

CONVERSATION RECORD

TIME
11 AM

DATE
1/25/84

TYPE VISIT CONFERENCE TELEPHONE
 INCOMING OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

ORGANIZATION (Office, dept., bureau, etc.)

TELEPHONE NO.

Steve Baker

BWIP

F-444-7981

SUBJECT

NRC comments on "Analysis of Two-Well Tracer Tests with a Pulse Input", L. Gelhar, RHO-BW-CR-131-P

ROUTING	
NAME/SYMBOL	INT
RWright	
MKnapp	
DocConCen.	

SUMMARY

Call was between M. Gordon (WMGT) and Steve Baker, L. Leonhart, Gail Hunt, and Jim Bazemore (all BWIP). Call made in response to request from BWIP to R. Wright for information on status of NRC review, to which NRC had committed itself by R. Wright in December 1983.

Summary of telephone conversation is provided on the attached pages.

WM Record File
101.2

WM Project 10

Docket No.

PDR

LPDR

Distribution:

(Return to WM, 623-SS)

C2

ACTION REQUIRED

Provide written NRC comments on document to DOE by February 29.
Consider possibility of inclusion of topic at May Hydrology Workshop.

NAME OF PERSON DOCUMENTING CONVERSATION

Matthew Gordon

SIGNATURE

Matthew Gordon

DATE

1/25/84

ACTION TAKEN

None

SIGNATURE

Matthew Gordon

TITLE

Proj. Mgr./ Hydrogeologist

DATE

1/25/84

50271-101

CONVERSATION RECORD

OPTIONAL FORM 271 (10-76)
DEPARTMENT OF THE INTERIOR

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PDR WASTE
WM-10

PDR

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Documentation of Conversation (from notes)

- MG: Our review of the document is still in the preparatory stages; we are having our contractors and staff review it at this time. I can offer some general, preliminary comments in advance of our detailed review. First of all, however, I have a question. The document describes a method of deriving estimates of dispersivity and effective porosity. How will such estimates of dispersivity be utilized in performance assessments of BWIP?
- SB: We are not sure at this time how dispersivities will be used by the performance assessment group.
- MG: OK. Based on our very preliminary review, I can offer you the following initial impressions of the document's approach. The analytical concentration solution used by Gelhar to analyze tracer tests in an assumed confined, homogeneous aquifer is accepted and well-documented in the literature. However, the assumptions used have generally been found to be inappropriate in actual field cases. Observations indicate that dispersivity varies with scale, and also varies from place to place. The assumption of a constant dispersivity to be used in the advective-dispersive transport equation applied at other scales, or along other flow paths, using results of a tracer test analysis such as Gelhar's, is controversial, in practice, within the hydrologic community. I believe that Dr. Gelhar himself, and many others, have done work demonstrating the scale-dependence of dispersivity.
- SB: We plan on collecting tracer test data at many locations and at many scales, in order to estimate the spatial- and scale-dependence of dispersivity.
- MG: I expect that that is a good strategy, and is likely to provide more useful information. However, it will require a great deal more analysis than has been presented in this document. The analytical framework for determining the scale-dependence of dispersivity from "point" dispersivity measurements is presently a "hot topic" among hydrologists. My point in bringing up this matter is the concern that dispersivity estimates gained by tracer tests at this scale (50 meters) may not be plugged into repository-scale transport analyses as a simple constant. I can offer no alternative, other than the strategy mentioned by Steve, which I suspect is on the right track.

TELECON

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- GH: Let me clarify the reason we arranged for this call. We are interested in NRC's opinion of the testing methods used, and in the analytical work done by Gelhar, since Dr. Gelhar is presently under contract to us and may be doing more of this type of work. Exactly how the data will be used we are not prepared to answer at this time.
- MG: I'll reiterate that these are our very preliminary comments, but as yet we have no unfavorable remarks to make regarding either the tracer test or Dr. Gelhar's analysis. We will be reviewing it further and will pass on any and all comments to you. The analysis appears to us to be quite good and sound. The question I have brought up refers only to its application in performance assessment of the site. But the whole concept of "dispersivity" is introduced as an artifact of the advective-dispersive transport equation, so I don't think we can separate the methods of estimation from its intended use. Gelhar's paper does not discuss the transport equation or its application in performance assessment of BWIP; he begins with the solution to the equation. A discussion of how BWIP intends to use dispersivity measurements in performance assessments would be helpful.
- SB: We are looking into these questions.
- MG: My other comment is in reference to the estimation of porosity which would be "backed out" of a tracer test analysis such as Dr. Gelhar's. The analytical method provides one only with a product term, "effective thickness", which is the product of effective porosity and aquifer thickness. When the aquifer thickness is uncertain, the value of porosity will be uncertain also. You have obviously recognized this problem, since in the BWIP SCR, the value of porosity yielded by this test was acknowledged to be uncertain within two orders of magnitude due to the uncertainty in aquifer thickness.
- LL (or JB?): For our purposes, we will only need to know the "effective thickness" [product] which, along with the transmissivity, will be used in our flow and transport analyses.
- MG: That would be true for two-dimensional ^{horizontal} analyses, but for three-dimensional analyses one needs to know conductivity and porosity.