



Department of Energy

Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

JUL 17 1989

WBS #1.2.9.3
"QA"

Larry R. Hayes
Technical Project Officer for Yucca Mountain Project
U.S. Geological Survey
101 Convention Center Drive
Suite 860
Las Vegas, NV 89109

CLOSURE OF STANDARD DEFICIENCY REPORTS (SDRs) 142, 144, 147, 149, 150, 151, 153, 155, 158, AND 160 RESULTING FROM YUCCA MOUNTAIN PROJECT OFFICE QUALITY ASSURANCE AUDIT 88-4 OF U.S. GEOLOGICAL SURVEY

SDRs 142, 144, 147, 149, 150, 151, 153, 155, 158, and 160 have been closed based on satisfactory verification of completed corrective actions. Copies of the SDRs are enclosed for your files.

If you have any questions, please contact Wendell B. Mansel of my staff at 794-7945 or Daniel A. Klimas of Science Applications International Corporation at 794-7881.

Edwin L. Wilmot, Acting Director
Quality Assurance Division
Yucca Mountain Project Office

YMP:WBM-4874

Enclosure:

Filed in Jacket
SDRs 142, 144, 147, 149, 150,
151, 153, 155, 158 and 160

cc w/encl:

Ralph Stein, HQ (RW-30) FORS
Dwight Shelor, HQ (RW-3) FORS
D. A. Klimas, SAIC, Las Vegas, NV, 517/T-08
J. J. Brogan, SAIC, Las Vegas, NV, 517/T-12
L. G. Scherr, SAIC, Las Vegas, NV, 517/T-06
J. E. Kennedy, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV

cc w/o encl:

K. G. Sommer, HQ (RW-3) FORS
Alan Flint, USGS, NTS
G. P. Fehr, SAIC, Las Vegas, NV, 517/T-12
R. J. Bahorich, W, Las Vegas, NV, 517/T-37
D. O. Porter, SAIC, Golden, CO
J. W. Gilray, NRC, Las Vegas, NV

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Trans W / L. W. D. H.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
 3/87

Completed by Originating QA Organization
 Completed by Organization in Block 5
 Comp. by Orig. QA Org.

1 Date June 16, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 3	
3 Discovered During Audit 88-4		3a Identified By S. P. Hans		3b Branch Chief Concurrence Date	
5 Organization USGS - NNWSI		6 Person(s) Contacted S. Shipley		4 SDR No. 142 Rev. 0	
7 Response Due Date is 20 Working Days from Date of Transmittal					
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI-USGS QMP-2.03 R1, para. 5.1.1 states in part, "Receiving inspection personnel shall also be qualified under this QMP. Appropriate criteria for certification of Receiving Inspection personnel include:					
9 Deficiency Contrary to the above, the certification for Alan L. Flint (NTS) and Mark C. Brooks (Denver) as Receiving Inspectors, did not include items d), e), f), above. Additionally, both Mr. Flint and Brooks have performed receiving					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective (1) Stop all receipt inspection of QA Level I & II items in all USGS organizations supporting NNWSI.					
11 QAE/Lead Auditor Date <i>Don Klumpp 7/25/88</i>		12 Branch Manager Date <i>James Blaylock 7/25/88</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>	
14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.					
15 Effective Date _____					
16 Cause of the Condition & Corrective Action to Prevent Recurrence					
17 Effective Date _____					
18 Signature/Date <i>Larry R. Hunt 8/31/88</i> <i>J. Wellmon 8/31/88</i>					
19 Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Don Klumpp 7/25/88</i>		Branch Manager/Date <i>James Blaylock 7/25/88</i>	
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		Branch Manager/Date	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <i>Don Klumpp 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/28/89</i>	
22 Remarks QMP 2.03 Rev 1 has been cancelled					
10207					
23 QA CLOSURE		QAE/Lead Auditor/Date <i>Don Klumpp 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/28/89</i>	
PQM/Date <i>James Blaylock 6/28/89</i>					

ENCLOSURE



WMPO STANDARD DEFICIENCY REPORT
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8 Requirement (continued)

- (a) Employer's name;
- (b) Identification of person being certified;
- (c) Activities certified-to perform;
- (d) Basis used for certification that includes such factors as:
 - Education, experience, and training (when necessary),
 - Test results (where applicable), and
 - Results of capability demonstration (i.e., visual acuity, colorblindness, etc.);
- (e) Results of periodic evaluation;
- (f) Results of physical examinations (when required);
- (g) Signature of employer's designated representative who is responsible for such certification;
- (h) Dates of certification and certification expiration.

9 Deficiency (continued)

inspections of QA Level I items (i.e., MRIR #88-13 and MRIR #88-13). For the purpose of this audit, the items from MRIR #88-13 were traced to determine if these QA Level I items had been installed and were infact generating data for Scientific investigation. Two (2) pressure transducers SN #226110 and 226103, received by Alan Flint on MRIR 88-13, have been installed in USWG-3 on 3/24/88 and UE-25 WT #6 on 3/25/88 respectively. In follow up action during the audit, it was determined by discussion with the Assistant QA Manager of USGS that this condition was not isolated to these inspectors. The assistant QA Manager stated that the requirements in question (see 8 above) had not yet been implemented anywhere within the USGS.

BASIS FOR SDR

The basis for this SDR is already established above.

RATIONAL FOR FINDING

The purpose for developing a certification process for individuals performing activities which effect quality is to ensure that such individuals have suitable proficiency for accomplishing the task correctly. Additionally, a certification is a testament that a specific indiidual has a specific body of knowledge and skills.

In the case of inspection (receipt or otherwise) specific requirements have been developed over the course of years of industrial experience. The requirements are intended to assure the inspection individuals have, (1) the knowledge of tools and set up processes for doing inspections; (2) a knowledge of the design attributes which the product must meet to assure conformance; (3) the physical ability of



W.M.P.O STANDARD DEFICIENCY REPORT
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9 Deficiency (continued)

inspectors to differentiate colors when necessary; (4) the visual acuity to discern sufficient details to assure product conformance; (5) sufficient experience to execute sound judgement during the inspection process in determining when products meet specified requirements. These abilities are necessary to perform the basic inspections and assure that items are conforming. Having a conforming product effects both the resultant quality of the task and its cost and schedule. (i.e., when the products are conforming, effort need only be expended once. Therefore, the cost of the task/effort is reduced by the amount necessary to correct and reduce the task.

It is therefore necessary to define the knowledge, skills, experience, etc...that an inspector must have in order to perform inspections properly.

The lack of a basis for certification of inspection personnel is a deficiency which is of major importance. It will require remedial action to resolve the specified problems identified in the audit. Additional investigative actions will be required to determine the extent of personnel certified without benefit of a basis. Also, the impact on the project of having personnel perform inspection without benefit of adequate experience and or training must be determined. Corrective actions will be necessary to assure that individuals are trained and properly evaluated against an established standard which reflects both specified requirements and the needs of the project.

The fact that Quality level I items are currently being procured without benefit of properly trained personnel is an unacceptable risk to the project. The ability of regulatory authority to accept the results of the NNWSI Project is reduced as a result of our current practice.

10 Recommended Actions (continued)

- (2) Implement fully or amend current inspection program.
- (3) Qualify & certify receipt inspection personnel in accordance with the approved QA Program.
- (4) Subsequent to amendment & implementation of inspection program, reinspect all QA Level I & II items.

USGS RESPONSE TO PO STANDARD DEFICIENCY REPORT (R) NO. 142

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

There is no adverse impact on the quality of the receiving inspections performed, and no remedial actions are needed. The equipment receipt inspected by the USGS to date has been "commercial grade items". Receiving inspection of commercial grade items as addressed in the USGS-QAPP-01, R4, relies on the manufacturer's published specifications and to ensure that the correct item/material was received and not damaged. The control of quality is exercised via the calibration program (QMP-12.01) and through the technical procedures (QMP-5.01 or 11.01). Special expertise or qualifications regarding visual acuity and colorblindness are part of the present USGS-QMP-2.03 requirements but are not considered relevant for receiving commercial grade items. The personnel identified within this SDR had been certified in accordance with the USGS-QMP-2.03 requirements and no additional qualification or limitation statements are necessary.

BLOCK 15: EFFECTIVE DATE: Not applicable.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

The cause of the condition is that NNWSI-USGS-QMP-2.03, R1, Certification of USGS and USGS Contractor Personnel for the NNWSI Project, states requirements for USGS receiving personnel that are more restrictive than necessary. Specialized certification of USGS receiving personnel is not required by NNWSI-USGS-QAPP-01, R4 which meets NVO-196-17, R5. Earlier revisions of the QA Plan contained explicit requirements for certification of inspection-type personnel. NVO-196-17, R5 distinguished these requirements as applicable to inspection and test personnel (Appendix C) and Non-Destructive Examination personnel (Appendix D). NNWSI-USGS-QAPP-01, R4 excluded both of these appendices.

Based on evaluation of NNWSI/88-9, R0 and R1, the USGS revised QAPP requirements will not change significantly. As included in the response to SDR 149, QMP-2.03 will be superseded by the next revision of QMP-2.02. The QMPs will be revised in accordance with the WMPO schedule. (Reference response to SDR-156.)

BLOCK 17: EFFECTIVE DATE: See SDR-156.

SDR 142 Rev. 0

Block 22 (continued)

Verification

In accordance with the USGS-YMP-QAPP 01, Rev. 4, there are no requirements for certified Inspection and Test personnel within the USGS-YMP organization. Consequently, QMP 2.03 Rev. 1 has been cancelled effective 5/23/89.

Therefore, no remedial or corrective actions are required.

YMP-USGS DOCUMENT TRANSMITTAL NOTICE

page 2 of 2

To: M.H. Mustard Participant No. 338
 U.S. Geological Survey MS-421
 Denver Federal Center, Box 25046
 Denver, CO 80225

Date: May 23, 1989

From: Joe R. Willmon, Quality Assurance Manager, U.S. Geological Survey

The following documents are being transmitted for the QA Program. Those procedures showing Rev. 0 should be placed in your book at the appropriate number sequence. Those procedures showing Rev. 1 or higher supersede a former revision which is to be removed from your files and destroyed or marked "superseded."

DOCUMENT No., Rev.	TITLE
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Table of Contents for the Management Procedures Manual (MPM).

Replace the Table of Contents and the Revision Record of the Management Procedures Manual (MPM) with the corresponding pages, iii through viii, dated 05/23/89.

The following procedures have been cancelled. They are to be removed and destroyed or marked "cancelled/uncontrolled."

- QMP-2.03, R1 Certification of USGS and USGS Contractor Personnel for the NNWSI Project
- QMP-2.06, R1 Control of Readiness Reviews
- QMP-3.01, R1 Procedure for Identification of Research/Experimental Activities

The material listed has been received and handled as instructed.

Name Matthew H Mustard
 (Signature of addressee or designee)

Date May 24 1989

RETURN WITHIN 30 DAYS TO:
 USGS QA Manager, USGS-YMP QA Program
 U.S. Geological Survey, MS-421
 Denver Federal Center, Box 25046
 Lakewood, Colorado 80225

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date June 16, 1988	2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During Audit 88-4	3a Identified By S. Hans/J. Clark	3b Branch Chief Concurrence Date	4 SDR No. 144 Rev. 0
5 Organization USGS-DENVER	6 Person(s) Contacted Tom Chaney		7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) (2-3) NNWSI-USGS-QMP-2.01, R1, para. 5.3 states in part, "QA office shall review all pertinent documents...perform a trend analysis that includes similarities in problem areas..."			
9 Deficiency Contrary to the above, no documented evidence was provided during the audit to demonstrate that an analysis of Nonconformance Reports had taken place to support the statements made in the 1987 Annual Assessment.			
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective (1) Develop and implement Trend Analysis Procedures.			

Aprvl.

11 QAE/Lead Auditor Date <i>Daniel Klunas 7/25/88</i>	12 Branch Manager Date <i>Tom Chaney 7/25/88</i>	13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.	15 Effective Date _____
16 Cause of the Condition & Corrective Action to Prevent Recurrence <i>James R. Haney</i>	17 Effective Date _____
18 Signature/Date <i>James R. Haney 8/31/88</i> <i>J. Wellman 8/31/88</i>	

Comp. by Orig. QA Org.

19 Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	<input checked="" type="checkbox"/> Amended Response	QAE/Lead Auditor/Date <i>Dan Klunas 12-5-88</i>	Branch Manager/Date <i>J. Wellman 5 Dec 88</i>
20 Amended Response	<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Dan Klunas 5-19-89</i>	Branch Manager/Date <i>J. Wellman 19 May 89</i>
21 Verification	<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <i>Dan Klunas 6-23-89</i>	Branch Manager/Date <i>J.W. Estelle 6/23/89</i>
22 Remarks				

23 QA CLOSURE	QAE/Lead Auditor/Date <i>Dan Klunas 6-23-89</i>	Branch Manager/Date <i>J.W. Estelle 6/23/89</i>	PQM/Date <i>James Blaylock 4/23/89</i>
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WPMO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 144

Rev. 0

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9 Deficiency (continued)

DEFICIENCY

BASIS FOR SDR SDR

The applicant for NNWSI is the Director of OCRWM. OCRWM has deligated this authority to WMPO. WMPO requires "Management assessments are to be performed by the WMPO and each NNWSI Project Participant. Each organization is to develop its internal procedures for planning, organizing, performing, and documenting the management assessment conducted, including the analysis and reporting of the results and the tracking of recommendations. Copies of all management assessments are to be provided to the Project Manager, WMPO and the WMPO PQM. The Project Manager, WMPO will make appropriate submittals of management assessment reports to OCRWM. Although management above or outside the QA organization is responsible for the management assessment activity, the QA organization may participate in the actual conduct of the management assessments.

USGS requires "Performance of Management Assessments: The USGS shall develop internal procedures for planning, organizing, performing, and documenting the management assessment conducted, including the analysis and reporting of the results and the tracking of recommendations, Copies of all management assessments are to be provided to the Director, WMPO, and the WMPO PQM."

The internal USGS procedures for performing the management assessment is quoted above.

RATIONAL FOR THE SDR

To perform a trend analysis, documentation of the facts to be analysed must be accomplished. It is reasonable to assume that if an analysis was done, records or documentation of that analysis would exist. No such documents were provided during the audit. Additionally, USGS has no procedures to define how to perform trend analysis.

10 Recommended Actions (continued)

- (2) Determine the impact of 1987 trending data in the annual assessment.
- (3) Train applicable personnel to trending anlysis procedure and document same.

USGS RESPONSE TO WPMO STANDARD DEFICIENCY REPORT (SDR) NO. 144

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The USGS investigation reveals there is no deficiency and no remedial actions are warranted as a result of this SDR. As stated in the Annual QA Report - 1987, potential adverse trends were identified within the Report if three or more of the documents listed above identified "the same or a similar negative condition". This evaluation and the reporting of the results does comply with USGS QMP-2.01 requirements. Due to the relatively small number of findings and the limited technical work activities underway in 1987 there was no adverse impact on the quality of the assessment statements due to an apparent lack of objective evidence as described in the SDR. The evidence was easily identified by a review of logs and open item reports in effect during 1987.

As required by USGS QMP-2.01, the following deficiency-type documents were evaluated in order to complete the 1987 Report:

Nonconformance Reports (NCRs)

USGS-87-01	USGS-87-03	USGS-88-02	USGS-88-04
USGS-87-02	USGS-88-01	USGS-88-03	

Internal Audit Findings and Observations

USGS-87-01, seven AFRs, 7 Observations
USGS-87-02, four AFRs, 3 Observations

Corrective Action Reports (CARs)

USGS-87-01

Other (externally generated findings and external USGS Audit results)

Audit USGS-BR87-01, two AFRs, 2 Observations
Audit WMPO 87-6/87-7, four SDRs, 5 Observations
Surveillance WMPO-SR-87-015, three SDRs
Surveillance WMPO-SR-88-001, three Observations

BLOCK 15: EFFECTIVE DATE: Not Applicable.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

The USGS QA Office addressed corrective actions and trending within the 1987 Annual QA Report. A detailed accounting of the trend analysis was not performed due to the small number of corrective actions involved in the evaluation. The USGS QAPP-01, R4, introduced a new requirement in Section 15 requiring a periodic analysis of NCRs to identify root causes and quality trends. The previous QAPP revision utilized trending as an integral part of the QA Annual Report and subsequent Management Assessment Report. The USGS QAPP-01, R4, was approved by WMPO on 1-5-88. As USGS QMPs were being drafted, revised, or planned to comply with Revision 4, the USGS was advised of additional revisions to the WMPO QA Plan that would require another revision to the USGS QA Plan. Priorities were then established on revising the QAPP before the individual QMPs. Recognizing that a 1988 Assessment Report or trend analysis of 1988 deficiency documents was not needed immediately, no further actions were warranted.

The WMPO 88-9 and USGS QAPP requirements involving management assessments, corrective actions and trending are changing and the USGS QMPs will be revised accordingly. The QMP-2.01 (assessments) and proposed QMP-16.03 (trending) will reflect the necessary methods for implementing the new QAPP requirements. The QMP will be revised in accordance with the WMPO schedule. (Reference response to SDR-156.)

BLOCK 17: EFFECTIVE DATE: See SDR 156.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Organization in Block 5

1 Date June 22, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During USGS-Denver	3a Identified By Dan Klimas/K. Schwartztrauber	3b Branch Chief Concurrence Date	4 SDR No. 147 Rev. 0	
5 Organization USGS-Denver	6 Person(s) Contacted Steve Harnsen/John Evans		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) USGS-QMP-3.03, Section 6.3.1.2 clearly requires that the SCIF (see Attachment 2 of QMP) supply "everything called for" including verification, validation, model and code method documentation, user documentation and certification for				
9 Deficiency Contrary to the above requirements, USGS has published USGS-OFR-87-596 (see Appendix A particularly), dated 1987, which contains Quality Level I data generated by undocumented (i.e., no SCIF) computer program titled HYP071.FOR,				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Modify QMP 3.03 to prevent the release for use of USGS software on NNWSI activities prior to the completion and certification of the SCIF.				

11 QAE/Lead Auditor Date <i>Dan Klimas 7/25/88</i>	12 Branch Manager Date <i>John Blaylock 7/25/88</i>	13 Project Quality Mgr. Date <i>John Blaylock 7/25/88</i>
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14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.	15 Effective Date _____
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16 Cause of the Condition & Corrective Action to Prevent Recurrence	17 Effective Date _____
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18 Signature/Date
Sam R. H... 8/31/88 *J.R. Williamson* 8/31/88

19 Response <input type="checkbox"/> Accept <input checked="" type="checkbox"/> Amended Response	QAE/Lead Auditor/Date <i>Dan Klimas 12-5-88</i>	Branch Manager/Date <i>John Blaylock 5 Dec 88</i>
20 Amended Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date <i>Dan Klimas 5-19-89</i>	Branch Manager/Date <i>John Blaylock 19 May 89</i>
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date <i>Dan Klimas 6/23/89</i>	Branch Manager/Date <i>J.W. Estelle 6/23/89</i>

22 Remarks

23 QA CLOSURE	QAE/Lead Auditor/Date <i>Dan Klimas 6/23/89</i>	Branch Manager/Date <i>J.W. Estelle 6/23/89</i>	PQM/Date <i>John Blaylock 6/23/89</i>
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WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

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Rev. 0

Page 2 of 2

8 Requirement (continued)

all scientific and engineering software. In addition, the SCIF must be "appropriately updated before the publication of any result depending on the software".

9 Deficiency (continued)

Version 1.000. This Scientific and Engineering software, according to USGS staff, has been used to conduct QA Level I Regional Seismicity Studies (SIP 3233G-03) to locate earthquakes and their magnitude from Great Basin seismograph station data. However, an appropriately updated SCIF for HYP071.FOR was not presented during the audit.

DISCUSSION

This SDR is based on an implementation deficiency identified during audit of USGS SIP 3233G-03, "Regional Seismicity Studies" and its related QA Level I Scientific and Engineering software, specifically USGS computer program HYP071.FOR. Publication USGS-OPR-87-596 is a clear violation of the USGS procedure and raises the question of acceptance of the data contained therein for licensing, since verification of the code and the changes made for the NNWSI Project are not documented, reviewed or approved.

10 Recommended Actions (continued)

- (1) Complete the SCIF for HYP071.FOR computer program.
- (2) Document by Nonconformance Report that Publication USGS-OPR-87-596 contains data/results unqualified for use on the NNWSI Project.
- (3) Stop utilizing HYP071.FOR for scientific investigation until the SCIF is complete and certified.
- (4) Investigate to determine if other USGS Publications have been released utilizing USGS scientific software for which no SCIF has been completed and certified.
- (5) Determine the impact on the quality of publishing documents which contain unqualified data/results generated from uncertified software computer programs.

USGS RESPONSE TO WMPD STANDARD DEFICIENCY REPORT (SDR) NO. 147

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The Software Checklist and Indexing Form (SCIF) will be completed for the HYPO71.FOR version used in the data report. However, it is not appropriate for the scientific investigation using HYPO71.FOR to stop until the SCIF is complete. HYPO71.FOR may be modified at any time, thereby requiring a new SCIF before the publication of any resultant data. The SCIF for HYPO71.FOR used in USGS Open File Report 87-596 is not a prerequisite for continuation of the scientific investigation, but only for the publication. The publication of data/results not yet qualified for licensing (USGS Open File Report 87-596) has been documented in USGS-NCR-88-43.

The review of QA records will identify any other USGS publications released using software for which no SCIF has been completed. This review will be defined as part of QMP-17.01 and performed before the records become part of the Central Records Facility for the project and before the data are approved for use in licensing activities. The impact on quality will be determined on a case-by-case basis. Overall impact on quality will be determined in accordance with QMP-16.03, Trending.

BLOCK 15: EFFECTIVE DATE:

Completion of SCIF - October 28, 1988.
Initiation of NCR - complete (copy attached).
Review of QA records will begin subsequent to revision of QMPs (see SDR 156) and will be a continuous activity.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

The cause of this condition was the timing of the subject publication. The work for the preparation of the report was completed prior to January 1987 with the cited QA requirement effective at the end of October 1986. This resulted in QA training being conducted between January and March 1987 which was subsequent to report preparation.

BLOCK 17: EFFECTIVE DATE: Complete.

SDR 147

SDR 147 WAS ISSUED BECAUSE USGS PUBLISHED
USGS - OFR - 87 - 596 WHICH CONTAINS QUALITY LEVEL I
DATA GENERATED BY UNDOCUMENTED (i.e. NO SCIF)
COMPUTER PROGRAM HYP071.FOR.

USGS ISSUED NCR - 88 - 43 ON 8/17/88 DOCUMENTING
THE SCIF FOR PROGRAM HYP071.FOR AS A NONCONFORMING
ACTIVITY.

DURING VERIFICATION OF THE CORRECTIVE ACTION FOR THIS SDR
IT WAS DETERMINED THAT THE SCIF FOR HYP071.FOR
WAS COMPLETED BY TECHNICAL CONTACT STEPHAN C. HARMSEN
ON 2/9/89 WITH THE CERTIFICATION SIGNED BY QA
MANAGER, J. R. WILKINSON ON 6/5/89. THE QUALITY
ASSURANCE DOCUMENTATION CONSISTED OF 3 VOLUMES
PLUS THE MAG TAPE. (SEE ATTACHED FIRST FEW PAGES)

SDR 147 SHOULD BE CONSIDERED CLOSED

J. G. SCHWEITZER

6/20/89

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date June 22, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During USGS-Denver	3a Identified By Dan Klimas/K. Schwartztrauber	3b Branch Chief Concurrence Date	4 SDR No. 147 Rev. 0	
5 Organization USGS-Denver	6 Person(s) Contacted Steve Harnsen/John Evans		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) USGS-QMP-3.03, Section 6.3.1.2 clearly requires that the SCIF (see Attachment 2 of QMP) supply "everything called for" including verification, validation, model and code method documentation, user documentation and certification for				
9 Deficiency Contrary to the above requirements, USGS has published USGS-OFR-87-598 (see Appendix A particularly), dated 1987, which contains Quality Level I data generated by undocumented (i.e., no SCIF) computer program titled HYP071.FOR,				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective Modify QMP 3.03 to prevent the release for use of USGS software on NNWSI activities prior to the completion and certification of the SCIF.				

Aprvl.

11 QAE/Lead Auditor Date <i>Dan Klimas 7/25/88</i>	12 Branch Manager Date <i>[Signature] 7/25/88</i>	13 Project Quality Mgr. Date <i>[Signature] 7/25/88</i>
---	--	--

Completed by Organization in Block 5

14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____
16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____
18 Signature/Date <i>[Signature] 8/31/88</i> <i>[Signature] 8/31/88</i>		

Comp. by Orig. QA Org.

19 Response	<input type="checkbox"/> Accept <input checked="" type="checkbox"/> Amended Response	QAE/Lead Auditor/Date <i>Dan Klimas 12/5/88</i>	Branch Manager/Date <i>[Signature] 5 Dec 88</i>
	<input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
	20 Amended Response	<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date
21 Verification	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	Branch Manager/Date
22 Remarks			
23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date <i>[Signature]</i>



W-0 STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 147

Rev. 0

Page 2 of 2

8 Requirement (continued)

all scientific and engineering software. In addition, the SCIF must be "appropriately updated before the publication of any result depending on the software".

9 Deficiency (continued)

Version 1.000. This Scientific and Engineering software, according to USGS staff, has been used to conduct QA Level I Regional Seismicity Studies (SIP 3233G-03) to locate earthquakes and their magnitude from Great Basin seismograph station data. However, an appropriately updated SCIF for HYP071.FOR was not presented during the audit.

DISCUSSION

This SDR is based on an implementation deficiency identified during audit of USGS SIP 3233G-03, "Regional Seismicity Studies" and its related QA Level I Scientific and Engineering software, specifically USGS computer program HYP071.FOR. Publication USGS-OPR-87-596 is a clear violation of the USGS procedure and raises the question of acceptance of the data contained therein for licensing, since verification of the code and the changes made for the NNWSI Project are not documented, reviewed or approved.

10 Recommended Actions (continued)

- (1) Complete the SCIF for HYP071.FOR computer program.
- (2) Document by Nonconformance Report that Publication USGS-OPR-87-596 contains data/results unqualified for use on the NNWSI Project.
- (3) Stop utilizing HYP071.FOR for scientific investigation until the SCIF is complete and certified.
- (4) Investigate to determine if other USGS Publications have been released utilizing USGS scientific software for which no SCIF has been completed and certified.
- (5) Determine the impact on the quality of publishing documents which contain unqualified data/results generated from uncertified software computer programs.

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USGS RESPONSE TO WMPO STANDARD DEFICIENCY REPORT (SDR) NO. 147

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The Software Checklist and Indexing Form (SCIF) will be completed for the HYPO71.FOR version used in the data report. However, it is not appropriate for the scientific investigation using HYPO71.FOR to stop until the SCIF is complete. HYPO71.FOR may be modified at any time, thereby requiring a new SCIF before the publication of any resultant data. The SCIF for HYPO71.FOR used in USGS Open File Report 87-596 is not a prerequisite for continuation of the scientific investigation, but only for the publication. The publication of data/results not yet qualified for licensing (USGS Open File Report 87-596) has been documented in USGS-NCR-88-43.

The review of QA records will identify any other USGS publications released using software for which no SCIF has been completed. This review will be defined as part of QMP-17.01 and performed before the records become part of the Central Records Facility for the project and before the data are approved for use in licensing activities. The impact on quality will be determined on a case-by-case basis. Overall impact on quality will be determined in accordance with QMP-16.03, Trending.

BLOCK 15: EFFECTIVE DATE:

Completion of SCIF - October 28, 1988.
Initiation of NCR - complete (copy attached).
Review of QA records will begin subsequent to revision of QMPs (see SDR 156) and will be a continuous activity.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

The cause of this condition was the timing of the subject publication. The work for the preparation of the report was completed prior to January 1987 with the cited QA requirement effective at the end of October 1986. This resulted in QA training being conducted between January and March 1987 which was subsequent to report preparation.

BLOCK 17: EFFECTIVE DATE: Complete.

NONCONFORMANCE REPORT

PART I - INTIATION Originator/Organization USGS-NNWSI QA Joe R. Willmon

Assigned Quality Assurance Level I ^{USGS-} NCR No. NCR-88-43 NCR Date 8/17/88

Nonconforming Item or Activity and Responsible Organization SCIF for program HYPO71.FOR

Specification/Drawing/Procedure Requirements NNWSI-USGS-QMP-3.03, para. 6.3.1.2. "However these activities (verification & validation) must be completed and the SCIF appropriately updated before the publication of any result depending on the software"

(Ref. WMPQ SDR No. 147)
Deficiency USGS Open File Report 87-596 was published without a completed SCIF for HYPO71.FOR.

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

J. J. Barth/ C. G. Bufe

PART III - DISPOSITION Repair Rework Use-as-is Reject/Scrap

Describe Technical Justification and Assignment of Responsibility _____

Approvals of Disposition

Dispositioner/Date _____ Dispositioner/Date _____

Project QA/Date _____ WMPQ/NTSO/Date _____

Disposition Action Complete Date _____

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

Accept Reject New NCR No. _____ Project QA/Date _____

Comments _____

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HYP071

Quality Assurance
Documentation

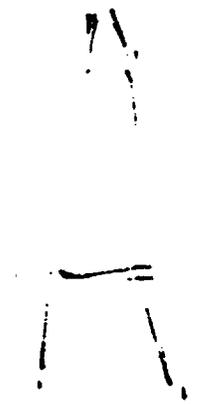
Volume 1

Program

Documentation

Tabs A-E

**UNCONTROLLED COPY
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**UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

**HYP071
Version 1.000
Earthquake Location Program**

**Yucca Mountain Project
Quality Assurance Level I
Software Documentation**

by

**Stephen C. Harmsen
and
William K. Smith**

February 1989

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CONTENTS

Tab

- A** **Software Summary Form (SSF) and Verification (approved 3/24/88)**
- B** **Software Checklist and Indexing Form (SCIF) for HYPO71 (approved ___/___/89)**
- C** **Reference: Lee and Lahr (1975)**
- D** **HYPO71 Master Variable Index and Common Block Index**
- E** **Compilation listings of HYPO71 and its subroutines**
- F** **Reference: Bakun and Joyner (1984)**
- G** **Reference: Bakun and Lindh (1977)**
- H** **Reference: Buland (1976)**
- I** **Reference: Hoffman and Mooney (1984)**
- J** **Reference: Lee, Bennett, and Meagher (1972)**
- K** **Reference: Lee and Stewart (1981)**
- L** **Reference: Rogers and others (1987a)**
- M** **Reference: Rogers and others (1987b)**
- N** **Reference: Johnson (1979)**

Software Summary Form (SSF)

USGS Computer Program "HYP071. FOR"; Version: 1.000;

Technical Contact: STEPHEN HARMSEN
address: MS 966 PO BOX 25046
DENVER FEDERAL CENTER
DENVER CO 80225

telephone: (303) 236-1603 x
FTS 303-776-H03

Organization: U.S. Department of the Interior, U.S. Geological Survey,
Geology Division, Branch of Geologic Risk Assessment
OR Contractor:

Summary prepared by TC or: _____
Summary Date: MAR 11 / 88; Software last modified: MAR 11 / 88
Action: 1st summary; Revision; Error; New TC; Other _____
If not "1st summary", version number of previous SSF submitted: _____

Brief description of software function and application area:
Earthquake hypocenter $\langle x, y, z, t \rangle$ estimation and
magnitude estimation. Used to locate southern Great
Basin earthquakes using "P" and "S" phase arrival times

Software is: Interactive; Batch; Combination

Software is: Scientific and Engineering or Auxiliary. Justification:
Event location and size determination require
invocation of several models; these include ray-tracing, reduction
of travel-time residuals via linearization of an inherently non-linear
model, assumptions about how amplitudes provide of wavelets determine size of eq.
Software may be used for NNWSI work at Quality Level I; II; III.

Narrative: HYP071, from Lee-Lahr, USGS Open File Report 75-311,
adapted for southern Great Basin location and magnitude
determination by modifying subroutines "trvdov" and "xfmag"
the ray-path travel-time subroutine and the magnitude subroutine,
respectively. Also, code has been made interactive.

Keywords (circle appropriate): Computer Program; SES; Auxiliary; Numerical Method; Modeling;
Inversion; Data Acquisition; Data Reduction; Other: _____

Programming Language(s): FORTRAN-77
Number of source statements (lines) (circle): 3314 (3314)
Any unusual operation requirements none: _____
Software is: Available; In Testing; In Preparation.
Documentation is: Available; Partly Available; In Preparation; Not Required.

For QA Manager use: **RECEIVED MAR 23 1988** *[Signature]*
SCIF received:

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FOR INFORMATION ONLY

SSF Verification

USGS Computer Program " HYP071. FOR "; Version: LOW0
Technical Contact: Stephen Hansen

The attached SSF is verified as complete except for the following items (if any):

A (not substantive):

Keyword "me 2/1"

Very good. Should be able to cover much of SCIF from published work a benchmark to a standard version. Also might ask Lark whether anyone has already done SQA for it - I know Woodward Clyde did for the Utah salt sites for HYPOELISE. Good luck!

B (substantive):

Exceptions listed under A are of no substantive impact and do not require resubmission of the SSF. The Technical Contact shall correct them at the next regular submission of the SSF.

Exceptions listed under B do have substantive impact. For any entries under B the Technical Contact is instructed to submit a revised SSF correcting the defects in a timely manner.

This page shall remain attached to the SSF permanently.



QA for software

03/24/88

Date

SOFTWARE CHECKLIST AND INDEXING FORM (SCIF)

USGS Computer Program: HYPO71; Version 1.000

UNCONTROLLED COPY
FOR INFORMATION ONLY

Technical Contact: Stephen Harmsen
Address: U.S. Geological Survey
Box 25046, Mail Stop 966
Denver, Colorado 80225
Telephone: (303) 236-1603
FTS: 776-1603

Documenting and testing as:

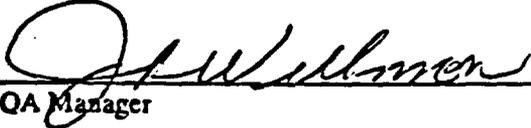
- Quality Level I Scientific and Engineering Software
- Quality Level II Scientific and Engineering Software
- Quality Level III Scientific and Engineering Software
- Quality Level I Auxiliary Software
- Quality Level II Auxiliary Software
- Quality Level III Auxiliary Software

CERTIFICATION

The undersigned certify that the documentation evidenced on this form is complete and correct to the best of our knowledge.



Technical Contact FEB 9 1989
Date



QA Manager 6/5/89
Date

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**ERRATA: "Lee and Stuart" should read "Lee
and Stewart" wherever it occurs
in this document.**

USE OF FORM

This form is to be completed so that it supplies, either on the SCIF itself or by reference to other documents, all the requisite documentation. Copies of all referenced documents or the appropriate parts thereof must be provided with the SCIF. A peer who unfamiliar with the software should be able to find *everything* called for by starting with the SSF and SCIF alone.

If the software is Auxiliary or is used only for Quality Level III work, no SCIF is required. If one is supplied anyway, no justification is required for leaving out any of the documentation listed in the SCIF.

The SCIF is divided into three parts: (I) MODELS, (II) USER'S MANUAL, AND (III) REVIEW, VERIFICATION, AND VALIDATION. Type or use indelible ink. At every blank in the form supply one or more of the following forms of documentation:

A concise narrative providing the required information. If appropriate, a mark in the labeled box is all that's needed.

The phrase "N sheets attached", or the equivalent, where N is the number of attached sheets. Label such sheets with the item number(s).

Either full reference citation(s) or "in text" citations corresponding to entries in an attached list of references.

For Quality Level II SES only: (1) a statement justifying the absence of the item on the basis of appropriateness, or (2) a mark in the box labeled "QA II" (items 2.2, 3.1, 13, 13.1, 14.1, 14.2, 17.2, 26.3, and 31.2).

For items 2 through 19.2 and 21 through 31.2 only: page number(s) in reference(s) given in item 1 or 20, respectively. (See following note.)

Note that items 1 and 20 contain special comprehensive entries. In theory a completed SCIF might have entries only in items 1 and 20 and in Part III. Listing relevant page numbers in items 2 through 19.2 and 21 through 31.2 is required if comprehensive entries are used.

Items 2.2, 34.1, 34.3, and 34.4 have a box labeled "see software user". If the box is marked, the user is cautioned that they must supply all documentation required by the item and not provided by the TC. Boxes for the software *developer* (items 33.1, 33.3, and 34.3), if marked, do not excuse the TC from obtaining and filing the information called for.

If the responses to several items are the same, writing the equivalent of either "see item M" or "same" is acceptable, the latter to point to the *immediately preceding* item. Some of the more commonly cross-referenced items are listed next to boxes which may be marked if appropriate. Be careful not to cause "circular referencing".

The SCIF is arranged "linearly", while software development and use are anything but linear, therefore a number of subjects are scattered among many items. The following major topics are addressed by the items listed, indirectly if in parentheses. Such groups of requirements often can be documented much more compactly.

Solution strategies: (2.1), (2.2), 3, 3.1, 3.2, 7, (8), 16, 16.1, (22), (22.1), (24), (26.2), (26.3)

Input, output, and governing equations: 2.3, 9, 9.1, 9.4, 10, 10.1, 11, 11.1, 17, 17.1, 17.2, 18, 23.1, 23.2, 23.3, (24), 26.3, 27 through 27.8, 28 through 28.5, (29), (29.1), (29.2), (31), (31.1), (31.2) (See example in SCIF Attachment 1.)

Printed or computer-readable listings: (9.4), (10.1), (11.1), 21, 21.1, 29.1, 29.2, 31.1

WMP0 STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date June 16, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3			Page 1 of 2
3 Discovered During AUDIT 88-4		3a Identified By S. Hans/J. Clark		3b Branch Chief Concurrence Date	
5 Organization USGS-Denver		6 Person(s) Contacted Tom Chaney			7 Response Due Date is 20 Working Days from Date of Transmittal
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI-USGS-QMP-3.04, E1, Para. 6.1.1, states in part, "The appropriate official ...shall have the responsibility of selecting and certifying...the technical reviewers for each publication." In addition, NNWSI-USGS-QMP-5.01,					
9 Deficiency Contrary to the above, the technical reviewers for OFR-87-408 and 598, were not certified as technical reviewers in their respective disciplines and for two (2) of the reviewers, no certifications of any type were provided during					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective The above (block 8) is not a WMP0 imposed requirement. Therefore, it is recommended that USGS delete all references to certifications required for					

Completed by Organization in Block 5/

11 QAE/Lead Auditor Date <i>Daniel Klunas 7-25-88</i>		12 Branch Manager Date <i>John R. Haney 7/25/88</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>	
14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.					
15 Effective Date _____					
16 Cause of the Condition & Corrective Action to Prevent Recurrence					
17 Effective Date _____					
18 Signature/Date <i>Larry R. Haney 8/31/88</i> <i>J.R. Williamson 8/31/88</i>					

Comp. by Orig. QA Org.

19 Response		<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response	QAE/Lead Auditor/Date <i>Don Klunas 12/5/88</i>		Branch Manager/Date <i>John R. Haney 5 Dec 88</i>		
20 Amended Response		<input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date		Branch Manager/Date		
21 Verification		<input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date <i>Don Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/23/89</i>		
22 Remarks <i>QMP 2.03 Rev 1 has been cancelled.</i>							
23 QA CLOSURE		QAE/Lead Auditor/Date <i>Don Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/23/89</i>		PQM/Date <i>James Blaylock 6/23/89</i>	



WMP0 STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 149

Rev. 0

Page 2 of 2

8 Requirement (continued)

R1, para. 4.5, states in part regarding review of technical procedures, "The Review shall be in accordance with QMP-3.07 (Technical Review) regarding selection and certification of reviewer(s), specifications or criteria of review, and documentation."

9 Deficiency (continued)

the audit. For three (3) of 11 Technical Reviewers on Technical procedures, no certifications were provided during the audit.

BASIS FOR SDR

This requirement is not a WMP0 imposed requirement. Therefore, the basis for the SDR is the USGS implementing procedures.

RATIONAL FOR SDR

10CFR50 Appendiix "B" Criteria V requires procedures to specify how work activities are done and to have the work activity accomplished in accordance with the procedures. USGS did not implement their own procedures.

10 Recommended Actions (continued)

NNWSI personnel except for Inspection, Non Destructive Examination, QA Auditors and performers of special processes as no NNWSI requirement exists for such certification except as noted. Response to the SDR will serve as the basis for future audit and surveillance activities.

USGS RESPONSE TO WPO STANDARD DEFICIENCY REPORT (SDR) NO. 149

NOTE: SDR-149 contains 2 parts. In the USGS response, Part a) refers to the condition noted as inadequate certifications. Part b) refers to the problem of "missing" certifications.

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

a) The USGS investigation reveals there is no deficiency and no remedial actions are required as a result of the SDR. The certifications contain information regarding work assignment areas, education and experience, thereby meeting identification of "discipline". QMP-2.03 states requirements for USGS technical reviewers that are more restrictive than necessary and certification is no longer required by QAPP-01, R4. There is no adverse effect on quality as a result of the certification requirements and no remedial actions are necessary.

b) NCR-88-44 has been initiated to document the missing certifications to assure proper traceability of requirements and correction of nonconforming conditions. This NCR will facilitate future record reviews because appropriate records or packages will reference the NCR and provide traceability for the resolution.

BLOCK 15: EFFECTIVE DATE:

- a) Not applicable.
- b) Initiation of NCR - Complete (copy attached).

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

a) Not applicable.

b) The cause of the condition is that NNWSI-USGS-QMP-2.03, R1, Certification of USGS and USGS Contractor Personnel for the NNWSI Project, states requirements that are more restrictive than necessary. Earlier revisions of the NNWSI Quality Assurance Plan contained requirements for certification of technical personnel, however, NVO-196-17, R5 loosened the requirements. NNWSI-USGS-QAPP-01, R4, has incorporated the requirements of NVO-196-17, R5, however, the QMPs have not yet been updated to reflect all changes. (See SDR-156.) USGS certifications are currently required by the QAPP only for auditors. QMP-2.03 will be superceded by the next revision of QMP-2.02. This revision will take place according to the WMPO schedule for QMP revisions. (See response to SDR-156.)

BLOCK 17: EFFECTIVE DATE:

- a) Not applicable.
- b) See SDR-156.

NONCONFORMANCE REPORT

PART I - INTIATION Originator/Organization USGS-NNWSI QA Joe R. Willmon

Assigned Quality Assurance Level I NCR No. USGS-NCR-88-44 NCR Date 8/19/88

Nonconforming Item or Activity and Responsible Organization Certifications

Specification/Drawing/Procedure Requirements Reference SDR-149

Deficiency Reference SDR-149

Certifications are not on file with the QA Office for five technical reviewers. **

**This NCR will be updated when WMPO QA advises the USGS of the specific names.

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

QA Office: Martha Mustard to coordinate with appropriate USGS QA Implementation Specialists

PART III - DISPOSITION Repair Rework Use-as-is Reject/Scrap

Describe Technical Justification and Assignment of Responsibility _____

Approvals of Disposition

Dispositioner/Date _____ Dispositioner/Date _____

Project QA/Date _____ WMPO/NTSO/Date _____

Disposition Action Complete Date _____

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

Accept Reject New NCR No. _____ Project QA/Date _____

Comments _____



United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 421
DENVER FEDERAL CENTER
DENVER, COLORADO 80225



IN REPLY REFER TO:

August 31, 1988

Carl P. Gertz, Project Manager
Waste Management Project Office
U.S. Department of Energy
P. O. Box 98518
Las Vegas, NV 89193-8518

SUBJECT: USGS responses to 20 SDRs from WMPO Audit 88-4

Dear Carl:

Enclosed are the USGS responses to the twenty WMPO Audit 88-4 SDRs. The conduct of the audit and its results have drawn a great deal of public scrutiny. Because of this visibility and the USGS's concern regarding the findings from this audit, I asked the Quality Assurance Manager and his staff to undertake an investigation and evaluation of each of the SDRs. The results of the investigation of the SDRs indicate that, although improvements need to be made with the NNWSI-USGS QA program, none of the deficiencies represent a significant quality program breakdown. Of the twenty SDRs our analysis indicates that sixteen represent deficiencies of varying significance.

The USGS will work to correct these deficiencies just as it has corrected those identified in the past. The USGS has put a substantive effort in implementing its QA program and will continue this effort until you and NRC indicate full acceptance of the USGS Quality Assurance program.

In closing, I must express my concern about the atmosphere under which the audit process was conducted. The types of pressures that can be associated with these conditions can lead

SAIC/T&MSS

SEP 06 1988

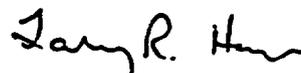
CCF RECEIVED

Letter to Carl Gertz, August 31, 1988

Page - 2 -

to situations where objectivity and logic can be distorted. Audit 88-4 has caused a number of repercussions throughout both our organizations. I feel confident, however, that we can now work together to build a technically sound and quality assured site characterization program.

Sincerely,



Larry R. Hayes, Chief,
Branch of NNWSI

THC/LRH/aa

Enclosures

cc w/enclos.: J. F. Devine, USGS, Reston, VA
V. Schneider, USGS, Reston, VA
E. H. Roseboom, USGS, Reston, VA
J. R. Willmon, USGS, Denver, CO
R. B. Raup, USGS, Denver, CO
D. G. Jorgensen, USGS, Denver, CO
J. Blaylock, DOE/WMPO, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
D. D. Porter, SAIC, Golden, CO
USGS/RC/1293/1/QA File 3.18.01 (88-4) WMPO Audit

SDR 149 Rev. 0

Block 22 (continued)

Verification of remedial and corrective actions.

QMP 2.03, Rev. 1 has been canceled effective 5/23/89. There is no requirement in USGS-YMP-QAPP-01, Rev. 4 for certification of technical reviewers. Therefore, the cited deficiency no longer exists.

YMP-USGS DOCUMENT TRANSMITTAL NOTICE

To: M.H. Mustard Participant No. 338
U.S. Geological Survey MS-421
Denver Federal Center, Box 25046
Denver, CO 80225

Date: May 23, 1989

From: Joe R. Willmon, Quality Assurance Manager, U.S. Geological Survey

The following documents are being transmitted for the QA Program. Those procedures showing Rev. 0 should be placed in your book at the appropriate number sequence. Those procedures showing Rev. 1 or higher supersede a former revision which is to be removed from your files and destroyed or marked "superseded."

DOCUMENT No., Rev.	TITLE
-----------------------	-------

Table of Contents for the Management Procedures Manual (MPM).

Replace the Table of Contents and the Revision Record of the Management Procedures Manual (MPM) with the corresponding pages, iii through viii, dated 05/23/89.

The following procedures have been cancelled. They are to be removed and destroyed or marked "cancelled/uncontrolled."

QMP-2.03, R1	Cerification of USGS and USGS Contractor Personnel for the NNWSI Project
QMP-2.06, R1	Control of Readiness Reviews
QMP-3.01, R1	Procedure for Identification of Research/Experimental Activities

The material listed has been received and handled as instructed.

Name Martha H Mustard
(Signature of addressee or designee)

Date May 24 1989

RETURN WITHIN 30 DAYS TO:
USGS QA Manager, USGS-YMP QA Program
U.S. Geological Survey, MS-421
Denver Federal Center, Box 25046
Lakewood, Colorado 80225

"BEST AVAILABLE COPY"

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization 82220

1 Date June 15, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During WMPO AUDIT 88-4		3a Identified By S. P. Nolan		3b Branch Chief Concurrence Date	
5 Organization USGS-Denver		6 Person(s) Contacted Joe Willmon/J.W. Reid		4 SDR No. 150 Rev. 0	
7 Response Due Date is 20 Working Days from Date of Transmittal					
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI-USGS-QMP-3.05, R1, para. 5.1; Criteria letters shall be prepared per para. 5.2 by the USGS organization requesting NTS contractor services and sent to the Chief, Branch of NNWSI office.					
9 Deficiency No criteria letter was available to specify the scope of REECO's responsibilities as they pertained to supplying calibration services on the Nevada Test Site in support of the NNWSI Project.					
10 Recommended Action(s): <input type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective (1) Determine the impact of this deficiency on the quality of any M&TE work performed by REECO for USGS.					

Completed by Organization in Block 5

11 QAE/Lead Auditor Date <i>Don Klunas 7/25/88</i>		12 Branch Manager Date <i>Joe Willmon 8/31/88</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>	
14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.					
15 Effective Date _____					
16 Cause of the Condition & Corrective Action to Prevent Recurrence					
17 Effective Date _____					
18 Signature/Date <i>Lang R. [unclear] 8/31/88</i> <i>Joe Willmon 8/31/88</i>					

Comp. by Orig. QA Org.

19 Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Don Klunas 8/23/89</i>		Branch Manager/Date <i>J.W. Estell 10 Feb 89</i>	
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		Branch Manager/Date	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <i>Don Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estell 6/23/89</i>	
22 Remarks <i>Supplementa response dated -9 30-88 accepted</i>					

QA CLOSURE

23 QA CLOSURE		QAE/Lead Auditor/Date <i>Don Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estell 6/23/89</i>		PQM/Date <i>James Blaylock 6/23/89</i>	
---------------	--	--	--	---	--	---	--



WMPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 150

Rev.

Page 2 of 2

9 Deficiency (continued)

DISCUSSION

The USGS-QAPP-01, Revision 4, Section 4.2, requires that when the USGS procures services from contractors or requests services from national laboratories and supporting Federal Agencies, the USGS shall prepare work agreements, memorandums of understanding, interagency agreements, management agreements, or other suitable documents.

The listed QMP-3.05, Revision 1, further amplifies this requirement in that criteria letters shall be prepared by the USGS organization requesting NTS contractor services.

A request was made of the USGS-QA Manager to provide said objective evidence with respect to the scope of REECOs work as related to calibration services provided by REECO to the USGS at the Nevada Test Site.

No documentation was presented during the course of the audit.

10 Recommended Actions (continued)

- (2) Determine the cause of the condition noted in this SDR and what action will be taken to prevent recurrence.

USGS RESPONSE TO WMPO STANDARD DEFICIENCY REPORT (SDR) NO. 150

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

An investigation is in process regarding the USGS actions taken as a result of WMPO Action Item 87-2368. This investigation will determine if remedial actions are warranted and the results will be forwarded to WMPO via a supplemental response.

BLOCK 15: EFFECTIVE DATE: Supplemental Response to WMPO - October 1, 1988

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE

An investigation is underway to determine the cause of the situation. Apparently, the use of REECo for calibration services has been a common practice by NNWSI participants because of REECo's status as an NTSO contractor. Once the investigation is concluded a more specific cause statement and preventive actions will be determined and forwarded to WMPO via a supplemental response.

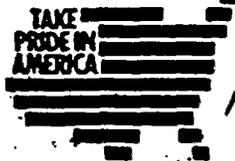
At this time, in compliance with WMPO instructions, NNWSI-USGS personnel and activities are prohibited from using REECo as a calibration contractor. If that decision is reversed in the future, a criteria letter will be prepared in compliance with NNWSI-USGS-QMP-3.05, R1.

BLOCK 17: EFFECTIVE DATE: Supplemental Response to WMPO -
October 1, 1988



United States Department of the Interior

GEOLOGICAL SURVEY
BOX-25046 M.S. 421
DENVER FEDERAL CENTER
DENVER, COLORADO 80225



IN REPLY REFER TO:

August 31, 1988

Carl P. Gertz, Project Manager
Waste Management Project Office
U.S. Department of Energy
P. O. Box 98518
Las Vegas, NV 89193-8518

SUBJECT: USGS responses to 20 SDRs from WMPO Audit 88-4

Dear Carl:

Enclosed are the USGS responses to the twenty WMPO Audit 88-4 SDRs. The conduct of the audit and its results have drawn a great deal of public scrutiny. Because of this visibility and the USGS's concern regarding the findings from this audit, I asked the Quality Assurance Manager and his staff to undertake an investigation and evaluation of each of the SDRs. The results of the investigation of the SDRs indicate that, although improvements need to be made with the NNWSI-USGS QA program, none of the deficiencies represent a significant quality program breakdown. Of the twenty SDRs our analysis indicates that sixteen represent deficiencies of varying significance.

The USGS will work to correct these deficiencies just as it has corrected those identified in the past. The USGS has put a substantive effort in implementing its QA program and will continue this effort until you and NRC indicate full acceptance of the USGS Quality Assurance program.

In closing, I must express my concern about the atmosphere under which the audit process was conducted. The types of pressures that can be associated with these conditions can lead

SAIC/T&MSS

SEP 06 1988

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to situations where objectivity and logic can be distorted. Audit 88-4 has caused a number of repercussions throughout both our organizations. I feel confident, however, that we can now work together to build a technically sound and quality assured site characterization program.

Sincerely,



Larry R. Hayes, Chief,
Branch of NNWSI

THC/LRH/aa

Enclosures

cc w/enclos.: J. F. Devine, USGS, Reston, VA
V. Schneider, USGS, Reston, VA
E. H. Roseboom, USGS, Reston, VA
J. R. Willmon, USGS, Denver, CO
R. B. Raup, USGS, Denver, CO
D. G. Jorgensen, USGS, Denver, CO
J. Blaylock, DOE/WMPO, Las Vegas, NV
S. H. Klein, SAIC, Las Vegas, NV
D. D. Porter, SAIC, Golden, CO
USGS/RC/1293/1/QA File 3.18.01 (88-4) WMPO Audit

UNCLASSIFIED
FACSIMILE TRANSMITTAL

MACHINE -- FTS 776-5046

VERIFICATION -- FTS 776-0516

FROM: Martha Mustard 776-1418
USGS

TO: Dan Klimas
SATIC / Las Vegas

COMMENTS:

Oct 11 '88 memo - 2 pages

Sept 30 '87 memo - 1 page

Sept 28 '88 memo - 5 pages

NUMBER OF PAGES, EXCLUDING COVER SHEET 8

DATE 6-20-89



United States Department of the Interior



GEOLOGICAL SURVEY
BOX 25046 M.S. 421
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

October 11, 1988

IN REPLY REFER TO:

MEMORANDUM

TO: DISTRIBUTION

FROM: USGS Quality Assurance Manager, USGS-YMP
QA Program, MS 421, Denver, CO

SUBJECT: CRITERIA LETTERS FOR CALIBRATION SERVICES
(Reference YMPO SDR-150)

The recent DOE audit of Denver and the NTS produced a Standard Deficiency Report (No. 150) concerning the lack of criteria letters "to specify the scope of REECO's responsibilities as they pertained to supplying calibration services on the Nevada Test Site in support of the NNWSI Project". All Principle Investigators are reminded that criteria letters are required for obtaining NTS contractor services, including support services, drilling, construction, engineering, and mining in support of the NNWSI Project.

As you are probably aware, there has been a problem in providing NBS traceability for calibrations performed using Sandia's Primary Standards Laboratory (PSL). At the request of the Project Office, an exhaustive investigation was conducted to determine any QA Level I calibration services provided to the USGS Yucca Mountain Project relying on the PSL for NBS traceability. This investigation resulted in issuance of two internal nonconformance reports concerning REECO calibration services. We are informed that REECO is now providing NBS traceability through another source. If you are planning on using REECO for calibration services for QA Level I, II, or III work, please be aware that you must use a criteria letter to obtain the services. See NNWSI-USGS-QMP-3.05 for a more detailed explanation.

Joe R. Willmon,
Quality Assurance Manager

MHM/JRW/aa

cc: USGS RC/1293/1/QA File 3.3.05 and 3.16.01 WMPO SDR-150

DISTRIBUTION:

L.R. Hayes
R.B. Raup
D.G. Jorgensen
R.L. Wise

PRINCIPAL INVESTIGATORS:

Anderson, L.	MS 964
Beck, David	USGS, Las Vegas
Bergquist, J. R.	MS 941, Menlo Park, CA
Bufe, C.	MS 966
Czarnecki, J.	MS 421
Downey, J.	MS 421
Flint, A.	USGS, Mercury, NV
Fox, K.	MS 913
Friedman, J.	MS 964
Glancy, P.	USGS, Carson City, NV
Glick, E.	MS 913
Glover, K.	MS 421
Hoxie, D.	MS 421
Klein, D.	MS 964
Lee, F.	MS 966
Lewis, B.	MS 421
Luckey, R. R.	MS 421
Mooney, W.	MS 977, Menlo Park, CA
Moore, D.	MS 913
Muller, D.	MS 964
Oliver, H.	MS 977, Menlo Park, CA
Rosenbaum, J.	MS 964
Rousseau, J.	MS 421
Sass, J.	Flagstaff, AZ
Spengler, R.	MS 913
Steinkampf, W.	MS 421
Stuckless, J.	MS 963
Weeks, E.	MS 413
Yang, A.	MS 421



United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25016 M.S. 421
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO

September 30, 1987

Dr. Carl P. Gertz, Project Manager
Waste Management Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, NV 89193-8518

SUBJECT: REVIEW OF QUALITY LEVEL I AND II WORK PERFORMED
UTILIZING INSTRUMENTS CALIBRATED AT THE PRIMARY
STANDARDS LAB (PSL) AT SANDIA NATIONAL
LABORATORIES (SNL) (WMPO ACTION ITEM #87-2368)

Dear Carl:

In response to your letter of September 1, 1987,
WMPO:JB-2593, we are performing a review of USGS NNWSI activities
to determine if any instruments used in Level I or II data
acquisition has calibration traceability through Sandia's PSL.

A poll of our Principal Investigators has turned up three
instances where SNL's PSL through REECO or EG&G was used to
perform instrument calibrations. They are currently engaged in
determining whether these instruments have been used in the
collection of Level I or II data. Should this be the case, NCRs
will be generated as soon as possible according to your
instructions.

Sincerely,

Larry R. Hayes

Larry R. Hayes, Chief
Branch of NNWSI

JWR/LRH/aa

cc: J. R. Willmon, USGS, Denver, CO
W. E. Wilson, USGS, Denver, CO
R. B. Raup, USGS, Denver, CO
J. J. Barth, USGS, Denver, CO
K. W. Causseaux, USGS, Denver, CO
J. Blaylock, WMPO/DOE, Las Vegas, NV
QA File 3.12.01
A. K. Sacco, REECO, Las Vegas, NV



United States Department of the Interior



GEOLOGICAL SURVEY
BOX 25046 M.S. 421
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO

September 28, 1988

Carl P. Gertz, Project Manager
Yucca Mountain Project Office
U.S. Department of Energy
P.O. Box 98518
Las Vegas, NV 89193-8518

SUBJECT: Review of Quality Level I and II work performed utilizing instruments calibrated at the Primary Standards Lab (PSL) at Sandia National Laboratories (SNL) (NN1-1988-3406)

In response to your letter of September 1, 1988 two YMP-USGS NCRs have been generated (USGS-NCR-88-46 & 47), and copies are enclosed. In NCR 88-46 the quality of the level I data has already been determined to be unaffected. In NCR 88-47 the identification, serial, and NBS numbers are included as you requested.

Sincerely,

Larry R. Hayes, Chief
Branch of YMP

JWR/LRH/aa

Enclosure

cc: J. R. Willmon, USGS, Denver, CO
J. Heaney, SAIC, Las Vegas, NV
USGS/RC/1293/1/QA File 3.15.01 NCRs 88-46 & 88-47

"BEST AVAILABLE COPY"

NONCONFORMANCE REPORT

PART I - INTIATION Originator/Organization Joseph Barth USGS

Assigned Quality Assurance Level 1 NCR No. 89-46 NCR Date 23 Sept. 1988

Nonconforming Item or Activity and Responsible Organization Calibration of equipment by Sandia for Branch of Engineering Geology and Tectonics

Specification/Drawing/Procedure Requirements OMP 12.01, R1, Section 5.3 standards used..., shall be traceable to NBS...

Deficiency Electronic equipment used in the evaluation of seismic hazards, at NTS as described in technical procedure USGS-SP-11, RO, was calibrated by Sandia's PSL.
(See attached sheet)

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

Dee Overturf/Joe Barth, Geologic Division

PART III - DISPOSITION Repair Rework Use-as-is Reject/Scrap

Describe Technical Justification and Assignment of Responsibility Sandia's primary standards Lab does not meet requirements. Dee Overturf, B. of ET, removed all suspect equipment to be re-calibrated by NBS traceable venders. None of the equipment was found to be out of manufacturers specifications. Therefore, no data are suspect. New calibration records ^{data} (attached) are on file in the Golden, Colo. office B. of ET. Therefore we recommend that the data be used-as-is.

Approvals of Disposition

Dispositioner/Date Joseph Barth 27/5/88 Dispositioner/Date _____

Project QA/Date William 9/20/88 WMPONTSO/Date _____

Disposition Action Complete Date complete 9-28-88

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

Accept Reject New NCR No. _____ Project QA/Date _____

Comments _____

NCR : USGS-NCR-98-46

Deficiency (Continued)

The standards used by Sandia do not meet the requirements of QMP 12.01, R1, section 5.3. The suspect equipment, model numbers, etc., are listed in the attached ^{inverted} calibration sheets.

NONCONFORMANCE REPORT

PART I - INTIATION

Originator/Organization Joseph Reid, USGS - QA Office

Assigned Quality Assurance Level I NCR No. USGS-NCR-88-47 NCR Date 9/28/88

Nonconforming Item or Activity and Responsible Organization Calibration of equipment by REECO for YMP-USGS.

Specification/Drawing/Procedure Requirements QIP 12.01, Pl Sec. 5.3: Standards used ...shall be traceable to NBS...

Deficiency Instrumentation used in YMP-USGS Level I activities was calibrated using REECO standards whose NBS Traceability, was developed through Sandia's (see attached)

PART II - PERSON/ORGANIZATION ASSIGNED DISPOSITION RESPONSIBILITY

Alan Flint/Wil Causseaux

PART III - DISPOSITION

Repair

Rework

Use-as-is

Reject/Scrap

Describe Technical Justification and Assignment of Responsibility _____

Approvals of Disposition

Dispositioner/Date _____

Dispositioner/Date _____

Project QA/Date _____

YMPD/ITSO/Date _____

Disposition Action Complete Date _____

PART IV - VERIFICATION (Approved Disposition Verified and Examined)

Accept

Reject

New NCR No. _____

Project QA/Date _____

Comments _____

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NCR - USGS-NCR-88-47

Deficiency (Continued)

Primary Standard Lab (PSL). Sandia's PSL does not have a quality assurance currently acceptable for YMP licensing needs.

Instrumentation in question includes:

- | | | | | | | | | | | |
|----|------|------|-----------|-------|--------|-----|------|-----|-----|-------|
| 1. | Type | 1507 | Sartorius | scale | ID No. | PTL | 0646 | NBS | NO. | 2793A |
| 2. | " | " | " | " | " | " | 3086 | " | " | " |
| 3. | " | " | " | " | " | " | 3482 | " | " | " |

WMPQ STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date June 10, 1988		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 2	
3 Discovered During AUDIT 88-4		3a Identified By S. Hans	3b Branch Chief Concurrence Date		4 SDR No. 151 Rev. 0
5 Organization USGS - NTS		6 Person(s) Contacted Jim Robison		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) NNWSI-USGS-QMP-3.06, R0,, Para. 6.2.3.1 requires SIPs to include "The methods or data collection activities technical procedures..."					
9 Deficiency Contrary to the above SIP-3310G-01, R0, did not include one (1) technical procedure, HP-60, R0. This procedure is required to perform activities within the scope of the referenced SIP.					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective (1) Include the necessary procedure in the referenced SIP.					

11 QAE/Lead Auditor Date <i>Daniel Klunas 7/25/88</i>		12 Branch Manager Date <i>Jim Robison 8/26/88</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>	
--	--	--	--	---	--

14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____	
--	--	-------------------------	--

16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____	
---	--	-------------------------	--

18 Signature/Date <i>Sam R. Hans 8/31/88</i> <i>J.R. Williamson 8/31/88</i>	
--	--

19 <input checked="" type="checkbox"/> Accept <input checked="" type="checkbox"/> Amended Response <input type="checkbox"/> Reject <input type="checkbox"/> Response		GAE/Lead Auditor/Date <i>Jim Robison 12-5-88</i>		Branch Manager/Date <i>Jim Robison 5 Dec 88</i>	
20 Amended Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject		GAE/Lead Auditor/Date <i>Dan Klunas 5-4-89</i>		Branch Manager/Date <i>Jim Robison 19 May 89</i>	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		GAE/Lead Auditor/Date <i>Dan Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/28/89</i>	

22 Remarks Verified Technical procedure HP-60 BERO has been added to SIP 3331 G-01 / Additionally, SIP 3331 G-01 has been submitted for review and approval.					
---	--	--	--	--	--

23 QA CLOSURE		GAE/Lead Auditor/Date <i>Dan Klunas 6/23/89</i>		Branch Manager/Date <i>J.W. Estelle 6/28/89</i>		PQM/Date <i>James Blaylock 6/28/89</i>	
---------------	--	--	--	--	--	---	--



WMP0 STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 151

Rev. 0

Page 2 of 2

9 Deficiency (continued)

The USGS QAPP-01, Rev. 4., para. 3.1.1.1 requires that SIPs shall "identify all factors and concerns that related [SIC] to the planning or the performance of the scientific investigation." The implementing procedure referenced in 8 above, implement this QAPP-01 requirement. In the specific instance of SIP 3310G-01, the SIP failed to identify one procedure which was necessary to perform the work involved with the SIP scope of work.

RATIONAL FOR SDR

The bifercation of the WMP0 Criteria III program in to Scientific Investigation and Design Control is predicated upon the use of SIPs as the overall controlling document. Therefore, all sub-tier documents get their efficacy from the upper-tier SIPs. The SIP, in order to function properly as the controlling and authorizing document, must be maintained current.

10 Recommended Actions (continued)

- (2) Determine the impact on the quality of data gathered using procedures not referenced in this SIP.
- (3) Review all SIPs to determine if similar situation exists.

USGS RESPONSE TO IPO STANDARD DEFICIENCY REPORT (SDR) NO. 151

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The USGS investigation reveals there is no deficiency that resulted in an adverse impact on quality and no remedial actions are necessary. SIPs are to be updated on an as-needed basis. Changes in SIPs that reflect editorial or housekeeping changes have been given a low priority due to administrative difficulties in getting SIPs and changes approved. Updates to tables identifying software and technical procedures will be incorporated as SIPs are revised for technical content. (Please note that the correct SIP reference should be 3331G-01, not 3310G-01.)

BLOCK 15: EFFECTIVE DATE: Not applicable.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

Not applicable.

BLOCK 17: EFFECTIVE DATE: Not applicable.

SDR 151 Rev. 0

Verified that HP-60, Rev. 0 has been added to SIP 3331G-01, Rev. 0, Table 3-2 (Pg. 36).

SIP 3331G-01, Rev. 1 has been submitted for review and approval in accordance with QMP 3.06.

Table 3-2. Method and Technical Procedures for Site Potentiometric-Level Evaluation

Method	-----Technical Procedure----- Number (NWM-USGS-)	Title or Subject	Date	QA Level Assignment Sheet (QALAS) Number (YMP-QALA-)	Software Reference
Test drilling	--	REECO drilling and completion procedures		3331G-01-01, R0	
Downhole geophysical surveys	GP-10, R0	Borehole videofracture logging	04-12-85	3331G-01-06, R0	
	HP-02, R0	Acoustic televiewer	08-14-84		
Water sampling, shipment, and analysis	HP-23, R1	Field analysis	10-03-84	3331G-01-04, R0	
	HP-08, R0	Inorganics	08-06-82		
	HP-11, R0	Radioactive substances	06-18-82		
Water-level Measurement and data processing	HP-25, R1	Use of multiconductor cable	09-13-88	3331G-01-05, R0	
	HP-26, R0	Use of steel tape	08-14-84		
	HP-60, R0	Use of transducer	05-04-88		
	HP-71, R0	Use of micrologger	09-01-87		
	HP-75, R0	Use of reeled steel tape	06-22-87		
	HP-93, R0	Processing of electronic data into water levels	05-11-88		TBD
Strain monitoring	(Needed)	Calibration of borehole strainmeters	--	3331G-01-07, R0	
	(Needed)	Emplacement of borehole strainmeters	--		
	(Needed)	Monitoring strain charge ^S	--		

RRZ
4-13-89
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WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization 8/89
Completed by Organization in Block 5 April
Comp. by Orig. QA Org.

1 Date June 22, 1988 2 Severity Level 1 2 3 Page 1 of 2

3 Discovered During WMPO-Audit 88-4 3a Identified By S. B. Mattson D. Klimas 3b Branch Chief Concurrence Date 4 SDR No. 153 Rev. 0

5 Organization USGS-Denver 6 Person(s) Contacted John Stuckless, Emily Taylor 7 Response Due Date is 20 Working Days from Date of Transmittal

8 Requirement (Audit Checklist Reference, if Applicable)
Question 2-48 - NNWSI Quality Assurance Plan NVO-198-17, Rev. 5, Section 3, Para. 1.5.4.1 and 1.5.4.2, establishes requirements for Scientific Notebooks, Initial Entries and In-Process Entries.

9 Deficiency
Contrary to these requirements, Scientific notebooks and sample collection forms are inadequate, in many cases, to provide the necessary sample traceability, location of samples, and the identification of the investigator

10 Recommended Action(s): Remedial Investigative Corrective
(1) Provide initial and in-process entries into Scientific notebooks by originator, if possible.

11 QAE/Lead Auditor Date *Daniel Klimas 7-25-88* 12 Branch Manager Date *[Signature] 7-25-88* 13 Project Quality Mgr. Date *James Blaylock 7/25/88*

14 Remedial/Investigative Action(s)
See attached response for Blocks 14-17.

15 Effective Date _____

16 Cause of the Condition & Corrective Action to Prevent Recurrence

17 Effective Date _____

18 Signature/Date
James R. H... 8/31/88 *[Signature] 8/31/88*

19 Accept Response <input type="checkbox"/> Accept <input checked="" type="checkbox"/> Amended Response <input checked="" type="checkbox"/> Reject	QAE/Lead Auditor/Date/5/89 <i>Don Klimas 12-5-88</i>	Branch Manager/Date <i>[Signature] 5 Dec 88</i>
20 Amended Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date <i>Don Klimas 5-14-89</i>	Branch Manager/Date <i>[Signature] 19 May 89</i>
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date <i>Don Klimas 6/23/89</i>	Branch Manager/Date <i>J.W. Estelle 6/28/89</i>

22 Remarks *See Attached documentation pages 6 of 6*

23 QA CLOSURE QAE/Lead Auditor/Date *Don Klimas 6/23/89* Branch Manager/Date *J.W. Estelle 6/28/89* PGM/Date *James Blaylock 6/28*



9 Deficiency (continued)

performing the geologic work in Trench #14. Scientific notebooks for the calcite and opaline silica (hydrogenic) deposits were observed to lack identification of the individual making the entry (e.g., Quaternary geologic and trenching work), lacking a date on which the work was performed, and widespread lack of a location for where the work was performed or a sample collected.

Further examples include:

- 1) Sample HD-18 has little sample description. Unit 1 and Unit 2 are mentioned with apparently no description of Unit 1 or 2. The description for this sample is brief and the sample location cannot be determined from the photographs.
- 2) Samples collected prior to 1986 for Quaternary geologic and trenching studies (calcite and opaline silica deposit work) are difficult to trace from the field notebook, to laboratory analyses, to soil stratigraphic units.
- 3) Samples HD-55-1 and HD-55-2 are not geologically described in the sample sheets or in the field notebook.

10 Recommended Actions (continued)

- (2) Investigate to determine the impact on quality of the data collected for the calcite and opaline silica studies.
- (3) Reinstruct applicable personnel as to the requirements for entries into Scientific Notebooks.

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

This SDR represents a technical difference of opinion, not a deficiency. The USGS disagrees with the majority of the stated deficiency.

The only discrepancy identified is very minor and isolated in nature - that of missing dates and signatures on each and every entry in the Trench 14 logbook. There is no negative impact on quality because the dates for the undated pages (only 2 out of 29) are obvious from context and the names of the individuals are given on the sample and/or sub-sample sheets. The remedial action is to supply dates and names of individuals on the entries of the Trench 14 notebook for which they are currently missing.

The description of sample locations is not required as such within the quoted requirement but rather the sample identification only. Trench 14 samples are adequately identified within the notebook in compliance with USGS QMP-8.01. The following information concerns the further examples cited in the SDR:

1. To avoid subjective conclusions and overcome technical differences of opinion, the USGS utilized independent third party personnel to determine the adequacy of the description of the sample location for HD-16. This location was verified in the field by an independent geologist and an independent observer utilizing the technical documents in question. See attached memorandums dated August 12, 1988 from J.C. Cole to J.R. Willmon and dated August 17, 1988 from R.A. Peterson to the Quality Assurance Manager. Descriptions of Units 1 and 2 are clearly shown in the Trench Log and described in the draft Study Plan, the Scientific Investigation Plan, and an in-press report approved by DOE. A copy of the descriptions and a reduced copy of the Trench Log are with the other documentation.
2. Samples were collected prior to 1986, therefore prior to the requirements of QAPP-01, R3 or R4. To date, there is no clear-cut project direction regarding the fate of samples such as this and whether or not they can ever be used in a QA level I or II application.
3. Samples HD-55-1 and HD-55-2 are identified in the notebook. They are clearly marked as sub-samples of HD-55 which is described, and the sample sheet for HD-55 notes that 2 sub-sample sheets for paleontology follow. Thus, no description of the sub-samples is required.

BLOCK 15: EFFECTIVE DATE: Correct minor anomalies with notebook entries - October 1, 1988.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

The cause of the condition regarding missing signatures and dates in the notebook is an oversight of small details. Applicable personnel will intrinsically be reinstructed as to the requirements for dating and identifying the investigator in connection with the remedial action. No corrective action is warranted for a minor deficiency that has a limited scope. The integrity of the end result of the activity is not affected nor does the deficiency affect the ability to achieve those results.

BLOCK 17: EFFECTIVE DATE: Not applicable.

SDR 153 Rev. 0

Block 22 (continued)

Verification of remedial actions:

1. The scientific notebook was verified to have been corrected by initialing of entries by John Stuckless for his notes and by numbering of pages where numbers were missing.
2. Verified that samples HD-55-1 and HD-55-2 are described on the Sample Description Sheet for HD-55.
3. Unit 1 and Unit 2 were verified to be described in Study Plan 831521, Rev. 0, pg. 7.1-3 and in SIP 3370G-02, Rev. 0, pg. 56.
4. Sample locations were identifiable from the trench #14 map in conjunction with the photographs.



United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 913
DENVER FEDERAL CENTER
DENVER, COLORADO 80225-0046

IN REPLY REFER TO:

August 12, 1988

To: J. R. Willmon, Quality Assurance Manager
Nevada Nuclear Waste Storage Investigations
USGS-Water Resources Division

From: J. C. Cole, Geologist
USGS-Branch of Central Regional Geology 

Subject: On-Site Evaluation of WMPO Standard Deficiency Report 153;
Report of Trip to Yucca Mountain, 9 and 10 August 1988

cc: J. S. Stuckless; Principal Investigator, Hydrogenic Deposits
E. M. Taylor, Geologist, Hydrogenic Deposits
R. A. Peterson, USBR Quality Assurance Manager
R. B. Raup; NNWSI Geologic Division Coordinator
L. R. Hayes, WRD; Chief, Branch of NNWSI
E. H. Roseboom; Chief, Office of Regional Geology
J. F. Devine; Assistant Director for Engineering Geology



Background

WMPO Audit 88-4 alleges deficiencies, as listed in WMPO SDR-153, in USGS Quality Assurance procedures concerning documentation and traceability of geologic samples collected for the USGS-NNWSI Hydrogenic Deposits activity (Calcite and Opaline Silica Vein Deposits) in February, 1988. At the request of John Stuckless, project Principal Investigator, I visited the sampling localities in the Yucca Mountain area on 10 August 1988 to determine whether the available QA documentation was sufficient to allow identification of the original sample sites, identification of the responsible investigators, and reconstruction of the collection and sample handling processes. I was accompanied by Stuckless and by Robert Peterson, U.S. Bureau of Reclamation Quality Assurance Manager.

Conclusions

As described in the Trip Report that follows, I found no specific evidence to support the auditor's allegations that "... notebooks and ... collection forms are inadequate ... to provide ... sample traceability, location of samples, and the identification of the investigator performing the work ..." To the contrary, I was generally able to locate the precise collection site with ease, solely on the basis of the ample documentation provided (field notebook, sample collection forms, outcrop photographs, and annotated trench logs).

The field notebook and sample collection forms, taken together, provide a clear record of the collection date and methodology, explicit designation of the scientific investigator for each sample, and adequate notation of sample transfers, subdivisions, and processing steps. With regard to deficiencies noted for specific sample sites, I found that:

- 1) The locations of samples HD-16-1 through HD-16-4 can be clearly established with reference to the trench log and the existing monuments along the south wall of Trench 14; although Units 1 and 2 are not explicitly defined, the log makes it clear that they are identifiable subunits of the uppermost soil above the platy calcareous layer (Unit 3), and no further description seems required "(for) another qualified scientist ... to retrace the investigation" [NNWSI-USGS-QAPP-01, R4, page 21-22].
- 2) Samples collected prior to 1986 were not examined by me.
- 3) Samples HD-55-1 and HD-55-2 from the Busted Butte locality are correctly recorded in the sample collection forms as subsamples of HD-55, which is described as "vertical (roughly) granular-looking white calcite vein filling" in the notebook and of the primary sample sheet. Both subsamples were collected to examine for microfossils, and the geologic description given is adequate. 

In summary, I affirm that the documentation I examined pertaining to samples collected for the Calcite and Opaline Silica Vein Deposits activities in February, 1988, is adequate for another qualified individual to repeat the procedures. The only deficiency in SDR-153 corroborated by my review of the records is that entries in the field notebook are not specifically attributed to either Stuckless or Taylor, but simple comparison to the handwriting on the sample collection forms eliminates any uncertainty.

**TRIP REPORT OF J. C. COLE
YUCCA MOUNTAIN SAMPLE LOCALITIES FOR
CALCITE AND OPALINE SILICA VEIN DEPOSITS ACTIVITY
9-10 AUGUST 1988**

9 August 1988

- 4:00 p Leave Denver office; travel to Mercury, Nevada
- 8:30 p Discussion with J. Stuckless and R. Peterson of plans for next day; briefly examined topographic maps of sample sites and photographic record of the sample collection trip in February, 1988

10 August 1988

- 6:15 a Leave Mercury with Stuckless and Peterson
- 7:00 a Arrive at Trench 14 on Exile Hill west of Midway Valley; approach to the Yucca Mountain NNWSI site from the Nevada Test Site is clearly marked along the roadway, and the turnoff to the Trench 14 access road is readily inferred from the topographic map.

Trench 14 and the subsequent five trenches, 14a through 14e, are not specifically designated in the field, but each is sufficiently different in size and exposed geology that all can be clearly recognized from the trench logs at 4"=1 m scale. Iron rods driven in the ground at 2 m spacing mark top of the south wall at Trench 14, and their numerical correspondence to the trench log index system is apparent by inspection.

With the aid of the trench log, the sample collection forms, the field notebook, and the photographic record, I was asked to locate the collection site for sample HD-16. The log plainly indicates sample 16 consists of four subsamples, 16-1 and 16-3 from the uppermost soil Unit 1, and 16-2 and 16-4 from the subjacent Unit 2. Collection forms show that 16-1 and 16-2 were collected by Z. Peterman and D. Muhs for tracer isotope studies, and that 16-3 and 16-4 were taken by E. Norris (LANL) and D. Muhs for chlorine-36 investigation. The specific sample sites were no longer apparent because the upper trench wall has eroded, but their positions (+/- 5 cm) were apparent from the trench log, with reference to the iron rods and to the tagged locations of nearby samples HD-5 and HD-6 in the underlying Unit 3 calcareous soil zone. The field notebook entries for these samples are consistent with the notations on the sample collection forms.

Other sample sites in Trench 14 were similarly located with ease.

Trench 14a was identified as the northernmost trench on the west side of Exile Hill because of its length, as determined from the sample site descriptions. No iron rods are present to indicate distance along the trench wall, but position can be established either by pacing or measuring from the upper (east) end, as stated in the notebook. The exact locations of samples HD-30, HD-31, HD-33-1, HD-33-2, HD-34, and HD-32-3 are still marked by numbered yellow tags or writing on the rock, and the locations of HD-32-1 and HD-32-2 are obvious from the descriptions and the holes in the trench wall, even though the tags are no longer present. Names of collectors and purpose of the sampling are clearly given in the field notebook and on the collection forms.

Location of a petrography sample in Trench 14b was examined. The description gives a very accurate position based on measured distances from the east end and floor of the trench, even though the trench is only 3 m long and the rock exposed in the walls is homogeneous. Any sample of bedrock here would adequately duplicate the original collection.

8:45 a Arrive at Busted Butte locality; the three ridges referred to as North, Center (or Middle, in some notes), and South can be clearly identified from the labeled documentary photograph taken from the west, or from the labeled topographic map.

In attempting to find the HD-55 sample locality, described as a near-vertical calcite-filled fracture on the north slope of the Center Ridge, I walked up the North Ridge to maintain an overview toward the south. Although no measured location is given, HD-55 is sufficiently described because the fracture zone is quite apparent from a distance and it is surrounded by 4 wooden stakes that are painted optic orange and labeled (LEVY - LANL). Its location is further substantiated by the collecting form description of "vertical (roughly) granular-looking white calcite vein filling", and this is the only steeply inclined vein zone visible.

Silicified volcanic breccia exposed in outcrop near the gully between North and Center Ridges was collected for petrographic examination at site HD-74. For the purpose of the sampling, any part of the outcropping ledge would suffice because the material is geologically homogeneous, but I was able to identify the exact position of the sampled block by comparison to the photographic record.

Site HD-56 was examined in detail on the south edge of the Center Ridge sand-ramp surface. The position from which the large block was cut and removed is unmistakable, and the locations of drilled samples obtained by Z. Peterman are still apparent, even though the soft outcrop has degraded considerably since February, 1988.

Sample sites HD-57, -58, -59, and -60 were located after a bit of casting about. They all pertain to the upper calcareous soil zone exposed along the top of the ramp west of site HD-56, but the field notebook and collection forms would be clearer if they also listed an estimated distance. Nevertheless, specific sample sites were found by comparison of the outcrop with photographs made at the time of collection.

Two minor errors were noted in the site records for HD-57 through HD-60, although these inconsistencies were not detected by the WMPO Auditor. Location descriptions for HD-58, HD-59, and HD-60 make reference to the "upper soil (56)", when it is clear from context that site HD-57 is intended. Further, confusing location descriptions are given for sample HD-57 ("north wall of mid ridge") and sample HD-59 ("south wall of central ridge"), even though both are collected from approximately the same spot on the south-facing slope of the Center Ridge. The geologic description of the samples and the photographic records are clear on this point.

10:00 a Leave Yucca Mountain area for Mercury.

Photocopies of five pages of field notes made during this review will be provided on request.

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization in Block 5/ Aprvl. Completed by Organization in Block 5/ Comp. by Orig. QA Org.

1 Date June 21, 1988		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 2	
3 Discovered During WMPO Audit 88-4		3a Identified By W. H. Camp	3b Branch Chief Concurrence Date		4 SDR No. 158 Rev. <u>0</u>
5 Organization USGS-Denver		6 Person(s) Contacted Susan Shipley		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) Question 7-24. USGS Technical personnel shall notify the USGS QA office when equipment is ready for calibration per NNWSI-USGS-QMP-7.02, R0, para. 5.6.3.					
9 Deficiency At this time, no objective evidence exists that USGS is in compliance with this procedure requirement.					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input type="checkbox"/> Investigative <input type="checkbox"/> Corrective Revise existing procedures or identify this requirement in another procedure that most suits the need. Train appropriate USGS Technical Personnel on					

11 QAE/Lead Auditor Date <i>Daniel Kuma 7/25/88</i>		12 Branch Manager Date <i>W. H. Camp 7/25/88</i>		13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>	
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14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____			
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16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____			
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18 Signature/Date <i>Larry R. Ihm 8/31/88</i> <i>JR Willmon 8/31/88</i>					
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19 Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Dan Kuma 12-5-88</i>		Branch Manager/Date <i>J. W. Estelle 5 Dec 88</i>	
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date		Branch Manager/Date	
21 Verifi- cation <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <i>Dan Kuma 4/23/89</i>		Branch Manager/Date <i>J. W. Estelle 6/23/89</i>	

22 Remarks					
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23 QA CLOSURE		QAE/Lead Auditor/Date <i>Dan Kuma 4/23/89</i>		Branch Manager/Date <i>J. W. Estelle 6/23/89</i>		PQM/Date <i>James Blaylock 4/23/89</i>	
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WMPU STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 155

Rev. 0

Page 2 of 2

8 Requirement (continued)

and filed with the QA office." Section 7.1 of SP-11 also states that when such data are kept in loose-leaf form, each page will be numbered consecutively and chronologically, signed or initialed and dated by the investigator on a daily basis as entries are made. Section 7.2 also states that "all data collected...will be reviewed and cosigned by a peer or supervisor..."

9 Deficiency (continued)

audit to demonstrate that methods and data generated by USGS computer program CALIBRATE.FOR have been entered, signed, numbered, reviewed, and cosigned according to procedural requirements.

CALIBRATE.FOR is a scientific computer program used to conduct QA Level I regional seismicity studies(SIP 3233G-03) Version 1.001 dated 2/22/88 per USGS QMP 3.03. The evidence examined indicated that this lack of compliance with specified requirements has existed since this NNWSI Program activity was started at USGS.

This SDR is based on an implementation deficiency identified during the audit of USGS SIP 3233G-03, "Regional Seismicity Studies" and its related QA Level I, Scientific and Engineering Software," specifically USGS computer program CALIBRATE.FOR, Version 1.001.

The deficiency resulted from non-compliance with the requirement(s) of SP-11: (1) Section 5.3 that calibration data be entered in a notebook or other organized document, (2) that entries shall be signed and dated by the person performing the calibration, (3) that when such data are kept in loose-leaf form, each page will be numbered consecutively and chronologically signed or initialed and dated by the investigator on a daily basis as entries are made, and (4) Section 7.2 that "all data collected...will be reviewed and cosigned by a peer or supervisor..."

10 Recommended Actions (continued)

- (2) Investigate to determine if other NNWSI software activities have the same non-compliance.
- (3) Determine the impact on quality resulting from this deficiency.
- (4) Train applicable personnel to procedure requirements and document same.

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The USGS investigation revealed that the requirements cited in Block 8 of this SDR are boilerplate QMP-5.01 requirements for technical procedures, and the technical procedure SP-11, R0, became effective on 5-27-88. Further investigation of the cited deficiencies revealed that the calibration data had been accumulated on an ongoing basis and consisted of four loose-leaf notebooks at the time of the audit. Each notebook contained various computer generated data sheets in date order and included a table of contents. The table of contents was updated each time the data packages were inserted into the notebooks and the table lists the data in the notebook.

Each calibration data package is accumulated based upon the date of calibration for a specific seismometer and a package includes a cover sheet accompanied by the associated data sheets. The cover sheets identify the software (name and version), the technical contact, the user initials, the run date and various calibration parameters, and the data sheets provide the date and the results of the calibration. Contrary to a portion of the stated deficiency, each page of a package contains the calibration date and "calibration entries" are being initialed by the person performing the calibration (SP-11, para. 5.3, effective 5-27-88). The person performing the calibration has been initialing the cover sheet and the first data sheet included with each package. The seismic calibration data is initiated by the person performing the calibration, accumulated on an ongoing basis, and reviewed and entered into a loose-leaf notebook by the supervisor. The review is evidenced by the record of updates on the table of contents.

The following discrepancies in the maintenance of the notebooks are acknowledged:

- o the individual data sheets were not "numbered consecutively and chronologically" nor "signed and dated" as they were entered into the loose-leaf notebooks (SP-11, para. 7.1); and
- o the collected data in the notebooks were not being "cosigned by a peer or supervisor" (SP-11, para. 7.2).

The calibration data packages that have been generated since the effective date of SP-11 include the applicable dates and the initials of the personnel that performed the calibration. The supervisor's initials and dates will be recorded on the package of calibration data for each date. Reference also will be made to SDR 155 within each of the current notebooks to provide traceability for the supervisor documenting the review as a result of this SDR.

Additionally, the supervisor has revised the format of the table of contents to provide a column to note the review and the date of that review. There is no adverse impact on quality as a result of the "missing" page numbers, signatures and dates. The necessary remedial actions can be taken easily to correct the records and bring them into compliance with the current SP-11 requirements.

BLOCK 15: EFFECTIVE DATE: October 1, 1988.

USGS RESPONSE TO WMPO STANDARD DEFICIENCY REPORT (SDR) NO. 155 (continued)

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

This condition was caused by an oversight in not implementing the detailed requirements of SP-11 that became effective on 5-27-88. The intent of performing, recording and reviewing the calibration and results was taking place but not according to the level of detail specified in the technical procedure.

Personnel performing the calibration will continue to initial and date the data sheets in the same manner as described herein. The supervisor will be paginating and documenting reviews of data prior to updating the notebooks as required by SP-11. By completing the remedial actions, appropriate personnel will become familiar with the detailed requirements and additional preventive actions will not be required.

BLOCK 17: EFFECTIVE DATE: October 1, 1988.

SDR 155

SDR 155 WAS ISSUED BECAUSE THE NOTEBOOK ENTRIES AND DATA COLLECTED THROUGH USE OF USGS COMPUTER PROGRAM CALIBRATE.FOR HAD NOT BEEN SIGNED, DATED, NUMBERED, REVIEWED AND COSIGNED BY A PEER OR SUPERVISOR, AS REQUIRED BY SR-11, REV.0 DATED MAY 27, 1988.

DURING VERIFICATION OF THE CORRECTIVE ACTION FOR THIS SDR IT WAS DETERMINED THAT INDIVIDUAL DATA SHEETS IN THE 4 VOLUMES FOR THESE SEISMIC STUDIES HAD BEEN NUMBERED CONSECUTIVELY AND CHRONOLOGICALLY; INITIALED BY THE INVESTIGATOR AND INITIALED AND DATED BY THE SUPERVISOR (STEVE HARMSEN). ADDITIONALLY THE FORMAT OF THE TABLE OF CONTENTS HAS BEEN REVISED TO PROVIDE A COLUMN TO NOTE THE SUPERVISORY REVIEW AND THE DATE OF THAT REVIEW. IT WAS MARKED THAT THE FORM REVISIONS (CORRECTIONS) BASED ON SDR 155 HAD BEEN MADE TO THE NOTEBOOKS (4 VOLUMES) BY STEVE HARMSEN ON 9/26/88.

SDR 155 SHOULD BE CONSIDERED CLOSED .

J.G. SCHWEITZER

6/20/89

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

Completed by Organization in Block 5

Comp. by Orig. QA Org.

1 Date June 22, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2
3 Discovered During Audit 88-4	3a Identified By K. / D. Klimas Schwartztrauber	3b Branch Chief Concurrence Date	4 SDR No. 155 Rev. 0	
5 Organization USGS - Denver	6 Person(s) Contacted S. Harmsen/J. Evans		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) USGS technical procedure SP-11, Rev. 0, Section 5.3, states in part that calibration data be entered in a notebook or other organized document and that "entries shall be signed and dated by the person performing the calibration				
9 Deficiency Contrary to the above requirements, the signing, dating, numbering, reviewing, and cosigning of notebook entries and all data collected have not been complied with. Specifically, no objective evidence was presented during the				
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective (1) Implement the procedural requirements of SP-11.				

11 QAE/Lead Auditor Date <i>Daniel Klimas 7-25-88</i>	12 Branch Manager <i>John R. Harmsen</i>	Date <i>7/25/88</i>	13 Project Quality Mgr. Date <i>James Blyden</i>	<i>7/25/88</i>
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14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____
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16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____
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18 Signature/Date <i>Larry R. Harmsen 8/31/88</i>	<i>J. Willmon 8/31/88</i>
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19 Response	<input type="checkbox"/> Accept	<input checked="" type="checkbox"/> Amended Response	QAE/Lead Auditor/Date <i>D. Klimas 12-5-88</i>	Branch Manager/Date <i>J. Willmon 5/2/88</i>
	<input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>D. Klimas 5-11-89</i>	Branch Manager/Date <i>J. Willmon 12/11/89</i>
	20 Amended Response	<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date
21 Verification	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date	Branch Manager/Date	

22 Remarks				
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23 QA CLOSURE	QAE/Lead Auditor/Date	Branch Manager/Date	PQM/Date
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WmPO STANDARD DEFICIENCY REPORT
CONTINUATION SHEET

N-QA-038
10/86

SDR No. 155

Rev. 0

Page 2 of 2

8 Requirement (continued)

and filed with the QA office." Section 7.1 of SP-11 also states that when such data are kept in loose-leaf form, each page will be numbered consecutively and chronologically, signed or initialed and dated by the investigator on a daily basis as entries are made. Section 7.2 also states that "all data collected...will be reviewed and cosigned by a peer or supervisor..."

9 Deficiency (continued)

audit to demonstrate that methods and data generated by USGS computer program CALIBRATE.FOR have been entered, signed, numbered, reviewed, and cosigned according to procedural requirements.

CALIBRATE.FOR is a scientific computer program used to conduct QA Level I regional seismicity studies(SIP 3233G-03) Version 1.001 dated 2/22/88 per USGS QMP 3.03. The evidence examined indicated that this lack of compliance with specified requirements has existed since this NNWSI Program activity was started at USGS.

This SDR is based on an implementation deficiency identified during the audit of USGS SIP 3233G-03, "Regional Seismicity Studies" and its related QA Level I, Scientific and Engineering Software," specifically USGS computer program CALIBRATE.FOR, Version 1.001.

The deficiency resulted from non-compliance with the requirement(s) of SP-11: (1) Section 5.3 that calibration data be entered in a notebook or other organized document, (2) that entries shall be signed and dated by the person performing the calibration, (3) that when such data are kept in loose-leaf form, each page will be numbered consecutively and chronologically signed or initialed and dated by the investigator on a daily basis as entries are made, and (4) Section 7.2 that "all data collected...will be reviewed and cosigned by a peer or supervisor..."

10 Recommended Actions (continued)

- (2) Investigate to determine if other NNWSI software activities have the same non-compliance.
- (3) Determine the impact on quality resulting from this deficiency.
- (4) Train applicable personnel to procedure requirements and document same.

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

The USGS investigation revealed that the requirements cited in Block 8 of this SDR are boilerplate QMP-5.01 requirements for technical procedures, and the technical procedure SP-11, R0, became effective on 5-27-88. Further investigation of the cited deficiencies revealed that the calibration data had been accumulated on an ongoing basis and consisted of four loose-leaf notebooks at the time of the audit. Each notebook contained various computer generated data sheets in date order and included a table of contents. The table of contents was updated each time the data packages were inserted into the notebooks and the table lists the data in the notebook.

Each calibration data package is accumulated based upon the date of calibration for a specific seismometer and a package includes a cover sheet accompanied by the associated data sheets. The cover sheets identify the software (name and version), the technical contact, the user initials, the run date and various calibration parameters, and the data sheets provide the date and the results of the calibration. Contrary to a portion of the stated deficiency, each page of a package contains the calibration date and "calibration entries" are being initialed by the person performing the calibration (SP-11, para. 5.3, effective 5-27-88). The person performing the calibration has been initialing the cover sheet and the first data sheet included with each package. The seismic calibration data is initiated by the person performing the calibration, accumulated on an ongoing basis, and reviewed and entered into a loose-leaf notebook by the supervisor. The review is evidenced by the record of updates on the table of contents.

The following discrepancies in the maintenance of the notebooks are acknowledged:

- o the individual data sheets were not "numbered consecutively and chronologically" nor "signed and dated" as they were entered into the loose-leaf notebooks (SP-11, para. 7.1); and
- o the collected data in the notebooks were not being "cosigned by a peer or supervisor" (SP-11, para. 7.2).

The calibration data packages that have been generated since the effective date of SP-11 include the applicable dates and the initials of the personnel that performed the calibration. The supervisor's initials and dates will be recorded on the package of calibration data for each date. Reference also will be made to SDR 155 within each of the current notebooks to provide traceability for the supervisor documenting the review as a result of this SDR.

Additionally, the supervisor has revised the format of the table of contents to provide a column to note the review and the date of that review. There is no adverse impact on quality as a result of the "missing" page numbers, signatures and dates. The necessary remedial actions can be taken easily to correct the records and bring them into compliance with the current SP-11 requirements.

BLOCK 15: EFFECTIVE DATE: October 1, 1988.

USGS RESPONSE TO WMPO STANDARD DEFICIENCY REPORT (SDR) NO. 155 (continued)

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

This condition was caused by an oversight in not implementing the detailed requirements of SP-11 that became effective on 5-27-88. The intent of performing, recording and reviewing the calibration and results was taking place but not according to the level of detail specified in the technical procedure.

Personnel performing the calibration will continue to initial and date the data sheets in the same manner as described herein. The supervisor will be paginating and documenting reviews of data prior to updating the notebooks as required by SP-11. By completing the remedial actions, appropriate personnel will become familiar with the detailed requirements and additional preventive actions will not be required.

BLOCK 17: EFFECTIVE DATE: October 1, 1988.

YMP - SR.

DOP - 08

PRC

also

DOP 8-2

PRC 7 & 11 need also

WMPO STANDARD DEFICIENCY REPORT

N-QA-038
3/87

Completed by Originating QA Organization

1 Date June 22, 1988		2 Severity Level <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 88-4		3a Identified By K. / D. Klimas Schwartztrauber		3b Branch Chief Concurrence Date	
5 Organization USGS - Denver		6 Person(s) Contacted S. Harmsen/J. Evans		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) USGS technical procedure SP-11, Rev. 0, Section 5.3, states in part that calibration data be entered in a notebook or other organized document and that "entries shall be signed and dated by the person performing the calibration"					
9 Deficiency Contrary to the above requirements, the signing, dating, numbering, reviewing, and cosigning of notebook entries and all data collected have not been complied with. Specifically, no objective evidence was presented during the					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input checked="" type="checkbox"/> Corrective (1) Implement the procedural requirements of SP-11.					

APR/

11 QAE/Lead Auditor Date <i>Daniel Klimas 7-25-88</i>		12 Branch Manager Date <i>[Signature] 7/25/88</i>		13 Project Quality Mgr. Date <i>James Blyford 7/25/88</i>	
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____	
16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____	
18 Signature/Date <i>Larry R. Harmsen 8/31/88</i> <i>J. Williams 8/31/88</i>			

Comp. by Orig. QA Org.

19 Response <input type="checkbox"/> Accept <input checked="" type="checkbox"/> Amended Response <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Dan Klimas 12-5-88</i>		Branch Manager/Date <i>[Signature] 5/2/88</i>	
20 Amended Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject		QAE/Lead Auditor/Date <i>Dan Klimas 5-19-89</i>		Branch Manager/Date <i>[Signature] 15/11/89</i>	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory		QAE/Lead Auditor/Date <i>Dan Klimas 6/23/89</i>		Branch Manager/Date <i>J. W. Estelle 6/23/89</i>	
22 Remarks					

23 QA CLOSURE		QAE/Lead Auditor/Date <i>Dan Klimas 6/23/89</i>		Branch Manager/Date <i>J. W. Estelle 6/23/89</i>		PQM/Date <i>James Blyford 4/23/89</i>	
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9 Deficiency (continued)

Discussion: During the interview process, I asked the contacted person if she (a QA person) or the technical personnel could present to me any objective evidence that the technical personnel had notified the QA office/person when equipment is ready for calibration. The contacted person said that the technical personnel has never contacted the QA office. USGS QMP 7.02, Rev. 2, states that the notification will "be written or by copy of receiving papers." The procedure also states that "calibration activities shall not commence without USGS QA personnel in attendance."

10 Recommended Actions (continued)

subsequent revisions.

USGS RESPONSE TO PO STANDARD DEFICIENCY REPORT (SDR) NO. 158

BLOCK 14: REMEDIAL/INVESTIGATIVE ACTION(S):

This procedure requirement will be deleted from NNWSI-USGS-QMP-7.02, R0. QMPs will be revised in accordance with the WMPO schedule.

BLOCK 15: EFFECTIVE DATE: See SDR 156.

BLOCK 16: CAUSE OF THE CONDITION & CORRECTIVE ACTION TO PREVENT RECURRENCE:

Not applicable.

BLOCK 17: EFFECTIVE DATE: Not applicable.

WMPO STANDARD DEFICIENCY REPORT

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Completed by Originating QA Organization

1 Date June 14, 1988		2 Severity Level <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3		Page 1 of 2	
3 Discovered During Audit 88-4		3a Identified By W. H. Camp		3b Branch Chief Concurrence Date	
5 Organization USGS-Denver		6 Person(s) Contacted A. M. Whiteside		7 Response Due Date is 20 Working Days from Date of Transmittal	
8 Requirement (Audit Checklist Reference, if Applicable) Audit Checklist Question: 15-21, 16-16, 18-30 - NNWSI-USGS-QAPP-01, R4, Section 15.01, Para. 15.4, Section 16, Para. 16.1.3 and Section 18, Para. 8.1.1.2. All three sited references state: " USGS shall evaluate NCRs, CARs					
9 Deficiency No objective evidence exists that NCRs, CARs, and Audit Findings were evaluated per the requirements. Implementing procedures QMP 15.01, R1, QMP 16.01, R1 and QMP 18.01, R1, do not instruct anyone to evaluate deficiency					
10 Recommended Action(s): <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Investigative <input type="checkbox"/> Corrective Remedial Action: Revise QMP 15.01, R1, QMP 16.01, R1 and QMP 18.01, R1, to remove the requirement for evaluation for unusual					

Aprvl.

11 QAE/Lead Auditor Date <i>Daniel Klumpp 7/25/88</i>	12 Branch Manager Date <i>A. M. Whiteside 7/25/88</i>	13 Project Quality Mgr. Date <i>James Blaylock 7/25/88</i>
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Completed by Organization in Block 5

14 Remedial/Investigative Action(s) See attached response for Blocks 14-17.		15 Effective Date _____
16 Cause of the Condition & Corrective Action to Prevent Recurrence		17 Effective Date _____

Comp. by Orig. QA Org.

18 Signature/Date <i>Daniel Klumpp 8/31/88</i>		<i>J. W. Estelle 8/31/88</i>	
19 Response <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Amended Response <input type="checkbox"/> Reject	QAE/Lead Auditor/Date <i>Dan Klumpp 12/5/88</i>	Branch Manager/Date <i>J. W. Estelle 5 Dec 88</i>	
20 Amended Response <input type="checkbox"/> Accept <input type="checkbox"/> Reject	QAE/Lead Auditor/Date	Branch Manager/Date	
21 Verification <input checked="" type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory	QAE/Lead Auditor/Date <i>Dan Klumpp 6/23/89</i>	Branch Manager/Date <i>J. W. Estelle 6/23/89</i>	
22 Remarks			

23 QA CLOSURE	QAE/Lead Auditor/Date <i>Dan Klumpp 6/23/89</i>	Branch Manager/Date <i>J. W. Estelle 6/23/89</i>	PQM/Date <i>James Blaylock 6/23/89</i>
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8 Requirement (continued)

and Audit Findings to determine if further processing, as an unusual occurrence is required, per DOE/5000.3."

9 Deficiency (continued) -

documents for unusual occurrence status.

Discussion: Prior to the audit, while reviewing the USGS QAPP, the auditor detected the stated requirement. Questions were added to three checklists. During the interview of each criteria (#15, 16, 18) the contacted person was asked the question three times. The question was "Have you evaluated each NCR, CAR, and AFR for unusual occurrences?" The contacted person said yes. When asked if the auditor could see and review the objective evidence, the contacted person said they didn't have any objective evidence. Good auditing practice indicated that without some form of objective evidence a deficiency existed.

10 Recommended Actions (continued)

occurrences.

Investigative Action: Review all closed and present NCRs, CARs and Audit Findings to establish whether an unusual occurrence has or has not occurred.