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RECORD OF TELEPHONE CONVERSATION

CALL TO: Sludge Treatment Team **DATE:** September 7, 1994

CALL FROM: Phil Nixon **DOCUMENT #:** SP307:090894:02

PROJECT: OU4 Solar Ponds IM/IRA

SUBJECT:

ATTENDEES:

Tom Boeckman, EG&G
Leon Collins, EG&G
Don Ferrier, EG&G
Kathy London, EG&G
Steve Hughes, HNUS
Harry Heidkamp
Ron Schmiermund
Dan Creek

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Soil Strength Discussions

Tom Boeckman indicated that the sludge treatment team questioned whether soil strength parameters should be established as waste acceptance criteria, and determined for the sludge/soil waste form. The sludge team noted that proctor testing is not a strength test but is more of a density test at a specific moisture content. Phil Nixon stated that a geotechnical testing program was currently underway to examine the following parameters:

Triaxial tests - ASTM D 2850
Direct Shear tests - ASTM D 3080
Consolidation tests - ASTM D 2435
Specific Gravity tests - ASTM D 854
Moisture Content tests - ASTM D 2216

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Gradation tests - ASTM D 422
Atterberg Limits tests - ASTM D 4318
Unit Weight tests - ASTM D 2937
California Bearing Ratio tests - ASTM D 1883

Dan Creek explained that these tests are being performed on samples from the soil/bedrock interface to establish the potential for hillside stability concerns. Therefore some of the data may not reflect the physical properties of consolidated soils beneath the engineered cover. Dan Creek indicated that he is most interested in Proctor test results for the sludge/soil mixture with respect to the compacted consolidated soils. The results of the geotechnical tests (which are anticipated to be received within two weeks) will provide little applicable data for compacted soils.

The primary reason why ES is not concerned with soil strength results is that the anticipated construction strategy provides one thin lift of the sludge/soil mixture within the entire footprint of the engineered cover. Therefore, settlement is anticipated to be negligible and constant over the entire area of the engineered cover. The sludge team was unaware of this construction strategy and felt that it should be identified as a design or waste acceptance criteria. It was noted that this construction strategy would require storage of the sludge/soil mixture until the construction subcontractor was ready to place the sludge/soil lift. Storage space may be a limiting factor in the success of the implementation strategy. Tom Boeckman stated that if the sludge treatment team could provide a sludge/soil mixture that had equal strength properties of the natural soils, then the sludge/soil mixture should be able to be placed in a more random manner instead of a uniform lift. It was agreed that this strategy was appropriate if the properties of the soil and the sludge/soil mixture were equal; however, Dan Creek stated that these properties would likely be significantly different for the two materials. Tom Boeckman asked what soil strength tests needed to be performed on the sludge/soil mixture to get adequate strength characteristics? Dan Creek responded that the following tests would be required:

CU Triaxial testing - ASTM D 4767
Consolidation testing - ASTM D 2435
Proctor testing - ASTM D 698 or D 1557

Ron Schmiermund added that soil moisture retention characteristics needed to be determined along with the proctor testing. These tests include:

Hanging Column testing - MOSA, 1986. Chp. 26 pp. 637-639
Pressure Plate Extractor testing - ASTM D 2325-68(81)M and MOSA, 1986. Chp 26. pp. 644-649

MOSA stands for the "Methods of Soil Analysis" written by A. Klute and published in 1986 by the American Society of Agronomy (Madison, WI). It was noted that these moisture and strength tests need to be performed on both native soils and the sludge/soil mixture to demonstrate that key

properties are equivalent. If the sludge/soil mixture has strenght properties that are either significantly less than or greater than the native soil properties, then the sludge/soil mixture should be placed into the closure as a thin lift throughout the waste consolidation area.

It was concluded that the sludge treatment team would perform the above mentioned soil strength and moisture retention testing. It was also concluded that the IM/IRA construction subcontractor would not be held to a soil strength characteristic as a QA/QC requirement, but the sludge treatment contractor could be directed to meet soil strength characteristics.

Modeling Discussions

Steve Hughes asked if ES had received the Kd information that HNUS had sent. Ron Schmiermund stated that the data had been received. Steve Hughes suggested that ES run the new model (VS2DT) in reverse using the conservative literature Kd values to determine the worst case requirements that HNUS would have to meet in order to be protective of human health and the environment. Phil Nixon indicated that ES had spoken to Richard Ninesteel during a previous conference call with Leon Collins and had agreed to run the model backwards to provide some requirements to HNUS. Phil Nixon stated that ES is procuring the model and it is expected to arrive by September 8,1994. Ron Schmiermund stated that it was important to obtain site specific Kd values because there are numerous intrinsic soil variables that affect the determination of absorption isotherms (Kd). None of the literature Kd values were derived from soils that adequately approximate OU4 soils. In addition, it remains impossible, without obtaining OU4 soil Kds, to unequivically state that the worst case has been determined by using literature Kd values that may not approximate the OU4 soils. It was agreed that EG&G would determine which contract should be modified to perform the additional Kd testing of native soils. ES is currently preparing a work plan. Soil samples may already exist from the recent geotechnical samples. A laboratory is needed. HNUS will provide absorption isotherm results from the sludge/soil mixture.