ENCLOSURE A-2 OF A-3
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TWS-QAS-QP-02.2, R1

PROCEDURE FOR PERSONNEL TRAINING

Effective Date: 2/20/89

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2/10/89
Date

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2/10/89
Date

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2/10/89
Date

PROCEDURE FOR PERSONNEL TRAINING

1.0 PURPOSE

The purpose of this quality administrative procedure (QP) is to establish and describe the actions to develop, implement, qualify, and document an effective training program in compliance with Yucca Mountain Project (Project or YMP) requirements. The training program will result in trained and qualified personnel who can proficiently perform assigned tasks, adequately document their training, manage training records, and assess training effectiveness.

2.0 SCOPE

This procedure applies to all Los Alamos National Laboratory (LANL) personnel assigned to perform, manage, or verify activities affecting quality for the Project.

3.0 REFERENCES

LANL-YMP-Quality Assurance Program Plan (QAPP).
TWS-QAS-QP-02.1, Procedure for Personnel Selection, Indoctrination, and Qualification.
TWS-QAS-QP-05.2, Preparation of a Detailed Technical Procedure.
TWS-QAS-QP-06.1, Procedure for Document Control.
TWS-QAS-QP-17.1, Procedure for the LANL Group Resident File.

4.0 DEFINITIONS

4.1 Training

Training is in-depth instruction provided to personnel to develop and demonstrate initial proficiency in the application of selected requirements, methods, and procedures and to adapt to changes in technology, methods, or job responsibilities. Such in-depth instruction may be any combination of internal or external classroom sessions, supplemental hands-on training, reading assignments, on-the-job training, and/or other instructional methods as appropriate.

4.2 Project Training Representative

The Project Training Representative is the individual assigned by the Technical Project Officer (TPO) to manage and coordinate the training activities necessary to support development, implementation, and documentation of personnel training.

4.3 Instructor

An instructor has relevant education, experience, or proficiency in the subject to be presented, as determined by his or her manager, and has been assigned by the manager to instruct personnel on that selected subject.

4.4 Instructional Materials

Instructional materials may include but are not limited to formal lesson plans, viewgraphs, visual aids, audiovisual material, manuals, handout packages and any other teaching items used in the development and presentation of training.

5.0 RESPONSIBILITIES

The Technical Project Officer (TPO) has overall responsibility for the development, implementation, and assessment of the training program in accordance with the applicable Project requirements. Responsibilities of the Quality Assurance Project Leader (QAPL), principal investigators (PI), Quality Assurance Liaisons (QAL), Project supervisors and employees, Project Training Representative, instructors, and Quality Assurance Support (QAS) staff are delineated in Section 6.

6.0 PROCEDURE

Responsibility	Action
6.1 Establish Training Needs	
Project Training Representative or designee	1. Identify specific training requirements and method of meeting them.
	2. Ensure that preparation of plans and procedures for the development, implementation, documentation, and assessment of the training program conforms with the YMP Training Management Plan and meets the general requirements of Department of Energy (DOE), other governmental, and industrial codes and standards.
	3. Manage and coordinate the activities necessary to support training development, implementation, and documentation.
Quality Assurance Project Leader, Principal Investigators, Supervisors, and Quality Assurance Liaisons	4. Identify the quality training necessary for each Project employee to accomplish his or her assigned activities; inform the QAPL of the need for training. Before assigning personnel to perform activities affecting quality, train the personnel to the required proficiency. The frequency of training shall be appropriate to the subject or activity, and shall include the principles, techniques, and requirements of the activity. Generally, the need to provide training will be identified by one or all of the following:

Responsibility		Action
		• a requirement in a Project-level document, • a formal analysis of job training needs that identifies the minimum training required for each job position performing activities affecting quality, • the results of a survey or audit finding, • the results of nonconformances or detected adverse quality trends, or • a request by a responsible manager.
6.2	Identification and Qualification of Instructors	
	Project Training Representative or Designee	5. Provide a course of instruction to train and qualify Project staff who are developing and/or presenting quality assurance training. When the instructors have successfully completed the training course, the Project Training Representative issues a letter of qualification to the instructors and forwards copies to the QAS and the group Resident File to be maintained in the individuals' training files.
	Group Leaders, Principal Investigators and/or supervisors	6. Assign and support qualified instructors to develop and present training. Personnel (e.g., QALs, QAS) assigned training responsibilities shall have their position descriptions updated to reflect these duties.
	Project Training Representative or Designee	7. For detailed technical procedure (DP) training, the LANL Project personnel who prepare and review DPs will be considered the experts on the subject matter and the instructors for those DPs in accordance with QP-05.2 and do not require instructor training. The author and/or reviewer providing training is responsible for documenting the training on the YMP Indoctrination/Training Form (QP-02.1, Attachment 2).

Responsibility		Action
6.3	**Development of Training Materials**	
	Quality Assurance Project Leader/Quality Assurance Support	8. Determine the training necessary for each individual by initiating the YMP Training Matrix Form (Attachment 1) in accordance with the instructions contained in the Difficulty/Importance/Frequency (DIF) Guidance (Appendix A). Forward Attachment 1 to the employee's supervisor for completion of training needs.
	Principal Investigator(s)/ Supervisor(s) and/or Quality Assurance Liaison(s)	9. Review YMP Training Matrix form, document which procedures Project personnel must be trained for, and indicate approval by signing and dating it. Return completed form to the QAPL.
		10. If the supervisor/QAL disagrees with training determination, return Attachment 1 with comments to the QAPL for reevaluation and reissue. After reissue, repeat Step 9.
	Quality Assurance Project Leader	11. Resolve conflicts between QAL and PI/-supervisors if agreement cannot be reached concerning training requirements.
		12. After receipt of completed, approved training matrices, coordinate training needs with the Project Training Representative. Forward completed Attachment 1 to QAS.
	Quality Assurance Support	13. Enter information contained on Attachment 1 into Project's computerized personnel training files. Schedule personnel for any formal classroom training.
		14. Forward notice of scheduled formal training to Project supervisors, if required.

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Responsibility		Action
	Quality Assurance Liaison/ Instructor/Quality Assurance Support	15. Develop lesson plans or modules, as required, to deliver formal classroom training. Formal classroom training requires a lesson plan reviewed and approved by the developer's supervisor; measurable training objectives; record of attendance; course critique; and, if applicable, an evaluation of training results.
	Quality Assurance Project Leader	16. By coordinating with the Project Training Representative, review and approve training program materials developed for Project use. Ensure that the materials provide flexibility for variation in the depth of application of training appropriate to the scope, number of trainees, and quality level of the activities.
6.4	Specific Training Requirements	
	Principal Investigator/Supervisor and/or Quality Assurance Liaison	17. For training that requires reading only, initiate YMP Reading Assignment Form (Attachment 2), by completing top of form. Indicate, by entering yes or no, which procedures Project personnel need to read and understand as specified on the applicable Training Matrix.
	Project Personnel	18. Complete Attachment 2. Read all required procedures. Indicate completion by initialing and dating each entry and, after completing all reading assignments, sign and date Attachment 2. Forward completed Attachment 2 to PI/supervisor. Note: For new or revised QPs issued through controlled distribution, fill out and return Receipt Acknowledgment forms in accordance with QP-06.1.
	Principal Investigator/ Supervisor	19. Review completed Attachment 2; if acceptable, retain a copy for group Resident Files and forward original to QAS for entry into Project's computerized personnel training files.
	Principal Investigator/ Supervisor and/or Quality Assurance Project Leader	20. Before assigning Project personnel to perform activities affecting quality, coordinate with the QAL and/or QAS to verify that personnel have received the following:

Responsibility	Action
	• required indoctrination, which is documented on the YMP Indoctrination and Certification Forms (QP-02.1, Attachments 2 and 3); • required training (in-depth instruction) to develop and demonstrate initial proficiency in the application of selected requirements, methods, or job responsibilities; this training is determined by examining the YMP Training Needs Analysis Form (Attachment 1); and • refresher training necessary to maintain or regain proficiency.
Quality Assurance Liaison/ Quality Assurance Support and/or Instructor	21. Enter a record of Project personnel training, which includes the objective, content of training, date(s) of training, and other applicable information, on the YMP Indoctrination/Training Form (QP-02.1, Attachment 2).
	22. Enter a record of Project personnel training on the YMP Certification Form (QP-02.1, Attachment 3, Part A). Mandatory reading lists shall be referenced on and attached to the QP-02.1, Attachment 3, Forms.
Project Personnel	23. Acknowledge receipt and understanding of initial indoctrination (as per QP-02.1) and training by signing and dating the YMP Indoctrination/Training and Certification Forms (QP-02.1 Attachment 2 and Attachment 3, Part B).
Quality Assurance Liaison/ Quality Assurance Support and/or Instructor	24. Forward completed Indoctrination/Training and Certification Forms to the Project employee's supervisor.
Principal Investigator/ Supervisor	25. Review records of indoctrination, training, and certification and, if acceptable, sign and date YMP Certification Form (QP-02.1, Attachment 3, Part B). Retain a copy for the group Resident File, send a copy to the Records Processing Center and the original to the QAS for entry into the Project's data base for personnel training records for tracking purposes.

Responsibility	Action
Quality Assurance Liaisons/ Quality Assurance Support and/ or Instructors	26. Provide training, as required, to all Project personnel and, as required, training for the following: • when employees join the Project, • when new or revised plans and procedures are issued, • when required by corrective actions, and • when required to retain or regain required proficiency.
6.5 Minimum Training Requirements	
Principal Investigators, Supervisors and/or Quality Assurance Liaisons	27. Determine the minimum training requirements for part-time, temporary, or subcontract personnel. Their minimum training should be equal to the minimum requirements for full-time personnel as specified in the Training Matrices; however, this determination will be performed on a case-by-case basis.
Part-time, Temporary, or Subcontract Personnel	28. Read or attend training as directed by the appropriate Project supervisor.
Instructor	29. Provide training to part-time, temporary, or subcontractor personnel and process records as in Step 25.
6.6 Assessment of Training Program	
Technical Project Officer	30. As appropriate, periodically assess the effectiveness of the identification of training needs and the achievement of training objectives. This task shall be performed at least annually, and it may be included in the trend analysis and/or management assessment reporting.
Quality Assurance Support	31. Maintain original files of all training records.
	32. Forward to responsible supervisors or instructors notices of required training sessions for employees and of make-up training sessions.

Responsibility	Action
	33. Provide copies of the current list of approved QPs to help supervisors and instructors determine training needs.
	34. Assist the QALs in the preparation of the annual project qualifications in accordance with QP-02.1; provide training or retraining as required.

7.0 QUALITY ASSURANCE REQUIREMENTS

7.1 Records

Original documentation of all training or retraining shall be sent to the QAS files for retention and entry into the Project's computerized personnel training files, and a copy shall be maintained in the group Resident File.

Responsibility	Action
Quality Assurance Support	35. Maintain originals of the following records: • training/qualification course for instructors, • personnel training matrix forms, • reading assignment forms, • training attendance forms, and • quality assurance lesson plans and/or training modules.
Resident File Custodians	36. Maintain a copy of all records listed in Step 35.

8.0 APPENDICES AND ATTACHMENTS

Appendix A: Difficulty/Importance/Frequency (DIF) Guidance

Attachment 1: Project Training Matrix

Attachment 2: Project Reading Assignment Form

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TRAINING NEEDS ANALYSIS WORKSHEET

DIFFICULTY/IMPORTANCE/FREQUENCY (DIF) GUIDANCE FOR SELECTING QUALITY PROCEDURES FOR TRAINING

As part of the analysis of training needs, factors of difficulty, importance, and frequency for performance of each activity controlled by a procedure are rated by experienced job incumbents/subject matter experts (SME). These factors are defined in the following paragraphs.

Difficulty

Difficulty refers to mental and physical effort required by a staff member to achieve proficiency in the performance of an activity. Some tasks are easy or familiar and require no training before performance. More difficult tasks require proper training to master. However, others require physical skill or intellectual ability that relatively few individuals are capable of achieving without in-depth training. Use of difficulty ratings provides assurance that the more complicated tasks are identified and personnel trained to perform them. The following is a scale to be used by SMEs to rate task difficulty:

Minimum: 1 = "very easy" to perform,
2 = "somewhat easy" to perform,
3 = "moderately difficult" to perform,
4 = "very difficult" to perform, and
Maximum: 5 = "extremely difficult" to perform.

Importance (Criticality)

Tasks have varying degrees of importance to the performance of activities affecting quality. Some tasks are vital to job performance, while others may be of relatively minor consequence. Task importance is rated in terms of consequences of inadequate performance (e.g., injury to personnel, damage to equipment). Importance ratings ensure that tasks essential to activities affecting quality are identified and that personnel are trained for them as appropriate. The following is a scale to be used by SMEs to rate task importance:

Minimum: 1 = consequences of improper performance are "negligible,"
2 = consequences of improper performance are "low,"
3 = consequences of improper performance are "about average,"
4 = consequences of improper performance are "negative impact," and
Maximum: 5 = consequences of improper performance are "extremely negative impact."

Frequency of Performance

Frequency of performance measures how often an activity affecting quality is performed. A frequently performed task is more likely a candidate for training, as the need of proficient performance is relatively continual.

A task performed infrequently (e.g., once in seven years) usually is not suitable for training. These tasks could be covered by drills, exercises on the job, or detailed procedures. Frequency of performance can be used to determine the need for initial and/or continuing training. It also can affect selection of the training setting. The following scale is to be used by experienced job incumbents/SMEs to rate frequency of performance:

Minimum: 1 = rarely (about once a year),
2 = seldom (about three to four times a year),
3 = occasionally (about once a month),
4 = often (about once a week), and
Maximum: 5 = very often (daily).

Task Averages

Selection of tasks using the factors of difficulty and importance is facilitated by computing the average of the numerical score assigned to each factor by the Job Incumbents during data collection.

The average value of each factor is used in the review process.

Factor	Point	Average Range
Difficulty	Very	Score ≥ 3
	Average	Score > 2 & < 3
	Easy	Score ≤ 2
Importance	Yes	Score ≥ 3
	No	Score < 3

The average scores for difficulty and importance are used to determine the appropriate category for each task. Composite ratings of difficulty and importance are produced. These tasks and ratings are reviewed by the participants, who determine which tasks do not require training or would not use training resources effectively.

The following criteria may be used to exclude tasks from further training analysis:

- a task or activity that can be learned easily, on the job, without adverse impact on plant operations;
- a task or activity that has both low difficulty and importance ratings, indicating that training resources should not be expended to produce formal training; and
- a task or activity that requires skills and knowledge that may be acquired at lower job classifications.

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Tasks that have combined averages ≥3 should always be considered with care; if the task does need not training, the justification for deleting the task shall be documented.

The following guidelines shall be used to determine the training requirements of a position within the Project; all three DIF areas shall be added and averaged for each procedure. A decision to train or not to train and the appropriate training will be based upon the following guidelines:

- < 2.5 — **DO NOT TRAIN;**
- ≥ 2.5 but ≤ 3.5 — read, understand, and sign procedure;
- > 3.5 but ≤ 4.5 — develop and present formal classroom training; and
- > 4.5 — develop and present formal classroom training with proficiency documented by exam or job proficiency measure.

These guidelines are developed in order to meet the minimum requirements for training to procedures for personnel who are performing activities affecting quality. This training is intended to be supplemented by

- project orientation;
- certification processes for auditors, peer reviewers, etc.; and
- special training assignments made by the cognizant manager when required.

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DIFFICULTY/IMPORTANCE/FREQUENCY GUIDANCE SHEET

When evaluating your use and application of a particular procedure, use the weighting factors listed below. Use your experience in performing the tasks controlled by the procedures in making your decisions. If you have never had to refer to or reference a procedure in the course of your work, do not mark that you use it. If you think you will need to use a particular procedure in the immediate future, then mark it and weight it as best you can.

DIFFICULTY

Measure the ability of the average person to follow and use the procedure to accomplish the task.

1 = very easy
2 = somewhat easy
3 = moderately difficult
4 = very difficult
5 = extremely difficult

IMPORTANCE

Measure the importance of improper performance and the short-term as well as the long-term consequence of error.

1 = negligible
2 = low
3 = about average
4 = negative impact
5 = extreme negative impact

FREQUENCY

Indicate how frequently you actually use or reference the procedure in the performance of activities affecting quality.

1 = rarely (about once a year)
2 = seldom (about three or four times a year)
3 = occasionally (about once a month)
4 = often (about once a week)
5 = very often (daily)

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LOS ALAMOS NATIONAL LABORATORY

YUCCA MOUNTAIN PROJECT
TRAINING MATRIX

GROUP INC-4		W. N. Woodruff, INC-4, MS C940
QAPP		
01.1 INTERFACE CONTROL		
01.2 STOP WORK		
02.1 PERSONNEL QUALIFICATIONS		
02.2 TRAINING		
02.3 CONFLICT RESOLUTION		
02.4 MANAGEMENT ASSESSMENT		
03.1 QA SOFTWARE PLAN		
03.2 TECHNICAL REVIEW		
03.3 SCIENTIFIC PLANNING		
03.4 QALAs		
03.5 NOTEBOOK CONTROL		
03.6 DESIGN INTERFACE CONTROL		
03.7 PEER REVIEW		
03.8 READINESS REVIEW		
03.9 SCIENTIFIC ANALYSIS CONTROL		
03.10 SOFTWARE DOCUMENT REVIEW		
03.11 CONFIGURATION MANAGEMENT		
03.12 SCIENTIFIC/ENGINEERING SW		
03.13 AUXILIARY SOFTWARE		
03.14 DESIGN INPUT FOR ESF		
03.15 DESIGN AND INTERFACE CONTROL		
04.1 PROCUREMENT		
04.2 PROCURED SERVICES		
04.3 SUPPLIER QUALIFICATION		
05.1 QP PREPARATION		
05.2 DP PREPARATION		
06.1 DOCUMENT CONTROL		
08.1 SAMPLE CONTROL		
08.2 CONTROL OF DATA		
12.1 M&TE CONTROL		
12.2 USER CALIBRATION CONTROL		
13.1 HANDLING, STORAGE, SHIPPING		
15.1 NONCONFORMANCES		
16.1 CORRECTIVE ACTION		
16.2 TRENDING		
17.1 GROUP RESIDENT FILE		
17.2 RECORDS PROCESSING CENTER		
18.1 AUDITS		
18.2 SURVEYS		
18.3 AUDITOR CERTIFICATION		

Approved: _____
Supervisor or QAL

Date: _____

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YUCCA MOUNTAIN PROJECT
READING ASSIGNMENT FORM

Name: _____ Date: _____

Title/Position: _____ Group: _____

Supervisor: _____ Signature Date: _____

Reading Assignments Complete by: _____

Procedure No.	Read Y or N	Initials	Date Read
QP-01.1			
QP-01.2			
QP-02.1			
QP-02.2			
QP-02.3			
QP-02.4			
QP-03.1			
QP-03.2			
QP-03.3			
QP-03.4			
QP-03.5			
QP-03.6			
QP-03.7			
QP-03.8			
QP-03.9			
QP-03.10			
QP-03.11			
QP-03.12			
QP-03.13			
QP-03.14			
QP-04.1			
QP-04.2			
QP-04.3			

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Procedure No.	Read Y or N	Initials	Date Read
QP-05.1			
QP-05.2			
QP-06.1			
QP-08.1			
QP-08.2			
QP-12.1			
QP-12.2			
QP-13.1			
QP-15.1			
QP-16.1			
QP-16.2			
QP-17.1			
QP-17.2			
QP-18.1			
QP-18.2			
QP-18.3			

I have read and I understand the documents indicated above.

Signature: _____ Date: _____

(Employee)

ENCLOSURE A-3 OF A-3
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DP #	SHORT DESCRIPTION	ISSUE DATE
TWS-ESS-DP-03R2	NTS CORE PETROGRAPHY PROCEDURE	02/ 3/89
TWS-ESS-DP-04R4	THIN SECTION PREP. PROCEDURE	02/ 3/89
TWS-ESS-DP-06R2	OPER. INSTR. FOR DV VACUUM EXP.	02/ 3/89
TWS-ESS-DP-07R2	MICROPROBE OPERATING PROCEDURE	03/ 7/89
TWS-ESS-DP-16R3	SIEMENS X-RAY DIFF. PROC.	02/22/89
TWS-ESS-DP-24R1	CAL. & ALIGN. OF SIEMENS DIFF.	12/30/88
TWS-ESS-DP-25R2	CLAY MIN. PREP. FOR X-RAY DIFF.	12/30/88
TWS-ESS-DP-50R0	SPUTTER COATER PROC. GOLD COAT.	01/20/89
TWS-ESS-DP-51R0	METTLER H80 OPERATING PROCEDURE	02/ 3/89
TWS-ESS-DP-52R0	FUSING USING JR. ORBIT SHAKER	02/ 3/89
TWS-ESS-DP-53R0	PULVERIZING USING SPEX 8500	02/ 3/89
TWS-ESS-DP-54R0	CRUSHING: 50 TON HYD. PRESS	02/ 3/89
TWS-ESS-DP-55R0	ROCK SPLITTING:50 TON HYD. PRESS	02/ 3/89
TWS-ESS-DP-56R1	BRINKMAN AUTO. GRINDER PROCEDURE	12/30/88
TWS-ESS-DP-101R0	SMP. ID AND CONTROL FOR MIN-PET	03/ 7/89
TWS-ESS-DP-102R0	VOL. % CONST. IN THIN SECTIONS	02/ 3/89
TWS-ESS-DP-103R0	GEOPETAL ORIENTATION MEASUREMNT	02/22/89
TWS-ESS-DP-105R0	THERMAL CALIBRATION PROCEDURE	12/30/88
TWS-ESS-DP-106R0	PHILLIP X-RAY DIFF. PROCEDURE	12/30/88
TWS-ESS-DP-107R0	THERMOGRAV. AND DIFF. CALORIM.	04/ 7/89
TWS-ESS-DP-110R0	ZEOLITE PURIFICATION/SEPARATION	12/30/88
TWS-ESS-DP-111R0	PROC. FOR X-RAY FLUORESCENCE	03/ 2/89
TWS-ESS-DP-112R0	OPER. ISI MODEL DS-130 SEM	02/ 3/89
TWS-ESS-DP-113R0	TEMP. DET. FOR ROCK VARNISH SDY	12/30/88
TWS-ESS-DP-114R0	SMP. COLLECT. FOR ROCK VARNISH	12/30/88
TWS-ESS-DP-116R0	QUANTITATIVE X-RAY DIFF. PROC.	12/30/88
TWS-ESS-DP-117R0	PROC. FOR NEUTRON ACTIVATION	01/20/89
NEW	LONG-TERM HEATING EXPERIMENTS	02/22/89
NEW	SEM PROCEDURE FOR ANALYSIS	02/16/89
NEW	MINERALS SEPARATIONS USING HEAVY LIQUIDS	03/30/89
NEW	USE OF HIGH TEMPERATURE STAGE	02/22/89
NEW	MOISTURE EVOLUTION ANALYZER	01/ 2/90
NEW	CERTIFICATION OF PROBE STANDARDS	03/30/89
TWS-HSE12-DP-301	FIELD SAMPLING	02/23/89
TWS-HSE12-DP-302	CATION AND ANION EXCHANGE	03/ 9/89
TWS-HSE12-DP-303	ZERO POINT OF CHANRGE (POTEN.)	02/16/89
TWS-HSE12-DP-304	ZERO POINT OF CHANGE (ELECT.)	02/23/89
TWS-HSE12-DP-305	EQUILIBRIUM BATCH SORPTION	03/16/89
TWS-HSE12-DP-306	KINETIC BATCH SORPTION	03/16/89
TWS-HSE12-DP-307	SAMPLE ID AND CONTROL	02/16/89
TWS-HSE12-DP-310	CALIB. & USE OF PHOTOACHOMETER	02/16/89
TWS-HSE12-DP-311	SAMPLE PREPARATION	03/ 2/89
TWS-HSE12-DP-312	PARTICLE SIZE REDUCTION	03/ 9/89
TWS-HSE12-DP-313	CALIBRATION AND USE OF CENTRIF.	03/ 9/89
TWS-HSE12-DP-315	TEMP. MEASUREMENT AND CONTROL	01/26/89
TWS-HSE12-DP-316	PREP. OF STOCK SOLNS. & REAGENT	03/ 9/89
TWS-HSE12-DP-317	CALIB/USE OF ANALYTICAL BALANCE	03/16/89
TWS-HSE12-DP-318	pH MEASUREMENT, ACID-BASE SOLN.	03/23/89
TWS-HSE12-DP-319	PARTICLE SIZE ANALYSIS	04/ 6/89
TWS-HSE12-DP-320	MEASUREMENT OF DISSOLVED OXYGEN	04/ 6/89
TWS-HSE12-DP-323	SPECTROPHOTOM. DET. TRACER CONC	02/16/89
TWS-HSE12-DP-324	ELECTROCHEM. DET. OF TRACER CONC	04/ 6/89

TWS-HSE12-DP-325 COLUMN TRACER TRANSPORT	04/ 6/89
TWS-INC-DP-02R3 QC IN COUNTING RADIO. NUCLIDES	03/14/89
TWS-CNC-DP-05R1 SORP/DESORP. RATIO IN GEO. MATLS	05/12/89
TWS-CNC-DP-15R1 CRUSHED ROCK COLUMN STUDIES	05/12/89
TWS-CNC-DP-17R1 SMPS. IN THEIR NATURAL STATE	08/ 7/89
TWS-INC-DP-26R0 AQU. STDS. FOR ANALYSIS OF WATER	03/15/89
TWS-INC-DP-27 TRACE DET. BY PLASMA EMIS. SPEC.	03/15/89
TWS-INC-DP-30R0 CO2 ATMOS. CONTROL OF GW CHEM.	09/ 8/89
TWS-INC-DP-35R0 pH MEASUREMENTS	03/20/89
TWS-INC-DP-36R0 Eh MEASUREMENTS	10/10/89
TWS-INC-DP-45R0 ACID ANIONS BY ION CHROMATOG.	10/10/89
TWS-INC-DP-60R1 CORE SMPLS. FOR SOLID CORE EXP.	06/12/89
TWS-INC-DP-61R1 SOLID ROCK COLUMN EXPERIMENTS	09/11/89
TWS-INC-DP-62R1 BULK NTS WELL WATER SAMPLES	02/23/89
TWS-INC-DP-63R0 PREP OF CORE FOR CRUSHED ROCK EX	04/18/89
TWS-INC-DP-64SMP COUNTING DYN TRANS.(9000 ROBOT)	11/ 7/89
TWS-INC-DP-66 SATURATED DIFFUSION CELL EXPERIMT.	12/ 7/89
TWS-INC-DP-67 ROCK BEAKER EXPERIMENT	01/18/90
TWS-INC-DP-68 NTS FRACTURED CORE EXPERIMENTS	02/ 8/90
TWS-INC-DP-69 OPER.OF SPEX FlUOROMETER MODEL 222	03/ 9/90
TWS-INC-DP-70 PREP. OF MIN. FOR DYN.TRANS.&SORP.	11/ 7/88
TWS-INC-DP-71 SOIL FIELD STUDIES	02/ 1/89
TWS-INC-DP-72 GEOMORPHIC PARAMETERS STUDIES	02/ 1/89
TWS-INC-DP-73 SEP. OF U AND Th FROM ROCK SMPLS.	11/ 7/88
TWS-INC-DP-74 FLEXIBLE CELL HYDROTHERMAL EXP.	04/28/89
TWS-INC-DP-75 PART. SIZE DIST. BY PHOTON SPEC.	03/ 9/90
TWS-INC-DP-76DATA ACQ. & FEEDBACK SYSTEM FOR SOL	05/ 5/89
TWS-INC-DP-77 RNUCLIDE CONC. BY GAMMA SPECTROS.	05/ 5/89
TWS-INC-DP-78 SOLNS. OF OX. STATES OF Np,Pl,Am	05/ 5/89
TWS-INC-DP-79 CNTG RNUCLIDES OUTSIDE COUNTING RM	07/10/89
TWS-INC-DP-80PURIF. OF COLL. Pl(IV) BY CENTRIFUG	04/ 6/89
TWS-INC-DP-81 UNSAT. BLOCK DIFFUSION EXP.	04/ 6/90
TWS-INC-DP-82 MEAS. pH FOR THE SOLUBILITY TASK	11/ 7/88
ISOTOPIC ANALYSIS OF CHLORIDE SAMPLES	11/ 1/88
NEW PROC. FOR POWDER X-RAY DIFFRACTION AT TA-48	03/27/89
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