see pocket 1 (1985) for inclosure

WM Record File 101.2

WM Project 10
Docket No.
PDR ✓
LPDR ✓

Distribution:

(Return to WM, 623-SS)

SUMMARY MEETING MINUTES
DOE/NRC MEETING
BWIP HYDROLOGY PROGRAM
MAY 22, 1985
SILVER SPRING, MARYLAND

The DOE and the NRC staffs met to exchange information relative to the BWIP hydrology program. The agenda for this meeting is contained in Attachment 1. The attendees are listed in Attachment 2.

The DOE presented information (Attachment 7) on the current and planned activities at test boreholes RRL-2B and RRL-2C including design, schedule and aquifer testing plan(s). Additional information was presented on the potentiometric surfaces as they exist in the area defined by test wells DC-19, DC-20 and DC-22. DOE presented a status of the hydrogeology testing program including a discussion of recent modifications to the program and current LHS testing baseline evaluations.

The NRC staff presented (Attachment 8) comments received in response to the December 1983 publication of Draft Technical Position 1.1 "Hydrogeologic Testing Strategy for the BWIP Site." Further information was presented on NRC statistical work of BWIP hydrochemistry data.

Both the NRC and DOE presented opinions and positions concerning the intent and definition of "consensus baseline" as identified in the Draft STP 1.1 logic diagram for BWIP Hydrology Test Strategy Stage 1 decision point. These opinions and positions plus general comments are detailed in Attachment 3 for DOE and Attachment 4 for the NRC staff.

Comments relative to this meeting were received from the technical representatives to Yakima Indian Nation, CERT and the USGS. These comments are found in Attachment 5.

Open items resulting from this meeting are identified in Attachment 6.

David H. Dahlem DOE — Date 5/23/85

Robert J. Wright NRC — Date 5/23/85

WM DOCKET CONTROL CENTER
'85 JUN 11 P2:56

8506250386 850523
PDR WASTE
WM-10 PDR

1409

see cover ltr on summary Meeting minutes
101.2
5/22/85

Attachment I

AGENDA
DOE/NRC HYDROLOGY WORKSHOP
MAY 22, 1985
SILVER SPRING, MARYLAND

MEETING OBJECTIVE: PROVIDE NRC WITH UP-TO-DATE INFORMATION CONCERNING UPDATED HYDROLOGIC TESTING STRATEGY AND RECENT BASELINE EVALUATION. PROVIDE DOE WITH NRC COMMENTS ON BASELINE EVALUATION AND TESTING STRATEGY, AND EVALUATION OF HYDROCHEMISTRY DATA.

9:00 A. M. OPENING REMARKS - DOE/NRC

9:15 A. M. DICUSSION OF BWIP/NRC ROLES IN THE "CONCENSUS BASELINE"

9:30 - 11:00 BACKGROUND

RRL-2B AND 2C DRILLING AND TESTING

- RRL-2 SITE CONFIGUARATION
- PROJECT SCHEDULE
- RRL-2C DRILLING STATUS
- RRL-2B DESIGN
- RRL-2C DESIGN
- AQUIFER TESTING PLANS

GROUNDWATER LEVEL BASELINE SUMMARY

RRL POTENTIOMETRIC SURFACES

- DC-19, DC-20 AND DC-22
- WANAPUM AND GRANDE RONDE BASALT HYDRAULIC HEAD RELATIONS

EFFECT OF RRL-2C DRILLING ON SADDLE MOUNTAINS AND WANAPUM HYDROGEOLOGIC MONITORING ZONES

12:00 NOON LUNCH

11:30 - 3:00 BWIP HYDROLOGIC TEST PROGRAM STATUS

- EVALUATION CRITERIA SUMMARY
- BASELINE STATUS SUMMARY
- DISCUSSION OF MODIFIED PROGRAM

3:00 P. M. NRC DISCUSSIONS

- COMMENTS ON BASELINE AND TEST STRATEGY
- COMMENTS RECEIVED NY NRC ON STP 1.1
- PRESENTATION OF RECENT STATISTICAL WORK ON BWIP HYDROCHEMISTRY DATA

5:00 P. M. CLOSING REMARKS AND PUBLIC COMMENT

Attachment 2

ATTENDEES - BWIP/NRC HYDRO WORKSHOP 05/22/85

Name	Organization	Phone
Matthew J. Gordon	NRC/WMGT	FTS 427-4438
Neil Coleman	NRC/WMGT	FTS 427-4131
Steve Baker	Rockwell/BWIP	FTS 444-4764
David H. Dahlem	USDOE Richland	FTS 444-3022
Maurice D. Veatch	Rockwell/BWIP	FTS 444-2566 (509-376-2566)
Jim Bazemore	Rockwell/BWIP	FTS 444-9188
Ron Smith	Rockwell/BWIP	FTS 444-0687
K. Michael Thompson	DOE-RL	FTS 444-6421 (509-376-6421)
P. A. Domenico	Texas A+M	409-845-0636
Gerry Winter	W&A/NRC	208-883-0153
Allan Jelacic	DOE/HQ	FTS 252-9362
Robert J. Wright	NRC	FTS 427-4674
Kenneth P. Parr	NRC/WMRP	FTS 427-4623
John Kovacs	D.O.E. BWIP	444-1291
Paul Davis	NRC/Sandia Labs	FTS 846-5421
Dale Ralston	NRC/Williams & Assoc.	208-883-0153
Bob Jackson	Weston/DOE	301-963-5211
A. K. Ibrahim	NRC/GT	FTS 427-4621
V. V. Nguyen	EWA/YIN	612-559-3706
G. Hokkanen	ENA	612-559-3706
L. Lehman	YIN	612-894-9359
K. Westbrook	NRC	FTS 427-4532
J. R. Rollo	USGeological Survey	FTS 928-6082
David Ward	GeoTrans/YIN	703-435-4400
V. (DUA) Guvanasen	GeoTrans/YIN	703-435-4400
John Linehan	NRC	FTS 427-4672
Hubert Miller	USNRC	FTS 427-4177
Phil Brown	Council of Energy Resource Tribes (CERT)	303-832-6600
David Brooks	NRC	FTS 427-4603
Philip S. Justus	USNRC	301-427-4684
Bruce W. Hurley	DOE-RL/BWIPO	(444-FTS) (509) 376-7059
Martha Pendleton	Weston	301-963-5217
Roy E. Williams	NRC Consultant	208-885-6259

ATTACHMENT 3

DOE COMMENTS

The following bullets represent DOE's positions and comments presented during the workshop:

- Consensus Baseline Discussion: Considerable discussions occurred relative to the definition of "consensus baseline" and the steps involved in determining if a baseline exists. It is DOE's understanding that the NRC staff's view is essentially the same as when STP 1.1 was developed. It is DOE's understanding that a view was expressed by the NRC staff that the decision as to whether a baseline exists is ultimately DOE's call; however, the BWIP Program would be best served if an effort is made by DOE to reach an agreement with the NRC on the existence of a baseline. Further, it is DOE's understanding that it is not NRC's intention to be signatory to such an agreement, but a general level of agreement should be made, perhaps summarized in meeting minutes.

  DOE's position is that the decision as to the establishment of a baseline is the sole responsibility of DOE. The DOE is in agreement with STP 1.1, Appendix A, Details of Approach, Section 1E, page A-2, which states:

  "The NRC staff considers that it would be prudent for DOE to solicit review by NRC and others as an approach to developing technical consensus that a piezometric baseline which is adequate for use in defensible assessments with respect to 10 CFR Part 60 has been established"."

  An integral part of the BWIP Test Strategy Logic is to fully discuss the data and decision analysis with the outside technical community, including the NRC, concerning baseline establishment, at the appropriate time, prior to initiating activities that would disturb the hydrologic system.

  At this time, the DOE projects that a baseline adequate to predict the spacial and temporal parameters of groundwater flow will exist to allow for testing in Fall, 1985. The test schedule has been delayed and other changes have been made to the hydrologic program. DOE is of the opinion that an understanding of water level trends exists at this time in the area defined by DC-19, DC-20 and DC-22.

- DOE commits to provide NRC an up-to-date piezometric data set for DC-19, DC-20, and DC-22, standardized to remove barometric effects within two weeks.

- In the view of DOE, an understanding of water level trends at DC-19, DC-20 and DC-22 exists adequate for the proposed first test analysis.

- DOE will fully analyze the potential impacts of testing before proceeding.

- Baseline data will continue to be collected throughout the hydrologic characterization effort.

- DOE provided a response to the seven items relative to inconsistencies in the June 12-13, 1984 workshop and the objectives of STP 1.1, as detailed in the October 29, 1984 letter Wright (NRC) to Olson (DOE). This appears in the following two pages.

BWIP ACTIVITIES RELEVANT TO NRC COMMENTS OF OCTOBER 1984

1. Lack of an adequate test program for RRL-2B

   - Additional Observation Points (RRL-2C)
   - At least one full test prior to start of ES
   - Additional tests (perhaps retest) after ES grouting

2. Lack of facilities near RRL-2B

   - Additional facility (RRL-2C)
   - Integrity tests of RRL-2A
   - Use Straddle Packers in RRL-2A

3. Failure to take advantage of RRL-6 and RRL-14

   - Westbay being installed in RRL-14 (Must be considered to be developmental!)
   - Rocky Coulee monitored in RRL-6
   - Straddle Packers in RRL-2A (including Rocky Coulee)

4. Facilities outside of the RRL

   - New facilities being proposed (BWIP is not prepared now to fully address the additional facilities to be provided)
   - Data Package 42 provides Hanford monitoring data

5. Strategy for Boundary Evaluation

   - More transmissive flow tops will provide boundary information (may need to deal with the "transferability" of boundary information from Wanapum
   - Image Well type analyses will be performed whenever possible.
   - Boundary definition will probably not be completed until after ES drilling

6. Strategy for Vertical permeability measurements

   - RRL-2C facilitates Ratio test analysis (Localized Kv of flow interior)
   - Inverse multi-layer modeling to determine integrated

leakage across flow interiors and detect major cross-cutting features

7. Strategy for transport pathways

- Pathway determination depends on large-scale "direct" testing, geologic structure and stratigraphy, and hydrochemistry
- Major testing may wait until after Exploratory Shaft is emplaced

ATTACHMENT 4

NRC COMMENTS

May 23, 1985

1) "Consensus Baseline Established" in "Logic Diagram for BWIP Baseline: Hydrologic Test Strategy," Diagram Presented by BWIP at the December 1984 Meeting

It is NRC's view that the supportability of the upcoming test program depends, to an important extent, on DOE's meaningful consideration of input by concerned parties, prior to testing, and general agreement that baseline has been established. This philosophy is consistent with the hydrologic testing strategy, evolved during the July 1983 DOE/NRC meeting and contained in staff Technical Position 1.1.

In the NRC view, the intent of Draft Site Technical Position 1.1 is that DOE will take steps to reach general agreement that baseline hydrologic conditions are sufficiently understood for Stage 2 testing to proceed. In this context, agreement means DOE's meaningful consideration of input by concerned parties, prior to testing, and attempting to reach a common technical view on baseline conditions, before testing. It does not mean written concurrence or sign-off by NRC or other parties. Such a technical view could be developed by review of the data and technical discussion at a meeting like the present one. This technical view would be recorded in the meeting notes.

The material presented at this meeting is a substantial contribution to NRC's understanding of the baseline. NRC is ready to further analyze the data provided, to examine additional data as provided and to meet again to work with DOE on the hydrologic baseline.

2. Clarification of Term "Hydrologic Baseline"

NRC considers that the "Hydrologic Baseline," as noted in Draft STP 1.1 and subsequent DOE/NRC discussions has two important components. These components are: 1) a hydrologic baseline adequate for the interpretation of future hydrologic tests; 2) a hydrologic baseline adequate for definition of the pre-emplacement groundwater flow system(s).

3. NRC Statement on "Hydrologic Baseline"

The data being collected at DC-19, DC-20, and DC-22 are useful for establishing the head trends at these locations. Based on the data reviewed by NRC up to this time, which is data from 1984, we note that the Grande Ronde water levels appear to remain in a state of transience. Until we obtain and review the monitoring data from January to the present we cannot provide any statement regarding the ability to extrapolate the head trends at these locations. Extrapolation of head trends is necessary for LHS test data analysis at these locations and to infer static heads to define the flow system. The NRC requests that we be provided with the analyses cited by DOE during the workshop in order to review and provide comment on the adequacy of the baseline in terms of interpretability of the LHS tests. The NRC also will need to examine data collected during the drilling of RRL-2C to evaluate the potential perturbations to the baseline caused by the drilling.

Based on the data seen by NRC up to this time it appears that a hydrologic baseline necessary for definition of the flow system does not presently exist. We note that a potential exists for perturbing the baseline by LHS testing. Testing may jeopardize the timely characterization of the pre-emplacement flow directions and gradients. We recommend that DOE consider development of maps of the areal and vertical potentiometric head distribution as a function of time using information from all available monitoring wells pertinent to performance assessments of the hydrogeologic setting of the repository. This will enable evaluations of the baseline for flow system definition.

4. Changes in Test Programs Since December 1984

A number of changes in the hydrologic test program were unveiled by DOE at the workshop. The most notable changes were:

a) A reduced scale hydraulic stress at the RRL-2 cluster installations prior to ES drilling.

b) The potential deletion of the previously planned large-scale hydraulic stress test prior to the Exploratory Shaft (ES) penetration of the Grande Ronde. A decrease in the scale of the LHS test limits the evaluation of hydraulic properties to a smaller portion of the Rocky Coulee flow top. The probability of detecting leakage or boundaries would be reduced by a reduction in scale of the LHS tests.

c) A number of additional planned holes outside the RRL.

d) Postponement of the first pump test from June to November 1985 (tentatively).

e) A program to perform independent regional modeling.

We will review these changes based on the information provided and plan to provide comments within a month.

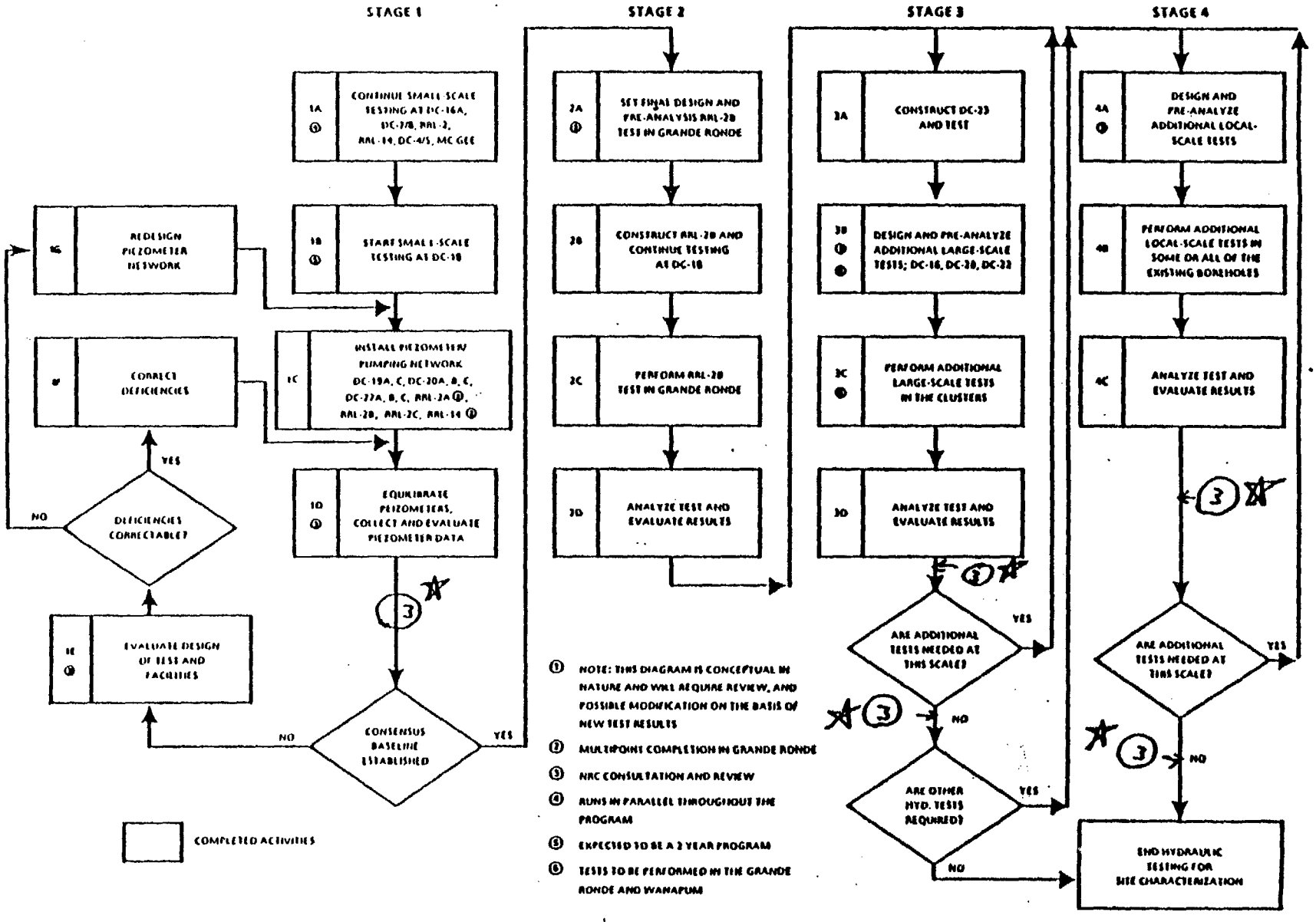
5. Items not Discussed

We note that the item on the preliminary agenda agreed on prior to the workshop, "Environmental Head Discussion", was not discussed during this workshop. We also note that characterization of effective porosity, dispersivity and vertical hydraulic conductivity were not discussed during this workshop. We suggest that these topics be covered in future NRC/DOE interactions.

6. Points of NRC Consultation

NRC and DOE have agreed on the reinstatement of NRC consultation and review in the logic diagram for the hydrologic testing program as shown on the attached "Logic Diagram," presented by DOE at the December 1983 hydrology meeting as well as this meeting. These consultations appear prior to all of the major decisions and planning points in the figure.

LOGIC DIAGRAM FOR BWIP HYDROLOGIC TEST STRATEGY ①
(AFTER NUCLEAR REGULATORY COMMISSION, 1983)



☆ changes agreed to by NRC and DOE at conclusion of May '85 hydrology meeting with respect to "NRC consultation and review" points only.

ATTACHMENT 5

COMMENTS FROM PUBLIC AND INTERESTED PARTIES

The following comments were presented at this workshop by the following parties.

Linda Lehman is a consultant to the Yakima Indian Nation; however, the comments below express her own opinion and do not necessarily reflect the official position of the YIN. Ms. Lehman requested clarification on the planned tracer, pump, and injection tests planned for the RRL-2 wells. Ms. Lehman also expressed a desire to see quantitative criteria developed for calculating the adequacy of the baseline data. Ms. Laehman also wishes to see agreement reached on the baseline prior to starting the Exploratory Shaft (ES), and considers that the State of Washington, the confederated tribes of the Umitilla Reservation and other interested parties should be involved in that agreement. Ms. Lehman also questions the ability to assess the adherence of RHO to Q/A procedures in collecting baseline data.

Phil Brown (CERT, consultant to the Umatilla and Nez Perce Indian Nations) questioned whether data on the water quality and stage information of the Columbia River will be collected. He also requested information on the chemistry and stability of the cement used in the wells in the RRL area. Information on the determination of the optimal pumping rates and on the effects of casing storage on the hydrologic tests was requested with respect to the procedures that will be used in data analysis.

Jim Rollo (U.S. Geologic Survey) expressed "comfort" with the general approach presented by DOE at this workshop. He did point out that the gains and losses must be carefully considered regarding the potential for reducing the scale of the "large scale" test planned for the RRL-2 wells.

ATTACHMENT 6

OPEN ITEMS

- DOE plans to provide information to substantiate schedule changes in LHS Testing at Hanford.
- DOE commits to provide NRC an up-to-date piezometric data set for DC-19, DC-20, and DC-22, standardized to remove barometric effects within two weeks.
- NRC will review the changes identified in item 4, and intends to provide comments to DOE within a month.
- NRC requests updates on the monitoring data from other on-site wells (data collected subsequent to September 1984).
- NRC requests that DOE provide the analyses cited by DOE during the workshop supporting their position that the baseline is adequate for interpretation of planned hydraulic tests.
- NRC requests that DOE provide data collected from neighboring boreholes during drilling of RRL-C2 to evaluate potential perturbations to the baseline caused by the drilling.

DEPARTMENT OF ENERGY|NUCLEAR REGULATORY COMMISSION

HYDROLOGY WORKSHOP

MAY 22, 1985

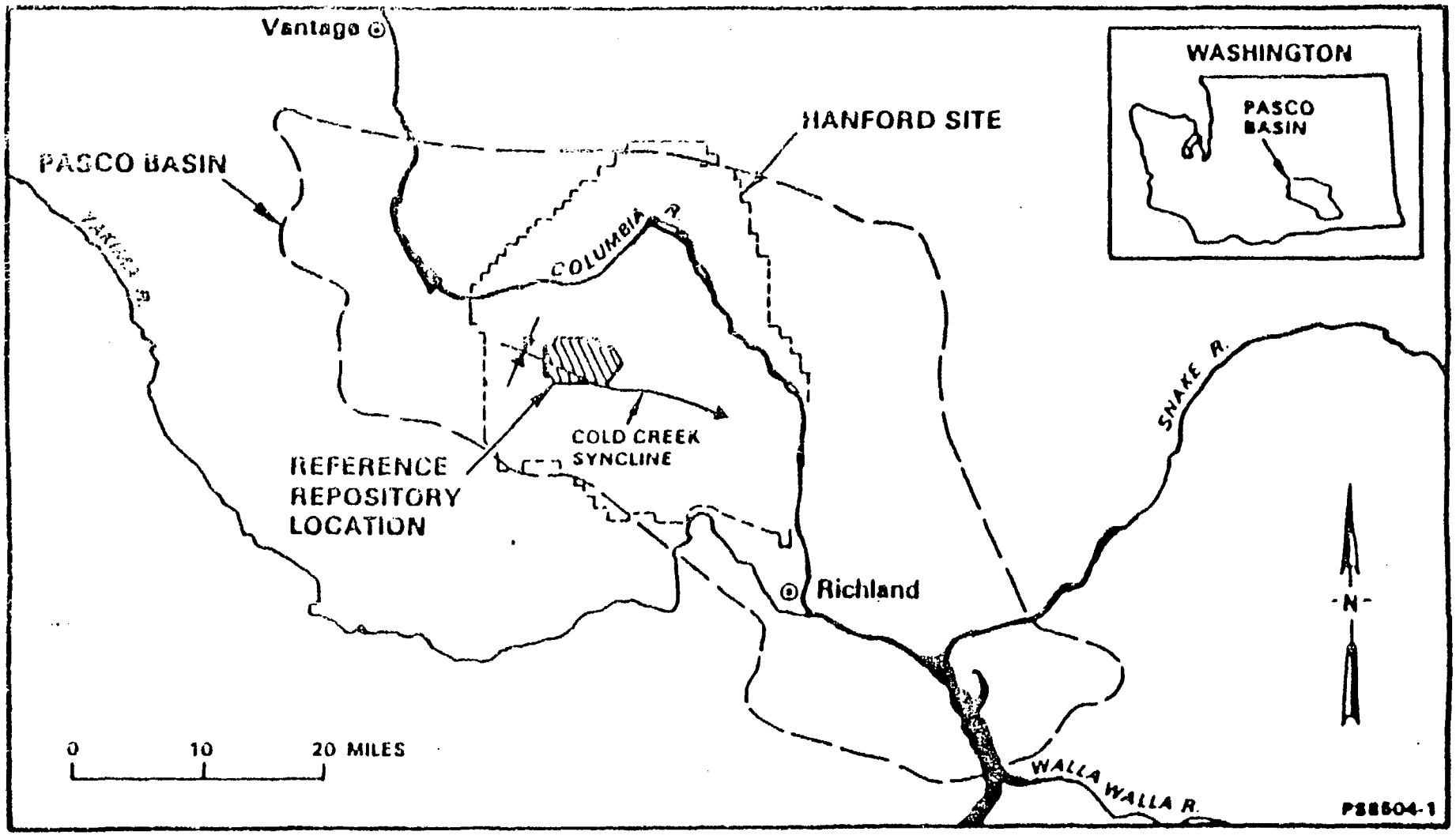
SILVER SPRINGS, MARYLAND

Attachment 7

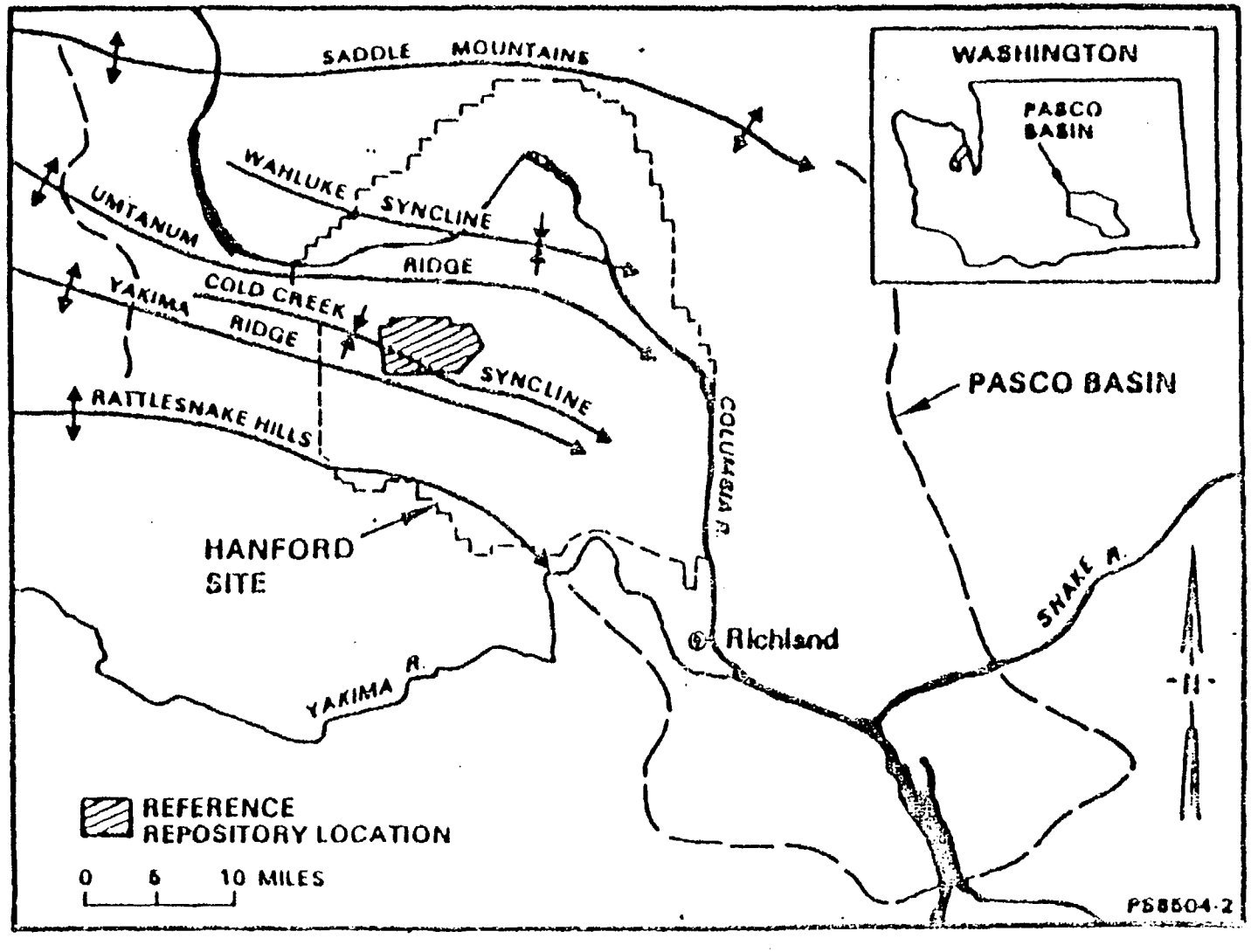
BASALT WASTE ISOLATION PROJECT

RRL-2B AND 2C DRILLING AND TESTING AND

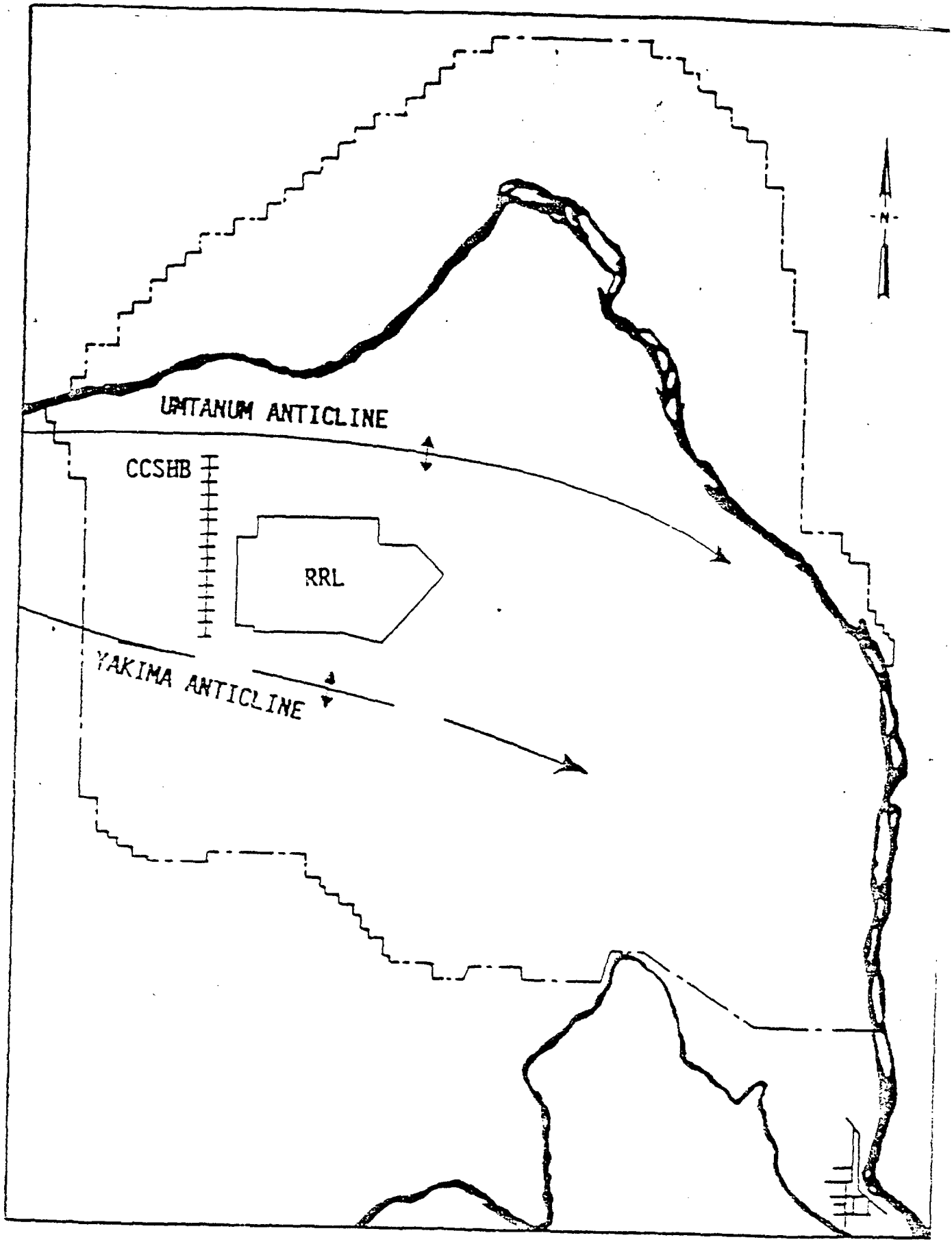
GROUNDWATER LEVEL BASELINE SUMMARY



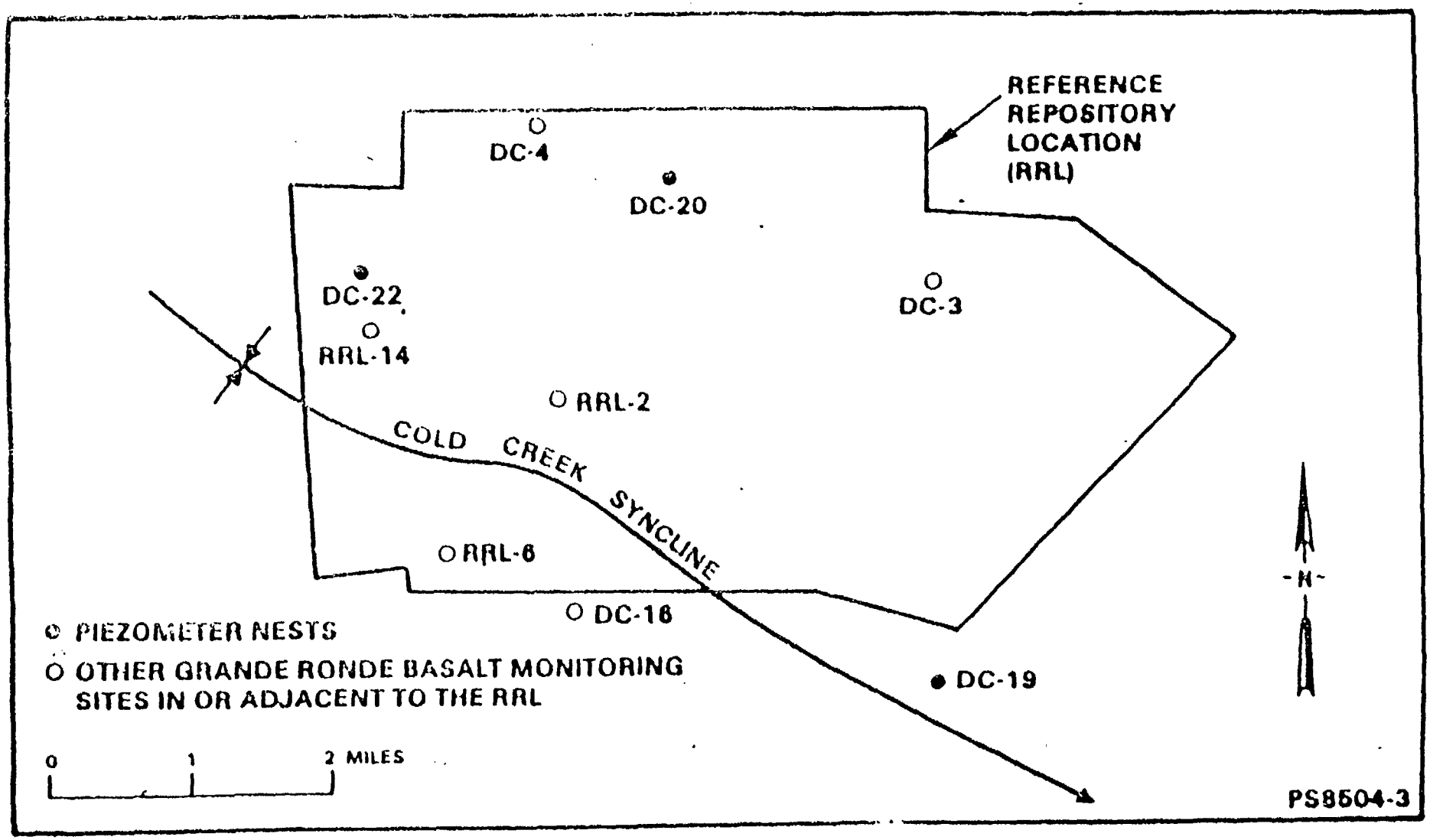
Hanford Site location map.



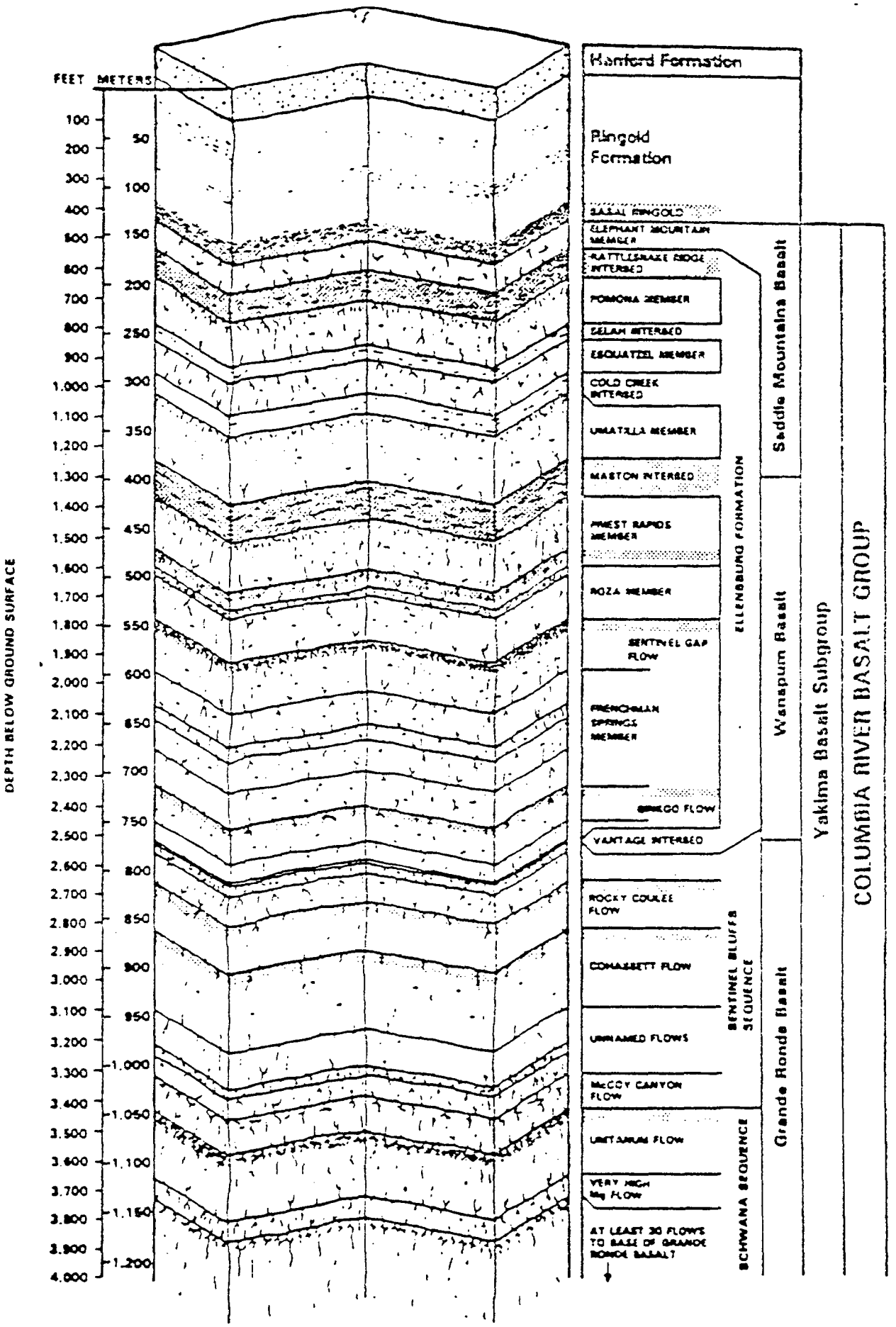
Major synclines and anticlines in the Pasco Basin.

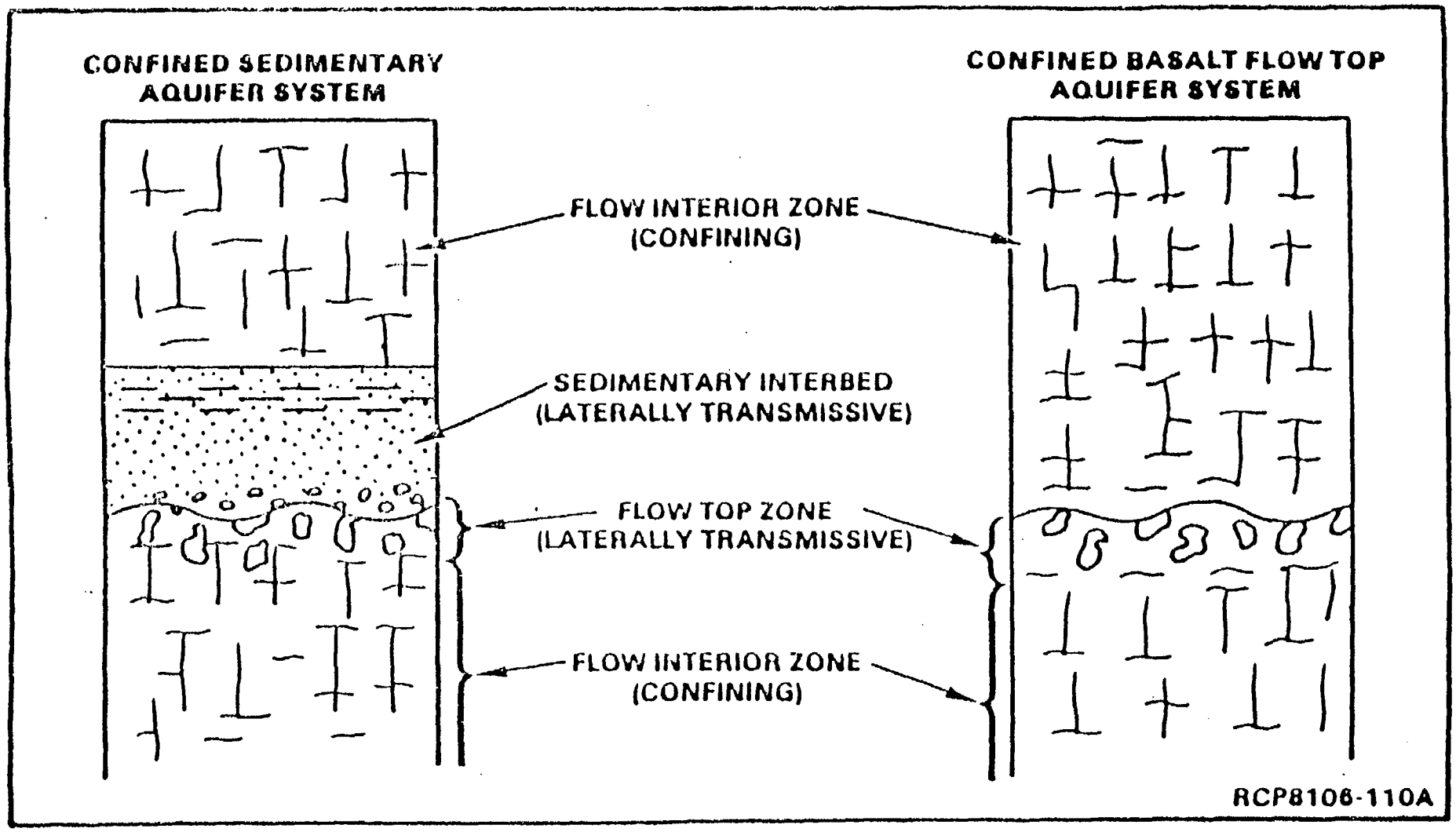


LOCATION OF MAJOR ANTICLINES WITH RESPECT TO REFERENCE REPOSITORY LOCATION (RRL) AND UPPER COLD CREEK SYNCLINE HYDROLOGIC "BARRIER" (CCSHB)

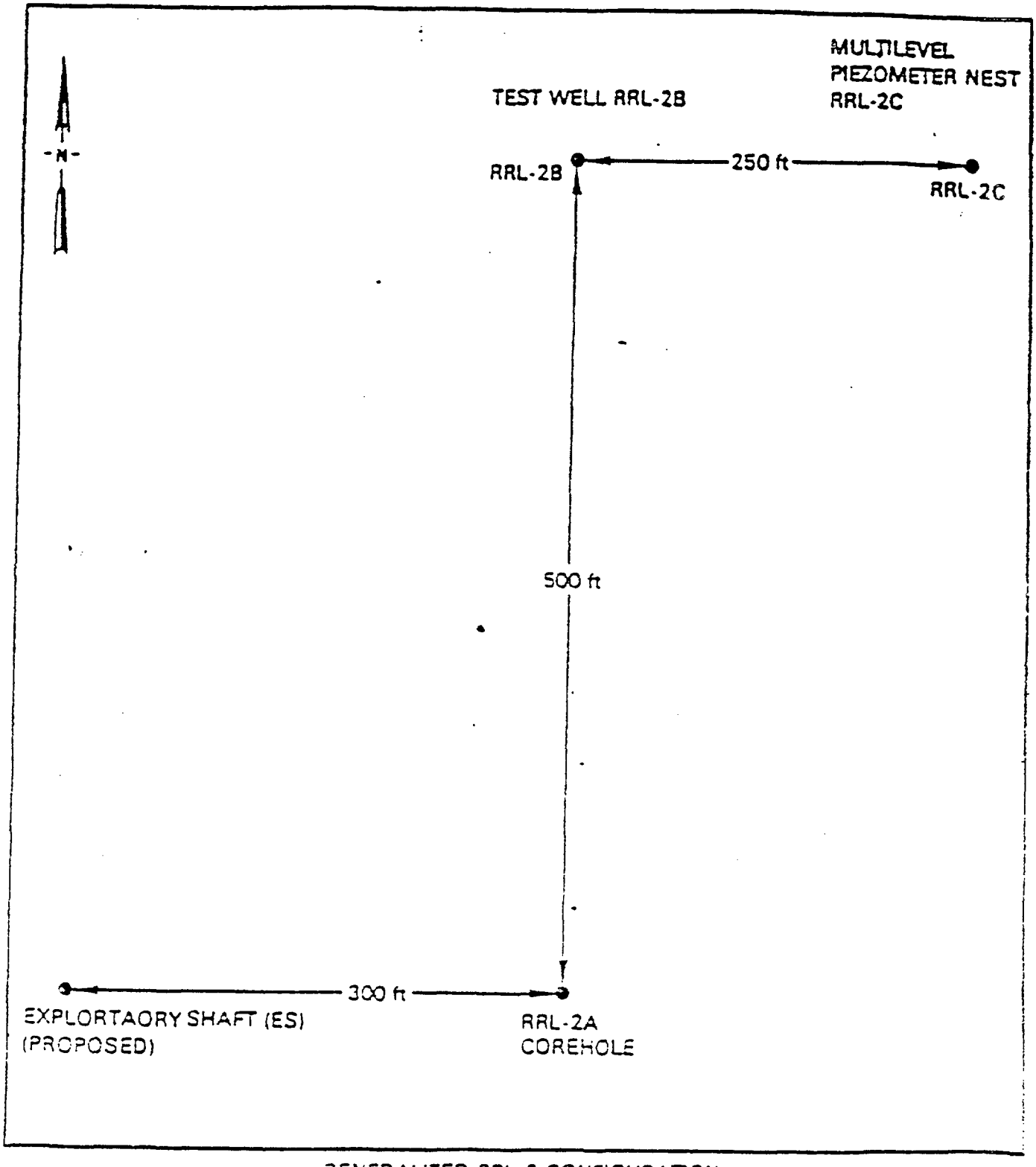


Location of multilevel piezometer nests DC-19, DC-20, and DC-22 at reference repository location.


FEET
METERS
DEPTH BELOW GROUND SURFACE
Hanford Formation
Ringold Formation
BASAL RINGOLD
ELEPHANT MOUNTAIN MEMBER
RATTLESNAKE RIDGE INTERBED
POMONA MEMBER
SELAH INTERBED
ESQUATZEL MEMBER
COLD CREEK INTERBED
UMATILLA MEMBER
MASTON INTERBED
PRIEST RAPIDS MEMBER
ROZA MEMBER
SENTINEL GAP FLOW
FRENCHMAN SPRINGS MEMBER
GINKGO FLOW
VANTAGE INTERBED
ROCKY COULEE FLOW
COHASSETT FLOW
UNNAMED FLOWS
McCOY CANYON FLOW
UMTANUM FLOW
VERY HIGH Mg FLOW
AT LEAST 30 FLOWS TO BASE OF GRANDE RONDE BASALT
ELLENSBURG FORMATION
SENTINEL BLUFFS SEQUENCE
SCHWANA SEQUENCE
Saddle Mountains Basalt
Wanapum Basalt
Grande Ronde Basalt
Yakima Basalt Subgroup
COLUMBIA RIVER BASALT GROUP
HYDROGEOLOGIC UNITS MONITORED

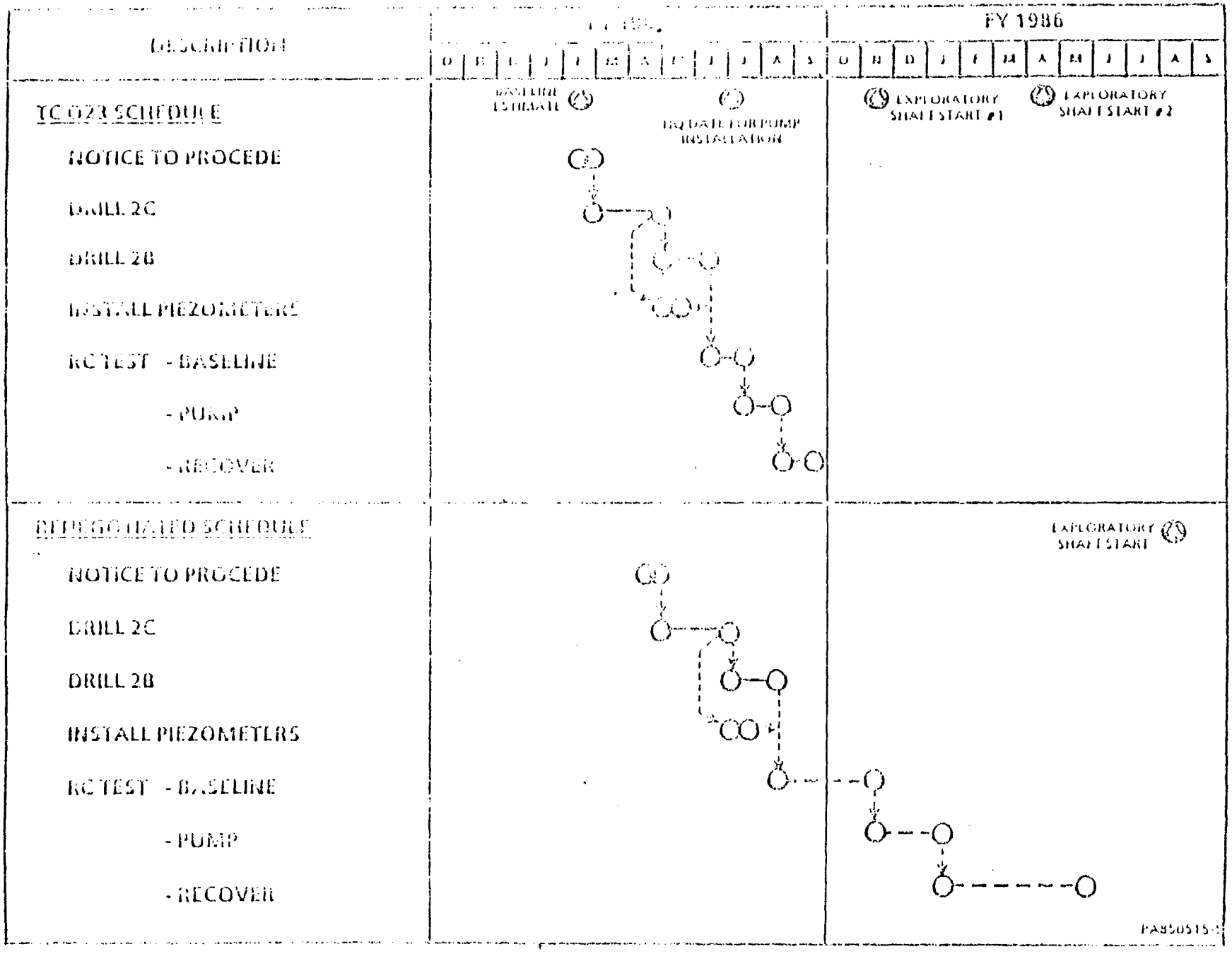


Schematic of confined aquifer systems within the Columbia River Basalt Group. (Modified after Leonhart et al. 1982.)



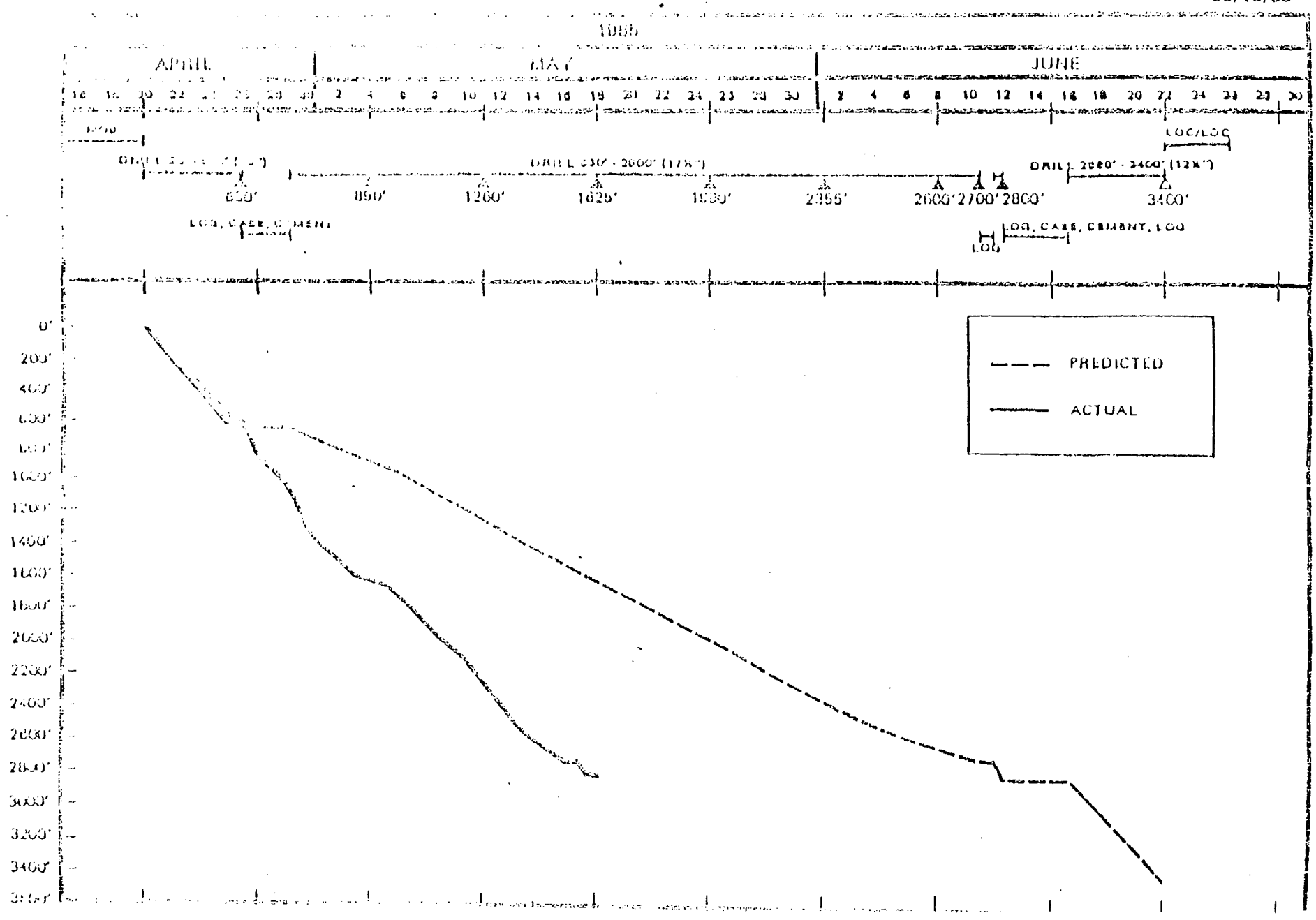
GENERALIZED RRL-2 CONFIGURATION

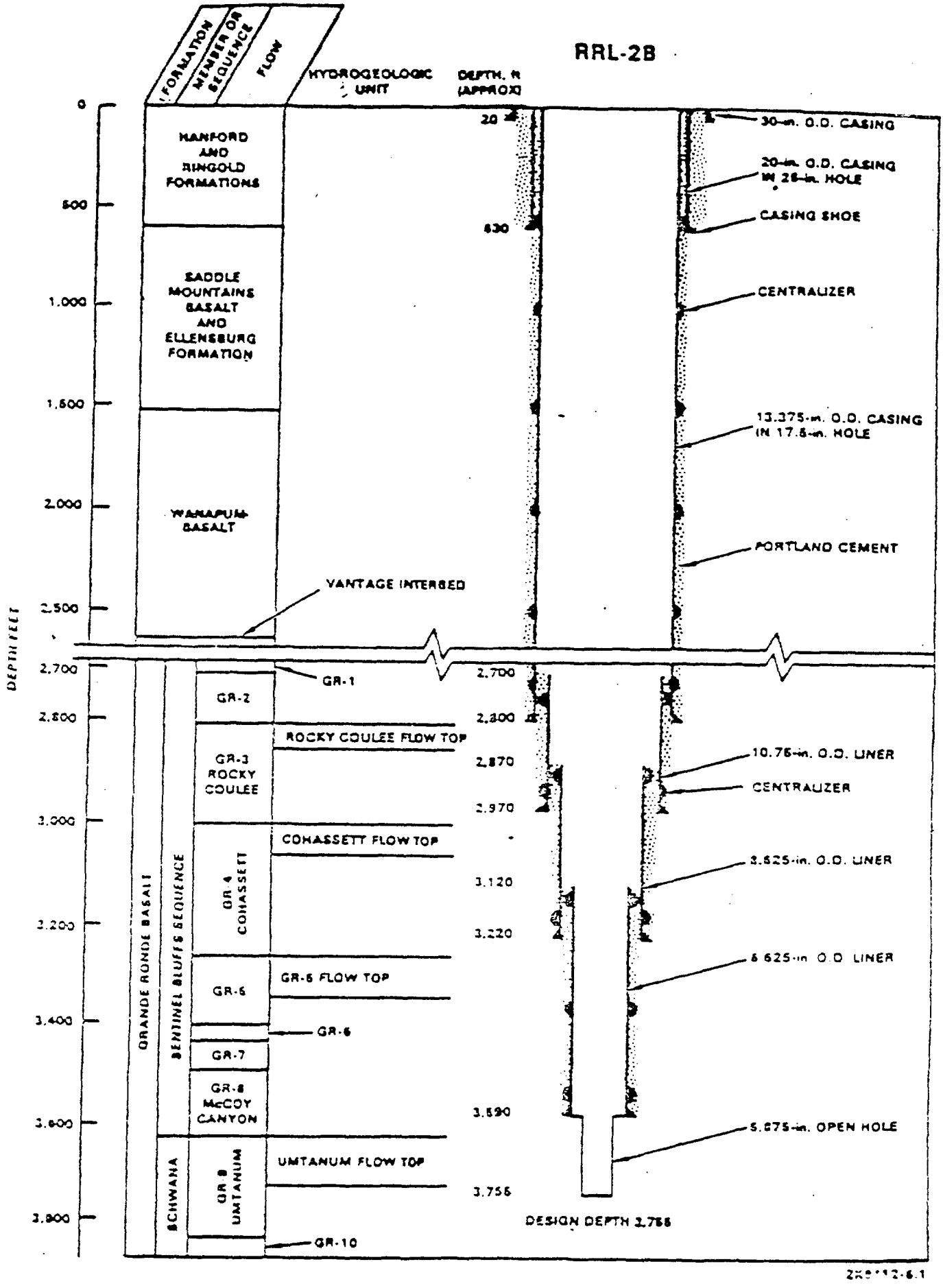
[illegible] SCHEDULE


DESCRIPTION
FY 1985
O N D J F M A M J J A S
FY 1986
O N D J F M A M J J A S
TC 023 SCHEDULE
BASELINE ESTIMATE
EST DATE FOR PUMP INSTALLATION
EXPLORATORY SHAFT START #1
EXPLORATORY SHAFT START #2
NOTICE TO PROCEDE
DRILL 2C
DRILL 2B
INSTALL PIEZOMETERS
RC TEST - BASELINE
- PUMP
- RECOVER
RENEGOTIATED SCHEDULE
EXPLORATORY SHAFT START
NOTICE TO PROCEDE
DRILL 2C
DRILL 2B
INSTALL PIEZOMETERS
RC TEST - BASELINE
- PUMP
- RECOVER
PA850515

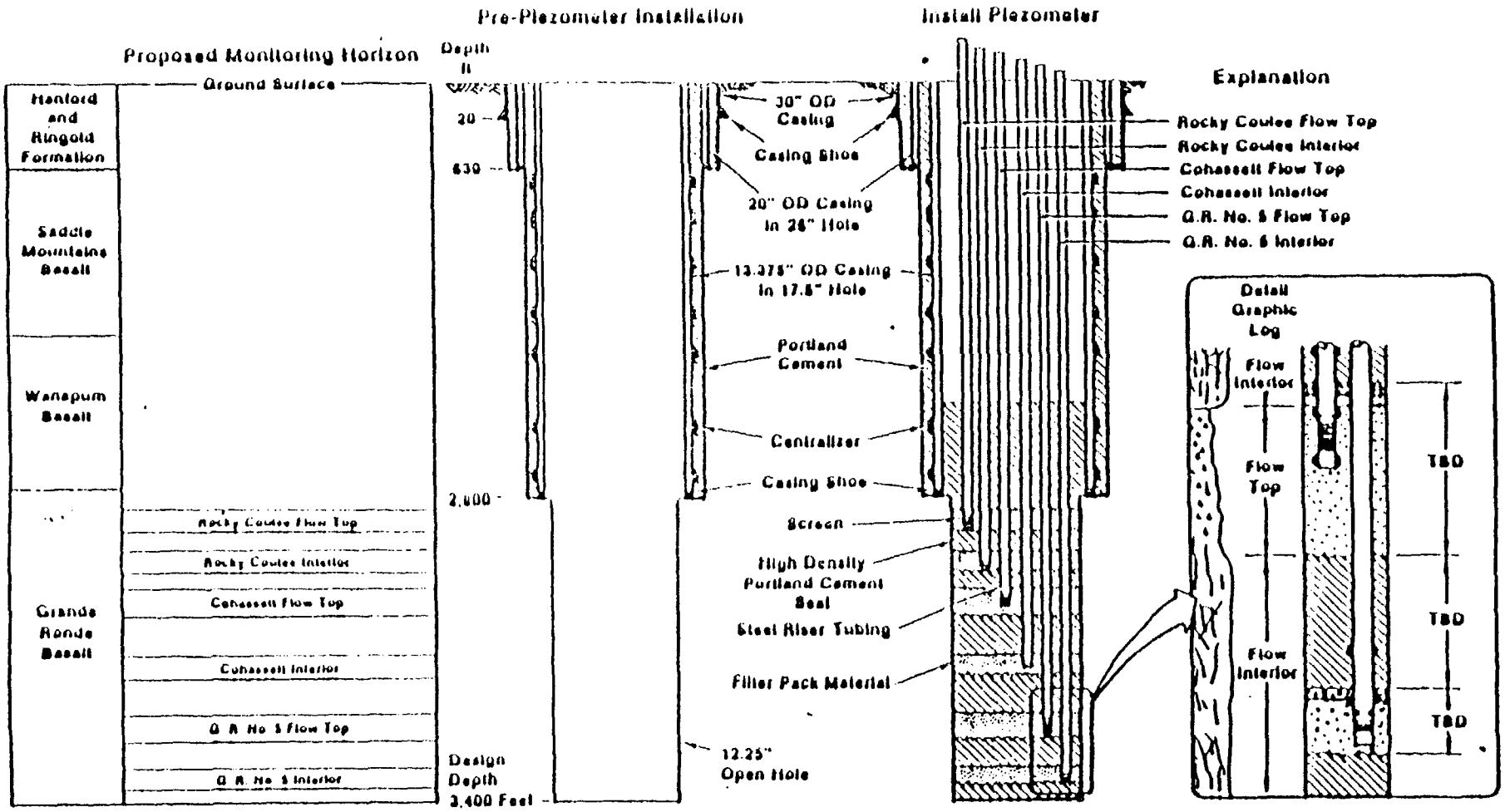
[illegible] SCHEDULE

05/18/85

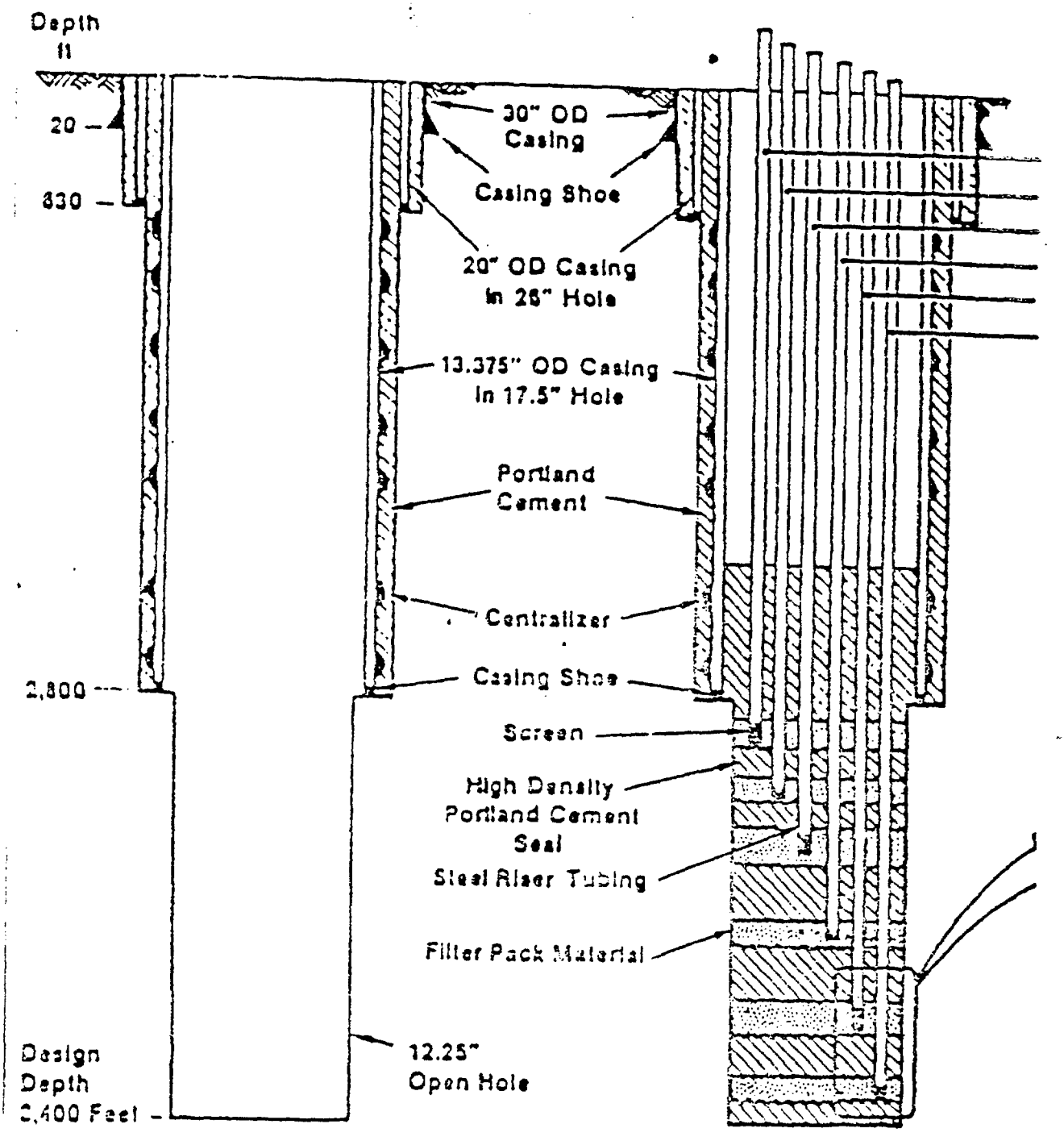




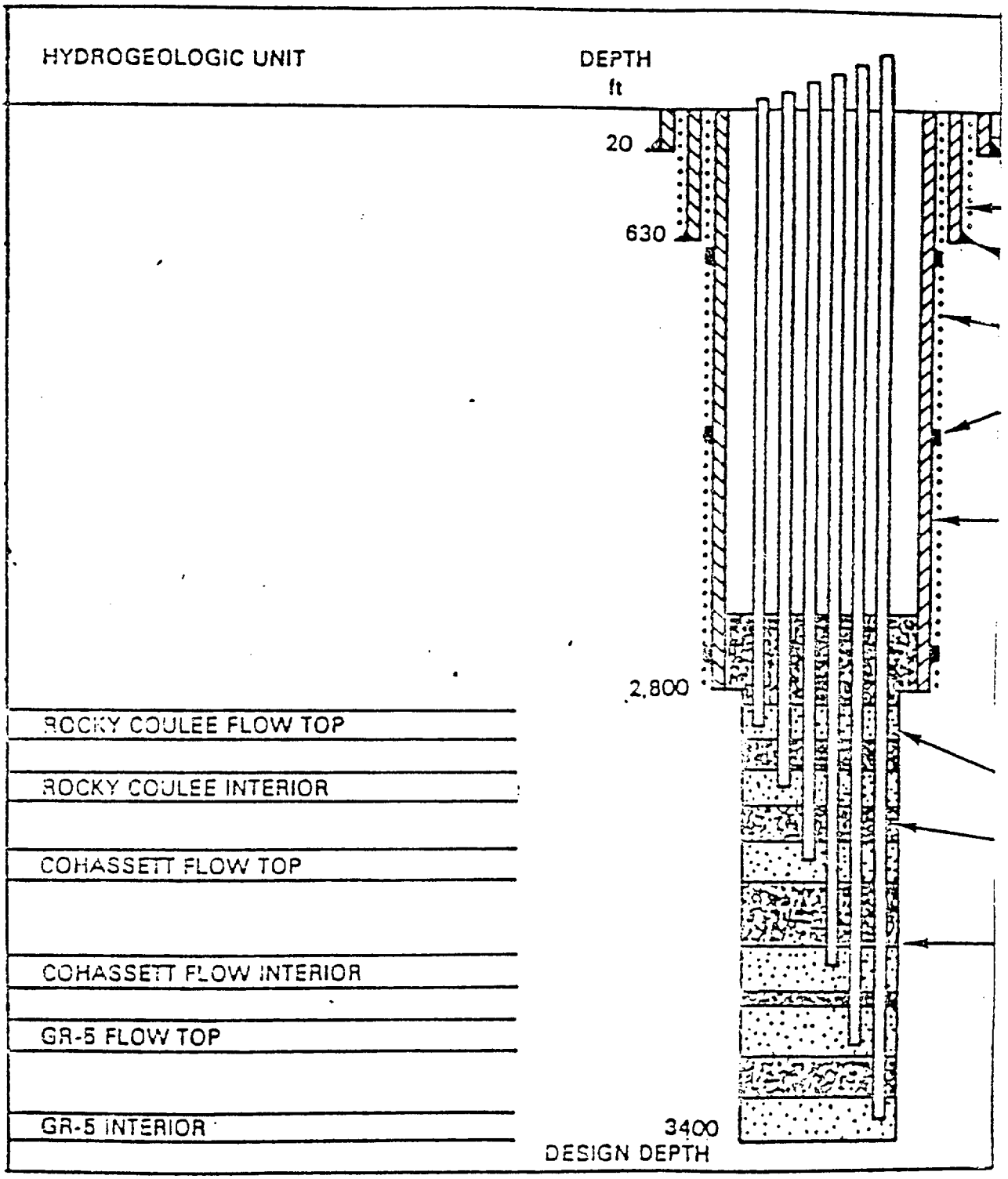
Conceptual Design of Test Well RRL-2B.



Configuration and Design Details of Multi-Level Piezometer Nest at RRL-2C

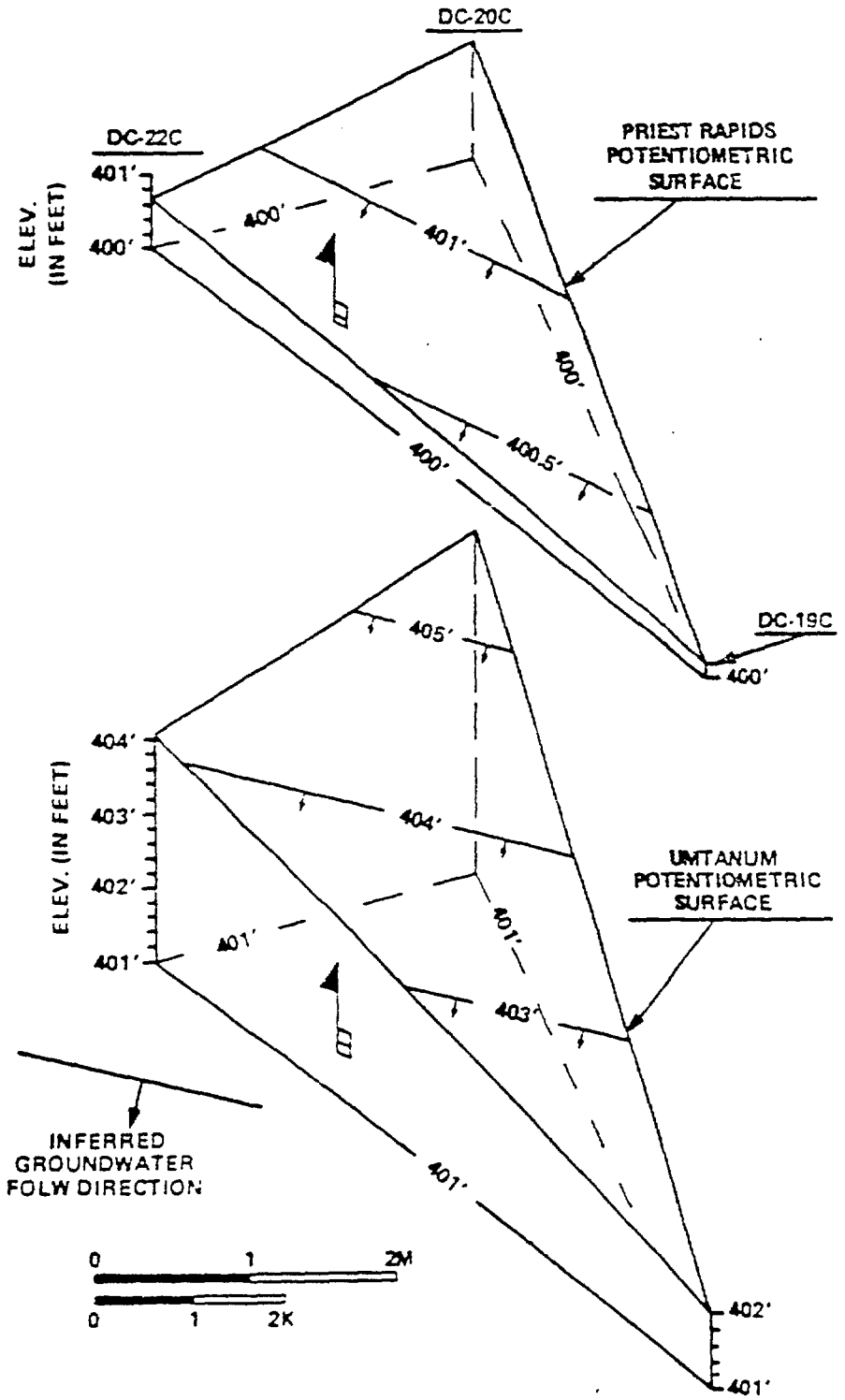


RRL-2C MULTI-LEVEL PIEZOMETER DESIGN DETAIL

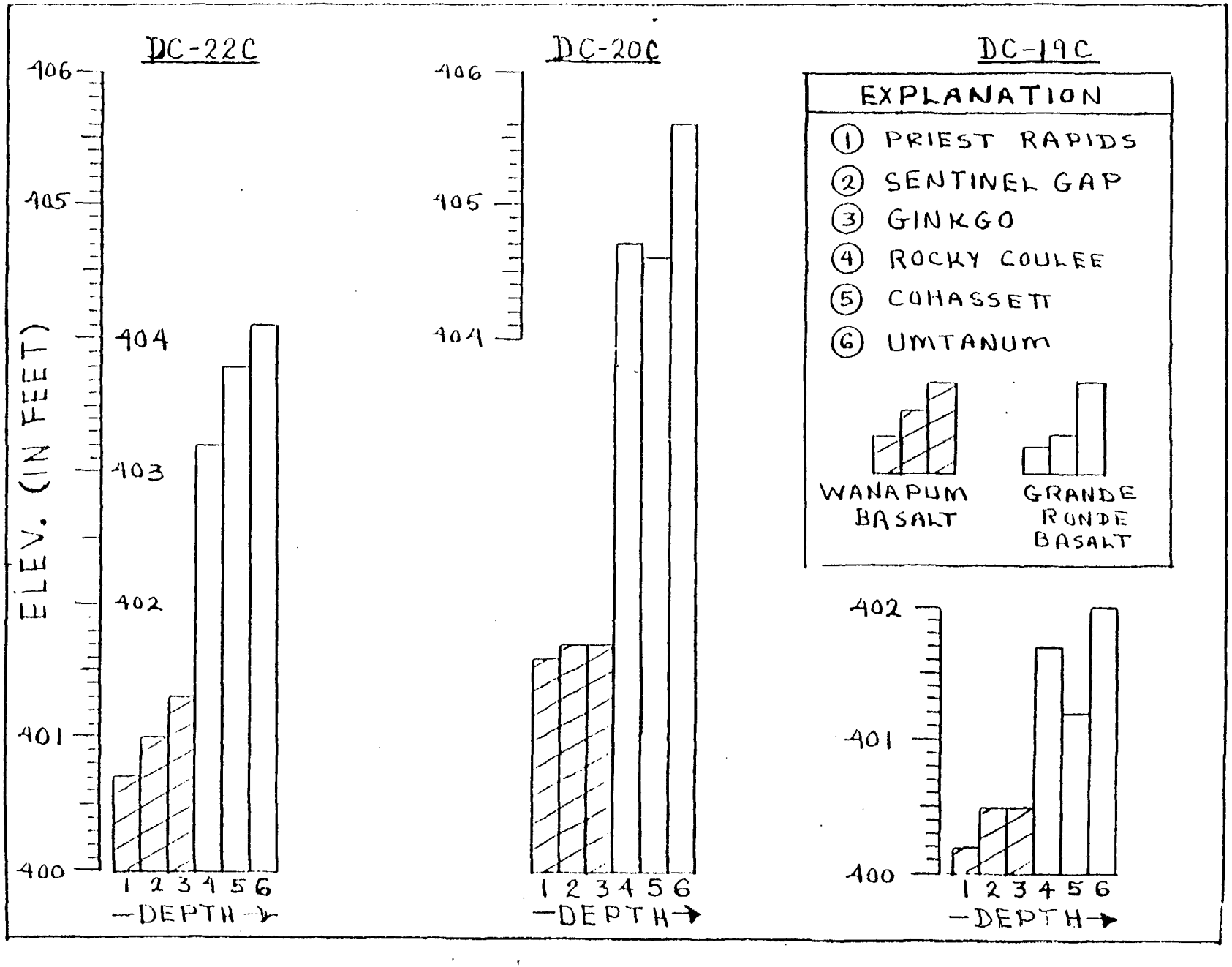


RRL-2C MULTI-LEVEL PIEZOMETER DESIGN DETAIL

RRL POTENTIOMETRIC SURFACES
(MARCH 31,1985)



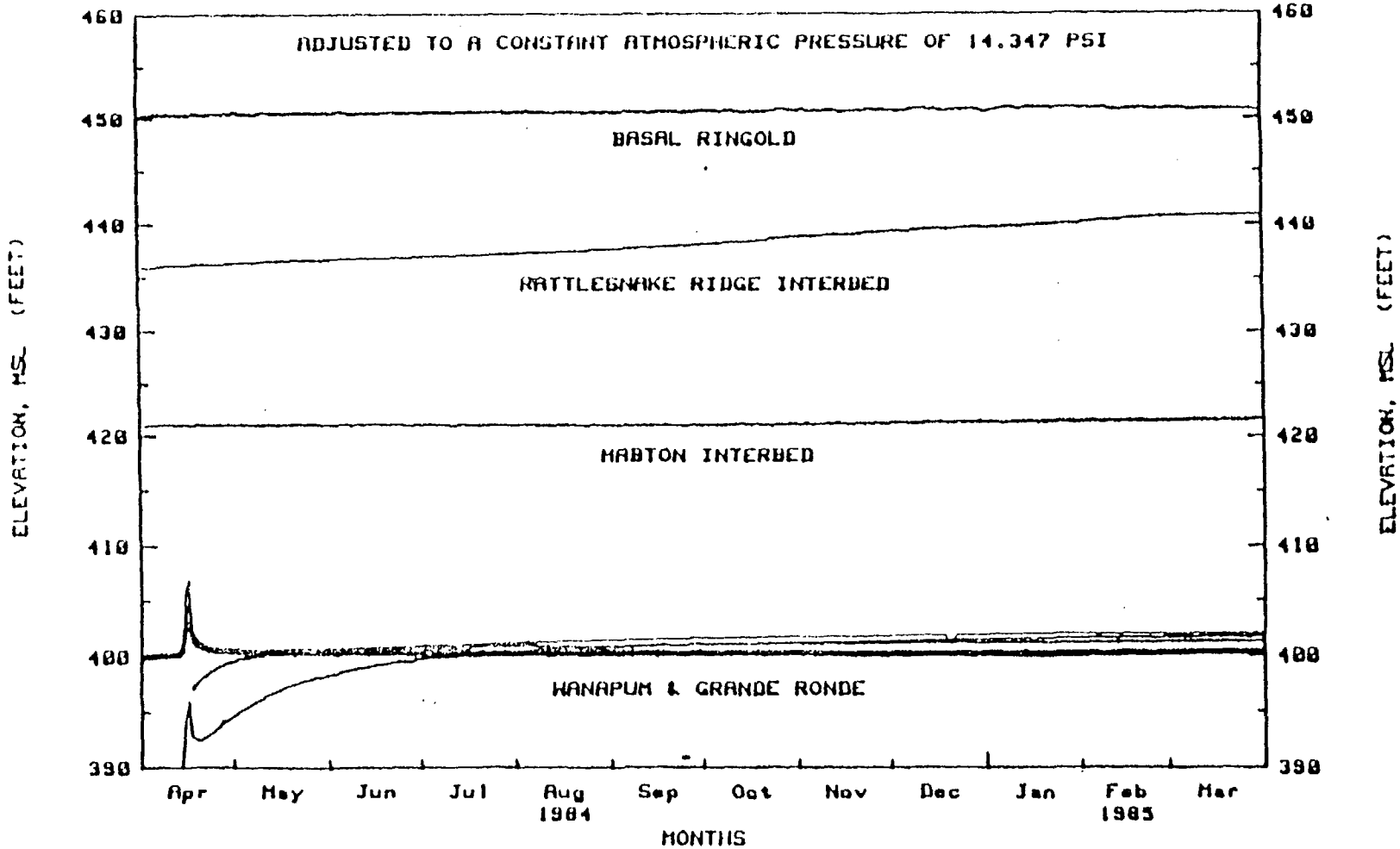
HYDRAULIC HEAD MARCH 31, 1985



WATER-LEVEL HYDROGRAPHS
DC-19 MULTI-LEVEL PIEZOMETER FACILITY
APRIL 1984--MARCH 1985

BOREHOLE: DC-19A HYDROGEOLOGIC UNIT: COLUMBIA RIVER BASALTS

LOCATION: HANFORD SITE DATUM ELEVATION: MEAN SEA LEVEL

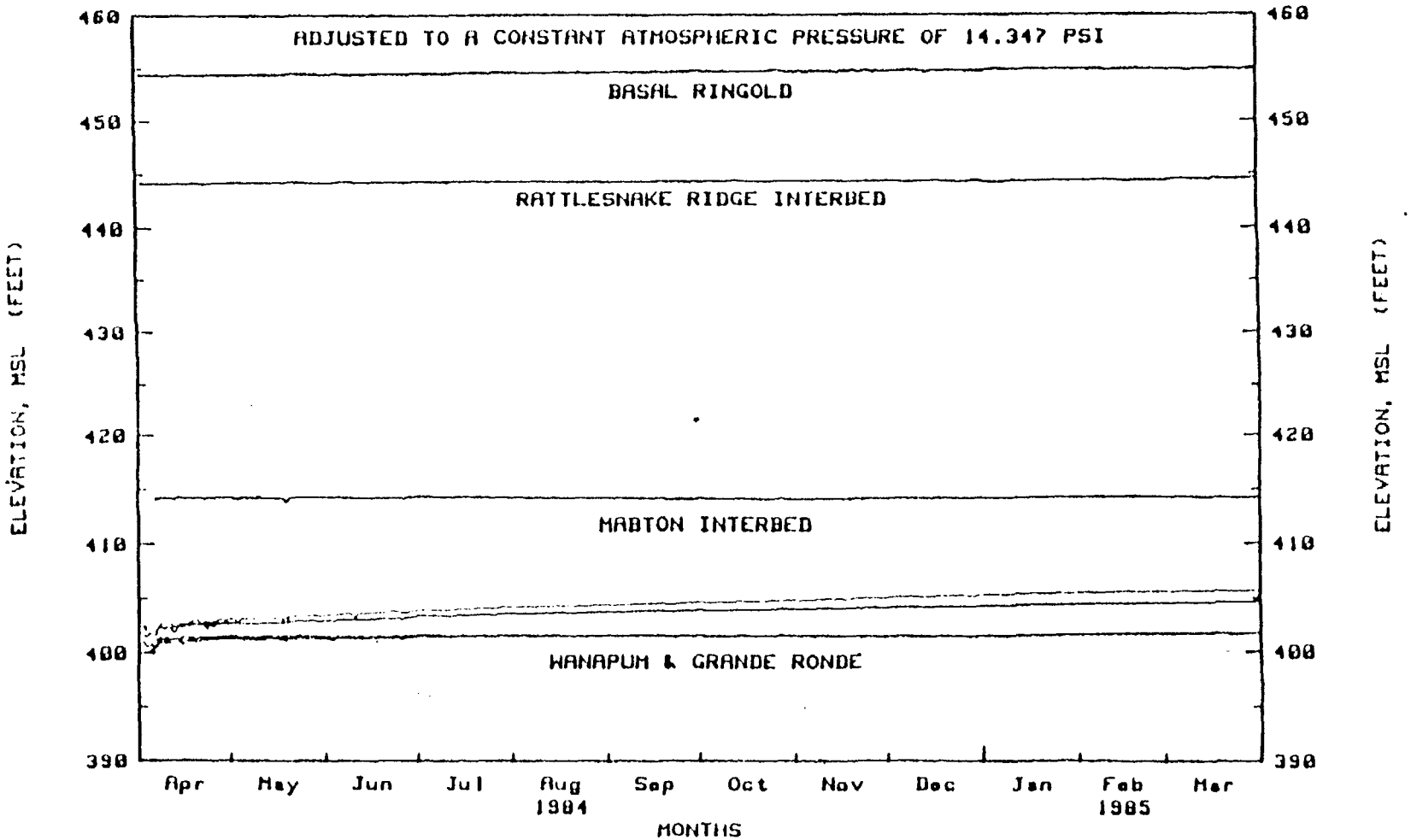


HYDROGRAPH PRODUCED BY
Program WHYDAT Rev 4.3 FILE: N18BWR

WATER-LEVEL HYDROGRAPHS
DC-20 MULTI-LEVEL PIEZOMETER FACILITY
APRIL 1984--MARCH 1985

BOREHOLE: DC-20 HYDROGEOLOGIC UNIT: COLUMBIA RIVER BASALTS

LOCATION: HANFORD SITE DATUM ELEVATION: MEAN SEA LEVEL

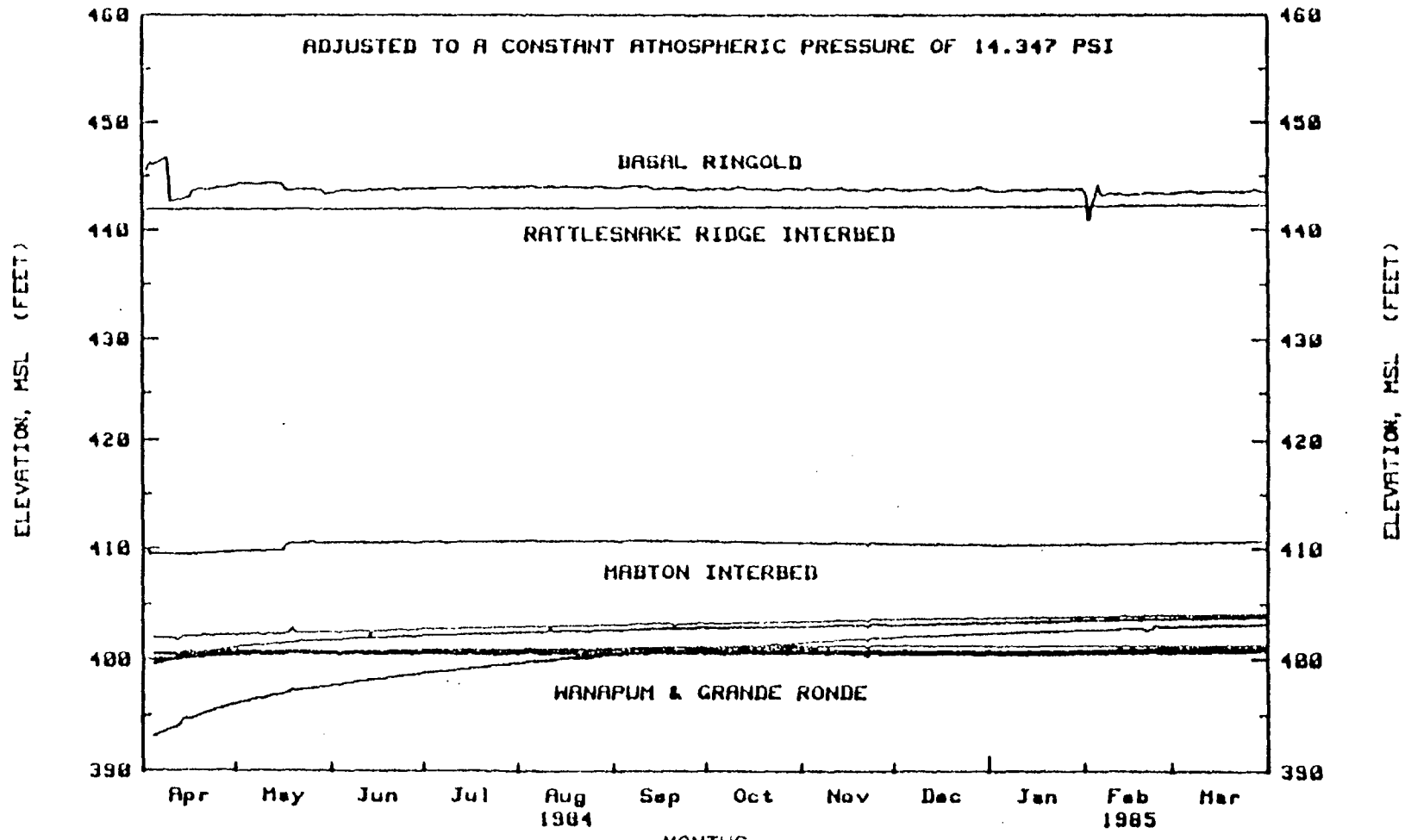


HYDROGRAPH PRODUCED BY
Program WHYDAT Rev 4.5 FILE: N20SBR

WATER-LEVEL HYDROGRAPHS
DC-22 MULTI-LEVEL PIEZOMETER FACILITY
APRIL 1984--MARCH 1985

BOREHOLE: DC-22 HYDROGEOLOGIC UNIT: COLUMBIA RIVER BASALTS

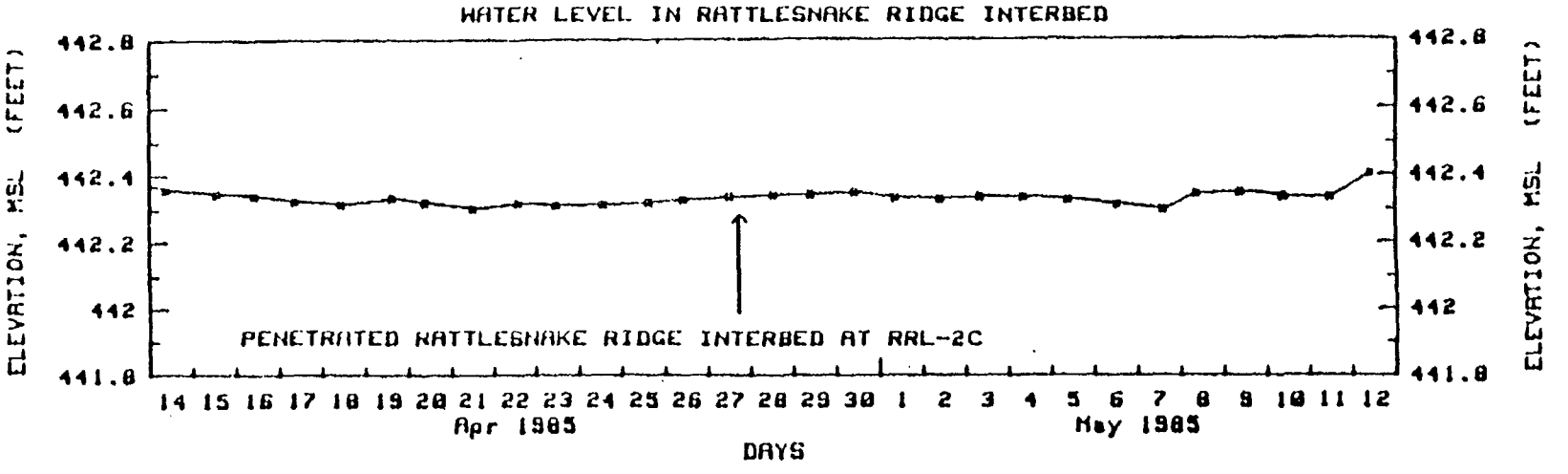
LOCATION: HANFORD SITE DATUM ELEVATION: MEAN SEA LEVEL

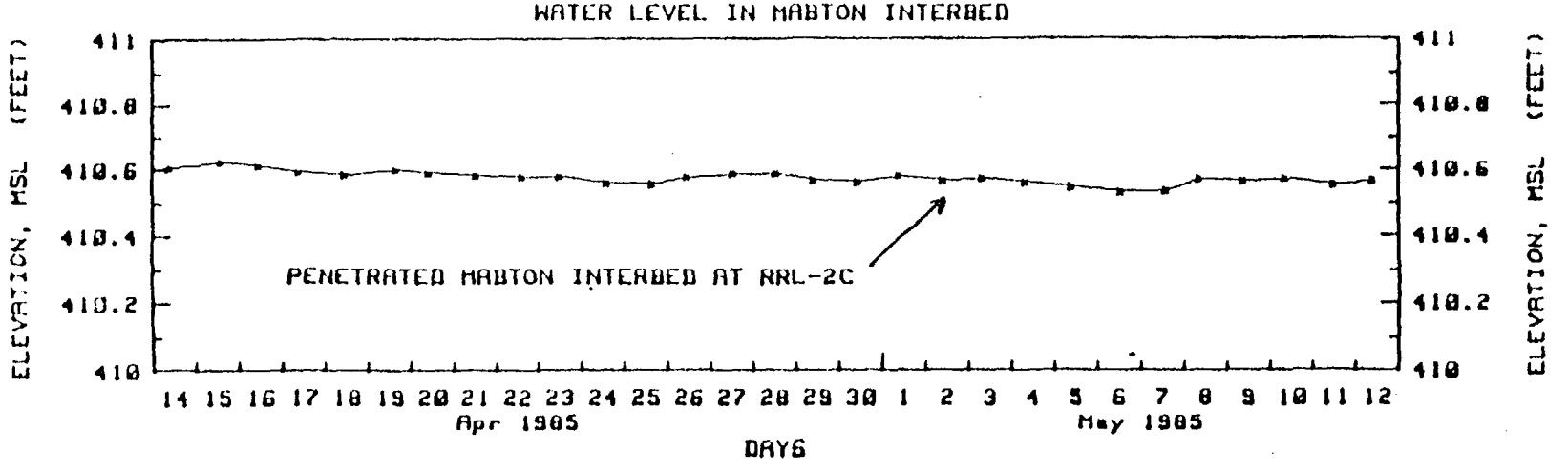


HYDROGRAPH PRODUCED BY
Program HYDAT Rev 4.5 FILE: N228BA

WATER-LEVEL HYDROGRAPHS
DC-22 MULTI-LEVEL PIEZOMETER FACILITY
DURING DRILLING OF RRL-2C

BOREHOLE: DC-22A HYDROGEOLOGIC UNIT: SADDLE MOUNTAINS





DATA ADJUSTED TO A CONSTANT ATMOSPHERIC PRESSURE OF 14.347 PSI

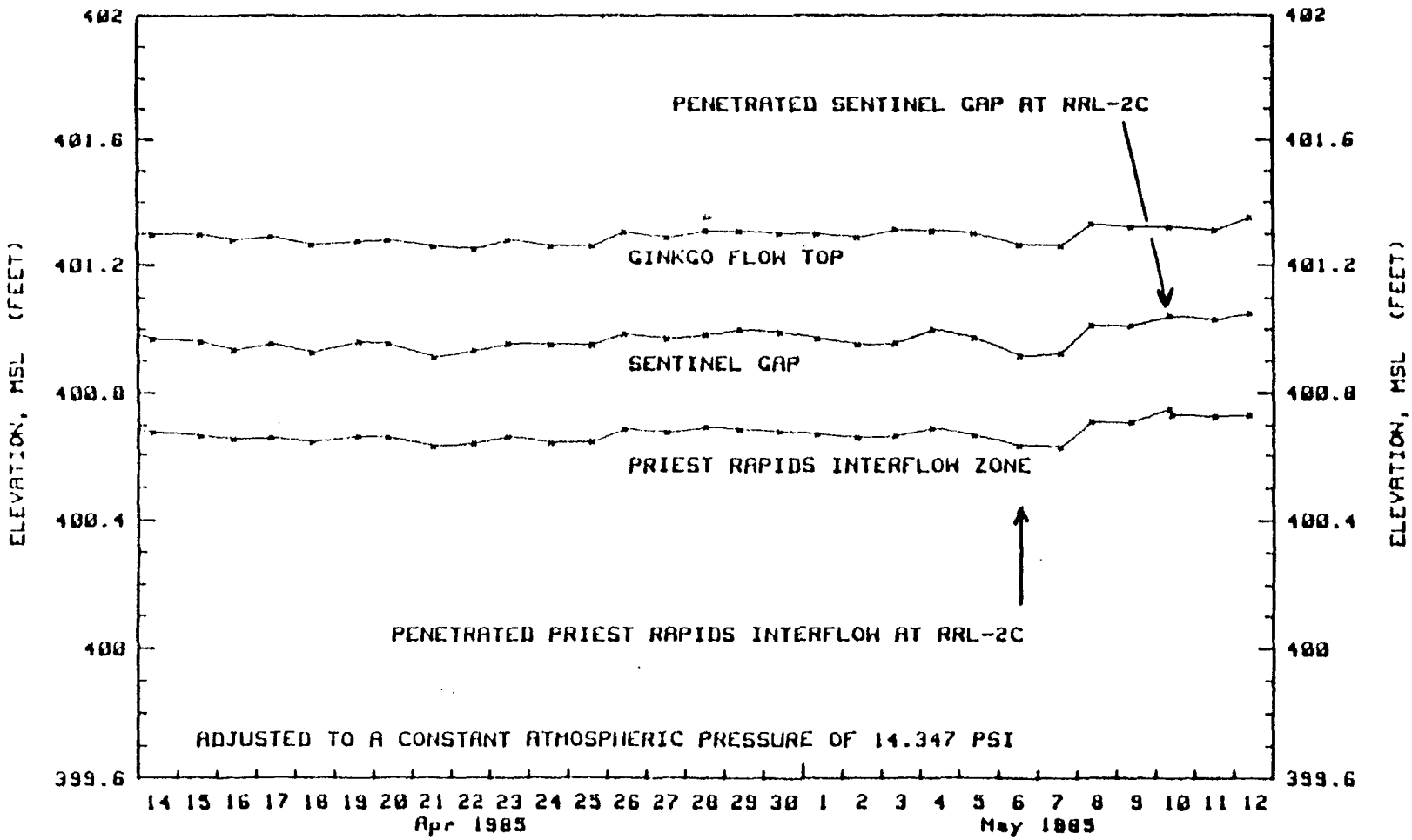
WATER-LEVEL HYDROGRAPHS
DC-22 MULTI-LEVEL PIEZOMETER FACILITY
DURING DRILLING OF RRL-2C

BOREHOLE: DC-22C

HYDROGEOLOGIC UNIT: HANAPUM

LOCATION: HANFORD SITE

DATUM ELEVATION: MEAN SEA LEVEL



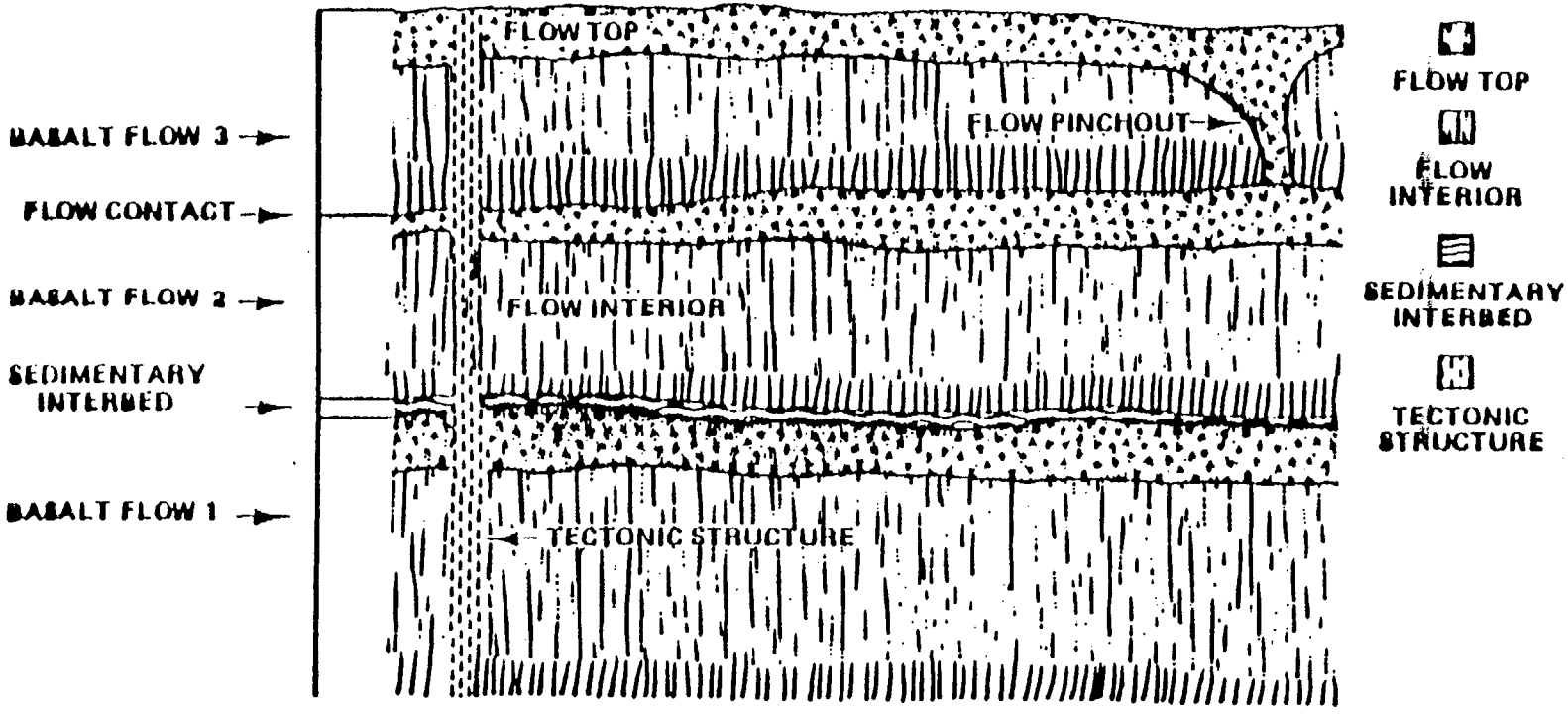
HYDROGRAPH PRODUCED BY
Program HHYDAT Rev 4.5 FILE: 22HPR

BASALT WASTE ISOLATION PROJECT HYDROLOGIC TEST PROGRAM STATUS

BWIP PROGRAM FOR HYDROLOGIC ISSUE RESOLUTION

- NRC AND U.S.G.S. CONCERNS WILL BE ADDRESSED BY SIGNIFICANT ADDITIONAL DATA COLLECTION AND ANALYSES
- WATER LEVEL MONITORING FOLLOWED BY PUMPING TESTS
- FULL RANGE OF CONCEPTUAL MODELS WILL BE CONSIDERED

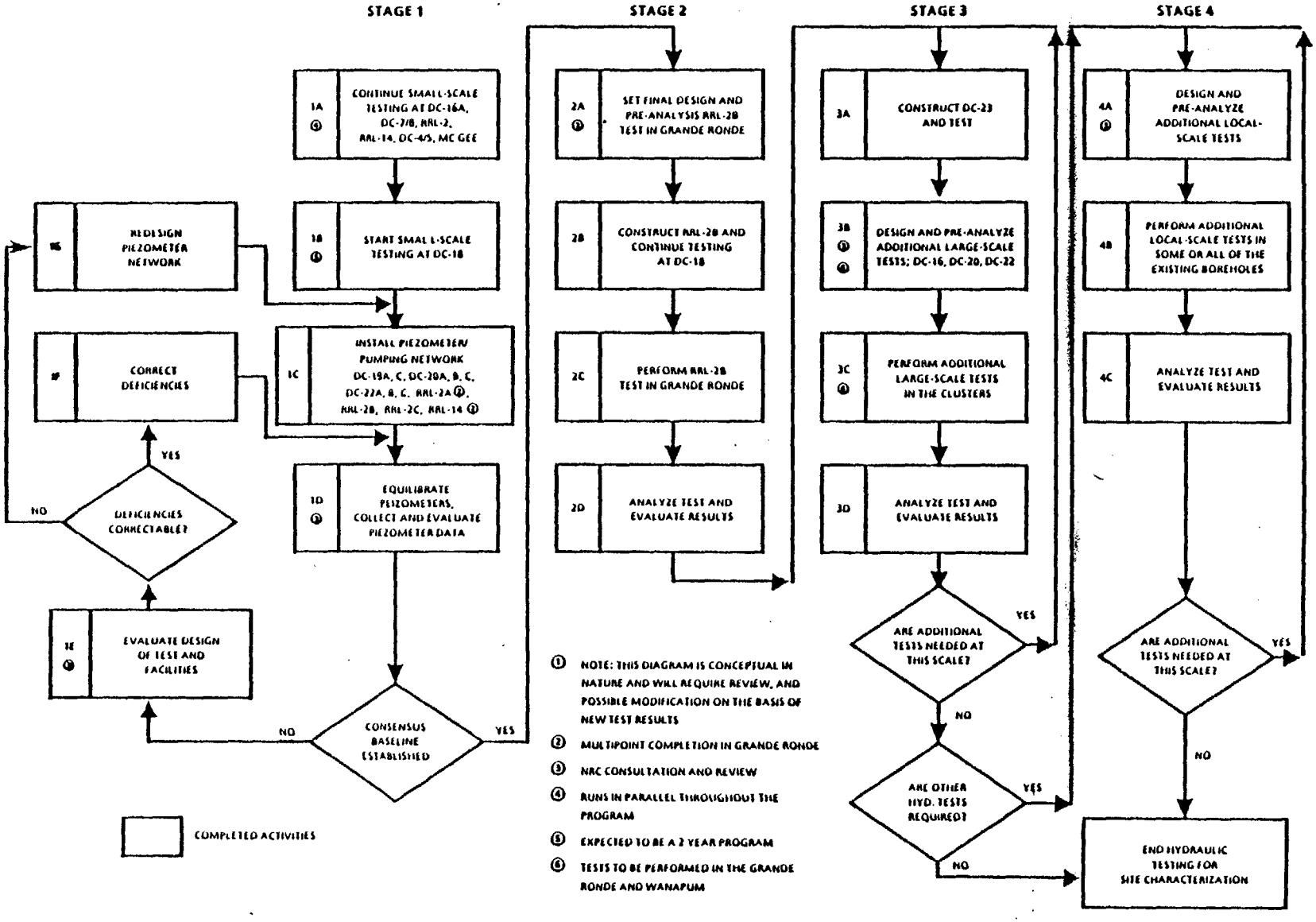
HYPOTHETICAL COMPOSITE CROSS SECTION OF GEOLOGIC FEATURES POTENTIALLY AFFECTING GROUNDWATER FLOW PATHS



NOT TO SCALE

LOGIC DIAGRAM FOR BWIP HYDROLOGIC TEST STRATEGY ①

(AFTER NUCLEAR REGULATORY COMMISSION, 1983)



① NOTE: THIS DIAGRAM IS CONCEPTUAL IN NATURE AND WILL REQUIRE REVIEW, AND POSSIBLE MODIFICATION ON THE BASIS OF NEW TEST RESULTS

② MULTIPOINT COMPLETION IN GRANDE RONDE

③ NRC CONSULTATION AND REVIEW

④ RUNS IN PARALLEL THROUGHOUT THE PROGRAM

⑤ EXPECTED TO BE A 2 YEAR PROGRAM

⑥ TESTS TO BE PERFORMED IN THE GRANDE RONDE AND WANAPUM

PA841016-2

Purpose of Large Scale Hydraulic Stress (LHS) Test Series

- "Direct" testing to determine flow paths and hydraulic characteristics
- Determine validity of Drill & Test data (heads and tranmissivity)
- Stage 4 would need to be implemented if the Grande Ronde is too tight
- STP 1.1 features
  - "Direct" testing to the maximum extent possible
  - "Defensible" conceptual models, boundary condition and hydraulic properties
  - The NRC staff should not be prescriptive
  - The STP is not comprehensive
    - + Regional flow system
    - + Hydrochemistry

GROUNDWATER LEVEL BASELINE OBJECTIVES

0 **UNDERSTAND GROUNDWATER FLOW SYSTEM**

- PRE-MAN ESTIMATE AND HISTORIC STRESS
- CURRENT MULTI-YEAR MEASUREMENTS WITH CURRENT STRESS
- LHS TESTING A PART OF THE BASELINE

0 **PREDICT WATER LEVEL CHANGES FOR DURATION OF TEST TO ALLOW INTERPRETATION**

- MINIMIZE DISTURBANCES TO DETERMINE CHANGES DUE TO OTHER THAN BWIP ACTIVITIES
- RELATIVELY SHORT TIME REQUIRED IF WATER LEVELS ARE NOT CHANGING RAPIDLY

BASELINE STATUS SUMMARY AS OF MARCH 1985

- SADDLE MOUNTAINS AND WANAPUM EQUILIBRATED
- GRANDE RONDE STILL RECOVERING FROM DRILLING
  - RECOVERY CLOSE TO COMPLETE
  - RECOVERY PREDICTABLE
- WANAPUM AND GRANDE RONDE "THREE POINT GRADIENTS" TO THE SOUTH OR SOUTH WEST
- LARGE DOWNWARD GRADIENT FROM SADDLE MOUNTAINS TO WANAPUM
- SMALL UPWARD GRADIENT FROM GRANDE RONDE TO WANAPUM (EXCEPT THAT ROCKY COULEE HEAD IS HIGH)
- HORIZONTAL GRADIENTS ARE LOW
- NO OBVIOUS TRENDS OR CYCLES IN WANAPUM OR GRANDE RONDE
- RRL IS IN A "HYDRAULICALLY ISOLATED" AREA OF THE COLD CREEK SYNCLINE
- ROCKY COULEE AND COHASSETT APPEAR HYDRAULICALLY CONNECTED AT DC-20

BASELINE CONSIDERATIONS AS OF MARCH 1985

0 **GROUNDWATER FLOW SYSTEM UNDERSTANDING**

- ADDITIONAL DATA NEEDED TO ESTABLISH POTENTIOMETRIC SURFACES (FLOW DIRECTION)
- SLOW RECOVERY FROM PIEZOMETER INSTALLATION AND TESTING SUGGESTS THAT RECOVERY FROM LHS TESTING WILL TAKE A LONG TIME
- THEREFORE, PRE-EMPLACEMENT POTENTIOMETRIC SURFACES SHOULD BE DETERMINED BEFORE CREATING A LARGE DRAW-DOWN ACCROSS THE RRL

0 **INTERPRETATION OF LHS TESTS**

- BASELINE UNDERSTANDING ADEQUATE TO CONDUCT LHS TESTS

PLANNED BASELINE ACTIVITIES

- INSTALL RRL-2B AND RRL-2C AS SOON AS POSSIBLE
- CONDUCT INITIAL RRL-2 LHS TEST IN A MANNER THAT WILL ALLOW DEVELOPMENT OF PRE-EMPLACEMENT POTENTIOMETRIC SURFACES
- INSTALL PROPOSED NEW PIEZOMETER FACILITIES (DC-23, -24 AND -25) IN PARALLEL WITH TESTING
- START ES DRILLING AFTER INITIAL RRL-2 TESTING
- ESTABLISH PRE-EMPLACEMENT POTENTIOMETRIC SURFACE IN GRANDE RONDE DURING TESTING AND ES DRILLING
- CONTINUE LHS TESTING AFTER GROUNTING OF ES'S

Attachment 8

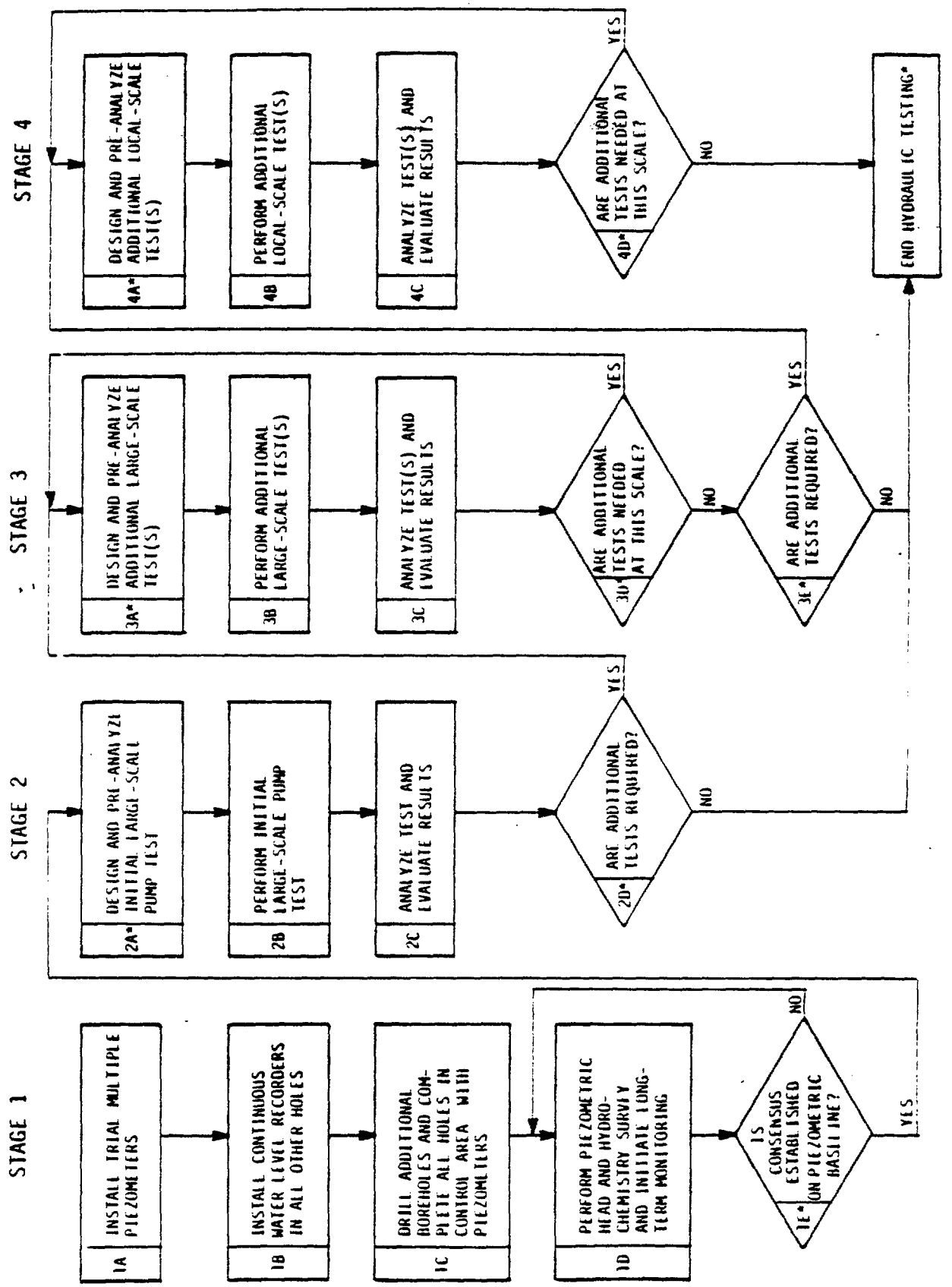
DRAFT BWIP SITE TECHNICAL POSITION 1.1: HYDROGEOLOGIC TESTING STRATEGY FOR THE BWIP SITE

PUBLISHED: DECEMBER 1983

PUBLIC COMMENTS RECEIVED: NOVEMBER 1984

DETAILED LOGIC CHART FOR A POSSIBLE GROUNDWATER TESTING STRATEGY AT THE BWIP SITE

Figure 4



*NRC CONSULTATION AND REVIEW

GENERAL FEATURES OF STP 1.1

1) non prescriptive: an envelope of approaches

2) large scale, multiple well testing as an alternative to single well point measurements

3) hydrologic and hydrochemical baseline establishment

4) NRC consultation and review at key decision points

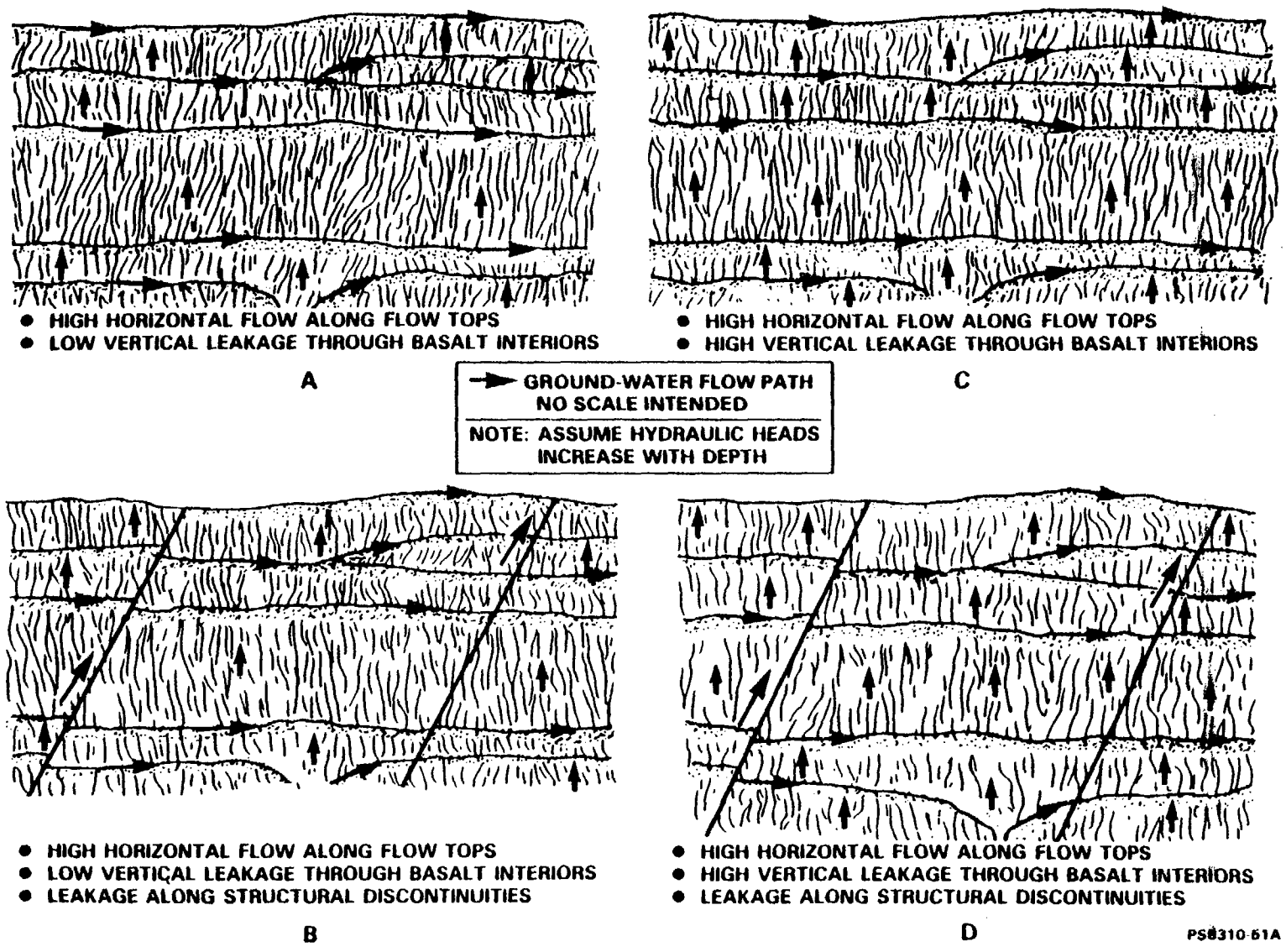


Figure 3-37. Alternative concepts for ground-water movement based on anisotrophy contracts and hypothetical structures (after Gephart et al., 1983).

DETAILS OF APPROACH OUTLINED IN STP 1.1

1) continuous multilevel monitoring in available holes, plus new holes

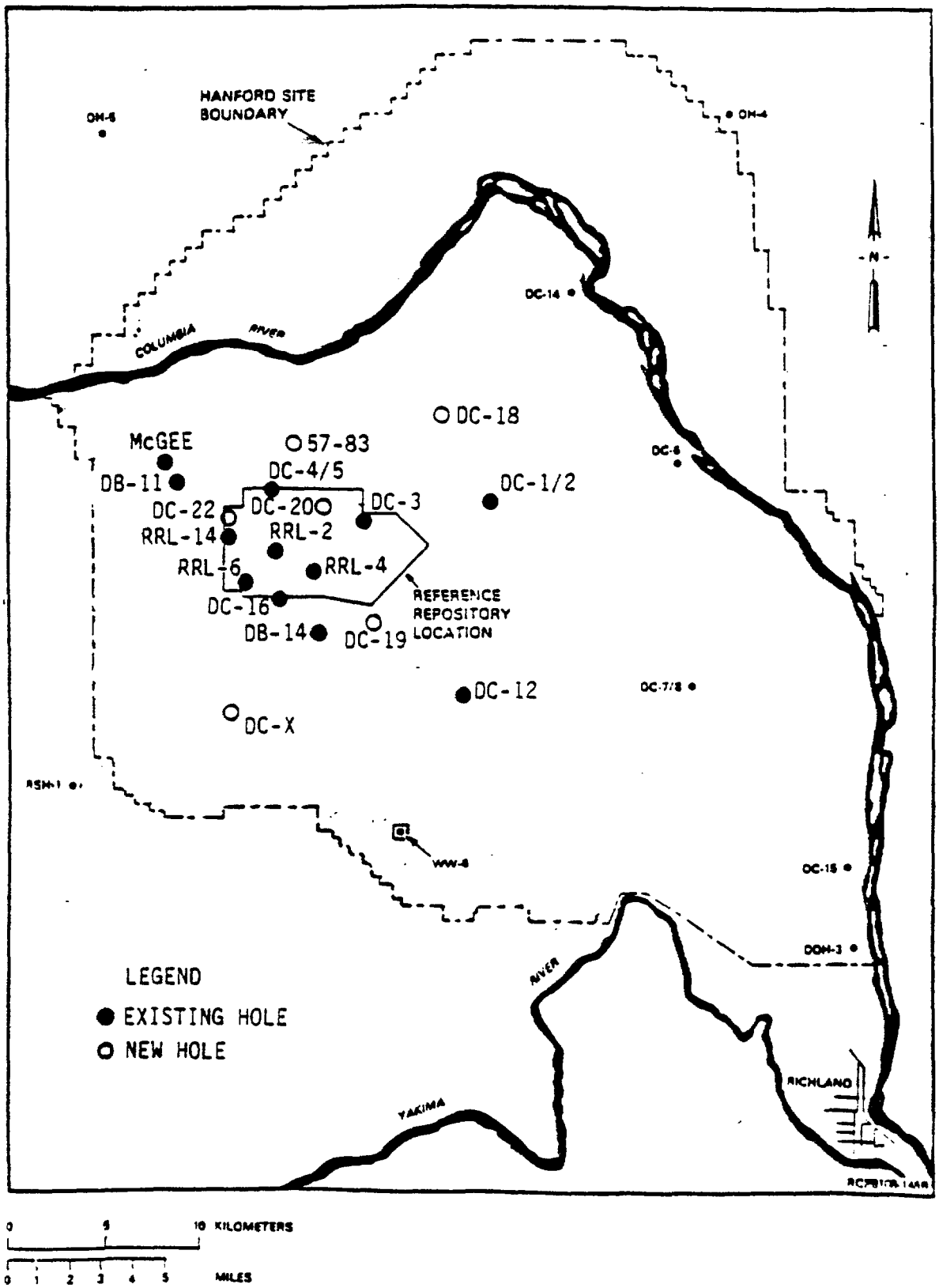
2) head and hydrochemistry survey to establish baseline

3) appropriate to start testing in the Grande Ronde , then test upper units

4) testing should involve largest practical stress

BOREHOLE LOCATIONS

Figure 2



STP 1.1 DOES NOT COVER:

1) effective porosity, dispersivity

2) hydrochemical characterization of hydrology

3) regional hydrology

4) near field hydrology

DOE COMMENTS ON STP 1.1

1) certain comments appear prescriptive

2) existing data base is adequate for its intended purpose of facilitating planning for the hydrologic characterization of the site

3) monitoring frequency need not be continuous nor multi level in all holes

4) monitoring of flow interiors may be unsuccessful due to packer compliance

5) DC 18 and 5783 delayed

6) no DC X to south

7) sequential completions appropriate

8) more than one LHS test necessary

9) hydrochem sampling to be performed after baseline because large withdrawals necessary to obtain good samples

Attachment 8

USGS COMMENTS ON STP 1.1

1) too prescriptive

2) data from river should be collected to determine preoperating conditions

3) tests will not detect small scale features

4) tests beginning in upper formation, e.g., Priest Rapids, would be OK

5) how and by whom technical concensus is to be achieved

6) periodic water samples from pumping well

YAKIMA INDIAN NATION COMMENTS ON STP 1.1

1) No less than two or three years worth of data should be collected to enable identification of short term and seasonal trends in baseline

2) assumption that flow is Darcian should be tested, e.g., by method of Hickey (1984)

EDISON ELECTRIC INSTITUTE COMMENTS ON STP 1.1

1) other potentially acceptable programs should be further emphasized e.g., it may be possible to reduce the pump test program