ISSUE
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02

A letter from Tony Morris dated July 8, 1991 was sent to Mr. Bob Baxter of Sunray Sanitation. The company was in the process of developing plans for a permit modification for final closure of the two permitted landfills (Sites 3 and 4). The letter indicated the staff was willing to work with the company to develop additional capacity, however the revised design must include some additional environmental safeguards. To justify the staffs' request for improved leachate collection capability and groundwater monitoring at the landfill complex, several graphs of water quality were included in the letter. The graphs depicted quite variable water chemistry between wells in the nine well monitoring system presently in place.

Accompanying Mr. Baxter's response to the Solid Waste Division staffs' concerns were reviews of the data by Edward Clement and Kirk Ellis of S.C.S. Engineers and Dan McCullough and Mark Witherspoon of James L. Grant and Associates, Inc. The following is a discussion of relevant points listed by the company's consultants:

- S.C.S. Engineers state that 10 ppb is the detection limit for the organic parameters listed in E.P.A. Methods 624 and 625.

The detection limits for the various organics are clearly shown in the referenced documents. Organic compounds can be detected at lower concentrations than 10 ppb with confidence as indicated in the methods.

The S.C.S. Engineers may be confusing the 10 ppb Practical Quantitation Limit in the Environmental Protection Agency's Contract Laboratory Program with the method detection limit. This 10 ppb value only applies to laboratories performing contract analytical work for the E.P.A.

Continued Memorandum: Response to Sunray Sanitation Letter
From: Tony Morris

- Both consultants pointed out the fact that potentiometric maps for the site indicate a clear northwest - southeast flow direction. They maintain that since the wells with the highest potentiometric levels have the poorest water quality, the landfills are not affecting the aquifer.

[REDACTED] literature documenting [REDACTED]
[REDACTED] predicting [REDACTED]
[REDACTED] A good example of this is at the Northwest Arkansas Solid Waste Management Landfill east of Springdale. This facility is also situated within the Boone Formation. Potentiometric maps prepared by Wyndal Goodman indicated a northeast flow direction within the aquifer. However, a dye trace conducted on the site indicated a 90 degree different direction of movement of the injected dye. This case clearly indicates the difficulty in reliably monitoring waste disposal facilities within the Boone Formation.

According to many researchers, potentiometric maps are not even good indicators of general groundwater flow in karst aquifers. While the Boone Formation is not a classic karst aquifer in the area of the Sunray Landfill complex, [REDACTED] formation has some degree of [REDACTED]. Therefore, contaminant movement in the area is uncertain and can not be predicted by potentiometric maps.

In conclusion, the staff is convinced that the landfills are impacting the quality of groundwater in the area. Since the closure modification will provide as much as 65 months (5.5 years) of additional disposal capacity, it would be in the best interest of the area to limit the amount of leakage from the facility into the aquifer. This can be accomplished by improving the cap design and installing a number of leachate removal wells into the waste mass.

WELL NAME IS W2
 PARAMETER IS TDS
 MEAN (AVE.) IS 132.5
 STANDARD DEVIATION IS 18.2939
 NUMBER OF DATA POINTS IS 13

MEAN ABSOLUTE DEVIATION IS 15.23077

WELL NAME IS W1
 PARAMETER IS TDS
 MEAN (AVE.) IS 522.8847
 STANDARD DEVIATION IS 20.95049
 NUMBER OF DATA POINTS IS 13

MEAN ABSOLUTE DEVIATION IS 15.93492

SUMMARY OF STATISTICAL TESTS ON 8/8/91 CONFIRMATION SAMPLES

WELL ID	PARAM	SAMPLE BKG		T*	TC	SIGNIFICANT DIFFERENCE AT .05 LEVEL?
		MEAN	MEAN			
W1	TDS	522.8847	132.5	50.60683	1.782721	YES (NOTE 1)

1. ANY SIGNIFICANT DIFFERENCES OCCURRING IN
 CONFIRMATION TESTS ARE REPORTABLE.
 REFER TO 40 CFR 264.98(h) OR SPECIFIC
 STATE RULES FOR REPORTING REQUIREMENTS.

WELL NAME IS W4
 PARAMETER IS TDS
 MEAN (AVE.) IS 185.5769
 STANDARD DEVIATION IS 20.82251
 NUMBER OF DATA POINTS IS 13

MEAN ABSOLUTE DEVIATION IS 16.30178

WELL NAME IS W9
 PARAMETER IS TDS
 MEAN (AVE.) IS 465.6769
 STANDARD DEVIATION IS 42.37077
 NUMBER OF DATA POINTS IS 13

MEAN ABSOLUTE DEVIATION IS 30.91006

SUMMARY OF STATISTICAL TESTS ON RUN CONFIRMATION SAMPLES

WELL ID	PARAM	SAMPLE MEAN	BKG MEAN	T*	TC	SIGNIFICANT DIFFERENCE AT .05 LEVEL?
W9	TDS	465.6769	185.5769	21.39161	1.782721	YES (NOTE 1)

1. ANY SIGNIFICANT DIFFERENCES OCCURRING IN CONFIRMATION TESTS ARE REPORTABLE. REFER TO 40 CFR 264.98(h) OR SPECIFIC STATE RULES FOR REPORTING REQUIREMENTS.

WELL NAME IS W8
 PARAMETER IS TDS
 MEAN (AVE.) IS 228.9583
 STANDARD DEVIATION IS 104.8949
 NUMBER OF DATA POINTS IS 12

MEAN ABSOLUTE DEVIATION IS 58.76388

WELL NAME IS W7
 PARAMETER IS TDS
 MEAN (AVE.) IS 553.4583
 STANDARD DEVIATION IS 54.56084
 NUMBER OF DATA POINTS IS 12

MEAN ABSOLUTE DEVIATION IS 42.04862

SUMMARY OF STATISTICAL TESTS ON 8/8/91 CONFIRMATION SAMPLES

WELL ID	PARAM	SAMPLE BEG		T*	TC	SIGNIFICANT DIFFERENCE AT .05 LEVEL?
		MEAN	MEAN			
W7	TDS	553.4583	228.9583	9.50724	1.796326	YES (NOTE 1)

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 STATE RULES FOR REPORTING REQUIREMENTS.