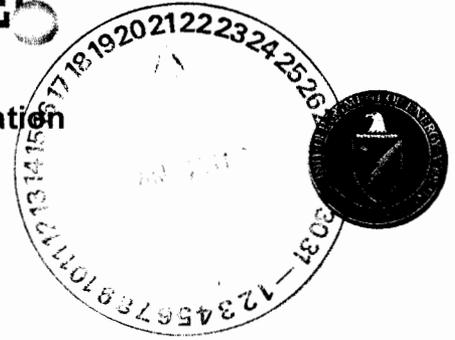




National Nuclear Security Administration
Sandia Site Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

ENTERED



JAN 19 2010

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Road East, Bldg. 1
Santa Fe, NM 87505

Dear Mr. Bearzi:

On behalf of the Department of Energy/National Nuclear Security Administration (DOE/NNSA) and Sandia Corporation (Sandia), DOE/NNSA is submitting Responses to the New Mexico Environment Department's (NMED) Comments in "*Notice of Disapproval: Response to the Notice of Disapproval for the Tijeras Arroyo Groundwater Investigation Report, February 2009, Sandia National Laboratories, EPA ID NM5890110518, SNL-05-028.*"

Should you have any questions regarding this response, please contact me at (505) 845-6036, or John Gould of my staff at (505) 845-6089.

Sincerely,

Patty Wagner
Manager

Enclosure (1)

cc w/enclosure:

- W. Moats, NMED (Via Certified Mail)
- L. King, EPA, Region 6 (Via Certified Mail)
- T. Skibitski, NMED-OB, MS-1396
- B. Birch, NMED-OB, MS-1396
- Records Center, SNL/NM, Org. 6765, MS-0718
- D. Barkley, Zimmerman Library, UNM
- J. Gould, SSO, MS-0184



James Bearzi

-2-

JAN 19 2010

cc w/o enclosure:

A. Blumberg, SNL/NM, Org. 11100, MS-0141
M. Walck, SNL/NM, Org. 6700, MS-0701
S. Saltzstein, SNL/NM, Org. 6702, MS-0701
D. Miller, SNL/NM, Org 6765, MS-0718
M. Skelly, SNL/NM, Org.6765, MS-0718
J. Cochran, SNL/NM, Org. 6765, MS-0719
M. Sanders, SNL/NM, Org. 6765, MS-0718
B. Langkopf, SNL/NM, Org. 6765, MS-0718
C. Daniel, SNL/NM, Org. 6765, MS-0718
J. Estrada, SSO, MS-0184

CERTIFICATION STATEMENT FOR APPROVAL AND FINAL RELEASE OF DOCUMENTS

Document title: Responses to the New Mexico Environment Department's Comments in "Notice of Disapproval: Response to the Notice of Disapproval for the Tijeras Arroyo Groundwater Investigation Report, February 2009, Sandia National Laboratories, EPA ID NM5890110518, SNL-05-028."

Document author: Mike Skelly, Department 06765

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Signature: Marianne C. Walck
Marianne Walck, Director
Nuclear Energy & Global Security Technologies
Center 6700
Sandia National Laboratories/New Mexico
Albuquerque, New Mexico 87185
Operator

1-11-10
Date

and

Signature: Patty Wagner
Ms. Patty Wagner, Manager
U.S. Department of Energy
National Nuclear Security Administration
Sandia Site Office
Owner and Co-Operator

1-18-10
Date

January 2010

**U.S. Department of Energy's/Sandia Corporation's Responses
to the New Mexico Environment Department's Comments
in
"Notice of Disapproval: Response to the Notice of Disapproval for the
Tijeras Arroyo Groundwater Investigation Report, February 2009
Sandia National Laboratories
EPA ID# NM5890110518 SNL-05-028"**

INTRODUCTION

This document responds to the comments received in a Notice of Disapproval (NOD) letter from the New Mexico Environment Department (NMED) to the U.S. Department of Energy (DOE) and Sandia Corporation (Sandia) on August 12th, 2009 regarding the response to the August 2008 NOD on the current conceptual model of groundwater hydrology and contaminant distribution in the Tijeras Arroyo Groundwater (TAG) study area in the vicinity of Technical Area I, II, and IV at Sandia National Laboratories/New Mexico (SNL/NM). The letter is entitled: "*Notice of Disapproval: Response to the Notice of Disapproval for the Tijeras Arroyo Groundwater Investigation Report, February 2009 Sandia National Laboratories, EPA ID# NM5890110518 SNL-05-028,*" (NMED August 2009). The original document reviewed by the NMED is the "Tijeras Arroyo Groundwater Investigation Report" submitted in November 2005 (SNL/NM November 2005).

For the benefit of the reader, the TAG NOD letter received from the NMED on August 1, 2008 (NMED August 2008) is hereinafter referred to as the "first NOD" and the NMED letter received on August 12, 2009 (NMED August 2009) is hereinafter referred to as the "second NOD". The second NOD contains one general comment and three specific comments that are addressed in this response. This document lists each NMED comment in boldface, followed by the DOE/Sandia response written in normal font under "Response".

GENERAL COMMENTS:

1. General Comment #2

Several inconsistencies occur within the data listed in Tables A-1 and B-1. A comparison of these data reveal discrepancies between groundwater elevations listed in Table A-1 (Column 4) and calculated groundwater elevations. Specifically, groundwater elevations were calculated using the depth to water (Table A-1, column 3) and the top of casing elevation (Table B-1, Column 5) for each well. The two sets of groundwater elevations vary from 0.08 ft to 1 ft at five wells that include Eubank-1, KAFB-0504, KAFB-3392, TJA-2, and TJA-5. The Permittees must explain the discrepancies and submit revised tables to correct the erroneous data.

Additionally, the data provided in Table B-1 do not correspond to the data shown in TAG IR Figure 3.1.3-5, "TAG Hydrologic Section." According to Table B-1, well completion data are unavailable for well KAFB-0506. However, TAG IR Figure 3.1.3-5 depicts well KAFB-0506 with its ground surface elevation, screened interval, and bottom of casing, indicating the availability of well completion data for well KAFB-0506. The Permittees must explain this discrepancy and provide the missing data in a revised Table B-1.

Response: The groundwater monitoring well survey data presented or used to construct these two tables was compiled from numerous sources, sometimes with conflicting information. The corrected top of casing elevations (obtained from original well completion data sheets) and recalculated groundwater elevations are provided in the revised Table A-1 and Table B-1, included as Appendix A. For the second portion of this comment, the completion information for KAFB-0506 has been obtained from Kirtland Air Force Base (KAFB) and added to Table B-1 (Appendix A). Sandia has verified the top of casing elevations for SNL/NM and City of Albuquerque wells and has incorporated the top of casing elevations provided electronically by KAFB contractors. To the best of our knowledge, the data provided in the revised tables are true and accurate and supersede all previously submitted groundwater monitoring well survey data and groundwater elevation data.

SPECIFIC COMMENTS:

2. Specific Comment #17: Section 2.9.3, page 2-43, Figure 2.9.3-1 and Section 2.9.8, page 2-44, Figure 2.9.3-2

Comparison of soil vapor well sampling port data and perched aquifer groundwater elevation data reveals two issues. First, according to perched aquifer groundwater elevations shown in revised Figures 2.9.3-1 and 2.9.3-2, the deepest soil vapor sampling port resides at or below the potentiometric surface of the perched aquifer for soil vapor well 46-VW-02. Table 1 (below) lists data from the revised figures and data published in the SNL document *Compilation of Monitoring Well Construction Diagrams Contained in the SNL/ER Project Well Database* (February 2004). According to the revised figures, the water table of

the perched aquifer occurs at approximately 5,080 feet above mean sea level (FAMSL) at this soil vapor well. Table 1 (below) indicates the deepest sampling port of soil vapor well 46-VW-01 [sic] has an elevation of 5,048.51 FAMSL, which is below the water table of the perched aquifer.

Table 1. Soil vapor sample elevation vs. Potentiometric surface elevation

Soil Vapor Wells	46-VW-02	Units
Depth of Deepest Sampling Port ¹	296	ft bgs
Protective Casing Elevation ²	5344.51	FAMSL
Calculated Deepest Sampling Port Elevation ³	5048.51	FAMSL
Nearest Perched Aquifer Contour Line Elevation ¹	5080	FAMSL

ABBREVIATIONS

bgs = below ground surface

FAMSL = feet above mean sea level

ft = feet

FOOTNOTES

¹ Revised Figures 2.9.3-1 and 2.9.3-2

² *Compilation of Monitoring Well Construction Diagrams Contained in the SNL/ER Project Well Database*, Sandia National Laboratories, February 2004.

³ Calculation: Protective Casing Elevation - Deepest Sample Depth = Deepest Sample Elevation

The Permittees must explain how the elevation of the deepest sample port was determined and whether the deepest sample port occurs below the perched aquifer potentiometric surface.

Related to the first issue, the TAG IR states in Section 2.9.3, "[i]n past attempts to sample soil-vapor wells 46-VW-02 and 227-VW-01, the deepest sampling port in each well could not be sampled. It is believed that these deep sampling ports are located within or near the capillary fringe, with the hydrostatic pressure being too great to allow vapor sampling [page 2-36, third paragraph, first two sentences]." The Permittees must explain this statement by elaborating upon the relationship between hydrostatic pressure and soil vapor sampling.

Response:

The soil vapor monitoring wells 46-VW-02 and 227-VW-01 were installed in early 2001 using the air rotary casing hammer drilling technique. The original elevation surveys were located for these wells to confirm that elevations for the two wells shown on well construction diagrams provided to NMED in 2004 were correct. The survey information on the construction diagrams was confirmed to be correct. The table below summarizes the information requested for the two soil vapor wells, and includes:

- ground elevation, in feet above mean sea level, as gleaned from well completion diagrams;
- elevation of the lowest soil vapor ports as determined from the surveyed ground surface elevation;
- elevation of the top of the perched system in December 2004/ January 2005 as shown on revised Figures 2.9.3-1 and 2.9.3-2 of the response to the first NOD (SNL/NM February 2009); and
- elevation of the top of the perched system in December 2008 as shown on Figure R-1 of the response to the first NOD (SNL/NM February 2009).

Data compiled in Support of Comment 2:

Summary of Elevations of Ground Surface, Deepest Soil Vapor Sampling Port, and Top of the Perched System for Soil Vapor Monitoring Wells 46-VW-02 and 227-VW-01

Well Name	Ground Elevation of Well (FAMSL)	Depth of Deepest Soil-Vapor Sampling Port (FBGS)	Elevation of Deepest Sampling Port (FAMSL)	Elevation of Top of Perched Aquifer at Well Location-- December 2004/ January 2005 ^a (FAMSL)	Elevation of Top of Perched Aquifer at Well Location-- December 2008 ^b (FAMSL)
46-VW-02	5341.7	296	5045.7	Approx. 5082	Approx. 5085
227-VW-01	5351.5	275	5076.5	Approx. 5083	Approx. 5082

Notes:

^a As shown on revised Figures 2.9.3-1 and 2.9.3-2 of the response to the first NOD (SNL/NM February 2009).

^b As shown on Figure R-1 of the response to the first NOD (SNL/NM February 2009).

Approx. = Approximately
FAMSL = Feet above mean sea level
FBGS = Feet below ground surface
VW = Vapor Well

As is apparent from the data in the table above, the deepest vapor sampling ports in 46-VW-02 and 227-VW-01 are submerged within the perched aquifer. The liners used to construct the soil-vapor wells are manufactured at an out-of-town facility before borehole drilling. Specifications for the sample port depths were presented to the manufacturer in advance of installation based on estimates of depth to water in the vicinity of the planned vapor wells.

In the case of 46-VW-02, the lateral extent of the perched aquifer was not known, but was assumed to not be present due to several attempts to install a perched aquifer well paired

with nearby groundwater well TJA-3 (regional aquifer well). The discovery of the perched aquifer at 46-VW-02 prompted another attempt at installing a perched aquifer well in the area and TJA-7 was successfully installed. In the case of 227-VW-01, the planned depth of the deepest vapor port was based on groundwater elevations in nearby perched monitoring wells. However, the estimates proved to be off by approximately 6 feet.

Due to saturated conditions neither of the deep sample ports in 46-VW-02 or 227-VW-01 could be sampled for soil vapor. This would also be the case for partially saturated conditions such as what would be found in the capillary fringe. With the viscosity of air being three orders of magnitude less than the viscosity of water the vacuum pump used to sample the vapor through the FLUTE™ sampling tube was not able to overcome the hydrostatic pressure and draw vapor through the pore spaces to the sample port. Therefore the pore spaces saturated or partially saturated with groundwater did not produce soil vapor samples.

3. Specific Comment #20: Section 3.1.3.2, page 3-3, Figure 3.1.3-1

In process of revising Figure 3.1.3-1, the labels for the West Sandia Fault, the Sandia Fault, the Tijeras Fault, and Manzano Base were removed. Additionally, the boundary line between southern Albuquerque and northern Isleta Pueblo is absent suggesting that Isleta Pueblo land abuts the western side of Kirtland Air Force Base (KAFB), where McCormick Ranch is actually located. To maintain consistency with TAG IR Section 3.1.3.2 and TAG IR Figure 3.3.5-2, the Permittees must modify revised Figure 3.1.3-1, as follows:

- **Add a label for the West Sandia Fault and restore the phrase "deeper than perched system."**
- **Revise the West Sandia Fault line to reflect that its location is approximate.**
- **Add a label for the Sandia Fault.**
- **Add a label for the Tijeras Fault.**
- **Add a label for the Coyote Fault.**
- **Add a label for the Manzano Base.**
- **Extend the Isleta Pueblo boundary line to the west.**

The Permittees must submit the revised figure to the NMED.

Response: The suggested changes have been made to Figure 3.1.3-1, and the revised figure is provided in Appendix B.

4. Specific Comment #22: Section 3.1.3.3, page 3-7, Figure 3.1.3-3 and Section 3.3.4.1, page 3-20, 1st paragraph, last two sentences

Specific Comment #23: Section 3.1.3.3, page 3-8, Figure 3.1.3-4

Two key issues arise from Specific Comments #22 and #23 of the NMED's August 1, 2008 NOD and the Permittees' response to both comments. Specific Comment #22 focused on the regional aquifer, and Specific Comment #23 focused on the perched aquifer. The first of the two issues addresses the construction of current water level maps for both the regional aquifer (Specific

Comment #22) and the perched aquifer (Specific Comment #23). The second issue addresses data quality.

Issue # 1: Current water level maps

In the first NOD dated August 1, 2008, NMED requested in Specific Comments #22 and #23 that the Permittees submit new potentiometric surface maps for the regional and perched aquifers using concurrent contemporaneous water levels newly obtained for the TAG wells. NMED also requested that the new maps depict those wells that were excluded due to "anomalous" groundwater elevations.

The Permittees provided new maps, in response to Specific Comments #22 and #23 of the August 1, 2008 NOD. Examination of the new maps raises new questions:

- In the written response to both Specific Comment #22 [sic], the Permittees indicated that one regional well (KAFB-0615) was not used for contouring because its water level elevation significantly differs from surrounding wells. The Permittees explain that the anomaly may be due to the West Sandia Fault, which lies between the excluded regional well (KAFB-0615) and the nearest TAG monitoring well (KAFB-0616), possibly affecting regional water levels. However, the map does not show the West Sandia Fault.
- The submitted figures remain limited to wells designated for TAG despite the existence of additional surrounding monitoring wells that may further understanding of the groundwater systems. For example, different configurations of the regional, perched, and intermediate or merging aquifer systems are evident upon inclusion of water level data from eleven KAFB wells (KAFB-0611, KAFB-0612, KAFB-0613, KAFB-0617, KAFB-0618, KAFB-0619, KAFB-0620, KAFB-0621, KAFB-0622, KAFB-0623, and KAFB-0624). While these eleven wells are not specifically TAG wells, their proximity to TAG wells makes them useful for defining the groundwater systems. Inclusion of these wells will require cooperation using the negotiated agreements of the TAG High Performing Team (HPT).

To further the understanding of the groundwater aquifer systems, the Permittees must revise the water table maps for the regional and perched aquifers. The revisions must include:

- The West Sandia Fault;
- The eleven additional KAFB wells ((KAFB-0611, KAFB-0612, KAFB-0613, KAFB-0617, KAFB-0618, KAFB-0619, KAFB-0620, KAFB-0621, KAFB-0622, KAFB-0623, and KAFB-0624); and
- Reinterpretation of all groundwater systems, as necessary.

The Permittees must resubmit all figures to the NMED.

Issue # 2: Data quality

In the first NOD dated August 1, 2008, NMED requested that the Permittees explain the discrepancies between groundwater elevation data provided in electronic format on March 10, 2008 and the water levels shown in two TAG IR figures (Figures 3.1.3-3 and 3.1.3-4).

In response to the first paragraph of Specific Comment #22 of the August 1, 2008 NOD, the Permittees stated:

"Please disregard the March 2008 data informally transmitted to the NMED by SNL/NM ER staff. At the time of the request, it was unclear why NMED required that data and it was thought that only general water level trends were of interest. The data that were readily available in the electronic format requested by NMED had not been through a quality assurance check. This data set does not supersede the data provided in the TAG IR."

The Permittees' response to Specific Comment #22 indicated this response also applied to Specific Comment #23.

Due to the discrepancy between informal data and published data, the Permittees must provide a groundwater elevation data set, from well installation to the present, in electronic format for all TAG monitoring wells and the eleven additional KAFB wells (KAFB-0611, KAFB-0612, KAFB-0613, KAFB-0617, KAFB-0618, KAFB-0619, KAFB-0620, KAFB-0621, KAFB-0622, KAFB-0623, and KAFB-0624). The data provided in the electronic submittal must undergo "a quality assurance check" and be true and accurate, to best of the Permittees' knowledge.

The Permittees' must submit the data set on a CD. In the interest of maximizing the use of both NMED's and the Permittees' limited resources, NMED urges the Permittees not to submit unreliable data.

Response to Issue # 1: The potentiometric surface maps have been revised to include groundwater elevation data from the eleven non-TAG High Performing Team (HPT) groundwater wells, and the groundwater systems have been reinterpreted, as necessary. Per Comment 1, the groundwater elevations presented in Revised Table A-1 (Appendix A) were used to prepare revised Figures Q-1 and R-1 (Appendix C). These maps were constructed based on December 2008 water level measurements from the 63 existing TAG HPT monitoring network wells, and also include March 2009 water level measurements from the eleven non-TAG HPT wells.

As described in the response to the first NOD (SNL/NM February 2009), the designation of the aquifer system is, at times, ambiguous. This is due to the very complex hydrogeologic system in the study area and the evolution of the conceptual model over time by numerous workers at a variety of agencies. The designations of the aquifer system presented in the revised potentiometric surface maps Q-1 and R-1 (Appendix C), as well as Revised Table B-

1 (Appendix A), are based on the most recent interpretation of the December 2008/March 2009 water level data by Sandia staff hydrogeologists. Technical staff at KAFB, KAFB contractors, and COA personnel may have different interpretations as to which aquifer system their wells are completed in, as is exhibited in the water level data set provided by KAFB (Appendix D).

For the regional aquifer map (revised Figure Q-1), although wells KAFB-0615 and KAFB-0624 are completed in the regional aquifer they were not used for potentiometric surface contouring. As seen on revised Figure Q-1, these wells have anomalous groundwater elevations that were very different than those in surrounding wells. The groundwater elevation in KAFB-0615 is over 500 ft higher than those in the two nearest adjacent monitoring wells (KAFB-0617 and KAFB-0618). The groundwater elevation in KAFB-0615 is believed to represent groundwater conditions that are localized near the Manzanita Mountain front, and that are not representative of the typical regional aquifer in the TAG study area. The groundwater elevation in KAFB-0624 is approximately 300 to 400 ft lower than those in the two nearest adjacent wells (KAFB-0621 and KAFB-0616). The groundwater elevation in KAFB-0624 is believed to be influenced by groundwater withdrawal at City of Albuquerque production well 4Hills-1 approximately 1 mile to the north-northeast.

Well TJA-4 was not used for potentiometric surface contouring for either the perched or regional aquifer maps. The groundwater elevation at TJA-4 is approximately 35 ft lower than the nearest perched aquifer well (TJA-5), and approximately 100 to 150 ft higher than those in the two nearest adjacent monitoring wells (KAFB-0311 and TJA-6). The groundwater elevation in TJA-4 is believed to represent a localized water-bearing zone between the perched system and regional aquifer, in the area where the two aquifers merge.

As an aside, there are no current, negotiated agreements among the members of the TAG HPT. The NMED Hazardous Waste Bureau has not re-convened the HPT since October 2003. The agreement in place at that time were that the responsible parties (Sandia, Kirtland Air Force Base, and the City of Albuquerque) were to collect groundwater analytical data and water level data for the agreed-upon well list for six quarters (October 2003 through December 2004). That data was provided to Sandia and compiled into the TAG Investigation Report and delivered in November 2005, fulfilling the requirements of the agreement that was in place at the time.

Response to Issue # 2: The majority of data requested by NMED is for wells that are not owned or operated by DOE/Sandia: 49 wells are owned by KAFB, 28 wells are owned by DOE/Sandia, and 4 wells are owned by the City of Albuquerque. The requested water level data is provided in two Excel spreadsheet files on a compact disc (Appendix D). One electronic file contains information from the KAFB database on wells owned and operated by KAFB (KAFB was not able to provide water level data for KAFB-0903 or KAFB-8282). The KAFB data is submitted "as is", and reflects the data collection and data management quality assurance procedures practiced by KAFB. The other electronic file contains information from the SNL/NM database on wells owned and operated by the City of Albuquerque and SNL/NM. To the best of our knowledge, the data provided in the electronic submittal of this

response to the second NOD is true and accurate, and supersedes all previously submitted water level data.

Although minor discrepancies may exist between previously-submitted water level data and this submission, the discrepancies are not large enough to produce any notable differences in groundwater flow direction, nor does our understanding of the hydrogeologic conceptual model of the study area change.

References

New Mexico Environment Department (NMED). August 2008. "*Notice of Disapproval: Tijeras Arroyo Groundwater Investigation Report, November 2005, Sandia National Laboratories, EPA ID# NM5890110518 SNL-05-028,*" August 1, 2008.

New Mexico Environment Department (NMED). August 2009. "*Notice of Disapproval: Response to the Notice of Disapproval for the Tijeras Arroyo Groundwater Investigation Report, February 2009 Sandia National Laboratories, EPA ID# NM5890110518 SNL-05-028,*" August 12, 2009.

Sandia National Laboratories/New Mexico (SNL/NM). November 2005. "*Tijeras Arroyo Groundwater Investigation Report,*" Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico. November 22, 2005.

Sandia National Laboratories/New Mexico (SNL/NM). February 2009. "*Response to the Notice of Disapproval for the Tijeras Arroyo Groundwater Investigation Report, February 2009 Sandia National Laboratories, EPA ID# NM5890110518 SNL-05-028,*" Environmental Restoration Project, Sandia National Laboratories, Albuquerque, New Mexico. February 26, 2009.

January 2010

**U.S. Department of Energy/Sandia Corporation Responses
to the New Mexico Environment Department's Comments
in
"Notice Of Disapproval: Response to the Notice of Disapproval for the
Tijeras Arroyo Groundwater Investigation Report, February 2009
Sandia National Laboratories
EPA ID# NM5890110518 SNL-05-028"**

Appendices

Appendix A

Documentation in Support of Second Notice of Disapproval Comment 1:

- Revised Table A-1. December 2008/March 2009 Groundwater Elevations, Tijeras Arroyo Groundwater, Sandia National Laboratories/New Mexico
- Revised Table B-1. TAG HPT Monitoring Well Network Well Completion Data

Revised Table A-1
December 2008/March 2009 Groundwater Elevations
Tijeras Arroyo Groundwater, Sandia National Laboratories/New Mexico

Well Number	Date of Measurement	Depth to Water (FBTOC^a)	Groundwater Elevation (FAMSL^b)
EUBANK-1	12/11/08	552.39	4904.96
EUBANK-2	12/15/08	581.67	4890.05
EUBANK-3	12/15/08	610.42	4885.64
EUBANK-5	12/15/08	619.76	4884.97
KAFB-0213	12/17/08	419.18	4860.15
KAFB-0214	Well is plugged and abandoned—no measurement available		
KAFB-0215	Well is plugged and abandoned—no measurement available		
KAFB-0216	Well is plugged and abandoned—no measurement available		
KAFB-0217	Well is plugged and abandoned—no measurement available		
KAFB-0218	Well is plugged and abandoned—no measurement available		
KAFB-0307	12/16/08	433.13	4928.73
KAFB-0308	12/16/08	449.61	4929.37
KAFB-0309	12/12/08	482.32	4926.81
KAFB-0310	12/12/08	351.17	5062.64
KAFB-0311	12/11/08	423.40	4927.22
KAFB-0312	12/12/08	420.40	5009.10
KAFB-0313	12/12/08	348.99	5067.32
KAFB-0314	12/12/08	415.41	5037.67
KAFB-0315	12/12/08	440.41	5023.03
KAFB-0504	12/16/08	496.58	4858.62
KAFB-0505	12/16/08	507.07	4853.07
KAFB-0506	12/16/08	204.92	5155.88
KAFB-0507	12/16/08	502.02	4854.13
KAFB-0508	12/16/08	498.19	4851.02
KAFB-0510	12/16/08	516.24	4848.19
KAFB-0512	12/16/08	447.16	4853.32
KAFB-0514	12/16/08	347.16	4856.58
KAFB-0516	12/16/08	345.73	4857.24
KAFB-0602	12/12/08	317.80	5045.00
KAFB-0608	12/12/08	293.37	5065.13
KAFB-0609	12/12/08	297.41	5065.79
KAFB-0610	12/12/08	288.55	5068.25
KAFB-0611	3/1/09	462.00	4921.42
KAFB-0612	3/1/09	306.18	5076.60
KAFB-0613	3/1/09	353.59	5034.52
KAFB-0615	12/16/08	190.97	5444.79

Revised Table A-1 (continued)
December 2008/March 2009 Groundwater Elevations
Tijeras Arroyo Groundwater, Sandia National Laboratories/New Mexico

Well Number	Date of Measurement	Depth to Water (FBTOC^a)	Groundwater Elevation (FAMSL^b)
KAFB-0616	12/12/08	442.28	5036.12
KAFB-0617	3/1/09	562.33	4940.78
KAFB-0618	3/1/09	483.74	4923.64
KAFB-0619	3/1/09	389.69	5018.42
KAFB-0620	3/1/09	442.49	4889.48
KAFB-0621	3/1/09	630.92	4936.30
KAFB-0622	3/1/09	544.51	4941.46
KAFB-0623	3/1/09	258.55	5067.72
KAFB-0624	3/1/09	769.77	4643.17
KAFB-0901	12/11/08	473.42	4913.98
KAFB-0903	12/10/08	235.51	5153.45
KAFB-0904	12/12/08	351.86	4937.37
KAFB-1021	12/16/08	486.71	4858.64
KAFB-3391	12/11/08	273.37	5120.56
KAFB-3392	12/12/08	541.46	4850.38
KAFB-8281	12/17/08	551.35	4847.01
KAFB-8282	12/17/08	270.35	5129.90
PGS-2	12/12/08	556.49	4849.13
TA1-W-01	12/11/08	545.29	4855.86
TA1-W-02	12/11/08	527.41	4886.54
TA1-W-03	12/11/08	344.03	5110.33
TA1-W-04	12/11/08	574.63	4883.68
TA1-W-05	12/12/08	576.92	4854.25
TA1-W-06	12/11/08	304.90	5109.53
TA1-W-07	12/11/08	285.02	5117.23
TA1-W-08	12/12/08	307.83	5123.69
TA2-NW1-325	12/12/08	315.30	5103.97
TA2-NW1-595	12/12/08	526.71	4891.88
TA2-SW1-320	12/12/08	315.60	5093.58
TA2-W-01	12/12/08	324.56	5092.76
TA2-W-19	12/10/08	269.49	5079.05
TA2-W-24	12/10/08	445.50	4915.49
TA2-W-25	12/10/08	473.46	4898.73
TA2-W-26	12/10/08	283.57	5089.53
TA2-W-27	12/10/08	277.52	5082.66
TJA-2	12/11/08	275.17	5075.36

Revised Table A-1 (concluded)
December 2008/March 2009 Groundwater Elevations
Tijeras Arroyo Groundwater, Sandia National Laboratories/New Mexico

Well Number	Date of Measurement	Depth to Water (FBTOC^a)	Groundwater Elevation (FAMSL^b)
TJA-3	12/10/08	499.12	4888.77
TJA-4	12/10/08	304.22	5034.27
TJA-5	12/10/08	268.89	5069.77
TJA-6	12/10/08	451.23	4889.26
TJA-7	12/10/08	302.26	5086.34
WYO-3	12/10/08	532.05	4857.37
WYO-4	12/10/08	288.99	5100.91

Notes:

^a FBTOC= Feet below top of casing

^b FAMSL= Feet above mean sea level.

Revised Table B-1
TAG HPT Monitoring Well Network Well Completion Data

Well Identification	Well Owner	Aquifer	Well Completion Elevations (ft amsl)						Sampled 6 Quarters?
			Ground Surface	Top of Casing	Screen Interval		Bottom of Casing	Bottom of Borehole	
					Top	Bottom			
EUBANK-1	COA	Regional	5455.35	5457.35	4905.35	4845.35	4840.35	4825.35	Yes
EUBANK-2	COA	Regional	--	5471.72	--	--	--	--	Yes
EUBANK-3	COA	Regional	--	5496.06	--	--	--	--	Yes
EUBANK-5	COA	Regional	--	5504.73	--	--	--	--	Yes
KAFB-0213	KAFB	Regional	5294.59	5279.33	4916.59	4866.59	4856.59	4844.59	No
KAFB-0214	KAFB	P&A	--	5252.55	--	--	--	--	No
KAFB-0215	KAFB	P&A	--	5260.43	--	--	--	--	No
KAFB-0216	KAFB	P&A	--	5238.94	--	--	--	--	No
KAFB-0217	KAFB	P&A	--	5249.11	--	--	--	--	No
KAFB-0218	KAFB	P&A	--	5266.82	--	--	--	--	No
KAFB-0307	KAFB	Regional	5360.00	5361.86	4955.00	4910.00	4900.00	4858.00	Yes
KAFB-0308	KAFB	Regional	5378.00	5378.98	4915.00	4890.00	4880.00	4858.00	No
KAFB-0309	KAFB	Regional	5408.00	5409.13	4908.00	4883.00	4873.00	4846.00	Yes
KAFB-0310	KAFB	Perched	5410.50	5413.81	5010.50	4965.50	4955.50	4900.50	Yes
KAFB-0311	KAFB	Regional	5349.00	5350.62	4916.00	4891.00	4881.00	4879.00	Yes
KAFB-0312	KAFB	Regional	5427.52	5429.50	4924.52	4899.52	4894.52	4890.52	Yes
KAFB-0313	KAFB	Perched	5414.27	5416.31	5066.27	5046.27	5041.27	4879.27	Yes
KAFB-0314	KAFB	Perched	5451.24	5453.08	5023.24	5003.24	4998.24	4994.24	No
KAFB-0315	KAFB	Perched	5461.40	5463.44	5014.40	4989.40	4984.40	4980.40	Yes
KAFB-0504	KAFB	Regional	5354.23	5355.20	4884.23	4864.23	4854.23	4836.23	No
KAFB-0505	KAFB	Regional	5358.14	5360.14	4862.74	4837.64	4836.84	4834.14	Yes
KAFB-0506	KAFB	Perched	5358.27	5360.80	5158.27	5138.27	5137.57	5089.57	Yes
KAFB-0507	KAFB	Regional	--	5356.15	--	--	--	--	Yes
KAFB-0508	KAFB	Regional	--	5349.21	--	--	--	--	Yes
KAFB-0510	KAFB	Regional	--	5364.43	--	--	--	--	Yes
KAFB-0512	KAFB	Regional	5298.40	5300.48	4874.40	4849.40	4848.40	4826.40	Yes
KAFB-0514	KAFB	Regional	--	5203.74	--	--	--	--	Yes
KAFB-0516	KAFB	Regional	--	5202.97	--	--	--	--	Yes
KAFB-0602	KAFB	Perched	5361.49	5362.80	4924.49	4904.49	4894.49	4866.49	Yes
KAFB-0608	KAFB	Perched	5357.23	5358.50	5050.23	5030.23	5019.23	4982.23	Yes
KAFB-0609	KAFB	Perched	5361.95	5363.20	5045.95	5025.95	5016.95	5006.95	Yes
KAFB-0610	KAFB	Perched	5354.60	5356.80	5021.60	5001.60	4991.60	4959.60	Yes
KAFB-0615	KAFB	Regional	--	5635.76	--	--	--	--	Yes
KAFB-0616	KAFB	Regional	--	5478.40	--	--	--	--	Yes

Refer to footnotes at end of table.

Revised Table B-1 (Continued)
TAG HPT Monitoring Well Network Well Completion Data

Well Identification	Well Owner	Aquifer	Well Completion Elevations (ft amsl)						Sampled 6 Quarters?
			Ground Surface	Top of Casing	Screen Interval		Bottom of Casing	Bottom of Borehole	
					Top	Bottom			
KAFB-0901	KAFB	Regional	5387.13	5387.40	4922.13	4860.13	4850.13	4816.13	No
KAFB-0903	KAFB	Perched	--	5388.96	--	--	--	--	Yes
KAFB-0904	KAFB	Regional	--	5289.23	--	--	--	--	Yes
KAFB-1021	KAFB	Regional	5345.31	5345.35	4865.81	4840.81	4839.81	4835.81	No
KAFB-3391	KAFB	Perched	--	5393.93	--	--	--	--	No
KAFB-3392	KAFB	Regional	5390.73	5391.84	4854.73	4829.73	4828.73	4820.73	No
KAFB-8281	KAFB	Regional	5399.03	5398.36	4855.03	4830.03	4829.03	4826.03	No
KAFB-8282	KAFB	Perched	--	5400.25	--	--	--	--	Yes
PGS-2	SNL/NM	Regional	5405.19	5405.62	4870.19	4840.19	4750.19	4745.19	Yes
					4820.19	4810.19			No
					4780.19	4760.19			No
TA1-W-01	SNL/NM	Regional	5399.10	5401.15	4824.10	4804.10	4798.30	4786.10	Yes
TA1-W-02	SNL/NM	Regional	5414.23	5413.95	4874.23	4854.23	4848.63	4836.23	Yes
TA1-W-03	SNL/NM	Perched	5452.24	5454.36	5115.24	5095.24	5089.64	5089.24	Yes
TA1-W-04	SNL/NM	Regional	5455.55	5458.31	4879.55	4859.55	4853.85	4825.55	Yes
TA1-W-05	SNL/NM	Regional	5431.47	5431.17	4833.97	4813.97	4808.27	4806.47	Yes
TA1-W-06	SNL/NM	Perched	5414.71	5414.43	5114.71	5094.71	5089.11	5084.71	Yes
TA1-W-07	SNL/NM	Perched	5400.08	5402.25	5131.48	5111.48	5110.98	5110.08	No
TA1-W-08	SNL/NM	Perched	5431.96	5431.52	5129.96	5109.96	5104.96	5096.96	Yes
TA2-NW1-325	SNL/NM	Perched	5417.31	5419.27	5122.31	5092.31	5087.01	5086.41	No
TA2-NW1-595	SNL/NM	Regional	5417.28	5418.59	4882.28	4862.28	4819.28	4767.28	Yes
					4832.28	4822.28			No
TA2-SW1-320	SNL/NM	Perched	5407.36	5409.18	5107.76	5087.76	5082.76	5082.56	Yes
TA2-W-01	SNL/NM	Perched	5414.71	5417.32	5102.71	5082.71	5082.71	5076.71	Yes
TA2-W-19	SNL/NM	Perched	5346.26	5348.54	5080.39	5060.39	5060.39	5046.26	Yes
TA2-W-24	SNL/NM	Regional	5359.05	5360.99	4894.05	4874.05	4868.45	4854.05	No
TA2-W-25	SNL/NM	Regional	5369.80	5372.19	4877.80	4857.80	4852.00	4849.80	No
TA2-W-26	SNL/NM	Perched	5371.09	5373.10	5095.09	5075.09	5069.49	5066.09	Yes
TA2-W-27	SNL/NM	Perched	5358.10	5360.18	5083.10	5063.10	5057.50	5051.60	Yes
TJA-2	SNL/NM	Perched	5348.58	5350.53	5073.58	5053.58	5043.58	5038.58	Yes
TJA-3	SNL/NM	Regional	5385.07	5387.89	4889.07	4869.07	4863.37	4863.07	Yes
TJA-4	SNL/NM	Merging	5335.80	5338.49	4975.80	4955.80	4950.10	4936.80	Yes
TJA-5	SNL/NM	Perched	5335.77	5338.66	5068.77	5048.77	5043.07	5037.77	No
TJA-6	SNL/NM	Regional	5337.90	5340.49	4883.00	4863.00	4857.20	4834.90	Yes

Refer to footnotes at end of table.

Revised Table B-1 (Concluded)
TAG HPT Monitoring Well Network Well Completion Data

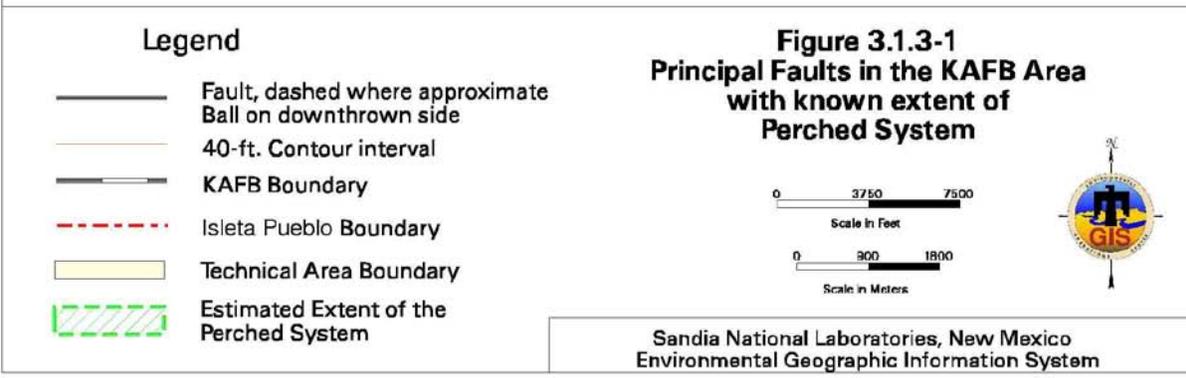
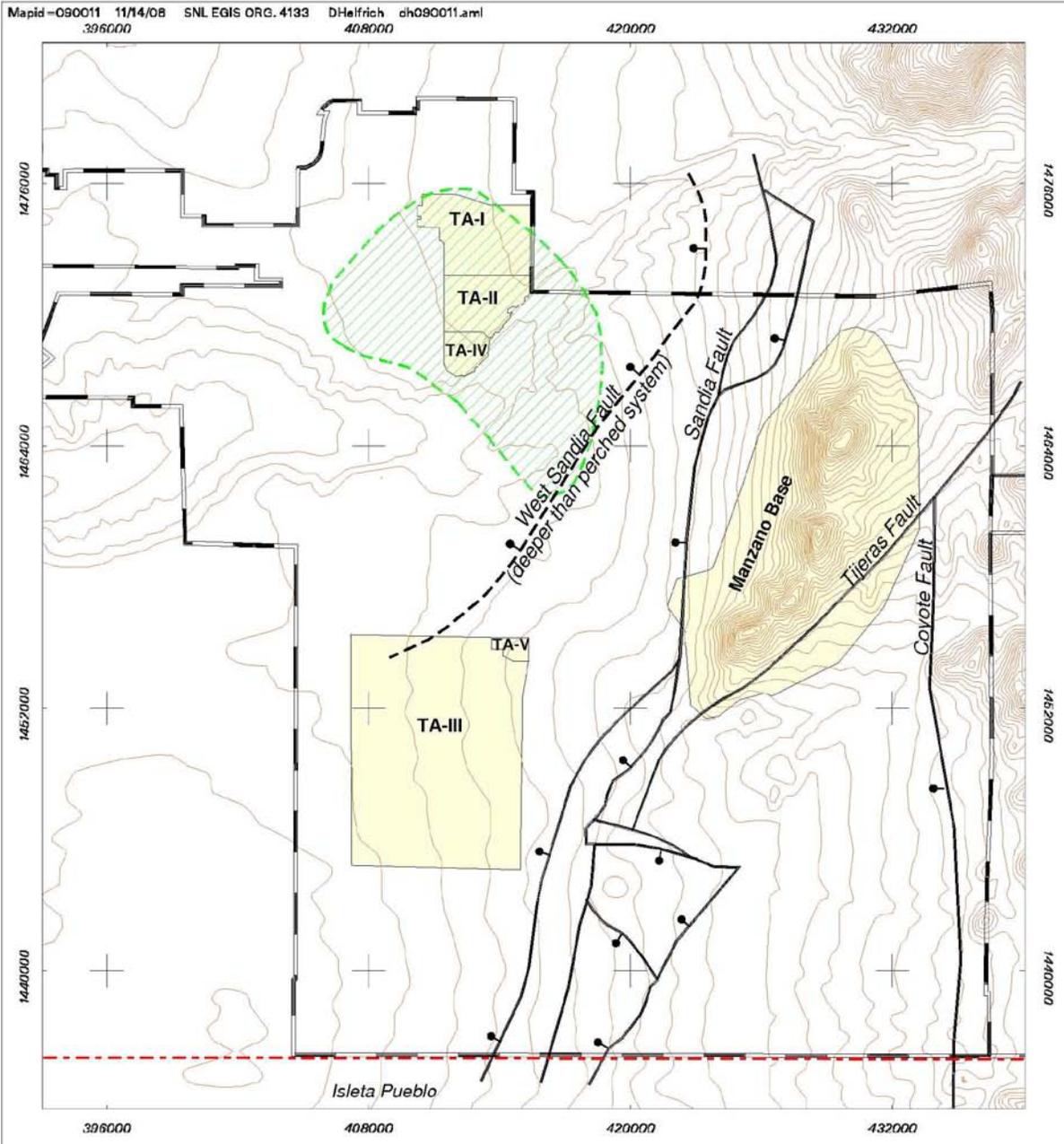
Well Identification	Well Owner	Aquifer	Well Completion Elevations (ft amsl)						Sampled 6 Quarters?
			Ground Surface	Top of Casing	Screen Interval		Bottom of Casing	Bottom of Borehole	
					Top	Bottom			
TJA-7	SNL/NM	Perched	5385.70	5388.60	5095.20	5075.20	5069.40	5069.40	Yes
WYO-3	SNL/NM	Regional	5387.32	5389.42	4867.32	4847.32	4842.32	4832.32	Yes
WYO-4	SNL/NM	Perched	5387.52	5389.90	5112.52	5092.52	5087.52	5082.52	Yes

COA = City of Albuquerque.
ft amsl = Feet above mean sea level.
KAFB = Kirtland Air Force Base.
P&A = Plugged and abandoned (as of December 2008).
SNL/NM = Sandia National Laboratories/New Mexico.
TAG = Tijeras Arroyo Groundwater.
-- = SNL/NM data for well not available or incomplete.

Appendix B

Documentation in Support of Second Notice of Disapproval Comment 3:

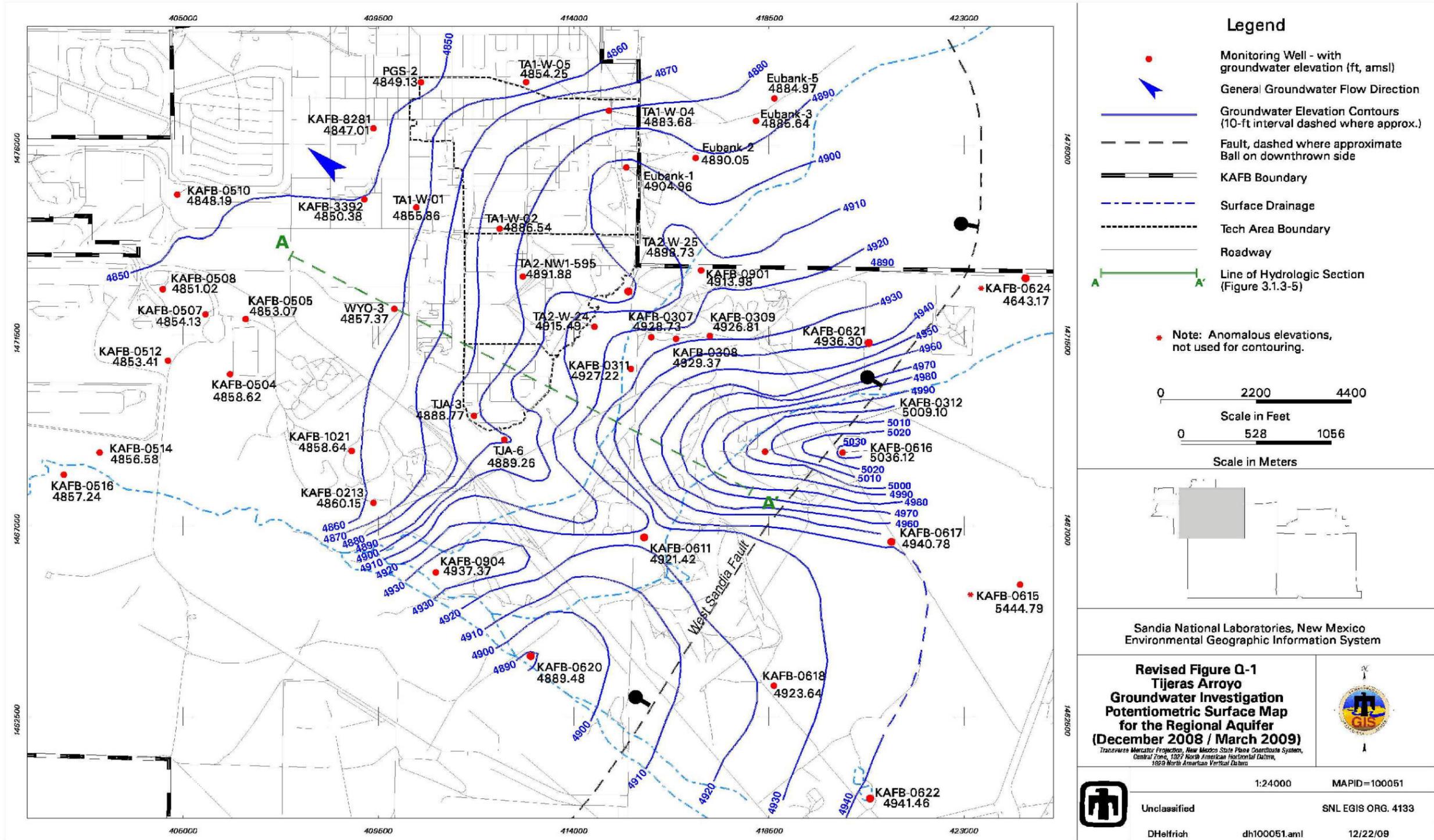
- Replacement Page 3-3 (revised Figure 3.1.3-1)

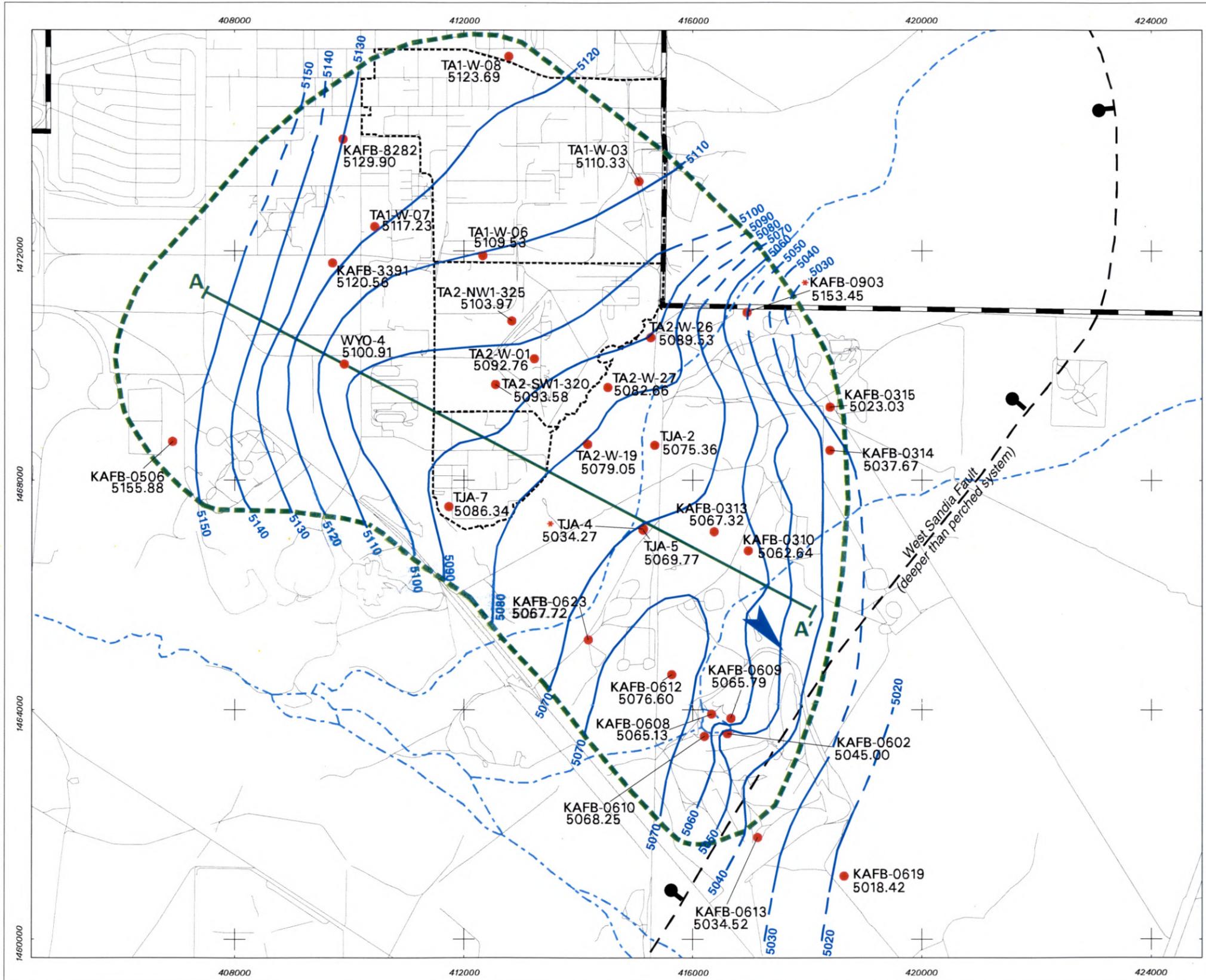


Appendix C

Documentation in Support of Second Notice of Disapproval Comment 4:

- Revised Figure Q-1. Tijeras Arroyo Groundwater Investigation Potentiometric Surface Map for the Regional Aquifer (December 2008/March 2009)
- Revised Figure R-1. Tijeras Arroyo Groundwater Investigation Potentiometric Surface Map for the Perched Aquifer (December 2008/March 2009)





Legend

- Monitoring Well - with groundwater elevation (ft, amsl)
- General Groundwater Flow Direction
- Groundwater Elevation Contours (10-ft interval, dashed = inferred)
- Fault, dashed where approximate Ball on downthrown side
- Extent of Perched System as of November 2005
- KAFB Boundary
- Surface Drainage
- Tech Area Boundary
- Roadway
- Line of Hydrologic Section (Figure 3.1.3-5)

* Note: Anomalous elevations, not used for contouring.

0 1900 3800
Scale in Feet

0 456 912
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

**Revised Figure R-1
Tijeras Arroyo
Groundwater Investigation
Potentiometric Surface Map
for the Perched System
(December 2008 / March 2009)**

Transverse Mercator Projection, New Mexico State Plane Coordinate System,
Central Zone, 1927 North American Horizontal Datum

	1:21600	MAPID=100052
	SNL EGIS ORG. 4133	
DHelfrich	dh100052.aml	01/06/10

Appendix D

Compact Disk containing electronic versions of:

- Excel spreadsheet file provided by KAFB of groundwater elevation data set (from well installation to the present) for KAFB-owned TAG HPT monitoring wells, plus the eleven additional KAFB wells
- Excel spreadsheet file provided by SNL/NM of groundwater elevation data set (from well installation to the present) for SNL/NM-owned and COA-owned TAG HPT monitoring wells
- Word file that contains this response to the second NOD, including revised tables and figures