White Sands Pupfish Status Report
2009

Prepared for the White Sands Pupfish Conservation Team

by

Stephanie Carman
Conservation Services Division
New Mexico Department of Game and Fish
Santa Fe, New Mexico

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I. INTRODUCTION

This annual status report was prepared pursuant to the *Cooperative Agreement for the Protection and Maintenance of the White Sands Pupfish, 1 May 2006* (Cooperative Agreement), part B. 5. g. which states that the New Mexico Department of Game and Fish shall provide "an annual report summarizing the activities of the Conservation Team, White Sands pupfish monitoring program, and other projects concerning the species". This report is an internal document prepared for the signatory agencies to the Cooperative Agreement. Its purpose is to provide information to the Conservation Team on the status of White Sands pupfish and a summary of the issues the Conservation Team has addressed. It was not peer reviewed and should not be cited. The data contained in this report are provisional and may not be used without permission of the author.

II. ACTIVITIES OF THE CONSERVATION TEAM

Monitoring of White Sands pupfish was initiated in 1995 and has been conducted at least once each year since then (Pittenger and Springer 1996; Pittenger 2009). The original sampling protocol involved a random design using minnow traps and hoop nets to capture fish from the four known populations of White Sands pupfish: Salt Creek, Malpais Spring, Lost River, and Mound Spring (Pittenger and Springer 1997). In 2009, John Pittenger, Blue Earth Ecological Consultants, was contracted by the New Mexico Department of Game and Fish (Department) to review the original monitoring protocol and associated data and update the protocol to better reflect the needs of the Conservation Team. In October 2008, Mr. Pittenger participated in the annual monitoring along with the Department, U.S. Fish and Wildlife Service (Service), Holloman Air Force Base (HAFB) and White Sands Missile Range (WSMR), to discuss goals of the monitoring protocol and field-test the new techniques. The Conservation Team reviewed the updated monitoring protocol in late 2008 and the final report was completed in February 2009 (Pittenger 2009). Monitoring, using the new protocol, was completed in October 2009 and the results are presented in Section III of this document.

The Conservation Team reviewed several projects on HAFB and WSMR which had potential to impact White Sands pupfish habitat. These were:

- Test Track Road Construction on HAFB – In November 2008, HAFB notified the Department and the Service that the construction at the intersection of Test Track and Tula Peak roads had expanded into the area of Lost River protected as Essential Habitat under the Conservation Agreement. Construction was immediately halted and the Conservation Team held a series of consultations and site visits to determine the best action(s) to resolve the issue. In 2009, remediation measures, such as silt traps and slope stabilization, were in place and construction was completed.
- Rita's Draw Communication Line and White Sands Pupfish Essential Habitat on HAFB – In July 2009, HAFB notified the Department and the Service that an ongoing fiberoptic communication line project was crossing Rita's Draw, a tributary of Lost River designated as Essential Habitat under the Conservation Agreement. Again, construction was halted until the Department and Service had the opportunity to inspect the site and make recommendations. It was determined that construction was not likely to adversely affect White Sands pupfish habitat and the installation was completed.

- Recreational Development at Lake Holloman, HAFB – In May 2009, the Service and the Department received an Environmental Assessment and FONSI reviewing the impacts of expanded recreational opportunities in the Lake Holloman area, including sport fishing and ATV use. Meetings were held in July and December 2009 to identify the issues including the restriction on bringing nonnative fish into the Tularosa Basin in the Conservation Agreement. Holloman Air Force Base and concerned parties have negotiated appropriate recreational development in the area and the final Environmental Assessment was provided in September 2009. The introduction of sport fishes into the Lake Holloman wetland complex is no longer being considered.
- Development of Mission and Major Capabilities at White Sands Missile Range – In early 2009, WSMR provided the Draft Environmental Impact Statement for Development and Implementation of Range-Wide Mission and Major Capabilities at White Sands Missile Range. Partners submitted comments in July, including conflicts with the Conservation Agreement (e.g., mission activities in Limited Use Areas). The plans are expected to be updated and a Record of Decision is forthcoming.

In 2007, the Service was petitioned to list the White Sands pupfish as endangered as part of a multi-species petition to list 475 species in the Service's Southwest Region. In December 2009, the Service made a positive 90-day finding that the petition presented substantial information indicating that the listing of the White Sands pupfish may be warranted [74 FR 66866]. As a result, the Service has begun a status review for the species and will complete a 12-month finding which will determine whether the listing of White Sands pupfish is warranted under section 4 of the Endangered Species Act.

The operation of two continuous-flow stream gages (White Sands Missile Range, Appendix 1) at Salt Creek at RR 316 (established August 1995) and Malpais Spring (established July 2003 continued through 2008 and 2009. The stream gage are operated and maintained by the U.S. Geological Survey. The summary of the streamflow during 2008 and 2009 (Water Years 2008 through early 2010) is presented in White Sands Missile Range, Appendix 2. The data are preliminary, subject to revision. After the review and certification of the data, the information is available from the national data base accessible on the worldwide web maintained by the U.S. Geological Survey.

Water-quality analyses and physical characteristics of water samples from the seven, established sampling points (White Sands Missile Range, Appendix 1) in the White Sands pupfish habitats were collected by the U.S. Geological Survey in 2008 and 2009 (White Sands Missile Range, Appendix 3). Ephemeral-habitat sampling points are reported on Salt Creek are "dry" if there is no streamflow; disconnected ponds and pools may exist. Instantaneous streamflow measurements are also reported for Salt Creek and Malpais Spring at the time water samples are collected. The data are preliminary, subject to revision. After the review and certification of the data, the information is available from the national data base accessible on the worldwide web maintained by the U.S. Geological Survey.

In FY09, WSMR funded the update and completion of an unpublished U.S. Geological Survey hydrologic data report (1911-2002). The first preliminary draft was reviewed in 2009. A new draft should be available in 2010. The U.S. Geological Survey report is a compilation of all

hydrologic data for surface waters to include springs, seeps, lakes, ponds, and streams in the northern Tularosa Basin on White Sands Missile Range. The report include water chemistry, physical characteristics of water, and streamflow measurements, mean-daily streamflow, peak flows, and other hydrologic data, from 1911 to 2007 by the U.S. Geological Survey and a White Sands pupfish habitat report by New Mexico State University (Turner 1987). Upon completion of all peer reviews, the report will be published as a digital, electronic publication and will be available at the U.S. Geological Survey web page.

White Sands Missile Range in cooperation with the New Mexico Bureau of Geology and Mineral Resources and the U.S. Geological Survey - National Geologic Maps Program, are creating geologic maps to include stratigraphy, geomorphology, and lithology of the White Sands pupfish habitats on WSMR. The base maps are U.S. Geological Survey 7.5 topographic quadrangles with a scale of 1:24000.

1. Phase 2 was funded in September 2008 and work continues through 2010. Phase 2 consists of a geologic map, stratigraphy, geomorphology, lithology, and paleontology of the U.S. Geological Survey 7.5 minute topographic map for Capitol Peak SE. The quadrangle includes Malpais Spring, Malpais Salt Marsh, and part of the Salt Creek White Sand pupfish habitats. A preliminary draft is currently in preparation.
2. Phase 3 was funded in September 2009 and work continues through 2010. Phase 3 consists of a geologic map, stratigraphy, geomorphology, lithology, and paleontology of the U.S. Geological Survey 7.5 minute topographic map for the Lumley Lake NW quadrangle and portions of the Sheep Mountain, Lumley Lake SE, Lumley Lake, and Fifteenmile Lake quadrangles for part of the Salt Creek White Sand pupfish habitat.
3. Phase 2 and Phase 3 also include the analyses of the seasonal salt accumulations to identify the various minerals for Salt Creek, Malpais Spring, and Malpais Salt Marsh.

The geologic map program, stream gages, water-quality analyses of surface water and groundwater, and precipitation gages at weather stations maintained by WSMR, also provide information for the relations of the groundwater in the alluvial aquifer, rainfall-runoff and base flow to surface water streams, ponds, and lakes, and recharge to the aquifers, in the WS pupfish habitats.

White Sands Missile Range in cooperation with the New Mexico Department of Game and Fish, manages the oryx (gemsbok) population within the boundaries of WSMR through the Comprehensive Oryx Management Plan (2000). The plan was completed and signed by both agencies in 2000 to manage and reduce the number of oryx on WSMR. The number of oryx harvested through hunt permits issued by NMDGF within the boundaries of the contiguous federal lands made up of WSMR, San Andres National Widlife Refuge, and HAFB was 1391 during the 2007/08 season and 1224 during the 2008/09 season. The estimated total population on WSMR was 3931 for 2008 and 4060 in 2009.

The U.S. Natural Resources and Conservation Service (NRCS) in cooperation with WSMR are finalizing a multi-year project started in 2005 to map and describe the soils of WSMR. After review and certification, this information will be published on the NRCS worldwide web site.

In late 2008, WSMR contracted an update of a previous draft support document for of an evaluation of potential refugia for the White Sands pupfish Malpais ESU. This document was initiated to prepare further environmental NEPA documentation for the creation of one or more refugia of the Malpais ESU within WSMR. The first preliminary draft was delivered to WSMR in mid-Dec 2009 for review. The next draft in 2010 will be provided for review and comment by the Conservation Team agency representatives.

In 2009, approximately 10,000 gallons of brackish water was used for military construction or other activities from the small construction well (NAD 83: latitude 33^{o} $29^{'}$ 54"; longitude 106^{o} $10^{'}$ 21") located at Oscura Range Center. This is the only production well located within the alluvial aquifer up-gradient from White Sands pupfish perennial habitats on WSMR. All projects and activities at WSMR are required to provide type of use, amount of use, and source of water, if any. All surface-water withdrawals from pupfish habitats were discontinued and prohibited in 1986.

In late 2009, the new Garrison Commander of WSMR was briefed on the issue of non-native fish species in the northern portion of WSMR. Beginning in January 2010, WSMR has contracted with White Sands Technical Services at WSMR to drain one tank and one pond in the northern Tularosa Basin and working with the WSMR Fire Department to drain Anderson Tank in the northern Jornada del Muerto. No pesticides are being used for fauna or flora. The project for these three locations is expected to be completed in 2010.

Several papers on the evolution and genetics of White Sands pupfish by Dr. Craig Stockwell, North Dakota State University, were submitted for review and security clearance to the Conservation Team. Copies of the articles will be provided to the Conservation Team upon publication.

In 2008 and 2009, the WSMR Conservation Team respresentative submitted 14 draft abstracts, presentations, posters, journal articles, invited colloquia, and one dissertation related to White Sands pupfish for Operational Security review and approval for public release. At least one journal article has not been accepted for publication. The authors and coauthors of one or more publication represented several different governmental agencies, universities, and/or museums from Miami University-Oxford, Miami University-Hamilton, Southern Adventist University, New Mexico Department of Game and Fish, North Dakota State University, SUNY College at Oneonta, Stephen F. Austin University, White Sands Missile Range, New Mexico Bureau of Geology and Mineral Resources, The National Air and Space Museum – Smithsonian Institution, and NASA Goddard Space Flight Center.

III. POPULATION STATUS

A. Methods

Pupfish populations were sampled 5-7 November 2009 on WSMR and HAFB following the updated protocol (Pittenger 2009). As stated in the protocol, and agreed upon by the Conservation Team, "the goal for conservation of White Sands pupfish is to maintain viability of the two native populations at Salt Creek and Malpais Spring and to maintain the persistence of replicated populations" (currently, at Lost River). To achieve this goal, three specific conservation goals were identified:

1. Allow a decline in abundance with a maximum cumulative change factor of -2.00 and lasting no more than two consecutive years at the Salt Springs and Range Road 316 sites on Salt Creek and the Upper Marsh and Middle Marsh sites at Malpais Springs
2. Maintain a flat or positive slope in trend, as indicated by simple linear regression of abundance over time, at the Salt Springs and Range Road 316 sites on Salt Creek and the Upper March and Middle Marsh sites at Malpais Springs.
3. Maintain presence of White Sands pupfish in the upper, middle, and lower reaches of Lost River and at the refugium for the Malpais Spring population, should one be established in the future.

To assess achievement of these goals, 30 standard galvanized wire minnow traps were fished overnight at each Salt Springs and Range Road 316 on Salt Creek and the Upper Marsh and Middle Marsh sites at Malpais Springs at specific locations identified in the monitoring protocol and visual surveys are completed in the upper and lower reaches of Lost River each autumn (Pittenger 2009). Results from the current year are then compared with previous years to determine if the population goals are being met. Standard water-chemistry parameters were recorded, as well as depth and flow at each trap set, and photos taken at set points to document habitat status.

B. Salt Creek

1. Salt Springs: Thirty traps were set overnight at the upper Salt Springs site on Salt Creek on 6 November 2009. There was no increase in catch per unit effort from 2008 to 2009 (paired t-test t = -0.90; Table 1, Figure 1). The cumulative change factor from 2007 through 2009 for the Salt Springs population was 2.39 and the regression slope was positive (0.07), indicating that the population is meeting the conservation objectives. Water quality at the site was similar to that documented in previous years (Table 2). Comparison of photo points at the site revealed no significant changes in habitat, although some bank sloughing was observed near the trap sets.

2. Range Road 316: Thirty traps were set downstream of the Range Road 316 crossing on Salt Creek on 5 November 2009 and 40 of the fish collected on 6 November 2009 were taken to Lost River for genetic maintenance (see Section D.2). There was a decrease in catch per unit effort between 2008 and 2009 (t = 4.12); however, the cumulative change factor from 2007 through 2009 was -0.55, meeting the conservation goal for the population (Table 1, Figure 2). The slope of

the regression for the population remained positive (0.32), meeting the second conservation goal for the population. Water quality was similar to that documented in previous years (Table 2). Comparison of the photo points at the site indicated less water in 2009 than in 2008.

C. Malpais Spring

1. Upper Marsh: Thirty traps were set overnight in the Upper Marsh at Malpais Spring on 6 November 2009. Catch of pupfish per unit effort between 2008 and 2009 (t = 1.70) did not change, and the cumulative change factor (-0.51) met the conservation goal (Table 1, Figure 3). However, the slope of the regression characterizing annual catches was negative (-0.33), indicating that the second conservation goal was not met. Water quality was similar to that reported previously (Table 2) and comparison of the photo points at the site indicated further encroachment of wetland vegetation and loss of open water habitat.

2. Middle Marsh: Thirty traps were set overnight in the Middle Marsh at Malpais Spring on 6 November 2009. Catch per unit effort did not change between 2008 and 2009 (t = 1.59) and the cumulative change factor from 2007 through 2009 was 5.36, thus the conservation goal for this location was met (Table 1, Figure 4). The slope of the regression equation describing CPUE was negative (-0.16), but not statistically significant. Water quality was similar to that documented in previous years (Table 2) and comparisons of photo points showed that habitat was also similar.

D. Lost River

1. Presence/Absence Monitoring: Visual surveys to document presence/absence of White Sands pupfish were conducted at the upper and lower sites on Lost River on 6 November 2009. White Sands pupfish was verified present (Table 3), meeting the conservation goal for this location. Water-quality parameters were similar to that recorded in previous years (Table 2) and comparison of photo points showed little change since 2008.

2. Genetic Maintenance: Forty White Sands pupfish were collected at Salt Creek, RR 316, and moved to Lost River on 6 November 2009 for genetic maintenance of the replicate population. Twenty fish were placed at each the upper and lower sites after completion of visual monitoring.

E. Mound Springs

Although not required in the monitoring protocol, a visual survey of White Sands pupfish and habitat at Mound Spring on WSMR was completed on 6 November 2009. Presence of White Sands pupfish was verified in the upper pond (low numbers), but no fish was seen in the lower pond. Aquatic invertebrates and algae were also collected for collaborators (B.K. Lang, NMDGF and B. Bixby, UNM, respectively). Water-quality parameters were similar to those documented in previous years (Table 2) and comparison of photo points showed habitat similar to 2008.

Table 1. White Sands Pupfish Population Catch Per Unit Effort Summary Statistics 2009.

	Salt Creek – Salt Springs	Salt Creek – RR316	Malpais Spring – Upper	Malpais Spring – Middle
2008 Mean Abundance (fish/hour)	1.09	8.11	3.78	0.75
2009 Mean Abundance (fish/hour)	3.92	3.66	2.56	0.29
2008-2009 Abundance Paired T-Test	$t_{1,29}$ = -0.90, p = 0.38	$t_{1,29}$ = 4.12, p = 0.0003	$t_{1,29}$ = 1.70, p = 0.10	$t_{1,29}$ = 1.59, p = 0.12
Power Analysis of T-Test	0.23	1.00	0.65	0.50
1.0 Change Factor Power	0.10	1.00	1.00	0.84
N Necessary to Detect Significant Change	1484	12	6	27
Two Year Cumulative Change Factor [(2007-2008)+(2008-2009)]	-0.19+2.58 = 2.39	-0.27-0.55 = -0.82	-0.19-0.32 = -0.51	5.38-0.02 = 5.36
Slope of Regression Line	0.07	0.32	-0.33	-0.16

Table 2. Physical Water-quality Parameters at White Sands Pupfish Monitoring Sites, 2009. Time of measurement is shown in parenthesis beneath the site name.

Parameter	Salt Creek – Salt Springs (1448)	Salt Creek – RR316 (1200)	Malpais Spring – Upper (1230)	Malpais Spring – Middle (1500)	Lost River – Lower (1015)	Lost River – Upper (1140)	Mound Spring – Upper (1610)
Temperature (°C)	15.7	10.8	17.6	11.5	9.6	15.5	17.7
Dissolved Oxygen (mg/L)	17.5	8.45	8.32	11.8	2.73	12.34	10.48
Dissolved Oxygen (% saturation)			88.3	110.2	26.5	151.5	112.0
Conductivity (mS)	33.27	26.62	5.00	44.79	20.62	43.92	40.26
Specific Conductivity (mS)	40.33	36.62	5.12	6.04	29.34	54.3	48.78
Salinity (ppt)	25.9	23.1	3.2	3.3	18.1	35.9	2.6
Average Depth of Trap Set (m)	0.74	0.34	0.32	0.36			

Figure 1. Density of White Sands Pupfish at Salt Creek, Salt Springs, 1995 through 2009.

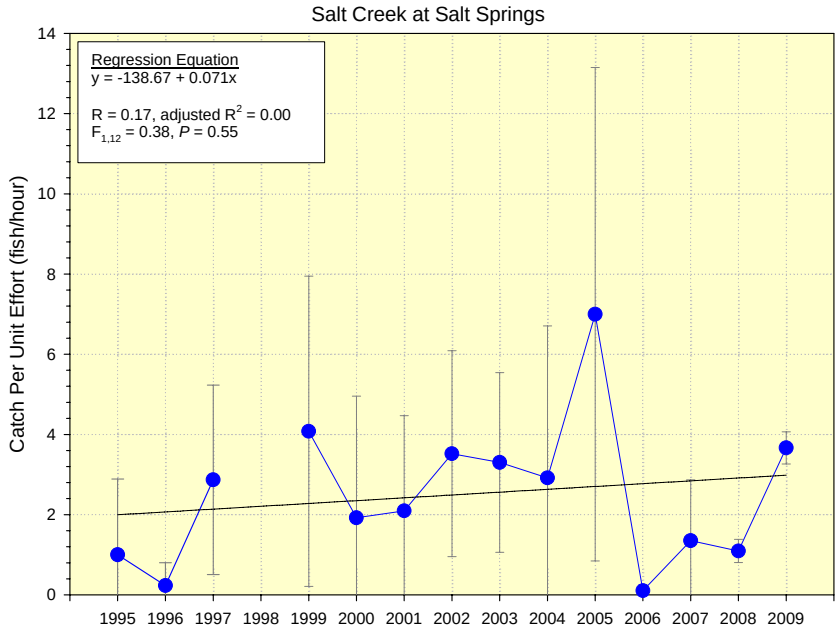

Figure 2. Density of White Sands Pupfish at Salt Creek, RR 316, 1995 through 2009.

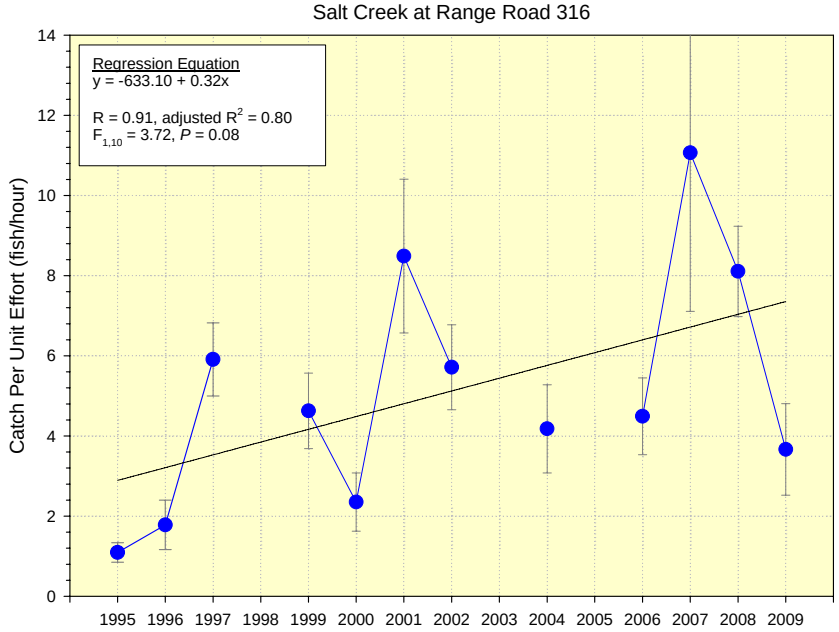

Figure 3. Density of White Sands Pupfish at Malpais Spring, Upper Marsh, 1995 through 2009.

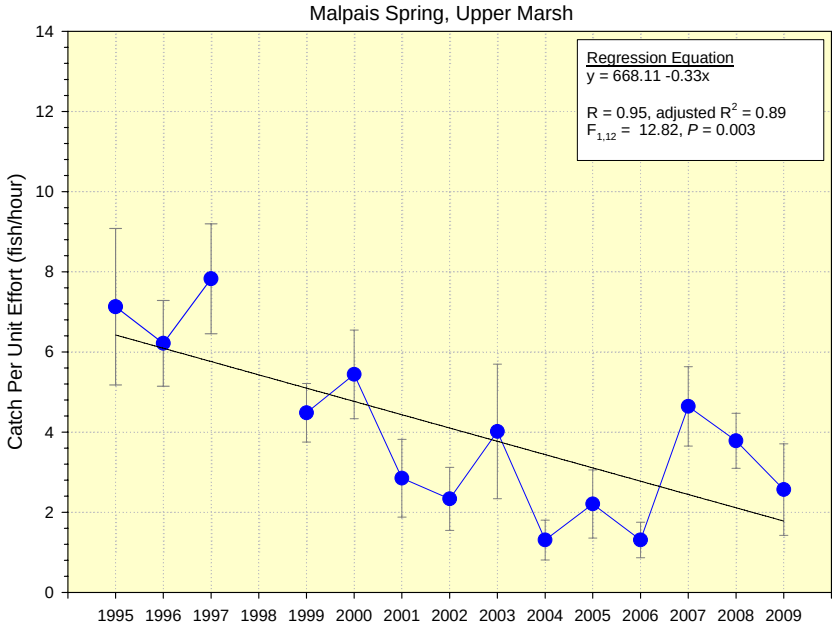

Figure 4. Density of White Sands Pupfish at Malpais Spring, Middle Marsh, 1995 through 2009.

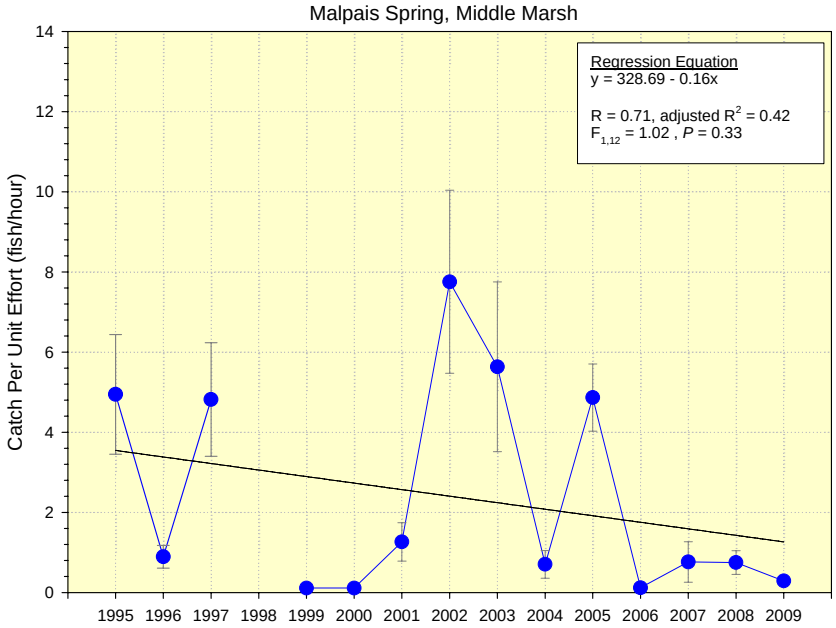

Table 3. Visual Monitoring of White Sands Pupfish, 2009. Cloud cover was estimated at less than 5%.

	Upper – 1st pass	Upper – 2nd Pass	Lower – 1st Pass	Lower – 2nd Pass
Distance	224 ft	224 ft	167 ft	167 ft
Time	8 minutes	5 minutes	3 minutes	3 minutes
Fish Estimate	1000-1500	500-1000	2000-3000	1500-2000

IV. RECOMMENDATIONS FOR WHITE SANDS PUPFISH CONSERVATION

A. Salt Creek Populations: Annual monitoring of White Sands pupfish populations in Salt Creek indicates that catch rates are stable and not declining. Currently, there are no known threats (i.e., impacts from military missions, nonnative species, water withdrawals, ungulate grazing) to this population that are not addressed by the Conservation Agreement.

B. Malpais Spring Populations: Annual monitoring indicates that catch rates for White Sands pupfish populations in Malpais Springs are declining in the Upper Marsh area. This is thought to be caused by changes in habitat; in early years of sampling, water was confined to channels where pupfish were concentrated and thus catch rates were higher. Since the removal of feral horses, the area has become a large wetland complex, with reduced areas of open water to concentrate the fish. Many pupfish, including juveniles, are visually observed throughout the shallows of the wetland complex, indicating that the population may not be imperiled, simply less concentrated and more difficult to sample. To better understand the trends seen in the monitoring data and determine if additional conservation actions are warranted, further investigation is recommended:
    a. A study should be completed comparing the White Sands pupfish population monitoring data to Malpais Spring habitat changes. In addition to the limited habitat data collected as part of White Sands pupfish monitoring, WSMR has vegetation monitoring transects in the area that may be available for the analysis.
    b. An investigation of White Sands pupfish habitat use in the Malpais Spring area should be completed to better understand the requirements of the species throughout its life history (spawning, nursery, juvenile and adult habitat needs).

    To protect against catastrophic events, the Malpais Spring White Sands pupfish population needs to be replicated at a suitable site. The Conservation Team has been working on this for several years, including assessing available sites, and efforts should continue to achieve this as soon as possible.

C. Lost River Population: To preserve the integrity of the Lost River White Sands pupfish population as a replicate for the Salt Creek population, genetic maintenance (moving of 40 fish per year) should continue through 2017 with tissue samples collected in 2013 and 2017 to evaluate the success, as recommended in the monitoring protocol.

D. Threat from Golden Algae: Toxins produced by golden algae *Prymnesium parvum* have caused large-scale fish kills in the Pecos River in New Mexico and Texas since the

1980s, with increasing frequency, extent, and severity (Rhodes and Hubbs 1992, Denny 2006). Because of the proximity of the Pecos Basin to the Tularosa Basin, the similarity in water chemistry and the ability of the algae to move on waterfowl or even in wind currents, White Sands pupfish populations may be threatened. To minimize potential for catastrophic loss of populations, the following actions are recommended:

a. Decontamination of all clothing and equipment should be completed prior to entering White Sands pupfish habitats. This includes, but is not limited to traps, water-quality meters, and waders. Standard decontamination techniques can be found on the internet (see http://www.haccp-nrm.org/ for examples) and most practical for field gear associated with White Sands pupfish management include rinsing all equipment in a 10% bleach solution before and between sites. An overview of golden algae management methods in Texas, including recommended decontamination, can be found at: http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_t3200_1404.pdf
b. Refuge populations of both remnant populations of White Sands pupfish (Salt Creek and Malpais Springs) should be maintained in a secure, controlled facility. It is suggested that these populations be held in an area not threatened by golden algae, in a facility experienced in holding native fish, and a genetic management plan be employed to maintain their suitability as conservation populations.
c. Speculative monitoring for golden algae has proven unreliable unless a fish-killing bloom is underway. For this reason, we are not recommending monitoring for golden algae. However, any notice of frothy or golden water and dead fish should immediately be reported to New Mexico Department of Game and Fish, Shawn Denny, 505.624.6135, shawn.denny@state.nm.us.

E. Habitat: The majority of identified threats to White Sands pupfish habitat, including feral horse grazing and trampling and impacts by military missions, have been significantly reduced by the implementation of the Conservation Agreement. However, events of the past year, including construction projects that have inadvertently occurred in Essential Habitat, and proposals to expand military and recreational activities in the Tularosa Basin indicate that vigilance is required. To that end, it is recommended that:

a. All projects with the potential to impact White Sands pupfish populations or Limited or Essential Habitat, must be reviewed by the Conservation Team, as stated in the Conservation Plan.
b. A meeting of the Conservation Team should be held annually to discuss planned and potential projects which may impact White Sands pupfish and foster early coordination between the signatories.

V. LITERATURE CITED

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WHITE SANDS MISSILE RANGE APPENDICES

APPENDIX 1.--LOCATION MAP OF USGS STREAM GAGES AND ANNUAL WATER-QUALITY SAMPLING SITES

APPENDIX 2.--USGS CONTINUOUS STREAMFLOW RECORDS, 2008-2009

APPENDIX 3.--USGS QUALITY-OF-WATER RECORDS, 2008-2009

APPENDIX 1.--LOCATION MAP OF USGS STREAM GAGES AND ANNUAL WATER-QUALITY SAMPLING SITES

APPENDIX 2.--USGS CONTINUOUS STREAMFLOW RECORDS, 2008-2009

The data are preliminary, subject to revision, after review and certification. After the review and certification of the data, the information is available from the national data base accessible on the worldwide web maintained by the U.S. Geological Survey

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480594 MALPAIS SPRING NR OSCURA, NM TYPE:SPRING AGENCY:USGS STATE:35 COUNTY:035
LATITUDE: 331715 LONGITUDE: 1061833 NAD83 GEOLOGIC UNIT:110AVMB DATUM: 4140 4140
Date Processed: 2009-10-20 07:48 By swreview
Lowest aging status in period is APPROVED
DD #2, from datalogger
Discharge, cubic feet per second
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.8	e1.7	e1.9	1.8	2.2	1.8	1.4	1.3	0.88	0.78	1.8	e1.6
2	e1.8	e1.7	e1.9	1.9	2.3	1.9	1.4	1.2	0.85	0.85	1.5	2.4
3	e1.8	e1.7	e1.8	1.9	2.3	1.8	1.4	1.2	0.81	0.75	1.5	2.6
4	e1.8	e1.8	e1.8	2.0	2.3	1.8	1.3	1.3	0.79	0.70	1.5	2.4
5	e1.8	e1.8	e1.8	2.0	2.2	1.8	1.4	1.2	0.75	0.64	1.4	2.3
6	e1.8	e1.9	e1.8	2.0	2.2	1.7	1.3	1.2	0.67	0.66	1.4	2.2
7	e1.8	e1.9	e1.8	2.0	2.2	1.7	1.4	1.2	0.69	0.67	e1.0	2.1
8	e1.8	e1.9	e1.8	2.0	2.3	1.8	1.4	1.2	0.72	0.73	1.5	2.2
9	e1.8	e1.9	e1.8	2.1	2.2	1.8	1.4	1.2	0.74	0.76	e1.1	2.1
10	e1.7	e1.9	e1.8	2.1	2.3	1.7	1.4	1.2	0.75	1.3	1.4	2.2
11	e1.7	e2.0	e1.8	2.1	2.3	1.7	1.3	1.1	0.78	1.7	e1.00	2.5
12	e1.7	e2.0	e1.8	2.1	2.1	1.7	1.4	1.2	0.83	e1.6	e1.00	3.0
13	e1.7	e2.0	e1.8	2.1	2.2	1.8	1.5	1.1	0.72	1.5	e1.00	2.7
14	e1.7	e2.0	e1.8	2.1	2.1	1.8	1.5	1.1	0.70	1.5	e1.00	2.5
15	e1.7	e2.0	e1.8	2.1	2.1	1.7	1.5	1.1	0.73	1.3	e1.00	2.3
16	e1.7	e2.0	e1.7	2.1	2.4	1.9	1.5	1.3	0.71	1.2	e1.3	2.3
17	e1.7	e1.9	e1.7	2.1	2.3	1.8	1.5	1.3	0.70	e1.3	e2.2	2.3
18	e1.7	e1.9	e1.7	2.0	2.2	1.6	1.5	1.4	0.71	1.1	e1.9	2.1
19	e1.7	e1.9	e1.7	2.0	2.1	1.6	1.5	1.3	0.72	1.0	e1.7	2.0
20	e1.7	e1.9	e1.7	2.1	2.1	1.7	1.6	1.2	0.78	0.86	e2.1	2.2
21	e1.7	e1.8	e1.7	2.1	2.1	e1.6	1.5	1.1	e1.7	0.85	e2.0	2.1
22	e1.7	e1.8	e1.7	2.1	2.1	e1.6	1.5	1.1	0.79	0.84	e1.8	2.0
23	e1.7	e1.8	e1.7	2.1	2.1	1.6	1.4	1.2	0.72	0.80	e1.9	1.9
24	e1.7	e1.8	e1.7	2.2	2.0	1.5	1.4	1.2	0.77	e1.0	e1.4	1.9
25	e1.7	e1.9	e1.7	2.2	2.0	1.5	1.4	1.2	0.80	1.1	e1.3	1.8
26	e1.7	e1.9	e1.7	2.2	1.8	1.6	1.3	1.2	0.82	e1.5	e1.3	1.8
27	e1.7	e1.9	e1.7	2.2	1.9	1.5	1.3	1.0	0.85	2.0	2.2	1.8
28	e1.7	e1.9	e1.7	2.3	1.9	1.5	1.3	0.98	0.81	1.8	2.5	1.8
29	e1.7	e1.9	1.8	2.3	1.9	1.5	1.3	0.98	0.76	e2.3	1.8	1.8
30	e1.7	e1.9	1.9	2.4	---	1.5	1.3	0.95	0.74	2.1	1.9	1.7
31	e1.7	---	1.9	2.2	---	1.6	---	0.90	---	1.8	e1.3	---
TOTAL	53.6	56.4	54.9	64.9	62.2	52.1	42.3	36.11	23.79	36.99	47.60	64.6
MEAN	1.73	1.88	1.77	2.09	2.14	1.68	1.41	1.16	0.79	1.19	1.54	2.15
MAX	1.8	2.0	1.9	2.4	2.4	1.9	1.6	1.4	1.7	2.3	2.5	3.0
MIN	1.7	1.7	1.7	1.8	1.8	1.5	1.3	0.90	0.67	0.64	1.0	1.6
AC-FT	106	112	109	129	123	103	84	72	47	73	94	128

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2008, BY WATER YEAR (WY)

MEAN	1.42	1.62	1.47	1.75	2.05	2.01	1.68	1.61	1.29	1.42	1.46	1.51
MAX	1.73	2.25	1.81	2.10	2.28	2.52	1.92	2.16	1.74	2.09	1.96	2.15
(WY)	2008	2007	2005	2005	2007	2004	2007	2007	2005	2007	2006	2008
MIN	0.97	1.23	1.15	1.27	1.81	1.68	1.41	1.16	0.79	1.15	0.81	0.89
(WY)	2004	2006	2007	2004	2006	2008	2008	2008	2008	2004	2003	2003

SUMMARY STATISTICS	FOR 2007 CALENDAR YEAR		FOR 2008 WATER YEAR		WATER YEARS 2003 - 2008	
ANNUAL TOTAL	695.42		595.49			
ANNUAL MEAN	1.91		1.63		1.63	
HIGHEST ANNUAL MEAN					1.88	2007
LOWEST ANNUAL MEAN					1.45	2004
HIGHEST DAILY MEAN	3.0	Jul 27	3.0	Sep 12	3.5	May 28 2005
LOWEST DAILY MEAN	0.89	Jan 1	0.64	Jul 5	0.64	Jul 5 2008
ANNUAL SEVEN-DAY MINIMUM	1.0	Jan 1	0.70	Jul 3	0.70	Jul 3 2008
MAXIMUM PEAK FLOW			12	Aug 28	12	Feb 11 2005
MAXIMUM PEAK STAGE			0.37	Aug 17	0.69	Feb 11 2005
INSTANTANEOUS LOW FLOW			0.58	Jun 30	0.58	Jun 30 2008
ANNUAL RUNOFF (AC-FT)	1380		1180		1180	
10 PERCENT EXCEEDS	2.3		2.2		2.2	
50 PERCENT EXCEEDS	1.9		1.7		1.6	
90 PERCENT EXCEEDS	1.7		0.85		1.1	

e Estimated

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480594 MALPAIS SPRING NR OSCURA, NM TYPE:SPRING AGENCY:USGS STATE:35 COUNTY:035
LATITUDE: 331715 LONGITUDE: 1061833 NAD83 GEOLOGIC UNIT:110AVMB DATUM: 4140 4140
Date Processed: 2010-02-18 13:35 By swreview
Lowest aging status in period is APPROVED
DD #2, from datalogger
Discharge, cubic feet per second
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.2	2.5	1.8	1.6	2.0	2.0	2.6	2.4	1.7	2.8	4.5
2	1.8	2.2	2.6	1.8	1.9	2.1	1.9	2.7	2.2	1.7	2.8	4.5
3	1.7	2.2	2.5	1.7	2.4	2.0	2.0	2.6	2.2	2.0	2.8	3.4
4	1.7	2.3	2.5	1.7	2.3	2.1	1.9	2.5	2.1	2.2	3.1	3.4
5	2.0	2.3	2.5	1.7	2.4	2.1	2.0	2.5	2.1	1.9	3.0	2.7
6	2.6	2.2	2.5	1.7	2.4	2.1	e2.0	2.5	2.0	2.2	3.5	2.6
7	e1.6	2.2	2.4	1.7	2.4	2.1	e2.1	2.5	2.0	2.9	3.8	2.7
8	2.2	2.2	2.4	1.7	2.4	2.1	e2.1	2.5	2.1	2.4	3.5	2.7
9	2.2	2.3	2.3	1.7	2.4	2.1	2.2	2.4	2.1	2.1	3.1	2.6
10	e1.4	2.3	2.2	1.5	2.3	2.1	2.2	2.5	2.0	2.0	2.9	2.5
11	2.2	2.2	2.3	1.6	2.1	2.1	2.3	2.3	1.9	2.2	3.2	2.8
12	2.3	2.2	2.3	1.6	2.2	2.1	2.3	2.3	1.9	2.2	3.5	2.9
13	2.1	2.1	2.3	1.6	2.1	2.3	2.2	2.3	1.8	2.2	3.3	2.6
14	2.2	2.1	2.2	1.7	2.1	2.2	2.2	2.4	1.9	2.6	3.9	2.3
15	2.3	2.0	2.1	1.7	2.1	2.1	2.3	2.2	1.8	3.3	4.5	2.4
16	2.1	2.0	2.2	1.6	2.1	2.1	2.3	2.1	1.8	3.3	4.9	2.3
17	2.0	2.1	2.1	1.5	2.2	2.2	2.3	2.2	1.8	3.3	3.5	2.8
18	2.0	2.1	2.2	1.5	2.1	2.1	2.3	2.2	1.7	3.1	3.1	2.8
19	2.0	2.2	2.2	1.5	2.1	2.1	2.1	2.1	1.8	3.0	3.0	2.8
20	2.0	2.2	2.1	1.5	2.2	2.1	2.1	2.0	1.7	3.1	2.9	3.9
21	2.0	2.2	2.0	1.6	2.1	2.0	2.3	2.0	1.6	3.0	2.9	4.4
22	2.0	2.2	2.1	1.5	2.1	2.1	2.7	2.3	1.6	2.7	3.0	4.0
23	2.0	2.3	2.1	1.4	2.1	2.1	2.7	2.4	1.6	2.9	3.0	4.2
24	2.0	2.2	2.0	1.4	2.1	2.0	2.7	2.4	1.5	3.1	3.2	4.2
25	2.0	2.2	2.1	1.7	2.2	2.1	2.5	2.5	1.3	3.6	4.6	4.2
26	2.0	2.5	2.1	1.6	2.0	2.3	2.7	2.4	1.4	3.1	4.4	3.8
27	1.9	2.7	1.8	1.6	2.0	2.3	2.7	2.2	1.4	3.1	4.1	3.7
28	2.0	2.8	1.8	1.6	1.9	2.3	2.8	2.2	1.7	3.1	4.2	3.7
29	2.1	2.7	1.9	1.6	---	2.2	2.7	2.1	2.0	2.9	3.8	3.6
30	2.2	2.5	1.9	1.5	---	2.0	2.8	2.2	1.7	3.1	3.5	3.5
31	2.2	---	1.8	1.6	---	1.9	---	2.5	---	3.1	4.0	---
TOTAL	62.6	67.9	68.0	49.9	60.3	65.5	69.4	72.6	55.1	83.1	107.8	98.5
MEAN	2.02	2.26	2.19	1.61	2.15	2.11	2.31	2.34	1.84	2.68	3.48	3.28
MAX	2.6	2.8	2.6	1.8	2.4	2.3	2.8	2.7	2.4	3.6	4.9	4.5
MIN	1.4	2.0	1.8	1.4	1.6	1.9	1.9	2.0	1.3	1.7	2.8	2.3
AC-FT	124	135	135	99	120	130	138	144	109	165	214	195

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2003 - 2009, BY WATER YEAR (WY)

MEAN	1.52	1.73	1.59	1.73	2.07	2.03	1.79	1.73	1.38	1.63	1.75	1.76
MAX	2.02	2.26	2.19	2.10	2.28	2.52	2.31	2.34	1.84	2.68	3.48	3.28
(WY)	2009	2009	2009	2005	2007	2004	2009	2009	2009	2009	2009	2009
MIN	0.97	1.23	1.15	1.27	1.81	1.68	1.41	1.16	0.79	1.15	0.81	0.89
(WY)	2004	2006	2007	2004	2006	2008	2008	2008	2008	2004	2003	2003

SUMMARY STATISTICS	FOR 2008 CALENDAR YEAR		FOR 2009 WATER YEAR		WATER YEARS 2003 - 2009	
ANNUAL TOTAL	629.09		860.7			
ANNUAL MEAN	1.72		2.36		1.75	
HIGHEST ANNUAL MEAN					2.36	2009
LOWEST ANNUAL MEAN					1.45	2004
HIGHEST DAILY MEAN	3.0	Sep 12	4.9	Aug 16	4.9	Aug 16 2009
LOWEST DAILY MEAN	0.64	Jul 5	1.3	Jun 25	0.64	Jul 5 2008
ANNUAL SEVEN-DAY MINIMUM	0.70	Jul 3	1.5	Jan 18	0.70	Jul 3 2008
MAXIMUM PEAK FLOW			6.9	Aug 15	12	Feb 11 2005
MAXIMUM PEAK STAGE			0.18	Aug 15	0.69	Feb 11 2005
INSTANTANEOUS LOW FLOW			0.93	Jun 13	0.58	Jun 30 2008
ANNUAL RUNOFF (AC-FT)	1250		1710		1270	
10 PERCENT EXCEEDS	2.3		3.2		2.3	
50 PERCENT EXCEEDS	1.8		2.2		1.7	
90 PERCENT EXCEEDS	0.85		1.7		1.1	

e Estimated

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480594 MALPAIS SPRING NR OSCURA, NM TYPE:SPRING AGENCY:USGS STATE:35 COUNTY:035
LATITUDE: 331715 LONGITUDE: 1061833 NAD83 GEOLOGIC UNIT:110AVMB DATUM: 4140 4140
Date Processed: 2010-02-18 13:44 By swreview
Lowest aging status in period is WORKING
DD #2, from datalogger
Discharge, cubic feet per second
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	2.7	3.6	2.8	---	---	---	---	---	---	---	---
2	3.4	2.7	3.5	2.8	---	---	---	---	---	---	---	---
3	3.8	2.7	3.5	2.8	---	---	---	---	---	---	---	---
4	3.4	2.7	3.7	2.7	---	---	---	---	---	---	---	---
5	3.3	2.8	3.8	2.8	---	---	---	---	---	---	---	---
6	3.2	2.7	3.7	2.7	---	---	---	---	---	---	---	---
7	3.3	2.9	3.5	2.6	---	---	---	---	---	---	---	---
8	3.3	3.3	3.5	2.6	---	---	---	---	---	---	---	---
9	3.2	3.2	3.4	2.6	---	---	---	---	---	---	---	---
10	3.2	3.1	3.4	2.6	---	---	---	---	---	---	---	---
11	3.1	3.2	3.3	2.6	---	---	---	---	---	---	---	---
12	3.0	3.2	3.4	2.5	---	---	---	---	---	---	---	---
13	2.9	3.2	3.3	---	---	---	---	---	---	---	---	---
14	2.8	3.2	3.3	---	---	---	---	---	---	---	---	---
15	2.7	3.2	3.3	---	---	---	---	---	---	---	---	---
16	2.7	3.2	3.3	---	---	---	---	---	---	---	---	---
17	2.7	3.2	3.3	---	---	---	---	---	---	---	---	---
18	2.7	3.2	3.2	---	---	---	---	---	---	---	---	---
19	2.8	3.2	3.2	---	---	---	---	---	---	---	---	---
20	2.9	3.2	3.2	---	---	---	---	---	---	---	---	---
21	3.1	3.2	3.2	---	---	---	---	---	---	---	---	---
22	2.8	3.0	3.2	---	---	---	---	---	---	---	---	---
23	2.8	3.0	3.2	---	---	---	---	---	---	---	---	---
24	2.8	3.0	3.1	---	---	---	---	---	---	---	---	---
25	2.8	3.0	3.1	---	---	---	---	---	---	---	---	---
26	2.8	3.0	3.0	---	---	---	---	---	---	---	---	---
27	2.9	3.2	2.9	---	---	---	---	---	---	---	---	---
28	3.0	3.2	3.0	---	---	---	---	---	---	---	---	---
29	2.9	3.7	3.0	---	---	---	---	---	---	---	---	---
30	2.7	3.6	3.0	---	---	---	---	---	---	---	---	---
31	2.7	---	2.8	---	---	---	---	---	---	---	---	---
TOTAL	93.1	92.7	101.9	---	---	---	---	---	---	---	---	---
MEAN	3.00	3.09	3.29	---	---	---	---	---	---	---	---	---
MAX	3.8	3.7	3.8	---	---	---	---	---	---	---	---	---
MIN	2.7	2.7	2.8	---	---	---	---	---	---	---	---	---
AC-FT	185	184	202	---	---	---	---	---	---	---	---	---

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480595 SALT CREEK NEAR TULAROSA, NM TYPE:STREAM AGENCY:USGS STATE:35 COUNTY:051
LATITUDE: 331632 LONGITUDE: 1062350 NAD83 DRAINAGE AREA: CONTRIBUTING DRAINAGE AREA: DATUM:4050 NGVD29
Date Processed: 2009-08-12 10:19 By swreview
Lowest aging status in period is APPROVED
DD #2
Discharge, cubic feet per second
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.44	0.39	19	0.60	0.62	0.57	0.48	0.36	0.29	0.19	0.22	24
2	0.51	0.39	1.8	0.63	0.65	0.55	0.48	0.37	0.28	0.18	0.17	3.1
3	0.44	0.39	0.61	0.65	0.62	0.56	0.48	0.40	0.25	0.30	0.15	0.79
4	0.42	0.39	0.52	0.70	0.62	0.55	0.50	0.42	0.21	0.54	0.15	0.59
5	0.42	0.39	0.47	0.69	0.63	0.56	0.48	0.44	0.13	0.33	0.17	0.51
6	0.40	0.38	0.47	0.63	0.58	0.55	0.49	0.42	0.15	0.27	0.14	0.48
7	0.41	0.39	0.45	0.58	0.63	0.56	0.48	0.39	0.21	1.3	0.16	0.45
8	0.39	0.41	0.45	0.65	0.65	0.57	0.48	0.39	0.20	3.5	0.15	0.56
9	0.41	0.39	0.50	0.62	0.62	0.58	0.41	0.40	0.21	39	0.21	0.49
10	0.44	0.39	2.1	0.62	0.62	0.55	0.42	0.39	0.22	68	0.32	64
11	0.43	0.39	5.6	0.63	0.64	0.56	0.43	0.37	0.20	73	0.19	44
12	0.39	0.40	0.91	0.61	0.63	0.57	0.45	0.36	0.15	0.61	0.14	66
13	0.35	0.40	0.69	0.61	0.61	0.56	0.48	0.29	0.16	58	0.13	1.1
14	0.35	0.39	0.62	0.61	0.53	0.48	0.48	0.34	0.17	17	0.13	0.53
15	0.37	0.37	0.55	0.59	0.60	0.49	0.46	0.42	0.18	0.38	0.13	0.42
16	0.37	0.40	0.57	0.61	0.89	0.45	0.41	0.56	0.18	0.29	89	0.39
17	0.36	0.40	0.62	0.55	0.80	0.51	0.42	0.50	0.16	0.24	87	0.38
18	0.36	0.40	0.62	0.54	0.67	0.51	0.45	0.57	0.15	0.27	3.1	0.39
19	0.36	0.40	0.64	0.60	0.66	0.52	0.47	0.46	0.17	0.20	2.4	0.37
20	0.36	0.40	0.63	0.59	0.63	0.51	0.44	0.41	0.17	0.19	21	10
21	0.35	0.42	0.62	0.62	0.63	e0.51	0.43	0.35	0.15	0.18	8.9	0.89
22	0.33	0.42	0.59	0.63	0.60	0.52	0.44	0.19	0.16	0.17	1.2	0.42
23	0.37	0.45	0.60	0.62	0.61	0.51	0.43	0.28	0.18	0.17	0.45	0.37
24	0.39	0.47	0.63	0.69	0.57	0.51	0.42	0.36	0.19	0.15	0.31	0.37
25	0.41	0.42	0.66	0.70	0.57	0.53	0.39	0.38	0.18	0.15	0.28	0.35
26	0.41	0.45	0.61	0.65	0.55	0.53	0.41	0.33	0.18	1.4	0.28	0.34
27	0.40	0.47	0.55	0.63	0.57	0.52	0.40	0.31	0.17	5.5	0.33	0.34
28	0.40	0.48	0.63	0.49	0.59	0.52	0.42	0.33	0.18	116	0.44	0.33
29	0.40	0.50	0.66	0.65	0.57	0.49	0.44	0.35	0.16	22	0.33	0.33
30	0.40	0.72	0.67	0.60	---	0.48	0.42	0.31	0.20	7.6	0.30	0.33
31	0.39	---	0.67	0.59	---	0.48	---	0.30	---	0.57	4.0	---
TOTAL	12.23	12.66	44.71	19.18	18.15	16.36	13.39	11.75	5.59	417.68	221.88	222.61
MEAN	0.39	0.42	1.44	0.62	0.63	0.53	0.45	0.38	0.19	13.5	7.16	7.42
MAX	0.51	0.72	19	0.70	0.89	0.56	0.50	0.57	0.29	116	89	66
MIN	0.33	0.37	0.45	0.49	0.53	0.45	0.39	0.19	0.13	0.15	0.13	0.33
AC-FT	24	25	89	38	36	32	27	23	11	828	440	442

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2008, BY WATER YEAR (WY)

MEAN	1.48	0.71	0.82	0.80	0.82	0.66	0.67	0.85	0.74	3.57	2.73	2.36
MAX	6.82	1.97	1.44	1.55	2.15	1.18	2.55	4.29	2.46	13.5	7.16	7.74
(WY)	2005	2005	2008	2005	2005	2005	2004	2005	1996	2008	2008	2001
MIN	0.02	0.13	0.19	0.27	0.34	0.29	0.15	0.08	0.00	0.00	0.29	0.06
(WY)	2004	2004	2004	2004	2004	2004	2006	2006	2006	2005	2002	2003

SUMMARY STATISTICS	FOR 2007 CALENDAR YEAR		FOR 2008 WATER YEAR		WATER YEARS 1995 - 2008	
ANNUAL TOTAL	554.47		1016.19			
ANNUAL MEAN	1.52		2.78		1.36	
HIGHEST ANNUAL MEAN					2.78	2008
LOWEST ANNUAL MEAN					0.52	2002
HIGHEST DAILY MEAN	144	Jul 5	116	Jul 28	154	Oct 5 2004
LOWEST DAILY MEAN	0.31	Jun 6	0.13	Jun 5	0.00	Aug 14 2002
ANNUAL SEVEN-DAY MINIMUM	0.36	Oct 16	0.16	Aug 2	0.00	Jul 5 2003
MAXIMUM PEAK FLOW			223	Jul 11	380	Sep 16 2001
MAXIMUM PEAK STAGE			5.29	Jul 11	7.12	Jul 5 2007
INSTANTANEOUS LOW FLOW			0.08	Jun 5	0.00	Aug 13 2002
ANNUAL RUNOFF (AC-FT)	1100		2020		983	
10 PERCENT EXCEEDS	1.2		0.74		1.0	
50 PERCENT EXCEEDS	0.60		0.45		0.48	
90 PERCENT EXCEEDS	0.39		0.19		0.14	

e Estimated

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480595 SALT CREEK NEAR TULAROSA, NM TYPE:STREAM AGENCY:USGS STATE:35 COUNTY:051
LATITUDE: 331632 LONGITUDE: 1062350 NAD83 DRAINAGE AREA: CONTRIBUTING DRAINAGE AREA: DATUM:4050 NGVD29
Date Processed: 2010-01-30 11:48 By swreview
Lowest aging status in period is APPROVED
DD #2
Discharge, cubic feet per second
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.33	0.42	0.49	0.62	0.66	0.64	0.52	0.42	0.35	0.12	0.13	0.00
2	0.32	0.41	0.52	0.63	0.64	0.66	0.51	0.41	0.18	0.10	0.15	0.00
3	0.32	0.42	0.52	0.63	0.67	0.67	0.45	0.41	0.15	0.14	0.14	0.00
4	0.32	0.38	0.51	0.65	0.67	0.66	0.46	0.42	0.15	7.4	0.13	0.00
5	0.72	0.38	0.54	0.61	0.67	0.62	0.50	0.41	0.14	2.8	0.13	0.01
6	3.3	0.39	0.53	0.63	0.65	0.59	0.52	0.39	0.11	0.55	0.16	0.03
7	0.68	0.38	0.54	0.62	0.67	0.52	0.54	0.38	0.09	9.0	0.56	0.04
8	0.43	0.40	0.56	0.63	0.66	0.57	0.49	0.35	0.11	0.44	0.24	0.06
9	0.40	0.44	0.60	0.63	0.65	0.62	0.48	0.33	0.13	0.27	0.14	0.06
10	0.37	0.42	0.52	0.59	0.66	0.68	0.49	0.34	0.15	0.18	0.12	0.06
11	0.40	0.47	0.57	0.60	0.66	0.63	0.64	0.33	0.14	0.13	0.11	0.07
12	0.57	0.47	0.59	0.62	0.66	0.63	0.77	0.32	0.13	0.12	0.10	0.09
13	0.41	0.47	0.53	0.61	0.67	0.70	0.61	0.32	0.11	0.11	0.10	0.08
14	0.46	0.49	0.52	0.63	0.64	0.72	0.54	0.31	0.11	0.11	0.61	1.5
15	0.63	0.40	0.60	0.63	0.66	0.71	0.37	0.32	0.09	0.12	3.5	0.89
16	0.51	0.45	0.59	0.64	0.67	0.66	0.44	0.32	0.09	0.13	0.25	22
17	0.43	0.46	0.61	0.64	0.62	0.64	0.47	0.32	0.10	0.15	0.08	9.2
18	0.39	0.48	0.59	0.65	0.65	0.64	0.50	0.35	0.11	0.25	0.04	1.2
19	0.39	0.49	0.59	0.65	0.65	0.63	0.50	0.35	0.13	0.18	0.02	0.38
20	0.40	0.52	0.60	0.65	0.65	0.63	0.50	0.33	0.13	0.17	0.01	0.71
21	0.41	0.42	0.58	0.65	0.65	0.63	0.48	0.35	0.12	4.4	0.00	0.39
22	0.39	0.49	0.55	0.68	0.66	0.58	0.47	0.54	0.11	2.2	0.00	0.12
23	0.35	0.52	0.49	0.70	0.67	0.44	0.46	0.50	0.13	0.21	0.00	0.06
24	0.39	0.51	0.62	0.70	0.69	0.49	0.42	1.3	1.4	0.14	0.01	0.07
25	0.41	0.51	0.56	0.68	0.67	0.52	0.41	0.91	0.37	0.63	0.05	0.08
26	0.39	0.54	0.48	0.55	0.65	0.48	0.41	0.36	0.12	0.24	0.06	0.09
27	0.36	0.78	0.59	0.61	0.65	0.51	0.43	0.33	0.10	0.13	0.04	0.08
28	0.40	0.74	0.57	0.60	0.61	0.55	0.43	0.42	0.10	0.11	0.07	0.07
29	0.42	0.61	0.59	0.62	---	0.53	0.43	0.24	0.12	0.11	0.03	0.03
30	0.42	0.52	0.60	0.61	---	0.52	0.42	0.23	0.12	0.11	0.02	0.04
31	0.42	---	0.62	0.64	---	0.51	---	2.2	---	0.11	0.00	---
TOTAL	16.14	14.39	17.37	19.60	18.38	18.58	14.66	14.51	5.39	30.86	7.00	37.41
MEAN	0.52	0.48	0.56	0.63	0.66	0.60	0.49	0.47	0.18	1.00	0.23	1.25
MAX	3.3	0.78	0.62	0.70	0.69	0.72	0.77	2.2	1.4	9.0	3.5	22
MIN	0.32	0.38	0.48	0.55	0.61	0.44	0.37	0.23	0.09	0.10	0.00	0.00
AC-FT	32	29	34	39	36	37	29	29	11	61	14	74

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2009, BY WATER YEAR (WY)

MEAN	1.41	0.69	0.80	0.78	0.81	0.66	0.65	0.83	0.70	3.39	2.55	2.29
MAX	6.92	1.97	1.44	1.55	2.15	1.18	2.55	4.29	2.46	13.5	7.16	7.74
(WY)	2005	2005	2008	2005	2005	2005	2004	2005	1996	2008	2008	2001
MIN	0.02	0.13	0.19	0.27	0.34	0.29	0.15	0.08	0.00	0.00	0.23	0.06
(WY)	2004	2004	2004	2004	2004	2004	2006	2006	2006	2005	2009	2003

SUMMARY STATISTICS	FOR 2008 CALENDAR YEAR		FOR 2009 WATER YEAR		WATER YEARS 1995 - 2009	
ANNUAL TOTAL	994.49		214.29			
ANNUAL MEAN	2.72		0.59		1.30	
HIGHEST ANNUAL MEAN					2.78	2008
LOWEST ANNUAL MEAN					0.52	2002
HIGHEST DAILY MEAN	116	Jul 28	22	Sep 16	154	Oct 5 2004
LOWEST DAILY MEAN	0.13	Jun 5	0.00	Aug 21	0.00	Aug 14 2002
ANNUAL SEVEN-DAY MINIMUM	0.16	Aug 2	0.00	Aug 30	0.00	Jul 5 2003
MAXIMUM PEAK FLOW			142	Sep 16	380	Sep 16 2001
MAXIMUM PEAK STAGE			4.73	Sep 16	7.12	Jul 5 2007
INSTANTANEOUS LOW FLOW			0.00	Aug 20	0.00	Aug 13 2002
ANNUAL RUNOFF (AC-FT)	1970		425		944	
10 PERCENT EXCEEDS	0.70		0.67		1.0	
50 PERCENT EXCEEDS	0.48		0.46		0.48	
90 PERCENT EXCEEDS	0.19		0.09		0.13	

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

STATION:08480595 SALT CREEK NEAR TULAROSA, NM TYPE:STREAM AGENCY:USGS STATE:35 COUNTY:051
LATITUDE: 331632 LONGITUDE: 1062350 NAD83 DRAINAGE AREA: CONTRIBUTING DRAINAGE AREA: DATUM:4050 NGVD29
Date Processed: 2010-01-30 11:58 By swreview
Lowest aging status in period is WORKING
DD #2
Discharge, cubic feet per second
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.03	0.12	0.50	0.21	---	---	---	---	---	---	---	---
2	0.00	0.12	0.31	0.24	---	---	---	---	---	---	---	---
3	0.10	0.12	0.22	0.24	---	---	---	---	---	---	---	---
4	0.14	0.12	0.62	0.23	---	---	---	---	---	---	---	---
5	0.09	0.12	0.50	0.23	---	---	---	---	---	---	---	---
6	0.07	0.12	0.36	0.24	---	---	---	---	---	---	---	---
7	0.08	0.13	0.26	0.23	---	---	---	---	---	---	---	---
8	0.07	0.13	0.17	0.23	---	---	---	---	---	---	---	---
9	0.07	0.13	0.20	0.21	---	---	---	---	---	---	---	---
10	0.06	0.13	0.20	0.24	---	---	---	---	---	---	---	---
11	0.08	0.13	0.21	0.25	---	---	---	---	---	---	---	---
12	0.07	0.15	0.22	0.24	---	---	---	---	---	---	---	---
13	0.09	0.12	0.21	---	---	---	---	---	---	---	---	---
14	0.09	0.12	0.25	---	---	---	---	---	---	---	---	---
15	0.09	0.13	0.28	---	---	---	---	---	---	---	---	---
16	0.05	0.12	0.24	---	---	---	---	---	---	---	---	---
17	0.04	0.12	0.25	---	---	---	---	---	---	---	---	---
18	0.05	0.14	0.25	---	---	---	---	---	---	---	---	---
19	0.08	0.14	0.24	---	---	---	---	---	---	---	---	---
20	0.09	0.14	0.24	---	---	---	---	---	---	---	---	---
21	0.13	0.14	0.25	---	---	---	---	---	---	---	---	---
22	0.10	0.15	0.26	---	---	---	---	---	---	---	---	---
23	0.10	0.14	0.38	---	---	---	---	---	---	---	---	---
24	0.09	0.14	0.29	---	---	---	---	---	---	---	---	---
25	0.10	0.14	0.23	---	---	---	---	---	---	---	---	---
26	0.09	0.14	0.21	---	---	---	---	---	---	---	---	---
27	0.08	0.16	0.21	---	---	---	---	---	---	---	---	---
28	0.07	0.16	0.22	---	---	---	---	---	---	---	---	---
29	0.13	4.5	0.38	---	---	---	---	---	---	---	---	---
30	0.11	0.94	0.33	---	---	---	---	---	---	---	---	---
31	0.12	---	0.25	---	---	---	---	---	---	---	---	---
TOTAL	2.51	9.16	8.74	---	---	---	---	---	---	---	---	---
MEAN	0.08	0.31	0.28	---	---	---	---	---	---	---	---	---
MAX	0.14	4.5	0.62	---	---	---	---	---	---	---	---	---
MIN	0.00	0.12	0.17	---	---	---	---	---	---	---	---	---
AC-FT	5.0	18	17	---	---	---	---	---	---	---	---	---

APPENDIX 3.--USGS QUALITY-OF-WATER RECORDS, 2008-2009

The data are preliminary, subject to revision, after review and certification. After the review and certification of the data, the information is available from the national data base accessible on the worldwide web maintained by the U.S. Geological Survey

Water Quality Data for White Sands Missile Range Sites 2008

Station Name and (ID Number)	Sample Date	Sample Time	P00020 Temp., air, degrees Celsius	P00061 Discharge, instant., cubic feet per second	P00300 Dissolved oxygen, water, unfiltered, milligrams per liter	P00400 pH, water, unfiltered, field, standard units	P00403 pH, water, unfiltered, laboratory, standard units	P90095 Specific conductance, water, unfiltered, laboratory, microsiemens per centimeter at 25 degrees Celsius	P00095 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	P00010 Temp., water, degrees Celsius	P70300 Dissolved solids dried at 180 degrees Celsius, water, filtered, milligrams per liter	P00915 Calcium, water, filtered, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	29	0.35	5.3	8	7.9	32400	31300	20	23100	788
	08/29/08	1024 Replicate Sample	29	0.35	5.3	8	7.9	32200	31300	20	23100	776
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	27.5				8.1	8		29	10	0.04
	08/28/08	1037	27.5	1.9	6.2	7.5	7.6	6280	5960	17.5	4970	635
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	25.5		15.7	7.8	7.9	5060	5270	25	4300	646
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	28	0.62	6.1	7.9	7.8	12600	13700	20	8310	384
SALT MARSH LOWER LAKE, sit (331622106191110)	08/28/08	1450	34		9.9	9	9.2	46200	48700	37	36800	1030
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	27.5	1.7	13.6	9.1	8.9	14600	16700	33.5	9740	373
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	28.5	1	6.1	8.7	8.5	18300	19600	18.5	12400	519

Station Name and (ID Number)	Sample Date	Sample Time	P00925 Magnesium, water, filtered, milligrams per liter	P00935 Potassium, water, filtered, milligrams per liter	P00930 Sodium, water, filtered, milligrams per liter	P29813 Acid neutralizing capacity, water, unfiltered, Gran titration, field, milligrams per liter as calcium carbonate	P29801 Alkalinity, water, filtered, fixed endpoint (pH 4.5) titration, laboratory, milligrams per liter as calcium carbonate	P39086 Alkalinity, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter as calcium carbonate	P00453 Bicarbonate, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter	P71870 Bromide, water, filtered, milligrams per liter	P00452 Carbonate, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter	P00940 Chloride, water, filtered, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	465	183	6160		174	170	203	2.21		10100
	08/29/08	1024 Replicate Sample	441	161	6380		174	170	203	2.04		9960
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	0.02	0.02	0.12		5			0.01		0.03
	08/28/08	1037	146	7.16	647		54	47	57	0.42		1160
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	150	4.95	366		75	66	79	0.36		707
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	134	57.3	2210		183	174	208	0.68		3620
SALT MARSH LOWER LAKE, sit. (331622106191110)	08/26/08	1450	2010	126	8000		79	72	64	4.04	11	15600
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	183	77.1	2570		46	50	46	0.89	7	4200
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	243	91.5	3190		66	60	66	1.1	4	5370

Station Name and (ID Number)	Sample Date	Sample Time	P00950 Fluoride, water, filtered, milligrams per liter	P00955 Silica, water, filtered, milligrams per liter as SiO2	P00945 Sulfate, water, filtered, milligrams per liter	P00631 Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	P00613 Nitrite, water, filtered, milligrams per liter as nitrogen	P00671 Orthophosphate, water, filtered, milligrams per liter as phosphorus	P01106 Aluminum, water, filtered, micrograms per liter	P01005 Barium, water, filtered, micrograms per liter	P01010 Beryllium, water, filtered, micrograms per liter	P01025 Cadmium, water, filtered, micrograms per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	3.04	12.3	4150	0.04	0.002	0.011	24	93.6	0.4	1
	08/29/08	1024 Replicate Sample	3.17	13.1	4290	0.04	0.002	0.01	24	116	4	12
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	0.01	0.04	0.01	0.04	0.002	0.006	1.6	0.4	0.2	0.6
	08/28/08	1037	1.3	24.9	1910	3.01	0.002	0.009	5.3	11.7	0.8	2
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	1.28	22	1990	0.03	0.001	0.004	2.7	10.4	0.6	2
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	1.51	20.3	1360	0.67	0.048	0.088	6	110	2	6
SALT MARSH LOWER LAKE, sit. (331622106191110)	08/28/08	1450	6.79	0.84	8290	0.04	0.002	0.004	32	8.3	5	15
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	1.45	5.95	1750	0.03	0.001	0.006	9.6	93.7	2	6
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	1.55	4.22	2360	0.04	0.002	0.006	12.8	86.6	2	6

Station Name and (ID Number)	Sample Date	Sample Time	P01030 Chromium, water, filtered, micrograms per liter	P01035 Cobalt, water, filtered, micrograms per liter	P01040 Copper, water, filtered, micrograms per liter	P01046 Iron, water, filtered, micrograms per liter	P01049 Lead, water, filtered, micrograms per liter	P01130 Lithium, water, filtered, micrograms per liter	P01056 Manganese, water, filtered, micrograms per liter	P71890 Mercury, water, filtered, micrograms per liter	P01060 Molybdenum, water, filtered, micrograms per liter	P01065 Nickel, water, filtered, micrograms per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	2	3	16	52	1.2	3250	332	0.01	4	4
	08/29/08	1024 Replicate Sample	24	28	40	160	1.2	2770	414	0.01	40	40
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	1	1	2	8	0.08	0.04	0.4	0.01	2	2
	08/28/08	1037	5	6	8	32	0.14	70	1.6	0.01	8	8
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	4	4	6	17	0.87	74	1.3	0.01	6	6
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	12	14	20	80	0.56	842	128	0.01	20	20
SALT MARSH LOWER LAKE, sit. (331622106191110)	08/28/08	1450	30	35	50	200	1.6	1130	6.8	0.01	32	50
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	12	14	20	80	0.43	1060	6.8	0.01	20	20
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	12	14	20	80	0.8	1310	55.7	0.01	20	16

Station Name and (ID Number)	Sample Date	Sample Time	P01075 Silver, water, filtered, micrograms per liter	P01080 Strontium, water, filtered, micrograms per liter	P01085 Vanadium, water, filtered, micrograms per liter	P01090 Zinc, water, filtered, micrograms per liter	P01000 Arsenic, water, filtered, micrograms per liter	P01020 Boron, water, filtered, micrograms per liter	P01145 Selenium, water, filtered, micrograms per liter	P70331 Suspended sediment, sieve diameter, percent smaller than 0.0625 millimeters	P80154 Suspended sediment concentration, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	4	19000	3	8	5.7	922	1.6	88	10
	08/29/08	1024 Replicate Sample	36	18800	15	80	6.2	967	1.7		
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	2	0.4	0.6	4	0.06	1.9	0.04		
	08/28/08	1037	7	11400	11	16	1.5	184	5.5	65	12
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	5	9590	5	12	0.44	171	2.3	31	1
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	18	7550	7	40	3.7	330	1	71	12
SALT MARSH LOWER LAKE, slt. (331622106191110)	08/28/08	1450	45	36600	20	100	9.1	3900	2.3	25	30
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	18	6510	8	40	3	511	0.83		
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	18	10600	6	40	3.5	560	0.95	99	767

Water Quality Data for White Sands Missile Range Sites 2009

Station Name and (ID Number)	Sample Date	Sample Time	P00020 Temp., air, degrees Celsius	P00061 Discharge, instant., cubic feet per second	P00300 Dissolved oxygen, water, unfiltered, milligrams per liter	P00400 pH, water, unfiltered, field, standard units	P00403 pH, water, unfiltered, laboratory, standard units	P90095 Specific conductance, water, unfiltered, laboratory, microsiemens per centimeter at 25 degrees Celsius	P00095 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	P00010 Temp., water, degrees Celsius	P70300 Dissolved solids dried at 180 degrees Celsius, water, filtered, milligrams per liter	P00915 Calcium, water, filtered, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	07/14/09	1608	33	0.11	5.2	8.2	8.2	48200	50300	28	35300	1160
MALPAIS SPRING NR OSCURO (08480594)	07/14/09	1710	33.5	2.1	6.2	7	7.6	6010	6660	16.5	4880	728
	07/14/09	1713 Replicate Sample					7.5	6020			4900	754
MOUND SPRING (UPPER POND) (332535106170501)	07/15/09	1105 Field Blank					8.4	5			10	0.03
	07/15/09	1152	36		7.7	7.4	7.7	5170	5350	26.5	4450	760
SALT CREEK 4 AT RANGE ROAD (332057106211310)	07/14/09	1243	39	0.17	8.3	7.7	7.8	33600	34500	27	23800	1170
SALT MARSH LOWER LAKE, sit. (331622106191110)	07/15/09	1511	39.5		11.6	7.6	7.7	6200	6460	25	4880	733
SALT CREEK NR NW-50 ON WSM (331158106265710)	DRY											
SALT CREEK 3 AT RANGE ROAD (330716106234510)	DRY											

Station Name and (ID Number)	Sample Date	Sample Time	P00925 Magnesium, water, filtered, milligrams per liter	P00935 Potassium, water, filtered, milligrams per liter	P00930 Sodium, water, filtered, milligrams per liter	P29813 Acid neutralizing capacity, water, unfiltered, Gran titration, field, milligrams per liter as calcium carbonate	P29801 Alkalinity, water, filtered, fixed endpoint (pH 4.5) titration, laboratory, milligrams per liter as calcium carbonate	P39086 Alkalinity, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter as calcium carbonate	P00453 Bicarbonate, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter	P71870 Bromide, water, filtered, milligrams per liter	P00452 Carbonate, water, filtered, inflection-point titration method (incremental titration method), field, milligrams per liter	P00940 Chloride, water, filtered, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	07/14/09	1608	605	271	9670			45	51	3.59	2	16500
MALPAIS SPRING NR OSCURO (08480594)	07/14/09	1710	169	7.41	660			46	56	0.44		1130
	07/14/09	1713 Replicate Sample	175	7.82	687					0.45		1130
MOUND SPRING (UPPER POND) (332535106170501)	07/15/09	1105 Field Blank	0.014	0.06	0.12					0.02		0.02
	07/15/09	1152	157	4.58	374			84	102	0.41		751
SALT CREEK 4 AT RANGE ROAD (332067106211310)	07/14/09	1243	441	167	6560			165	200	2.36		11400
SALT MARSH LOWER LAKE, sit (331622106191110)	07/15/09	1511	170	7.49	669	48		48	58	0.42		1150
SALT CREEK NR NW-50 ON WSM (331158106265710)	DRY											
SALT CREEK 3 AT RANGE ROAD (330716106234510)	DRY											

Station Name and (ID Number)	Sample Date	Sample Time	P00950 Fluoride, water, filtered, milligrams per liter	P00955 Silica, water, filtered, milligrams per liter as SiO2	P00945 Sulfate, water, filtered, milligrams per liter	P00631 Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	P00613 Nitrite, water, filtered, milligrams per liter as nitrogen	P00671 Orthophosphate, water, filtered, milligrams per liter as phosphorus	P01106 Aluminum, water, filtered, micrograms per liter	P01005 Barium, water, filtered, micrograms per liter	P01010 Beryllium, water, filtered, micrograms per liter	P01025 Cadmium, water, filtered, micrograms per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	3.04	12.3	4150	0.04	0.002	0.011	24	93.6	0.4	1
	08/29/08	1024 Replicate Sample	3.17	13.1	4290	0.04	0.002	0.01	24	116	4	12
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	0.01	0.04	0.01	0.04	0.002	0.006	1.6	0.4	0.2	0.6
	08/28/08	1037	1.3	24.9	1910	3.01	0.002	0.009	5.3	11.7	0.8	2
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	1.28	22	1990	0.03	0.001	0.004	2.7	10.4	0.6	2
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	1.51	20.3	1360	0.67	0.048	0.088	6	110	2	6
SALT MARSH LOWER LAKE, sit. (331622106191110)	08/28/08	1450	6.79	0.84	8290	0.04	0.002	0.004	32	8.3	5	15
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	1.45	5.95	1750	0.03	0.001	0.006	9.6	93.7	2	6
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	1.55	4.22	2360	0.04	0.002	0.006	12.8	86.6	2	6

Station Name and (ID Number)	Sample Date	Sample Time	P01030 Chromium, water, filtered, micrograms per liter	P01035 Cobalt, water, filtered, micrograms per liter	P01040 Copper, water, filtered, micrograms per liter	P01046 Iron, water, filtered, micrograms per liter	P01049 Lead, water, filtered, micrograms per liter	P01130 Lithium, water, filtered, micrograms per liter	P01056 Manganese, water, filtered, micrograms per liter	P71890 Mercury, water, filtered, micrograms per liter	P01060 Molybdenum, water, filtered, micrograms per liter	P01065 Nickel, water, filtered, micrograms per liter
SALT CREEK NEAR TULAROSA (08480595)	08/29/08	1020	2	3	16	52	1.2	3250	332	0.01	4	4
	08/29/08	1024 Replicate Sample	24	28	40	160	1.2	2770	414	0.01	40	40
MALPAIS SPRING NR OSCURO (08480594)	08/28/08	0945 Field Blank	1	1	2	8	0.08	0.04	0.4	0.01	2	2
	08/28/08	1037	5	6	8	32	0.14	70	1.6	0.01	8	8
MOUND SPRING (UPPER POND) (332535106170501)	08/27/08	1455	4	4	6	17	0.87	74	1.3	0.01	6	6
SALT CREEK 4 AT RANGE ROAD (332057106211310)	09/03/08	1010	12	14	20	80	0.56	842	128	0.01	20	20
SALT MARSH LOWER LAKE, sit. (331622106191110)	08/28/08	1450	30	35	50	200	1.6	1130	6.8	0.01	32	50
SALT CREEK NR NW-50 ON WSM (331158106265710)	09/03/08	1505	12	14	20	80	0.43	1060	6.8	0.01	20	20
SALT CREEK 3 AT RANGE ROAD (330716106234510)	09/04/08	1000	12	14	20	80	0.8	1310	55.7	0.01	20	16

Station Name and (ID Number)	Sample Date	Sample Time	P01075 Silver, water, filtered, micrograms per liter	P01080 Strontium, water, filtered, micrograms per liter	P01085 Vanadium, water, filtered, micrograms per liter	P01090 Zinc, water, filtered, micrograms per liter	P01000 Arsenic, water, filtered, micrograms per liter	P01020 Boron, water, filtered, micrograms per liter	P01145 Selenium, water, filtered, micrograms per liter	P70331 Suspended sediment, sieve diameter, percent smaller than 0.0625 millimeters	P80154 Suspended sediment concentration, milligrams per liter
SALT CREEK NEAR TULAROSA (08480595)	07/14/09	1608	9	34300	3	7	2.3	1980	1.5		
MALPAIS SPRING NR OSCURO (08480594)	07/14/09	1710	16	12900	10	6	1.6	266	7.7		4400
	07/14/09	1713 Replicate Sample	16	13300	10	8	1.6	257	8.1		
MOUND SPRING (UPPER POND) (332535106170501)	07/15/09	1105 Field Blank	4	0.4	1	2	0.06	1.4	0.06		
	07/15/09	1152	4	10600	3	2	0.86	242	2.8		
SALT CREEK 4 AT RANGE ROAD (332057106211310)	07/14/09	1243	80	25200	20	40	0.9	887	6.1		1600
SALT MARSH LOWER LAKE, sit. (331622106191110)	07/15/09	1511	16	13000	13	4	1.7	238	7.2		
SALT CREEK NR NW-50 ON WSM (331158106265710)	DRY										
SALT CREEK 3 AT RANGE ROAD (330716106234510)	DRY										