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QA: QA

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Mark T. Peters, Manager Science & Engineering Testing Bechtel SAIC Company, LLC 1180 Town Center Drive Las Vegas, NV 89144

VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF DEFICIENCY REPORTS (DRs) BSC(V)-02-D-048, -049, -050, AND -051 RESULTING FROM THE BECHTEL SAIC COMPANY, LLC (BSC) QUALITY ASSURANCE AUDIT BSC-SA-02-007 OF THE UNIVERSITY OF WESTERN ONTARIO (UWO)

BSC Quality Assurance has verified implementation of corrective action for DRs BSC(V)-02-D-048, -049, -050, and -051 and determined the results to be satisfactory. As a result, the DRs have been closed.

If you have any questions, please contact either Richard L. Maudlin at (702) 295-2961 or Daniel A. Klimas at (702) 295-2665.

D.T. Cinsta

Donald T. Krisha, Manager Quality Assurance

RLM:bw-0429022444

Enclosure: DR BSC(V)-02-D-048, -049, -050, and -051

4/30/02

Date Signed

NM55 07

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cc w/encl: L. H. Barrett, DOE/HQ (RW-2) FORS L. W. Bradshaw, Nye County, Pahrump, NV Margaret Chu, DOE/HQ (RW-1) FORS J. R. Dyer, DOE/YMSCO, Las Vegas, NV W. J. Glasser, NOS, Las Vegas, NV Birdie Hamilton-Ray, DOE/YMSCO, Las Vegas, NV C. E. Hampton, DOE/YMSCO, Las Vegas, NV R. W. Henderson, BSC, Las Vegas, NV D. G. Horton, DOE/YMSCO, Las Vegas, NV D. A. Klimas, BSC, Las Vegas, NV D. T. Krisha, BSC, Las Vegas, NV Robert Latta, NRC, Las Vegas, NV S. W. Lynch, State of Nevada, Carson City, NV S. P. Mellington, DOE/YMSCO, Las Vegas, NV Ram Murthy, DOE/OQA, Las Vegas, NV D. G. Opielowski, NQS, Las Vegas, NV R. E. Powe, BSC, Las Vegas, NV J. M. Replogle, DOE/YMSCO, Las Vegas, NV N. K. Stablein, NRC, Rockville, MD D. D. vonderLinden, BSC, Las Vegas, NV Engelbrecht von Tiesenhausen, Clark County, Las Vegas, NV T. J. Wall, BSC, Las Vegas, NV B. L. Wilson, BSC, Las Vegas, NV

cc w/encl:

R. W. Andrews, BSC, Las Vegas, NV
R. D. Habbe, BSC, Las Vegas, NV
R. L. Maudlin, BSC, Las Vegas, NV
Venkataraman Pasupathi, BSC, Las Vegas, NV
Sridhar Ramamurthy, UWO, London, Ontario, Canada
R. E. Rucinski, BSC, Las Vegas, NV
Roxanna VanDillen, BSC, Las Vegas, NV

DEFICIENCY/CORRECTIVE ACTION REPORT         1. Controling Document: University of Western Ontario (UWO) Quality Assurance Plan, Seponsible Organization: BSC-SA-02-007         3. Responsible Organization: BSC/UWO       4. Discussed With: M. Peters. BSC; S. Ramamurthy, UWO         5. Requirement:       4. Discussed With: M. Peters. BSC; S. Ramamurthy, UWO         5. Requirement:       4. Discussed With: M. Peters. BSC; S. Ramamurthy, UWO         5. Requirement:       4. Discussed With: M. Peters. BSC; S. Ramamurthy, UWO         6. Description of Condition:       The numbering processe ensures that sample numbers remain clearly visible on the specimen or traceability is maintained in an appropriate manner.         6. Description of Condition:       Contrary to the above, UWO sent several rods of different material to their machine shop for saw cutting into multiple samples and there was no procedure to ensure that the samples cut were traceable to the individual rod. Additionally, UWO sent several samples to Laboratory Testing, Inc. (LTI) for chemical analysis and the LTI test reports do not identify the unique specimen number that was analyzed.         7. Initiator:       9. Dese a stop work condition exist? (Not required for a DR I Yes M to I Yes M to I Yes M to I Yes M to I I Yes, Check One: A B C D         7. Initiator:       9. Dese a stop work condition exist? (Not required for a DR I Yes M to I Yes M to I I Yes, Check One: A B C D         7. Initiator:       9. Dese a stop work condition exist? (Not required for a DR I Yes M to I Yes M to I Yes M to I I A Reciment do determine if samples can be traced to their original	R4	OFFICE OF CIVILI ADIOACTIVE WASTE MA U.S. DEPARTMENT OF WASHINGTON, D	NAGEMENT ENERGY J.C.	GINAL red		
University of Western Ontario (UWO) Quality Assurance Plan, Version 1, Revision 3       BSC-SA-02-007         3, Responsible Organization:       4. Discussed With: M. Peters, BSC; S. Ramamurthy, UWO         5. Requirement:       WO QA Plan, Section 4.11 states: All samples are clearly numbered or identified according to the procedure entitled "Specimen Control". The numbering process ensures that sample numbers remain clearly visible on the specimen or traceability is maintained in an appropriate manner.         6. Description of Condition:       Contrary to the above, UWO sent several rods of different material to their machine shop for saw cutting into multiple samples and there was no procedure to ensure that the samples cut were traceable to the individual rod. Additionally, UWO sent several samples to Laboratory Testing, Inc. (LTI) for chemical analysis and the LTI test reports do not identify the unique specimen number that was analyzed.         7. Initiator: <ul> <li>Methadulin FoK</li> <li>Date 12/17/01</li> <li>Pres ⊠ No</li> <li>If yes, Check One: □ A □ B □ C □ D</li> </ul> 10. Recommended Actions: <ul> <li>Provide a method to determine if samples can be traced to their original material heat/lot or scrap the material.</li> <li>Prepare a procedure to describe the process for maintaining traceability of YMP samples.</li> </ul> 11. OA Review:	DE	FICIENCY/CORRECTIVE	ACTION REPO	DRT		
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Complete	RADIOACTIVE WASTI	E MANAGEMENT		PAGE 2 OF 5
Amended	U.S. DEPARTMENT			
	WASHINGTO			QA: QA
		ORIGIN		
			red	
<u> </u>	DEFICIENCY/CORRECTIVE A	CTION REPORT (RE		E)
4a. Immediate Actions				-)
ilready been cut would	s issued on 12/5/01 by the Program Mana be labeled 'not to be used for quality affec ject was temporarily suspended until defic	cting work' and scrapped.	) stating tha All quality-	It all specimens that had affecting testing supporting
Compliance Date: 12/0	5/01			
4. Remedial Actions:			<u>-</u>	
<ul> <li>Uncut samples</li> <li>A procedure w</li> <li>Mr. Bruce Carr will be trained and Titanium C samples as pe</li> </ul>	actions address the lack of traceability of s will be labeled with their heat number alo ill be written that outlines the process for r pbell, the supervisor at the University of V and qualified according to the Quality Assi arade-7 Under Yucca Mountain Conditions r the written procedure. 11-01 will be resolved.	ng with their material nam naintaining traceability du Vestern Ontario Dept. of F urance Plan for the Investi	ie. ring section hysics and igation of L	ing and machining process. Astronomy Instrument Shop,
<ul> <li>Since it was de purchase order</li> </ul>	ability at LTI will be resolved in the followin termined that the lack of traceability at LT	was due, in part, to a lac	1	
detailed inform Detailed correc - The lack of trac went to LTI from sample traceat	s, such as the need for sample identification in the purchase orders. This issue is tive actions regarding this issues are proviseability of the $\pm$ samples was also due, n UWO. This issue will be resolved by imbility at UWO.	ion, the procurement proc s identified and addressed ided there. in part, to the fact that the	edure will b I in deficient	e revised to require more cy report BSC(V)-02-D-051.
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<ul> <li>detailed inform Detailed correct</li> <li>The lack of tractive went to LTI from sample traceat</li> <li>5. Extent of Condition:</li> <li>UW</li> <li>s a result of the failure</li> <li>here were two LTF pure</li> <li>sociated with these prior</li> <li>ate (12/5/01) only one</li> <li>uality-affecting work.</li> </ul>	s, such as the need for sample identificati ation in the purchase orders. This issue is tive actions regarding this issues are prov cability of the LTT samples was also due, n UWO. This issue will be resolved by im pility at UWO.	ion, the procurement proc s identified and addressed rided there. in part, to the fact that the plementing the remedial a $t \rightarrow LT I P 25^{-02}$ les and associated data w hey are identified as follow affecting work, and cut main oleted. Data generated du	edure will be I in deficient by were not p actions listed "/or/or will not be us vs: Q11546 aterial samp uring this ex	e revised to require more cy report BSC(V)-02-D-051. properly labeled when they d above for maintaining ed for quality-affecting work. 69 and Q115474. Data bles will be discarded. To periment will not be used for
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TYPE RESPONSE:				DRICAD NO DECAU 02 D 049
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Amended	U.S. DEPARTMEN		RGY	
	WASHINGT	ΓΟΝ, D.C. <sub>Γ</sub>		Add 3-11-02 QA: QA
		1	ORIGINAL	
			ređ	
	DEFICIENCY/CORRECTIVE	ACTION RE	PORT (RESPONS	É)
14a. Immediate Actions:	<u></u>			
the Yucca Mountain Pro	vere initially found, during the audit, it w ject would be temporarily suspended un ed quality-affecting work, based on an	ntil deficiencies	were resolved. This be	eeame <sup>r</sup> a permanent
Compliance Date: 2/15/	02			
14. Remedial Actions:				
the following seven note C-2000 Specimen Prep. C276 Sample Preparatio C-22 Electrochemical Ex C-22 Specimen Preparations Ti2 Surface Analysis - 1 Ti2 Specimen Preparations Solution Preparation - 1 15. Extent of Condition:	- 1 on - 1 xps 1 tion - 1			work. This involves data in
16. Cause: (Attach res	ults of root cause determination prepare	ed in accordan	ce with AP-16.4Q for a	significant deficiency.)
Lack of understanding of	of the requirements of implementing a q	juality assurance	e program.	
17. Action to Preclude F	Recurrence:			
UWO will no longer be	used for the collection of quality-affectir	ng data, based	on email from Cindy Pa	Imer, dated 2/15/02.
	moved from Qualified Supp			
			1 11 1	
			2-28-02	
18. Due Date: 3/31/02			by: Mark Peters (Shell	ie Rucinski-responsible ind.)
For submittal of c	omplete response	with 111	1 1htm	2/22/or my similar
S For completion of	f corrective action	Date: 02/2	27/02 Phone: 702-2	95-3644 MUS 05004
20. Evaluation: Acce	pt  Partially Accept Reject	21. Concurrence		
IA IA	Ablahul For		71/1	5/15/
QAR R.L. MAUDI		DOQA (G	1. Caisha	Date 202
Exhibit AP-16.1Q.1		<u> </u>		Rev. 12/20/19

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.	ORIGINAL	8. ⊠DR/CAR ☐ Stop Work Order NO. BSC(V)-02-D-048 PAGE <b>4</b> OF <b>5</b>
DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WOR		
SH 3/14/02 in Block 19 of the 1	nitial & Complete,	DADMISE
For clarification purposes only: Actions identified on response dated 01/25/02 are superceded by actions c		
Continued from block 14:		
Notification will be provided to UWO that BSC purchase order P.O.24540-1	60-PA-00469 will be te	erminated.
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Submittal Page 1 of 1       OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.       No. BSC(V)-02-D-048 PAGE 5' OF 5 QA: QA         PRIGINAL red       red       NO. BSC(V)-02-D-048         CONDITION ADVERSE TO QUALITY CONTINUATION PAGE         Verification of corrective action and closure of DR BSC(V)-02-D-048.         This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Westron Ontario (UWO).         Verification of humediate Actions:         The QAR verified that Pasu Pasupathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-07 addit exit meeting. The QAR verified that Cynthia Palmet issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.         Verification of Remedial Actions:         The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q diat. The notebooks reviewed wet: C-2000 Specimen Preparation pages 1-2; Tor ZA Surface Analysis pages 1-6; C-22 Electrochemistry pages 1-5; TT Specimen Preparation pages 1-4; TD Specimen Preparation pages 1-12; TD Specimen Preparation pages 1-4; TD Specimen Preparation pages 1-12; Tor S-3m Calibration page 1-17; TD Specimen Preparation			· · · · · · · · · · · · · · · · · · ·
CONDITION ADVERSE TO QUALITY CONTINUATION PAGE           Verification of corrective action and closure of DR BSC(V)-02-D-048.           This verification of corrective action and closure of DR BSC(V)-02-D-048.           This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Western Ontario (UWO).           Verification of Immediate Actions:         The QAR verified that Pasu Pasupathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.           Verification of Remedial Actions:         The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-4; To PL Sufface Analysis pages 1-18; TD Specimen Preparation pages 1-2; To PL Coaling Optical Microscope Calibration pages 1-4; C+22 Electrochemical and the Paster Preparates pages 1-4; C+22 Electrochemical pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration pages 1-2; Toror Calibration pages 1-2; TopL Coaling Optical Microscope Calibration pages 1-2; TopL Coaling Optical Microscope Calibration pages 1-2; TopL Coaling Optical Microscope Calibration pages 1-3; TOF Sims Calibration pages 1-4; TopL Coaling Optical Microscope Calibration pages 1-3; ToF Sims Ca	ORIGINAL	RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY	SWO NO. BSC(V)-02-D-048 PAGE 5 OF 5
<ul> <li>Verification of corrective action and closure of DR BSC(V)-02-D-048.</li> <li>This verification was based on a review of documentation provided by Science Engineering and Testing (SE&amp;T) and University of Western Ontario (UWO).</li> <li>Verification of Immediate Actions:</li> <li>The QAR verified that Pasu Pasupathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.</li> <li>Verification of Remedial Actions:</li> <li>The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C22 2 Specimen Preparation pages 1-6; T12 Surface Analysis pages 1-8; T12 Surface Analysis pages 1-4; C-22 Electrochemical Solution Preparation pages 1-6. Additionally, UWO has marked the following records as NON-Q. T12A Surface Analysis pages 1-4; C22 Electrochemical Preparation pages 1-6. T12 Surface Analysis pages 1-2; Tencor Calibration pages 1-2; Tencor Calibration pages 1-3; T07 Specimen Preparation pages 1-2; TMC Alibration pages 1-3; T07 Specimen Preparation pages 1-2; Tencor Calibration pages 1-4; C22 Electrochemical pages 1-4; C22 Electrochemical pages 1-4; C22 Specimen Preparation pages 1-2; TMC Alibration pages 1-3; T07 Specimen Preparation pages 1-2; TMC Alibration pages 1-5; T37 Specimen Preparation pages 1-2; TMC Alibration pages 1-3; T07 Specimen Preparation pages 1-2; TMC Calibration pages 1-3; ToF-Sins Calibration pages 1-17; SBM/EDX Calibration pages 1-5; Laboratory Aged T12a6 pages 1-6; and XPS Calibration pages 1-3; ToF-Sins Calibration pages 1-17; SBC/EDX Calibration pages 1-6; Electrochemical Calibration pages 1-17; SBM/EDX Calibration pages 1-6; Electrochemical Calibration pages 1-6; C200</li></ul>			<u></u>
<ul> <li>This verification was based on a review of documentation provided by Science Engineering and Testing (SE&amp;T) and University of Western Ontario (UWO).</li> <li>Verification of Immediate Actions:</li> <li>The QAR verified that Pasu Pasupathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.</li> <li>Verification of Remedial Actions:</li> <li>The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks review of the following notebooks appess 1-4; C-22 Electrochemistry pages 1-5; TrY Specimen Preparation pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemistry pages 1-5; TrY Specimen Preparation pages 1-2; Try Calibration pages 1-2; Tencor Calibration pages 1-1; TS EM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.</li> <li>The QAR performed a review of an email from John Giannin, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.</li> <li>Extent of Condition:</li> <li>Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.</li> <li>Verification of Action to Preclude Recurrence</li> <li>The QAR verified that the</li></ul>	CONE	DITION ADVERSE TO QUALITY CONTINUATION	NPAGE
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<ul> <li>The QAR verified that Pasu Pasupathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.</li> <li>Verification of Remedial Actions:</li> <li>The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q. T12A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration pages 1-4; C-22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-2; To Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.</li> <li>The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.</li> <li>Extent of Condition:</li> <li>Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.</li> <li>Verification of Action to Preclude Recurrence</li> <li>The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.</li> <li>A review of the extent of condition did not indicate that this DR is a significant condition.</li> <li>The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions f</li></ul>		review of documentation provided by Science Engineering and Te	esting (SE&T) and University of
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<ul> <li>data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; Ti2 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration pages 1-3; To7 Secure Preparation pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.</li> <li>The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.</li> <li>Extent of Condition:</li> <li>Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.</li> <li>Verification of Action to Preclude Recurrence</li> <li>The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.</li> <li>A review of the extent of condition did not indicate that this DR is a significant condition.</li> <li>The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions for this DR. Based on the above this DR is considered closed.</li> <li>Richard L. Maudlin, 4/17/02</li> </ul>	Verification of Remedial Action	s:	
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	The documentation provided an Based on the above this DR is a	d the corrective actions taken provide satisfactory implementation considered closed.	of correction actions for this DR.

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OFFICE OF CIVIL RADIOACTIVE WASTE MA U.S. DEPARTMENT OF WASHINGTON, D	NAGEMENT ENERGY .C.	CORRECTIVE ACTION REPORT D. BSC(V)-02-D-049
		PAGE 1 OF 5 QA: QA
	red	
DEFICIENCY/CORRECTIVE		
1. Controlling Document: University of Western Ontario (UWO) Quality Assurance Plan Revision 3; BSC PO 24540-160-PA-00469, Technical Service Work, Rev 00, Section III.B.6.0, and QARD, Section 12.2.7.	s Statement of	
3. Responsible Organization: BSC/ UWO	4. Discussed With: M. Peters, BSC; S. Ramamurth	iy, UWO
5. Requirement:	<u> </u>	
A-UWO QA Plan, Section 4.6, states: Instruments will be calib approved by OCRWM. BSC PO 24540-160-PA-00469, Techn states: The method used to assure that M&TEis adjusted recognized standards.	ical Services Statement of Work, against reference standards hav	Rev 00, Section III.B.6.0 e traceability to nationally
B- UWO QA Plan, Section 4.6, states: Calibration status of the appropriate records.	equipment is noted on the respe	ective instruments or on
C- QARD, Section 12.2.7 states: Measuring and test equipme information: A. Identification of the M&TE calibrated; B. Tracea Calibration Data; and D. Identification of the individual perform 6. Description of Condition:	ability to the calibration standard u	l include the following used for calibration; C.
Contrary to the above: A The following UWO M&TE was not calibrated by a supplie traceable to nationally recognized standards: Thermometer (1 37030044): Weight Set 1g-1kg, (No ID); Ag/AgCl electrode (N	00 DegC); Thermometer (400 De	oC): Balance (ID
B The following UWO M&TE was not uniquely identified or o DegC, No ID); Thermometer (400 DegC, No ID); Weight Set 1	ontained calibration status indica g-1kg, (No ID); Ag/AgCl electrode	tors: Thermometer (100 e (No ID).
C- The UWO calibration records did not include: the unique in calibration results, or the individual who performed the calibrat DegC); Thermometer (400 DegC); Balance (ID 37030044): We Saturated Calomel Electrode (No ID).	ion for the following UWO M&TE eight Set 1g-1kg, (No ID); Ag/Ag(	: Thermometer (100 Cl electrode (No ID); and
7. Initiator: Richard L. Maudlin For Date 12/17/01	9. Does a stop work condition exis	t? (Not required for a DR)
	If Yes, Check One: 🗌 A 📋 I	
<ol> <li>Recommended Actions:</li> <li>A. Take the necessary action to have all M&amp;TE calibrated by traceable to a nationally recognized standard.</li> <li>B. Label or assign a unique identification to each piece of M&amp; calibration status in the calibration records.</li> <li>C. Modify the calibration record forms to include all required in the calibr</li></ol>	TE and attach a calibration statu	
11. QA Review: MAH 00.0	12. Response Due Date:	
QAR Richard L. Maudlin For Date 12/17/01	20 Working Days From Issuanc	e
13. DOQA Issuance Approval:	1 2	
Printed Name Donald T. Krisha Signal	- KINN & Spile/ XM	Date 12/81/01
22. Corrective Actions Verified: QAR Maclh Date 04/18/02	3. Closure Approved by: 70	Date 430
Exhibit AP-16.1Q.1	El. 1. Fresha	Rev 12/20/1000

	Rev.	12/	20/1	999
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TYPE RESPONSE: OFFICE OF		1	
	CIVILIAN		R/CAR NO. BSC(V)-02-D-049
Complete RADIOACTIVE WAST	E MANAGEMENT	P	AGE 2 OF 5
Amended U.S. DEPARTMEN	T OF ENERGY		<u>.</u>
WASHINGT			QA: QA
	ORIG		
		red	
DEFICIENCY/CORRECTIVE	ACTION REPORT (RE	SPONSE)	
14a. Immediate Actions:			
All quality-affecting testing supporting OCRWM was tempo	prarily suspended until de	eficiencies ar	e resolved.
	•		
Compliance Date: 12/05/01			
14. Remedial Actions:			
The following remedial actions refer only to M&TE being us	sed to produce quality-af	fecting data	or OCRWM. These
actions will be completed by 3/31/02:			
	11 <b>.</b>	00000	
<ul> <li>The thermometers and weight set will be calibrate</li> <li>A balance calibration procedure will be written des</li> </ul>	a by a supplier on the OC	DHWM USL.	inst a properly
<ul> <li>A balance calibration procedure will be written des calibrated weight set. The balance will then be ca</li> </ul>	librated using such proce	edure.	
<ul> <li>UWO M&amp;TE will be uniquely identified and contain</li> </ul>	n a calibration due date (i	if applicable).	The requirement to
identify "calibration due date" will replace "calibrati	on status" in the revised	QA Plan.	
The calibration records for quality affecting items y	will be written to include:	the unique id	entifier/model# and/or
serial# of the instrument being calibrated, the stan	dard used in the calibrat	ion, the calibi	ration results, the
signature of the individual who performed the calib	pration and the date of ca	indration. In	is requirement will be
added to the UWO QA Plan and relevant procedu The Saturated Calomel Electrode will either be cal	librated (internally or exte	ernallv) or a r	new one will be procured
from a supplier on the OCRWM QSL. This proces	ss will insure traceability	to nationally	recognized standards.
The Ag/AgCl electrode will then be calibrated agai	nst the properly calibrate	ed Saturated	Calomel Electrode.
15. Extent of Condition:			
It is unknown how this deficiency affected the data collected	ed. To date (12/5/01) only	y one experir	nent has been
performed and completed. Data generated during this exp	periment will not be used	for quality-at	ffecting work.
16. Cause: (Attach results of root cause determination prepare	d in accordance with AP-10	5.4Q for a sigr	nincant deficiency.)
Lack of understanding of the requirements of implementin	g a quality assurance pr	ogram.	
17. Action to Preclude Recurrence:			
		re trained on	d/or retrained to the
On December 11, 2001, individuals at UWO doing work in			
<ul> <li>UWO QA plan. The following areas were covered:</li> <li>Review of the UWO QA plan (with emphasis Plan)</li> </ul>	red on calibra	NONKK	20-02 ( 10/02
- Heview of the UWU UA plan (WI th emphasis Pla	<u></u>	03	- <b>v</b>
<ul> <li>Review of the procedure for writing a procedure</li> </ul>			
<ul> <li>Review of the qualification and training procedure</li> </ul>			
<ul> <li>Training to the corrective action procedure</li> </ul>			
	19. Response by: Mark Pe	tore (Shallia E	Pusinski rosnonsihla ind
		0	1 Am
	ć i		, <b>2</b> 611 - 2
For submittal of complete response	Dr Ol	uver to	ISSC AN IN
For completion of corrective action	Date: 01/25/02 Phone	スルーヘ tーー e: 702-295-36	ISSC AN IN
For completion of corrective action	Dr Ol		ISSC AN IN
For completion of corrective action 20. Evaluation: Accept Partially Accept Reject	Date: 01/25/02 Phone		ISSUMA IV

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RADIOACTIVE WASTE MANAGEMENT       PAGE 3 OF 5         Amended       U.S. DEPARTMENT OF ENERGY       ORIGINAL         U.S. DEPARTMENT OF ENERGY       ORIGINAL       ORIGINAL         DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)       A.         4a. Immediate Actions:       When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the "recore work outlobe temporarily suspended until deficiencies were resolved. This became is permanent amination of WP-related duality-affecting work, based on an email from Cindy Palmer, on 2/15/02.         A. Remedial Actions:       IVMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:         220 Specimen Preparation - 1       122 Specimen Preparation - 1         222 Specimen Preparation - 1       122 Sufficient Preparation - 1         222 Specimen Preparation - 1       122 Specimen Preparation - 1         222 Specimen Preparation - 1       122 Sufficient Preparation - 1         22 Specimen Preparation - 1       122 Specimen Preparation - 1         22 Sp			N/11 LAN1		
Decompace     Decompace     Deficiency     U.S. DEPARTMENT OF ENERGY     OA: C     ORIGINAL     red     DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)  4. Immediate Actions:     Deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting     resolved. This became is permanent     red     Deficiency vosenated and deficiencies were resolved. This became is permanent     red     red     red     Deficiency vosenated and deficiencies were resolved. This became is permanent     red     red     red     red     Deficiency vosenated and deficiencies were resolved. This became is permanent     red     re	Initial			DR/CAR NO. BSC(V)-02-D-049	
WASHINGTON, D.C.  ORIGINAL red  DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)  4a. Immediate Actions: When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This became if permanent arminetion of WP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. 4. Remedial Actions: When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This became if permanent arminetion of WP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. 4. Remedial Actions: WOM will be marked non-Q and will not be used for quality-affecting work. This involves data in teollowing system. The permation - 1 22 Septimen Proparation - 1 23 Septimen Proparation - 1 24 Septimen Proparation - 1 25 Septimen Proparation - 1 25 Septimen Proparation - 1 26 Septimen Proparation - 1 27 Septimen Proparation - 1 28 Septimen Proparation - 1 29 Septimen Proparation - 1 29 Septimen Proparation - 1 20 Septimen Proparation - 1 21 Septimen Proparation - 1 22 Septimen Proparation - 1 23 Sept				PAGE 3 OF 5	
Construction of the program of the requirements of implementing a quality assurance program.	🛛 Amended				
red         DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)         4a. Immediate Actions:         When the deficiencies were resolved. This became if permanent armination of VMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. A will be come of permanent armination of VMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. A will be come of permanent armination of VMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. A will be come of permanent armination of VMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following source networks:         Supporting Ens. 1         2200 Septimen Preparation - 1         22 Experimen Preparation - 1         22 Specimen Preparation - 1<		WASHINGTO	N, D.C. ORIGINAL	QA: Q/	
DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)         4a. Immediate Actions:         Men the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucas Mountain Project would be temporarily suspended until deficiencies were resolved. This become and the collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:         2:300-52         A Remedial Actions:         III VMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         2:300-52:300         3:300 <td cols<="" th=""><th></th><th></th><th></th><th></th></td>	<th></th> <th></th> <th></th> <th></th>				
4a. Immediate Actions:         When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This became? is permanent and the deficiencies were resolved. This became? is permanent and the deficiencies were resolved. This became? is permanent and the deficiencies were resolved. This became? is permanent and the deficiencies were resolved. This became? is permanent and the deficiencies were resolved. This became? is permanent and the deficience data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks: "2000 Specimen Preparation - 1         2:2000 Specimen Preparation - 1       1         2:21 Eloctochemical Exps 1       1         2:22 Eloctochemical Exps 1       1         2:2 Eloctochemical Exps 1       1         2:2 Eloctochemical Exps 1       1         2:2 Surface Analysis - 1	<u> </u>	DEFICIENCY/CORRECTIVE A		ISE)	
When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting re Yucca Mountian Project would be temporarily suspended until deficiencies were resolved. This became is permanent armination of YMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. A will became is permanent for the collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:         2:00-00       If MP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:         2:200 Specimen Prep 1       2:276 Sample Preparation - 1         2:22 Specimen Preparation - 1       1         2:22 Specimen Preparation - 1       1         2:23 Specimen Preparation - 1       1         2:24 Specimen Preparation - 1       1         2:25 Mark Preparation - 1       1         2:25 Mark Preparation - 1       1         2:01 more preparation - 1       1         2:02 more information preparation - 1       1         2:02 more information of the requirements of implementing a quality assurance program.         7. Action to Preclude Recurrence:       1         WO will no longer be used for the collection	4a. Immediate Actions:				
4. Remedial Actions:         11 YMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following serven notebooks:         2200 Supple Preparation - 1         2276 Sample Preparation - 1         2276 Sample Preparation - 1         2276 Sample Preparation - 1         228 Uncer Analysis - 1         229 Uncer Analysis - 1         22 Surface Analysis - 1         23 Uncer Analysis - 1         24 Specimen Preparation - 1         5. Extent of Condition:         II YMP-related data collected at UWO was affected. See list of notebooks in Block 14.         6. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)         .ack of understanding of the requirements of implementing a quality assurance program.         7. Action to Preclude Recurrence:         JWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.         UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.         UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.         UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.         UWO will no longer be used for the collection of quality-affecting data, based	he Yucca Mountain Project	twould be temporarily suspended until	deficiencies were resolved. This	became <sup>r</sup> a permanent 2. Awill become pp	
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	OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGE U.S. DEPARTMENT OF ENER			DR/CAR Stop Work Order
	WASHINGTON, D.C.	ORIGINAL	d	PAGE 4 OF 5 QA: QA
DEFICIENCY/CORRE	CTIVE ACTION REPORT/STOP	WORK ORDER C	ONTINUAT	ION PAGE
For clarification purposes only: Actions identified on response d	In Block 19 of th ated 01/25/02 are superceded by ac	ne Initial & Complet stions committed to in		
Continued from block 14: Notification will be provided to U	WO that BSC purchase order P.O.2	4540-160-PA-00469	will be termi	nated.
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Submittal Page <u>1</u> of <u>1</u>		DR/CAR/QO
ORIGINAL red	RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.	NO. BSC(V)-02-D-049 PAGE 5 OF 5 QA: QA
CONDITI	ON ADVERSE TO QUALITY CONTINUATION	I PAGE
Verification of corrective action and	closure of DR BSC(V)-02-D-049.	
This verification was based on a revi Western Ontario (UWO).	ew of documentation provided by Science Engineering and Te	sting (SE&T) and University of
Verification of Immediate Actions:		
	hi, BSC, verbally notifed UWO on 12/05/01 to stop testing wo audit exit meeting. The QAR verified that Cynthia Palmer is vities be performed at UWO.	
Verification of Remedial Actions:		
data. The notebooks reviewed were: Exps. pages 1-6; C-22 Specimen Pre Solution Preparation pages 1-16. Ac 1-6; C22 Electrochemistry pages 1-5 Optical Microscope Calibration Page 1-17; SEM/EDX Calibration pages 1	following notebooks and verified that the pages in the notebook C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation paration pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Spec Iditionally, UWO has marked the following records as NON-Q ; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages es 1-2; Top Loading Optical Microscope Calibration pages 1-3 -5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page	pages 1-4; C-22 Electrochemical simen Preparation pages 1-12; and 2: Ti2A Surface Analysis pages 5 1-2; Tencor Calibration page 1; 5; ToF-Sims Calibration pages age 1.
The QAR performed a review of an e notified that the BSC contract with U	email from John Giannini, BSC Buyer dated 3/15/02 stating th JWO will be terminated.	at UWO was contacted and
Extent of Condition:		
Based on discussions with R. Rucins testing activities.	ki, BSC the above mentioned records are the only documents a	generated by UWO for the BSC
Verification of Action to Preclude R	ecurrence	
The QAR verified that the OCRWM	Qualified Supplier List (QSL) was updated on 3/15/02 to rem	ove UWO from the QSL.
A review of the extent of condition	did not indicate that this DR is a significant condition.	
The documentation provided and the Based on the above this DR is consi	e corrective actions taken provide satisfactory implementation or idered closed.	of correction actions for this DR.
Richard L. Maudlin, 4/17/02		

OFFICE OF CIVIL RADIOACTIVE WASTE M U.S. DEPARTMENT OF WASHINGTON, I	ANAGEMENT F ENERGY D.C.	RIGINAL		DEFICIENCY REPORT CORRECTIVE ACTION REPORT C(V)-02-D-050 1 OF 5 QA: QA
DEFICIENCY/CORRECTIV	E ACTION REPO	ORT	-	
1. Controlling Document: University of Western Ontario (UWO) Quality Assurance Pl Version 1, Revision 3	lan,	2. Related R BSC-SA-0		
B. Responsible Organization: BSC/ UWO	4. Discussed W M. Peters, BS		nurthy, U\	NO
5. Requirement:	· · · · · · · · · · · · · · · · · · ·			· · ·
3. Description of Condition: Contrary to the above, no objective evidence could be pro used in the C22 electrochemical experiments for BSC wa desired results.				
Contrary to the above, no objective evidence could be pro used in the C22 electrochemical experiments for BSC wa desired results.	s tested/verified to 9. Does a stop v	o determine i work condition X No	f the softv exist? (Not	vare produced the required for a DR)
used in the C22 electrochemical experiments for BSC wa	s tested/verified to 9. Does a stop v	o determine i	f the softv exist? (Not	vare produced the required for a DR)
Contrary to the above, no objective evidence could be pro- used in the C22 electrochemical experiments for BSC wa desired results. 7. Initiator: Richard L. Maudlin For Date 12/17/01	s tested/verified to 9. Does a stop v Yes I If Yes, Check ducing the desired verifying software	o determine i work condition No One: A i results. programs use	f the softw exist? (Not	vare produced the required for a DR) C □ D
Contrary to the above, no objective evidence could be pro- used in the C22 electrochemical experiments for BSC was desired results. 7. Initiator: Richard L. Maudlin For Date 12/17/01 10. Recommended Actions: Take the necessary action to verify that the software is pro- Prepare a procedure to describe the process for testing or w Determine if condition had any affect on the experiments p	s tested/verified to 9. Does a stop v Yes I If Yes, Check ducing the desired verifying software	o determine i work condition No One: A i results. programs use samples.	exist? (Not	vare produced the required for a DR) C □ D
Contrary to the above, no objective evidence could be pro- used in the C22 electrochemical experiments for BSC was desired results. 7. Initiator: Richard L. Maudlin For Date 12/17/01 10. Recommended Actions: Take the necessary action to verify that the software is pro- Prepare a procedure to describe the process for testing or v Determine if condition had any affect on the experiments p 11. QA Review: MMADLA	s tested/verified to 9. Does a stop v Yes [ If Yes, Check ducing the desired verifying software erformed on YMP	o determine i work condition No One: A i results. programs use samples.	exist? (Not	vare produced the required for a DR) C □ D
Contrary to the above, no objective evidence could be pro- used in the C22 electrochemical experiments for BSC was desired results. 7. Initiator: Richard L. Maudlin <i>For</i> Date 12/17/01 10. Recommended Actions: Take the necessary action to verify that the software is pro- Prepare a procedure to describe the process for testing or v Determine if condition had any affect on the experiments p 11. QA Review: QAR Richard L. Maudlin <i>For</i> Date 12/17/01 13. DOQA Issuance Approval:	s tested/verified to 9. Does a stop v Yes [ If Yes, Check ducing the desired verifying software erformed on YMP	o determine i work condition No One: A i results. programs use samples.	exist? (Not	vare produced the required for a DR) C  D
Contrary to the above, no objective evidence could be pro- used in the C22 electrochemical experiments for BSC was desired results. 7. Initiator: Richard L. Maudlin <i>For</i> Date 12/17/01 10. Recommended Actions: Take the necessary action to verify that the software is pro- Prepare a procedure to describe the process for testing or v Determine if condition had any affect on the experiments p 11. QA Review: QAR Richard L. Maudlin <i>For</i> Date 12/17/01 13. DOQA Issuance Approval:	s tested/verified to 9. Does a stop v Yes I If Yes, Check ducing the desired verifying software erformed on YMP 12. Response D 20 Working D	o determine i work condition No One: A i results. programs use samples. Due Date: pays From Iss	exist? (Not	vare produced the required for a DR) C □ D

☑ Complete       RADIOACTIVE WASTE MANAGEMENT       PAGE 2       OF 5         □ Amended       U.S. DEPARTMENT OF ENERGY       PAGE 2       OF 5			······································
<ul> <li>14a. Immediate Actions:</li> <li>All quality-affecting testing supporting the Yucca Mountain Project was temporarily suspended until deficiencies are resolved.</li> <li>Compliance Date: 12/05/01</li> <li>14. Remedial Actions:</li> <li>The performance of the Corrware software is verified as part of the Solartron 1287 monthly performance verification insure control over this M&amp;TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, be modified to require that the current version of the Corrware software be documented during the monthly performance verification checks. The instrument will undergo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02.</li> <li>15. Extent of Condition:</li> <li>It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.</li> <li>16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)</li> <li>Lack of understanding of the requirements of implementing a quality assurance program.</li> <li>17. Action to Preclude Recurrence:</li> <li>On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered: <ul> <li>Review of the UWO QA plan (with emphasis placed on Software) France of Yut/oz</li> <li>Review of the qualification and training procedure</li> </ul> </li> </ul>	☑ Initial       OFFICE C         ☑ Complet∈       RADIOACTIVE WA         □ Amended       U.S. DEPARTM	ASTE MANAGEMENT IENT OF ENERGY GTON, D.C. ORIGINAL	DR/CAR NO. BSC(V)-02-D-050 PAGE 2 OF 5 QA: QA
All quality-affecting testing supporting the Yucca Mountain Project was temporarily suspended until deficiencies are resolved. Compliance Date: 12/05/01 14. Remedial Actions: The performance of the Corrware software is verified as part of the Solartron 1287 monthly performance verification. insure control over this M&TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, be modified to require that the current version of the Corrware software be documented during the monthly performance verification checks. The instrument will undrgo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02. 15. Extent of Condition: It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work. 16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.) Lack of understanding of the requirements of implementing a quality assurance program. 17. Action to Preclude Recurrence: On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered: - Review of the UWO QA plan (with emphasis placed on Suftware) of the UWO QA plan (with emphasis placed on Suftware) of the review of the procedure for writing a procedure - Review of the procedure for writing a procedure	DEFICIENCY/CORRECTIV	/E ACTION REPORT (RESPO	NSE)
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<ul> <li>14. Remedial Actions:</li> <li>The performance of the Corrware software is verified as part of the Solartron 1287 monthly performance verification. insure control over this M&amp;TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, be modified to require that the current version of the Corrware software be documented during the monthly performance verification checks. The instrument will undergo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02.</li> <li>15. Extent of Condition:</li> <li>It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.</li> <li>16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)</li> <li>Lack of understanding of the requirements of implementing a quality assurance program.</li> <li>17. Action to Preclude Recurrence:</li> <li>On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:</li> <li>Review of the UWO QA plan ( with emphasis placed on Software) France or frained to the grave of the procedure for writing a procedure</li> <li>Review of the qualification and training procedure</li> </ul>	All quality-affecting testing supporting the Yucca Mount resolved.	ain Project was temporarily suspe	nded until deficiencies are
<ul> <li>The performance of the Corrware software is verified as part of the Solartron 1287 monthly performance verification. insure control over this M&amp;TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, be modified to require that the current version of the Corrware software be documented during the monthly performance verification checks. The instrument will undergo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02.</li> <li>15. Extent of Condition:</li> <li>It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.</li> <li>16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)</li> <li>Lack of understanding of the requirements of implementing a quality assurance program.</li> <li>17. Action to Preclude Recurrence:</li> <li>On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:</li> <li>Review of the UWO QA plan (with emphasis placed on Software) from a cover of the UWO QA plan (with emphasis placed on Software) from a cover of the qualification and training procedure</li> <li>Review of the qualification and training procedure</li> </ul>	Compliance Date: 12/05/01		
<ul> <li>insure control over this M&amp;TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, be modified to require that the current version of the Corrware software be documented during the monthly performa verification checks. The instrument will undergo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02.</li> <li>15. Extent of Condition:</li> <li>It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.</li> <li>16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)</li> <li>Lack of understanding of the requirements of implementing a quality assurance program.</li> <li>17. Action to Preclude Recurrence:</li> <li>On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:</li> <li>Review of the UWO QA plan (with emphasis placed on Software) FR-20-0* 0*/-/oz</li> <li>Review of the procedure for writing a procedure</li> <li>Review of the qualification and training procedure</li> </ul>	14. Remedial Actions:		<u></u>
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<ul> <li>performed and completed. Data generated during this experiment will not be used for quality-affecting work.</li> <li>16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)</li> <li>Lack of understanding of the requirements of implementing a quality assurance program.</li> <li>17. Action to Preclude Recurrence:</li> <li>On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered: <ul> <li>Review of the UWO QA plan (with emphasis placed on Software) CP, 2000 - 0</li></ul></li></ul>	15. Extent of Condition:		······································
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<ul> <li>UWO QA plan. The following areas were covered:</li> <li>Review of the UWO QA plan (with emphasis placed on Software) RR, 00 Charles are the procedure for writing a procedure</li> <li>Review of the procedure for writing procedure</li> <li>Review of the qualification and training procedure</li> </ul>	17. Action to Preclude Recurrence:	······································	
	UWO QA plan. The following areas were covered: - Review of the UWO QA plan ( with emphasis p) - Review of the procedure for writing a procedure - Review of the qualification and training procedure		,
18. Due Date: 3/15/02 19. Response by: Mark Peters (Shellie Rucinski-responsible ind	18. Due Date: 3/15/02	19. Response hv. Mark Peters (Sh	ellie Bucinski-responsible ind
□ For submittal of complete response			
$\square$ For completion of corrective action $\square$ Date: 01/25/02 Phone: 702-295-3644 $\square$ $\square$ $\square$	✓ For completion of corrective action		V 1350.914
20. Evaluation: Accept Partially Accept Reject 21. Concurrence:		21. Concurrence:	
QAR Mandi Date /21/02 DODA (D.T. Linkon Date 2/20/02	<u> </u>	DODA (C. Lutho	Date 2/20/02

Exhibit AP-16.1Q.1

Rev. 12/20/1999

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TYPE RESPONSE:		ON/ILLAN		DR/CAR NO. BSC(V)-02-D-05
🔲 Initial				PAGE 3 OF 5
🖾 Complete		RTMENT OF ENERGY		
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	DEFICIENCY/CORRECTIVE	ACTION RE	EPORT (RESPO	NSE)
he Yucca Mountain Proie	re initially found, during the audit, it w ct would be temporarily suspended u d quality-affecting work, based on an	ntil deficiencies	were resolved. This	s became a permanent
Compliance Date: 2/15/0 4. Remedial Actions:		ad will not be u	and for quality offact	ing work. This involves data in
he following seven noteb C-2000 Specimen Prep C276 Sample Preparatior C-22 Electrochemical Exp C-22 Specimen Preparation T2 Surface Analysis - 1 T2 Specimen Preparation	1 1 - 1 0s 1 0n - 1	na wili not de u	Sed for quality-anect	ing work. This involves data in
Solution Preparation - 1				
15. Extent of Condition:	ected at UWO was affected. See list o	of notebooks in	Block 14.	
<ul> <li>15. Extent of Condition:</li> <li>All YMP-related data colle</li> <li>16. Cause: (Attach result)</li> </ul>	ected at UWO was affected. See list o ts of root cause determination prepare the requirements of implementing a q	ed in accordan	ce with AP-16.4Q for	a significant deficiency.)
<ul> <li>15. Extent of Condition:</li> <li>All YMP-related data colle</li> <li>16. Cause: (Attach resulack of understanding of</li> <li>Lack of understanding of</li> <li>17. Action to Preclude Resonance</li> </ul>	ts of root cause determination prepare the requirements of implementing a q	ed in accordancuality assuranc	ce with AP-16.4Q for e program.	
<ul> <li>15. Extent of Condition:</li> <li>All YMP-related data colle</li> <li>16. Cause: (Attach resulated data colle</li> <li>Lack of understanding of</li> <li>17. Action to Preclude Resulation</li> <li>UWO will no longer be used</li> </ul>	ts of root cause determination prepare	ed in accordanc uality assuranc	ce with AP-16.4Q for e program. on email from Cindy	Palmer, dated 2/15/02.
15. Extent of Condition: All YMP-related data colle 16. Cause: (Attach resu Lack of understanding of 17. Action to Preclude Re UWO will no longer be us UWO will no longer be us	Its of root cause determination prepare the requirements of implementing a q ecurrence:	ed in accordance uality assurance ng data, based Ried Supp	ce with AP-16.4Q for the program. on email from Cindy Plier List (G	Palmer, dated 2/15/02. QSL). <i>RR 2-28-</i> 02-
15. Extent of Condition: All YMP-related data colle 16. Cause: (Attach resu Lack of understanding of 17. Action to Preclude Re UWO will no longer be us UWO will no longer be us UWO will no longer be us UWO will be cer	the requirements of implementing a q ecurrence: sed for the collection of quality-affection in OVED From the Quality	ed in accordance uality assurance ng data, based Ried Supp	ce with AP-16.4Q for e program. on email from Cindy plier List (ອ	Palmer, dated 2/15/02. QSL). 2-25-02 rellie Rucinski-responsible ind, 27/02 Jay 33(27)02
15. Extent of Condition: All YMP-related data colle 16. Cause: (Attach resul Lack of understanding of 17. Action to Preclude Re UWO will no longer be us UWO will no longer be us UWO will no longer be us UWO will no longer be us	the requirements of implementing a q ecurrence: sed for the collection of quality-affection in OVED From the Quality	ed in accordance uality assurance ng data, based Ried Supp	ce with AP-16.4Q for the program. on email from Cindy plier List (G by: Mark Peters (Sh	Palmer, dated 2/15/02. QSL). 2-28-02 rellie Rucinski-responsible ind, 27/02 JM 33(37)02
15. Extent of Condition: All YMP-related data colle 16. Cause: (Attach resu Lack of understanding of 17. Action to Preclude Re UWO will no longer be us UWO will no longer be us UWO will no longer be us UWO will be cer	the requirements of implementing a q the requirements of implementing a q ecurrence: sed for the collection of quality-affection in oved from the Quality mplete response corrective action	ed in accordance uality assurance og data, based o Gied Supp 19. Response	ce with AP-16.4Q for the program. on email from Cindy plien List (G by: Mark Peters (Sh Juluo 2/ 7/02 Phone: 702-	Palmer, dated 2/15/02. QSL). 2-26-02 Hellie Rucinski-responsible ind 27/02 M 33(27/02

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C. DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WO	ORIGINAL red	8. \(\Box DR/CAR) Stop Work Order NO. BSC(V)-02-D-050 PAGE 4 OF 5 QA: QA UATION PAGE				
For clarification purposes only: Actions identified on response dated 01/25/02 are superceded by actions committed to in this response. Continued from block 14:						
Notification will be provided to UWO that BSC purchase order P.O.24540-	тои-РА-00469 will be te	erminated.				
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Exhibit AP-16.1Q.2		Rev. 06/01/1999				

Submittal Pag	ge <u>1</u> of <u>1</u> ORIGINAL red	OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.	DR/CAR/QO SWO NO. BSC(V)-02-D-050 PAGE 5 OF 5 QA: QA			
	CON	DITION ADVERSE TO QUALITY CONTINUATION	PAGE			
Verification	of corrective action	n and closure of DR BSC(V)-02-D-050.				
	ation was based on a tario (UWO).	a review of documentation provided by Science Engineering and Tex	sting (SE&T) and University of			
Verification	of Immediate Action	ons:				
activities du	ring the BSC-SA-0	supathi, BSC, verbally notifed UWO on 12/05/01 to stop testing wor 2-007 audit exit meeting. The QAR verified that Cynthia Palmer iss g activities be performed at UWO.	k on Yucca Mountain Project ued an email on 2/15/02			
Verification	of Remedial Actio	ns:				
data. The r Exps. pages Solution Pr 1-6; C22 El Optical Mic 1-17; SEM	otebooks reviewed 5 1-6; C-22 Specime eparation pages 1-1 lectrochemistry page croscope Calibration /EDX Calibration page	of the following notebooks and verified that the pages in the noteboo were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation on Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Spec 6. Additionally, UWO has marked the following records as NON-Q es 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages n Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3 ages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration pages	pages 1-4; C-22 Electrochemical imen Preparation pages 1-12; and : Ti2A Surface Analysis pages 1-2; Tencor Calibration page 1; ; ToF-Sims Calibration pages ge 1.			
The QAR p notified that	erformed a review of the BSC contract v	of an email from John Giannini, BSC Buyer dated 3/15/02 stating the with UWO will be terminated.	at UWO was contacted and			
Extent of C	ondition:					
Based on d testing activ		Lucinski, BSC the above mentioned records are the only documents g	generated by UWO for the BSC			
Verificatio	n of Action to Precl	ude Recurrence				
The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.						
	A review of the extent of condition did not indicate that this DR is a significant condition.					
The docum Based on	entation provided a the above this DR is	nd the corrective actions taken provide satisfactory implementation of considered closed.	of correction actions for this DR.			
Richard L.	Maudlin, 4/17/02					
	Manell:					

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OFFICE OF CIVILI RADIOACTIVE WASTE MA U.S. DEPARTMENT OF WASHINGTON, D	NAGEMENT     CORRECTIVE ACTION       ENERGY     NO. BSC(V)-02-D-051       .C.     ORIGINAL   PAGE 1 OF 5 OA: OA
DEFICIENCY/CORRECTIVE	
1. Controlling Document: University of Western Ontario (UWO) Quality Assurance Pla Version 1, Revision 3	2. Related Report No.:
3. Responsible Organization: BSC/ UWO	4. Discussed With: M. Peters, BSC; S. Ramamurthy, UWO
5. Requirement:	
UWO QA Plan, Section 4.3 states: All purchase orders for a approved by Dr. Ramamurthy and Professor Shoesmith. T requirements have been adequately addressed.	quality affecting items or services should be reviewed and his review will ensure that all technical and quality
6. Description of Condition:	
Contrary to the above, no objective evidence could be prov Shoesmith had reviewed quality affecting purchase orders' Additionally, the purchase orders did not contain quality or t referenced on the PO).	Q115469 and Q115474 to Laboratory Testing, Inc.
7. Initiator: Ustofable	9. Does a stop work condition exist? (Not required for a DR)
Robert D. Habbe     Date 12/17/01       10. Recommended Actions:	If Yes, Check One: A B C D
Revise the procurement procedure to ensure that Dr. Ramam purchase order for quality affecting items/services to determin addressed. Determine if conditions had any affect on the experiments pe	ne that quality and technical requirements have been
11. QA Review: Radable	12. Response Due Date: 20 Working Days From Issuance
QAR Robert D. Habbe Date 12/17/01 13. DOQA Issuance Approval:	
Printed Name Donald T. Krisha Signatu	ure ANNA Kill In Date playlog
22. Corrective Actions Verified:	23. Closure Approved by:
QARR.D.HABBE Date 4-17-02	C.T. Linha Date 302
Exhibit AP-16.1Q.1	Rev 12/20/1999

Rev. 12/20/1999

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	WASHING	TON, D.C.	ORIGINAL	
	DEFICIENCY/CORRECTIV	E ACTION RE	L	SE)
4a. Immediate Actions				
All quality-affecting te resolved.	esting supporting the Yucca Mounta	in Project was	temporarily suspend	ed until deficiencies are
Compliance Date: 12/0	)5/01			
4. Remedial Actions:	· · · · · · · · · · · · · · · · · · ·	·····		·
All past purchase ord 2/28/02.	lers related to quality affecting items	s/services will b	e reviewed for defici	encies and dispositioned by
- Dr. Rama items/ser documen - The state	cedure, SSW-PROC, will be revise amurthy and Professor Shoesmith r vices to determine that quality and at their review of the purchase orde ement of work be referenced on the ement of work be enclosed with the	eview the issue technical requin r. purchase orde	ed purchase order for rements have been a r.	
5. Extent of Condition				
The data collected ur	o to 12/05/01 date will not be used f	or OCRWM au	ality-affecting work.	
provided in the comp	-			
·	sults of root cause determination prepa			significant deficiency.)
	g of the requirements of implement	ang a quality as	surance program.	
7. Action to Preclude	Recurrence:			
JWO QA plan. The Review of the UWO Review of the proc	edure for writing a procedure	in support of O	CRWM were trained	and/or retrained to the
	ification and training procedure			
Ū	nt procedure is revised, the appropri	iate personnel v	vill be trained to the	revised procedure. This will
activites will be review	quality-affecting statements of work wed by BSC S&ET for completenes ar reviews of purchase orders will be	s prior to issua	nce to subcontractor	
8. Due Date: 2/28/02	p	19 Response	w. Mark Poters (Shall	ie Rucinski-responsible ind.
For submittal of c				N XIS ARY QM
For completion o		Date: 01/25/02	- Oliver Phone: 702-295-3	t WW B01/25/02-pl
20. Evaluation: 🛛 Acce	ept Partially Accept Reject	21. Concurrence:		· · ·
DAR R.D. HAB	BE DADA Daje 29-02	DOQA	7. T. Cicha	Date 28/02
xhibit AP-16.1Q.1				Rev. 12/20/1999

Exh	ib	it	A	P	-1	6.	1Q.1	

🔲 Initial	OFFICE OF	CIVILIAN		DR/CAR NO. BS	SC(V)-02-D-051
Complete	RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY			PAGE 🖌	OF XG
:				3 RAH 3	
Amended	WASHING		-	4	QA: QA
	WASHING		ORIGINAL	1	
			red		
<u> </u>	DEFICIENCY/CORRECTIVE				
14a. Immediate Actions	DEFICIENCY/CORRECTIVE	ACTION REP	UKI (KESPUNS	) <b>– )</b>	······
When the deficiencies w	rere initially found, during the audit, it w ject would be temporarily suspended u ed quality-affecting work, based on an	ntil deficiencies we	ere resolved. This be	ecame <sup>t</sup> a perman	ent
1210	5101				
Compliance Date: 2/15					
14. Remedial Actions:					
C-22 Specimen Prepara Ti2 Surface Analysis - 1 Ti2 Specimen Preparation					
Solution Preparation - 1 15. Extent of Condition:				11na kd - (4 127	469 2R02
Solution Preparation - 1 15. Extent of Condition: All YMP-related data col 16. Cause: (Attach res	UWO will be notifie	of notebooks in Blo ed in accordance v	with AP-16.4Q for a s	9 	5402
Solution Preparation - 1 15. Extent of Condition: All YMP-related data col 16. Cause: (Attach res Lack of understanding c 17. Action to Preclude F	UWO will be notified lected at UWO was affected. See list of ults of root cause determination prepare f the requirements of implementing a q Recurrence:	of notebooks in Blo ed in accordance v uality assurance p g data, based on e	with AP-16.4Q for a s program. email from Cindy Pal	significant deficie	ency.)
Solution Preparation - 1 15. Extent of Condition: All YMP-related data col 16. Cause: (Attach res Lack of understanding c 17. Action to Preclude F UWO will no longer be u しいの いい かい かい	UWO will be notified lected at UWO was affected. See list of ults of root cause determination prepare f the requirements of implementing a q	of notebooks in Blo ed in accordance v uality assurance p g data, based on e ລຸປ ຳ <del>G</del> ໂ	with AP-16.4Q for a sorogram.	imer, dated 2/15/ (QSL). RR 2-28-02	ency.)
Solution Preparation - 1 15. Extent of Condition: All YMP-related data col 16. Cause: (Attach res Lack of understanding of 17. Action to Preclude F UWO will no longer be u しんの いい かい かっ col 18. Due Date: 3/31/02	UWO will be notified lected at UWO was affected. See list of ults of root cause determination prepare f the requirements of implementing a q lecurrence: used for the collection of quality-affecting emoved from the Quality-	of notebooks in Blo ed in accordance v uality assurance p g data, based on e ລຸປ ຳ <del>G</del> ໂ	with AP-16.4Q for a sorogram. email from Cindy Pal policer List 2 Mark Peters (Shelli	imer, dated 2/15/ (QSL). RR 2802- e Rucinski-respo	ency.)
Solution Preparation - 1 15. Extent of Condition: All YMP-related data col 16. Cause: (Attach res Lack of understanding c 17. Action to Preclude F UWO will no longer be u しいの いい かい かい	UW0  will be notified lected at UWO was affected. See list of ults of root cause determination prepared f the requirements of implementing a quality for the collection of quality-affecting the moved from the Quality for the collection of quality affecting the moved from the Quality for the collection of quality for the quali	of notebooks in Blo ed in accordance v uality assurance p g data, based on e ລຸປ ຳ <del>G</del> ໂ	with AP-16.4Q for a sorogram.	significant deficie Imer, dated 2/15/ (QSL). RR 2-28-02 e Rucinski-respo /o 2- <i>XU</i> S	(02.

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	OFFICE OF CIVIL RADIOACTIVE WASTE MA U.S. DEPARTMENT OI WASHINGTON,	ANAGEMENT F ENERGY D.C.	ORIGINAL	8. ØDR/CAR Stop Work Order NO. BSC(V)-02-D-051 PAGE 4 OF 5 QA: QA
For clarification purposes on	rective Action Report in Block y: e dated 01/25/02 are supercede	19 OF THE	INITIAL & CONPL	ETE RESPONSE
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Submittal Pa	gel of l				
Submittarra		OFFICE OF CIVILIAN	DR/CAR/QO		
		RADIOACTIVE WASTE MANAGEMENT	Swo		
		U.S. DEPARTMENT OF ENERGY			
	ORIGINAL red	WASHINGTON, D.C.	NO. BSC(V)-02-D-051 PAGE 5 OF 5		
L		,	QA: QA		
	CONE	DITION ADVERSE TO QUALITY CONTINUATION	PAGE		
Verification	of corrective action	and closure of DR BSC(V)-02-D-051.			
This verifica Western On	ation was based on a tario (UWO).	review of documentation provided by Science Engineering and Tes	ting (SE&T) and University of		
Verification	of Immediate Action	ns:			
activities du	ring the BSC-SA-02-	apathi, BSC, verbally notifed UWO on 12/05/01 to stop testing work -007 audit exit meeting. The QAR verified that Cynthia Palmer issu activities be performed at UWO.	k on Yucca Mountain Project Jed an email on 2/15/02		
Verification	of Remedial Actions	<b>3:</b>			
The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration pages 1; Optical Microscope Calibration Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.					
The QAR per notified that	erformed a review of the BSC contract with	an email from John Giannini, BSC Buyer dated 3/15/02 stating that the UWO will be terminated.	UWO was contacted and		
Extent of Co	ondition:				
Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.					
Verification	of Action to Preclude	e Recurrence			
The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.					
A review of the extent of condition did not indicate that this DR is a significant condition.					
The docume Based on th	ntation provided and e above this DR is co	the corrective actions taken provide satisfactory implementation of onsidered closed.	correction actions for this DR.		
Robert D. H	abbe, 4/17/02				
RAL	Halihe				